WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

Land Transport Asset Management Plan 2024-34

ŌTOROHANGA DISTRICT COUNCIL

AUGUST 2023

Te Kaunihera ā-Rohe o
Ōtorohanga
District Council
Where kiwi can fly

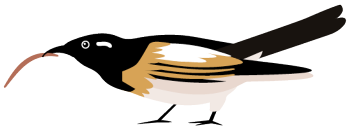
FRAMEWORK

RESPONSIBILITY	Group Manager Engineering & Assets
STATUS	DRAFT
NEXT REVIEW DATE	1 July 2027
REVIEW FREQUENCY	Three Years
APPROVAL AUTHORITY	Waka Kotahi New Zealand Transport Agency
CONSULTATION REQUIRED	Aligns with Long Term Plan
ASSOCIATED DOCUMENTS	Council's Long Term Plan Infrastructure Strategy Financial Strategy District Plan

REVISION RECORD

DOCUMENT

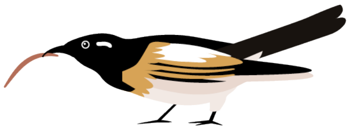
Revision	Revision Date	Issued By	Details	PDF Doc ID
1.0	24 August 2023	E Good	Initial issue for Internal comment	
1.1	25 August 2023	R Griffin	Initial Proofread	
1.2	29 August 2023	M Lewis	Internal Review	
1.3	31 August 2023	M Lewis	Final Draft	



DISCLAIMER

This Asset Management Plan for the Ōtorohanga District Council roading activity:

a) has been prepared on the basis of information provided up to 15 August 2023;
b) is for the sole use of Ōtorohanga District Council;
c) must not be used by any person other than Ōtorohanga District Council; and,
d) has been prepared ahead of the issue of the Government Policy Statement for Land Transport and its associated guidance and priority setting for each activity class.



INTRODUCTION

The Ōtorohanga District Land Transport Activity Management Plan sets out the direction for Ōtorohanga District Council's land transport activity for the next 10 years.

It describes Council's roading network, how it will be managed, and the basis for its chosen areas of focus. It also provides the reasons why this plan has been prepared and explains the work gone into developing it.

The plan includes outcomes and strategies, and covers all Council vested assets associated with transport services. It also acknowledges and incorporates the values and principles developed by Te Ringa Maimoa (formerly Road Efficiency Group, REG).

PURPOSE

The purpose of the Activity Management Plan (AMP) is to ensure that Council's land transport assets are operated and maintained in a sustainable and cost-effective manner in order to provide the required level of service for both present and future users.

The AMP supports this by demonstrating responsible management and operation of the roading network; justifying funding requirements; complying with statutory requirements; and demonstrating clear linkage to agreed community outcomes and levels of service.

This AMP will be used by Council's roading team to ensure that the management, financial, engineering, and technical processes and procedures are appropriately undertaken.

TEAM EFFORT

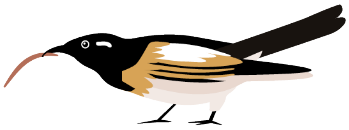
The planning process to develop the AMP was inclusive of the roading team with results achieved via in depth discussion and consensus. This will ensure the team has greater ownership in both the planning and subsequent implementation of the AMP and forward works programme.

TE RINGA MAIMOA

The Te Ringa Maimoa programme supports the New Zealand transport sector to deliver an integrated system which aligns with the objectives of local, regional and central Government. The One Network Road Classification (ONRC) system has become a core element of the transport management system over the past eight years, providing a consistent and well-understood classification for a wide range of planning processes.

That work that Te Ringa Maimoa has done has been of great benefit to Ōtorohanga District Council's roading team by providing training, support in decision making, and improving the capability of the team. The tools provided by Te Ringa Maimoa have proven beneficial, including empowering the decision making, which in turn optimises the use of funds in balance with maintaining an acceptable level of service for road users in the Ōtorohanga District.

With the knowledge gained by Te Ringa Maimoa and further work being done to create better consistency and best practice, the development of the One Network Framework (ONF) – which involves people and places as key considerations in network planning, has been adopted across the roading network sector.



EXECUTIVE SUMMARY

Ōtorohanga District Council intends to provide a well maintained and consistent roading network that meets a pleasing level of service in the most cost-effective manner, for residents and other road users travelling through the district. This aligns with Council's vision for the district: to be dynamic, inclusive and unique - a place where kiwi can fly, supported by themes of people, place and partnerships and a focus on resilience, sustainability and transformation.

By working towards this, Council is committed to providing clear logic, reasoning and context behind how we propose to operate, maintain, renew and improve Ōtorohanga's land transport network. The road network is an integral part of the district's transport system and ongoing maintenance, safety and network improvements are important to ensure the best use of this infrastructure, while supporting community needs.

PLANNING AND DEVELOPMENT

In planning the development of the 2024-2034 Land Transport Activity Management Plan, the roading team has maintained the rigor of its previous AMP which was independently evaluated as one of the highest scoring AMPs across all Road Controlling Authorities (RCAs). A lot of thought and data analysis has gone into the process to ensure the best value for Council's roading spend. This includes extensive use of the infrastructure asset management software dTIMS, which calculates the renewal times of roads. This data gives the roading team a starting point, which combined with field validation, ensures there is a consistency throughout the network. Feedback from road users and requests via Council's Service Request system are also taken into account. Comprehensive cost estimates and business case analyses have also been undertaken to prove money is well spent, and workshops with elected members and external stakeholders helped identify issues which are important to our community.

Our vision remains to continue to provide a well maintained and consistent roading network that meets a pleasing level of service in the most cost-effective manner.

Ōtorohanga District Council has also embraced the values and principles developed by Te Ringa Maimoa and has used many of their tools to maintain capability in all aspects of the roading team, including planning, decision making, training, improved knowledge and consistent levels of service. With Te Ringa Maimoa's new road classification programme, One Network Framework (ONF), evolving to include people and places as key considerations in network planning, the roading team continue to incorporate ONF into the AMP as well as day-to-day business as usual.

A lot of thought and data analysis has gone into the process to ensure the best value for Council's roading spend.

PROCESS

The robust process undertaken to update the AMP gives assurance that ratepayer money and Waka Kotahi funding is spent prudently. The AMP will validate the value of any investment made in addressing our transport issues as well as undertaking core business activities such as road maintenance. The AMP also provides greater transparency and an understanding of the planning process used to determine the areas of focus and agreed outcomes while working towards the vision.

DIRECTION

While the Infrastructure Strategy sets the strategic direction to ensure the roading network continues to meet the needs of the district and people travelling through it, the AMP aligns with the overall strategy and includes tactical planning in order to implement it. The AMP also defines the scope of work required and associated costs over the next 10 years. It is important that we also show how we will meet regulatory requirements and address current and future environmental challenges. Together, the Infrastructure Strategy and this AMP contribute to the achievement of Council's vision for the district.

The AMP informs and determines what roads we are going to rehabilitate and when, what safety improvements need to be made, what roads will be resealed and when, how we are going to control vegetation, how we will maintain stormwater drainage, edge markers, bridges, and how and when we will maintain and renew unsealed metal roads. The AMP also feeds directly into Council's Long Term Plan.

The specific purpose of this AMP is to:

- Demonstrate responsible stewardship of the roading assets
- Provide the basis for compliance with the Local Government Act (2002), tracking changes in service potential and determining optimal long-term financial strategies for roading network assets
- Manage the environmental, social and financial risks associated with roading assets
- Achieve best value asset management by optimising life cycle activities
- Assess the demand and key performance indicators for roading assets to inform best practice asset and activity management

Over the past three years Ōtorohanga District Council has made a concerted effort to maintain and improve the standard of its asset management. It is also recognised for the level of service of its roading assets. Notwithstanding, our practices are subject to independent external review and there will always be ways in which we can improve our processes and practices to become more efficient and effective.

As part of a continuous improvement programme, identified projects in this area include further development of:

- Risk and project management processes
- Level of service monitoring and performance management
- Asset inventory and work management systems
- Renewal planning systems

Despite challenging economic circumstances, particularly in relation to the ongoing impacts of COVID-19, we have a busy time ahead ensuring the Ōtorohanga District is a safe place to live, and our services and facilities meet the needs of the community.

DISTRICT OVERVIEW

Ōtorohanga District encompasses 1,976 square kilometres (197,600 hectares) of predominantly rural land on the west coast of the Central North Island. The western boundary is the Tasman Sea. It is adjacent to Waipā District to the north, South Waikato District to the east and Waitomo District to the south.

Ōtorohanga is the principal administrative and main trading centre, with approximately 30% of the district population residing in the town. There are a number of smaller settlements located throughout the district, the largest of which is the popular beach settlement of Kāwhia.
The district is part of the North King Country, but is also located within the Waikato Region. State Highways 3 and 31/39 run through the district.

DESCRIPTION OF SERVICE

The roading activity involves the maintenance, renewal and development of roads, kerbs and channels, bridges, street lighting, footpaths, culverts and underpasses, and signage for all roads (except state highways) in the district.

State highways fall under the jurisdiction of Waka Kotahi.

The district is reliant on road transport to move people, goods and services around, and the Council maintains its roads in accordance with this AMP.

FINANCE

The fair value of the Council’s roading assets at 30 June 2020 is $306.9 million excluding land (e.g. road reserve).

Roading infrastructure (including footpaths) is by far the most significant activity of Council in financial terms, accounting for more than 80% of Council’s total assets by value, and more than 40% of total operating expenditure.

Over the next 10 years, to sustain current levels of service, existing assets will require a baseline expenditure of $107 million (up from $92), (un-escalated) in relation to operating, maintaining, renewing and managing the built asset base.

Additionally, over the next 10 years, a further $19 million expenditure is planned to deliver improvements to assets and address the impacts of a changing climate.

Not all identified service improvements, such as seal extensions or the creation of new footpaths, have been included as funded projects for the next 10 years in this Activity Management Plan. Typically, as an example, using ten years to complete these unfunded projects could require an estimated $6.5 million additional expenditure on footpaths alone.

During the 2021/31 LTP Council committed $200,000 local share (unsubsidised) per annum to complete seal extensions, which works out to be less than 1km of sealing per year, this will be considered in the next LTP. With 278 km of unsealed roading in the district, it would take at least 278 years for the entire roading network to be sealed under the current commitment. A total of $56 million in capital expenditure would need to be 100% funded from rates to complete seal extensions in a quicker timeframe. As it costs more to maintain sealed roads, an estimated $640K per year would need to be budgeted to maintain the network to a pleasing level of service.

WAKA KOTAHI MODERATION PROCESS

Following the submission of this and funding requests from all RCAs Waka Kotahi will go through a process of considering the affordability of all requests, and as there is currently a draft Government Policy Statement in place for the next three year NLTP block, there is uncertainty about the national funding available. This AMP is therefore based on the previous approved version.

SCOPE

While much of the content in this AMP focuses on the next 10 years, to facilitate and demonstrate alignment with the Long Term Plan, in practice, activity management planning tends to be considered over much longer time frames. The majority of community assets have life cycles far greater than 10 years. More than 80% of the replacement value of the existing fixed asset base relates to assets which have useful lives well in excess of 50 years and are inter-generational in nature. Roading assets make up a substantial proportion of the Council's infrastructure assets by value.

DRIVERS

Key drivers of activity management planning include legislative requirements and customer demands.
The Local Government Act 2002 states that the purpose of local government relating to transportation is:

"To enable the free, efficient and safe movement of people, goods and services around the district."

It therefore follows that Ōtorohanga District Council exists principally to supply services as directed or permitted by legislation to meet the needs of the communities of Ōtorohanga district.

In the case of roading, the services relate to enabling our communities to travel safely, easily and efficiently through the district while maintaining good access to properties, businesses and other areas of interest.

The Act requires:

- Identification of community outcomes
- Policy of significance identifying critical assets
- Development of the LTP every three years
- A process to identify community outcomes and priorities every six years
- Amendments to the LTP to go through special consultative procedure.

Activity Management Plans are major feeder plans for the LTP and they are a key input to it. The Council's community outcomes form an integral part of the Long Term Plan (LTP) and this AMP and the management of the road network, as a critical asset, are key contributors to the achievement of those outcomes.

STAKEHOLDERS

The services provided by Council depend on the levels of service determined by the community. How the services are provided are determined by the Council in response to the requirements of both the key stakeholders and legislation.

Key stakeholders are broadly defined as:

- Customers
- Elected members
- Other Stakeholders

CUSTOMERS – Ōtorohanga District Council's customers are the direct users of the district's roading network. This includes commercial and private road users and users of footpaths.

ELECTED MEMBERS – Elected members represent the interests of the community. They include Councillors and Community Board members for Ōtorohanga and Kawhia.

OTHER STAKEHOLDERS – These are parties with an interest in the management of ODC road assets and include, although are not necessarily limited to:

- Staff from ŌDC e.g. Roading Team, consultants and contractors
- New Zealand Transport Agency/Waka Kotahi
- Ministry of Transport
- Police
- Co-Lab
- RATA
- Te Ringa Maimoa (Previously Road Efficiency Group -REG)
- Waikato Regional Council
- Business community
- Local Iwi

LEVELS OF SERVICE

Roads are essential to the community's economic and social wellbeing. The district's roads, footpaths and associated infrastructure have been consistently well designed, constructed and maintained, and provide levels of service that meet current and expected future needs. No significant level of service issues are expected to arise over the period of this AMP.

In order to meet ODC's vision *"to provide a well maintained and consistent roading network that meets a pleasing level of service in the most cost effective manner",* various performance measures are collated to provide evidence that our vision is being achieved.

Data is regularly captured to identify, classify, value and rate the asset's condition. All this information is stored in the RAMM software where it can be accessed when required in formats that satisfies Forward Works Programmes (FWP). Whilst evaluating this data a negative trend has been identified as commencing the relation to the measures used to assess the deterioration of water proofing road surface layers. This is not yet at a stage of major concern, however, measures have been made to start to address this as the failure mode can cause rapid deterioration of the road if left unchecked, when the tipping point is reached and water enters the pavement layers.

Condition surveys and validations are regularly undertaken to keep the data in RAMM as accurate as possible. This information is then used to determine treatment selection of road sections for maintenance, reseal sections and rehabilitation sites. The best option is then selected for longevity and value for money.

Council has invested large amounts of funding to create the best possible surfaced roads that can be afforded by the residents over many years. It is imperative to maintain this high standard for the current and future residents of the district. A well maintained road network allows for economic prosperity.

Ōtorohanga District Council has very low numbers of fatal and serious crashes compared to national statistics.

Targeted education of road users and working towards speed management is the proposed response to maintaining the level of service.

Based on our gathered information, it is widely believed that the customers and stakeholders are generally well satisfied with the current land transport standards and management practices which go together to form the customer level of service.

PROBLEM AND BENEFIT STATEMENTS

Over the next 10 years, the roading team will face a variety of issues and challenges. A Logic Mapping workshop involving a range of stakeholders was completed for the 2021-31 LTP and identified three primary problems relating to transport activity which are still relevant for this 2024-34 AMP:

1. *The central location and attractiveness of the district is increasing growth, placing additional demand on infrastructure and resources.*
2. *Increasing pressure from climate and environmental impacts coupled with a lack of courageous leadership is leading to increased risk to communities.*
3. *The current state of our infrastructure and how people use it is unable to meet the speed and uncertainty of technological change.*

These problem statements are additional to the 'business as usual' challenges of managing a safe and effective road network for our customers. More recent consultation and discussion with the community has not identified any significant change to these.

Investment in addressing these challenges will generate the benefits outlined below:

1. Strong community leadership focussed on the future of the district's success.
2. Increased prosperity for the whole district.
3. *Building a thriving and healthy community where people want to stay and grow.*

With reference to the above benefits this document relates to and supports them in the following ways. This forward works programme and level of service requirements have been developed based on input from strong community leaders. The production of the last AMP's content demonstrated strong leadership from the team who compiled the document where every previous assumption was challenged with a fresh perspective once the Investment Logic Mapping exercise, (some 17 early engagement meetings across the district which were well attended by local residents) and subsequent Council workshops summarising the themes identified had been completed. This resulted in a fit for purpose 10 year programme which reflected the needs of the district. The quality of this work was such that it formed the basis of the planning during the current AMP update which largely verified previous assumptions and confirmed that council was indeed on the right track.

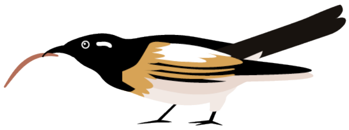
By maintaining our road network to an acceptable level of service and adding well planned and cost-effective improvements, this document will help ensure the prosperity of the district by making it easy to transport people and products around the district. A further benefit of such well planned maintenance and hence a reduction in the overall life costs of the assets, will help maintain the prosperity of those residing in the district by keeping rates at a reasonable level and optimising the overall funding input from Waka Kotahi. Perhaps most importantly, a well-maintained roading network makes the district an enjoyable place to live and adds a sense to pride to the residents which will then attract others to move to the Ōtorohanga District.

A well-maintained road network is a safe road network. When people feel safe on the roads this is a major factor in enjoying the place where they live. There is a theme running through this document which identifies areas within the network where minor safety improvements can be completed which will continue to reduce the chances of serious injuries being incurred in the event of a driver making an error or judgement. There is also provision within this document to continue the funding for a fulltime Road Safety Co-ordinator plus associated educational promotions and a number of rest stops planned for high traffic holidays and travel times.

FURTHER CHALLENGES

With 96% of the district's roads being rural, a large portion of our road users in the district are associated with the agricultural sector, either directly or via supporting functions. The two State Highways carry the bulk of the through-district travellers. A challenge relating to this is unplanned events requiring a road closure / detour on the State Highway network for road crashes, weather events or similar, which puts more pressure on local roads.

Challenges also include freight; the increasing size of commercial vehicles which puts pressure on the capacity (width) of some roads; and addressing the potential impacts of climate change. To help mitigate this changing environment, ŌDC is committed to increasing the size of culverts when needed and a stronger



focus on vegetation control among others. There is also a significant budget allocated to widening roads which fall below the desired width standard to make these roads safer.
Continued themes in Waka Kotahi's Arataki (30 year plan) include, sea level rise, increased rain and storm intensity and frequency which will affect communities, particularly Kāwhia and Aotea. Council will consider the effects of sea level rise within our road planning and resilience improvements, particularly in the areas that are vulnerable to increased coastal inundation. Waikato Regional Council's coastal inundation (sea level rise) tool has not changed in the last three years which indicates that the model remains relevant and this is again included in this document.

ASSUMPTIONS

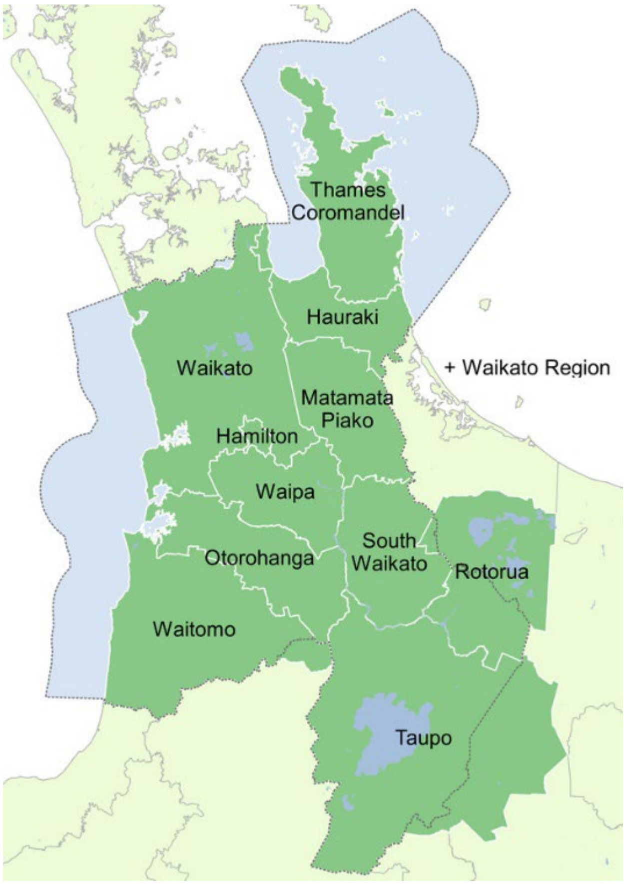
In developing the AMP, Council has made the following assumptions about the district and its roading network:

- Potential increases in subdivisions will increase demand for extending the roading network
- A potential increase in demand for seal extensions
- Community efforts to reduce injuries and road fatalities will continue
- Climate change will impact on storm events; this in turn will result in the increased likelihood of road damage particularly in rural areas of the district as well as in Kawhia and Aotea due to rising sea levels
- Roading costs will continue to increase over time
- External funding, mainly through the New Zealand Transport Agency, will remain at similar levels to those currently received. This could lead to Agency expectations that levels of service will be maintained by seeking further opportunities for value-for-money and improved efficiencies (Note the Funding Assistance Rate (FAR) has increased from 61% to 63%)
- The economic impacts of COVID-19 and Cyclone Gabrielle are yet to be fully realised, which could in turn impact funding and create variances with tender submissions and a resource constrained sector.

A WORKING DOCUMENT

This document is designed to be used on a day to day basis – the detailed planning on the forward works programme for the next three years means that the programme is confirmed and can be implemented. As the effects of climate change and Cyclone Gabrielle become more apparent it is anticipated that staff will review this document on a regular basis, to update each annual plan as a minimum requirement.

STRATEGIC CONTEXT



Waikato Region

DISTRICT OVERVIEW

Ōtorohanga District Council is a territorial local authority in the Waikato region of New Zealand. It covers an area of 1976 square kilometres that extends from the shores of the Tasman Sea in the West to the Waikato River in the East. It has diverse topography, productive farmland, extensive native vegetation, ocean beaches and protected harbours.

The principal township is Ōtorohanga located centrally in the District with a smaller urban settlement of Kāwhia located at the coast, which is a popular holiday destination.

The District maintains 804 km of roads (526km sealed) with latest daily traffic volumes ranging from 1440 to 10 (rural) and 3150 to 20 (urban) vehicles per day.

POPULATION AND GROWTH

Based on the 2018 census (2023 Census data not yet published), there are 10,104 of us living in the District, of which 3027 (30%) are in Ōtorohanga town. We collectively make up 0.2% of New Zealand's population. More recent estimates indicate we have grown to around 10,500. This indicates our numbers have been growing at an annual rate of around 2% since 2013. This population growth is a positive sign, as numbers had previously been dropping since the 1990s and were likely to stay static or only grow slightly.

The population growth is relatively evenly split between rural and urban.

There are likely to be many reasons for our numbers increasing, which is predominantly associated with people moving into the District, rather than a significant increase in the birth rate. Some of our new residents have been attracted by the lifestyle and relatively cheap housing, some have come to set up new businesses or take up a new job, and others may have come to connect with family/whanau.

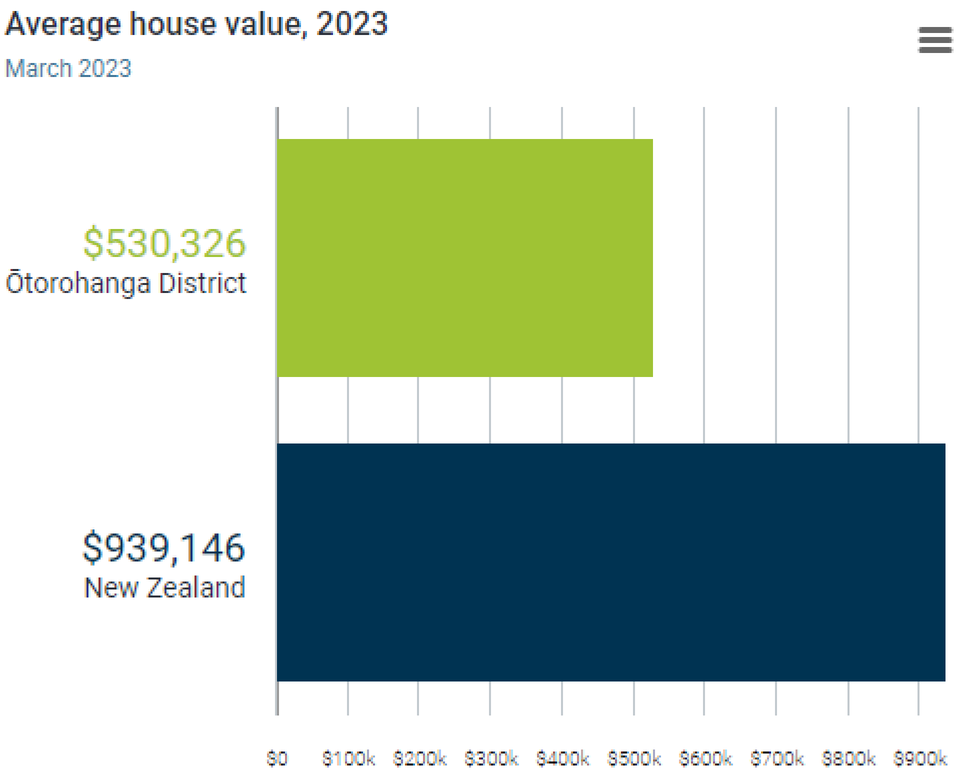
We are becoming more ethnically diverse, with new residents arriving from different parts of the world. More than 11% of us were born overseas. European (67%) and Māori (26%) still make up the majority of the population, although 33% of us have Māori ancestry.

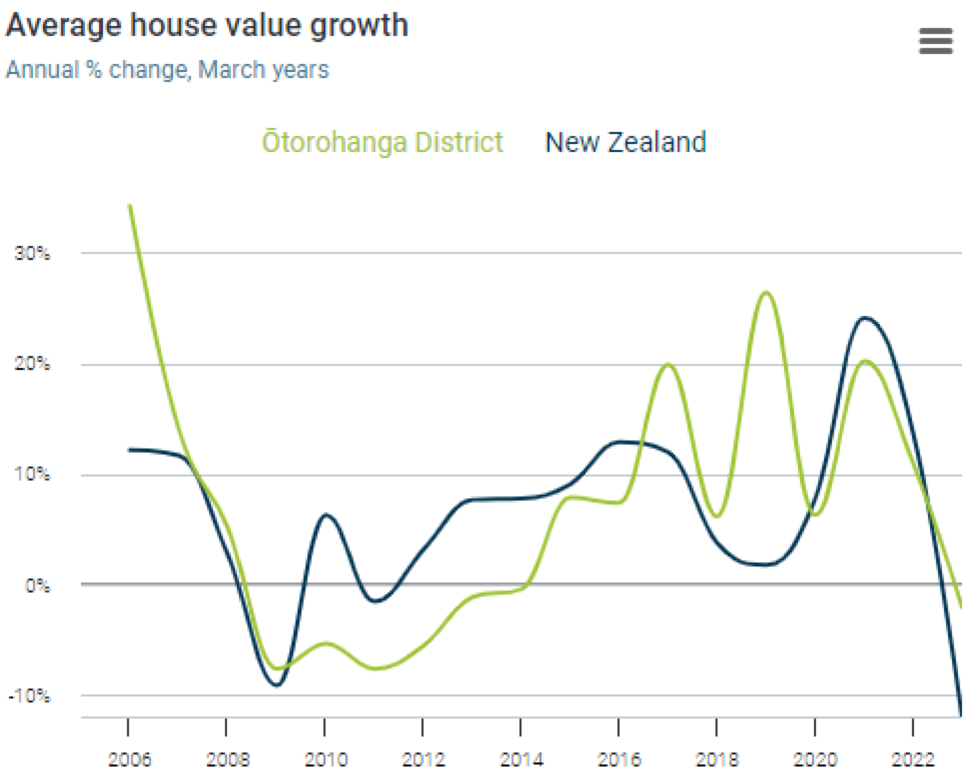
The median age of residents (2018) is 36.3 years, which is younger than the New Zealand population at 37.4 years. Our Māori population is younger still, at 27.8 years. The proportion of us aged 65+ is the fastest growing sector, which is in line with the rest of New Zealand.

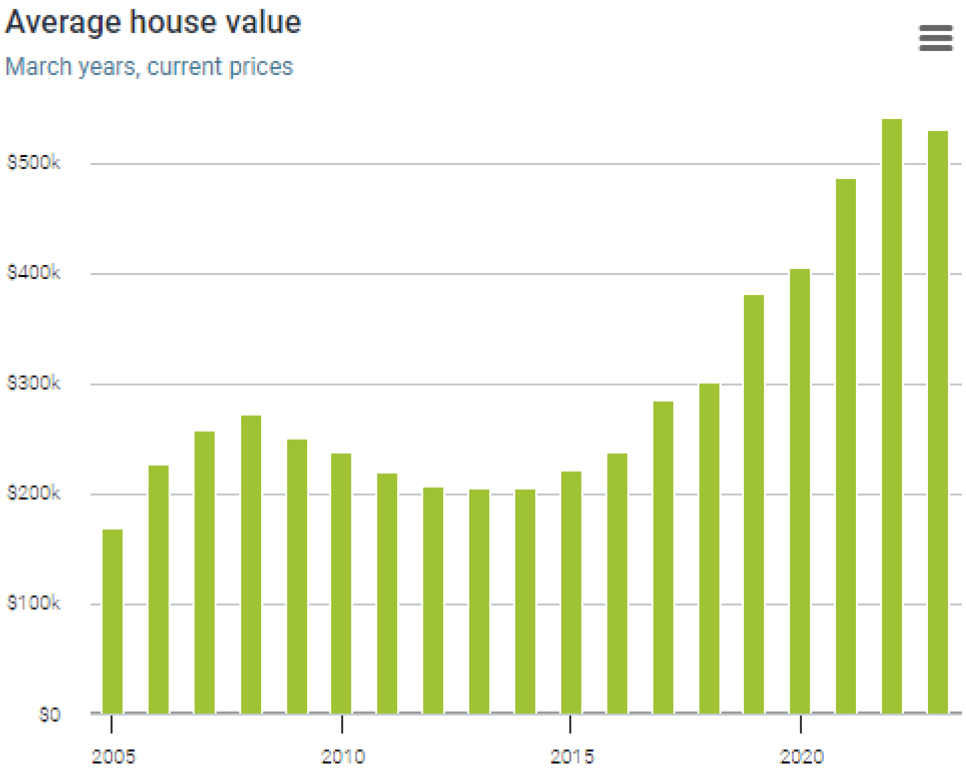
The 2018 Census tells us there are more than 4300 homes in the District, which is around 230 more than in 2013. Home ownership rates in the District are 63.4%, which is only slightly lower than the nationwide level of 64.6%. The cost of renting a house continues to be significantly lower in our District than the average for New Zealand. The average house value (March 2023) in the district was $530,326 (NZ $939,146).

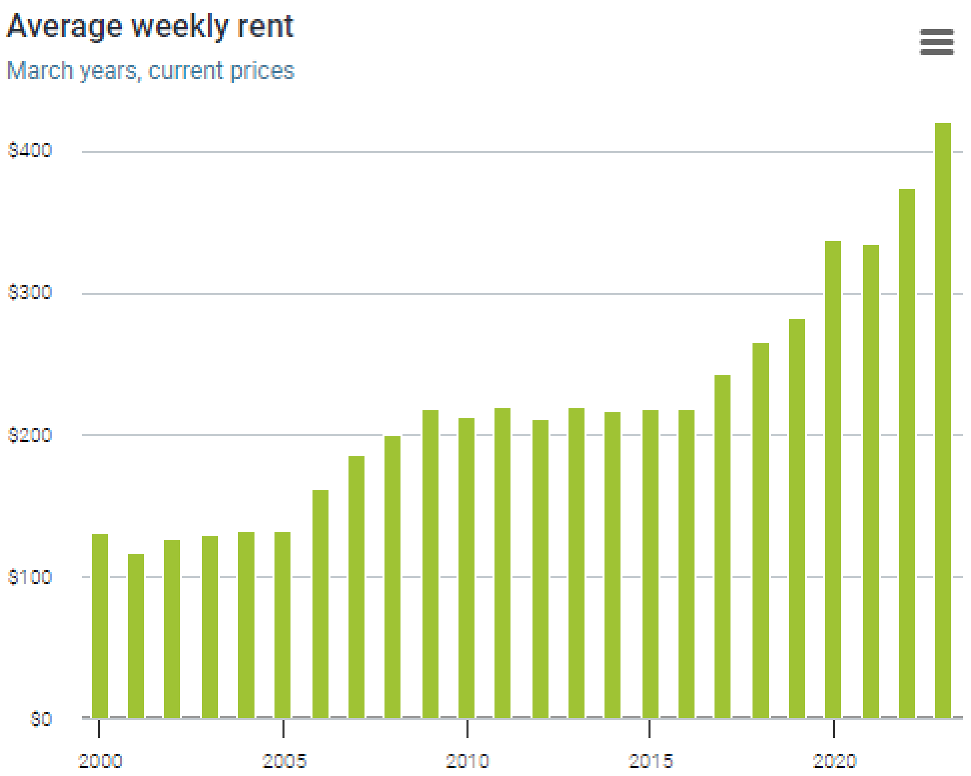
House value insights for Ōtorohanga District from 2023

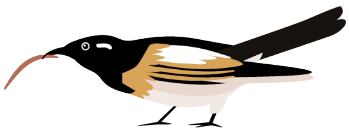
- The average house value in Ōtorohanga District was $530,326 in March 2023, which was lower than the New Zealand median of $939,146.
- House value growth in Ōtorohanga District decreased by 2.0% for the year to March 2023. Growth was not as low as in New Zealand (-11.9%).
- Since 2005 house value growth in Ōtorohanga District reached a maximum of 34.2% in 2006 and a minimum of -7.6% in 2011


Average house value, 2023
March 2023
$530,326
Ōtorohanga District
$939,146
New Zealand
$0
$100k
$200k
$300k
$400k
$500k
$600k
$700k
$800k
$900k


Average house value growth
Annual % change, March years
Ōtorohanga District
New Zealand
30%
20%
10%
0%
-10%
2006
2008
2010
2012
2014
2016
2018
2020
2022

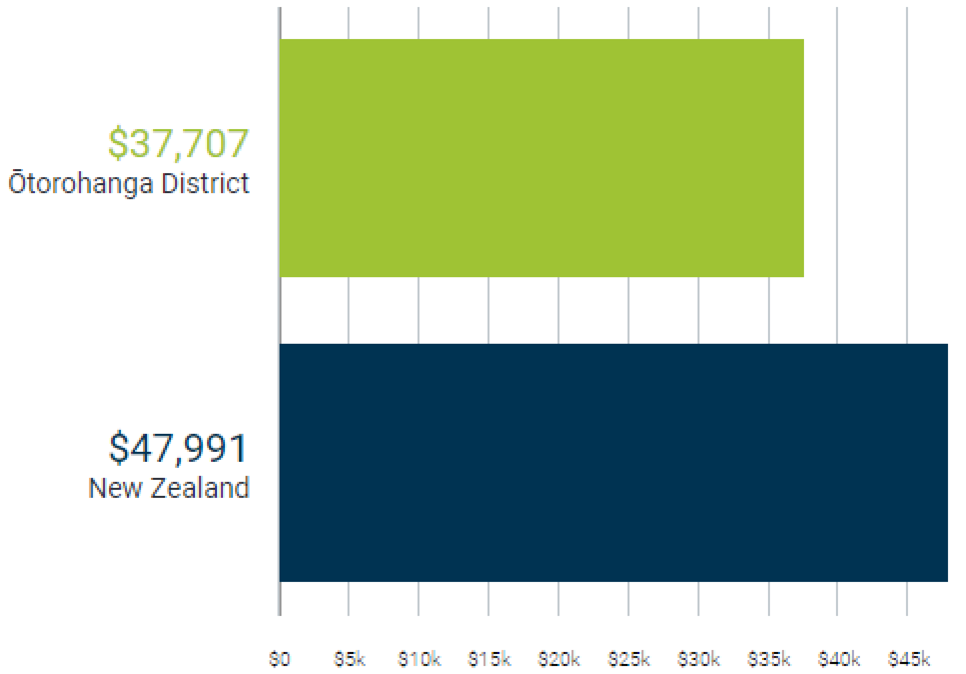

Average house value
March years, current prices
$500k
$400k
$300k
$200k
$100k
$0
2005
2010
2015
2020


Average weekly rent
March years, current prices
$400
$300
$200
$100
$0
2000
2005
2010
2015
2020



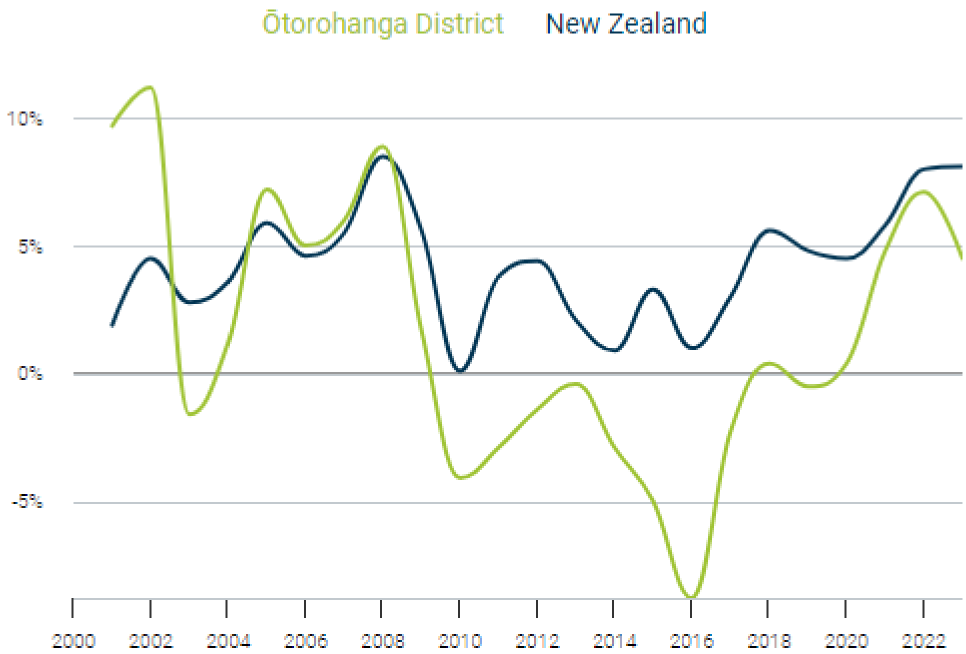
Per capita income, 2023

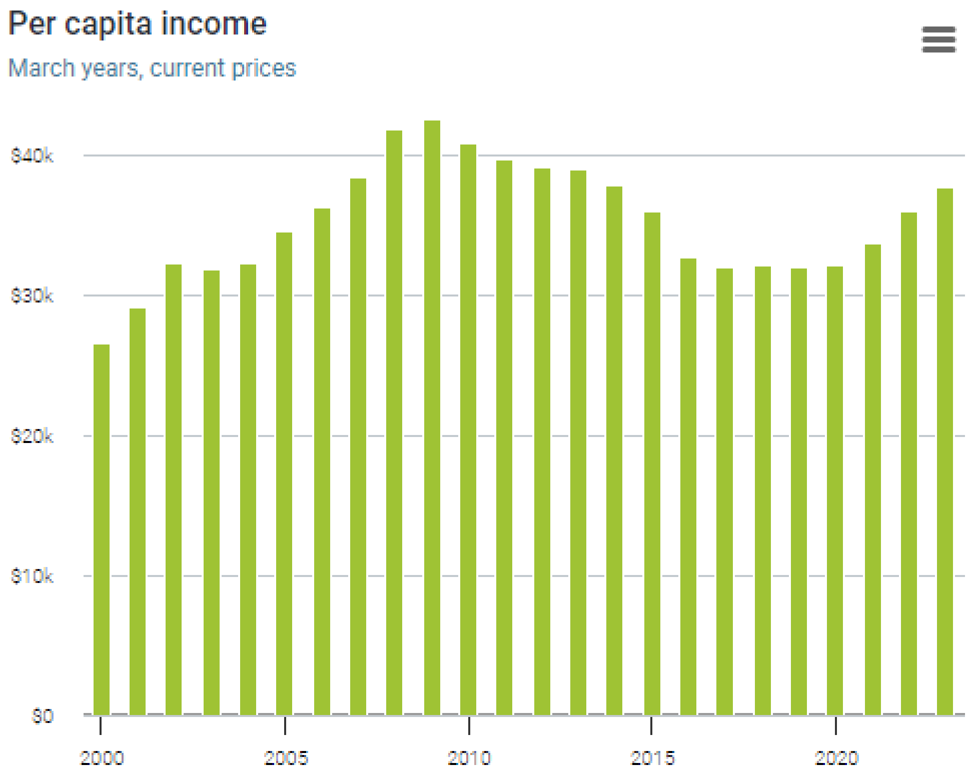
Year to Mar 2023



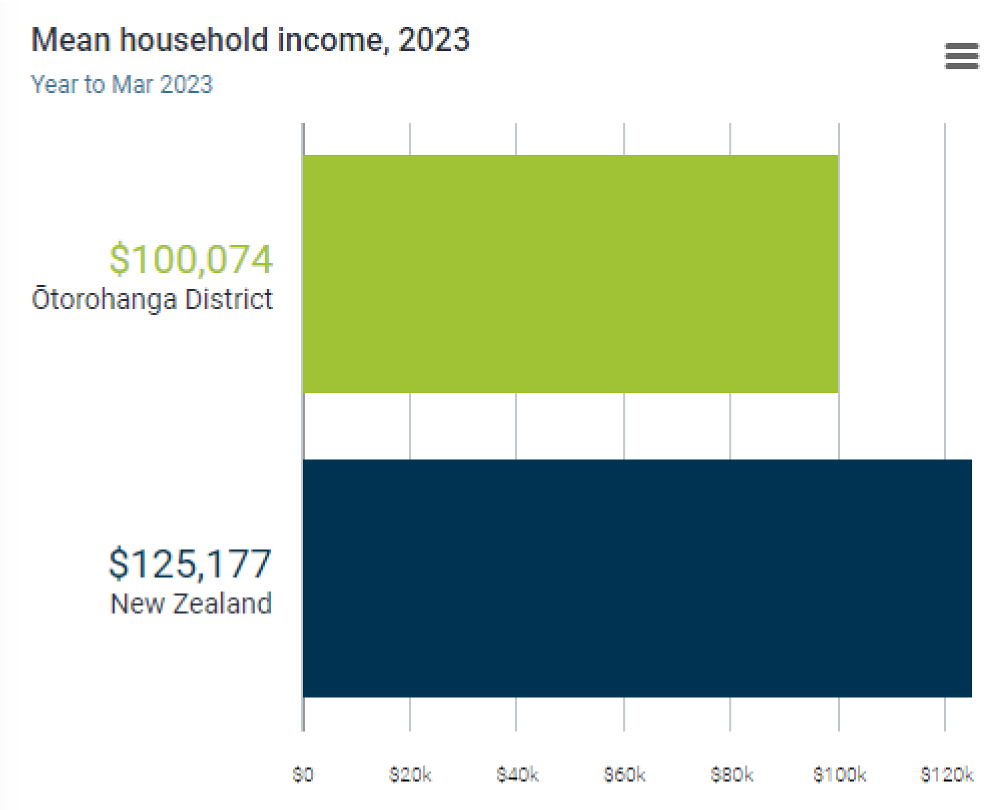
Per capita income growth

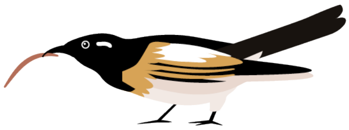
Annual % change, March years





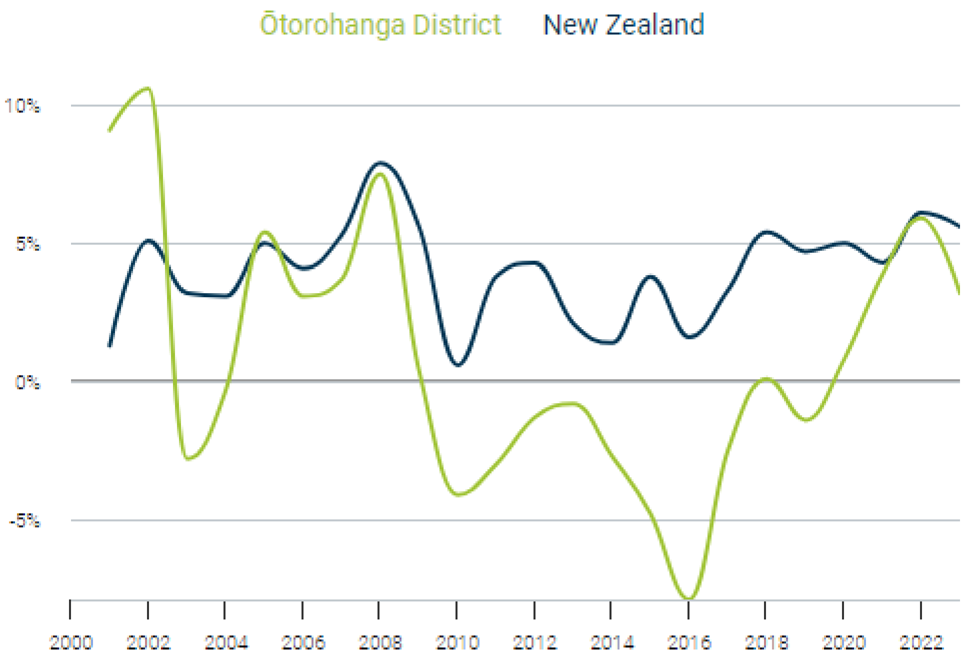
Our average household income was $100 074 (NZ $125 177).





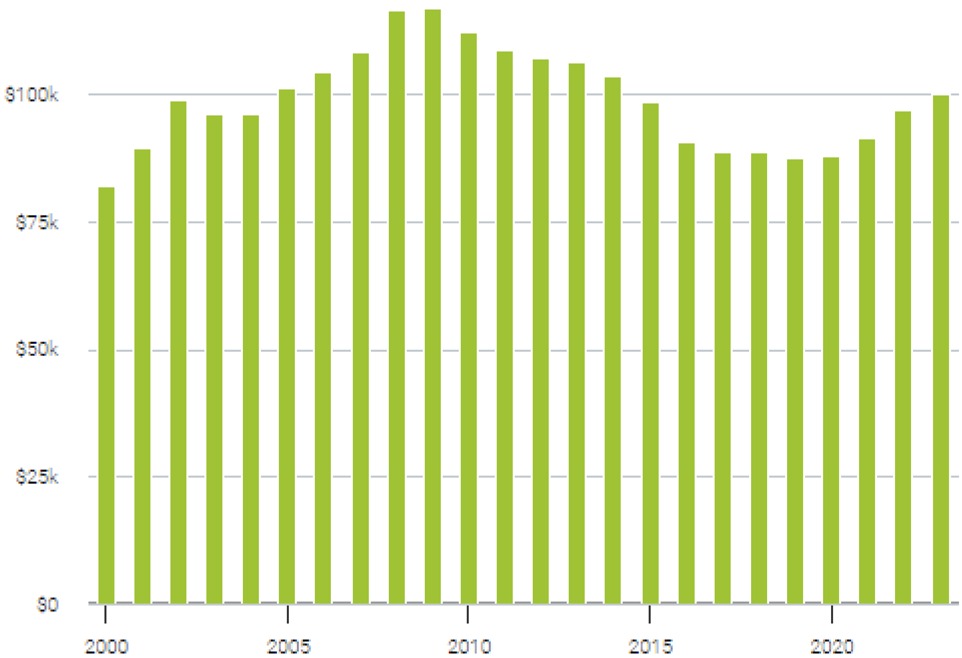
Mean household income growth

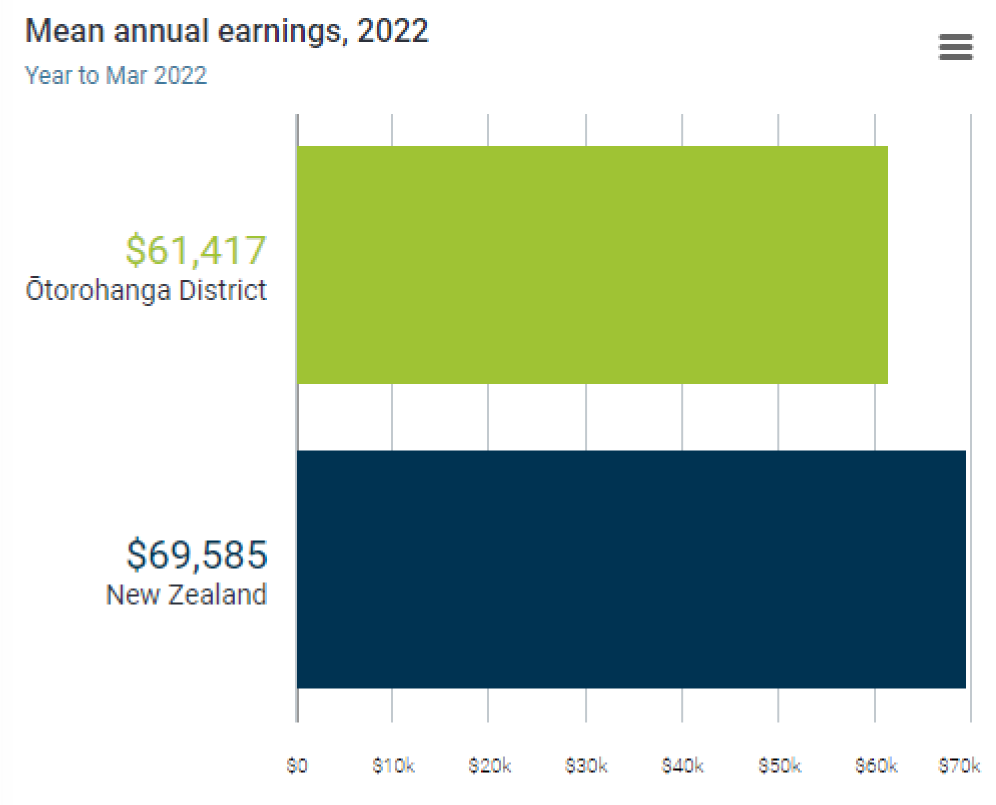
Annual % change, March years



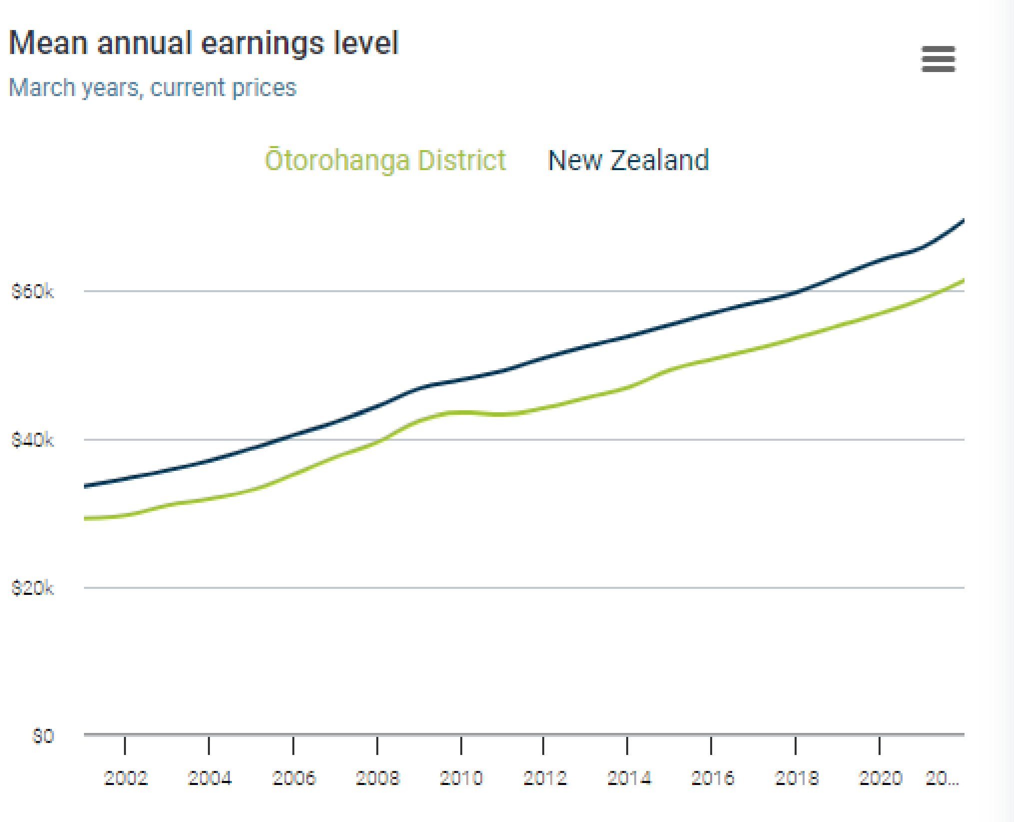
Mean household income

March years, current prices




Mean annual earnings, 2022
Year to Mar 2022
$61,417
Ōtorohanga District
$69,585
New Zealand
$0
$10k
$20k
$30k
$40k
$50k
$60k
$70k

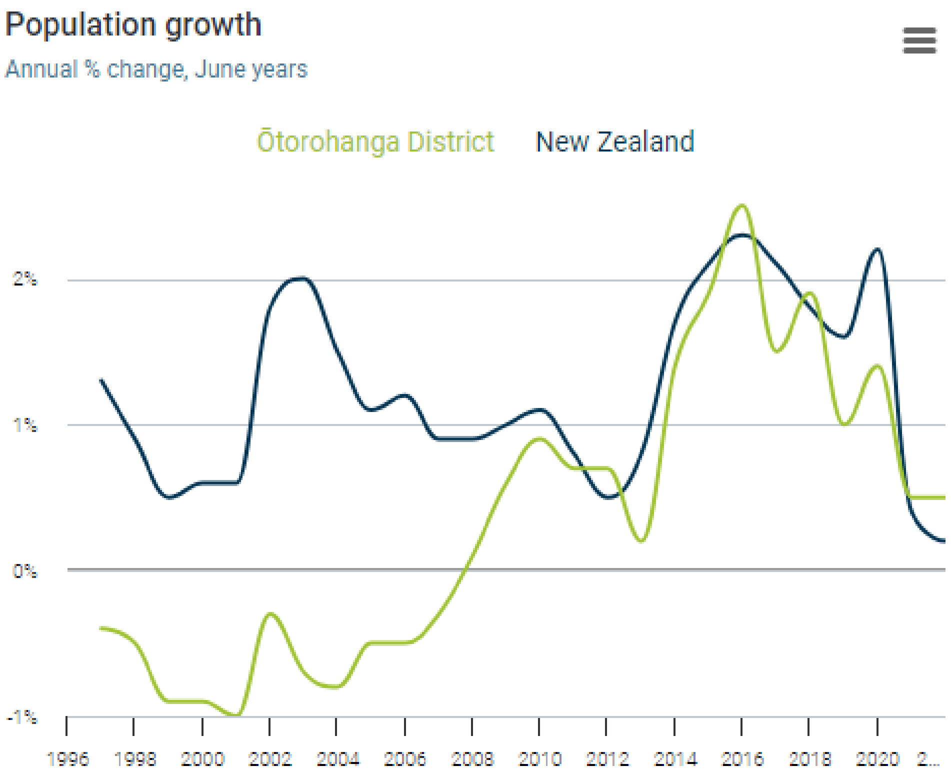

Mean annual earnings growth
Annual % change, March years
Ōtorohanga District
New Zealand
6%
4%
2%
0%
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
20…

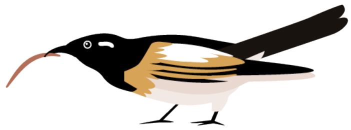


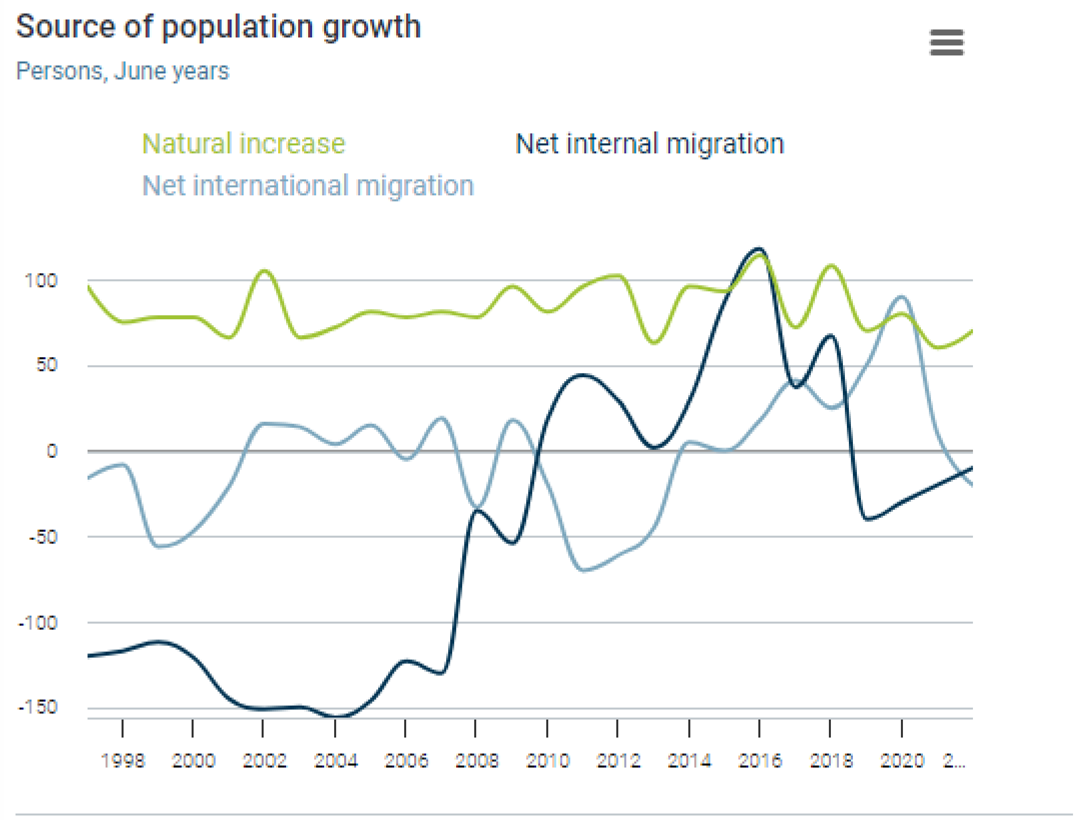
POPULATION – SOURCE INFOMETRICS

Population insights for Ōtorohanga District from 2022

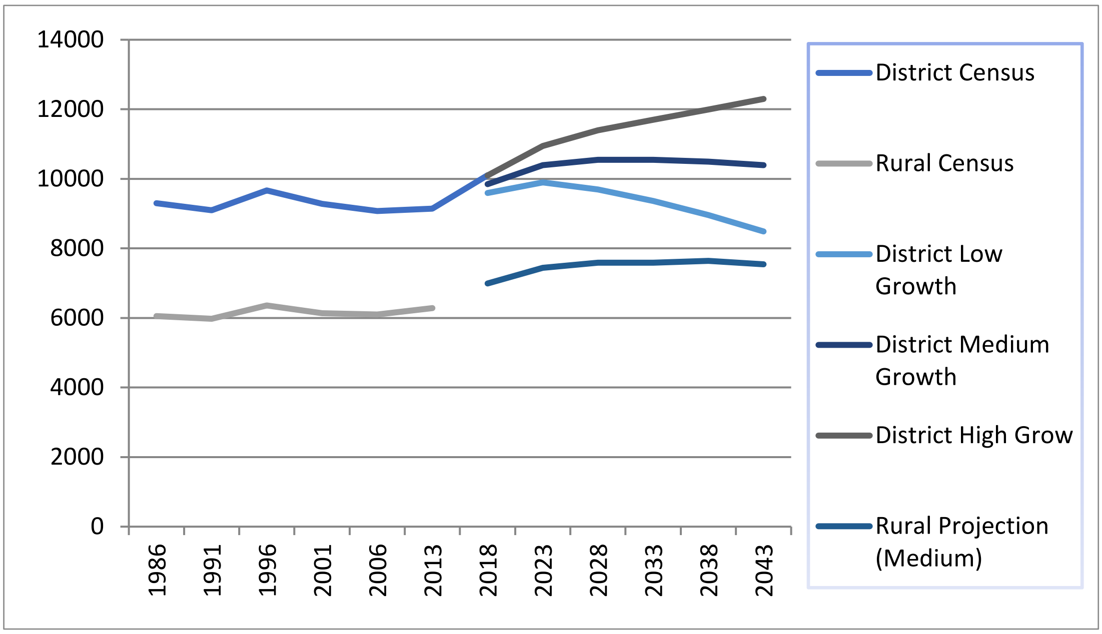
- Ōtorohanga District's total population was 10,850 in 2022, up 0.5% from a year earlier. Total population grew by 0.2% in New Zealand over the same period.
- Population growth in Ōtorohanga District averaged 1.1%pa over the 5 years to 2022 compared with 1.2%pa in New Zealand.
- Since 1996 growth in Ōtorohanga District reached a high of 2.5%pa in 2016 and a low of -1.0%pa in 2001.


Population growth
Annual % change, June years
Ōtorohanga District
New Zealand
2%
1%
0%
-1%
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2...

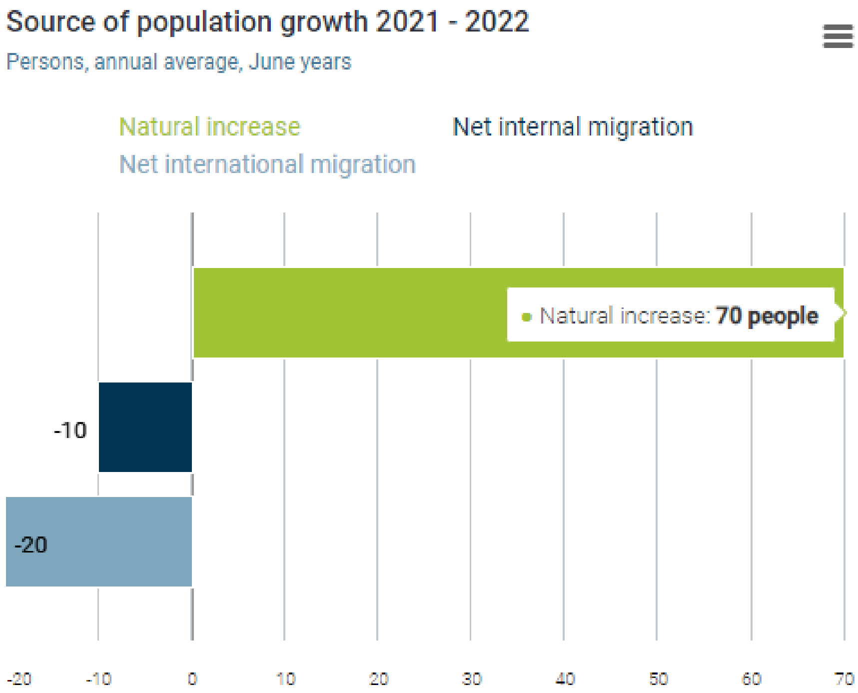




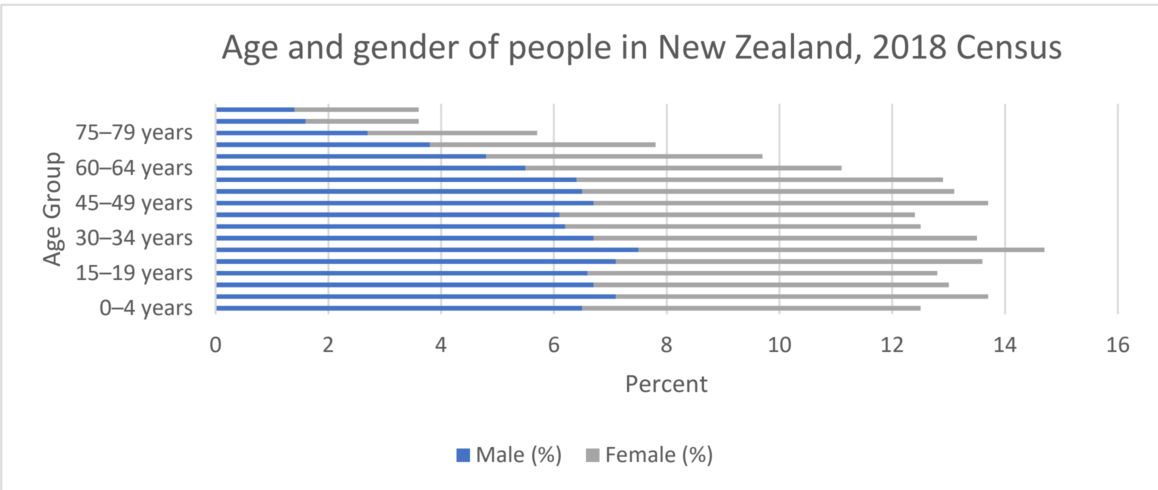
Source of population growth
Persons, June years
Natural increase
Net internal migration
Net international migration
100
50
0
-50
-100
-150
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2...

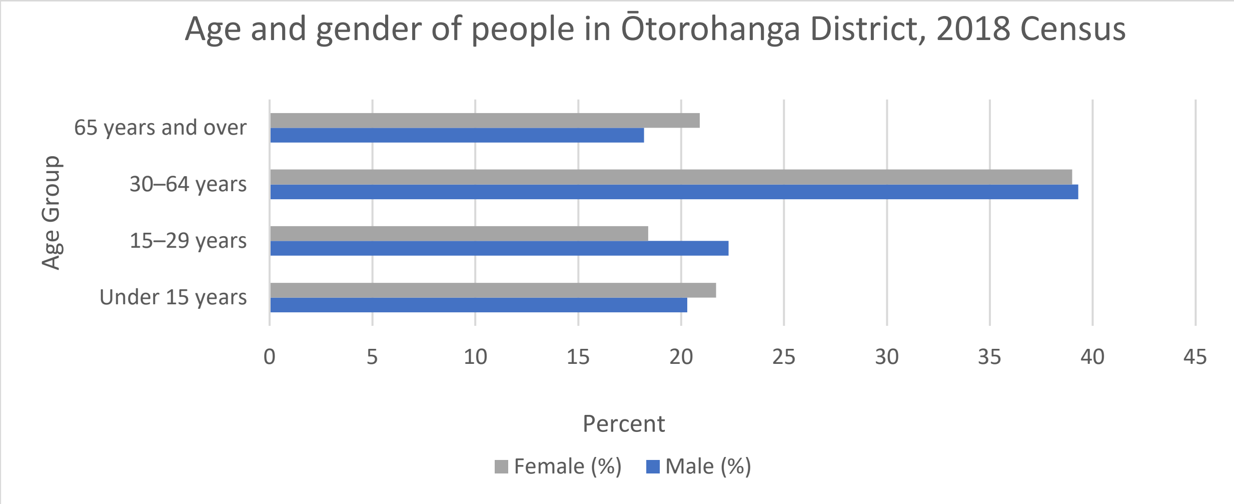


14000
12000
10000
8000
6000
4000
2000
0
1986
1991
1996
2001
2006
2013
2018
2023
2028
2033
2038
2043
District Census
Rural Census
District Low Growth
District Medium Growth
District High Grow
Rural Projection (Medium)



The potential population effects on the transport network are expected to be limited to a small number of roads in the District being Waikeria Road accessing the Waikeria prison and Harper Avenue accessing the proposed residential development.





The existing population demography in the District generally mirrors that of the country at present. Statistics NZ forecasts do, however, show a dramatic increase in the over 65 year old population by 2043.

There is potential for an increased service level need for alternative modes of transport to cater for the aging population, both for better walking or mobility device provision (extent and quality) and potential public or on-demand travel services for access to distant health and community services.

An improved transport service to allow residents to continue residing in the district rather than moving to a regional town for access to relevant age related services is an issue for further investigation.

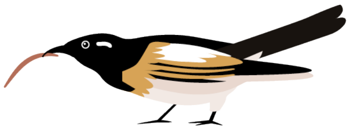
The interpretation of the overall economic data as it pertains to residents of the Ōtorohanga District is such any growth is limited and is unlikely to have any effect on the land transport network. **A significant concern is the ability of the district to obtain sufficient local share funding from rates to maintain the roads in the district as the relative prosperity of the residents is effectively diminishing**. This is reflected in the increase in the funding assistance rate from 61% to 63% as a direct result of such calculations.

ECONOMY

Agriculture is the economic backbone of the District, with 34.8% of the District's employed population listing their occupation as relating to Agriculture, Forestry and Fishing. It is still believed that upwards of 75% of all economic activity in the District is closely associated with the agricultural sector. The prevailing economic climate has been difficult for some of the smaller Ōtorohanga businesses, and there have been some changes to businesses in the retail and service sectors, though it is suspected that these changes have occurred without any substantial net loss or gain in total employee numbers.

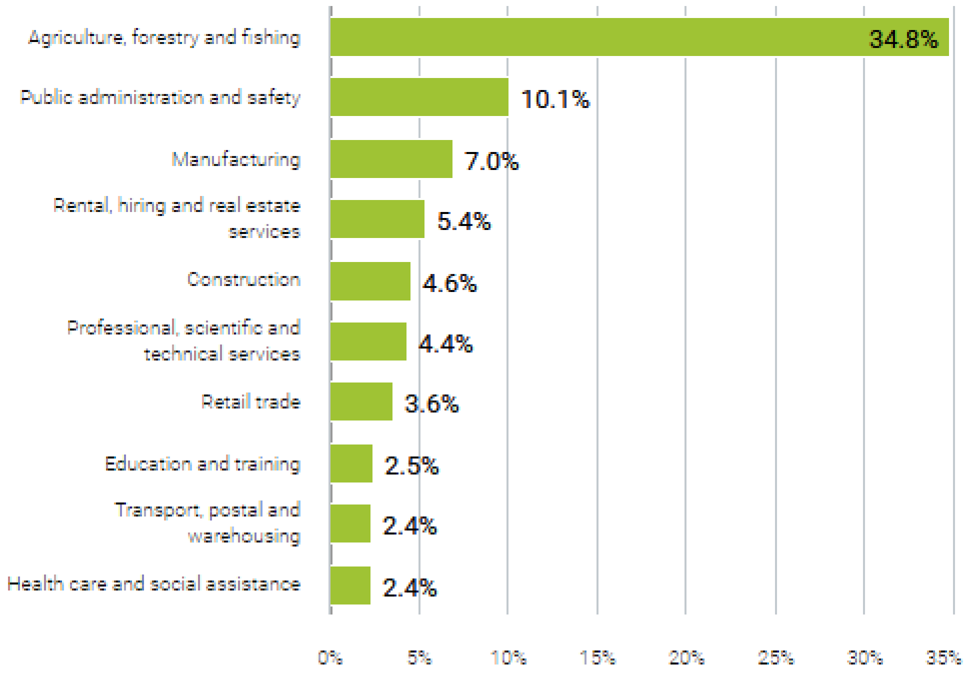
Economic Insights for Ōtorohanga District from 2022

- Among the broad economic sectors primary industries accounted for the largest proportion of GDP (35.8%) in Ōtorohanga District, which was higher than in New Zealand (5.8%).
- Goods-producing industries accounted for the second largest proportion in Ōtorohanga District (12.2%) compared with 18.5% in New Zealand.
- High-value services accounted for the smallest proportion in Ōtorohanga District (9.1%) compared with 26.7% in New Zealand.



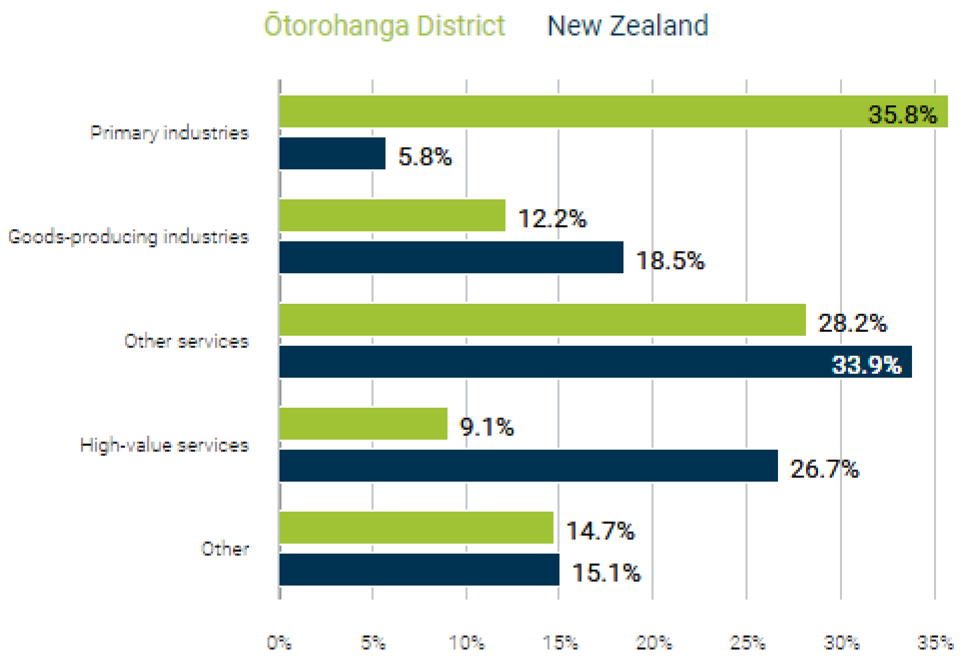
Ten largest ANZSIC Level 1 industries, 2022

% of total, year to Mar 2022



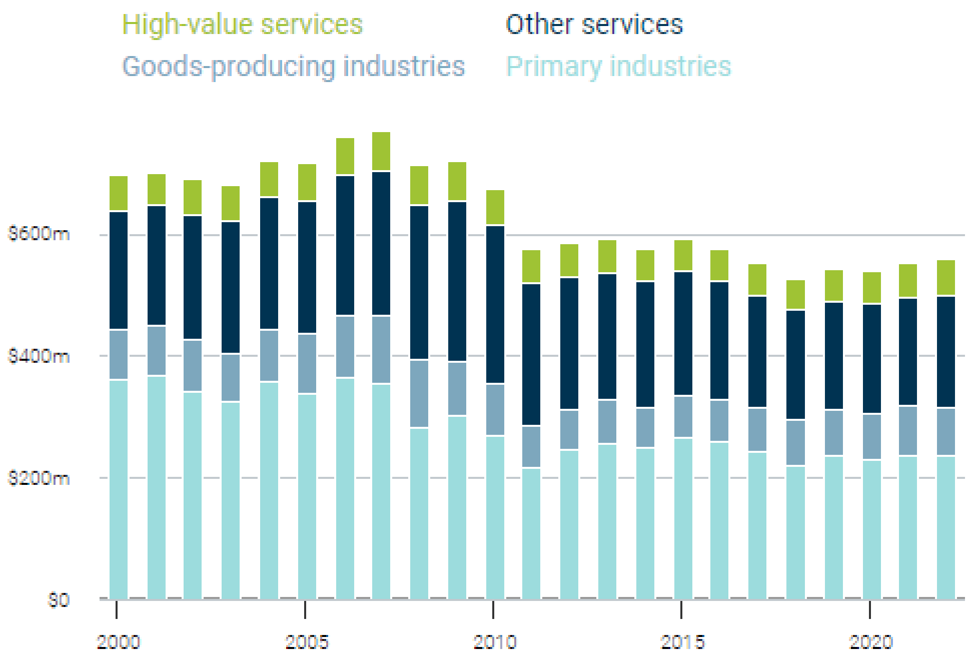
Economic structure by broad sector, 2022

% of total, year to Mar 2022



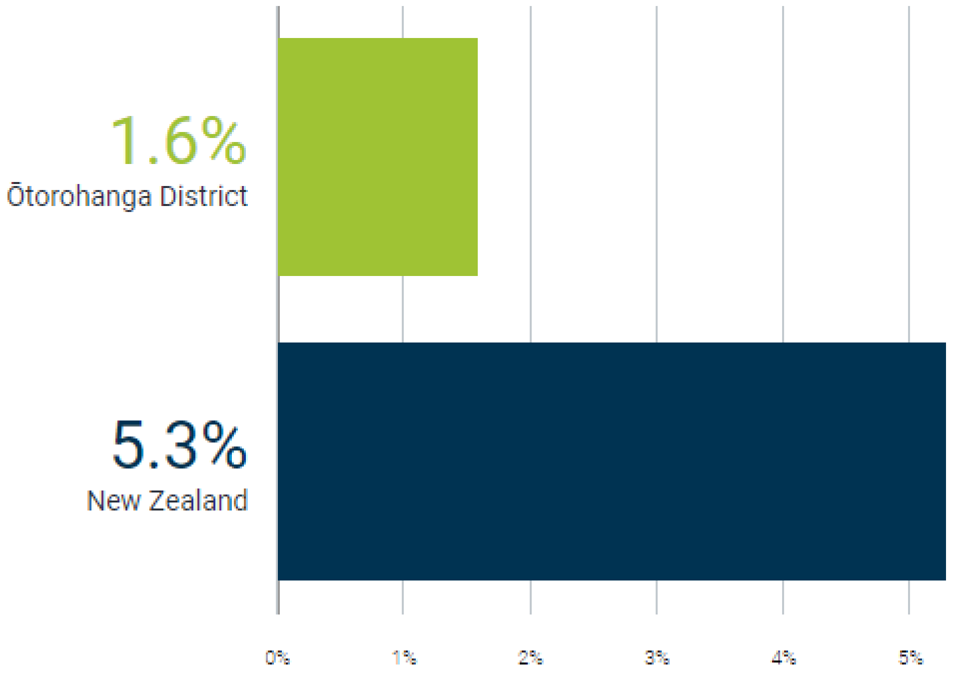
Economic structure by broad sector

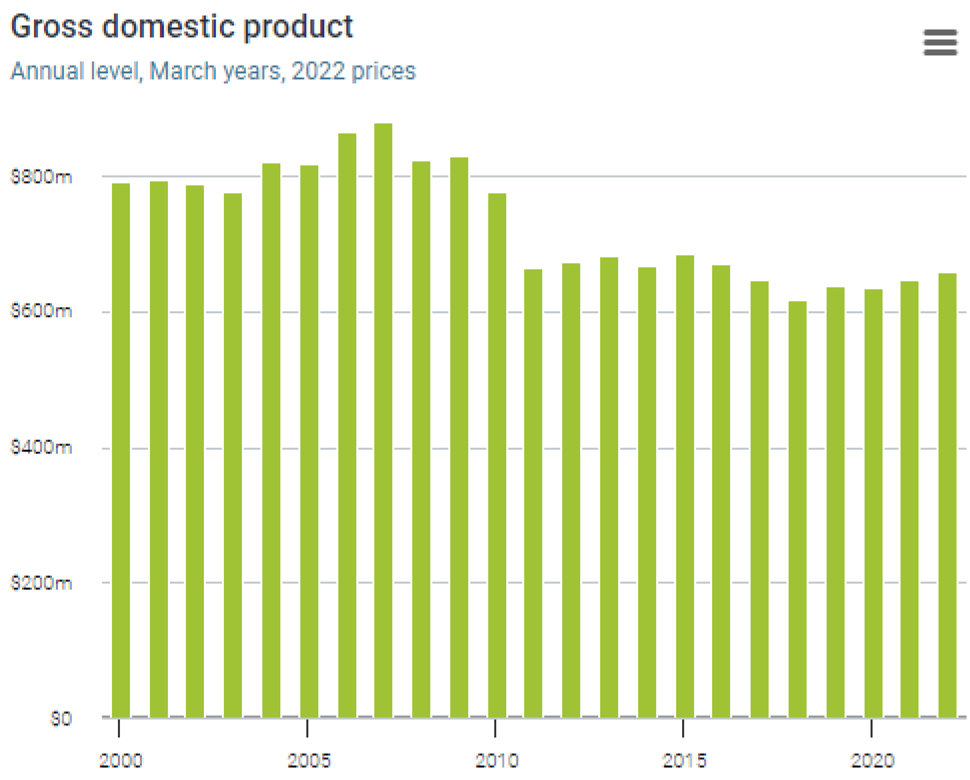
March years, 2022 prices



Gross domestic product growth, 2022

Annual average % change, year to Mar 2022





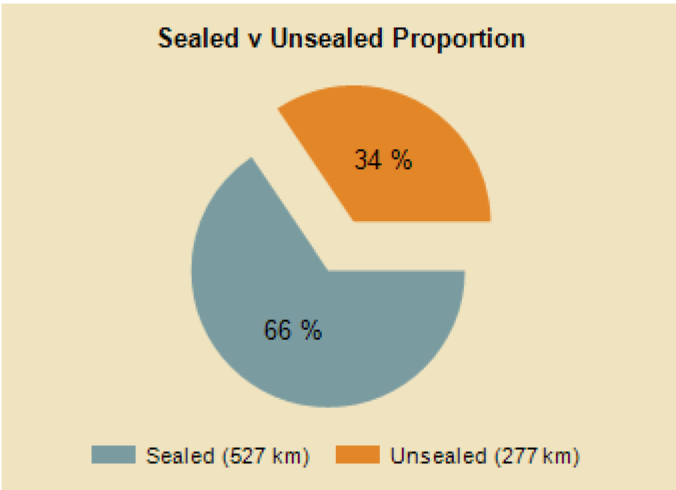
Growth in the Ōtorohanga District is slow relative to New Zealand with effectively no net growth from 2010 to 2023 in real terms. The LTP is therefore very much a 'business as usual' plan, generally focused on retaining the existing extent and levels of service at the most reasonable cost.

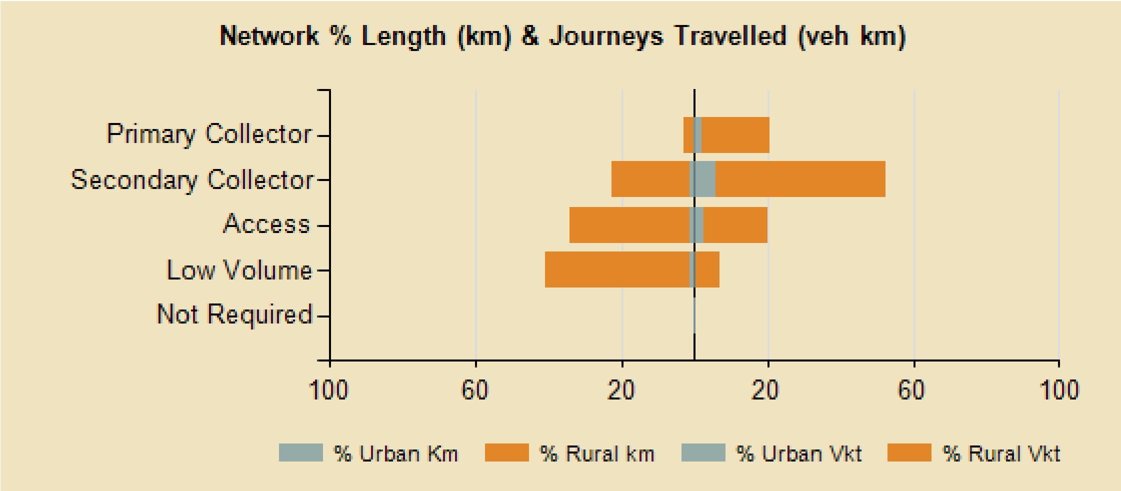
ASSETS AND CONDITION

The Council's roading system includes 804km of roads, 134 bridges, 81 stock underpass structures, 34.8km of footpath, 5686 individual stormwater culverts and 2,805 signs with a total network replacement cost of $408.3 million (2022 asset valuation).

The network is predominantly rural at 96.1%, and sealed roads make up 65% of the total network (526km) with an additional 278km of rural unsealed roads.

The ONRC makeup for the district is relatively evenly made up of Secondary Collector, Access and Low Volume roads with a small length of Primary Collectors.

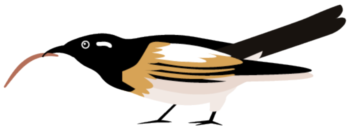




ONRC	Urban (Km)	Rural (Km)	Total Length(Km)	Lane (Km)	Urban Journeys (M VKT)	Rural Journeys (M VKT)	Annual Total Journeys Travelled (M VKT)	Percentage of length
Primary Collector	1	22	24	47	1.0	7.6	8.7	3%
Secondary Collector	9	172	181	359	3.2	24.7	27.9	22%
Access	11	264	274	530	1.6	10.0	11.6	34%
Low Volume	10	315	325	593	0.3	3.4	3.8	40%
Not Required	0		0	0	0.0		0.0	0%
Unclassified								0%
TOTAL NETWORK	**31**	**773**	**804**	**1,530**	**6.2**	**45.7**	**51.9**	

Network Statistics for network length (km) and journeys travelled (Million vehicle km) by ONRC Class

The existing condition of the sealed pavements as measured by smooth travel exposure (as shown in the detailed business case chapter) show the District's roads are maintaining an acceptable level of service but showing slight negative trends when compared with the previous condition and the peer groups. Provision has been made in this plan to halt this trend before the roads deteriorate to a stage which adversely affect the level of service enjoyed by the road users.



STRATEGIC CONTEXT

The Central Government's direction to RCA's is through the **Land Transport Management Act** and the triennial **Government Policy Statement on Land Transport**. These documents give the broad strategic direction for the nation's transport networks.

The Land Transport Management Act 2003

To contribute to an effective, efficient, and safe land transport system in the public interest

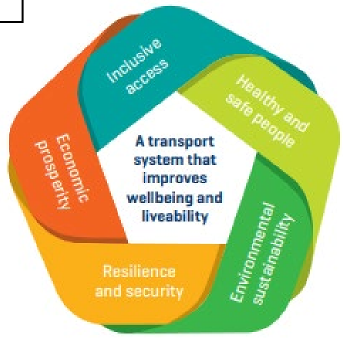
- Effective when it moves people and freight where they need to go in a timely manner
- Efficient when it delivers the right infrastructure and services to the right level at the best cost
- Safe when it reduces harm from land transport
- In the public interest where it supports economic, social, cultural and environmental wellbeing

This section cannot be updated until the GPS for Land Transport is published.

Government Policy Statement on Land Transport (2021)

Government's strategy to guide land transport investment over the next 10 years, and influences decisions on how money from the NLTF will be invested across activity classes

PORT OUTCOMES FRAMEWORK



STRATEGIC PRIORITIES

OUTCOME

Safety
Develop a transport system where no-one is killed or seriously injured

- Develop a transport system that advances New Zealand's vision that no-one is killed or seriously injured while travelling
- New Zealand roads will be made substantially safer

Improving Freight Connection
Improve freight connections to support economic development

Well-designed transport corridors with efficient, reliable and resilient connections, will support productive economic activity.

Better travel options
Providing people with better travel options to access places for earning, learning, and participating in society

Improve people's transport choices in getting to places where they live, work and play and to make sure our cities and towns have transport networks that are fit for purpose and fit for the future.

Climate change
Transforming to a low carbon transport system that supports emissions reduction aligned with national commitments, while improving safety and inclusive access

Support the rapid transition to a low carbon transport system, and contribute to a resilient transport sector that reduces harmful emissions, giving effect to the emissions reduction target, the Climate Change Commission recommended to Cabinet until emissions budgets are released in 2021.

Support for these high level documents is provided through the **Road to Zero 2020 -2030 strategy** and the **Road to Zero Action Plan 2020-2030.**

This section will be updated when the GPS for Land Transport is published.

VISION

● Our vision is: a New Zealand where no one is killed or seriously injured in road crashes.

● It is based on the world-leading ‘Vision Zero’ approach, which says that no death or serious injury while travelling on our roads is acceptable.

● We know we have a long way to go, but we can achieve our vision if we shift the way we think about road safety and work together.

TARGET

● We want to reduce death and serious injuries on our roads by 40 percent over the next decade.

● Steady progress towards this would mean around 750 fewer people would be killed on our roads over the next 10 years, compared to 2018.

FOCUS

● We will focus our efforts in the areas that will have the greatest impact:

· Speed management

· Vehicle safety ∂ Work-related road safety

· Road user choices

· System management

PRINCIPLES

● Seven principles will guide how we design the network and make road safety decisions.

● They include:

· We promote good choices but plan for mistakes

· We design for human vulnerability

· We strengthen all parts of the road transport system

· We have a shared responsibility for improving road safety

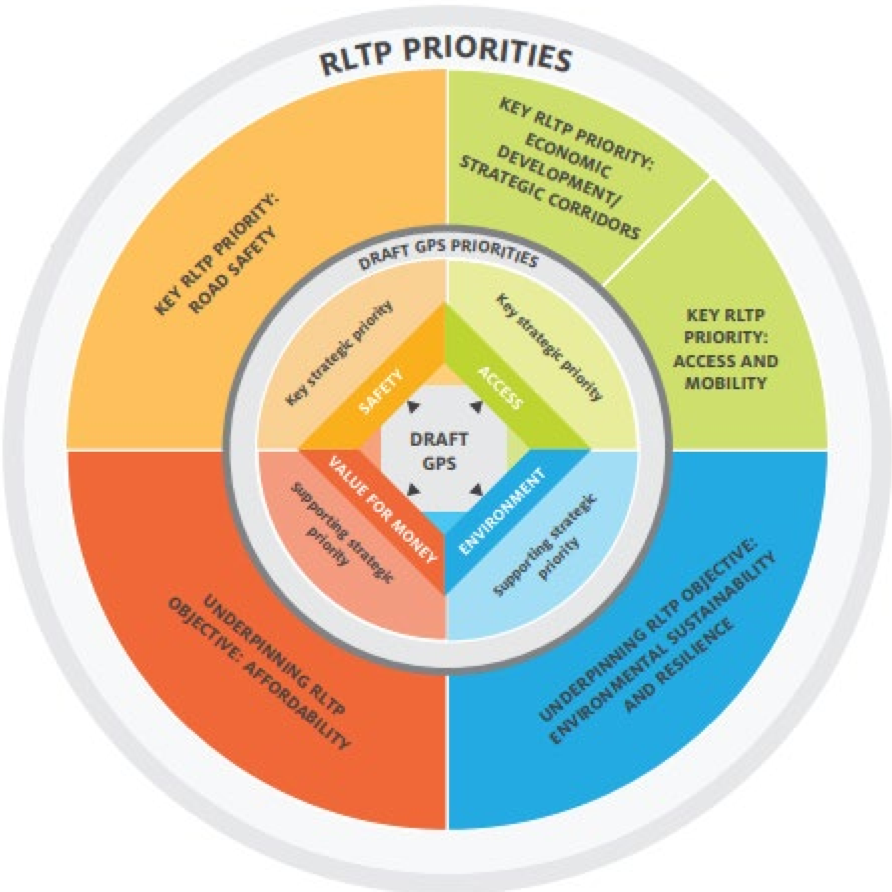
· Our actions are grounded in evidence and evaluated

· Our road safety actions support health, wellbeing and liveable places ∂ We make safety a critical decision making priority

Additional support for the high level GPS is provided through the **Speed Management Guide.**

The speed management guide gives a sound and nationally consistent methodology for considering the correct and most appropriate speed for a section of road, with tools to achieve those speeds. Roads may be improved to allow safe travel at 100kph, or conversely other roads may have traffic calming devices installed to reduce the travel speed, also improving their safety.
The five and 10 year records for Fatal & Serious Injury crashes show 45% of crashes result from loss of control or inappropriate speed, and this is understood to be from speed not matching the environment.
The use of speed management on the network to guide motorists to a more appropriate environment speed, may help to reduce approach speeds for curves and address this crash history.

The regional Transport Committee of the Waikato Regional Council consider and publish the **Regional Land Transport Plan** (RLTP) which also provides guidance for the Waikato Councils. The updated (2023) RLTP is under development so was not available at the time of preparing this AMP.



ALIGNMENT OF REGIONAL AND NATIONAL PRIORITIES AND OBJECTIVES

OPERATIVE RLTP	Strategic corridors	Road safety	Manage demand transport choices	**COMMON BASELINE OBJECTIVES:** Environmental sustainability and resilience; planning integration and affordability
ILM REVIEW OUTCOMES	Growth impacting strategic corridors and economic development.	Road safety	Ability to access the transport system	

Ōtorohanga District Council and the District Development Board have also jointly produced the District Development Strategy with four key areas of focus.

Council will particularly focus on the following relative strengths of the Ōtorohanga District:

- Sustainable flows of tourists through the District that are not fully exploited
- Property prices that are relatively low in relation to adjacent growing to the north
- Potential availability of water supply in Ōtorohanga
- Systems to sustain a capable and motivated workforce, including youth support.

The Economic Development Strategy is currently being reviewed as part of the current Long Term Plan (LTP) process being undertaken by Council. This work will not be complete prior to the submission on this document. As part of this LTP the need / desire of the community to enhance and revitalise the district has been given effect by the planned completion of the Ōtorohanga Town Concept Plan, the scope of which will include:

1. Develop, maintain and protect an ecological network and green belt for Ōtorohanga
2. Weaving nature through town
3. Transform the Huipūtea reserve
4. Ōtorohanga Reserves Management Strategy
5. Zero Waste initiative
6. Maniapoto Street Upgrade
7. Turongo Street Upgrade
8. Upgrade three key intersections and manage heavy-vehicles
9. Create an interconnected walking and cycling network for Ōtorohanga
10. Develop a district wide cycle trail network
11. Parking strategy

Aspirational longer term projects identified are:

1. Ōtorohanga Sports and Recreation Hub
2. Multipurpose Culture, Community and Arts Facility
3. Ōtorohanga Town Gateways
4. Swimming Pool Facilities (upgrade / build new)

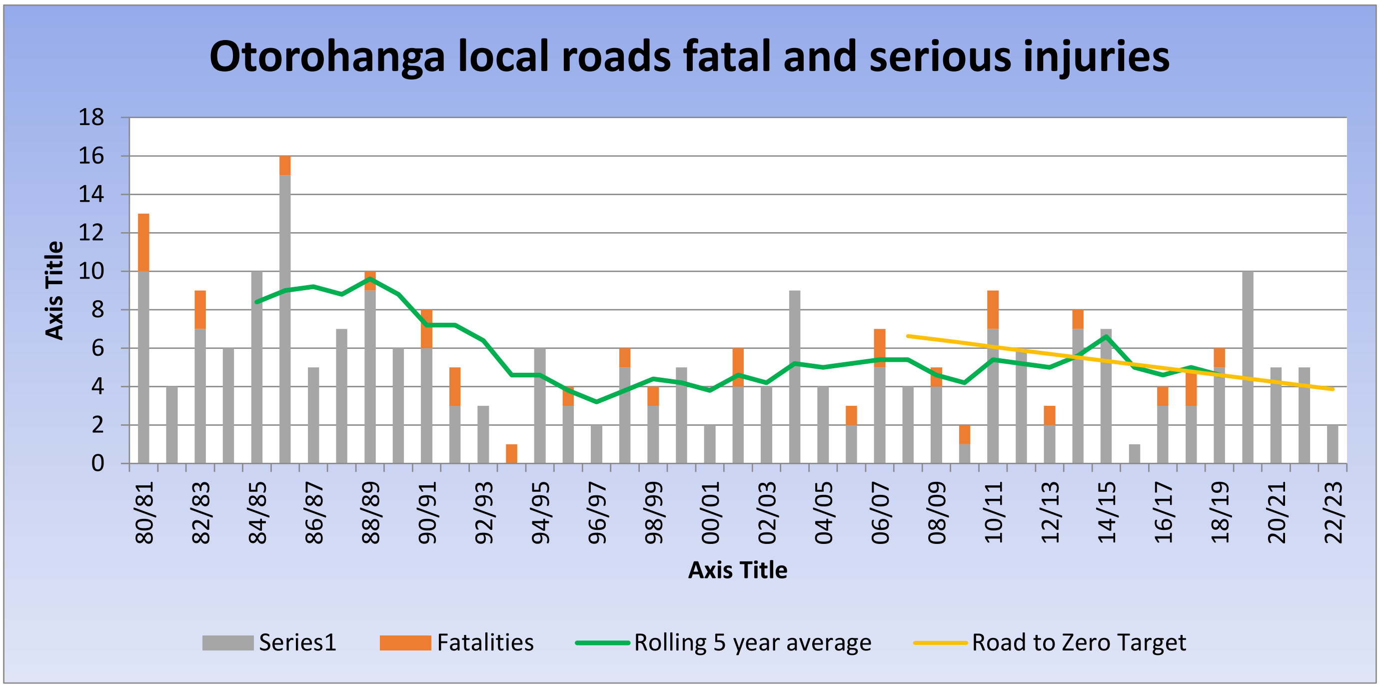
In alignment with the Ōtorohanga Town Concept Plan, Council, together with our mana whenua partners, is currently engaging with our communities and stakeholders to develop two comprehensive concept (spatial) plans covering the Kāwhia/Aotea/Ōpārau area and the balance of our rural areas. These plans will guide the development of and investment (including enabling community action) in these areas, having regard to the current and likely future challenges, issues and opportunities identified.

The scope of these plans will be shaped by what is important to mana whenua and our communities and stakeholders. However, we anticipate the plan development process will consider and document in draft Plans (where appropriate) the following:

1. The opportunities for and the potential nature and extent of growth, including the infrastructure, such as roading/walking/cycling, required to enable/support that growth.
2. Options assessments for key community facilities and reserves/public spaces.
3. Infrastructure requirements to support and build resilience and enable wellbeing, including providing for safe, efficient and effective roading, walking and cycling activities.
4. ‘Main Street’ enhancement/improvement opportunities for Kāwhia, including enabling greater walking and cycling connectivity in/around the village.
5. Options for the threshold treatment of main route (road) entry points to the district and key communities.
6. Place-based enablers for lifting community wellbeing.

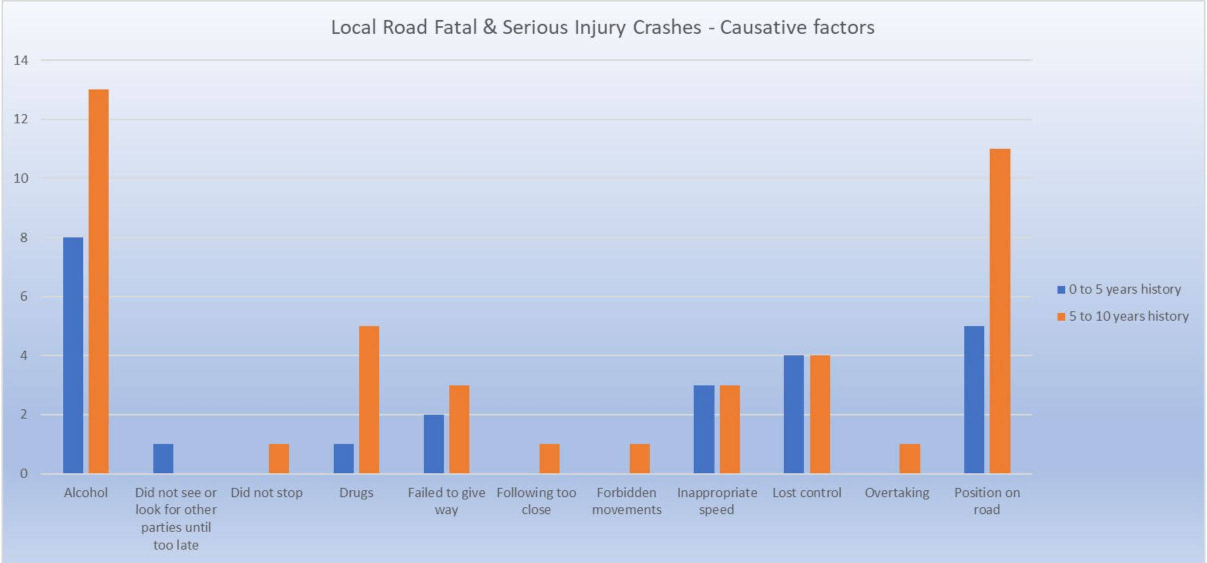
CHALLENGES AND OPPORTUNITIES

ROAD SAFETY



FATAL AND SERIOUS INJURY CRASH RECORDS

The five year average annual fatal and serious injury rate in 2018/19 was 4.6 per annum. A 40 % reduction over 10 years of 1.84 to set a target of 2.76 fatal and serious injuries (five year average) per annum has been adopted as a performance target, to match the Road to Zero Target. Ōtorohanga is currently trending above this target.



Analysis of the crash statistics shows that most Fatal & Serious Injury crashes occur in fine weather, on dry roads and during daylight hours, eliminating environmental factors as a significant causative issue, and suggesting that road surface texture causing slippery roads during rainfall is not an issue in the District.

Alcohol is major contributing factor which unfortunately cannot be addressed by physical intervention measures although a concerted advertising campaign is undertaken by council's Road Safety Co-ordinator.

With reference to "position on the road" as a factor causing accidents, many rural roads in the district are relatively narrow with tight radius curves and limited runoff room / roadside safety zones, particularly on the Access and Low Volume roads. It is thought that inappropriate approach speed to road corners, even within the legal speed limit, and a level of distractedness / fatigue / over familiarity is causing the high frequency of loss of control. A proposal to increase the road safety promotion, and continue with the new driver training provision in conjunction with implementation of speed management across the district will target these issues. This initiative is supported by a dedicated low cost programme to improve road widths together with the business as usual deficiency data base safety improvements.

TOURISM

Tourism is recognised as a significant industry that supports Ōtorohanga District. Council acknowledges two key issues in this sector that relate to the transport activity. Council continues to develop Raglan Road as a significant tourist route. Raglan Road is part of the connection between Kāwhia and Raglan which are both popular destinations for tourists exploring the rugged west coast. The increased popularity of this route has resulted in the number of tourist coaches, campervans, and rental vehicles increasing which has raised road safety and environmental concerns.

Council continues to support sealing the 10km that currently remains unsealed on Raglan Road in the Ōtorohanga District Council local roading network.


Raglan Road

There is another approximately 10.6km that remains unsealed in the adjacent Waikato District Council network to completely seal the link between Kāwhia and Raglan. Council will continue to lobby Waikato DC to seal their portion of this popular route.

The increased popularity of Raglan Road has resulted in the number of tourist coaches, campervans and rental vehicles increasing, which has raised road safety and environmental concerns

The link forms part of the Wild West Coast Discovery Themed-Drive Itineraries, an emerging experience in the Hamilton and Waikato Tourism Opportunity Plan. These are diverse journeys that have a very distinctive character with a variety of experiences, attractions and accommodation.

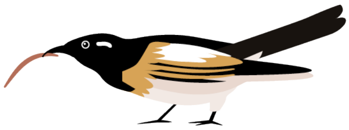
Access to Waitomo Caves via Waitomo Valley Road by international self-drive tourists is not considered to be the most appropriate route due to the nature of this road in comparison to the roads generally used by tourists between this district and Auckland / Bay of Plenty (particularly roads with narrow width, single lane bridges and tight curves).

Work to promote the use of the State Highway network through to the caves will continue, including speed management initiatives, negotiation with GPS navigation providers, vehicle rental companies and travel agents, and improved advisory signage.

FREIGHT

Since the 2021 – 2031 Asset Management Plan, there has been a significant amount of analysis undertaken on the District’s bridges. This has resulted in only 1.2% of the network being not accessible to 50 Max vehicles (PMRT Accessibility CO1). There was also strengthening work completed on six under-strength bridges during 2020/21 to lift these structures load carrying capacity to 50 Max.

The only weight restricted bridge is that of Waiharakeke Stream Bridge on Harbour Road that has a 44 tonne (Class 1) posting. Mangawhaio Bridge on Waipapa Road does however require further analysis to determine condition and confirm load carrying capacity. This will be done during 2024/25 and preliminary analysis indicates that it is not expected to raise any significant concerns.



CAPACITY

The increasing size of commercial vehicles, and particularly the milk tanker fleet, is also starting to put pressure on the capacity (width) of some roads. There is anecdotal evidence from Fonterra of HCV having difficulties when encountering similar approaching traffic.

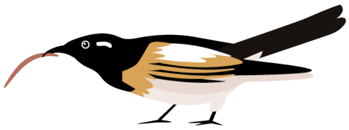
There is also a number of truck / trailer roll overs occurring in the district. This can happen when heavy commercial vehicles drop a wheel into the storm water channel to avoid approaching traffic.

Seal width analysis of the existing network indicates that 44% of our sealed roads are greater than 0.5m below historical best practice levels of service. 0.5m was used as the threshold for when seal widening would be considered as an independent exercise. Less than this would not justify the cost of widening the road as a separate seal widening exercise.

Previous thinking was to progressively upgrade the network to the desired seal width by increasing the works plan for the minor improvement's category; to provide for pavement widening and curve easing during pavement renewals, 12 to 36 months prior to planned reseals, particularly as prioritised for Primary and Secondary Collector roads. With the advent of the Road to Zero and Speed Management Planning this process has been put on hold as making roads wider may encourage higher speeds.

Seal Widths	length	% of network	length	% of network	length	% of network	length	% of network
Length 2m or more over width								
Length 2m to 1m over width	8828	1.68%	8017	1.52%	2269	0.43%	1373	0.26%
Length1m to 0.5m over width	5374	1.02%	8656	1.65%	3063	0.58%	2633	0.50%
Length 0.5m to 0.1m over width	3817	0.73%	47073	8.95%	2935	0.56%	2975	0.57%
Length 0.1m over to 0.1m under width	7828	1.49%	60904	11.58%	29801	5.66%	0	0.00%
Length 0.5m to 0.1m under width	10638	2.02%	49757	9.46%	33159	6.30%	5617	1.07%
Length 1m to 0.5m under width	11488	2.18%	26915	5.12%	65586	12.47%	320	0.06%
Length 2m to 1m under width	18997	3.61%	18541	3.52%	41707	7.93%	16247	3.09%
Length 2m or more under width	17458	3.32%	7565	1.44%	1480	0.28%	5109	0.97%
Sum of lengths - 526130	84428		227428		180000		34274	
Sum of lengths that are >0.5m under width	47943		53021		108773		21676	
Total	231413	44%						

SAMPLE ROAD WIDTH ANALYSIS



VALUE FOR MONEY

Information supplied by Waka Kotahi provides three year average costs per km for most work categories supported by Waka Kotahi, with comparisons within the standard peer group. In most instances the results for Ōtorohanga District are in the median or lower range, but some results are surprisingly high in comparison with the peer group.

Investigation is being done into the actual costs involved, and consultation with other RCAs within the peer group to establish if the higher cost reflects a higher level of service, and if any level of service differences are warranted may result in efficiencies being identified for future works. Higher Network and Asset Management costs are a reflection of the increased costs in gathering data to better understand the condition of the network and improve our ability to predict future trends, the need to use consultancies due to lack of skill within the industry along with the increase in staff salary costs.

IMPLEMENTATION OF ONRC IN MAINTENANCE WORKS

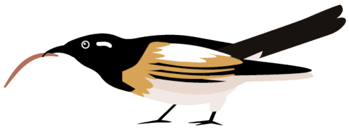
The current district roads maintenance contract has been significantly revised to fully adopt the ONRC, and the principals of differing levels of service based on road Hierarchy. Inspection regimes for roads are based on their hierarchy, as are response times, and standards between work cycles. The tendered price is indicating a saving of up to 15% over the previous contract which was based on levels of service which did not take into account the road's classification.

A single pothole with a dia of:	600mm	300mm	100mm	<70mm
Or this number of potholes (any size) in any one 100m road length	6	4	2	1
ONRC	Response time in (working) days			
Primary Collector	1	2	10	nil
Secondary Collector	1	2	10	nil
Access Road	2	5	20	nil

RESPONSE TIMES POTHOLE REPAIRS

Width of edge break from nominal edge of seal	200mm, or 100 mm on the moving lane side of the edge line	100mm, or within the edge line	Less than 100mm, and between the edge line and the normal Edge of seal
ONRC	Response time in months		
Primary Collector	3	6	nil
Secondary Collector	3	6	nil
Access Road	6	nil	nil
Low Volume Road	6	nil	nil

RESPONSE TIMES EDGE BREAK REPAIRS



	High Priority (currently highly likely to fail completely)	Low Priority (currently unlikely to fail completely)
ONRC	Response time in months	
Primary Collector	3	6
Secondary Collector	3	6
Access Road	6	9
Low Volume Road	6	9

RESPONSE TIMES PAVEMENT DIG OUT OR STABILISATION REPAIRS

ONRC	Response Time in Working Days
Primary Collector	3
Secondary Collector	3
Access Road	10
Low Volume Road	10

RESPONSE TIMES PAVEMENT REPAIR RESURFACING

EMERGENCY DETOURS FOR STATE HIGHWAYS ONTO LOCAL ROADS

An unplanned event requiring a road closure / detour on the State Highway network for road crashes, weather events or similar which render the Highway unsuitable for continued safe use will inevitably involve the diversion of traffic onto the local roading network.

There are some possible issues with this sudden change in traffic volume onto the local roads in the Ōtorohanga District. A diversion from SH3 with approximately 7353 vehicles per day (2018) with 16% of those vehicles being Heavy Commercial Vehicles, onto local roads with levels of service for typical usage volumes of 160 (Puketarata Road) to 330 vehicles per day (Te Kawa Road) is likely to create significant issues for road safety, resilience, and should the detour last for periods of more than a day, considerable accelerated pavement deterioration.

Waka Kotahi have recently provided planned detour routes, and some consideration should be given to the potential impacts from these detours, Okupata Road being an example from a recent closure of State Highway 31. It is possible that local road routes for use during long term State Highway closures should be upgraded in preparation for detours.

LINKING WORKS TO THE STRATEGIC CONTEXT

Throughout this document works, strategies and practices which link directly to identified problems or benefits and the key performance indicators of success, the flowing icons are used to highlight linkages to this Strategic Context section.

Reference	Description	Icon
PS 1	Problem statement 1: The central location and attractiveness of the district is increasing growth, placing additional demand on infrastructure and resources.	
PS 2	Problem statement 2: Increasing pressure from climate and environmental impacts.	
PS 3	Problem statement 3: The current state of our infrastructure and how people use it is unable to meet the speed and uncertainty of technology change.	
BS 1	Benefit statement 1: Strong community leadership focussed on the future of the districts success.	
BS 2	Benefit statement 2: Increased prosperity for the whole district.	
BS 3	Benefit statement 3: Building a thriving and healthy community where people want to stay and grow.	
LOS 1	Road safety: How road users experience the safety of the road.	
LOS 2	Transport Resilience: The consistency, availability and reliability of an effective route particularly during unexpected events.	
LOS 3	Transport Amenity: The level of travel comfort experienced by the road user, and the aesthetics of the road environment.	
LOS 4	Accessibility: The ease with which people are able to reach key destinations, and the transport networks available to them.	
LOS 5	Cost Efficiency: Value for money and best whole of life cost.	

LEVELS OF SERVICE

A primary objective of this Activity Management Plan (AMP) is to establish the expectations of stakeholders and customers, define the external drivers for provision of service and match these requirements with Levels of Service which are clear in setting out what is intended to be provided by Council for land transport. Effect is also to be given the Local Government Act and Government Policy Statement (GPS) for Land Transport. At the time of this draft the GPS had not been passed and hence assumptions are made based on the previous document.

LEVEL OF SERVICE DRIVERS

BEST VALUE LEVEL OF SERVICE SCENARIO PLANNING

The current emphasis from The Ministry of Transport via Waka Kotahi and Te Ringa Maimoa is to ensure that scenario modelling is used to calculate the impact of increasing or decreasing levels of service in relation to cost / risk / carbon emissions. To this end Te Ringa Maimoa provided a spreadsheet to model these scenarios which is included as appendix A.

The objectives are to maximise the return on investment made in land transport by good decision making, cost management, reduce carbon emission and understand and manage the associated risk with the decisions made. The model translates risk into a dollar value which in essence calculates to the cost of poor asset management due to fiscal constraints and poor decision making.

The following graphs summarise the scenarios over the ten year Land Transport Activity Management Plan. The overarching headline being the current level of investment is the correct one justified by the detailed analysis and scenario modelling.

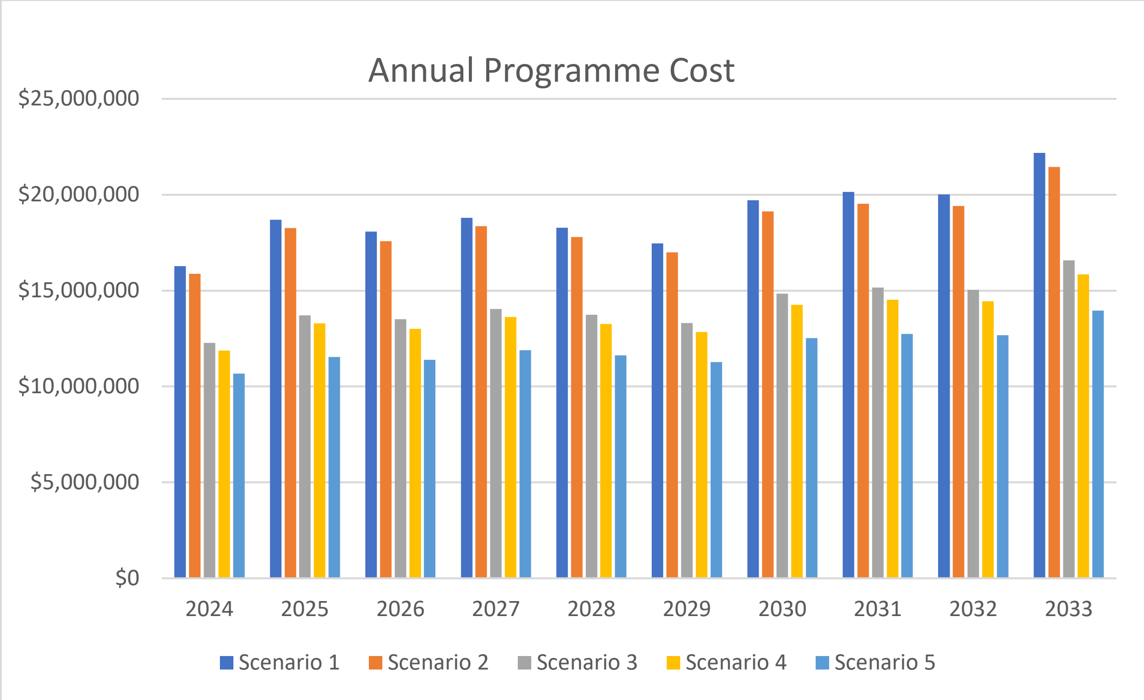
Scenario 1 is all option A, an increased level of service in operational, tactical and strategic activities.

Scenario 2 is option B, maintaining the current level of service on strategic activities and option A increased level of service Tactical and Operational activities.

Scenario 3 is option B, maintaining the current level of service on operational, tactical and strategic activities.

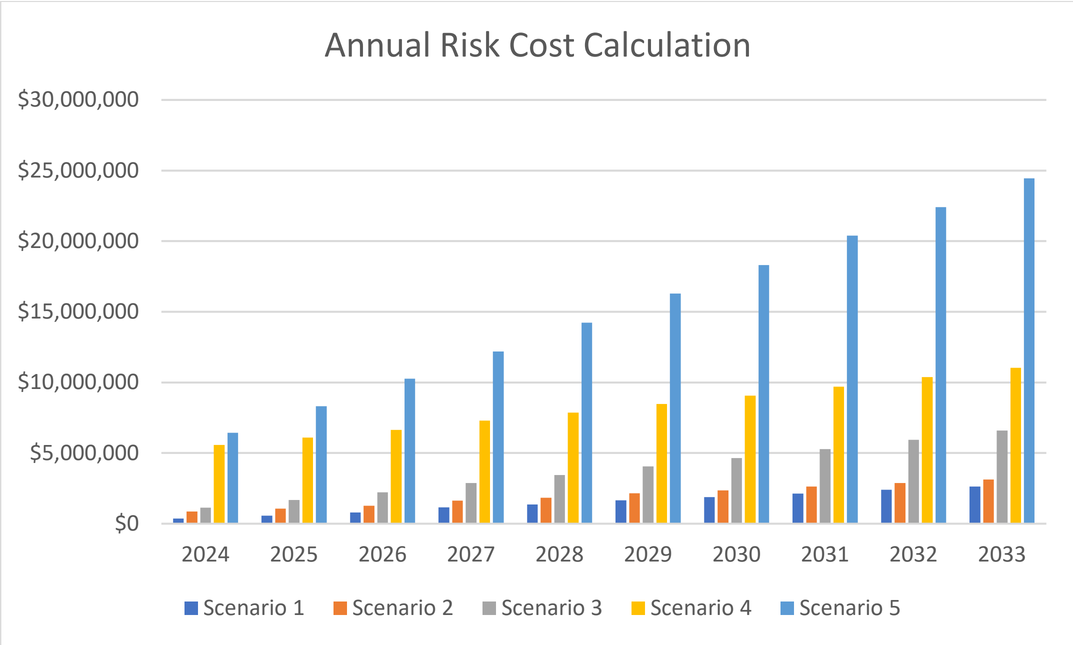
Scenario 4 is option C, decreasing the level of service on operational activities and option B maintaining the current level of service on tactical and strategic activities.

Scenario 5 is option C, decreasing the level of service on operational, tactical and strategic activities.



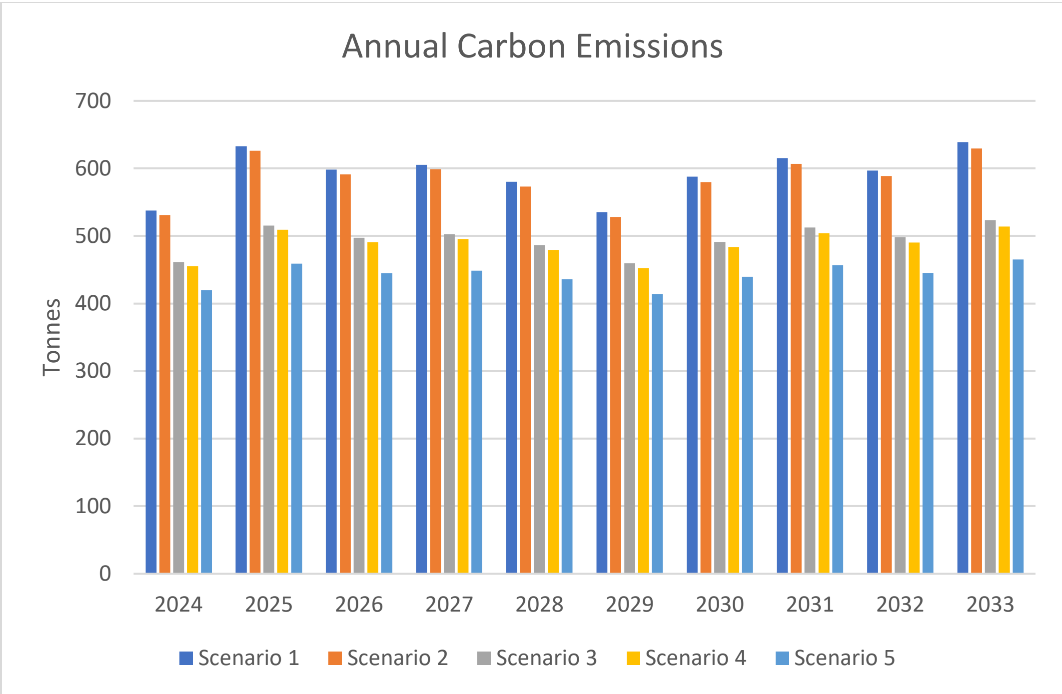
As the level of service decreases the costs decrease as expected. The pertinent analysis of this graph is when scenario 3 is calculated, which is maintaining the current level of service, there is a steep change in cost up for the improved levels of service of 29.32% from scenario 2 to 3, equally reducing the levels of service drop the costs by a very small 3.33%. Reducing the amount invested is clearly a false economy.

COST	**2024**	**2025**	**2026**
Scenario 3 to 1 cost change percentage	32.65%	36.26%	33.89%
Scenario 3 to 2 cost change percentage	29.32%	33.17%	30.21%
Scenario 3 to 4 cost change percentage	-3.33%	-3.09%	-3.68%
Scenario 3 to 5 cost change percentage	-13.12%	-15.85%	-15.69%



As the level of service decreases the risk increases as expected. The pertinent analysis of this graph is when scenario 3 is calculated, which is maintaining the current level of service, there is a relatively small 24.94% decrease in risk between scenario 3 and 2, however reducing the levels of service from scenario 3 to 4 significantly increases the risk by a huge 387.22%. The other point to emphasise is that risk grows significantly over time for the ten years 2024 to 2033 the increase in risk between scenario 3 and 4 in dollar terms is an “eye watering” $44,244,000 and between scenario 3 to 5 a staggering $115,405,500 which equates to 115,405,500 / 153,398,184 = 75.23% of the total programme. In simple terms, cutting back on the levels of service and investing less in asset management will have enormous financial consequences.

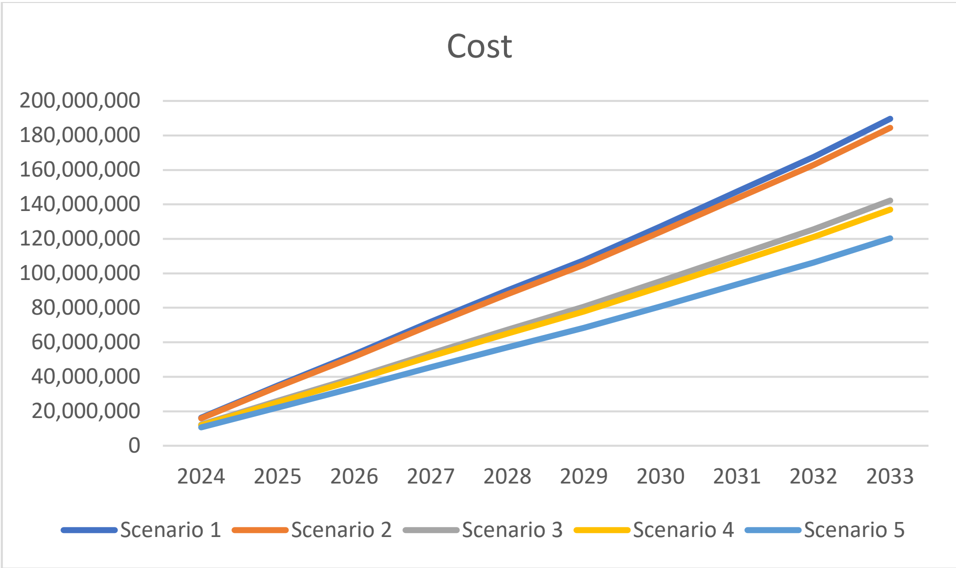
RISK	**2024**	**2025**	**2026**
Scenario 3 to 1 cost change percentage	-67.97%	-66.16%	-64.77%
Scenario 3 to 2 cost change percentage	-24.94%	-36.77%	-42.67%
Scenario 3 to 4 cost change percentage	387.22%	264.52%	198.93%
Scenario 3 to 5 cost change percentage	463.94%	397.29%	361.09%

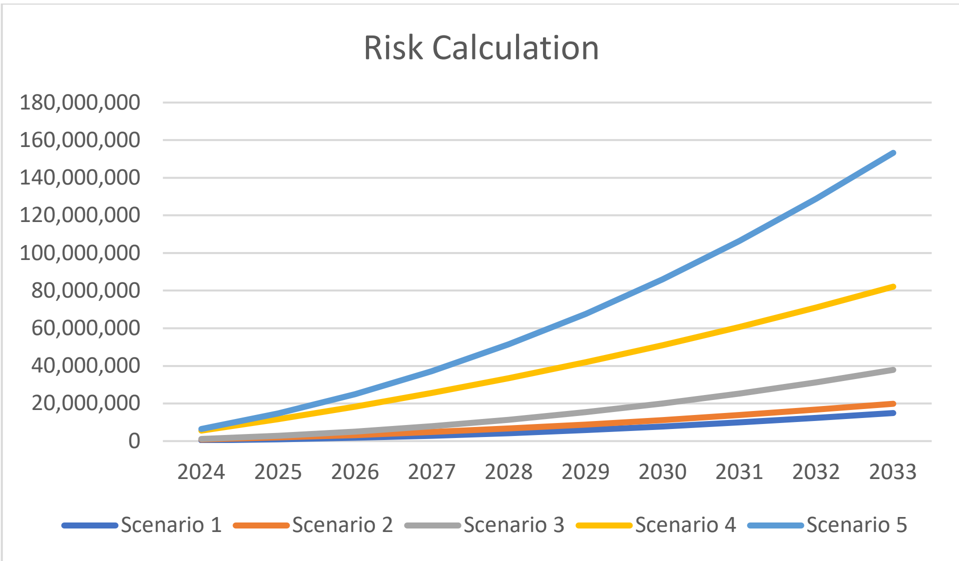


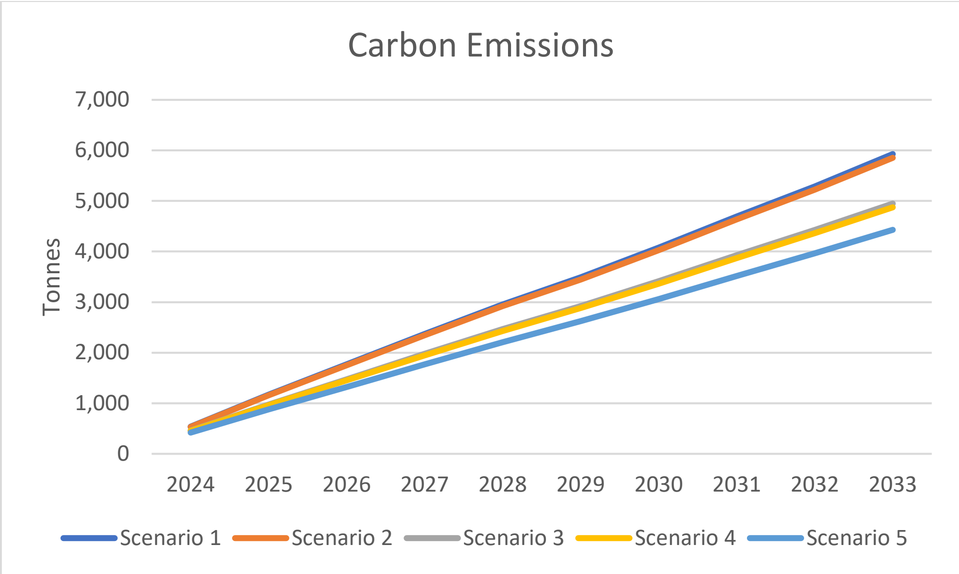
As the level of service increases the carbon emission increase as expected. The pertinent analysis of this graph is when scenario 3 is calculated in relation to scenario 2, there is a much larger increase in the carbon emission (15%) than when the levels of service drops from scenario 3 to 4 (1.39%). This supports the current levels of service as being the optimum return on carbon emission. Focus should also be on minimising rework which would add to the carbon footprint.

Emissions	**2024**	**2025**	**2026**
Scenario 3 to 1 cost change percentage	16.50%	22.74%	20.23%
Scenario 3 to 2 cost change percentage	15.11%	21.50%	18.86%
Scenario 3 to 4 cost change percentage	-1.39%	-1.24%	-1.37%
Scenario 3 to 5 cost change percentage	-9.02%	-10.94%	-10.61%

The following cumulative graphs give further proof that the current levels of service provide the optimal relationship between costs /risk / carbon emissions.


Cost
200,000,000
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5


Risk Calculation
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5



CUSTOMER EXPECTATIONS

The last three years have been particularly challenging, primarily due to the impact of Covid-19. Stakeholder expectations have been under pressure and a general acceptance of some things having "to give" has become more prevalent. As part of the development of the 2021/31 Long Term Plan (LTP) it was decided to consult with communities within Ōtorohanga and Kawhia townships more directly, and feedback from the rural sector indicated that the levels of service on the rural road network was at an acceptable standard. A wide cross section of township residents were consulted and township development plans established. The overall impact of these on the transport network, is a need for interconnected cycleways and footpaths along with safety improvements through the Ōtorohanga Township to give effect to the place component of the One Network Framework. The level of service on the local roads within both the main townships was accepted as fit for purpose. This consultation also confirmed clear identification of the levels of service Ōtorohanga Rate Payers are willing to pay for. There is commitment made by council of over $1 million (1,056,971) in the next three year NLTP cycle to give effect to the Ōtorohanga Town Concept Plan.
A wide range of budgeting information was available and direct discussions around levels of service were encouraged. The sentiment of the community had not changed during the latest three year cycle, confirming the community were satisfied with the current levels of service.

Several specific regular maintenance items were improved during the three years including poor footpath condition and better vegetation control ensuring improved sight lines. The budget in this AMP for footpath renewals has been doubled to $350k per year which is significant with only 35.27 kms of footpaths in total. Seal extension remained a common theme throughout the course of these meetings although none were completed during the last three year cycle due to the resource limitation during the Covid-19 pandemic and the significant increase in costs. Seal extensions are a good example of balancing cost against levels of service, they are popular in rural areas although the capital cost plus increased maintenance costs (between 2 and 3 times) over that of unsealed roads are difficult to justify. Ōtorohanga District Council have approved a formula / methodology to give priority to the stretches of road where the most value can be added.

Other interactions with ratepayers and stakeholders between Council staff and elected members are continuously ongoing in both formal and informal forums including:

- Further Long Term Plan and Annual Plan consultation
- General customer service requests
- Developer discussions during applications for resource consent

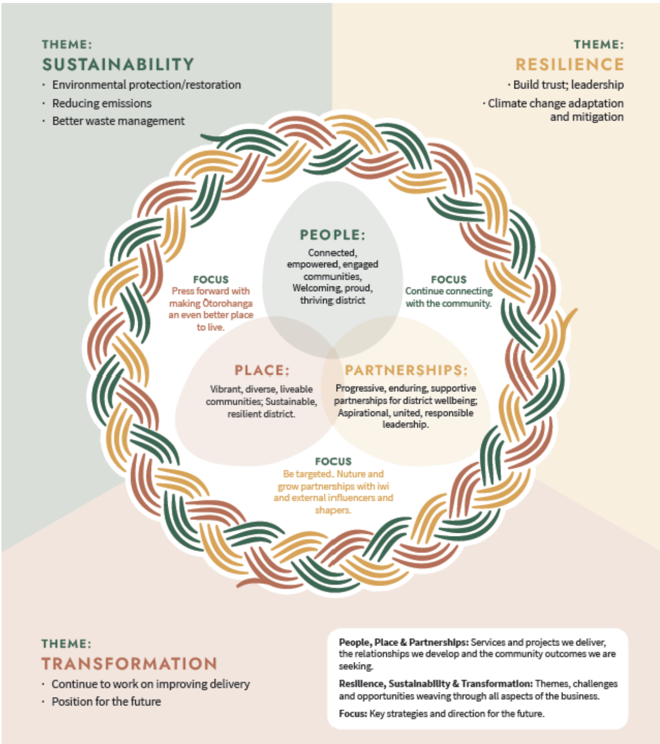
- Discussions with NZ Transport Agency funding staff and technical auditors
- Discussions with Regional Council transport and road safety staff
- Road safety industry members at Road Safety Action Plan meetings (RSAP) and similar forums
- Active and alternative mode transport representatives
- Annual Council and RATA customer satisfaction surveys

Based on these interactions it is widely believed that the customers and stakeholders are generally well satisfied with the current land transport standards and management practices which go together to form the customer level of service.

CORPORATE GOALS

As a result of the community consultative process for the 2024/34 Council Long Term Plan, the key message for Council remains “business as usual” with a strong focus on operational efficiency and financial prudence. The Long Term Plan also included some additional areas of focus and these are discussed as they relate directly to land transport levels of service (and in particular improvements).
Facilitate Managed Growth - the provision for growth, particularly economic growth, can be impacted directly by the land transport network. It is considered that working with the One Network Framework (ONF) functional levels of service and performance measures will ensure the network is in a position to absorb traffic impacts from modest growth. As well as identifying engineering works to provide appropriate capacity and prioritising any improvement works through the ONF hierarchy, roads within the District Plan “Countryside Living Area” specifically identified for rural intensification can be prioritised for improvements associated with safety and capacity.

The 2024/34 Council Long Term Plan further provides the community outcomes in the form of the following image:



The priorities identified as relating direct to land transport as:

- Maintain existing services and levels of services, with our road network continuing to be our largest spend area.
- Understand the likely impacts of climate change on our stormwater networks, and other activity areas, and reflect that in our ongoing work programmes.
- Ensure we have the right staff resources in place to deliver our plans.

LEGISLATIVE REQUIREMENTS

A number of Central Government requirements provide specific guidance and legislative framework to be considered in formulating the Levels of Service as follows:

The Government Policy Statement 2021 (indications only at this stage.)
This document sets out the Ministers national strategic direction for the National Land Transport Programme investment and the priorities and objectives in delivering the transport programme. The key focus areas of the GPS are road maintenance with emphasis on value for money investment / spend, climate change / resilience, reducing carbon emissions and improving road safety.

The Local Government Act 2010 and Local Government (community well being) Amendment act 2019
This document establishes the four areas of community wellbeing, Economic, Cultural, Environmental and Social which underpin the general activities of Council.

The Department of Internal affairs non-financial performance measure rules 2013
This document establishes mandatory performance reporting for a number of public assets including roads and footpaths, which are focussed on:

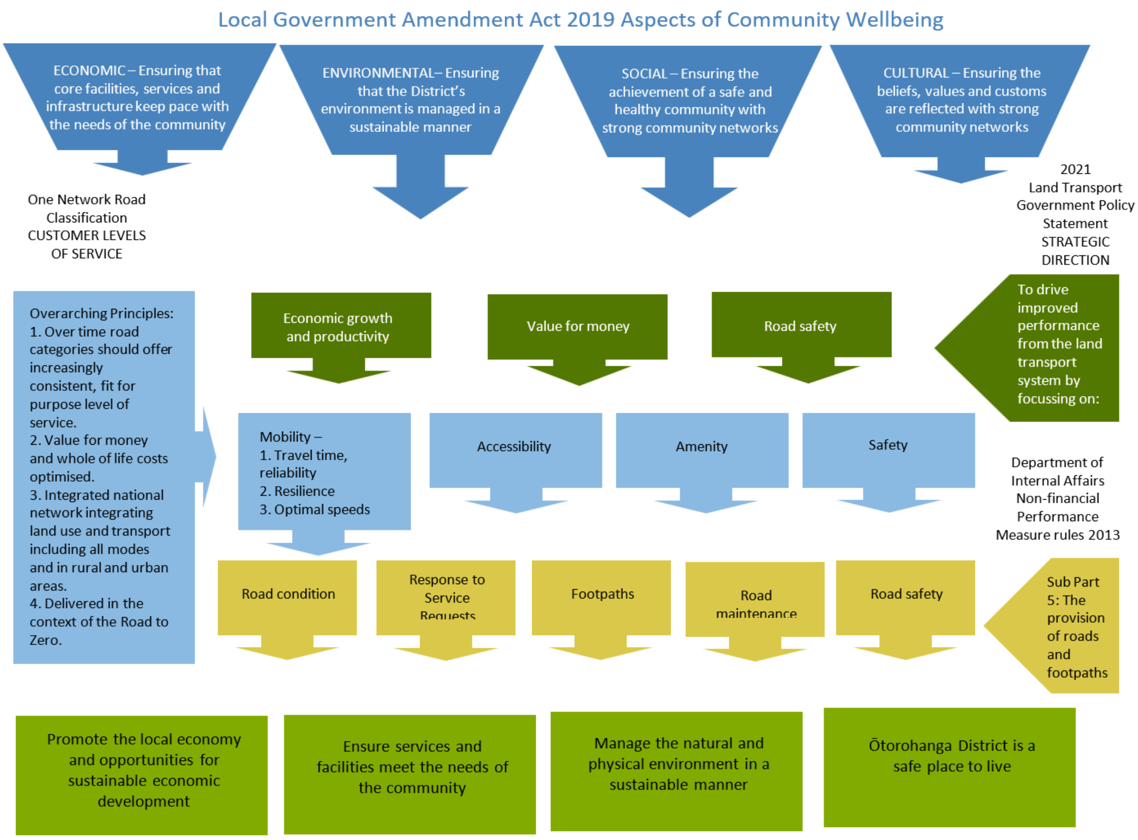
- How safe are the local roads?
- What is the overall condition of sealed roads in the local road network?
- Is the sealed roads network being maintained adequately?
- Are the footpaths that form part of the local road network being maintained adequately?
- Does the local authority responsible for the service provide a timely response if there is a problem?

For each of these aspects of service delivery, prescriptive measures are provided, which will allow Council to compare its level of service to its peers.

The NZ Transport Agency One Network Road Classification (ONRC) and One Network Road Framework (ONF) customer levels of service outcomes
There is currently a transition from the One Network Road Classification (ONRC) to the One Network Framework (ONF). Whilst the ONRC identified different road classifications based on traffic volumes and breakdown, the ONF uses the factors including the interactions of people with the environment adjacent to the road to add a “place” factor. The current Resource Management Act reforms which give direction on the land use adjacent to roads has further complicated this exercise and it is anticipated that the joint development of these two changes will work hand-in-hand over time. For the purpose of this AMP ONF measures have been incorporated into the data collected and hence performance will be measured against these. In terms of affecting the current level of service review ONF is not regarded as a significant factor, as the majority of council roads are now classified as rural connectors (25%) and rural roads (75%) both of which have a low place rating and hence there is no need to amend the level of service to incorporate this requirement. The changes to using the ONF categorisation are by definition designed to provide a safer and more interactive environment for people and changing the thinking from roads being for vehicles to roads are about the movement of people and goods in many different modes. This will in turn encourage mode shift and help give effect to the reduction of carbon emissions and reducing the road toll.

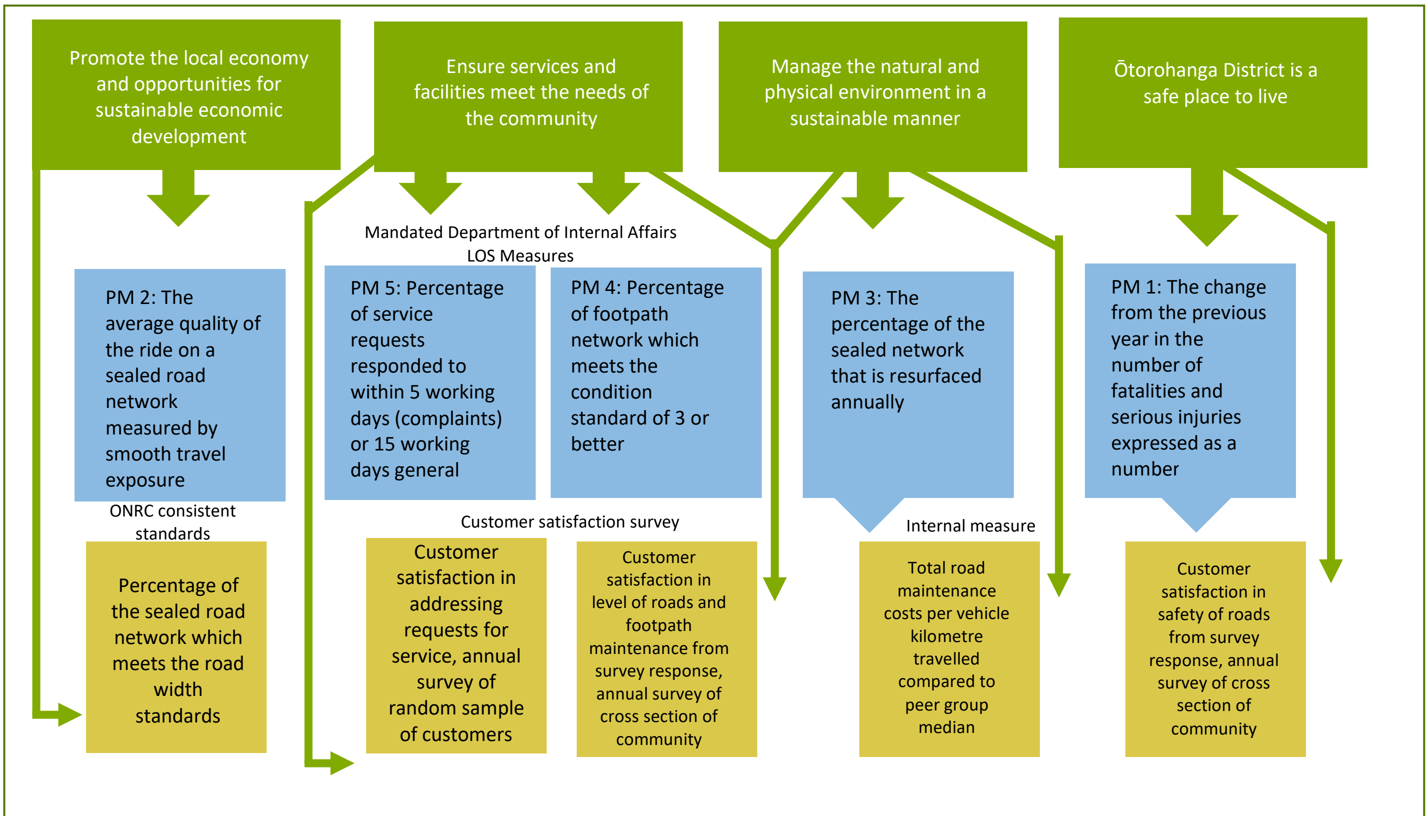
The ONF service outcomes and performance measures provide clear direction on the intended service provisions which are intended, in time, to provide an appropriate and unified network across all TLA’s. Measures are compared against peer groups to determine performance.

The following diagrams demonstrate the linkages between the various legislative requirements and the four relevant Council Community outcomes, and how these inform the general areas of the levels of service.



General Relationship of Level of Service Drivers

Relevant Ōtorohanga District Council 2024-34 LTP COMMUNITY OUTCOMES



Relationship of Community Outcomes to Level of Service Reporting Area

CURRENT AND TARGET LEVELS OF SERVICE

The levels of service in this edition of the Activity Management Plan have been revised from previous editions, primarily to align with new legislative requirements and updated central government approaches to land transport. The Department of Internal Affairs performance measures, sub-part 5 - The Provision of Roads and Footpaths are included in these levels of service. The change from the ONRC to ONF performance measures are included in these levels of service and form the bulk of the reporting measures.

MEASURE ADOPTION

The current levels of service adopted for this issue of the AMP have been based on the positive feedback from the community on the previous level of service maintained over the last three years. Minor amendments set by staff are with regard to our performance in relation to the peer group, and existing high customer satisfaction levels.

Through the various surveys undertaken in the past and more recent 2024/34 LTP community meetings, it is clear that the ratepayers are wanting to maintain the current level of service. This is consistent with the direction NZ Transport Agency (Waka Kotahi) requires for the development of the 24/27 National Land Transport Programme (NLTP). The performance levels set are those that staff believe accurately reflect the current levels of service. It is noted that the accelerated renewal programme for footpaths has been maintained and funded accordingly.

ROAD SAFETY LEVEL OF SERVICE TARGET SETTING

Road safety improvement targets are based on the Road to Zero Road Safety Strategy 2020 - 2030 which has the following targets:

- 40% reduction in Fatalities and Serious Injuries from 2020 to 2030

Safety Performance Measure – reducing number of serious and fatal injuries

Statistics for serious injuries and fatalities resulting from crashes on the Ōtorohanga District local roading network have been taken from the CAS database, with a five year rolling average established.
The combined five year rolling average annual fatality and serious injuries reduction rate from 2018/19 is 0.18 per annum. This represents a 40 % reduction of the combined fatal and serious injury accidents over a 10 year period to align with the Road to Zero target.
The five year average annual fatal and serious injury rate in 2018/19 was 4.6 per annum. A 40 % reduction over 10 years of 1.84 to set a target of 2.76 fatal and serious injuries (five year average) per annum has been adopted as a performance target, to match the Road to Zero Target.

Current Performance

For the most appropriate of the ONF measures there is information on peer group averages and ranges. Discussion on ODC performance compared to its peer group is provided below.

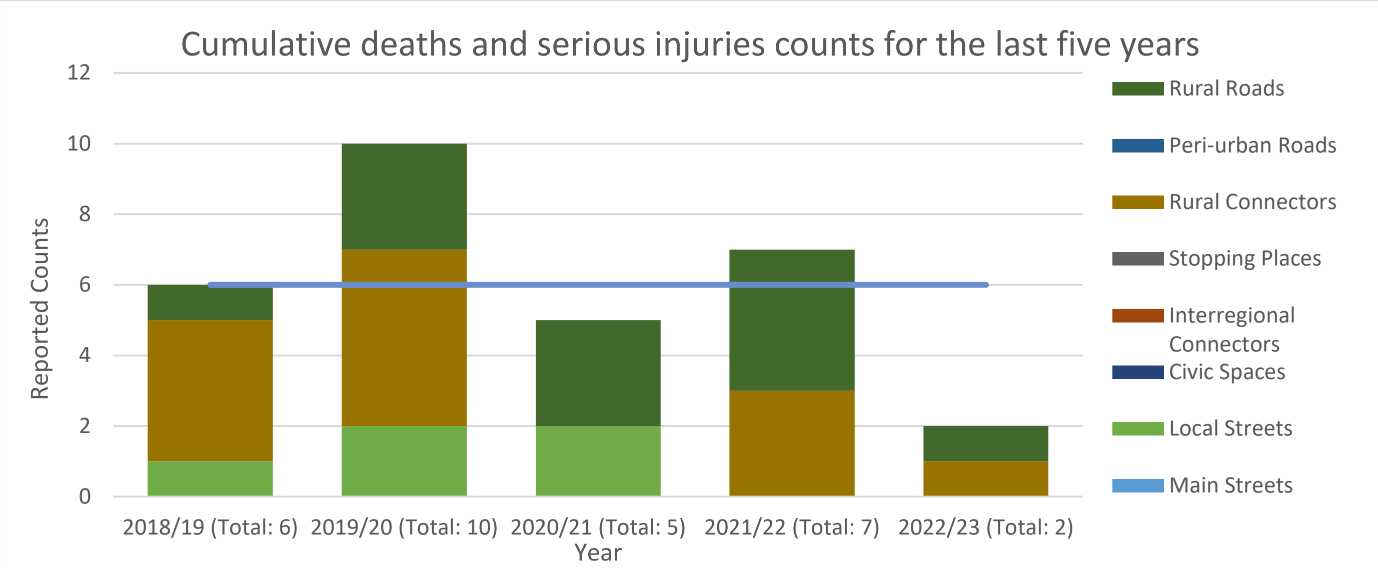
Safe Travel and DSIS

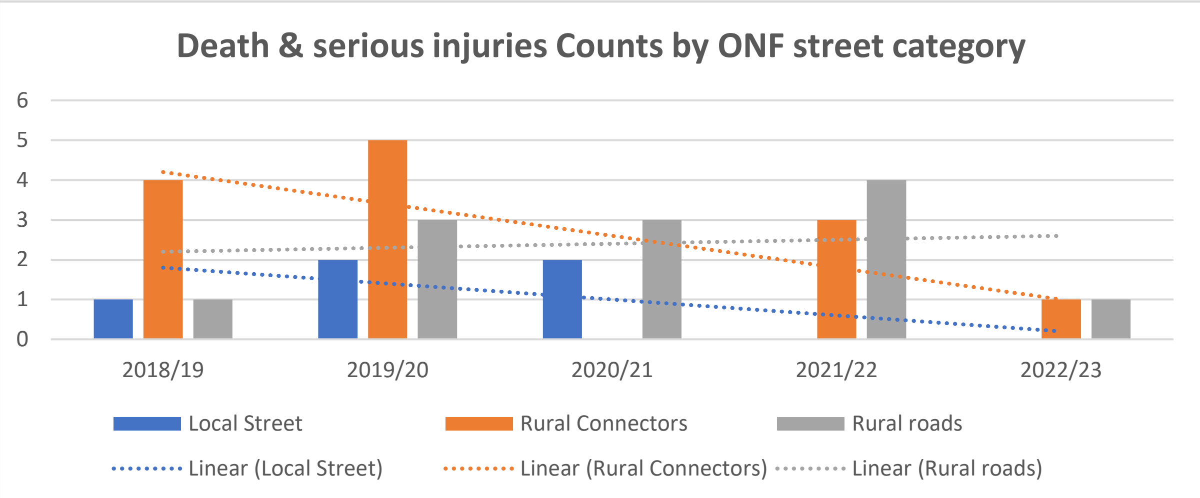
Commentary on the graphs below
The graphs below show how the annual deaths and serious injuries have improved or become worse over the last five years. The commentary focuses on local streets, rural connectors (20%) and rural roads (75%) which make up almost 100% of the Ōtorohanga District Road network.

Category	Percentage by length	Percentage by VKT	5 Year DSI Trend	Rural Districts
Rural Roads	75	31	+23% (increase)	-13% (decrease)
Rural Connectors	20	57	-13% (decrease)	-2% (decrease)
Local streets	3	6	+10% (increase)	+3% (increase)
Others	2	6		

Whilst the overall numbers are low the increase on both rural roads and local streets is concerning. Further investigation of these accidents did not show that any of these accidents were as a result of the road surface conditions or other factors which Ōtorohanga District Council are able to directly influence.

Historical records and the established target are as shown below:

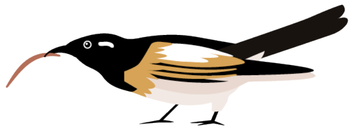




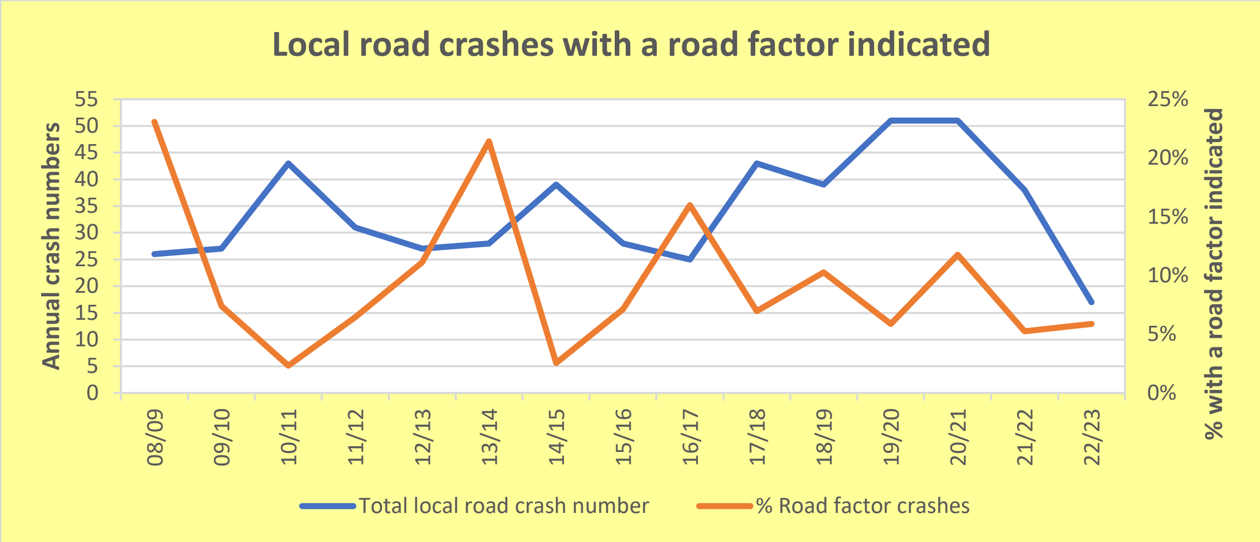
The current fatal and serious injury rate five year rolling average are not achieving the level of service targets required. 2021/22 was a bad year with 7 deaths or serious injuries which reduced to only 2 in 2022/23. Targeting education of road users and working towards speed management is the proposed response to maintaining the level of service.

<u>Safety Performance Measure – reducing trend in fatal and serious injuries by specific crash types</u>
Due to the relatively low number of crashes on the local road network, particularly when considered by individual road hierarchy, the rolling five year average for fatal and serious injuries are extremely sensitive to single event crashes. It was therefore decided that individual numerical targets would not be set, rather an annual target level of service of zero or a declining trend in fatal and serious injuries has been established.

<u>Road Factor Crashes Safety Performance Measure</u>
Statistics have been taken from the CAS database to determine the percentage of local road crashes (including minor and non-injury crashes) which have a "road factor" listed as a contributor to the crash (but not always the primary reason for the crash) for example a slippery road surface resulting from rain. These crashes made up between 2% to 23% of the total crash numbers and averaged 10% since 2008/09.
The level of service target is set to reduce the number of crashes where physical road factors are a contributing factor. The spike in road factor crashes in 2013/14 was primarily in one location on Ouruwhero



Road after a reseal failed leaving a flushed surface. This section of road has since been the subject of a significant capital improvement project, and it is hoped that this issue has been addressed.
Although it is pleasing to see "road factors" trending downwards and reduction to only 2 DSIs in the 22/23 year the analysis of the crashes enables us to focus on other crash causes more relating to driver behaviour whilst continuing to adopt a similar approach to road safety improvements as we have in the last few years.



Historical Data for Crashes with Road Factors listed as a Contributing Factor

CUSTOMER EXPERIENCE USING THE ROAD NETWORK

Smooth Travel Exposure is a customer outcome measure indicating ride quality.
For a more detail explanation please visit https://www.nzta.govt.nz/assets/Road-Efficiency-Group/docs/practice-overviews/REG-practice-overview-smooth-travel-exposure.pdf

Smooth Travel Exposure (STE)

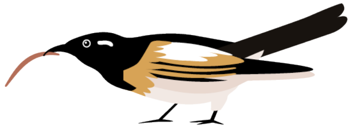
Category	Percentage by length	Percentage by VKT	Journey % meeting STE	5 Year STE Trend	Rural Districts % meeting	Rural Districts
Rural Roads	75	31	92%	-2% (decrease)	95%	+2% (increase)
Rural Connectors	20	57	96%	-1% (decrease)	96%	- (no change)
Local streets	3	6	79%	-6% (decrease)	87%	-3% (increase)
Others	2	6				

Peak Roughness is a customer outcome measure indicating ride quality and can be thought of in a similar manner to the human perception of surface texture through touch.

Peak Roughness

Category	Percentage by length	Percentage by VKT	NAASRA	5 Year STE Trend	Rural Districts NAASRA	Rural Districts
Rural Roads	75	31	99	+5 (increase)	99	-5 (decrease)
Rural Connectors	20	57	83	(no change)	79	- 1 (decrease)
Local streets	3	6	159	+15% (increase)	128	-2% (decrease)
Others	2	6				

The peak roughness trends for the Ōtorohanga District show a negative trend i.e. increase in the NAASRA score, especially on local streets. The national trend over rural districts shows and improvement across each of these categories with the latest NAARSA scores being lower for local streets and rural collectors and the same for rural roads. One significant trend to consider when deciding on future investment levels is that the national average score for rural roads has reduced by 5 points while the Ōtorohanga District Score has increased by 5 points – a 10 point swing. Whilst this has not manifested in negative feedback from the community typically an increase in the peak roughness measurement is an indication that the road surface is deteriorating which is therefore a good indicator of the future need and hence investment levels. To address this negative trend, before pavement failure sets in, Council has identified an investment of $930,000 over the next three year cycle - currently identified as “rehabilitation for long term surfacing and roughness improvements” and this work is likely to include rutting filling, improvements in drainage and holding treatments.



REPORTING

Reporting of the achieved annual levels of performance to the public is proposed to be through the publication of the annual report. The relatively technical nature of the LOS measures not included in the Annual Plan and report are unlikely to be interpretable to the rate paying public without significant supporting information, so it is not proposed to formally publish those results. The publication of results through the Te Ringa Maimoa Transport Insights web portal https://portal.transportinsights.nz/onf/transport-outcomes which is the ideal place for this information to be made available to our funding partners and auditors. (As the total numbers of DSI by ONF category are relatively small individual events make a significant impact on the ODC values, a positive result for 21/22 zero fatalities or serious injuries on the ODC roading network.)

ONF Reference Number	Description	Measure	Road Classification	ODC 2021/22 performance	National 2021/22	Waikato 2021/22	Rural Districts 2021/22	Comments
Safety – CO 1	Reducing the number of serious and fatal injuries on the local network each financial year.	The trend in annual Death and Serious Injury count over the last 5 years. E.G an average of 10 DSI's per year increasing by 1 per year = 10% increase. Decrease in green, increase in red	Urban Connectors	N/A	-3.66	4.12	7.86	
			City Hubs	N/A	-11.79	0.00	0.00	
			Activity Streets	0.00	-5.58	-4.26	-1.47	
			Main Streets	N/A	-2.78	-10.00	50.00	
			Local Streets	10.00	-4.31	-5.41	2.90	ODC are trending negatively against each comparator.
			Civic Spaces	N/A	-29.17	0.00	50.00	
			Interregional Connectors	N/A	-11.11	-11.84	0.00	
			Stopping Places	N/A	-10.47	-37.5	-13.64	
			Rural Connectors	-13.33	-2.6	-0.52	-2.48	ODC are trending positively against each comparator.
			Peri-Urban Roads	N/A	-5.78	15.22	0.00	
			Rural Roads	23.08	-8.56	1.29	-12.62	ODC are trending negatively against each comparator.

ONF Reference Number	Description	Measure	Road Classification	NAASRA Standard Upper Threshold	ODC 2022/23 performance	National 2022/23	Waikato 2022/23	Rural Districts 2022/23	Comments
Peak Roughness	Level of Service to road users.	NAASRA reading, the higher the reading the lower level of service – comparison against acceptable level for each ONF category. 75th percentile used for the comparison.	Urban Connectors	150	120.25	102	106	94	
			City Hubs	150	N/A	99	N/A	N/A	
			Activity Streets	150	202.5	114	117	108	
			Main Streets	150	N/A	111	116.25	112	
			Local Streets	150	159	140	127	125	ODC are trending negatively against each comparator.
			Civic Spaces	150	N/A	149	147	132	
			Interregional Connectors	130	N/A	75	N/A	88.5	
			Stopping Places	150	85	94	97	93	
			Rural Connectors	150	83	85	88	80	ODC are trending well against each comparator.
			Peri-Urban Roads	150	89	101	96	89	ODC are trending negatively against each comparator.
			Rural Roads	180	103	101	100	92	

ONF Reference Number	Description	Measure	Road Classification	ODC 2022/23 performance	National 2022/23	Waikato 2022/23	Rural Districts 2022/23	
Amenity – CO 1	The smoothness of the journey reflects the ONRC classification of the road	The percentage of travel on local roads smoother than the specified threshold by classification	Urban Connectors	82%	85%	84%	86%	Current performance is slightly below the peer group, the negative trend is concerning and needs further investigation however current levels of service remain at acceptable levels No changes in LOS proposed in this 3 year cycle.
			City Hubs	N/A	85%	N/A	N/A	
			Activity Streets	79%	81%	81%	83%	
			Main Streets	N/A	79%	77%	86%	
			Local Streets	79%	82%	85%	86%	
			Civic Spaces	N/A	72%	84%	86%	
			Interregional Connectors	N/A	95%	N/A	100%	
			Stopping Places	88%	90%	89%	95%	
			Rural Connectors	97%	94%	95%	96%	
			Peri-Urban Roads	95%	90%	95%	93%	
			Rural Roads	92%	92%	93%	95%	
Pavement Chipseal resurfacing – CE 2	Demonstrate that chipseal resurfacing on the network is timed to minimise whole-of-life cost while delivering the required customer outcomes	The total quantity of local sealed road chipseal resurfacing undertaken over the previous year as renewal work (% of classification) by classification	Sealed roads	10.5%				As above, calculated forward works plan average 10 year life is adopted for the AMP. The actual achieved is now sitting at 10.5%, this means a small amount of progress has been made catching up on the backlog.
Service Request response	Related directly to roads and footpaths.			Results not in yet.				From Brendan for 21/22 = 64%
Footpath condition	Ensure services and facilities meet the needs of the community	Percentage of the footpath network which meets or is at or above the condition rating standard 3 (Minor cracking)		80%				

DEMAND

POPULATION AGE PROFILE CHANGE

The expectation is that the aging population is likely to focus on the two principal urban areas where the required facilities for retirement are generally more available. The inevitable improvements in the availability, quality, effectiveness and affordability of alternative transport mode options (such as mobility scooters and electric bicycles) will also place pressure in the non-road transport network (pathways and cycle ways) in the Ōtorohanga urban communities. To this end, budgets for footpath and cycleway maintenance have been significantly increased in associated cost centres.

There is no immediate need to commence any capital improvements to provide for this shift or increase in alternative mode, but options are now under consideration. Thought is also being given to broadly defining a direction to manage the provision of appropriate transport services for the full range of the vulnerable road user sector of our community.

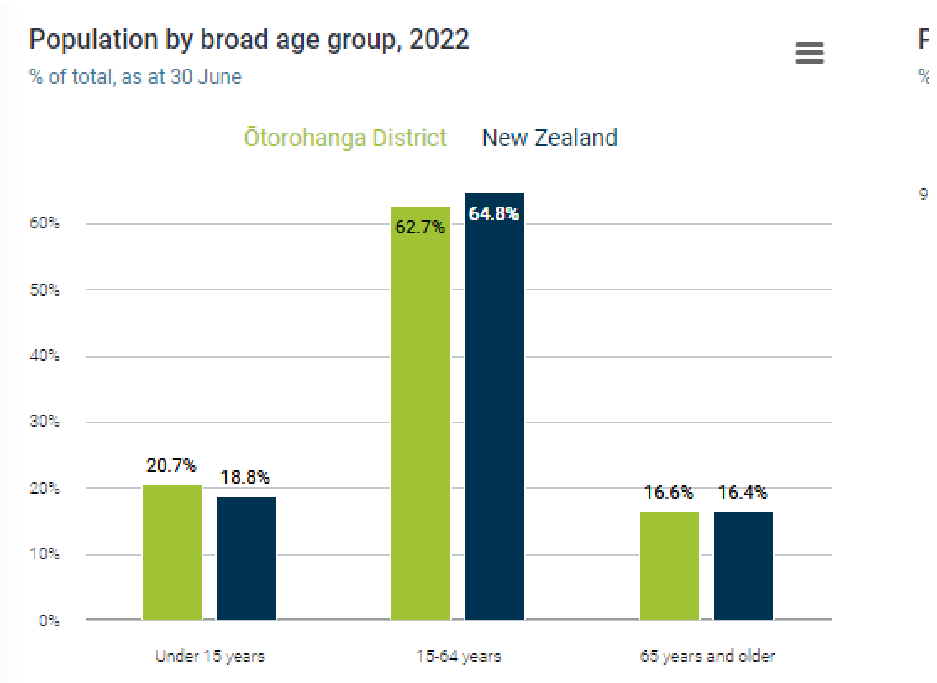
This work is included in the most with the Ōtorohanga Town Concept Plan and the two comprehensive concept (spatial) plans covering the Kāwhia/Aotea/Ōpārau area and the balance of our rural areas

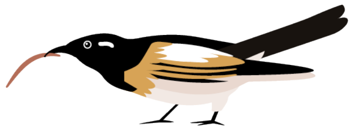
- In 2022, 62.7% of Ōtorohanga District's population was of working age (15-64). This proportion was lower than in New Zealand (64.8%).

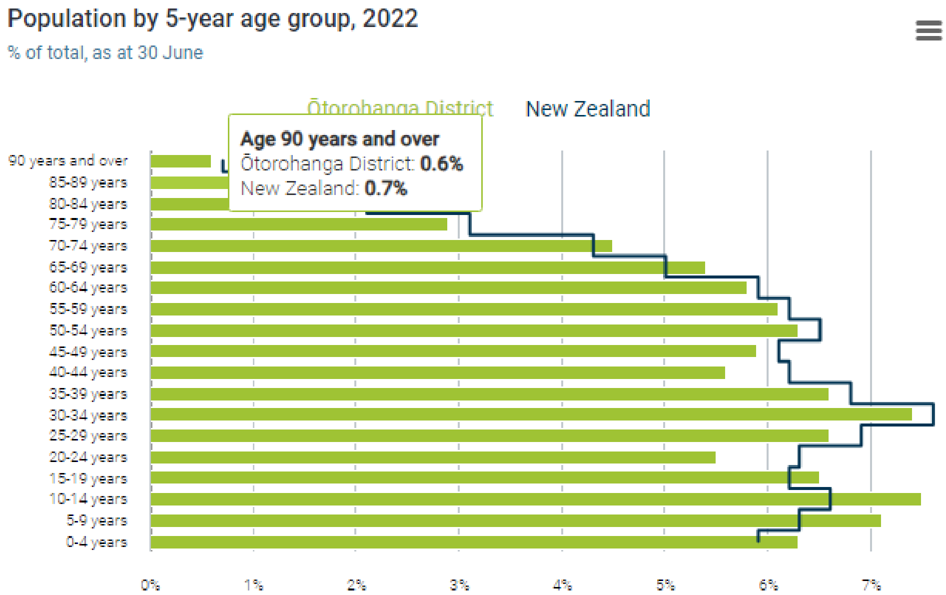
- The proportion of young people (0-14) was 20.7% in Ōtorohanga District. This proportion was higher than in New Zealand (18.8%).

- The proportion of people 65 years and older was 16.6% in Ōtorohanga District. This proportion was higher than in New Zealand (16.4%).

- Overall, the dependency ratio was 59.6% in Ōtorohanga District. This proportion was higher than in New Zealand (54.4%).





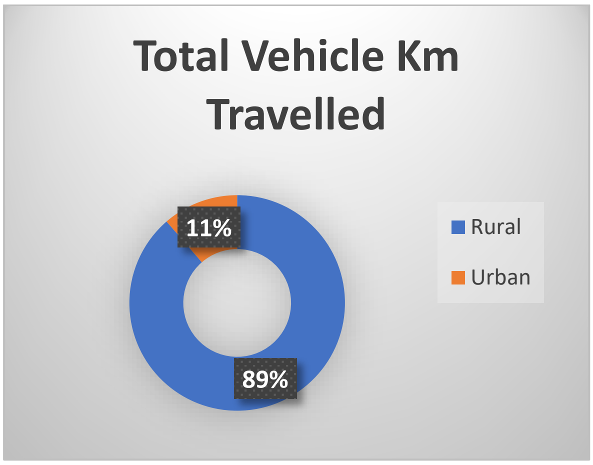


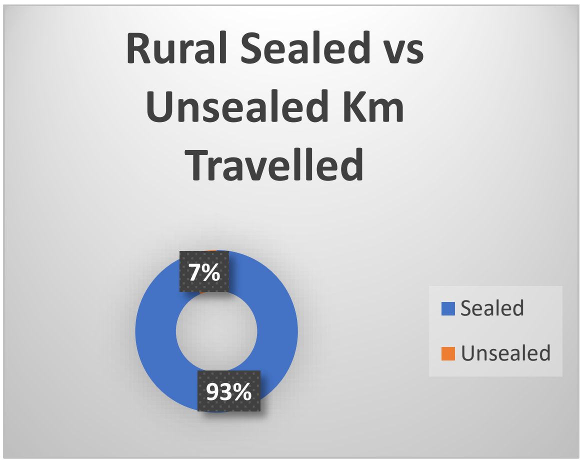
ŌTOROHANGA DISTRICT TRAFFIC GROWTH PROJECTIONS

CURRENT AND HISTORIC DEMAND

Ōtorohanga District Council's Roading staff has for many years undertaken a robust traffic counting programme, with some roads counted annually since 1959. The traffic counts for each of the 218 rural and 90 urban traffic count sites are carried out at the same location and same time of year, and as a result the traffic volumes and degrees of change are well understood.

A total of 51.9 million vehicle kilometres are currently travelled across the Ōtorohanga District network. (Excluding State Highways in the district)





Urban roads make up 4% of the roading network however 15% of the vehicle kilometres travelled are in urban areas

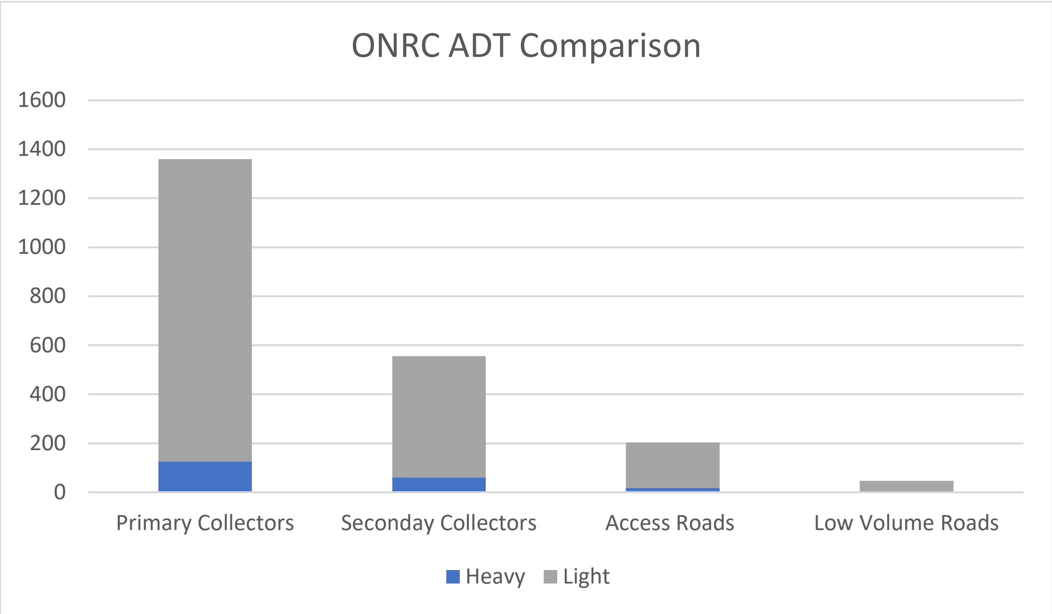
Sealed roads make up 65% of the rural network however 95% of the kilometres travelled on the sealed roads.

TRAFFIC GROWTH

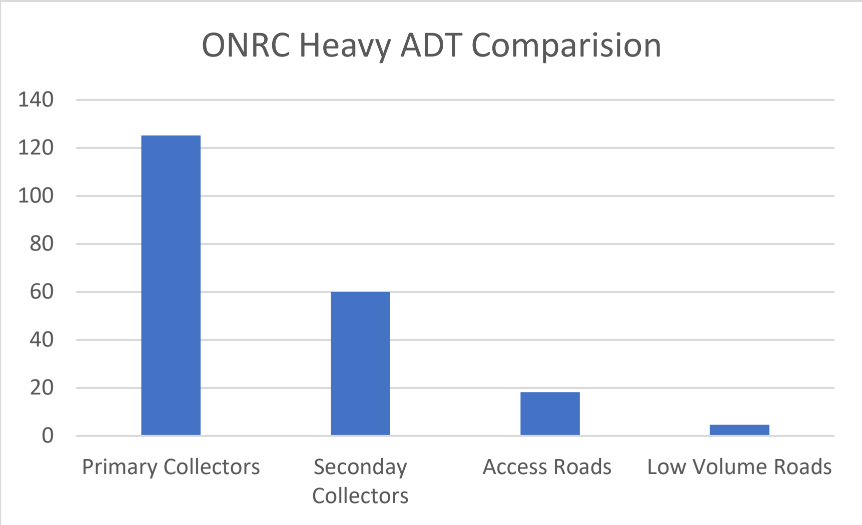
In general, the following series of graphs recording the Average Daily Traffic (ADT) Counts for roads across the district, do not provide definitive data that there has been any significant growth in traffic volumes over the last 11 years. These figures have been broken down into light and heavy vehicles in order to assess the damage caused by heavy vehicles to the roads and any level of service improvements required as a result of more cars using the roads.

Total traffic volumes on each of the four ONRC road classifications are low and do not approach thresholds where relatively small increases become significant for increased wear and hence shorter road rehabilitation cycles. Typically, roads built in the 1950s and 60s have layer works which are less than current design standards and adjustments are made accordingly when rehabilitation works take place.

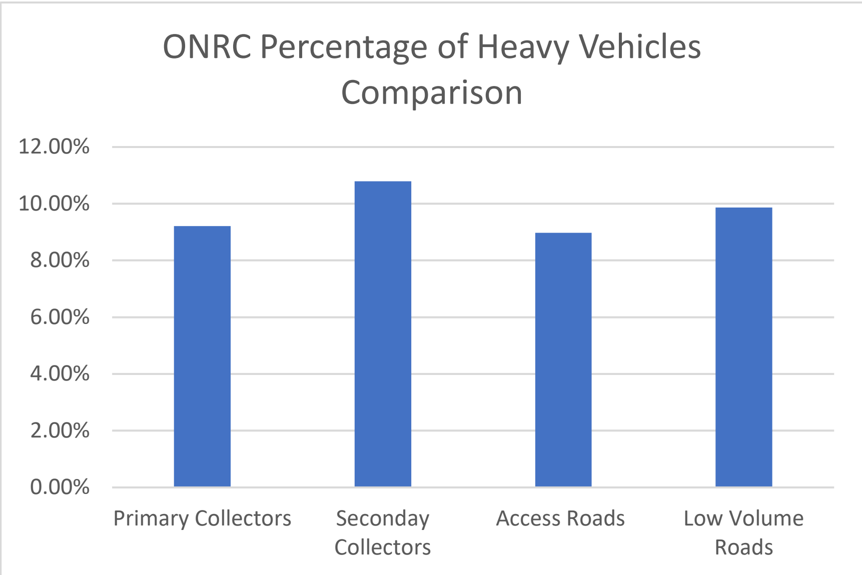
To further expand on this logic, for a nominal increase in layer works of 40mm (for granular pavements with thin bituminous surfacing and a subgrade CBR of 3) there would have to be twice the Equivalent Standard Axles (ESA's) to require such a change in design speciation. We believe that it is equally valid that any changes to the timing of the planned resealing or rehabilitation of roads are much more likely to be caused by local geology and existing road design rather than growth in vehicle numbers. As an empirical formula when completing rehabilitation work on all sealed roads we increase the effective basecourse thickness by a minimum of 50mm which effectively adds to the durability of the road and also future proofs the pavement design against increases in the traffic volume in the foreseeable future. We also make the reasonable assumption that axle loads will not increase based on recent legislative trends.



This graph clearly demonstrates the traffic volumes in the district based on the ONRC road hierarchy.



There is a very similar trend in the heavy vehicle numbers across the ONRC classification.

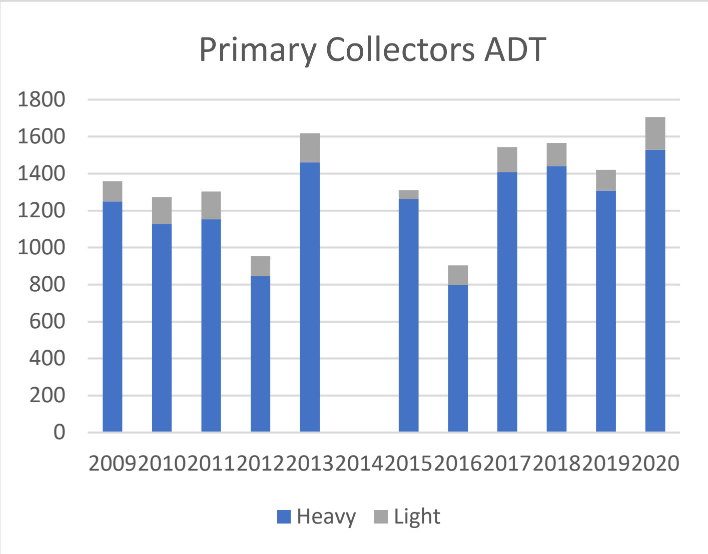


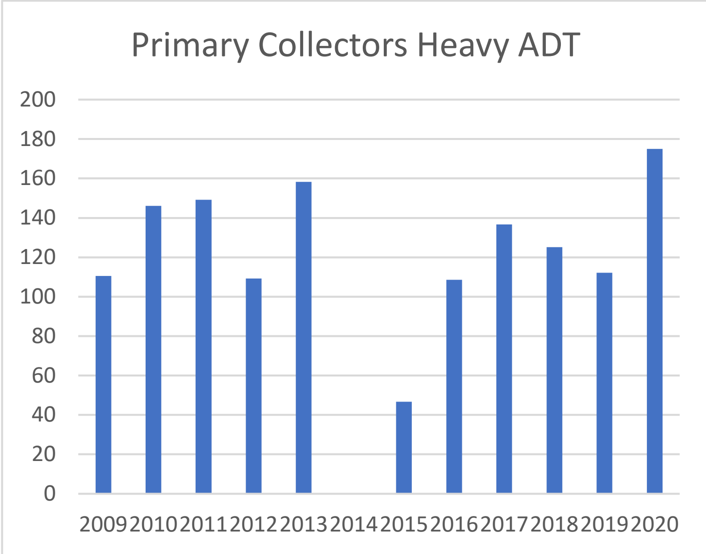
There is a very similar percentage of heavy vehicles on all the roads in the district.

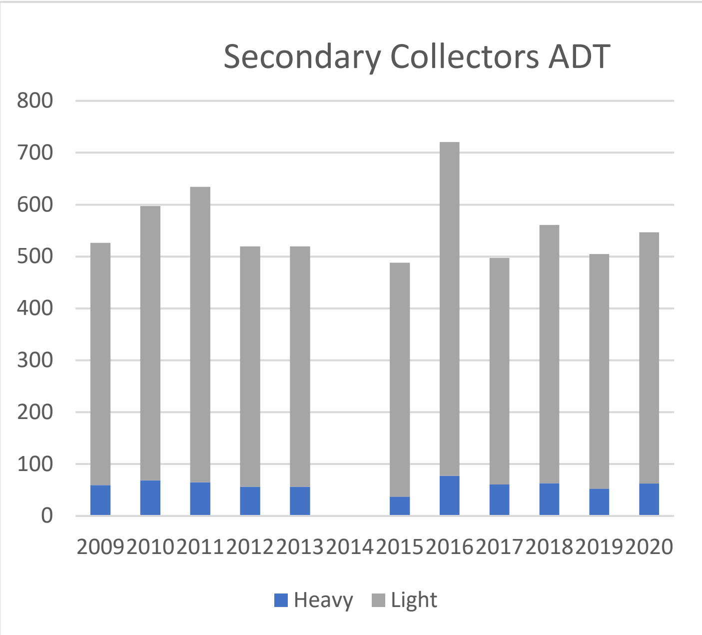
The following series of graphs show similar trends in the vehicle counts taken over the last 11 years across each of the ONRC classifications and give further weight to these conclusions:

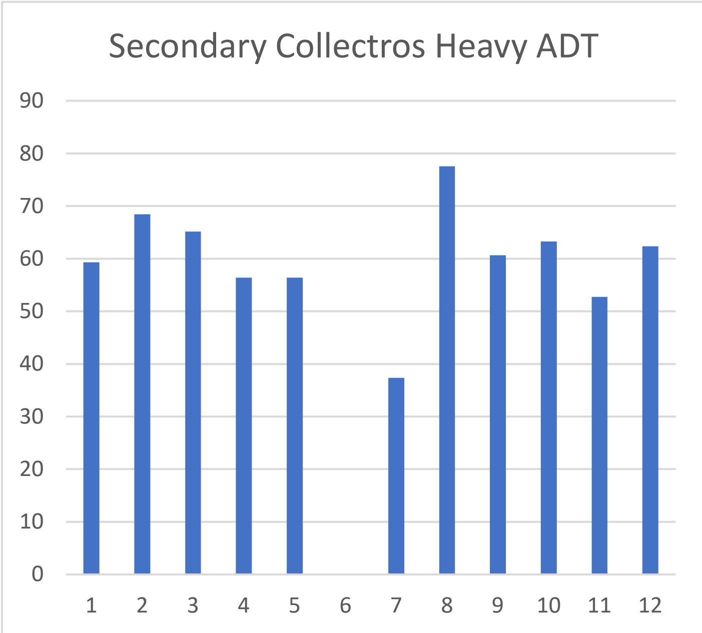
- There is not a significant increase in traffic volumes across the district
- There are similar vehicle demographics across the sealed roading network
- Their traffic count data is not as accurate as we would like and the variations in traffic volumes could easily be accounted for by taking counts on different days or at different times of year.

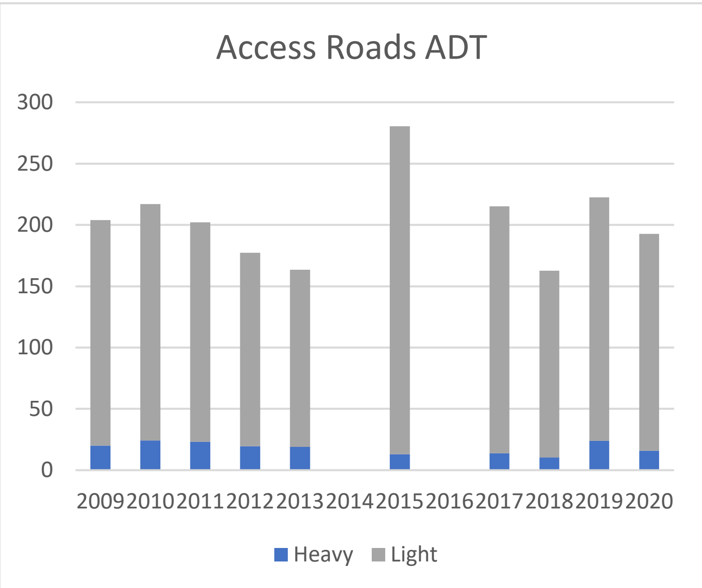
There is currently a plan in place to improve the traffic counts data across the Waikato Region by utilising the services of the Regional Asset Technical Accord (RATA) to provide consistency and continuity of service.

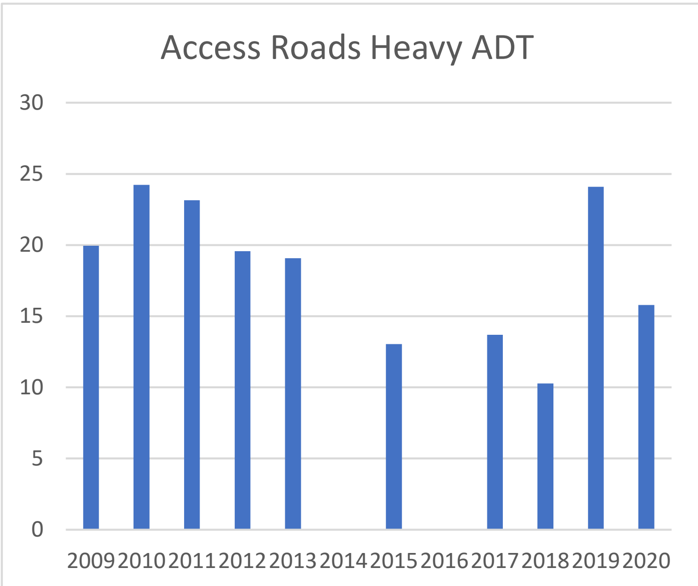

Primary Collectors ADT
1800
1600
1400
1200
1000
800
600
400
200
0
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Heavy
Light

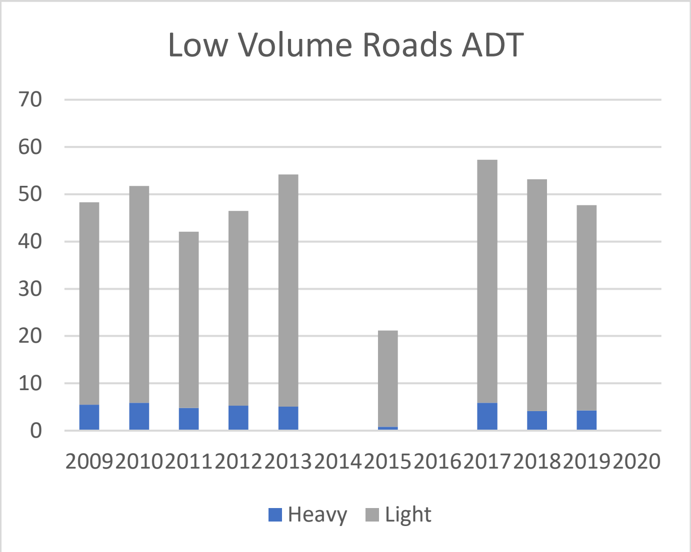

Primary Collectors Heavy ADT
200
180
160
140
120
100
80
60
40
20
0
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

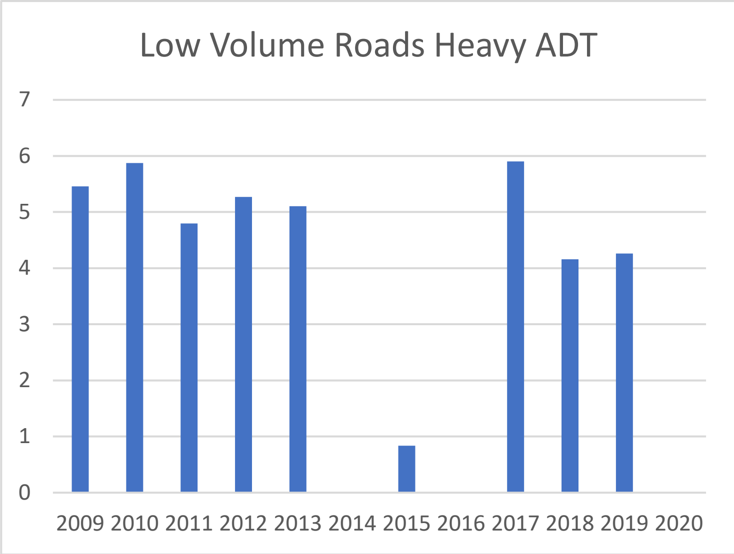

Secondary Collectors ADT
800
700
600
500
400
300
200
100
0
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Heavy
Light


Secondary Collectros Heavy ADT
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12


Access Roads ADT
300
250
200
150
100
50
0
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Heavy
Light


Access Roads Heavy ADT
30
25
20
15
10
5
0
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020





ROAD WIDTH ASSESSMENT

Ōtorohanga District Council has recently completed a revision of the typical construction cross sections for rural roads which included pavement width. These cross sections have been reviewed to fit directly against the ONRC hierarchy table (see details in appendix B). There are currently no typical urban cross sections as the road network is mature and any new developments are covered under the Waikato Regional Technical Specification which has been adopted by Council.

During this review all traffic accident data across the district including analysis of the Waka Kotahi “mega maps” tool was undertaken and the question asked “do we need to increase the width of our roads?”
Based in the data available, the principal answer was: No, as there is no crash data to support this and with the likely move to reducing the speed limit in rural roads any increase in road widths could be seen to be encouraging poor behaviour, as when people perceive the road is wide enough they are more likely to speed.

Consideration is being given to specific localised width issues which have been identified and these are then assessed as minor safety improvements under the low cost / low risk cost centre.

CONCLUSION

Current small increases in population and traffic demand (which is questionable due to insufficient data) do not indicate any need for level of service improvements based on either of these factors, therefore the current policies on road rehabilitation and resealing will continue. As detailed elsewhere in the document budgets have been included to address the slight negative trend in road surface condition and to gradually address the number of under width roads in the district.

DETAILED AND PROGRAMMED BUSINESS CASE

This chapter details the different programming options and weighs up the best approach for Council to take in maintaining the local network. All options are based on sound activity management principles and processes, and have been well considered to ensure consistent levels of service and best practice value for money decision making while taking into account timing, net present value methodology and delivery.

The planned maintenance programme will over time deliver appropriate customer levels of service consistent with the One Network Road Classification Framework (ONRC) hierarchy, One Network Framework (ONF) transport corridor perspective linking place and movement and Government Policy Statement on Land Transport priorities via Waka Kotahi maintenance guidelines.

This AMP 2024/34 is prepared under One Network Framework where it can currently be applied and future AMPs will continue this transition. The current maintenance contract is under ONRC level of services and will finish in year 2027, as the majority of the council's roads are rural the practical impact of the transition to ONF does not require a large shift in levels of service across the network.

PAVEMENT

SEALED ROADS

Strategic Case Link

In the last AMP Investment Logic Mapping (ILM) was used to identify what issues and needs were important to our community. A review of the community needs was completed and they remain unchanged. During the 2024/34 AMP development the need for the ILM was not identified since the problem statements were still relevant to the previous AMP 2021/31. The response to these problem statements have been reviewed and amended slightly based on community feedback and weather pattern over the last three years.

Icon	Problem	Benefit	Strategic response	Measure (ONRC)	Measure (ONF)
	The central location and attractiveness of the district is increasing growth, placing additional demand on infrastructure and resources (35%)	Infrastructure is developed to meet future demand (20%)	Create a resilient environment that encourages established and new leaders to lead with an outlook for the future that develops a strong community (45%) Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region (55%)	ONRC Amenity – Smooth Travel Exposure (STE) ONRC Amenity – Peak and average roughness Programme renewals completed- Tracked through budget expenditure spreadsheet Co-LAB annual traffic count programme	ONF - Smooth Travel Exposure – Based on Vehicle per day (VPD) and ONF movement classes ONF Peak Roughness – Transport outcome IO2 - VKT% / ONF street category, Peak roughness compared to VKT and network length, Peak roughness trends per ONF category, Peak comparison to other peer network groups – Renewal Programme renewals and Co-LAB annual traffic count programme
	Increasing pressure from climate and environment impacts (50%)	Increase in community resiliency (35%)			
	The current state of our infrastructure and how people use it is unable to meet the speed and uncertainty of technology change (15%)	Decrease in death & serious injuries on roads (45%)			

Strategic Response 1

Create a resilient environment that encourages established and new leaders to lead with an outlook for the future that develops a strong community.

The impact of Covid-19, extreme weather events and an overall national deterioration of the road network, has resulted in both a capacity and capability constrained sector. This has made it difficult to retain and attract highly skilled staff (supply and demand) which has required an amended response to resourcing however the strong principles and strategic response remain by focusing on:

- Allowing the leaders in the roading team to lead
- Ensuring data is accurate and up to date in order to inform leadership decisions
- Supporting growth and development of leadership skills at all levels within the team
- Supplementing the knowledge of the team with the careful use of external consultants
- Consultants engaging with the Te Ringa Maimoa (previously REG) training workshops and tools provided

The focus on this goal is the reason why the budget allocated to 108 151 is proportionately higher than that of similar councils because we believe that resourcing the team correctly and having first class information results in strong leadership and decision making.

Strategic Response 2

Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region.

"Fit for purpose' remains the focus of this AMP and the associated thinking is applied to ensure appropriate data is consistently gathered to verify fit for purpose and hence acceptable level of service are maintained the measures of Smooth Travel Exposure (STE) and peak roughness are used as the primary tools for measurement and validation. Completed renewal programmes and Co-Lab's annual traffic count programme are also included in the data utilised.

LOS associated with pavement

Overall, the current performance of the roads in the district is close to national averages using smooth travel exposure, peak and average roughness, completed renewal programmes and surveys, plus unsolicited feedback from road users. A slight negative trend has been identified by analysing this data and Council has allocated funding to reverse this trend over time.

ONRC LOS delivered through road pavement assets include:

Safety – The aim of this measure is to ensure that roads and roadsides are becoming safer for road users.

Resilience – The number of planned and unplanned road closures with or without a detour provided, and the number of vehicles affected by the closures annually

Amenity – The percentage of travel on roads smoother than the threshold specified for each traffic grouping or each classification.

Cost Efficiency – Includes cost efficiency across operational and capital expenditure including chipseal/asphalt resurfacing, unsealed road metalling and maintenance costs.

The Te Ringa Maimoa differential levels of service tool has been used extensively to inform the right decisions and hence investment levels are made. This is incorporated into the levels of service chapter and the appendix A. The “headline” of this exercise is that maintaining the current levels of service represented the best balance between the level of investment, risk management and mitigation and carbon emissions.

Activities Delivered

Activities delivered through the road pavement assets and their respective Waka Kotahi funding work categories are included in the table below:

Work Category	Function	Examples
108.111 Sealed Pavement Maintenance	Routine maintenance, structural integrity and serviceability	Dig-outs, patching, pre-seal repairs, potholes
108.112 Unsealed Pavement Maintenance	Routine care and structural integrity and serviceability	Grading, pothole repair, restoration, spot metalling
108.211 Unsealed Rd metalling	Top surface metal on unsealed roads.	Planned periodic renewal of wearing coarse aggregate and restoration of pavement strength
108.212 Sealed Road resurfacing	Planned periodic resurfacing of sealed roads	Chip Sealing, resurfacing, second coat seal
108.214 Seal Road Rehabilitation	Restoration of strength	Granular overlay, rip & relay, pavement stabilization and replacement
108.341 Low Cost low risk	Increase capacity and function	Geometric alignment, shaping, seal extension, sight benching

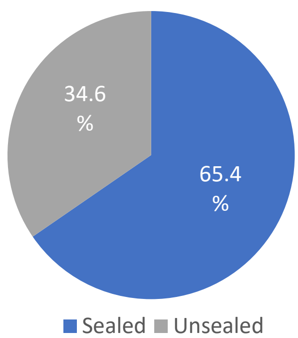
A full list of the work categories can be found on the Waka Kotahi website, these categories remain unchanged from the 2021/24 NLTP. https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/201821-nltp/activity-classes-and-work-categories/

ASSET DESCRIPTION

Council’s Roading system includes 804km of road, of which 526km sealed and 278km is unsealed road. Sealed pavement widths within the district vary and have an average of 6.7m.

A summary of the road pavements assets is included below.

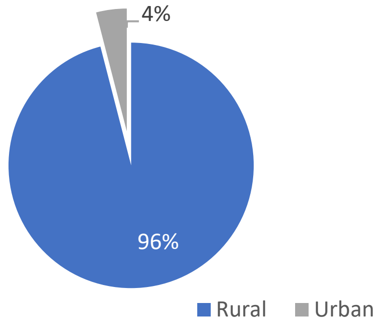
Asset Group	Rural (KM)	Urban (KM)	Total (KM)
Sealed	494	32	526
Unsealed	278	0.41	278
Total	772	32.41	804



Unsealed roads make up 35% of the total roading network within the Ōtorohanga District and includes 0.41km of unsealed urban roads in Kawhia.

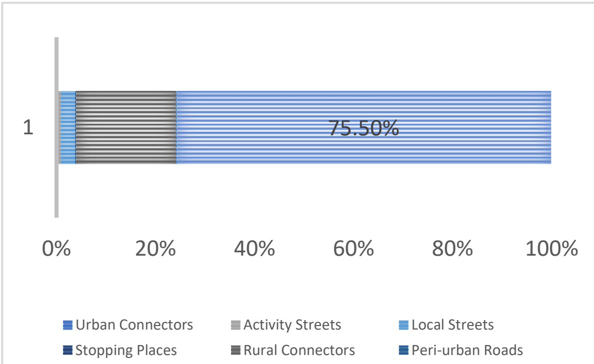
A summary of the roads assets using ONRC categories is given below:

ONRC Hierarchy	Length (km)	%Age
Access Road	256	32%
Access Road (Low Volume)	333	41%
Primary Collector	35	4%
Secondary Collector	180	22%
Total Network Length	804	



In the Ōtorohanga District 96% of roads are rural and only 4% of roads are urban.
A summary of the roads assets using ONF categories is given below:

U/R	ONF Category	Length (km)	Length (%)
Urban	Urban Connectors	2.4	0.30%
	Activity Streets	4.7	0.60%
	Local Streets	23.6	2.90%
Rural	Stopping Places	1.3	0.20%
	Rural Connectors	162.3	20.20%
	Peri-urban Roads	0.8	0.10%
	Rural Roads	606.6	75.50%



Majority of lengths (75.50%) of the roads under ONF category are rural roads, only 0.8km (0.10%) are peri-urban roads and 1.3km roads are stopping places this is due to the rural nature of the district.

DELIVERY

CURRENT DELIVERY MODEL

Having an endorsed Road Transport Activity Procurement Strategy for all subsidised land transport activities is a requirement of the Waka Kotahi - New Zealand Transport Agency's (NZTA) Procurement Manual. (Currently Procurement Manual amendment 6, effective 1 April 2022).
https://www.nzta.govt.nz/assets/resources/procurement-manual/docs/procurement-manual-amendment-6.pdf

The Waka Kotahi - NZTA's Procurement Manual in turn requires all road controlling authorities to maintain Waka Kotahi's endorsed procurement strategy. ODC's strategy was signed off by Council on 18 May 2023, on same day was sent to Waka Kotahi for endorsement.

The strategy sets out the objectives around value of money, method for procurement, support for competition, and encourages a competitive market to best achieve these objectives for both taxpayers and the rate payers of the Ōtorohanga District.

The majority of land transport activities in the Ōtorohanga region are well defined and low risk. The scope of the work has been easily defined in contract documents, therefore our road transport activities fit the "staged" delivery model.

PHYSICAL WORKS DELIVERY CONTRACTS

ODC's roading maintenance contract terms, as tabled below, are working well for our district and are not expected to be revised for the 2024/34 AMP.

Contract Name	Term	Approximate value (2022/23 values)	FY-Contract Commencement	Comments
District roads maintenance	3+2+2+2	$2,000,000 per annum	2018/19 awarded 14-08-2018	Term approved by Waka Kotahi (New Zealand Transport Agency)
Sealed road resurfacing 2020-2022	2+1+1	$2,861,229	6 August 2020	
Unsealed road metal replacement	3+1+1	$1,822,287	1 July 2021	
Street light maintenance	5+5	$30,000 per annum	2016/17 awarded 15-02-2017	Combined tender with capital upgrade
District Footpath Maintenance 2020-2022	2+1+1+1	$419,582	30 April 2021	
Pavement Marking 2021-2024	3+1	$660,738	19 Nov 2021	

PROCUREMENT REVIEW AND DEVELOPMENT

The Procurement Strategy is for all land transport activity procurement within the Ōtorohanga District and is managed by the Group Manager Engineering & Assets.
There is a requirement from Waka Kotahi to review the Procurement Strategy every three years. ODC engages with the road contractors and supplier industries, Waka Kotahi, and other local Road Controlling Authorities with similar conditions to the Ōtorohanga District to understand and explore changes in the industry and

wider legislation. This information is then used to update the strategy in line with the current LTP and best industry practices.

ASSET VALUATION

Council engaged Beca to conduct valuation of roading infrastructure assets owned by Council as at 30 June 2022 for all asset classes.
The 8% overhead/escalation applied, however consideration was given to apply different escalations by asset type. The variation in calculations was insignificant so a blanket 8% rate was used. The 2020 rates have been reviewed against current and recent ODC contract rates. The indexes used were December 2020 to June 2022. These include:

14.61% - Reseals (excluding bitumen)
17.80% - Structures (typically bridges)
16.15% - Network outcome
19.62% - Construction

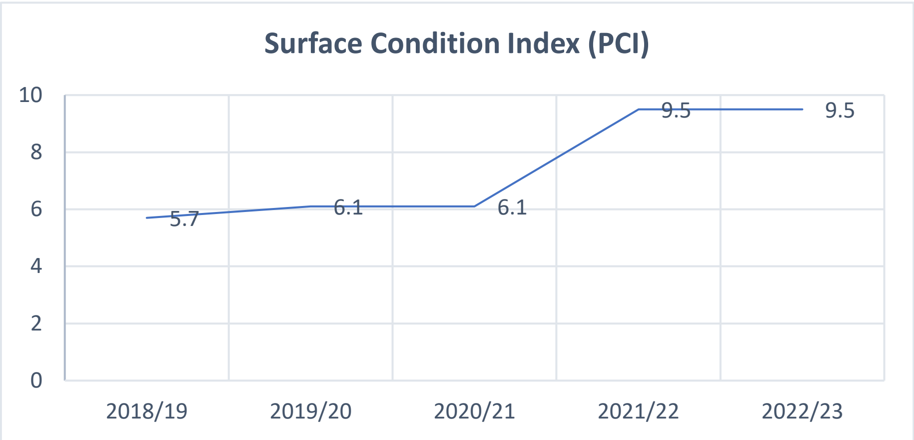
The remaining rates where no corresponding recent contract rate was available have been increased according with the Waka Kotahi NZ Transport Agency's infrastructure cost indices.

ASSET CONDITION AND REMAINING LIFE

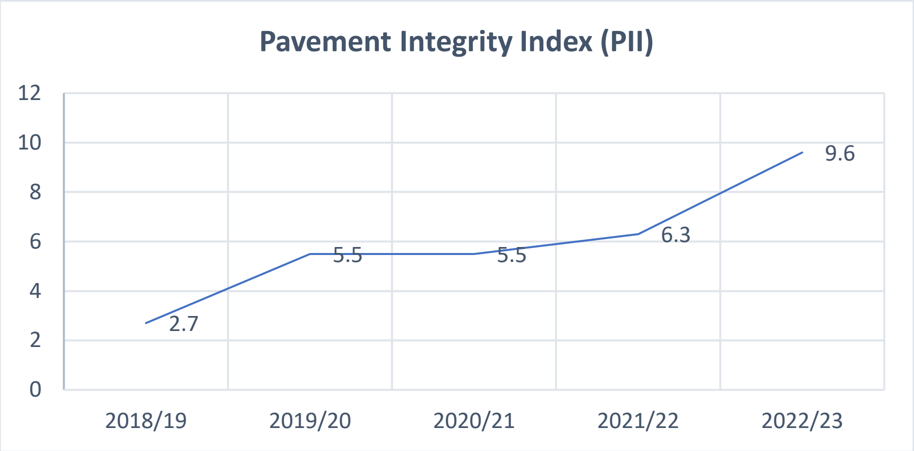
SEALED ROAD PAVEMENTS

There are two indices that are key indicators of road condition – Surface Condition Index (SCI) and Pavement Integrity Index (PII). These indices take into account faults on the roads, with data collected from a visual road condition survey. These faults include cracking, scabbing, potholes, pothole patches and flushing, and are the function of the condition index (CI), however roughness is generally the main influencing factor for PII.

The SCI is a good indicator of the need to re-surface. A SCI of "0" is perfect condition and "10" is very poor condition. For example, if a road that is overdue for resurfacing in 2022 due to age has a SCI of "10", it will be given a higher priority order for resurfacing compared to one due in 2020 that has a SCI of "2".
The following information for PII and SCI is extracted from Waka Kotahi reports.



The PII is a good indicator of the need for pavement rehabilitation. The PII scale is the reverse of SCI - a PII of "0" is very bad condition and PII of "10" is perfect condition. For example, a road with a PII of "0" will be given higher priority order in pavement rehabilitation work than a road with a PII of "8." The trend of the PII below appears to be add odds with the PCC above, investigating this identified that the sample size for the PII exercise was relatively small and therefore perhaps not fully representative. Further on site assessments by staff verified that the other measures are aligned and that there is a slight negative trend in the surface condition of the roads.



The condition of road pavement is determined through a roughness and visual condition rating. Road conditions are assessed in accordance with national best practice and is carried out by the same team that assess regional state highways and adjoining roads maintained by neighbouring local authorities. This information is then confirmed by staff who complete a drive over during the development of the forward works programme (FWP).

To address these trends an allowance of $310K/year is allocated for Rehab, long term surfacing & roughness improvements. Interpreting the PII from above and site verification there are no significant signs of underlying pavement layer works failing over and above the sites already identified for rehabilitation.

VISUAL CONDITION RATING

RAMM data shows that in last three (3) years 410 km, 341 km and 512 km of the road network rating has been conducted for year 2017, 2019 and 2022 respectively.

Fault Type	**2013**	**2015**	**2017**	**2019**	**2022**
Network Length (m)	512 789	521 278	410 661	34174	512 989
%Age Network	97.49%	99.10%	78.07%	6%	98%
Fatigue Cracking	0.29%	0.22%	0.30%	0.19%	
Shoving	0.05%	0.05%	0.06%	0.23%	0.19%
Flushing	0.23%	0.36%	0.66%	3.77%	6.69%
Scabbing	0.64%	0.32%	0.29%	0.31%	1.05%
Potholes	0.07%	0.05%	0.03%	0.05%	0.06%
Rutting	0.01%	0.00%	0.01%	0.00%	0.08%
Edge Breaks	0.14%	0.23%	0.17%	0.28%	0.27%

Fatigue cracking is the primary indicator of the network's waterproofness and the need to seal/reseal. Scabbing levels have been decreased, this is indicative of technically sound resurfacing treatments being placed in the network as part of annual resurfacing contracts.

The dTIMS modelling, results from the model shows that the road flushing levels have been somewhat inconsistent, which is perhaps indicative of the difficulties in achieving consistency with this type of defect repair. The forward works program contains approximately 34km (2022/23) road lengths where flushing is considered severe enough to warrant noting. This equates to 6.69% of the sealed road network, confirming there is a significant flushing issue.

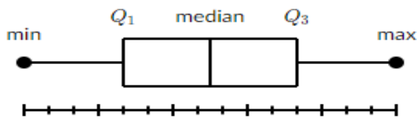
ROUGHNESS

The result from the 2021/22 (85th percentile) by ONRC are included in the table below, It is recommended that no 100 m moving average of lane roughness over the extent of works shall exceed a maximum of 70 NAASRA counts/km. The target NAASRA counts/km for a new section of road pavement is 70.

ONRC	Traffic Volume (ADT)	NAASRA Threshold	NAASRA ODC	Variance Below/Above
Rural				
Primary Collector	1194	130	88	42
Secondary Collector	369	150	104	46
Access	97	150	111	39
Low Volume	28	150	122	28
Urban				
Primary Collector	2126	150	121	29
Secondary Collector	1287	150	141	9
Access	427	180	155	25
Low Volume	105	180	177	3

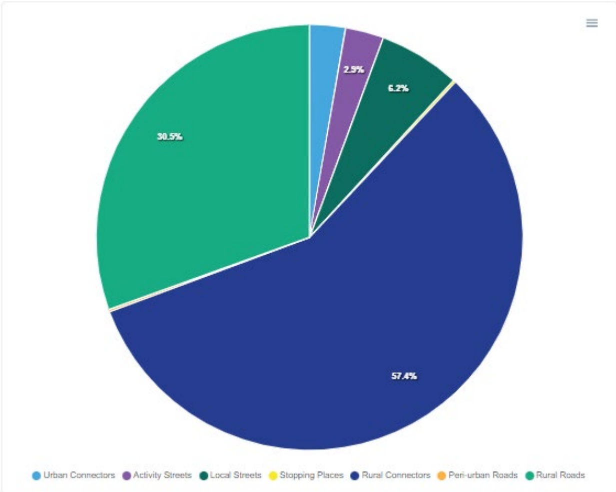
The result from the 2022/23 by ONF category are included in the table below

U/R	Category	Minimum	Q1	Median	Q3	Maximum
Urban	Urban Connectors	58.8	79.25	98.5	120.25	175.45
	Activity Streets	66	104.5	144	202.5	280
	Local Streets	52.7	86	123	159	271.9
Rural	Stopping Places	39	49	64	85	141
	Rural Connectors	40	51	66	83	119
	Peri-urban Roads	52.65	59	78	89	145.5
	Rural Roads	45	61	78	103	153



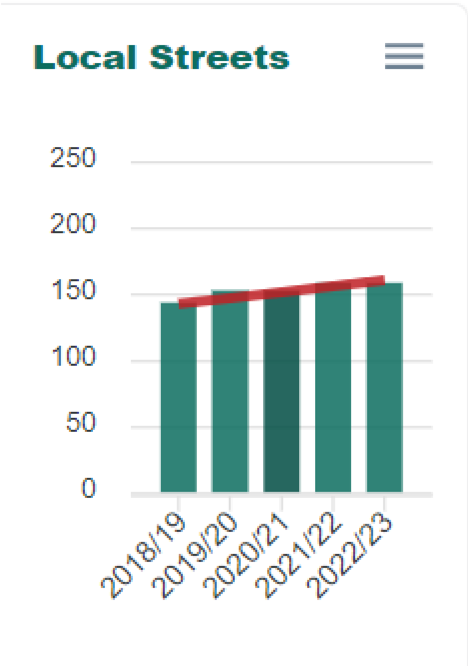
AVERAGE NETWORK ROUGHNESS TRENDS
Using the 75th Percentile as the benchmark score for local streets, rural connectors and rural roads the following trends are evident. (These three categories make up 94% of the network.)

Breakdown of VKT% per ONF category



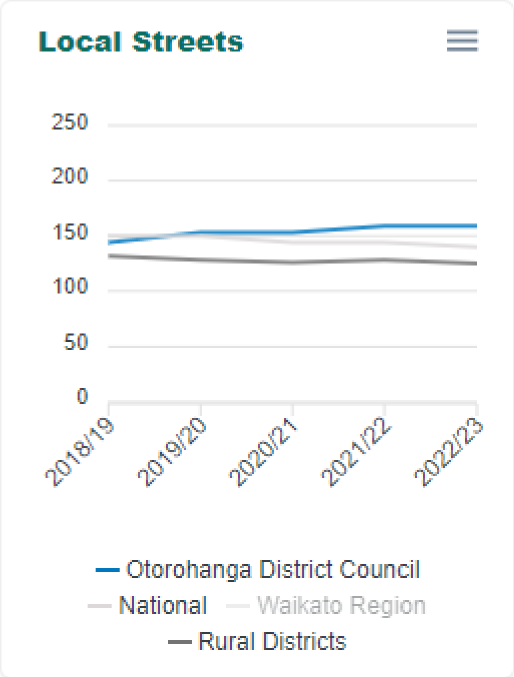
Category	%age
Urban Connectors	2.72%
Activity Streets	2.90%
Local Streets	6.17%
Stopping Places	0.18%
Rural Connectors	57.35%
Peri-urban Roads	0.18%
Rural Roads	30.49%
	100.00%

Local Streets are trending negatively, all be it at a slow decline, which the AMP plans to address over time.
Ōtorohanga VKT Trend



Category	Local Streets	Trend
2018/19	144	143
2019/20	153.25	147.4
2020/21	153.25	151.9
2021/22	159	156.4
2022/23	159	160.85

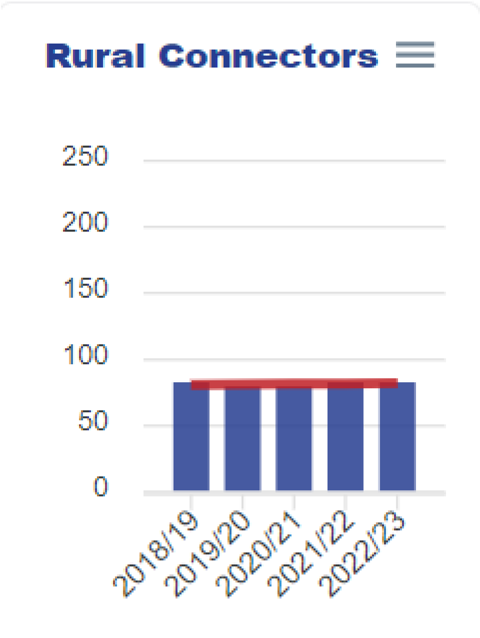
Comparison with other networks



Category	Ōtorohanga District Council	National	Waikato Region	Rural Districts
2018/19	144	150	124	132
2019/20	153.25	150	128	128
2020/21	153.25	144	129	126
2021/22	159	144	126	128
2022/23	159	140	127	125

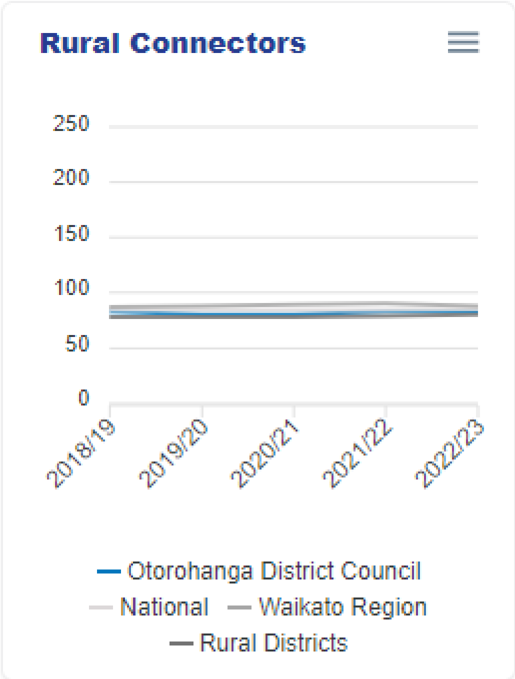
Ōtorohanga Trend

Rural connectors are consistently at an acceptable level of service and will be maintained accordingly.



Category	Rural Connectors	Trend
2018/19	83	80.9
2019/20	80	81.3
2020/21	80	81.7
2021/22	83	82
2022/23	83	82.4

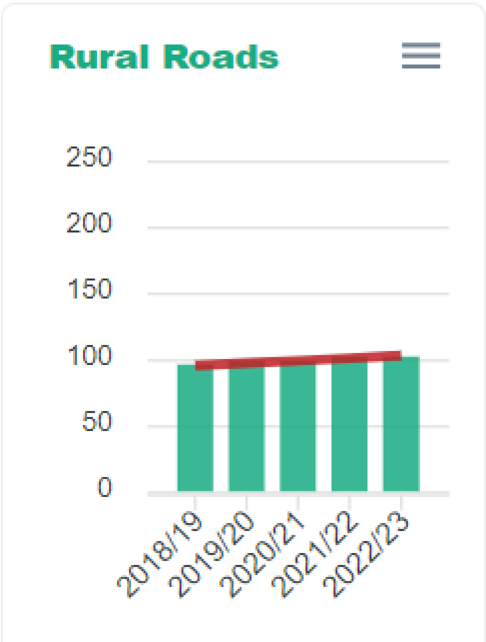
Comparison with other networks



Category	Ōtorohanga District Council	National	Waikato Region	Rural Districts
2018/19	83	84	87	78
2019/20	80	84	88	78
2020/21	80	84	89	78
2021/22	83	84	90	79
2022/23	83	85	88	80

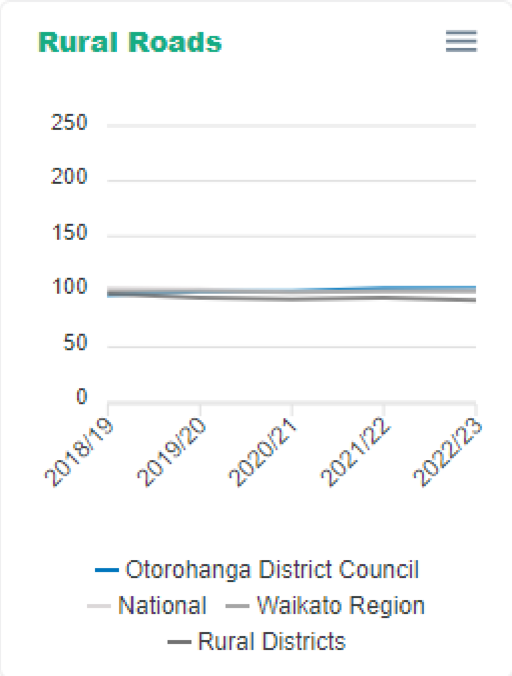
Rural roads are trending negatively, all be it at a slow decline, which the AMP plans to address over time.

Ōtorohanga Trend



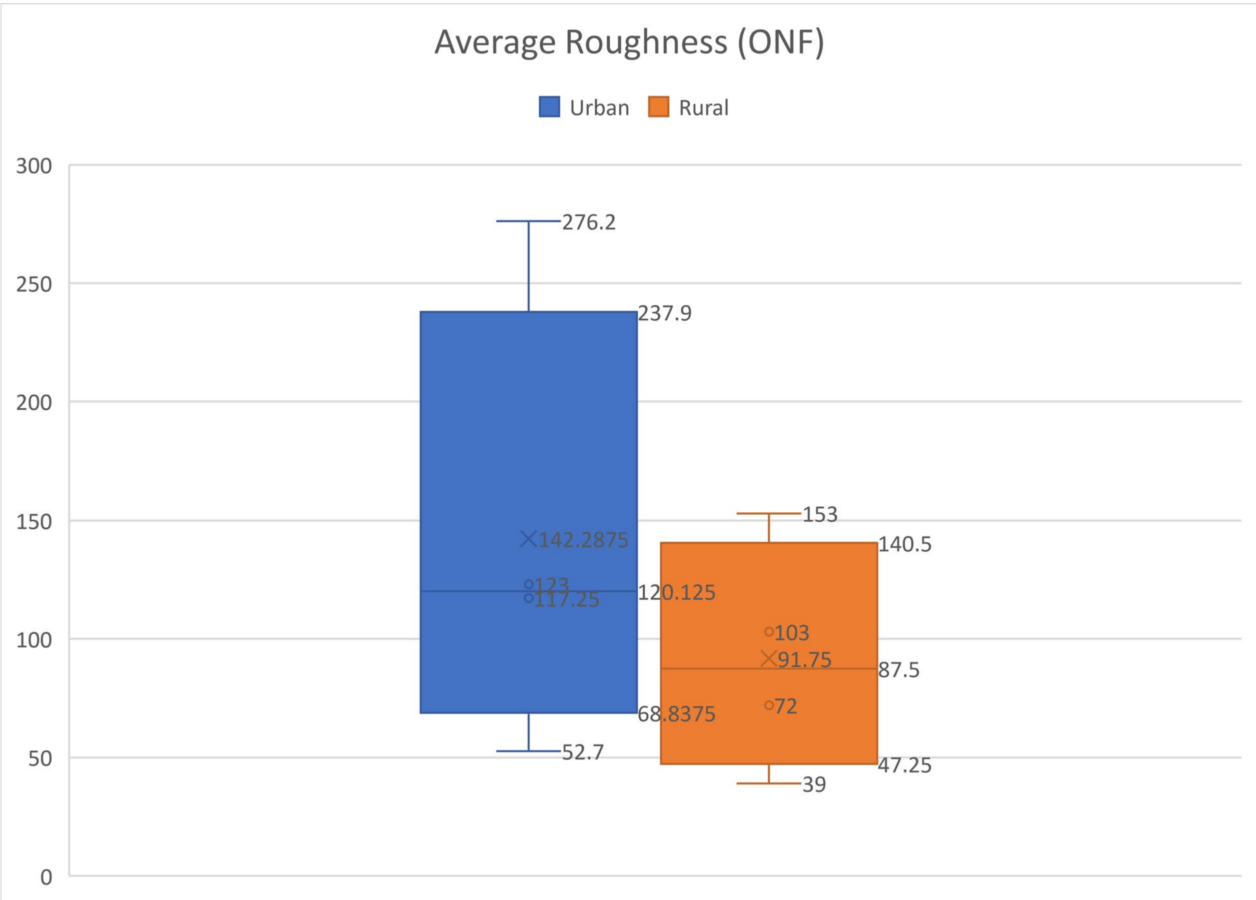
Category	Rural Roads	Trend
2018/19	97	96.1
2019/20	100	98
2020/21	100	99.8
2021/22	103	101.7
2022/23	103	103.6

Comparison with other networks



Category	Ōtorohanga District Council	National	Waikato Region	Rural Districts
2018/19	97	103	100	98
2019/20	100	102	100	94
2020/21	100	99	99	93
2021/22	103	100	100	94
2022/23	103	101	100	92

Following box whisker graph shows both urban and rural average peak roughness.



Graphs show that the minimum peak roughness for the urban network is 52.7 count/km however have the peak value of 271 which is representing local street 2.90% (23km) of the network. On the other hand, rural network has the minimum of 39 count/km however have the max peak level of 153 count/km. Urban roads tend to be affected more by services running underneath them so these readings are subject to manhole and valve covers plus patches as a result of service repairs to leaking water pipes for example.
Variance in roughness from year to year is very likely due to a calibration difference between roughness measurement vehicles and the amount of rain prior to the survey, which are permitted a tolerance of +/-7.5%. The improvement of roughness ratings across the district can take a long time with several years of concentrated effort only likely to improve the average roughness by only 2-3 counts/km. This effort is however essential to ensure the ongoing resilience of the roads.

SEALED ROAD SURFACING

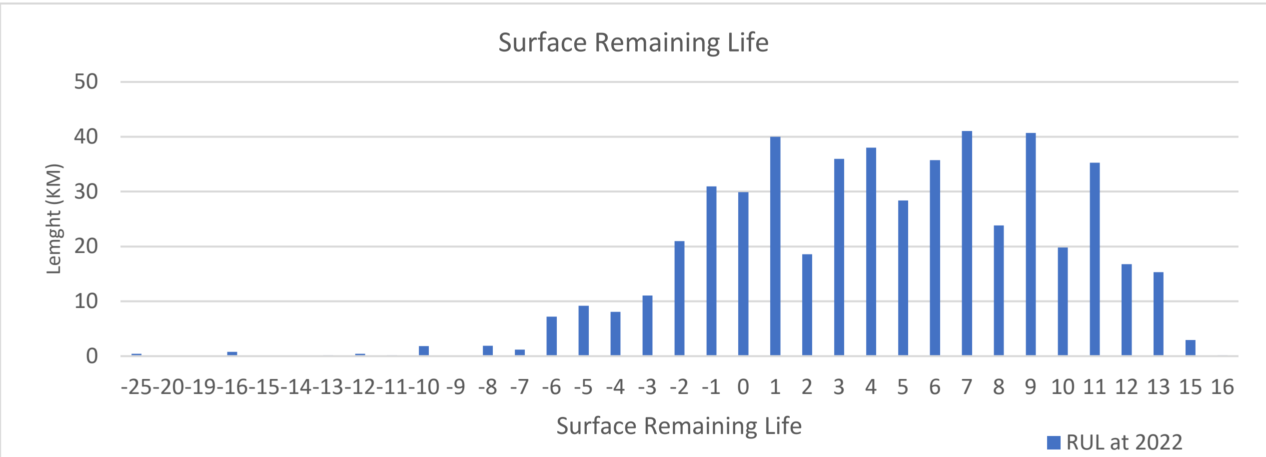
The following average surface life achieved is being extracted from the transport insights – Te Ringa Maimoa webpage (previously PMRT) 2021/22– cost efficiency-CE2 – Chip Seal resurfacing (cost & average life). The achieved life data shows how many years the seal has lasted in actual. (Note 22/23 Figures are not available.)

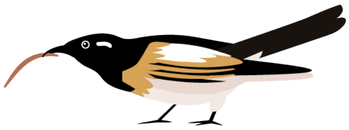
ONRC	Average Life Achieved(Years)
Primary Collector	13.1
Secondary Collector	12.2
Access	15.3
Low Volume	14.7

There are three different life fields used in RAMM to calculate the seal expiry date. RAMM uses expected life field to calculate expiry date.

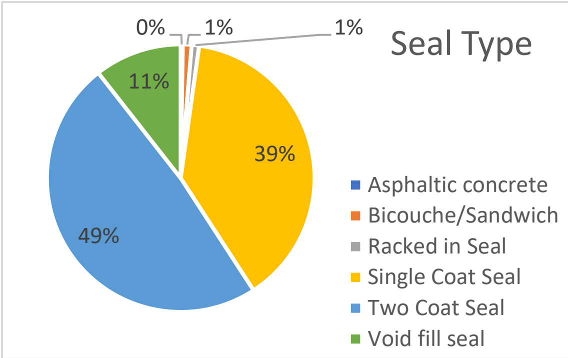
- Expected life = Design life if populated
- If Design life not populated but modified life is then expected life = Modified life
- If neither design life or modified life populated then expected life = Default life

The following bar chart is created based on the combination of above mentioned life types. The following bar chart shows that there is backlog of 125km of the reseal which shall be required to be planned or strategically considered in the forwards works program (FWP).



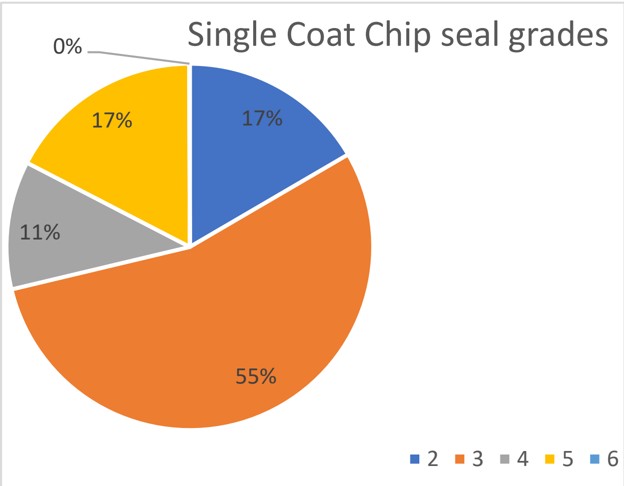


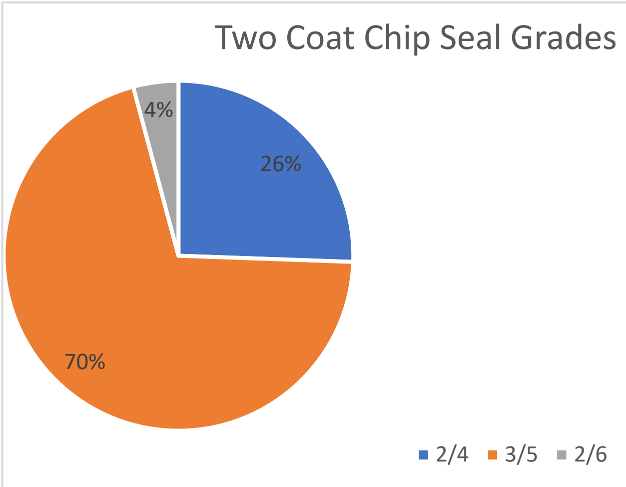
Sealed roads make up 65% of the total roading network within the Ōtorohanga District (526km of 804 km total).
Other than very limited extents in the Ōtorohanga urban area, the road surfacing is chip seal. Chip seal is used due to its relatively low cost (in comparison with asphaltic concrete) and it is a well understood material for construction and management and well suited as a value for money option for New Zealand conditions.



Given the excellent local materials available for subbase and basecourse in the district, the thin surfaced flexible approach to pavements and surfacing offers the best whole of lifecycle costs on this network with such a high proportion of access and low volume roads.

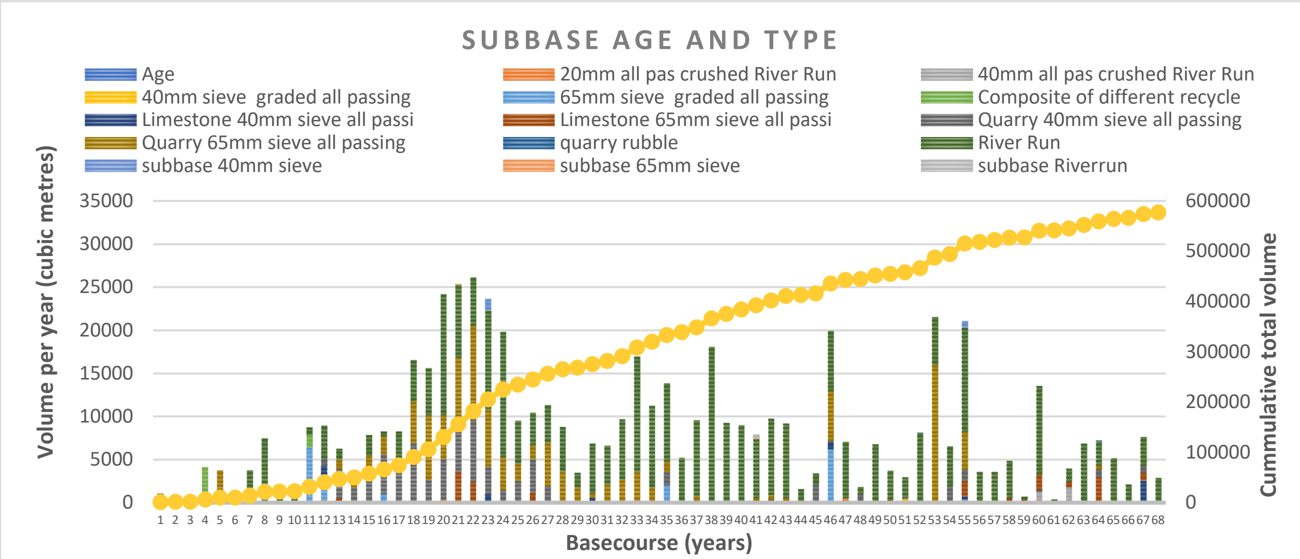
As shown in following graphs, the chip seal grades are dominated by the very cost effective traditional single coat and two coat seals of the single coat seals, the bulk are Grade 3 (55%) or grade 4 (11%). The two coat seals are predominantly Grade 2/4 (29%) or Grade 3/5 (70%). The predominance of these larger sizes, which are naturally stronger and more durable, indicates historically good surfacing treatment selection practice in the district.





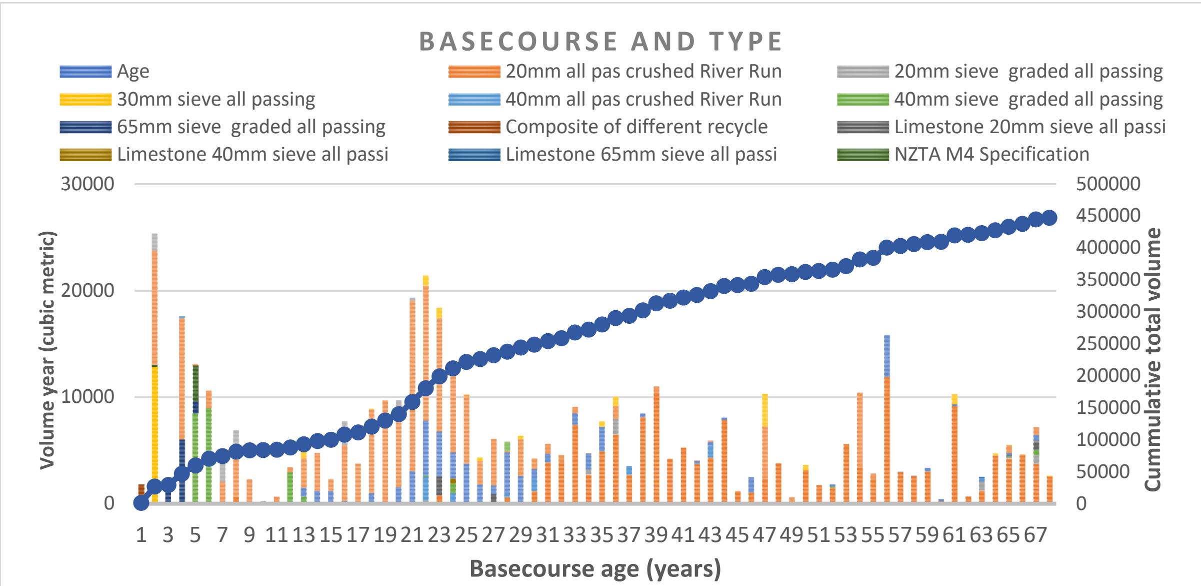
SUBBASE AND BASECOURSE
The road pavement layers are one of the most critical elements of the transport asset, forming a significant proportion of the value of the asset, and literally providing the foundation upon which the District's transport is undertaken.

SUBBASE
A total volume of 576,697 cubic metres of subbase with an average age of 36 years (in 2022) and a design life of generally 83 years is in place across the District. Most of the material (59%) is classified as "river run" material sourced from 18 different pits across the District. This material is generally very durable with a low fines content, providing excellent drainage and strength qualities. More recently the difficulties in obtaining Regional Council consent for extraction of these river gravels has seen a gradual increase in the crushed material volumes. No significant increase in heavy vehicle traffic volumes means the subbase generally remains in good condition across the network.



<u>*BASECOURSE*</u>

A total of 447,440 cubic metres of basecourse with an average age of 34.8 years (in 2022) and a design life averaging 50 years is in place across the District. The basecourse material is made up of crushed river gravels and graded quarry won aggregates in almost equal proportions. Ōtorohanga is fortunate to be in an area where good quality stone is readily available for road making and the quality of in place basecourse can be considered to be very good. No significant increase in heavy vehicle traffic volumes means the basecourse generally remains in good condition across the network.



<u>*UNSEALED ROAD PAVEMENT*</u>

The condition of the unsealed roads, although not formally assessed, is considered to be good to above average. A regular metal replacement programme and grading schedule has been in place for many years resulting in roads with a good profile with water control mechanisms and wearing course which remains in place to protect the structural layers beneath.

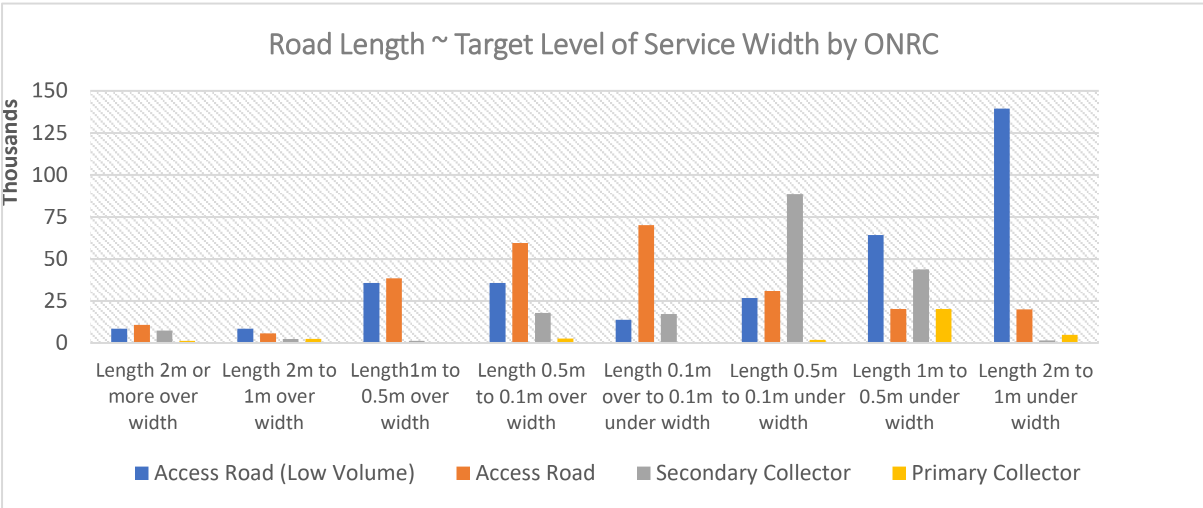
Traffic volumes on the unsealed roads are very low, and the need for renewal of these pavements has historically been largely unnecessary and it is considered that the metal replacement programme on an average five year cycle is sufficient to provide for pavement renewal of these roads.

ASSET CAPACITY AND UTILISATION

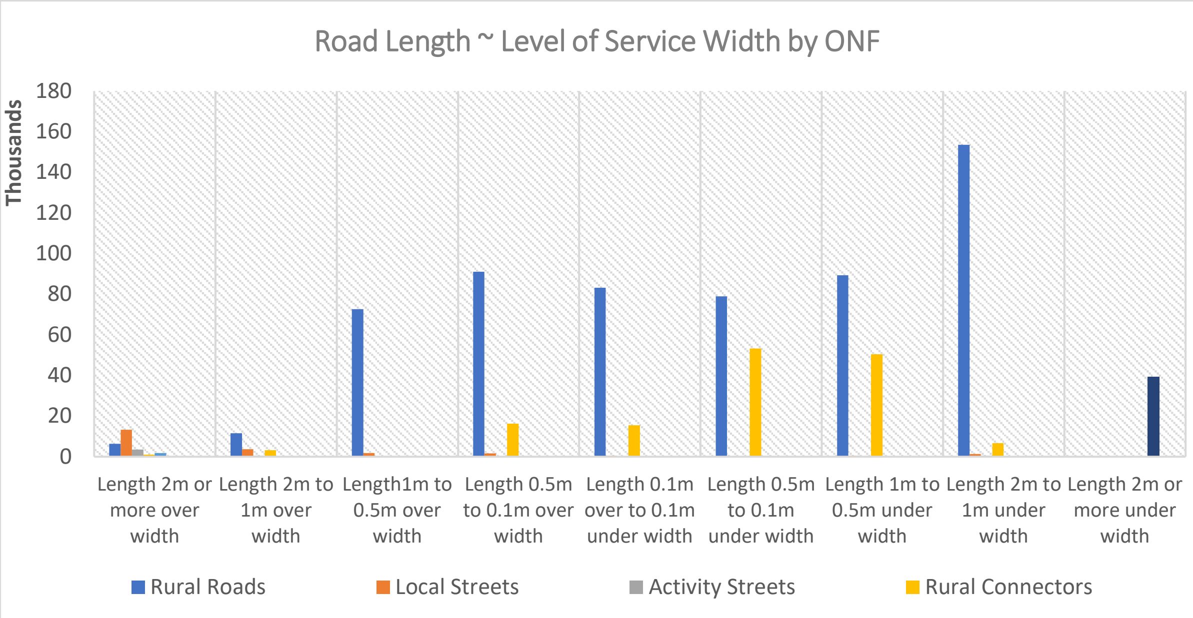
SEALED ROAD PAVEMENTS

The traffic carrying capacity of the sealed road network has been previously assessed against the best practice typical road profile sections as shown in appendix B. An analysis of existing seal width against these standards has identified almost 43% of the total sealed network is below the target pavement width. In light of the current speed management and road to zero initiatives these road profiles are currently being reassessed.

In previous AMPs, the position taken was that systematically widening roads below the specified widths was needed as a significant safety improvement as and when these roads were rehabilitated. Over the last three years, this has been reassessed as there have been no reported accidents in the district attributable to the road being 'too narrow". Furthermore, it is expected that the speed management implementation programme will result in lower limits on most rural roads, it is also believed that in some cases widening the roads would encourage higher speeds and be counter productive. A programme for widening any areas identified as excessively narrow has been identified and these factors may result in less extensive seal widening taking place in future.



Assuming same level of services (road seal width by ONF category)



<u>*UNSEALED ROAD PAVEMENTS*</u>

Unsealed roads make up 35% of the total roading network within the Ōtorohanga District and includes 0.41km of unsealed urban road in Kawhia. The Unsealed roads are primarily Low Volume roads with a smaller number of access roads, and are generally between 10 and 50 vehicles per day.

Curtailing of the seal extension programme in the 1970s, and funding constraints, left a legacy of 1940s standard unsealed roads designed for Class III loadings and related smaller heavy vehicle sizes on the network. Good progress on upgrading these roads continues to be achieved and at present there are 278 km of rural unsealed roads, of which about 176 km are still to the old standards. The almost 300 kilometres of upgrading carried out from 1988 to date has mostly been higher traffic volume roads within the district and the remaining unimproved length is mostly lesser traffic and no-exit roads. Of the remaining unsealed roads:

- 50 are no exit roads (73%) and 19 through roads (27%)
- 24 of the unsealed roads are extensions beyond the end of seal on otherwise sealed roads
- 5 roads cross the District boundary into Waitomo or Taupo Districts

Although there is a significant proportion of unsealed roads in the district, the traffic volumes are all very low, and in general are roads only used by residents on those roads or vehicles providing service to those properties and there is very little non-resident traffic.

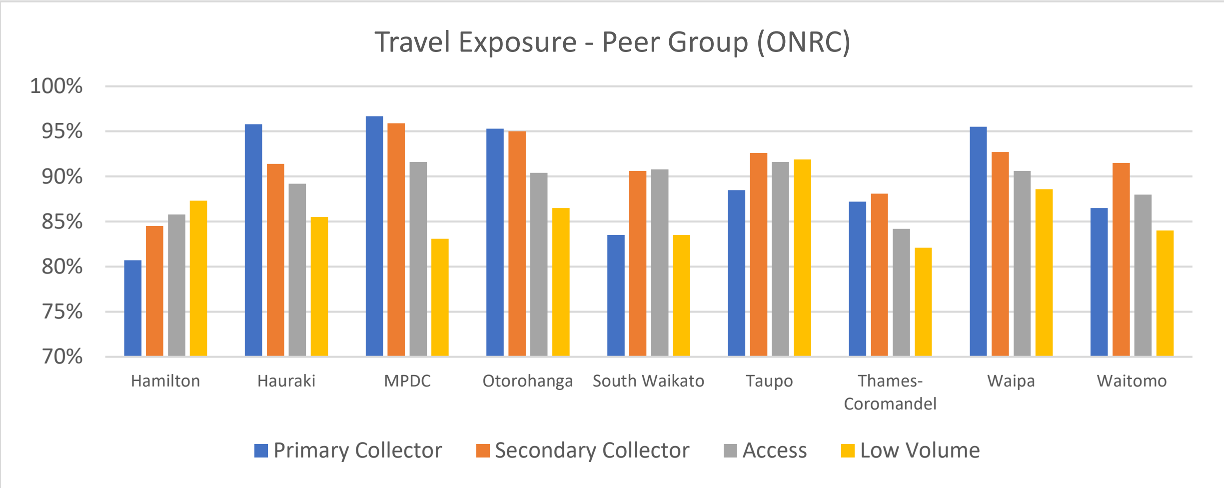
There are no specific road crash issues or trends identified on unsealed roads in the district, and it is likely that most drivers on those roads are long time users of unsealed roads and travel at appropriate speeds for that environment. There are currently no plans to improve unsealed road widths as the current level of service is acceptable.

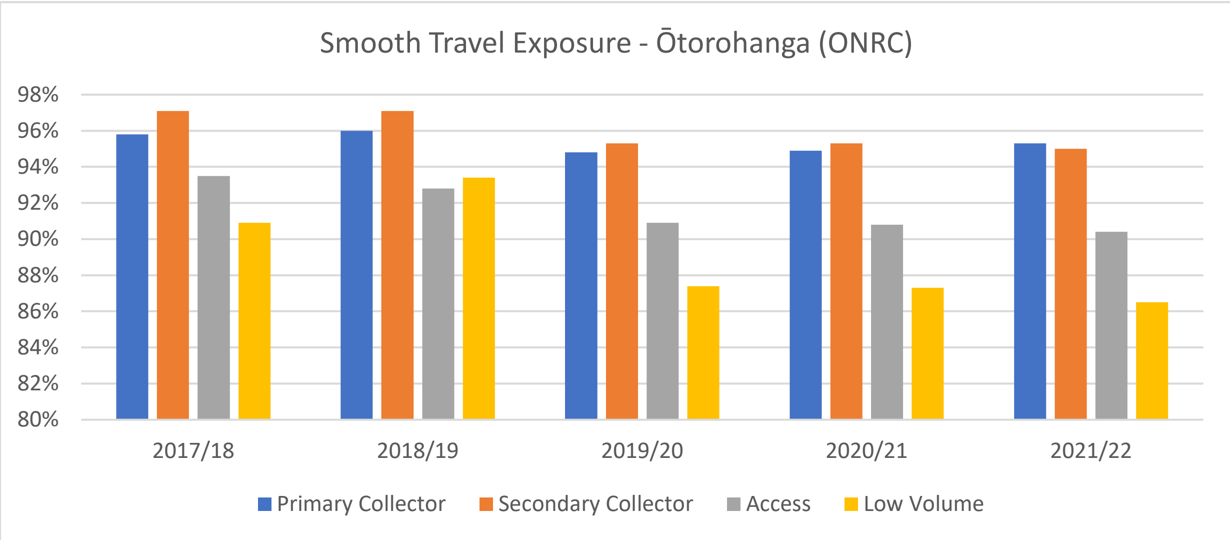
ASSET PERFORMANCE

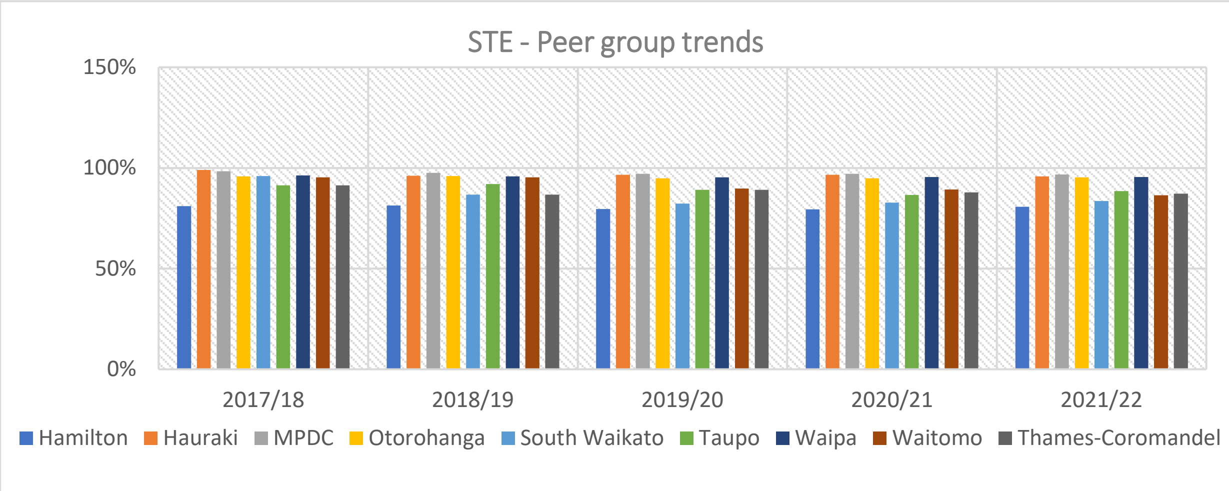
<u>*SMOOTH TRAVEL EXPOSURE - ONRC*</u>

Data from the transport insights (previously PMRT) tool indicates that the record smooth travel exposure compares well with the peer group.

The trend data from road efficiency group ONRC performance measures reporting tool indicates that the recorded smooth travel exposure compares well with the neighbouring councils for both urban and rural environment and shows a clear stratigraphy between the ONRC classes.



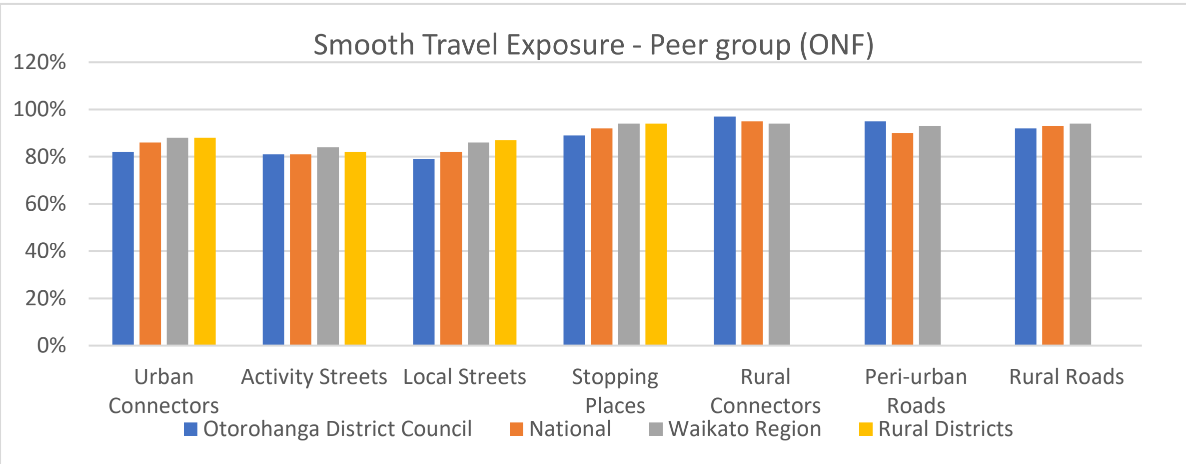


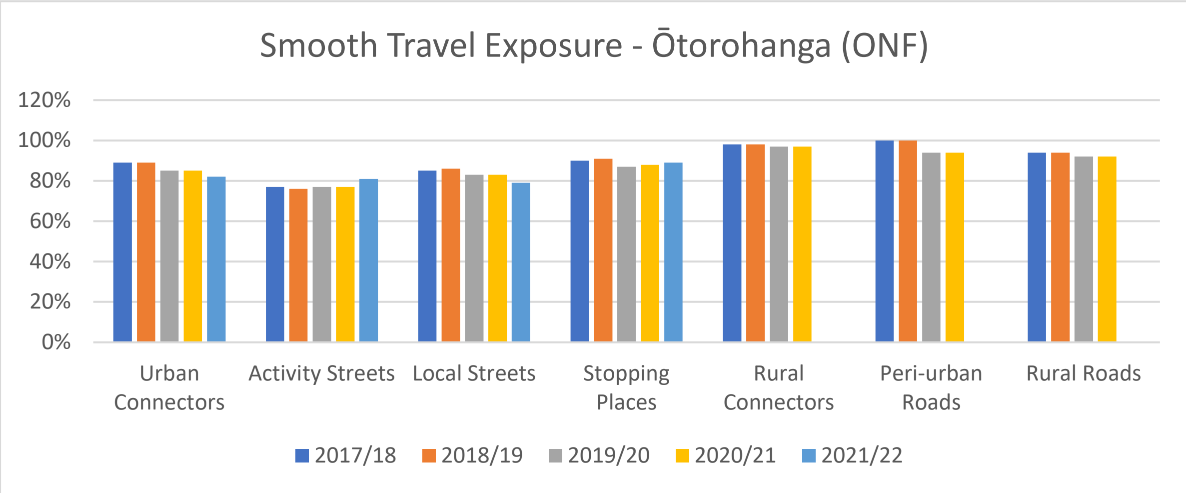


Overall, smooth travel exposure trends in the Ōtorohanga District are consistent with an overall slight decline in the percentage of travel on roads below the set benchmark declining, hence an acceptable level of service is being maintained, however, the need to address this trend over time is consistent with other measures such as roughness and surface condition index.

<u>SMOOTH TRAVEL EXPOSURE - ONF</u>

Data from the transport insights (PMRT) tool indicates similar trends as ONRC classes. Currently no data is available for all the peer groups to compare except as shown on graph below.





Data from these peer group comparisons are consistent with the roughness analysis and show a favourable measure on rural connectors, but negatively for rural roads and local streets.

LOW RISK, LOW COST AND IMPROVEMENTS

The table below is a summary of Council's three-year low cost low risk programme (excluding inflation & admin). These locations are detailed further down in this document in the ODC Pavement Rehabilitation Preferred Programme section.

Improvement Works	2024/25 ($000)	2025/26 ($000)	2026/27 ($000)
District wide Stock underpass facilities	30	30	30
Road widening associated with reseals	387	190	166
2024/25 Haerehuka St Pavement Rehabilitation	106	0	0
2024/25 Otewa Rd Pavement Rehabilitation	61	0	0
2024/25 Otewa Rd Pavement Rehabilitation	75	0	0
2025/26 Harbour Rd Pavement Rehabilitation	0	71	0
2025/26 Honikiwi Rd Pavement Rehabilitation	0	68	0
2025/26 Lethbridge Rd Pavement Rehabilitation	0	21	0
2025/26 Ranfurly St Pavement Rehabilitation	0	5	0
2025/26 Te Kawa Rd Pavement Rehabilitation	0	17	0
2025/26 Te Kawa Rd Pavement Rehabilitation	0	48	0
2025/26 Turitea Rd Pavement Rehabilitation	0	12	0
2027/28 Harbour Rd Pavement Rehabilitation	0	0	111
2027/28 Ngutunui Rd Pavement Rehabilitation	0	0	23
District wide Rural storm water management Implementation	200	100	100
Ōtorohanga Town Concept Plan	302	301	454
District wide Speed management design and implementation	381	264	323
District wide Identification and design of resilience improvements (Sites are subject to identification)	40	40	40
District wide Resilience works implementation	135	135	135

CLIMATE CHANGE AND RESILIENCE

All the capital works related to the pavement included in the low cost low risk category 341 for the financial year 2024/25-2026/27 are shown above.

During the ILM discussion (AMP 2021/31), issues related to environmental impact resilience due to climate change were identified which are still valid. Further research and planning will be required to manage resiliency and help to ensure all infrastructure remains fit for purpose as the impact of climate change become more certain. This in turn will open opportunities that sustainability drive future development and excellence in the region.

The AMP team advised to undertake a rural stormwater management investigation in year 2022/24 to understand the extent of the problem and come up with an implementation plan as a part of the investigation. A total budget of $400k over the first three year AMP cycle has been allocated to this.

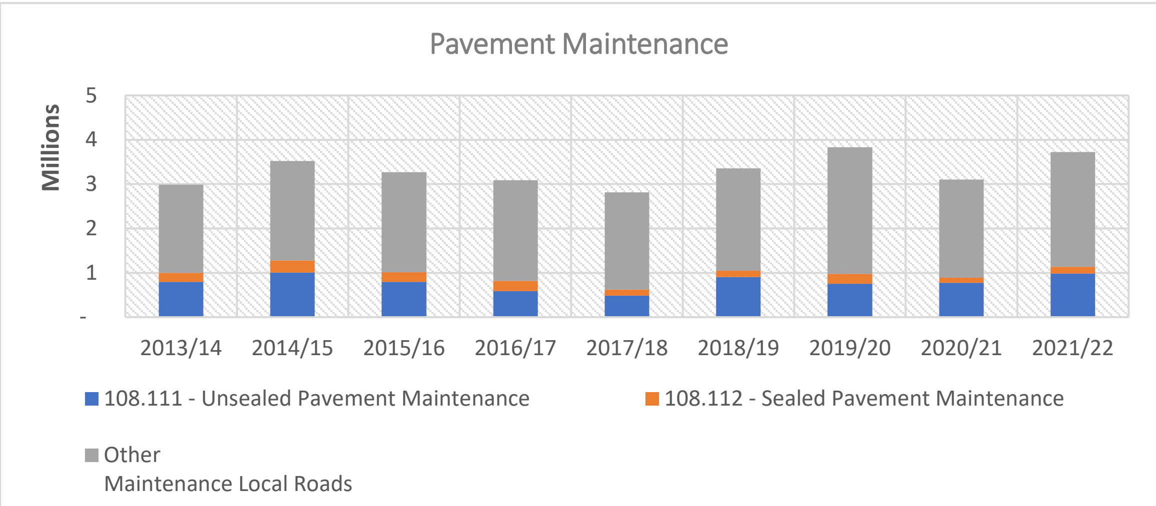
ROAD SAFETY

Road safety is one of the identified problems from previous ILM process. The need to plan for future uncertainties were identified and recommendations were made to undertake further work on speed management which Council has already progressed. Council has budgeted a total of $968k over the next three years and $3.225k over the ten year planning cycle for speed management design and implementation. This is a clear signal of the importance that Council gives to decreasing the number of deaths and serious injuries on the roads.

Capacity improvements were also raised as it relates to heavy traffic passage. Concerns around having sufficient roadway width for passing trucks on many of the district's roads. The transport response is to include width improvement in conjunction with our reseals and renewals programmes on roads that are currently under width. A total of $1.361k over the next three years and $6.611 over the ten year planning cycle. This again is a clear signal of the importance that council gives to decreasing the number of deaths and serious injuries on the roads.

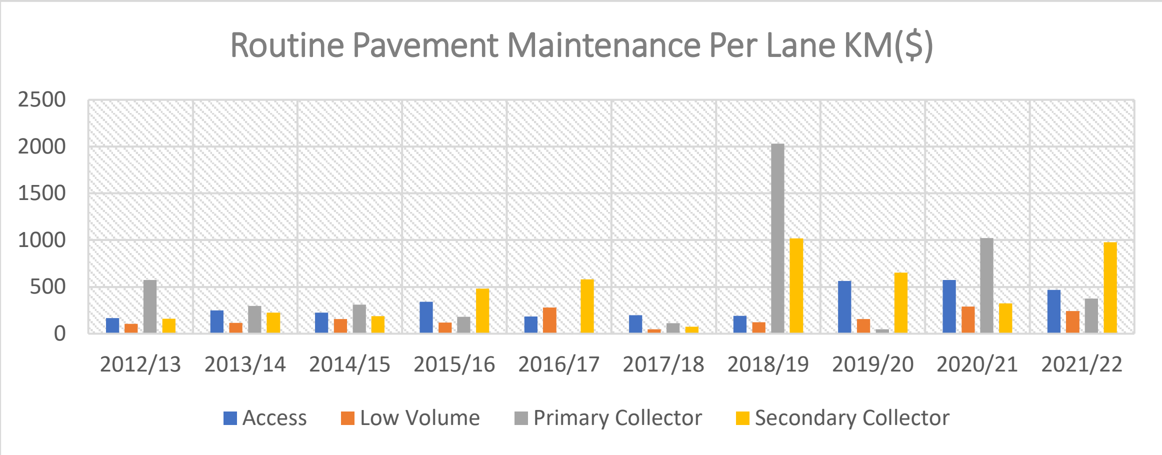
OPERATIONS AND MAINTENANCE PLAN

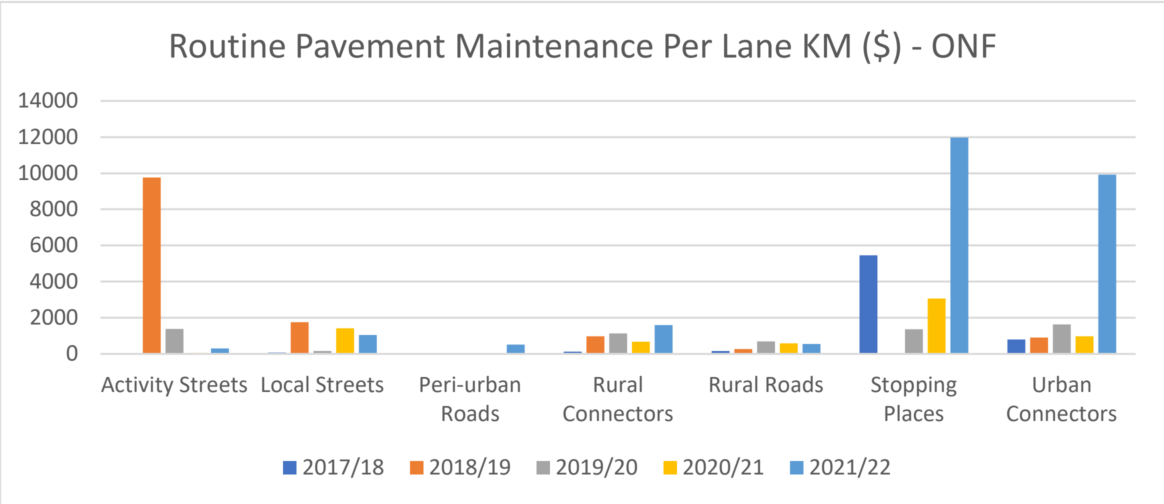
The graph below shows the sealed and unsealed maintenance costs as percentage of total actual maintenance expenditures (excluding 200 renewal series) over the last nine (9) years.

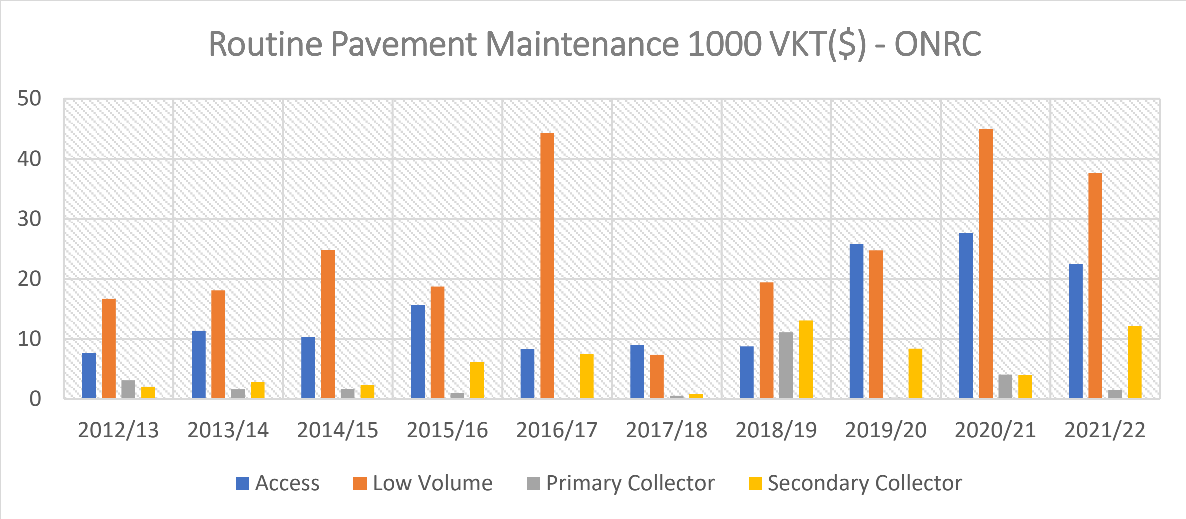


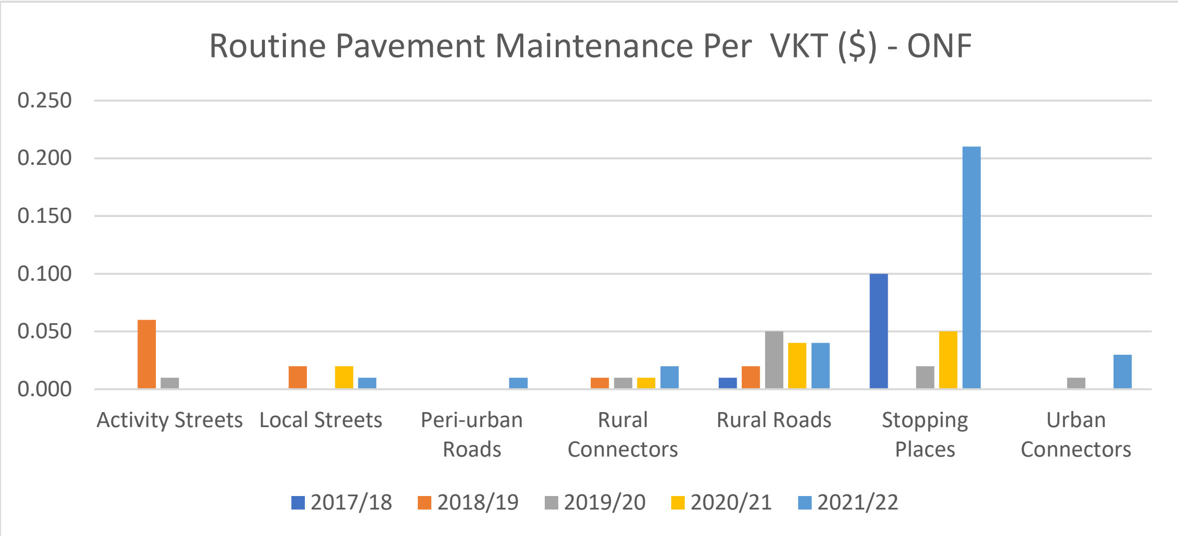
The following routine pavement maintenance costs are for pavement cost group only and excludes the cost of drainage, shoulder, surfacing & bridge maintenance. The following bar charts show maintenance cost breakdown by ONRC and ONF per vehicle kilometers travel & 1000 VKT plus maintenance costs per lane km. Information source is transport insights (previously PMRT).

The total maintenance costs are trending and has been consistent with an exception of 2018/19 where the costs has gone up on low volume roads due and less use of other roads (COVID19 restrictions)









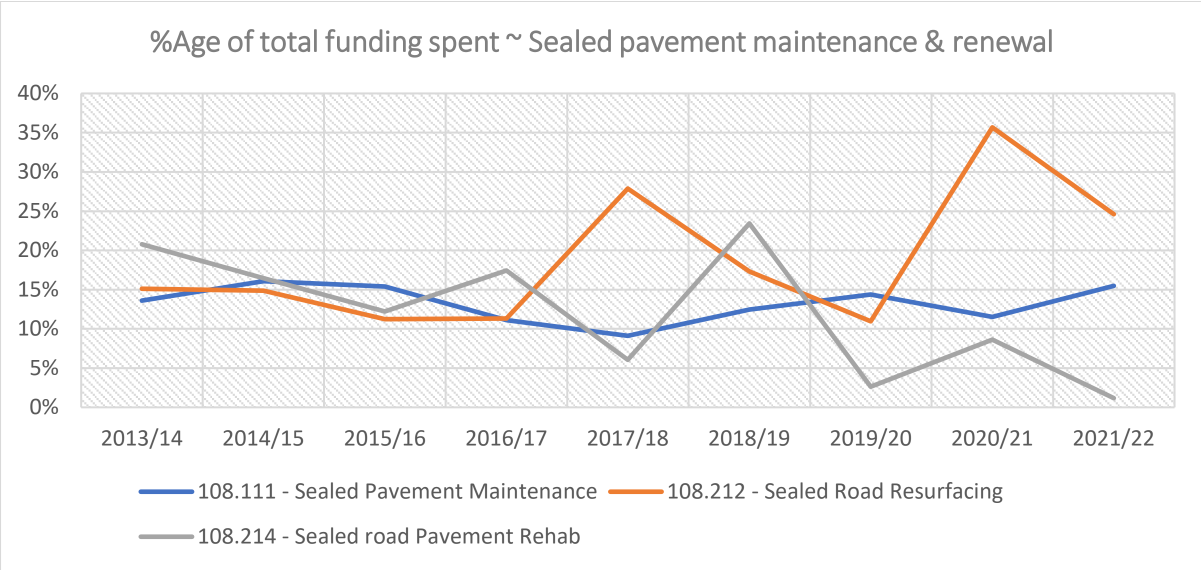
Based on graphs above more consideration needs to be given to prioritisation of spending funds on busier sections of road.

SEALED ROAD PAVEMENTS

The overall approach ODC takes to maintain the network's sealed pavement is a mix of proactive planning, assessment and inspections, while reactive work is driven by exception reports and service requests.

The maintenance needs of these sealed roads are identified through service requests, and resurfacing is scheduled as per Council's forward works programme (FWP). Maintenance tasks are provided to Council's maintenance contractor Inframax, who are responsible for completing the work, however, reseals or resurfacing is done under a separate contract.

The graph below shows the percentage of maintenance funding (100 series) spent on sealed pavement maintenance over the last nine years. Nine (9) years has been consistent with a reasonable decrease in year 2017/18. It then increased in 2018/19 due to the maintenance contractor Services South East failing to finish the programmed work, in particular preseal repairs (108.111). The source information is ODC's actual cost expenditure.

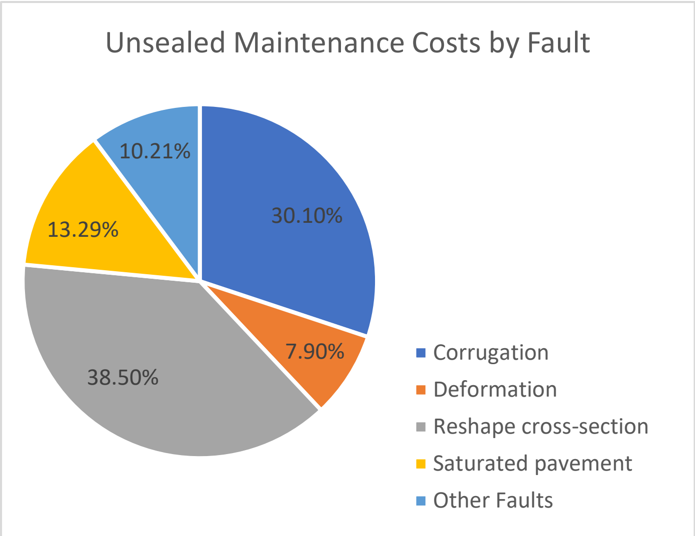


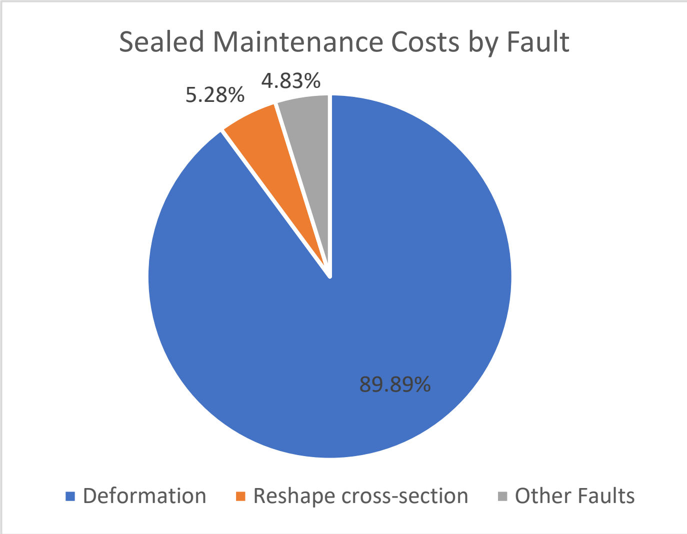
In years 2020/21 and 2021/22 resurfacing (108.212) costs are higher than the previous years. A significant amount of physical work for resurfacing ($2,393,210 & $1,566,102 respectively) were carried over from financial years 2020/21 to 2021/212.

During 2021/24 cycle, pavement rehab strategy was changed, In year 2021/22 the lower actual spend ($74,617) for rehabilitation (108.214) is a result of change into rehab programme delivery strategy i.e. Year 21/22 and 22/23 financial years for the planning, tendering and award of the contractor and 2023/24 for the programme delivery.

The decrease in year 2019/20 in rehab programme is due to COVID-19 however, the increase in sealed pavement maintenance (108.111) was mainly due to needing to catchup the work leftover by the previous maintenance contractor (Services South East), and to maintain roads which were subject to resealing.

The type of work undertaken for routine maintenance of sealed pavement includes deformation-stabilisation, reshaping cross sections, and other faults (aggregate loss, corrugation, depression-digouts, potholes and saturated pavements). The breakdown of each of these faults are represented in following pie chart. 89.89% of the faults are due to deformation-stabilisation, generally, repairs on the sealed roads are related to faults in the pavement, rather than faults in the surfacing (although they may have been caused by surfacing failure and the resulting ingress of water into the pavement layers).





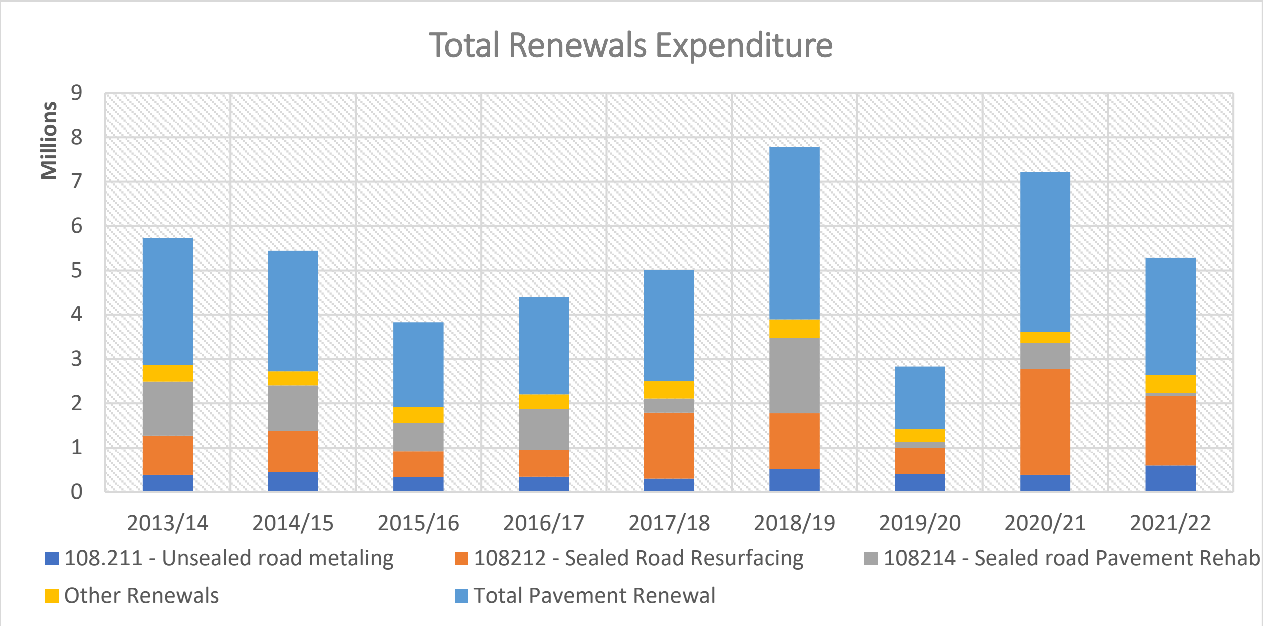
UNSEALED ROAD MAINTENANCE

Unsealed roads represent 35% of the road network length within the Ōtorohanga District. The need for renewal of the unsealed roads has historically been very low and it is considered that the metal replacement programme on an average five-year cycle is sufficient to provide for pavement renewal of these roads.

The unsealed roads with unbound wearing courses are required to be maintained by reshaping crossections, removing corrugations and reparing deformation (aggregate loss, depression, potholes) with grading and spreading of metal to keep them in a good serviceable condition. These are considered as the basic maintenance requirements for unsealed roads, along with complementary drainage maintenance. The reasons for maintenance completed in the last five years are shown in the above figure . Reshaping cross sections accounts for 36% of the unsealed pavement costs while corrugation and deformation account for 30.10% & 10.21% respectively.

PAVEMENT RENEWALS

The Graph below shows the sealed and unsealed pavement renewals cost as a percentage of the total renewals expenditures over the last nine (9) years.



PROGRAMME OPTIONEERING

The need to resurface a road is generally determined by a combination of:

- Detailed network inspections (forward works programmes)
- Seal age (based on average seal life cycles)
- Remaining useful life – RUL
- Existing surface conditions indicators (determined from road rating survey)
- Historical maintenances cost records (if accurate and available)
- dTIMS modelling

Based on the above, Ōtorohanga District Council considered different options to select the best optimised FWP for pavement renewals and maintenance. Programme optioneering was completed to achieve the best value of money to the rate payers and the transport agency.

SEALED ROADS – FORECASTING FUTURE RESEALING

The following average surface life achieved is extracted from the transport insights (previously REG PMRT) reports 2021/22– cost efficiency-CE2 – Chip Seal resurfacing (cost & average life) and ONF average life resurfacing under economic necessity. This achieved life data shows how many years the seal has lasted.

An analysis of the database shows that the average life cycle of all current road sealing surface layers is 13.84 years. This is calculated using a weighted average. i.e. sum (surfacing section length x surfacing section life) / total sealed network length.

ONF categories are not yet applied to the average achieved life as there is not enough data available to make this calculation.

Option 1: Based on Average Achieved life

The reason to evaluate this option was to check, how many KM/year surfacing is the minimum required to maintain the integrity of the pavement and hence road network.

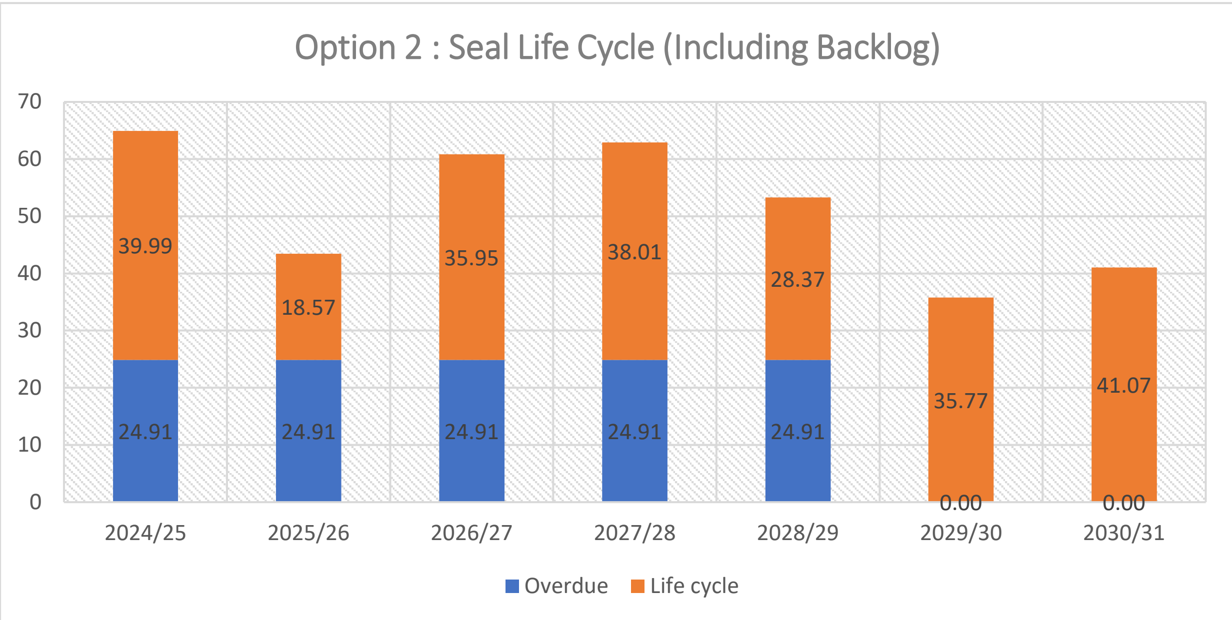
ONRC	Average Surfacing Life Achieved	Sealed Roads Length(km)	Km/Year Resurfacing Required
Primary Collector	13.1	34	3
Secondary Collector	12.2	180	15
Access	15.3	227	15
Low Volume	14.7	84	6
Total	**13.84**	**526**	**38**

The current average surfacing life achieved of all surfacing in the network is 13.84 years. This therefore implies that approximately 8.2% (43km) of the network requires sealing annually as a minimum, without consideration of the overdue surfacing.

Option 2: Based on Seal Life Cycle Values (including backlog)

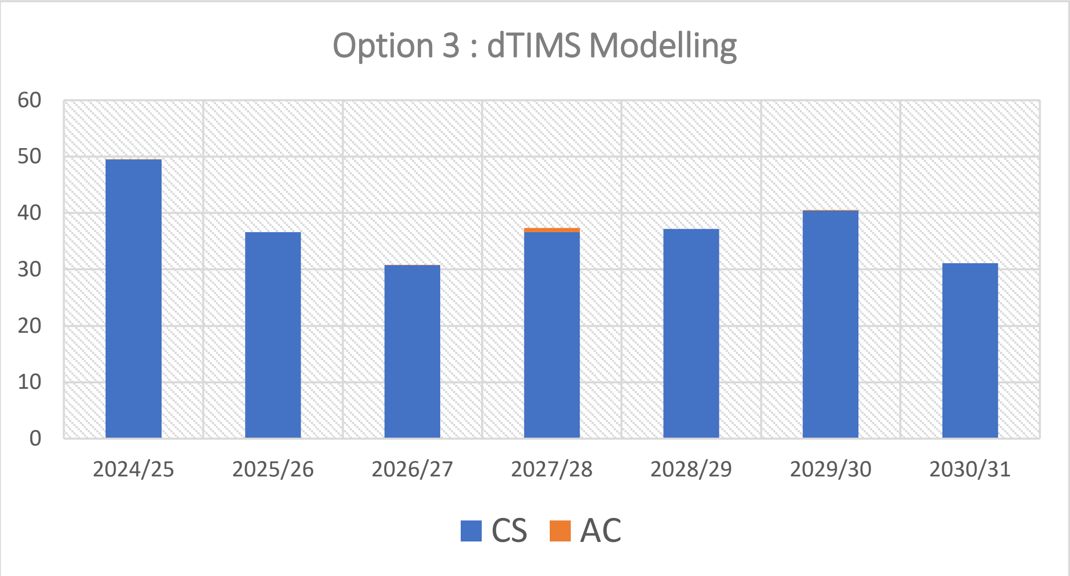
The RAMM data shows that there is a backlog of 124km of reseals. Ōtorohanga District Council has calculated the need to add 20% (0.2x124=24.91km) of the backlog for resurfacing to each year's programme for the next five years. The following bar chart shows the lengths of road which are due for resurfacing in the next ten years from the financial year 2024-onwards. So in order to resurface the backlog as well as the roads presently due, an average 57Km/year of reseal will be required in the next five years.

The current reseal/km calculated as life cycle plus 20% backlog i.e. 64.90km, 43.47km , 60.86km, 62.92km and 53.27km/year in financial years 2024-2025/26 respectively.



Option 3: Based on dTIMS modelling

Our current programme is based on the 2021 dTIMS model. For the new dTIMS model, the data has been collected but has not been officially released and yet to be field validated and calibrated. The dTIMS-2021/22 model suggests an average of 38.29Km/year in next five (5) years (Including 0.77KM of AC treatment)



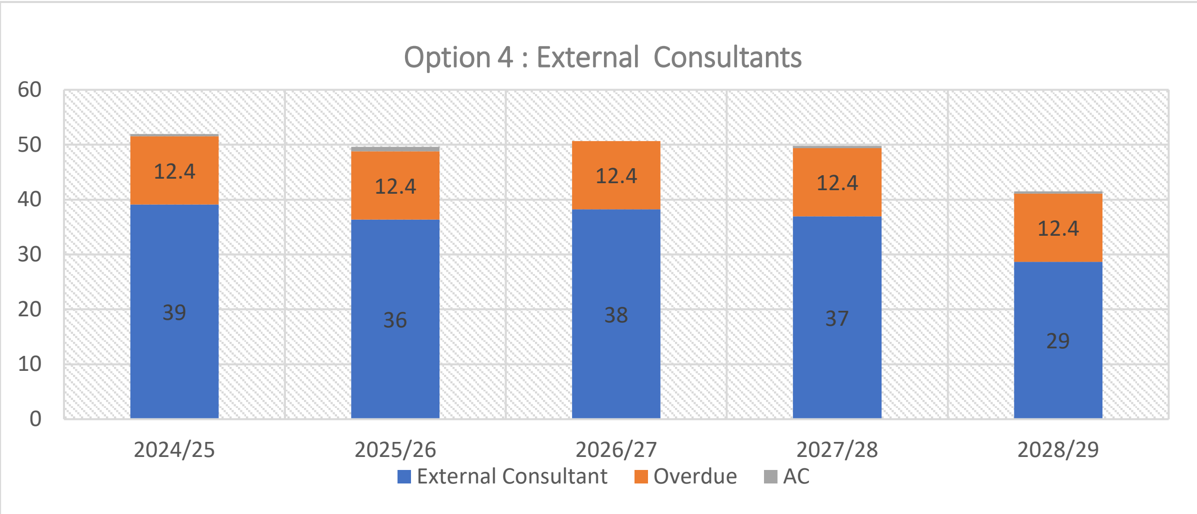
Option 4: External Consultants

In March 2023, external consultants completed a thorough inspection of the entire sealed road network and produced a forward works programme of resurfacing.

The entire network was inspected to ensure that no problem was overlooked, and to provide an overall intuitive feel for network condition and rate of deterioration. There were three requirements:

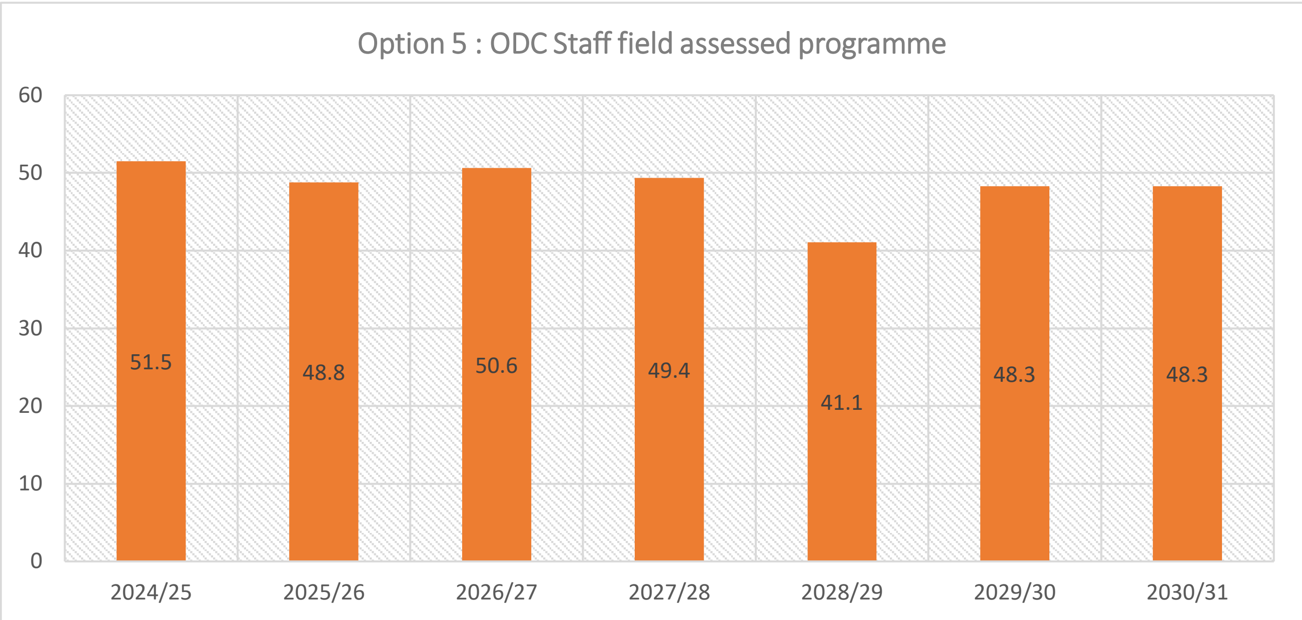
- Visual inspection of the network by experienced roading engineer
- Average seal life
- Condition, using RAMM treatment selection Algorithm (TSA)

The resurfacing lengths/km for next 5 years of programmes as follows:

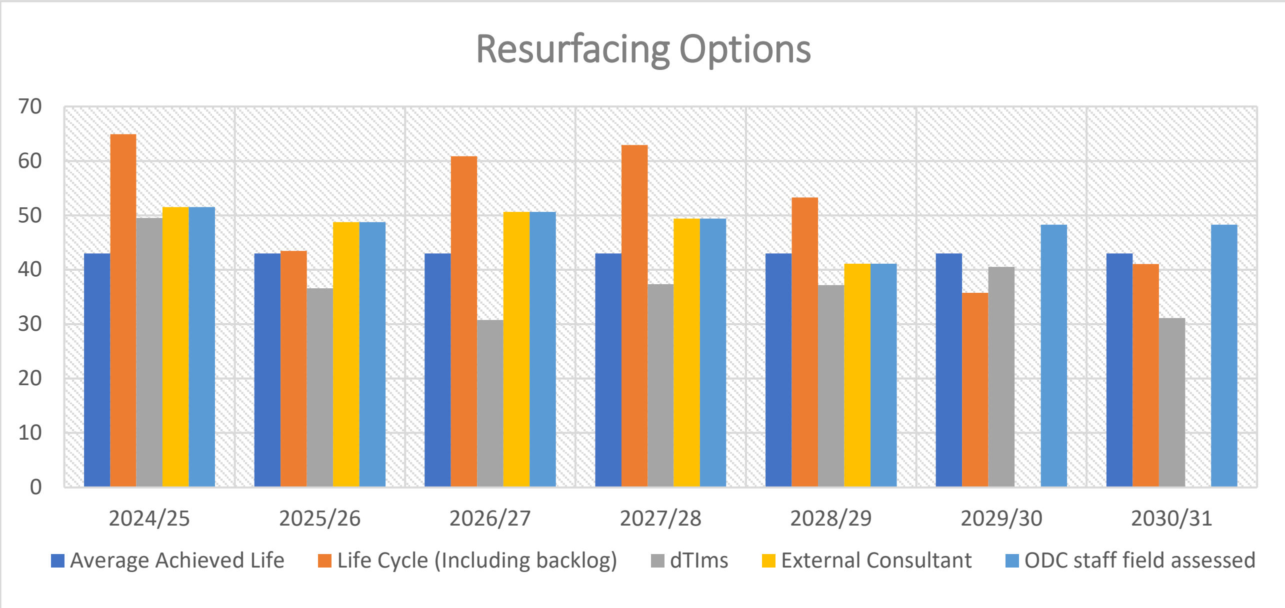


Option 5: Ōtorohanga District council staff field assessed programme

In consideration of the above options, the suggested resurfacing programme for the next seven (7) years is shown in the following bar chart. It shows that the average resurfacing length required over the five-year period 2024/25 to 2026/27 is 48.38km, resulting a reduction in the length of overdue seals and improving the current condition.



RESURFACING OPTIONEERING COMPARISON
The following bar chart shows the comparison between all the five options discussed above and shows the forward works programme for next seven (7) years.



Ōtorohanga District Council has performed multi criteria analysis for the programme optioneering to choose the best programme that is fit for purpose and delivers the best value for money. ODC has chosen option 5, which is the combination of all the four options. The decision was drawn together by the experienced and knowledgeable ODC staff who are very familiar with the network.

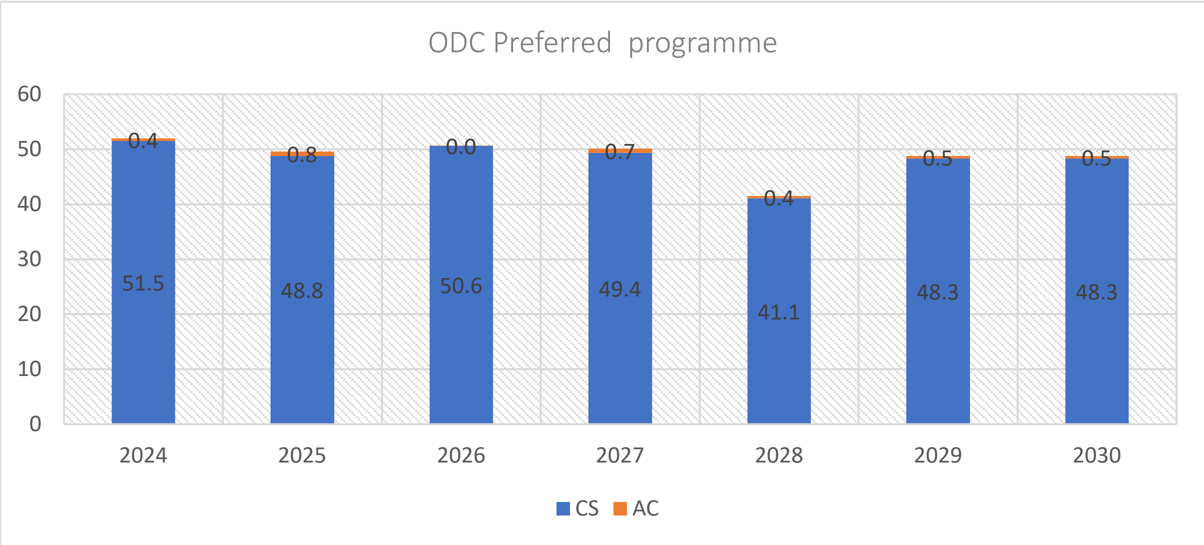
Criteria	Weighting	Options									
		Option 1 - Average Surfacing life achieved		Option 2 - Seal Life Cycle (including backlog)		Option 3: dTIMS modelling		Option 4: External Consultant		Option 5: ODC staff field assessed programme	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Value for Money - Affordability	25%	75	18.75	75	18.75	50	12.5	80	20	90	22.5
Field based assessment	30%	80	24	80	24	60	18	85	25.5	95	28.5
Life Cycle Management	10%	65	6.5	75	7.5	65	6.5	80	8	90	9
ONRC/ONF Performance gaps - Condition index	30%	90	27	90	27	90	27	90	27	85	25.5
Risk based - Hold assets longer	5%	90	4.5	90	4.5	80	4	90	4.5	95	4.75
Totals	**100%**	**80.79**		**81.75**		**68**		**85**		**92**	

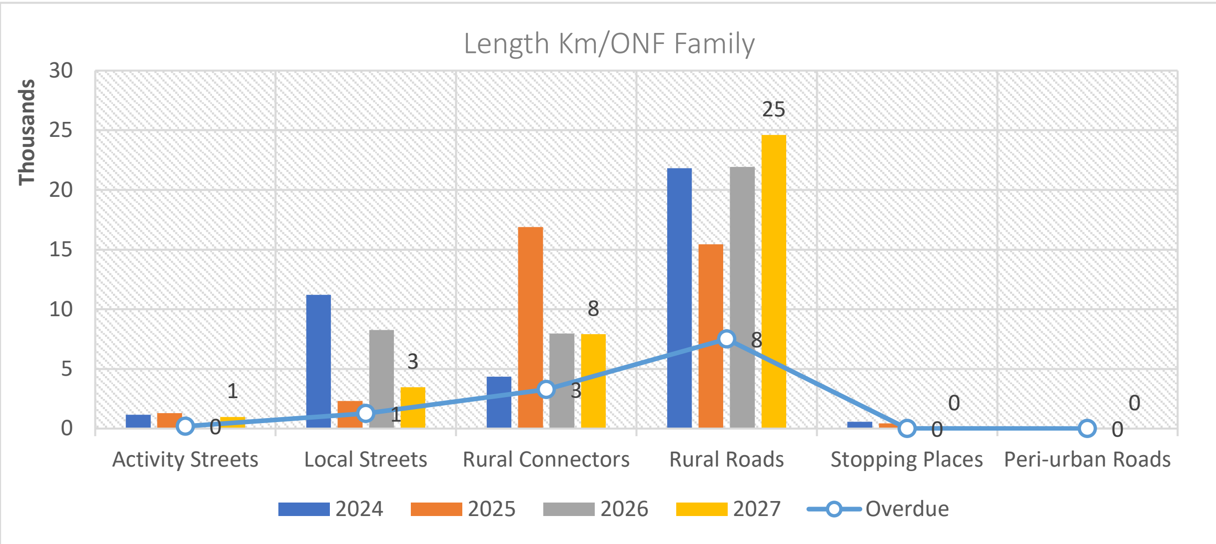
The process for the selection of the forwards works programme as follows:

- The chosen option 5 is the combination of all the options
- Sites are further prioritised allowing the ability to adjust the programme to suit available funding, although tender values are used to forecast budgets

- Surfacing, maintenance cost and condition data are used during surveying, but engineering judgement takes precedence. No sections are based solely on "birthday sealing" which is a date simply calculated on the age of the seal.
- Any existing Council projects – pavement rehabilitation and resurfacing work – are considered.
- Council adjusts the calculated programme to suit budgets limitation where required and focuses the money spent on the roads with the poorest level of service. Although the budget forecasts are based on the tender prices and quantities the scope of work may vary due to localised conditions.

Based on the multi criteria analysis, the following graph represents ODC's preferred programme. The quantity of resurfacing – Chipseal (51.5Km, 48.8Km & 50.6Km respectively/year) and AC (0.4Km, 0.8Km & 0.00Km respectively/year) for the first three years as shown below and this programme has been used to calculate the forward works budget for reseals.





PAVEMENT REHABILITATION

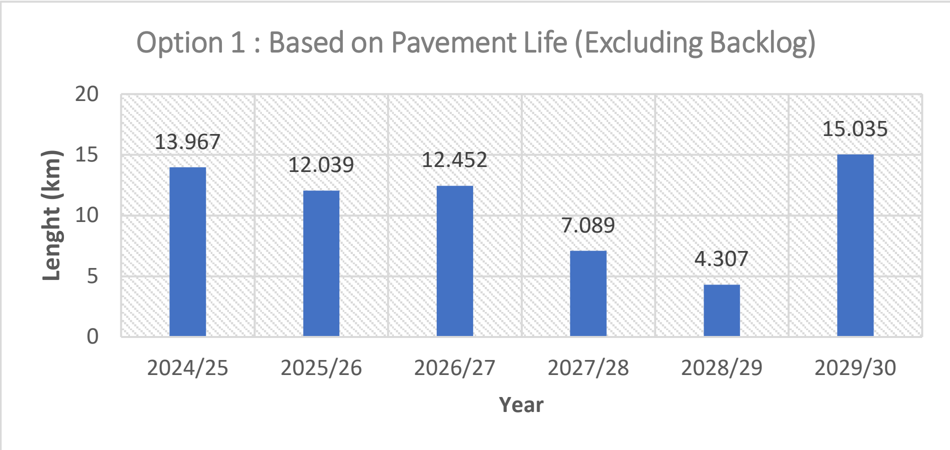
The need for pavement rehabilitation is generally determined by a combination of:

- Detailed network inspections (forward works program)
- Existing surface condition indicators (determined from road rating survey)
- Historical maintenance cost records
- dTIMS pavement deterioration modelling analysis

The amount of rehabilitation work carried out by Ōtorohanga District Council over the last NLTP 2021/24 is approximately 4.83km/year, which is 0.8% of the sealed network.

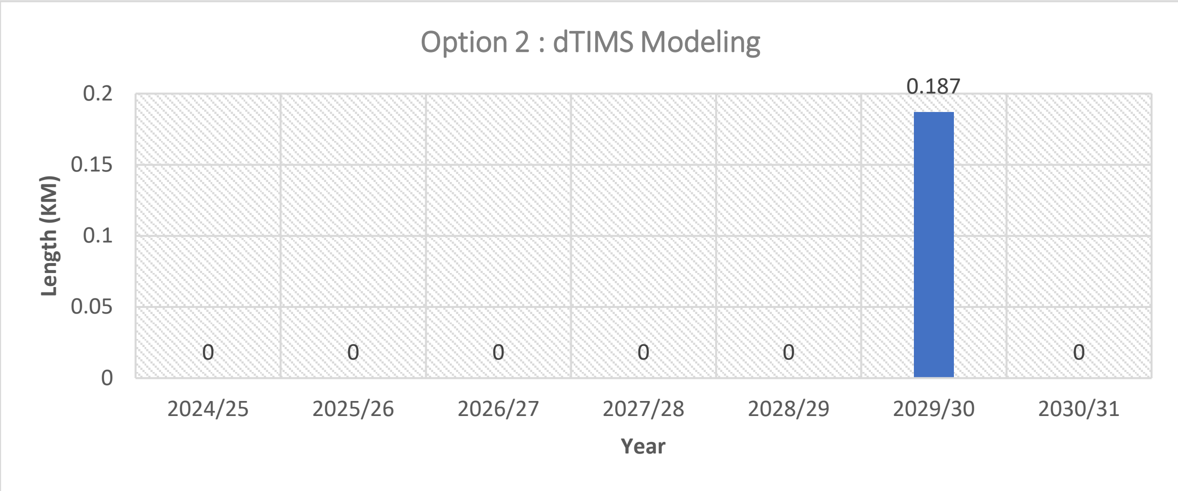
Option 1: Based on Life Cycle Values

The RAMM data shows that there is a backlog of 70km of roads to be rehabilitated based on their remaining useful life. Assuming there is no backlog, then the calculated of rehab sites/year is 14km, 12km and 12.5km financial years 2024-27 respectively. This approach was found to be quite innaccuate based on field validation and has therefore not been considered as an option though the process is helpful to give prespective on the methodology to calculate the FWP.



Option 2: Based on dTIMS modelling

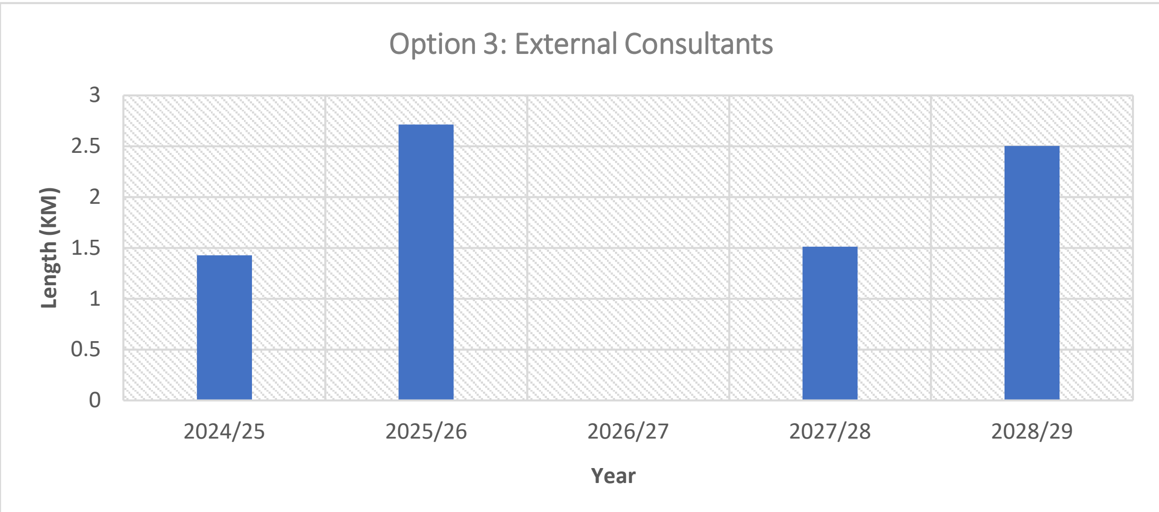
The current dTIMS (2021/22) programme is still at trigger model stage suggesting only 0.187km of Rehabs in the next 7 financial years which also seems to be unrealistic and required programme validation in the field. (Refer to option 4 below.)



Option 3: External Consultants

The entire network was inspected by an experienced external consultant. This ensured that no problem is overlooked, and provided a direct analysis and an overall intuitive feel for network condition and rates of deterioration. The rehabilitation assessment was based on the following three requirements:

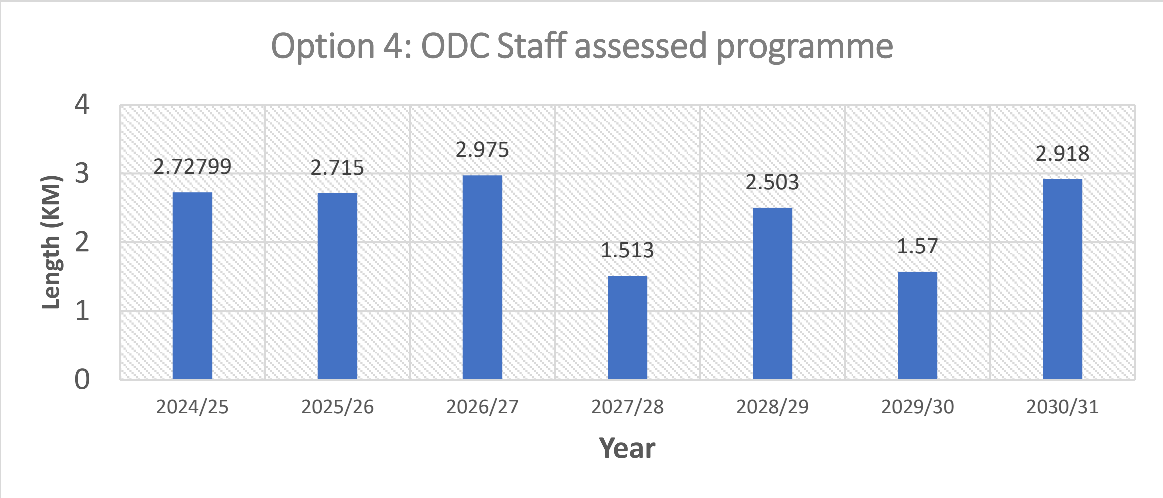
- Visual inspection
- The rehabilitation lengths identified from the network inspection
- Condition, using RAMM Treatment Selection Algorithm (TSA)



The road conditions trends were checked against the targeted values for each distress type i.e. Fatigue cracking, deformation, flushing, scabbing and potholes. The external consultants recommended an average of 2km/year of pavement rehabilitation.

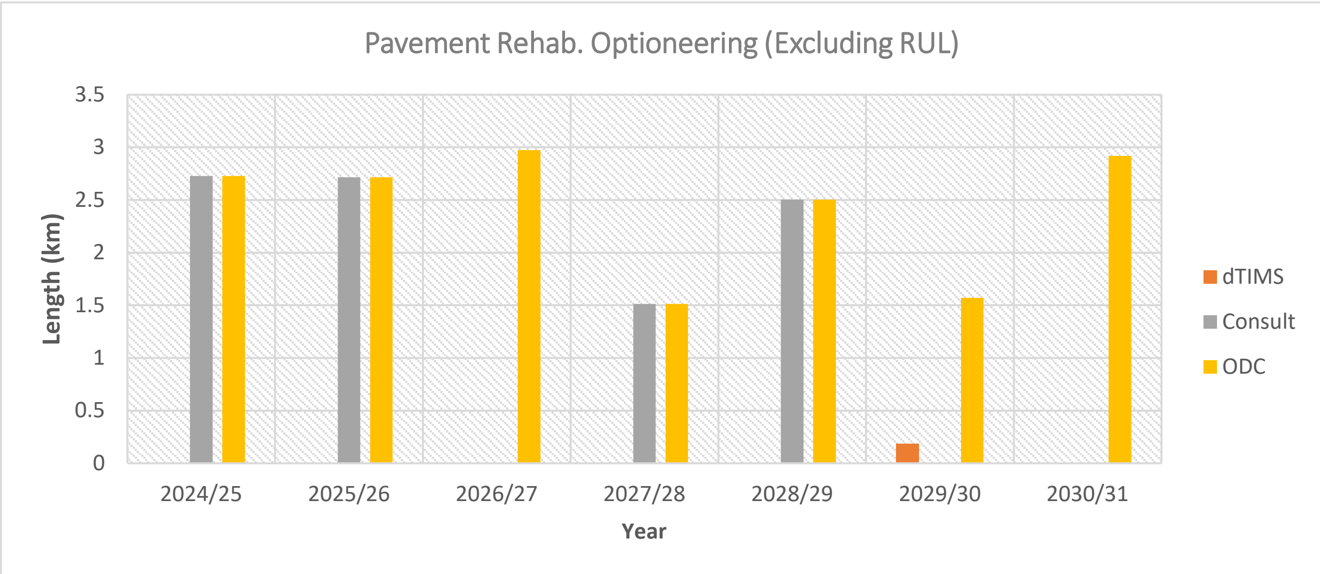
Option 4: Ōtorohanga District council staff field assessed programme

ODC staff assessed, the list of the roads recommended in the AMP 2021/31 and the forward works program (FWP) of 2021 dTIMS trigger model and the consultant's programme. ODC staff came up with the recommended forward programme based on the combination of above options (1-3). The following bar chart shows that the average pavement rehab required over seven (7) years 2024/25-2030/31 is 2.23km. In year 1, 1.3Km allowed for various maintenance Rip & Remake (R&R) sites.



PAVEMENT REHABILITATION OPTIONEERING COMPARISON

The following bar chart shows the comparision between all the options showing the recommended length of the pavement rehab/year, the option 1 was discarded due to being unrealistic approach for the renewal.



MULTI CRITERIA ANALYSIS – OPTION SELECTION

Ōtorohanga District Council has performed multi criteria analysis for the programme optioneering to choose the best programme that is fit for purpose and deliver the value for money. ŌDC chose option 4, which is the combination of all the three options though option 1 was discarded from the pavement rehabilitation optioneering comparison due to unrealistic figures.

Criteria	Weighting	Option 1 - Life Cycle (Excl. backlog)		Option 2: dTIMS modelling - 2017		Option 3: External Consultant		Option 4: ODC staff field assessed programme	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score
Value for Money - Affordability	**20%**	50	10	65	13	85	17	95	19
Field based assessment	**35%**	40	14	70	24.5	90	31.5	95	33.25
Life Cycle Management	**5%**	75	3.75	65	3.25	80	4	90	4.5
ONF/ONRC Performance gaps - Condition index	**35%**	90	31.5	90	31.5	90	31.5	80	28
Risk based - Hold assets longer	**5%**	90	4.5	80	4	90	4.5	95	4.75
Totals	**100%**		**63.75**		**76.25**		**88.5**		**89.5**

The process for the selection of the forwards works programme shall be similar to the reseals programme. The pavement rehabilitation quantities shall be reviewed again in the next forward work programme in the next three year term i.e. 2027/30.

ODC PAVEMENT REHABILITATION PREFERRED PROGRAMME

Based on the multi criteria analysis following is the ŌDC's preferred programme. The quantity of the pavement rehab required per annum for the each road with the priority is given as below.

FY	Road Name	Start RP	End RP	Length	Priority/year
2024/25	Haerehuka St	10	771	761	1
	Otewa Rd.	12102	12358	256	
	Otewa Rd	12358	12769	411	
2025/26	Harbour Rd.	1996	2799	803	2
	Honikiwi Rd	14239	15000	761	
	Lethbridge Rd	5	240	235	
	Ranfurly St	0	59	59	
	Te Kawa Rd	11239	11426	187	
	Te Kawa Rd	11426	11965	539	
	Turitea Rd	26	157	131	
2026/27	Waipapa Rd	19219	22194	2975	3
2027/28	Harbour Rd	6826	8080	1254	4
	Ngutunui Rd	20	279	259	
2028/29	Ngutunui Rd	1272	1868	596	5
	Ngutunui Rd	1868	3000	1132	
	Ngutunui Rd	3000	3321	321	
	Ngutunui Rd	3321	3775	454	
2029/30	Adam Rd	0	1570	1570	6
2030/31	Wairehi Rd	5991	8909	2918	7
2031/32	Mangare Rd	7584	9224	1640	8
	Mangare Rd	12265	13461	1196	
2032/33	Paewhenua Rd	3100	4250	1150	9
	Tauraroa Valley Rd	244	1950	1706	
2033/34	Kahorekau Rd	2443	4050	1607	10
	Hauturu Rd	2445	4841	2396	

The calculated quantity of the pavement rehab. per annum for the first three (3) year 2024/25-2026/27 forwards works programme (FWP) is 1.4Km (plus 1.3Km allowed for various maintenance Rip & remake sites needed to deal with isolated failures as a result of changing weather patterns), 2.7 & 2.9km respectively. In addition a budget of $310K is allowed in this rehabilitation section for surfacing & roughness improvements to address negative SCI, roughness and smooth travel trends, such specific sites not having be identified as yet as the majority of this is likely to need flexibility of programming.

UNSEALED BULK METALLING

Ōtorohanga District Council has managed the current bulk metaling contract since 2021/22, it is in the last year of the contract period (23/24) and there is potential to extend for another two years. The contract has been successfully executed and the widths surface condition of the unsealed roads accurately maintained.

The payment for the unsealed bulk metaling is based on volume of imported material and it is therefore very important to be accurate on the unsealed road widths. Prior to the finalisation of the tender document, roads widths in the District were re-checked by the ŌDC staff to make sure the contract unsealed widths are correct.

The calculated road length of the unsealed bulk metalling per annum for the five year cycle ranges between 45 and 60km per year. The five year cycle being such that every unsealed road receives additional metal at least once every five years. Regular grading and maintaining of the road profile ensures that the minimum quantity of metal is used to maintain the required formation depth.
A multicriteria analysis is not used to assess the unsealed road bulk metalling as the current methodology is tried and proven over time.

PREFERRED PROGRAMME

The preferred programme based on the lifecycle management plan, prioritised by ONRC & ONF (where possible), strategic problem, programme optioneering and acceptable levels of service is summarised as follows and are un-escalated:

Work Category		**Budget ($000)**									
		24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
111	Sealed pavement maintenance	1,141	1,141	1,144	1,131	1,140	1,132	1,143	1,127	1,127	1,152
112	Unsealed pavement maintenance	301	301	301	301	301	301	301	301	301	301
211	Unsealed road metaling	633	735	930	819	831	633	735	930	819	831
212	Sealed road resurfacing	1,971	2,108	1,748	2,012	1,706	1,909	1,909	1,909	1,909	1,909
214	Sealed road pavement rehabilitation	1,222	1,787	1,302	1,417	1,159	851	1,283	1,257	1,263	1,631
341	Minor improvements	1,928	1,601	1,843	1,649	1,749	1,749	2,058	2,239	2,084	2,512

BRIDGES, LARGE CULVERTS AND STOCK CROSSINGS/UNDERPASSES

STRATEGIC CASE

The previous ILM workshops and community consultation identified the following problems, benefits and strategic responses relating to bridges, culverts, stock crossings and underpasses.

Icon	Problem	Benefit	Strategic response	Measure	Measure (ONF)
	Increasing pressure from climate and environment impacts. (50%)	Increase in leadership focus on climate and environmental adaptation (20%) Infrastructure planning incorporates the management of future uncertainties, adaptation & transition planning (35%) Decrease in death & serious injuries on roads (45%)	Create a resilient environment that encourages established and new leaders to lead with an outlook for the future that develops a strong community (45%) Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region (55%)	Routine inspections under maintenance contract C1070. Condition rating by an independent bridge specialist Engineer on a six year cycle ONRC accessibility outcomes CO1 – Key routes un/available to class 1 & 50MAX vehicles ONRC Safety C01	Routine inspection under maintenance Contract C1070- still operating under ONCR level of services. Independent bridge specialist Engineer on a six-year cycle ONF – Outcome - Heavy vehicle accessibility (data yet to be updated into transport insights.
	The current state of our infrastructure and how people use it is unable to meet the speed and uncertainty of technology change (15%)				

STRATEGIC RESPONSE

Ensure all infrastructure is fit for purpose and to open opportunities that sustainably drive future development and excellence in the region.

In this section, the response is focused on:

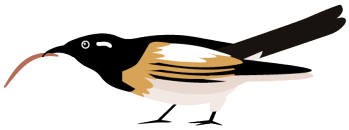
- Ensuring bridges are well maintained and safe, which enables the effective transportation of products and service providers to move in and around the district
- Underpasses are well maintained ensuring the road above them continues to operate effectively, while remaining safe
- Cattle are also able to move to and from different areas of farms, thus optimising business returns for farmers.

ACTIVITIES DELIVERED

Activities delivered through the road pavement assets and their respective Waka Kotahi funding work categories are included in table below:

Work Category	Function	Examples
108.114 Structure maintenance	Maintain function and structural integrity	Repair, cleaning & painting
108.215 Structure component replacement	Road Bridges, Retaining structures, Guardrails	Replacements of guardrails, deteriorated structural members, bridge decks
108.341 Low Cost/Low Risk	Increase capacity and function	Bridge strengthening

Bridges	Quantity



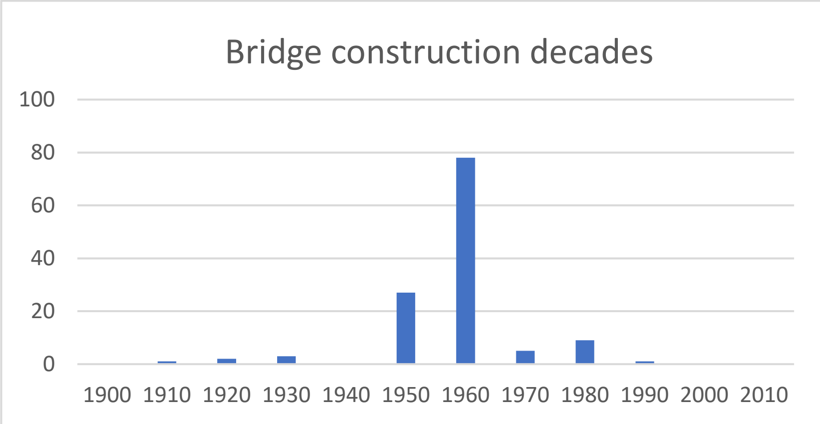
ASSET DESCRIPTION

This section of the AMP includes three assets i.e. bridges, large stormwater culverts and stock underpasses. Each asset shall be discussed in subsequent sections.

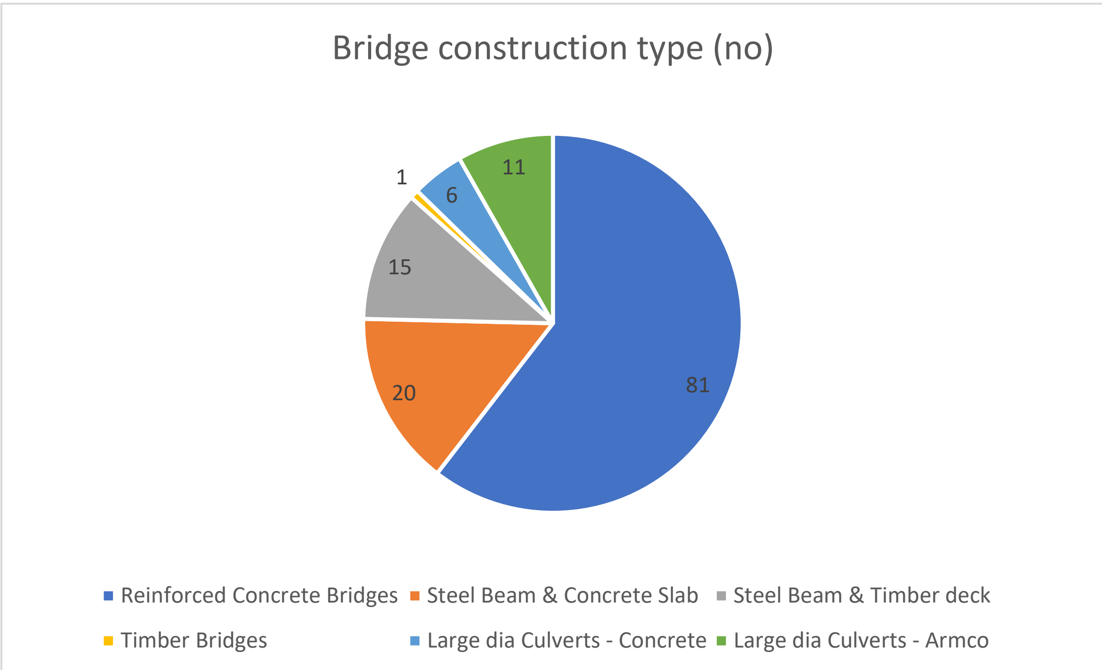
Bridges	129
Stormwater Culvert	5
Stock Underpass	83
Total	217

BRIDGES, LARGE CULVERTS & STOCK CROSSINGS/UNDERPASSES

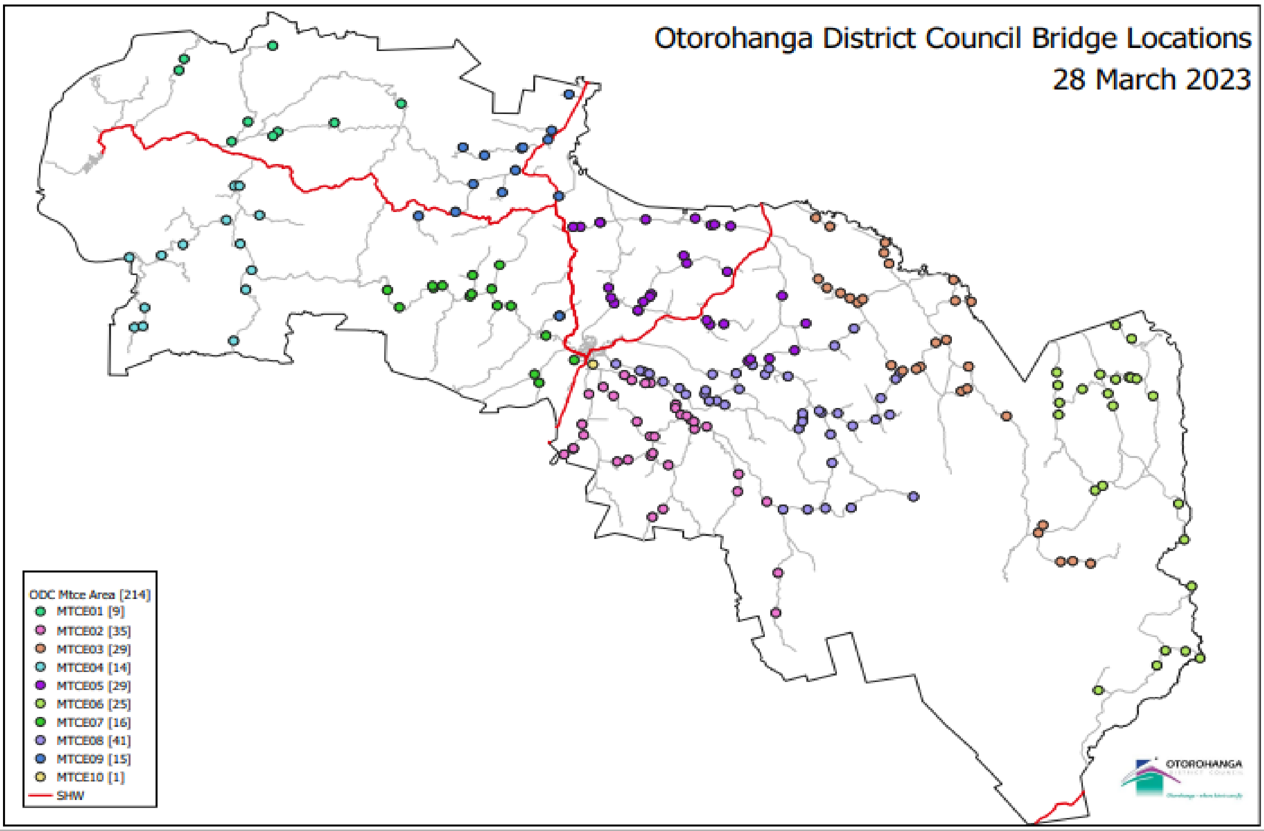
Within the Ōtorohanga District there are 134 structures classed as bridges, including five stormwater culverts which are over 1.2m diameter. There are 83 stock underpass structures. The bridges were constructed from 1920 onwards, with a large proportion of the bridges constructed from the 1950s to 1960s. Most of the structures are generally in very good condition even though some of them are now over 100 years old.



Most of the bridges are of reinforced concrete construction, typically being either a reinforced concrete deck or timber deck on steel beams, with only a small number of fully timber bridges, large diameter culverts of Armco construction or similar make up the remainder.

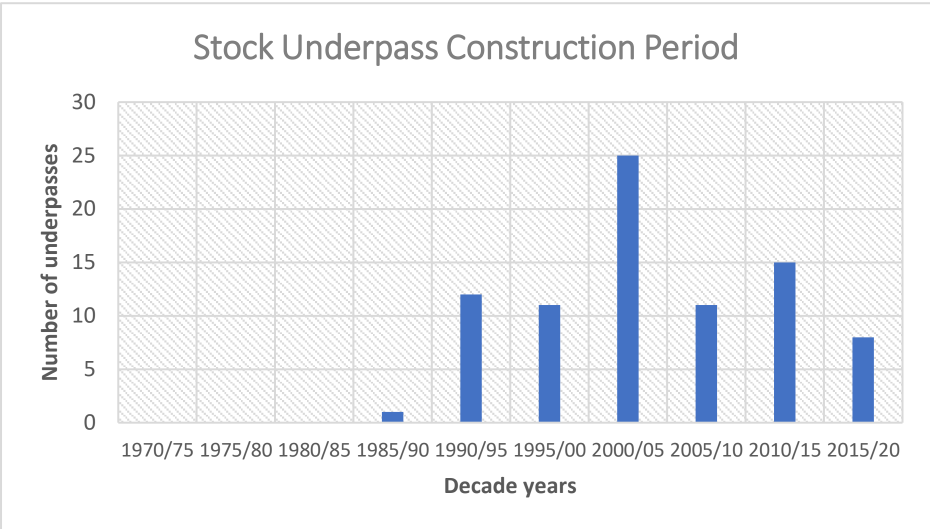


The location of bridges within Ōtorohanga is shown on the map below:



STOCK CROSSINGS/UNDERPASSES

Within the Ōtorohanga District there are 83 stock underpasses, and although these structures are officially classed as bridges they are discussed separately here. The underpasses have all been constructed since 1974 in response to the general increase in the size of dairy farms. Since the 1990s in particular and following the Council policy of requiring farm owners to install an underpass rather than operate stock crossings on public roadways there has been a more recent increase in underpass numbers



Subsidy and Requirement Formulae and Commentary

Under the Bylaw, a stock underpass is required where a crossing has an Index Value greater than 10,000. This is calculated by using the formula:

Index Value = Cattle x Frequency of Crossing x Traffic Count/ days in a year

Council will use the New Zealand Transport Agency subsidy rules as set out in the Planning and Investment Knowledge Base (PIKB), for cost sharing for stock underpasses. At its discretion, and subject to the funding provisions of the Long Term Plan, the Council may contribute to the costs of construction of an underpass as shown below:

Cost sharing for stock underpasses or overpasses

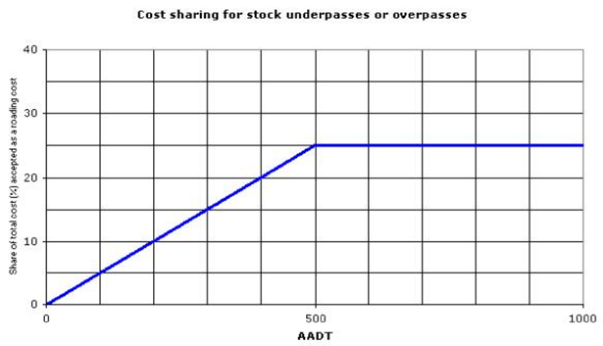


Figure 1

<u>Formula for cost sharing for stock underpasses or overpasses</u>

CS = 0.05 * AADT (on roads having less than 500 AADT) in percent

Where:

CS = 25 percent (on roads having greater than or equal to 500 AADT)

CS = Approved Organisations' or Transport Agency's (state highways) contribution, including the Transport Agency's funding assistance, to the total construction cost of an access structure on an existing road (in percent)

AADT = average traffic volume per day

3.2 Subsidy relates to a standard sized underpass (4m x 2m), approaches and pumping facilities if required.

3.3 The cost of supply and installation of approved temporary warning signs and stock mats may be eligible for subsidy.

<u>Delivery</u>

The current delivery model and the procurement review and development process are detailed in the pavement section of the detailed business case.

There is no upgrade or replacement of the bridges expected, however budget is allowed for the two timber deck renewals/year. There will be a separate contract as required for the deck replacements. The routine maintenance of the bridges is covered under current ŌDC maintenance contract C1070.

<u>Asset Valuation</u>

Council engaged Beca to conduct valuation of roading infrastructure assets owned by Council as at 30 June 2022 for the all asset classes.

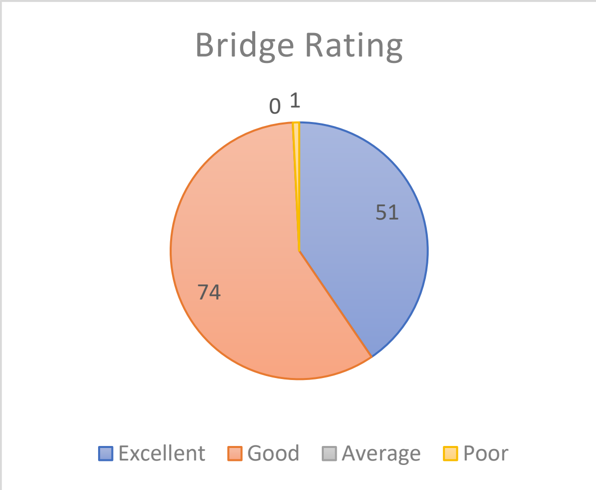
The 8% overhead applied, however consideration was given to apply different escalations by asset type. The variation in calculations was insignificant so a blanket 8% rate was used. The 2020 rates have been reviewed against current and recent ŌDC contract rates. The indexes used were December 2020 to June 2022, i.e. 17.80% for Structures (typically bridges) and 19.62% for Construction.

The confidence rating of the source data and unit costs rates has been assessed to result in an overall rating of A - reliable which is considered by Council to be appropriate for the highly reliable and complexity of the network. For the valuation summary refer to appendix C.

ASSET CONDITION AND DESIGN LIFE OF ASSETS

BRIDGES

A six yearly condition rating inspection undertaken by an independent Professional Structural Engineer showed that despite their current age, our bridge stocks are in good or excellent condition. Only a single asset is rated as poor condition, a twin Armco culvert on Mangatutu Road which is being monitored and a replacement solution currently being designed.



Based on the bridge data analysis there were six bridges – including five large culverts (Waiharakeke, Thrones No.1, Woosters, Ngapeke, Weales, Pukewhau) identified for further investigation. Budget is allowed for a comprehensive inspection of these bridges.

Based on an empirical design life for the various bridge structure types in general accordance with the IIMM (International Infrastructure Management Manual) guidelines and shown in table below, the bridge stock generally has a significant remaining life of between 50 and 90 years. It is considered that the design lives selected are relatively conservative as there is every likelihood of concrete structures lasting well over 100 years.

Bridge Construction Type	Design Life (Years)
Reinforced concrete	130
Steel beam with reinforced concrete deck	110
Steel beam with laminated timber deck	100
All timber	100
Steel / Aluminium culverts	55
Reinforced concrete culverts	60

There are no current plans to renew any concrete bridge structure as their design life is nominal and regular inspections do not raise any concerns about their condition.

STOCK CROSSINGS/UNDERPASSES

The underpasses are inspected on a six-year cycle by an independent engineering specialist to determine the current overall condition and identify immediate / urgent structural maintenance needs. The remaining useful life has been established for the stock underpasses based on their useful design life, together with the ONRC Traffic volumes as follow. The Traffic volumes (ADT) under ONF yet to be determined and will be considered in next NLTP

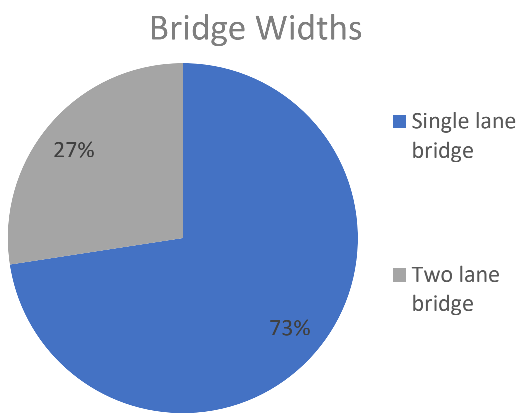
AADT (Average Annual Daily Traffic)

The design life is highlighted below.

	10	50	200	350	500	1000
ONRC	**Steel underpasses**					
Low Volume	70	65	65	65	60	60
Access	70	65	65	60	60	60
Secondary Collector	60	60	55	55	55	55
Primary collector	60	60	55	55	50	50
ONRC	**Concrete underpasses**					
Low Volume	115	115	115	115	115	115
Access	110	110	105	105	105	105
Secondary Collector	100	100	98	98	95	95
Primary collector	100	100	90	90	90	85

<u>ASSET CAPACITY AND PERFORMANCE OF BRIDGES</u>

Within the land transport industry there is currently a growing move towards larger single truck units, both in physical size and maximum vehicle weight, through the legislative changes associated with the High Productivity Motor Vehicle (HPMV) and 50 MAX vehicle types. 50MAX vehicle combinations have one more axle than conventional 44-tonne vehicles combinations, meaning the overall truck load is spread further and there is no additional wear on roads per tonne of freight. This means 50MAX gives operators an option to carry increased payloads on parts of the network that, while economically important to New Zealand, carry lower volumes of freight.



While to date there has been little apparent take-up of this initiative within the Ōtorohanga District, the 50MAX vehicle approvals consider a network area in readiness for anticipated demand uptake by freight operators which is occurring across New Zealand, rather than individual vehicles as previously considered.

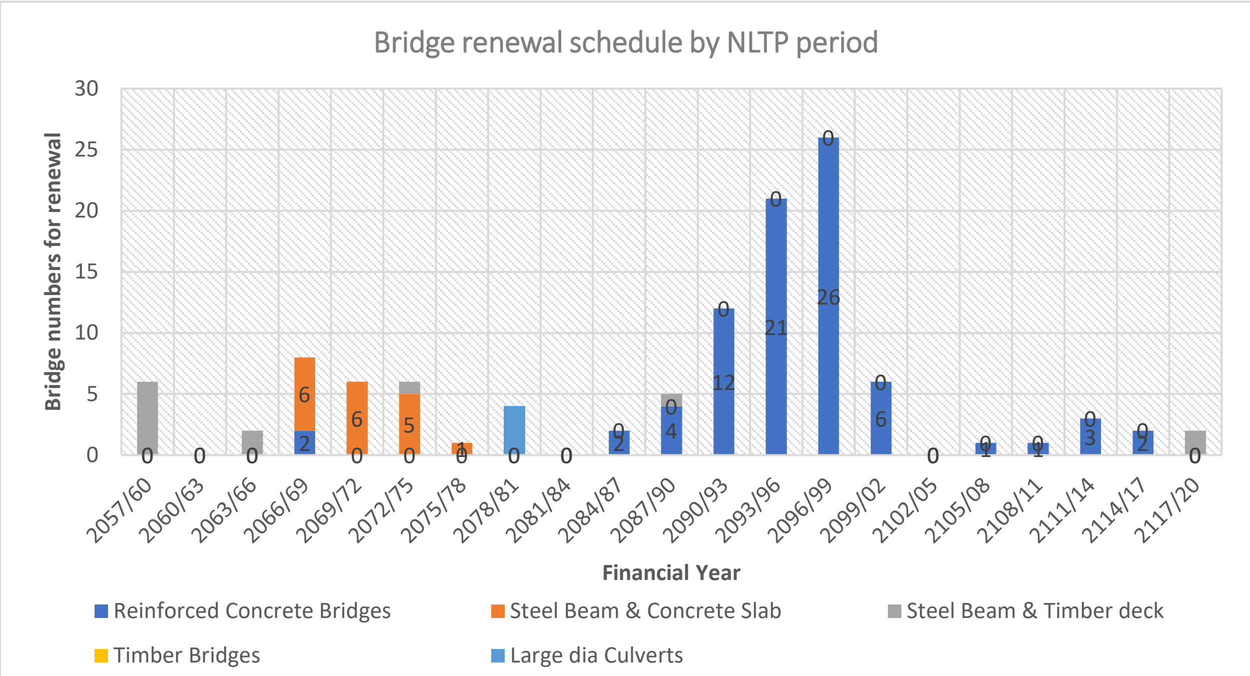
To clear the way for this network approval for trucks of up to 50 tonnes gross, Waka Kotahi has undertaken a review of all the bridges in the district and all but two bridges have been approved for 50MAX vehicle use.

Other than for these new vehicle rules, the weight carrying capacity of the District's bridges is considered to be good or adequate with only two isolated bridges with moderate load restrictions posted. Both these bridges are at the end of long no exit unsealed roads and are effectively 'in farm' bridges.

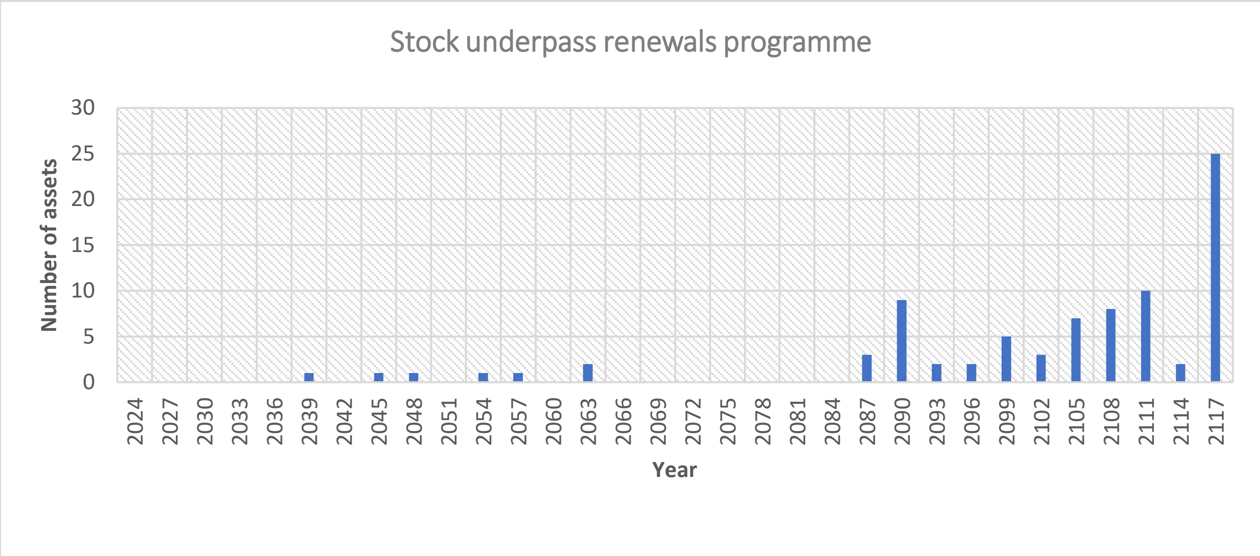
The traffic volume capacity on single lane bridges is an issue to be more closely examined in relation to the obvious road safety issue inherent with single lane bridges. The 91 single lane bridges exist across a range of road hierarchies including 5 bridges on Harbour Road classified as a secondary collector. There is no single lane bridge on primary collector roads however there are twenty-two single lane bridges on secondary collector roads i.e. Bayley, Happy Valley, Harbour, KioKio Station, Lethbridge, Maihiihi, Mangawhero, Old Te Kuiti, Otewa, Puketawai, Seafund, Te Kawa, Waipapa, Waitomo Valley and Whibley Roads.

Crash data does not indicate a traffic capacity issue at bridges within the district, and there is no record of service requests from the motoring public in relation to single lane bridges. Approach visibility on the higher traffic volume single lane bridges is in general adequate to good as is existing signage. Traffic volume capacity has therefore been assessed as adequate for the single lane bridges. Consideration may be given to replacing these bridges with two lane bridges when the bridges are renewed at the end of their lives.

LIFE CYCLE PLANING
BRIDGES



STOCK CROSSINGS/UNDERPASSES
The stock underpasses with a remaining useful life limited from thirty to fifty years are those constructed of steel Armco of which there are eight. The bulk of the stock underpasses are not planned for renewal until the end of the century.



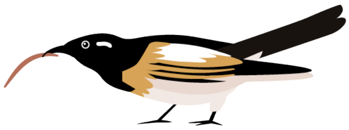
PREFERRED PROGRAMME

The preferred programme based on the lifecycle management plan, prioritised by ONRC/ONF (where possible) and strategic problems is included below, these figures are un-escalated.

Work Category		Budget ($000)									
		24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
114	Structures maintenance	311	227	227	227	311	227	227	227	311	227
215	Structures component replacements	143	143	143	143	143	143	143	143	143	143
216	Bridge replacement	0	0	0	0	0	0	0	0	0	0
341	Stock underpass facilities	34	34	34	34	34	34	34	34	34	34

DRAINAGE

STRATEGIC CASE LINK



The previous ILM workshops and community consultation identified the following problems, benefits and strategic responses relating to stormwater drainage.

Icon	Problem	Benefit	Strategic response	Measure (ONF)	Measure (ONF)
	Increasing pressure from climate and environment impacts (50%)	Increase in leadership focus on climate and environmental adaptation (20%) Infrastructure planning incorporates the management of future uncertainties, adaptation & transition planning (35%) Infrastructure is developed to meet future demand	Create a resilient environment that encourages established and new leaders to lead with an outlook for the future that develops a strong community (45%) Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region (55%)	Routine inspections under maintenance contract C1070. Condition rating by roading team on a five (5) year cycle ONRC Resilience CO1 measure – No. of journeys impacted by closure Capacity calculations done where the Rehab contracts are carried out. All the new culverts replaced with the concrete culverts.	Routine inspections under maintenance contract C1070. (Currently contract is design and delivered under ONRC LOS) ONF – Economic prosperity – Unplanned road closures Culvert replacement programme based off condition and capacity.

Create a resilient environment that encourages established and new leaders to lead with an outlook for the future that develops a strong community.

Leaders within the Engineering Team have been bold in starting the climate conversation both in this document and the Infrastructure Strategy.

STRATEGIC RESPONSE

Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region.

With reference to Stormwater, a decision has been made to nominally increase the diameter of all culverts replaced by at least one pipe size with a minimum diameter of 300mm. Catchment assessments are also done whenever a significantly sized culvert is replaced and when a section of road is rehabilitated future proofing planning and design are incorporated to provide for climate change.

Additional funds have also been allocated to ensuring stormwater drains and water tables are well maintained and free from sediment and growth which may impede the flow of run-off.

“High shoulder” maintenance is also a priority and is funded accordingly to make sure run-off from the pavement surface is unimpeded and the risks of ponding causing accidents is mitigated during higher intensity downpours.

ACTIVITIES DELIVERED

Activities delivered through the road pavement assets and their respective Waka Kotahi funding work categories are included in the table below:

Work Category	Function	Examples
108.113 Drainage maintenance	Routine area maintenance, un/sealed SWC construction,	Catchpit cleaning, Sweep urban K&C Repair, cleaning and painting, vegetation control in Stormwater drains
108.213 Drainage renewals	Drainage renewals	SWC, K&C, culvert replacement

ASSET DESCRIPTION

This section of AMP 2024/27 includes assets i.e. culverts, kerb & channels, surface water structures and surface water channel. An overview of each asset shall be discussed in subsequent sections.

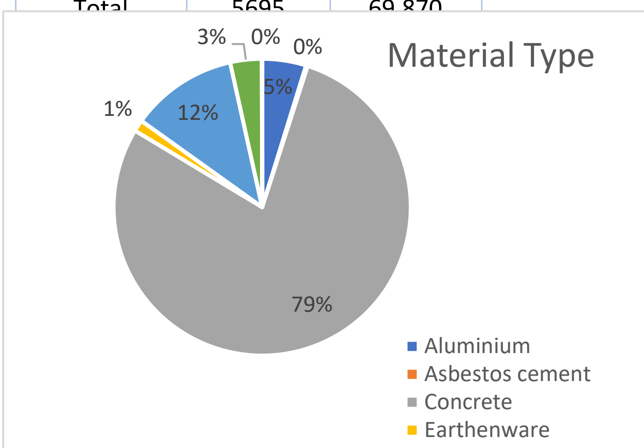
CULVERTS

The Ōtorohanga District has a total of 5695 individual recorded culverts totalling a length of 69.87km. A wide range of materials have been used for culverts in the past, but 78% of the total current stock is concrete and currently use concrete or high density polyethelene for new culvert construction or for renewals. Stormwater pipe structures larger than 2.1m in diameter or 3.4 square meters in waterway area are classified as structures for asset management purposes and are not included in this summary.

Material	Length (m)
Aluminium	3,336
Asbestos cement	128.7
Concrete	54,997
Earthenware	878.8
Galvanised Steel	8,134.8
Poly Vinyl Chloride	2,394
Timber construction	27
Total	69,870

Diameter (mm)	Number	Length (m)
50 to 225	1737	16,518
300	2,871	36,012
375	353	5,317
450	351	5,427
600	155	2,711
750	56	1,029
900	74	1,345
≥1050	98	1,510
Total	5695	69,870

The culverts within the Ōtorohanga District are generally made up of the smaller range of diameters with 82.7% of the length of concrete culverts being 375mm diameter or less, which is representative of the total culvert asset stock. It is current policy to set the minimum culvert size as 300mm diameter for improved performance and reduced blocking risk.



For a period in the 1990s corrugated steel, aluminium and Armco culverts were an attractive option for culvert replacements due principally to favourable installation cost savings, however it has been the experience in the Ōtorohanga District that the expected design life has not always been

achieved, particularly on unsealed roads where inlet and outlet damage during road grading has been endemic. The reduced "whole of life" costs and resilience of concrete culverts has been the primary driver to adopt concrete as the material of choice for all new and replacement culverts since 2002.
There are a very small number of asbestos cement pipes in the District (11 in total to a length of 129m) all of which are likely to be at vehicle crossings. Given this very small number it is proposed that a contract to replace these culverts by a specialist in asbestos handling and disposal will be undertaken once the failure of the culverts becomes apparent to ensure worker and public safety.

KERB AND CHANNEL
There are different types of kerb and channel installed with in Ōtorohanga District with a small quantity in the Kawhia settlement. This table shows the different types of kerb & channels and their length.

Type	Length (m)
Barrier Kerb & Channel (Concrete)	34,512
Dished Channel (Concrete) boxed	405
Dished Channel (Sealed)	27
Dished Kerb & Channel (Concrete)	92
Reinforced Concrete Half-pipe Channel	197
Slot Channel (Concrete)	14
Kerb & Channel (Stone)	1,347
Kerb Only (Concrete)	659
Kerb Only (Stone)	76
Mountable Kerb & Channel (Concrete)	4,937
Grand Total	**42,226**

Type	Quantity
Catch pit type 1	382
Catchpit type 2	27
Catchpit type 3	2
Subsoil drain	15
Cave	1
Dropper Pipe	494
Flume down batter	43
Lateral	104
Manhole	15
Scour Protection	14
Side Culvert	107
Soak pit	8

SURFACE WATER STRUCTURES
There are 382 type 1 catchpits in the urban centres of Ōtorohanga Township and Kawhia Township within the Ōtorohanga District. Although very few records exist to establish the construction date of the catchpits, it is understood they were principally installed during two periods of road kerb installation in the 1960's and 1980's.
There are 494 recorded dropper pipes across the rural roading network, of both 600m and 1050mm diameter. There are also 43 flumes down batters, 15 manholes and 8 soak-pits recorded in the RAMM database.

SURFACE WATER CHANNELS
There is a length of 885km of surface water channels for sealed and unsealed roads. The RAMM asset database records for the constructing or reconstruction of the stormwater channels indicates that these assets are all quite old, especially for an asset type which might not normally be expected to last for any significant period. It is likely that reformation of these assets has occurred as part of pre reseal repair works but not recorded in the asset database. It is the assertion of the Engineering Team that regular and appropriate maintenance of surface water channels give in effect an ongoing and unlimited life expectancy.

Type	Length (m)

SWC (Shallow, <150 below Seal Edge)	66,290
SWC (Deep, >150 below Seal Edge)	470,704
SWC (Deep, >150 below Metal Feather Edge)	300,999
SWC (Shallow, <150 below Metal Feather Edge)	44,276
SWC (Sealed Shallow Channel, <150 below Seal Edge)	2,526
Total length(m)	**884,795**

DELIVERY
There is no specific contract for delivery of the drainage works however some kerb and channel was renewed under contract C1053 Footpaths and some of the kerbs & channels are programmed to be renewed under contract C1106. The routine maintenance of the drainage related is covered under the ŌDC maintenance contract C1070. The culverts are mainly replaced and upgraded during the pavement rehabilitation contract. As and when any culverts fail, then those culverts are replaced under the ŌDC current maintenance contract under reactive works.

ASSET VALUATION
Council engaged Beca to conduct valuation of roading infrastructure assets owned by Council as at 30 June 2022 for the all asset classes. The process of revising the valuation from in house spread sheets to the full use of RAMM was completed as part of this valuation.

The 8% overhead was applied, however consideration was given to apply different escalations by asset type. The variation in calculations was insignificant so a blanket 8% rate was used. The 2020 rates have been reviewed against current and recent ŌDC contract rates. The indexes used were December 2020 to June 2022, i.e. 19.62% for Construction.

There were few changes that came out of the asset valuation:

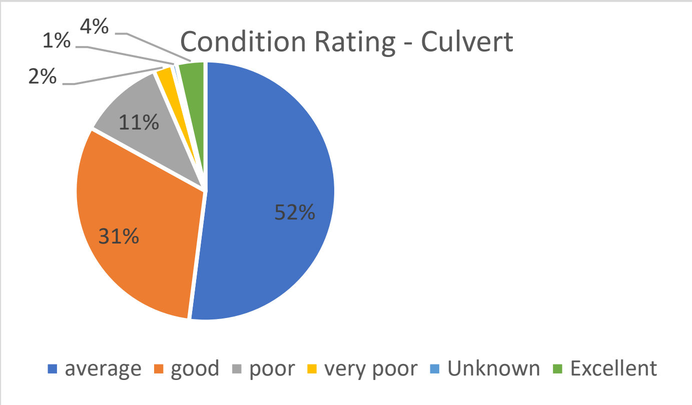
- Useful life of the timber culverts changed from 70 years to 50 years
- Useful life of soak pits changed to 50 years which is slightly less than drop structures due to silt blockage

The confidence rating of the source data and unit costs rates has been assessed to result in an overall rating of A, reliable for surface water channels and drainage. The construction dates for these assets is still less reliable. For the valuation summary refer to appendix C.

ASSET CONDITION AND DESIGN LIFE
The condition of the assets is divided into five ranks i.e. 1-Excellent or Very Good, 2-Good, 3-Average, 4 - Poor and 5- Very Poor. The unknown or uncategorized assets are denoted by U.

CULVERTS

Following pie chart shows the condition rating of the culverts and the table for the adopted culvert design life & adjustments for condition.



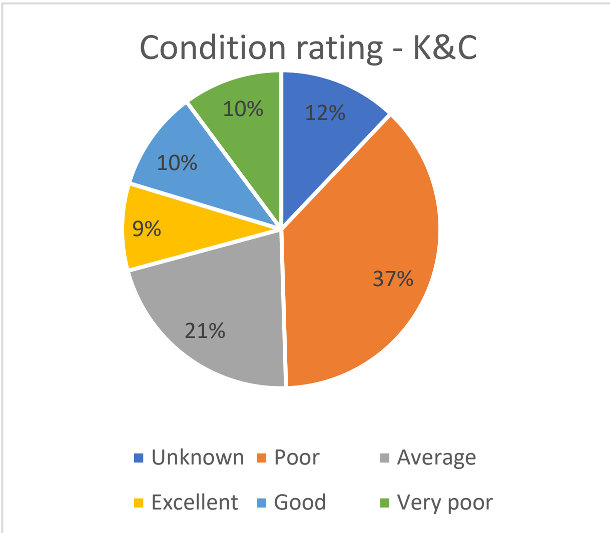
Culvert material	Design useful life (years)
Concrete	90
Galvanised steel	60
Aluminium	30
PVC	70
Earthenware	75
Timber	50
Asbestos Cement	70

Since the 2015/25 AMP the culverts have been confirmed and condition rated, with less than 0.58% of the culvert stock remaining to be rated. 94% of the culverts are good, very good or excellent in condition. Improved culvert replacement forecasting based on known condition assessment is now taking place as part of this AMP.

KERB AND CHANNEL

Following pie chart shows the condition rating of the kerb & channels and the table for the design life and adjustments for condition.

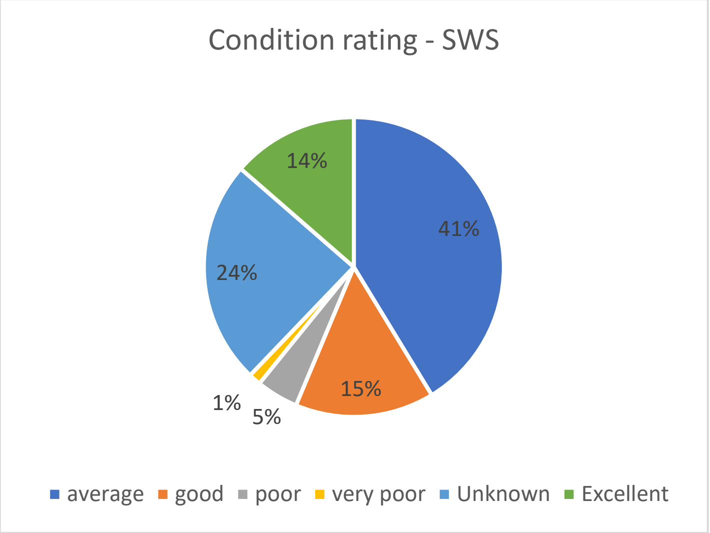
Type	Life
Barrier Kerb & Channel (Concrete)	90
Dished Channel (Concrete) boxed & p	70
Dished Channel (Sealed)	60
Dished Kerb & Channel (Concrete)	60
Kerb & Channel (Stone)	60
Kerb Only (Concrete)	70
Kerb Only (Stone)	60
Mountable Kerb & Channel (Concrete)	80
Reinforced Concrete Half-pipe Channel	60
Slot Channel (Concrete)	60



SURFACE WATER STRUCTURE

The following pie chart shows the condition rating of the surface water structure's design life and adjustments for condition.

Drain Type	Design life
Catchpit type 1	60
Catchpit type 2	60
CAVE	60
Dropper Pipe	40
Flume down batter	15
Lateral	90
Manhole	90
Scour Protection	10
Side Culvert	90
Soak pit	50
Subsoil Drain	50



SURFACE WATER CHANNEL

The adopted design life for surface water channels is 55 years. No records exist to confirm construction dates for these structures, and the assets are yet to be formally assessed for the current condition.
Condition and performance of the surface water channels is done regularly as part of our routine inspection programme under contract C1070.

ASSET CAPACITY AND PERFORMANCE

CULVERTS

Based on observation of the network performance during heavy rainfall events, and the number of public complaints or requests for improvements it is considered that the culvert network is currently of an adequate capacity to deal with typical rainfall events. In recent years it has become policy to adopt a minimum culvert diameter of 300mm (including for new private entranceway development) based on reduced maintenance risk from local detritus blockage of culverts. Although currently the network includes 16.18km of culverts of 225mm diameter (and a very small quantum of 150 to 200 mm diameter), there is no current plan to replace these culverts with the minimum 300mm diameter default size ahead of the design engineering life for the culvert material. One exception is during capital upgrading works, pavement renewals and in some cases during resealing operations when the opportunity is generally taken to upgrade culverts. Such upgrades are identified in response to climate change.

KERB AND CHANNEL

There is a total length of 42.26km of concrete kerb and channel in the district, mostly in the Ōtorohanga Township with a small quantity in the Kawhia settlement. Most of the kerb and channel is 50 to 60 years old and considered to be in good condition, although the formal condition rating has not been completed.

Very few sections of urban roadway do not have kerb and channel on both sides of the road, and there are currently no plans for additional capital construction of kerb and channel.

SURFACE WATER STRUCTURES AND CHANNELS

Capacity of the surface water collection system is generally adequate under typical weather patterns, with some limited areas of persistent shallow water collection during heavy rain events, although no habitable floors are thought to be at risk of flooding in other than extreme events beyond the economic design threshold.

In general, the roadside stormwater control systems are considered "to be fit for purpose" based on the generally observed performance of the network, limited number of public complaints or requests for service, and very limited recorded incidence of capacity issues in all but extreme events.

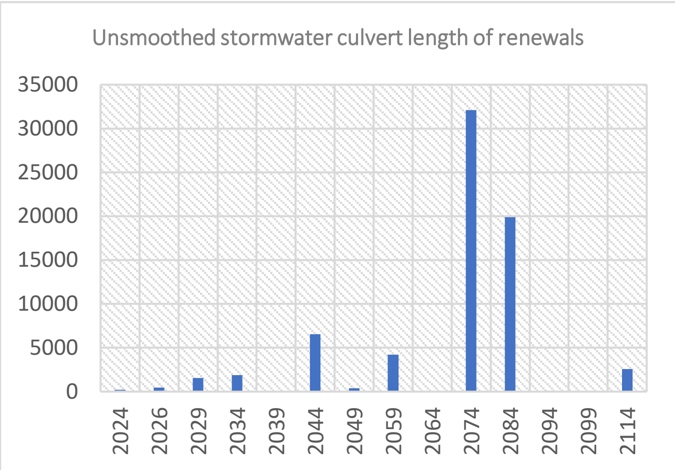
LIFECYCLE PLANNING

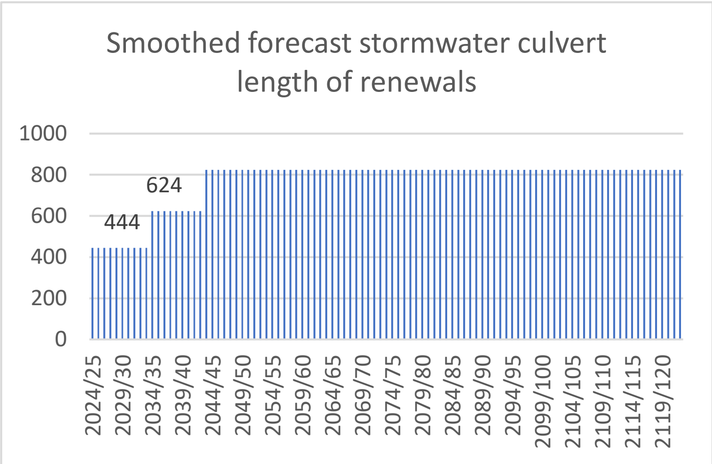
CULVERTS

To spread the peaks of forecast renewal, it is acknowledged that the likelihood that all culverts of one condition standard and similar installation dates will not degrade at the same rate, and therefore will not require renewal within a single year.

The calculated renewal programme for culverts based on the condition rating and the remaining useful life was unrealistic and there was a high degree of culvert replacement in some years with no replacement in other years.   The AMP team came up with the strategy of smoothing the renewal programme.

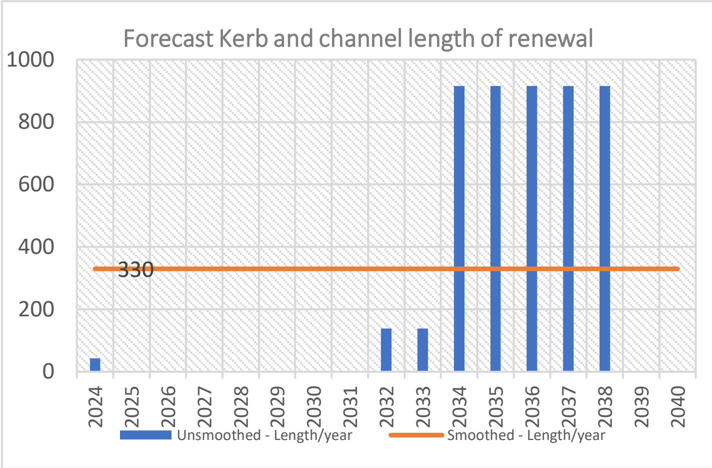
The calculated length of the renewal after smoothing came out to be approximately an average 444m/year over ten years until financial year 2033/34 and approximately 624m/year from 2033/34 onwards for the next 10 years.





KERB AND CHANNEL

To spread the peaks of forecast renewal, it is acknowledged that the likelihood that all kerb and channels of one condition standard will not degrade at the same rate and therefore will not require renewal within a single year.



The calculated renewal programme for kerbs and channels based on the condition rating and the remaining useful life was unrealistic and there was a high degree of kerb and channel replacement in some years with no replacement in other years. The AMP team came up with the strategy of smoothing the renewal programme. The calculated length of the renewal after smoothing came out to be approximately an average 330m/year (smoothed-length/year).

SURFACE WATER STRUCTURES AND CHANNELS

As mentioned earlier, the catchpits have not yet been individually assessed for condition (94.34% unknown condition), but are understood to be in good condition and operating satisfactorily.

PREFERRED PROGRAMME

The preferred programme based on the lifecycle management plan, prioritised by ONRC and strategic problems is included below, figures are un-escalated.

Work Category		Budget ($000)									
		24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
113	Routine drainage maintenance	690	690	690	690	690	690	690	690	690	690
213	Drainage renewals	459	452	337	401	446	398	403	394	400	406

STREET LIGHTING

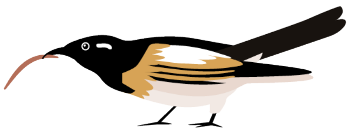
STRATEGIC CASE LINK

The previous ILM workshop and lack of customer complaints indicate there are not any problems relating to street lighting. Currently cyclic maintenance of the street lights are in progress, with little work needing to take place as the streetlights were upgraded to LED lanterns in 2019.

ACTIVITIES DELIVERED

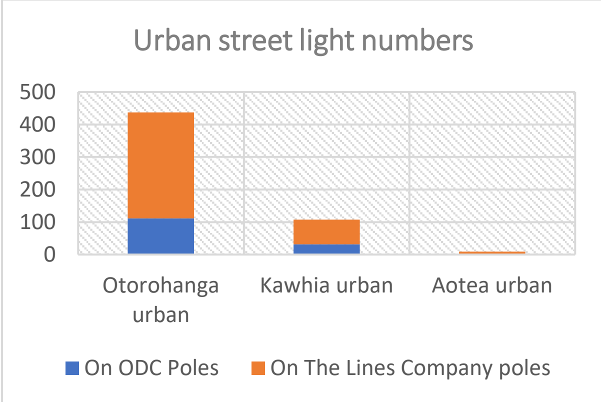
Activities delivered through the road pavement assets and their respective Waka Kotahi funding work categories are included in table below:

Work Category	Function	Examples
108.122 **Traffic services maintenance - energy costs**	Carriageway & pedestrian crossing lighting and poles	Operation, maintenance of associated facilities including signs, lighting etc.
108.222 **Traffic services renewals**	Renewal of existing road lights	Carriageway lighting and lighting at pedestrian crossing lighting
108.324 **Capital improvement projects**	Capital improvement projects related to lights, signs and marking etc.	Street lights



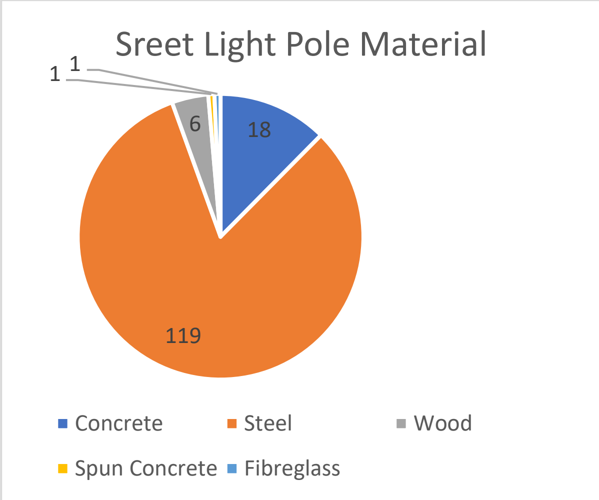
ASSET DESCRIPTION

Ōtorohanga District has 517 streetlights, mainly within the three urban centres of Ōtorohanga, Kawhia and Aotea. There are 146 individual street light poles owned by Council with most streetlights being located on electricity reticulation poles under the management of The Lines Company.



Since the 2015/18 AMP the RAMM database has been audited and updated and there is now a high level of confidence in the available data.
The street light poles owned by Council are predominantly galvanised steel poles 82%, with
a further 12% being reinforced Concrete.

The existing stock of lanterns has been upgraded to LED lantern technology, with some additional streetlights also being installed during the upgrade contract which is completed 2019-20 financial year.



DELIVERY

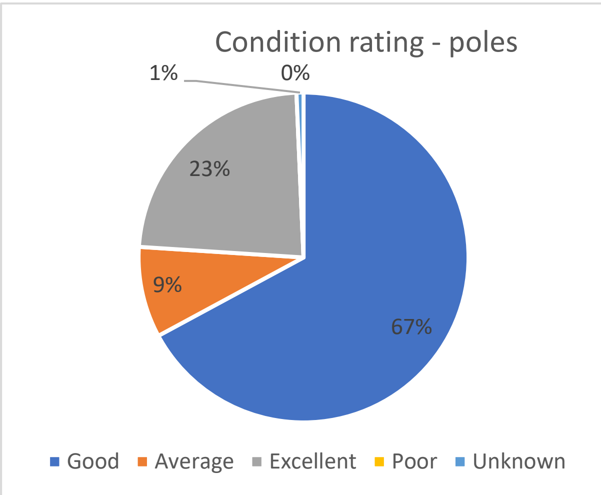
ŌDC has completed the capital upgrade works of street lighting, with no further upgrades required. The maintenance of current street lighting is in progress and carried out under contract C1058 until 2022, with another five-year term subject to performance.

ASSET VALUATION

Council commissioned Beca Engineer Consultants to undertake the road asset valuation for the AMP 2024/27, which included revising the valuation of in house spread sheets to the full use of RAMM.
The confidence rating of the source data and unit costs rates has been assessed to result in an overall rating of B, reliable. For the valuation summary refer to appendix C.

ASSET CONDITION AND DESIGN LIFE

The asset database does not generally record the installation date for street-light assets, but condition of the poles has been recently assessed and remaining useful life has been established based on current condition as shown.



The adopted asset lives and adjustments for current condition are as shown in the tables below:

Street light pole adopted design life

Street light pole material	Design useful life (years)
Concrete	60
Steel	50
Others	50

Street light lantern design life

Street light lantern	Design useful life (years)
All	40

Street light bracket design life

Street light bracket	Design useful life (years)
All	50

Street Light Pole Remaining Life Adjusted for Condition

Condition Assessment	Percent of design life remaining
Excellent	90%
Good	75%
Average or unknown	50%
Poor	10%
Very Poor	5%

Light Bracket Remaining Life Adjusted for Condition

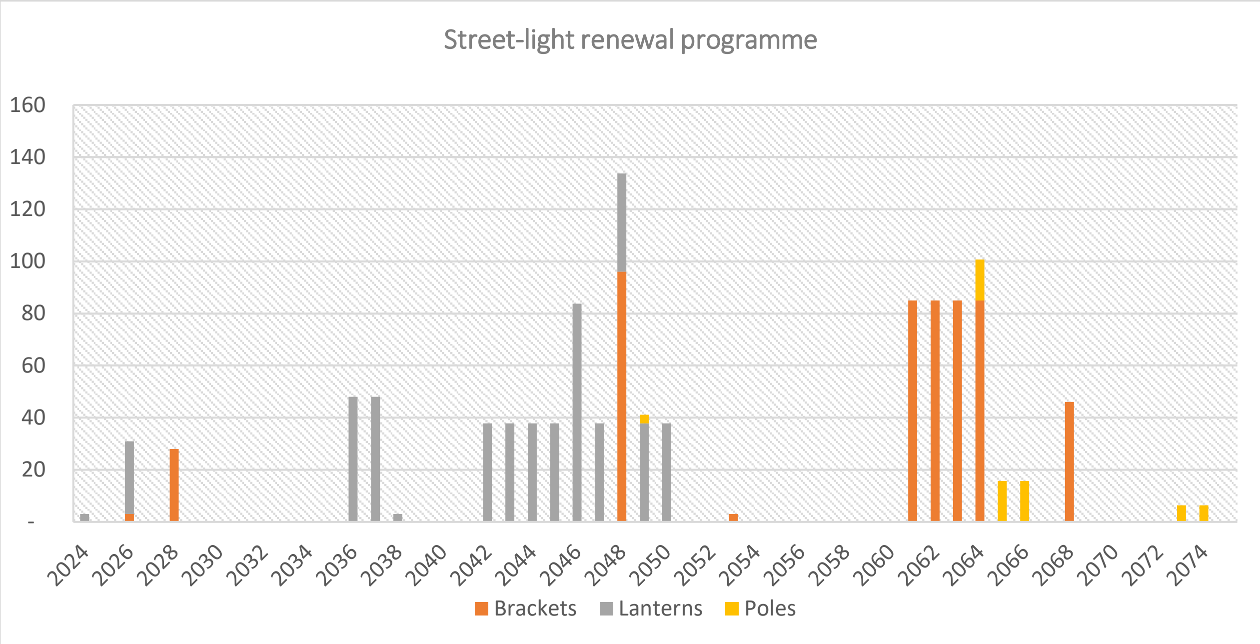
Condition Assessment	Percent of design life remaining
Excellent	90%
Good	75%
Average or unknown	50%
Poor	10%
Very Poor	5%

ASSET CAPACITY AND PERFORMANCE

The existing stock of lanterns has been upgraded to LED lantern technology, with some additional street-lights also being installed during the upgrade contract which is completed in 2019-20 financial year. The additional lights will not bring the lighting up to the NZ standard for Pedestrian Category lighting which would have required the addition of approximately a further 400 lights which was not considered by Council to be cost effective.

LIFE CYCLE PLANNING

Ōtorohanga District Council completed the upgrade of its street-lights in 2019, therefore the street-light assets renewal programme indicates little renewal work is required for another 30 years. However, some street-light brackets on The Lines Company poles will be addressed in the next two to three years.



TRAFFIC SERVICES

STRATEGIC CASE LINK

The previous ILM workshops and community consultation identified the following problems, benefits and strategic responses relating to traffic services (guardrails, signage and marker posts).

Icon	Problem	Benefit	Strategic response	Measure (ONRC)	Measure (ONF)
	The central location and attractiveness of the district is increasing growth, placing additional demand on infrastructure and resources (35%)	Infrastructure is developed to meet future demand (20%)	Create a resilient environment that encourages established and new leaders to lead with an outlook for the future that develops a strong community (45%)	ONRC Amenity CO1 – Smooth Travel Exposure (STE) ONRC Amenity CO2 – Peak and average roughness Programme renewals completed- Tracked through budget expenditure spreadsheet	ONF-Inclusive access – Smooth travel exposure (STE) ONF-Inclusive access – Peak roughness
	The current state of our infrastructure and how people use it is unable to meet the speed and uncertainty of technology change (15%)	Decrease in death & serious injuries on roads (45%)	Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region (55%)	ONRC Safety CO2 - Collective Risk ONRC Safety CO3 - Personal risk	ONF- health and safe people – Safe travel: Collective risk ONF- health and safe people – Safe travel: Personal risk

Strategic Response

Ensure all infrastructure is fit for purpose to open opportunities that sustainably drive future development and excellence in the region.

With reference to signs, guard rails and maker posts, the impact of climate change on their performance is not currently assessed as being significant. Consideration has been given to regular inspections for damage and to make sure that the assets are clean, in an acceptable condition and fit for purpose. With the increased likelihood of intense downpours and possibly fog, signs reaching the end of their "reflective lives" will be replaced sooner.

ACTIVITIES DELIVERED

Work Category	Function	Examples
108.114- Structural Maintenance	Maintain integrity and appearance of guardrails	Repair to handrails, guardrails
108.122 Traffic services maintenance -	Road signage	Maintenance of Traffic signs, sight rails
Traffic services renewals i.e. Signs, markers, posts & railings	Renewals of existing road signs, marking ,posts	Renewal of traffic signs, sight rails, marker posts etc.

Activities delivered through the road pavement assets and their respective Waka Kotahi funding work categories are included in table below:

ASSET DESCRIPTION – TRAFFIC SIGNS

Road signs by type

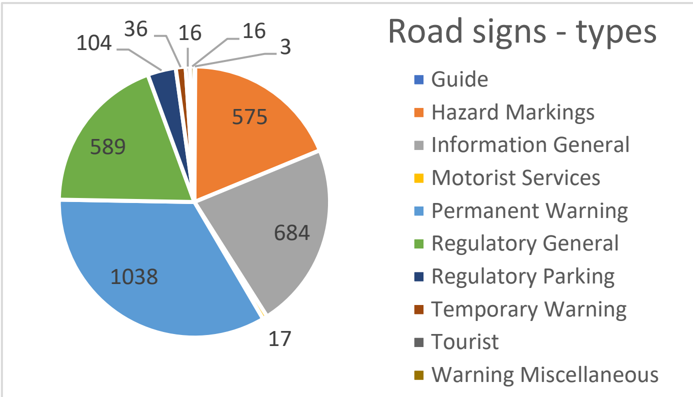
There are 3078 signs within the Ōtorohanga District, with 2349 individual sign posts. A wide range of signs is in use, dominated by the road name finger boards (20%) and the permanent warnings group (34%).

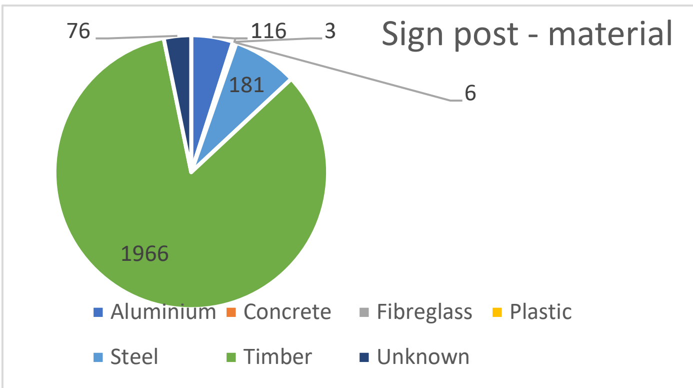
Sign posts by material

There are 2349 individual signs posts and predominantly are made of timber (84%), and 5% (116) are of aluminium.

Edge Marker Posts

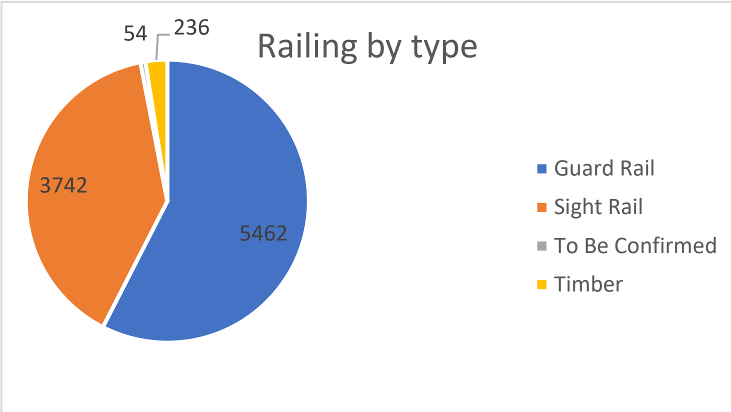
There are 7144 edge markers posts within Ōtorohanga District. The information was added into RAMM in 2018.

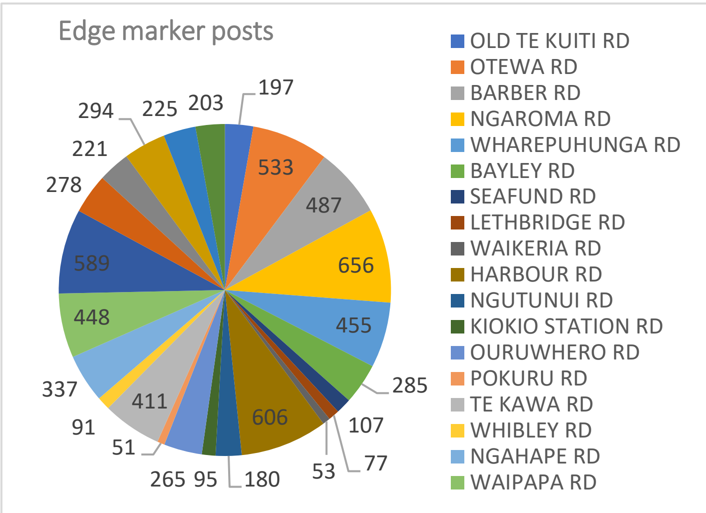




Guard Railings

Since the 2018/21 AMP when fieldwork to identify and data capture existing guard railings information was considerably improved, the understanding of this asset category remains good. There is now a recorded combined length of 9,494m of guard railing and sight rails at 732 sites within the Ōtorohanga District.





DELIVERY

The delivery of the contract is under current routine maintenance contract for all activities related to the traffic services except for the road marking. There is a distinct contract (3+1 term) commenced in November 2021 for the road marking for Ōtorohanga District roads.

ASSET VALUATION

Council commissioned Beca Engineer Consultants to undertake the road asset valuation for the AMP 2024/27, which included revising the valuation of in house spread sheets to the full use of RAMM.

The confidence rating of the source data and unit costs rates has been assessed to result in an overall rating of A, reliable however construction dates are still rating B. For the valuation summary refer to appendix C.

ASSET CONDITION AND DESIGN LIFE

ROAD SIGNS AND POSTS

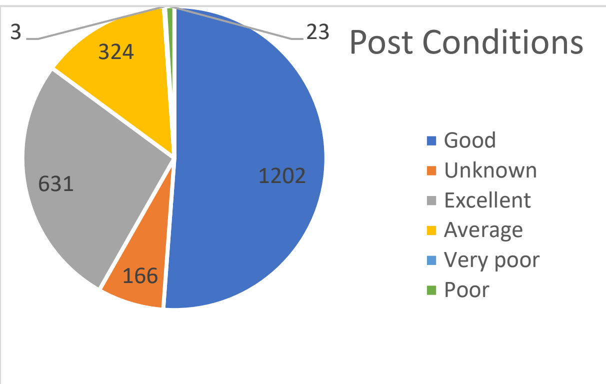
The existing condition of both signs and posts is now generally understood, with 87% of the signs being in average or better condition.

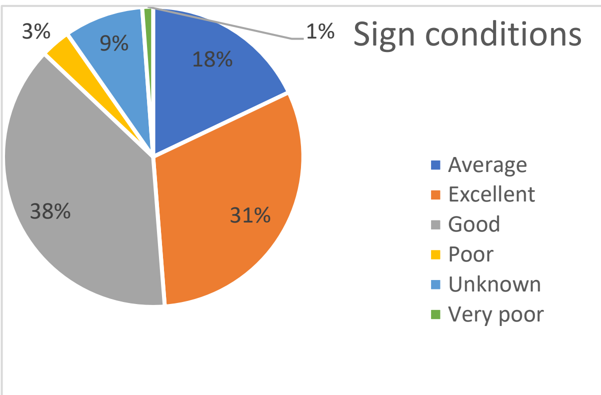
Traffic Signage replacement assumptions

Sign Class	Excellent	Good	Average	Poor	Very poor	Unknown	Design Life
Guide	3						15
Hazard Markings	141	317	105	9		3	10
Information General	193	251	142	32	5	61	10
Motorist Services	1	6	3		1	6	15
Permanent Warning	413	334	143	26	7	115	10
Regulatory General	175	244	108	19	7	36	10
Regulatory Parking	11	18	38	12	7	18	15
Temporary Warning	4	4	5	1	7	15	12
Tourist	1	3	4			8	20
Warning Miscellaneous	7	2	4		2	1	15
Total signs at this condition	**949** **31%**	**1179** **38%**	**552** **18%**	**99** **3%**	**36** **1%**	**263** **9%**	**3078**

Sign posts replacement assumptions

Post Material	Excellent	Good	Average	Poor	Very poor	Unknown	Design Life
Aluminium	24	92					**40**
Concrete	1	1				1	**30**
Fibreglass		1					**30**
Plastic	1	4				1	**60**
Steel	69	79	22			11	**60**
Timber	521	999	295	23	2	126	**30**
Unknown	15	26	7		1	27	**30**
Total posts at this condition	**631**	**1202**	**324**	**23**	**3**	**166**	



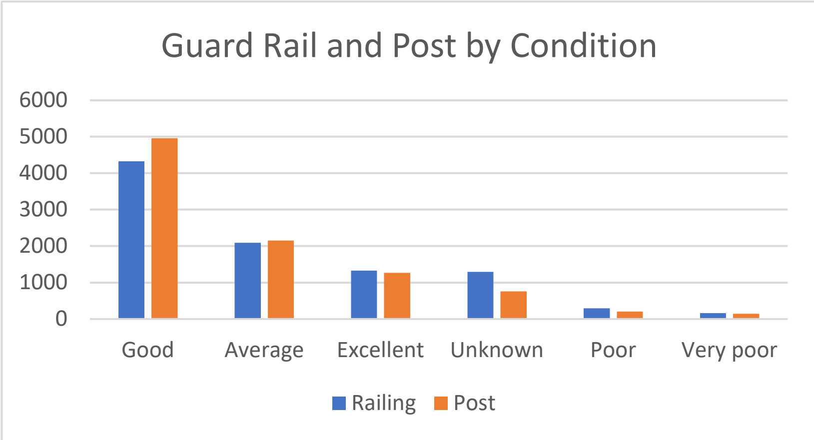


EDGE MARKER POSTS

The current extent of edge marker posts (EMPs) and raised pavement markers (RPMs) is not accurately known. It is anticipated than an intended review of the road markings across the District will include establishment of accurate asset quantities. The value for replacement of damaged and end of life EMP's and RPM's together with culvert markers is currently based on historic contract works values which is considered adequate until more accurate data is available. Regular inspection under the C1070 maintenance contract ensure damaged edge marker posts are quickly replaced.

GUARD RAILS

One staff member has undertaken additional training in guard rail assessment during 2017/18 and 2019/20 and is now able to individually assess guard rails for compliance and safety. These inspections of guard rails have reduced number of unknown type and condition from 22% to 14% (previous AMP 21/24 change from 72% to 22%).



ASSET CAPACITY AND PERFORMANCE

TRAFFIC SIGNS AND EDGE MARKER POSTS (EMPs)

A focused effort in 2009 saw a general upgrading of signs in the district to meet regulatory requirements. Crash statistics from the CAS system do not indicate any issues with the adequacy of the signs. Very few public complaints about signage shortfalls are received (other than signs which have been damaged or stolen) and the existing signage is considered to be fit for purpose and sufficient to meet regulatory guidelines.
The undertaking of a signage and "way finding" review and subsequent policy is likely to further enhance the signage standards, although at this stage a timetable to complete the review has not been confirmed.

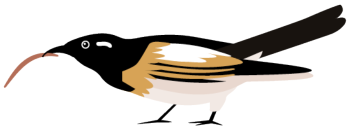
It is proposed to assess the edge marker posts, (EMPs) road line marking and raised reflective pavement markers (RRPMs) on the network for compliance with Manual of Traffic Signs and Markings (MOTSAM) and the Regional Infrastructure Technical Specification, (RITS) standards. A likely increased level of service for some assets to meet the standards is anticipated.

GUARD RAILS

Much of the existing guard railing on the network is likely to have been installed retrospectively at sites in response to perceived risk or crash history. It is unclear how many of the guard rails were installed to meet current best practice safety standards.

The timber sight rails currently on the network are considered to be "anecdotally fit for purpose".

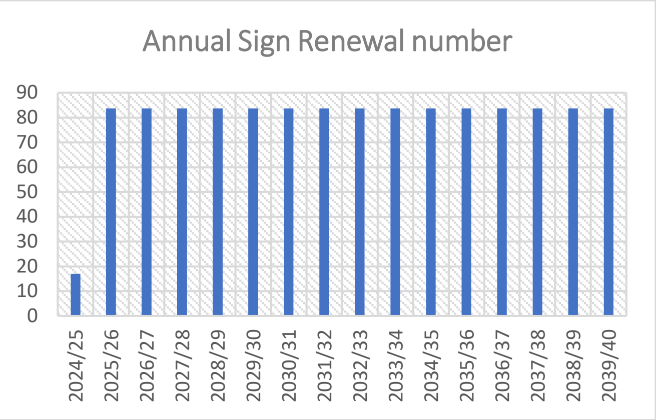
Where the need for safety or amenity improvements are identified the funding of these is allocated to the Low Cost Low Risk activity.

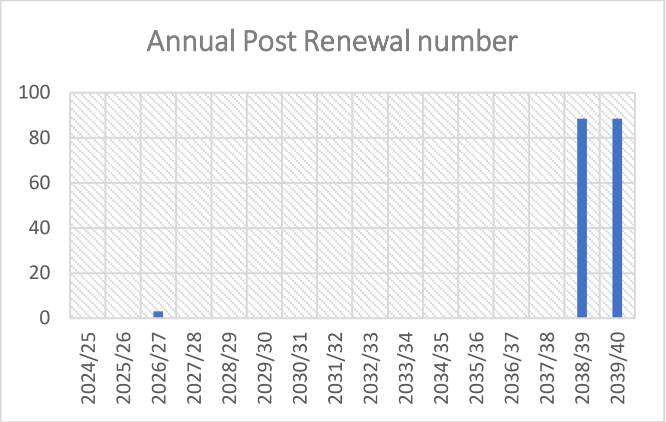


LIFE CYCLE PLANNING

SIGNAGE

Signage renewal numbers for the next 10 years, being the full expected life for most signs, and renewal numbers for posts over the next 15 years is as shown on the figures below. Additional budget is also provided for renewing those signage assets damaged or which disappear overnight, with a value established from historical records.



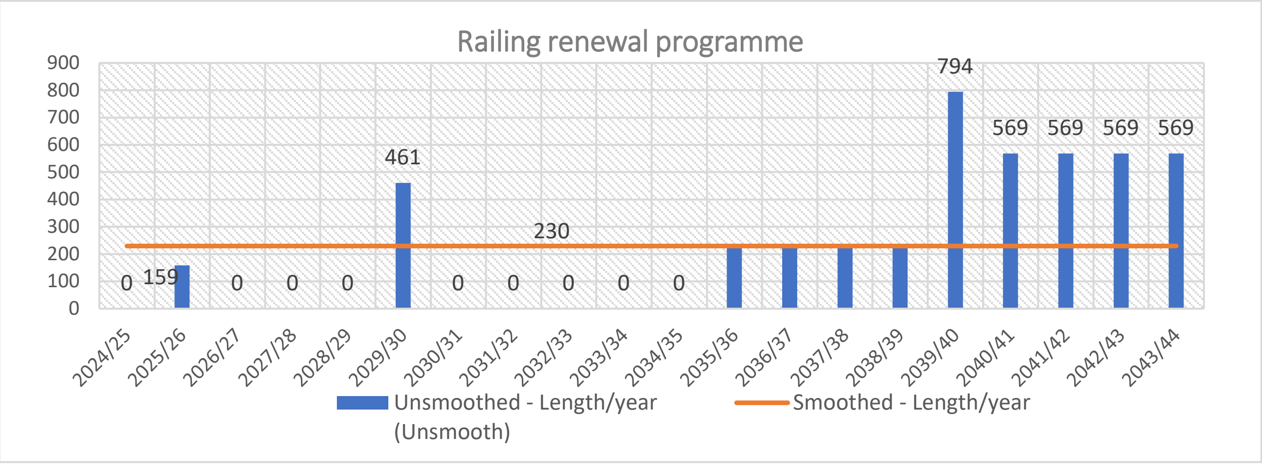


EDGE MARKER POSTS

Asset	Average Annual renewal volume
Edge marker posts	2858 (roughly 1/3 of RMP)
Culvert marker posts	171 (3% of across road culverts)

RAILING

The renewal programme for railings indicates that some short lengths of timber sight rails will be required during the next NLTP period, with more significant volumes in the 2030 and 2039/40. However most of the steel guardrail is yet to be accurately assessed for condition. The railing replacement assumption table suggests 159m of the very poor railing, which is planned to be renewed in financial year 2025/26. There are 461m of railing in a poor condition, based on the remaining useful life, the railing replacement is not required until 2029/30. Referring to the following bar chart, it shows that there is high degree of replacement in some years with no replacements in other years. The AMP team came up with a strategy to smooth annual renewals. The calculated length of renewal after smoothing (2024/55-onwards) came out to be 230m/year.



PREFERRED PROGRAMME

Work Category		Budget ($000)									
		24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
114	Str. Maintenance Annual allowance-Railing	311	227	227	227	311	227	227	227	311	227
122	Traffic services maintenance	341	341	341	341	341	341	341	341	341	341
222	Traffic services renewals i.e. Signs, markers, posts & railings	132	172	178	158	171	200	161	161	161	161

FOOTPATHS

STRATEGIC CASE LINK

The ILM workshop did not identify any strategic problems relating to the provision of footpaths, however it does tie in to creating safe, accessible recreational facilities (Ōtorohanga Stopbank pathway) and also an integrated mode of transport for the Ōtorohanga community. In future, consideration will also be given to footpath extensions to accommodate an aging population and decrease in car usage with more pedestrians and bikes.

ACTIVITIES DELIVERED

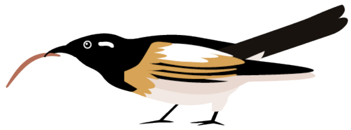
Activities delivered through the road pavement assets and their respective Waka Kotahi funding work categories are included in the table below:

Work Category	Function	Examples
108.124	Cycle path maintenance	Ōtorohanga footpath walkway maintenance
108.125 Footpath maintenance	Provides the maintenance of public footpaths and facilities with public footpaths such as pedestrian network connections, including stairs, alleyways and off-road connections.	Footpath patching and pothole repairs
108.225 Footpath maintenance	Provides renewal of public footpaths and facilities with public footpaths such as pedestrian network connections, including stairs, alleyways and off-road connections.	Footpath renewals, such as resurfacing or reconstruction

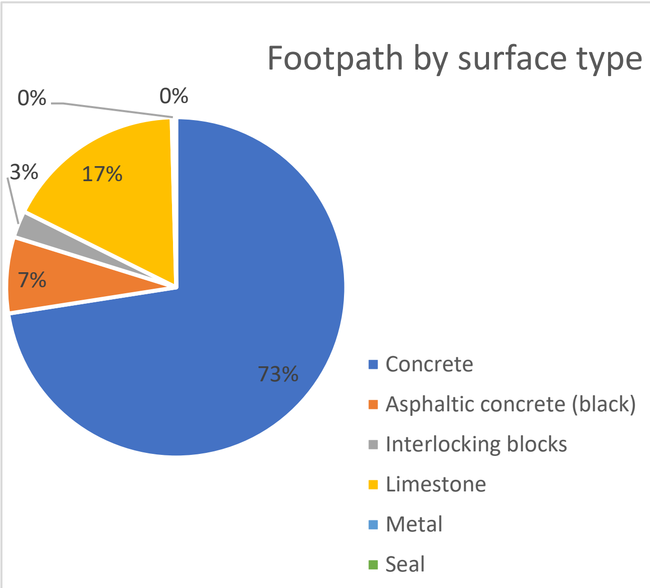
ASSET DESCRIPTION

The footpath network in Ōtorohanga is well developed as a result of well thought out planning which aims on having all streets serviced by a footpath on at least one side. The last major phase of this work was undertaken as part of the government sponsored PEP programmes during the 1970s.

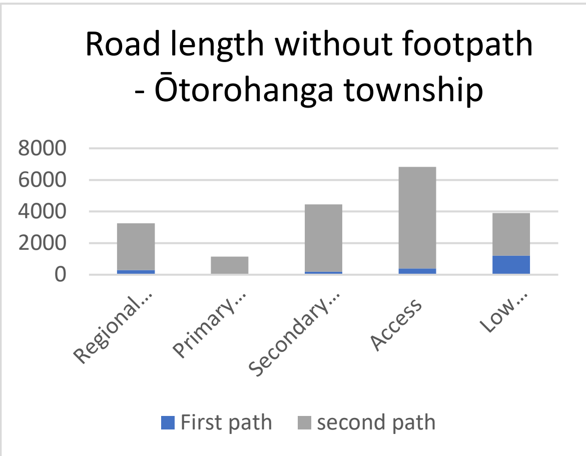
Most of the footpath network is concrete (73%) with smaller volumes of asphalt surfacing, and the CBD in Maniapoto Street footpaths are surfaced with concrete interlocking blocks.

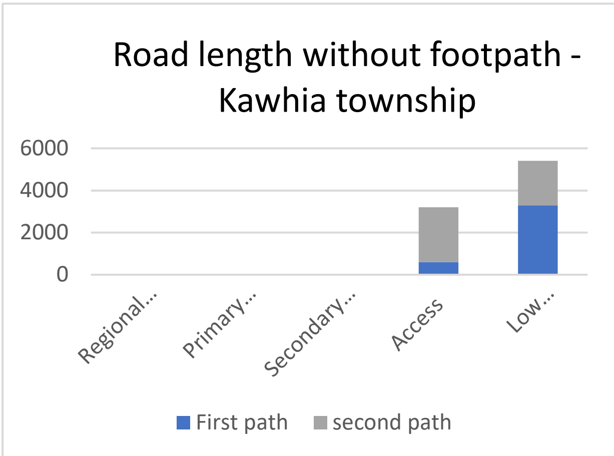


In the Ōtorohanga urban community there is a total of 2.6km of roads without any footpath and 15.4km of roads without a second path. The sections of regional road without a footpath, or a second footpath are State Highways where construction of a footpath is challenging on technical grounds, due to steep slopes and limited space. In the CBD area of Ōtorohanga the footpaths are interlocking blocks, these have a remaining useful life of 14 years these will need renewal within this NLTP cycle.



In the Kawhia Community there is a total of 3.9km of roads without any footpath and 4.7km of roads without a second path.





DELIVERY

The delivery of the footpath maintenance is included under specific contracts, with the most recent contract C1025 completed in financial year 2018/19. Currently there is a new contract C1106 in place for footpath renewal.

Previously under contract C1053, several attempts to tender the footpath maintenance contract did not reach an acceptable outcome. Originally the contract was tendered and the submitted prices were double the budget. After not awarding the contract to any of the tenders a negotiated tender was eventually awarded to the contractor with the lowest tender. When the contract was awarded, the contractor indicated they would start at the end of the year. This timeframe passed and the subsequent starting dates were also not honoured. Other commitments from their existing contracts were cited as the reason. In addition, they did not provide the required Bond. The contractors were then requested to confirm a date to comply, but they responded by relinquishing the contract.

Several other contractors were then issued with the tender document and finally after several negotiations a contractor provided a price that was acceptable and the work was subsequently completed to high standard, all be it at a perceived cost premium. This commentary is provided for context for future budgets and to demonstrate a resource shortage in this area.

ASSET VALUATION

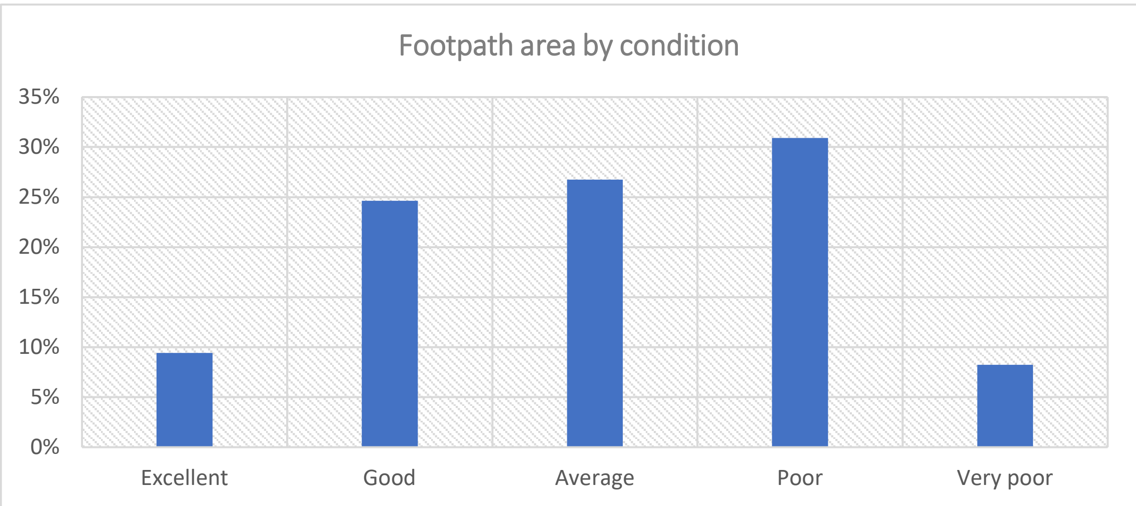
Council engaged Beca to conduct valuation of roading infrastructure assets owned by Council as at 30 June 2022 for all asset classes.

The 8% overhead applied, however consideration was given to apply different escalations by asset type. The variation in calculations was insignificant so a blanket 8% rate was used. The 2020 rates have been reviewed against current and recent ŌDC contract rates. The indexes used were December 2020 to June 2022, i.e. 19.62% for Construction.

The confidence rating of the source data and unit costs rates has been assessed to result in an overall rating of A - reliable which is considered by Council to be appropriate for the highly reliable scale and complexity of the network. For the valuation summary refer to appendix F.

ASSET CONDITION AND DESIGN LIFE

Most footpaths have now been assessed for condition, with 61% being at an average or better condition. All of the poor or very poor condition footpath is of concrete construction, being a length of 4.3km or 3651sqm has been programmed for repair / replacement.



Footpath Replacement assumptions

Footpath Material	Remaining useful footpath life by condition				
	Excellent	Good	Average	Poor	Very poor
Concrete	75	68	45	15	4
Asphaltic concrete (black)	30	27	18	6	2
Interlocking blocks	40	36	24	8	2
Limestone	10	9	6	2	1
Metal	10	9	6	2	1
Seal	20	18	12	4	1
Total area of path at this condition(m^2)	4981.1	13015.2	14132.7	16332.5	4351.5

ASSET CAPACITY AND PERFORMANCE

It has concluded that the existing roadside footpath network extents are sufficient for the needs of the community, due to very low traffic volumes, very few recorded pedestrian injuries on roads without footpaths, high current level of service and no requests for additional footpath from residents. It is currently considered that the footpath network is adequate and fit for purpose in the Ōtorohanga Township for the short term.

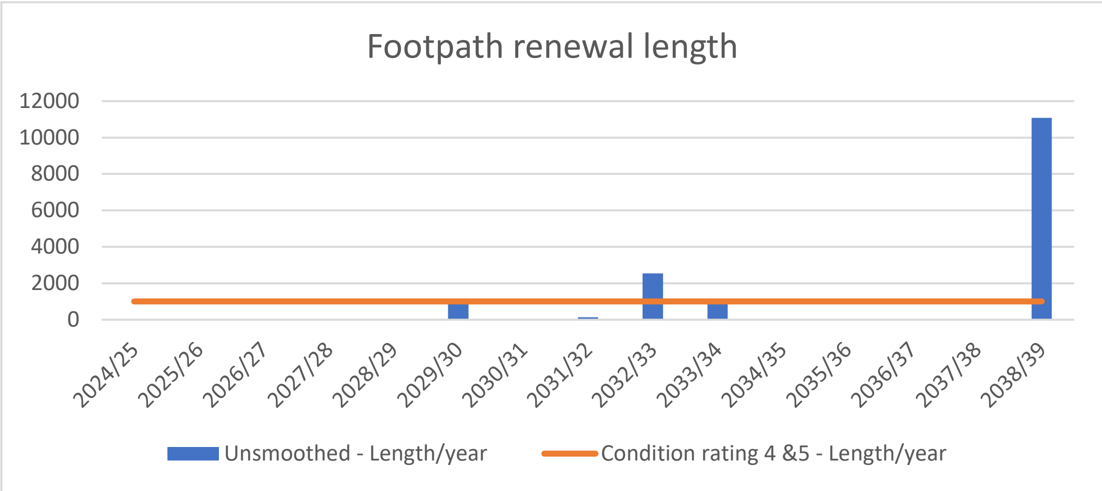
In the Kawhia Township there is a lower proportion of the roads which have footpaths, and consideration to continue with the limited capital expansion programme for footpaths as required. While the availability of footpaths is low in the urban area, for much of the year while the holiday homes are at low occupation rates, the pedestrian traffic volumes are very low. This combined with wide grassed berms which are generally free from physical obstructions and the local practice of utilising small four wheel motorbikes for local trips (generally at speeds much lower than 50km/h) creates a very safe pedestrian environment.

A previous mobility audit in the central community in Ōtorohanga identified a small number of potential improvements which have generally been completed, however with the forecast change in the community makeup increasing the number of elderly residents, and the increasing availability, performance and need for powered mobility aids, it is likely that the path network in both Ōtorohanga and Kawhia will need to be considered in more detail in future.

LIFE CYCLE PLANNING

The calculated renewal programme for footpaths is based on the condition rating, however, was found to be inconsistent and not practical to follow. The AMP team decided to make footpath renewal a priority and has smoothed out the renewal programme. The strategy for the renewal came out of a discussion to prioritise and renew very poor (condition rating 5) and poor (condition rating 4) footpaths as the first priority.

The Plan for Ōtorohanga District Council is to focus only on renewal of 'very poor' and 'poor' footpaths for next 10 years.



PREFERRED PROGRAMME

Work Category		**Budget ($000)**									
		24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
124	Cycle path Maintenance	61	61	61	61	61	61	61	61	61	61
125	Footpath maintenance	33	33	33	33	33	33	33	33	33	33
225	Footpath Renewals	363	363	363	363	363	363	363	363	363	363

CUSTOMER LEVELS OF SERVICE SATISFACTION

Early consultation on the 2024/34 LTP is not planned to start until September 2023 which does not align with the NLTP timeline however, at this time pending any significant matters arising from the consultation process that existing levels of service will continue for this NLTP cycle. In support of maintaining the current levels of service a customer satisfaction survey, undertaken by Co-Lab, indicates high levels of satisfaction for the roading activity from those residents surveyed. An extract from this survey is included in appendix E.

RISK MANAGEMENT

RISKS TO SERVICE DELIVERY

It is a general expectation of the community and stakeholders that the land transport network will always be available for use, even if occasional minor reductions in standards are experienced. However, there is always a risk that circumstances or events will result in a reduced level of service, including partial unavailability.

Recent events such as the Auckland January flood and Cyclones Hale & Gabrielle have highlighted the potential for events to have a major and ongoing effect on a community, and in response to this Council has significantly reviewed the risk section of this Activity Management Plan.
The Transport network also plays a key role in support of other lifelines networks, providing access for ongoing monitoring and maintenance as well as during unplanned events.

POTENTIAL RISKS

The possible risks to service delivery facing the Ōtorohanga District land transport network can be separated into two principal areas, external risk and internal risk, each with its own likelihood of occurrence and is discussed below:

External Risk

- Extreme weather events
- Earthquake
- Volcanic activity
- Changes in Regional or Central Government policy
- Pandemic – Implications for land transport
- Rising sea level
- Construction sector capacity
- Construction sector capability
- Central government funding levels- limited land transport funding

Internal Risk

- Council management performance
- Council staff leaving and unable to find replacements (Market conditions)
- Asset capability.

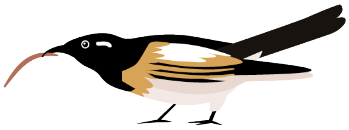
EXTREME WEATHER EVENTS

In the past Ōtorohanga District has experienced extreme weather events which have caused damage sufficient to cause a loss of service to sections of the network. In 1958 a reportedly 1 in 100 year rainstorm event caused widespread flooding and damage, particularly in the Ōtorohanga Township (now protected by flood stop banks) but which also caused widespread damage to rural roads and bridges. Localised heavy rainfall events have often occurred which have caused washouts and slips/slumps blocking or destroying discrete sections of the rural network, taking a number of weeks to return to full service. The potential effects of climate change may increase the likelihood of these sorts of events in the future, and recent weather patterns support the potential for climate change to have a noticeable impact on the frequency of extreme rainfall events.

It is considered that heavy rainfall events are the most likely event to impact the land transport network, however for medium term return period events the damage is likely to be localised in area and while not significant in extent across the network, the affected areas can suffer from access loss for periods of several weeks or months, as evidenced in recent storm events.

During the recent extreme weather events – Cyclones Hale and Gabrielle the Ōtorohanga District avoided the heaviest impact, however the roading network stood up well and showed good resilience traits.

The risk however remains significant as evidenced by the devastation in the Coromandel, Gisborne and Hawkes Bay Regions.



FINANCIALS

FINANCIAL SUMMARY

This section sets out the forecast expenditure for provision of transport service in the Ōtorohanga District. It also details the assumptions made and the degree of data confidence.

FORECASTING ASSUMPTIONS

CHANGE IN DEMAND

Previously the expected change in total resident population in the Ōtorohanga District was predicted to be a small decline of around 0.5% annually (medium forecast) but these forecasts were produced prior to the announcement of local commercial developments. Consent has been granted for a small gas fired back up power generation plant, which has been put on hold and consent applications and construction started on the site works on a milk processing factory which has also been put on hold. The large scale upgrading of the Waikeria Prison facility is now substantially complete. It is evident that these developments are already attracting additional workers to move to the district. Construction of the Beattie Home Dementia Unit will also provide for up to 20 additional jobs opportunities. An application for a bovine processing facility on Tapuae Road has also been approved and this plant is now fully operational with 16 jobs created.

The completion of stages 1 and 2 of the new 120 lot sub-division in Otorohanga are complete and is the biggest new domestic development project, coupled with numerous rural lifestyle lot subdivisions Otorohanga is experiencing a growth phase that Otorohanga has not seen for many years.

The results of the 2023 census are not yet published.

For the purpose of the assumption made in this AMP, the medium forecast has been used and no significant level of service improvements needs in the network have been identified.

Traffic volumes continue to show a constant but low rate of growth in general, however the commercial developments, in particular the Waikeria Prison, have made a significant impact on Waikeria Road, which was improved for capacity and safety in direct response to the localised development.

Our level of certainty – Medium

INFLATION PROJECTIONS

The Business and Economic Research Limited projections have been adopted for this AMP as shown below:

Financial year	1	2	3	4	5	6	7	8	9
Per annum change	3.90%	3.20%	2.80%	2.30%	1.90%	1.60%	1.30%	1.00%	0.70%

Reference - Forecast of Price Level Changes Adjustors – 2022 Update
Our assumption – The figures as provided are adopted.
Our level of certainty – Medium

FUNDING ASSISTANCE

At the time of preparing this Activity Management Plan our assumptions are:

- ŌDC FAR rate 63%, recently increased from 61%, unlikely to change further
- Emergency Works funded at standard FAR rate in most circumstances
- Level Crossing Warning Devices maintenance funded at standard FAR rate
- Value of Administration as currently approved (4.90%) will not change

Our level of certainty – Medium

CONFIDENCE AND ACCURACY LEVELS

The tables below provide an assessment of the accuracy, and corresponding confidence levels in the financial forecast and their supporting asset data. The confidence grades and accuracy ratings been assessed using the system detailed in the tables below:

Confidence Grade	Description	
A	Highly reliable	Data based on sound records, procedures, investigations and analysis which is properly documented and recognised as the best method of assessment.
B	Reliable	Data based on sound records, procedures, investigations and analysis which is properly documented, but has minor shortcomings. For example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete, unsupported, or extrapolated from a limited sample for which confidence for which grade A or B applies.
D	Very uncertain	Data is based on unconfirmed verbal reports and / or cursory inspection and analysis.

CONFIDENCE GRADES

Grade	Description	Accuracy
1	Accurate	100%
2	Minor inaccuracies	± 5%
3	50% estimated	± 20%
4	Significant data estimated	± 30%
5	All data estimated	± 40%

ACCURACY RATINGS

The table below provides an assessment of the confidence and accuracy of the 10 year financial forecasts and supporting asset data.

Activity		Confidence	Accuracy
Depreciation and current value		A	2
Operations and maintenance		B	2
Capital expenditure	Renewals	B	2
	Improvements	B	2
Overall		B	2

FINANCIAL FORECAST CONFIDENCE LEVELS

The confidence in the capital improvements forecasts are not able to be supported with individual designs or specifications of the work, although to date the project estimates generated by previous staff members has proven to have a high level of accuracy.

Recent improvements in the use of the RAMM database and software has significantly improved the pavement and surfacing renewal confidence and accuracy, and the information produced by RATA through the dTIMS and forward works plan modules also improves our forecasting confidence, as does the use of experienced engineers to field validate the treatment selections and locations.

An overall confidence grade in the financial forecasts is assessed as level B – reliable

The table below gives an assessment of the confidence and accuracy in the supporting data. Asset data is held in the RAMM system and in recent years a significant effort has been made to improve existing data and collect additional information to populate previously unused sections of the database. The resultant improvement in supporting data quality and completeness is expected to be improving the AMP in many areas.

Asset Data	Confidence Grade	Accuracy	Comment
Quantity	B	2	Principal assets now well recorded, but railings, markings and delineation still being addressed
Type	B	2	As above
Material	B	2	Believed to be well understood
Location	B	2	Well recorded
Dimension	B	2	Believed to be well understood
Age	B	3	Pavements and bridges are accurately recorded for age, but older drainage items, and retaining structures are often not recorded
Condition	C	3	Significant improvement in assessing and recording condition continues with systems now in place to ensure ongoing updating.
Performance	C	3	Little retrospective performance monitoring to date.
Replacement cost	B	2	Limited contracts on which to base replacement rates. Bridge costs are considered to be possibly un-reliable.
Deterioration rate	C	3	Little retrospective deterioration monitoring to date.

An overall confidence grade in the supporting data is assessed as level B – Reliable

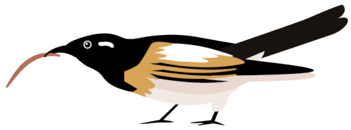
The overall confidence level has improved since the 2018-28 AMP but remains in the reliable range. It is considered by the senior management that a reliable confidence grade is appropriate for our relatively lightly trafficked network, with limited expected growth in network need.

FINANCIAL FORECASTS IN DETAIL – 2024/25 TO 2026/27

(values not inflated and exclude TA admin)

Work category	Activity	2024/25	2025/26	2026/27
108.003.001	Activity management planning	-	58,365	59,891
	Total transport planning expenditure		**58,365**	59,891
108.111.001	Sealed pavement maintenance	1,141,460	1,141,350	1,143,538
108.112.001	Unsealed pavement maintenance	300,979	300,979	300,979
108.113.001	Routine drainage maintenance	690,072	690,072	690,072
110.113.003	Street cleaning	45,500	45,500	45,500
108.114.001	Structures maintenance	310,606	227,486	227,486
108.121.001	Environmental maintenance	701,263	701,263	701,263
108.121.271	Environmental maintenance - consent costs	5,003	5,003	5,003
108.122.001	Traffic services maintenance	282,441	282,441	282,441
108.122.166	Traffic services maintenance - energy costs	58,182	58,182	58,182
108.122.001	Level crossing warning devices	9,294	9,294	9,294
108.124.001	Cyclepath Maintenance	61,145	61,145	61,145
108.125.001	Footpath maintenance	33,352	33,352	33,352
108.140.001	Minor events	458,943	464,138	469,333
108.141.001	Emergency works	207,800	207,800	207,800
110.151.006	Outstanding road legalisation	10,000	10,000	10,000
110.451	Pedestrian facilities maintenance	-	-	-
110.451	Footpath renewals	-	-	-
108.151.	Network & asset management	1,399,445	1,209,374	1,203,191
138.685.020	General Administration	-	-	-
110.537.199	ODC District Sundry expenditure	20,000	20,000	20,000
	Total maintenance expenditure	**5,735,486**	**5,467,380**	**5,468,580**
108.432.001-2	Road safety Promotion, education & advertising	170,567	170,567	170,567
108.432.003	Driver Training	80,351	80,351	80,351
	Total road safety education and training expenditure	**250,918**	**250,918**	**250,918**
108.211	Unsealed road metaling - physical works	633,185	735,465	930,491
108.212	Sealed road resurfacing	1,971,337	2,108,036	1,748,126
108.213	Drainage renewals	458,608	452,419	336,923

108.214	Sealed road pavement rehabilitation	1,222,454	1,786,949	1,301,645
108.215	Structures component replacements	142,863	142,863	142,863
108.222	Traffic services renewals	131,509	171,503	178,426
108.225	Footpath renewals	363,425	363,425	363,425
108.322	Bridge and structure replacements	-	-	-
108.341	Stock underpass facilities	34,287	34,287	34,287
108.341	Sealing rural vehicle crossings	-	-	-
108.341	Capacity improvements associated with renewal works	-	-	-
108.341	Road widening associated with - Rehab	277,115	275,795	153694
108.341	Road widening associated with - Reseal	442,093	217,083	189,518
108.341	Environmental impact resilience - Climate change	-	-	-
108.341	Rural storm water management strategy development	-	-	-
108.341	Rural stormwater management strategy Implementation	228,516	114,290	114,290
108.341	Safety Deficiency database progression	114,290	114,290	114,290
108.341	Speed management design and implementation	435,445	301,726	368,585
108.341	Identification and design of resilience improvements	45,716	45,716	45,716
108.341	Resilience works implementation	154,292	154,292	154,292
108.341	Bridge Replacement	-	-	-
108.341	Road legalization processing	-	-	-
108.357	Ōtorohanga Town Concept Plan	344,938	343,566	519,509
Unsub - 110.251	Resilience improvements	-	-	-
Unsub - 110.324	Impact fee funded capacity improvements	236,000	236,000	236,000
Unsub - 110.428	Sealed smoothing Road (local share funding only value)			
Unsub - 110.429	Ōtorohanga Footpath Construction - physical works	-	-	-
Unsub - 110.448	Sundry Ōtorohanga community expenses	20,000	20,000	20,000
Unsub - 110.449	Kawhia Footpath Construction	-	-	-
	Sundry Kawhia/Aotea community expenses	10,000	10,000	10,000
	Total capital expenditure	***7,266,071***	***7,627,705***	***6,962,079***
	Total expenditure	***13,252,475***	***13,508,087***	***12,681,578***



FINANCIAL FORECASTS FOR 2027/28 TO 2033/34

(values not inflated and exclude TA admin)

Work category	Activity	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
108.003.001	Activity management planning	-	162,084	-	-	162,084	-	-
	Total transport planning expenditure							
108.111.001	Sealed pavement maintenance	1,131,234	1,139,566	1,131,714	1,143,059	1,127,041	1,127,102	1,152,190
108.112.001	Unsealed pavement maintenance	300,979	300,979	300,979	300,979	300,979	300,979	300,979
108.113.001	Routine drainage maintenance	690,072	690,072	690,072	690,072	690,072	690,072	690,072
110.113.003	Street cleaning	45,500	45,500	45,500	45,500	45,500	45,500	45,500
108.114.001	Structures maintenance	227,486	310,606	227,486	227,486	227,486	310,606	227,486
108.121.001	Environmental maintenance	701,263	701,263	701,263	701,263	701,263	701,263	701,263
108.121.271	Environmental maintenance - consent costs	5,003	5,003	5,003	5,003	5,003	5,003	5,003
108.122.001	Traffic services maintenance	282,441	282,441	282,441	282,441	282,441	282,441	282,441
108.122.166	Traffic services maintenance - energy costs	58,182	58,182	58,182	58,182	58,182	58,182	58,182
108.122.001	Level crossing warning devices	9,294	9,294	9,294	9,294	9,294	9,294	9,294
108.124.001	Cyclepath Maintenance	61,145	61,145	61,145	61,145	61,145	61,145	61,145
108.125.001	Footpath maintenance	33,352	33,352	33,352	33,352	33,352	33,352	33,352
108.140.001	Minor events	474,528	479,723	484,918	490,113	495,308	500,503	505,698
108.141.001	Emergency works	207,800	207,800	207,800	207,800	207,800	207,800	207,800
110.151.006	Outstanding road legalisation	10,000	10,000	10,000	10,000	10,000	10,000	10,000
110.451	Pedestrian facilities maintenance	-	-	-	-	-	-	-
110.451	Footpath renewals	-	-	-	-	-	-	-
108.151.	Network & asset management	1,471,158	1,214,627	1,215,917	1,373,262	1,209,374	1,203,191	1,473,025
138.685.020	General Administration	-	-	-	-	-	-	-
110.537.199	ODC District Sundry expenditure	20,000	20,000	20,000	20,000	20,000	20,000	20,000
	Total maintenance expenditure	***5,729,438***	***5,569,554***	***5,485,066***	***5,658,952***	***5,484,242***	***5,566,433***	***5,783,431***
108.432.001-2	Road safety Promotion, education & advertising	170,567	170,567	170,567	170,567	170,567	170,567	170,567
108.432.003	Driver Training	80,351	80,351	80,351	80,351	80,351	80,351	80,351
	Total road safety training expenditure	***250,918***	***250,918***	***250,918***	***250,918***	***250,918***	***250,918***	***250,918***
108.211	Unsealed road metaling - physical works	819,227	831,104	633,185	735,465	930,491	819,227	831,104
108.212	Sealed road resurfacing	2,012,264	1,705,719	1,909,097	1,909,097	1,909,097	1,909,097	1,909,097
108.213	Drainage renewals	401,286	446,068	397,857	403,337	394,407	400,075	406,338
108.214	Sealed road pavement rehabilitation	1,416,759	1,159,184	851,201	1,283,371	1,256,710	1,263,494	1,631,223
108.215	Structures component replacements	142,863	142,863	142,863	142,863	142,863	142,863	142,863
108.222	Traffic services renewals	157,635	171,004	199,873	160,855	160,855	160,855	160,855
108.225	Footpath renewals	363,425	363,425	363,425	363,425	363,425	363,425	363,425
108.322	Bridge and structure replacements	-	-	-	-	-	-	-
108.341	Stock underpass facilities	34,287	34,287	34,287	34,287	34,287	34,287	34,287
108.341	Sealing rural vehicle crossings	-	-	-	-	-	-	-
108.341	Capacity improvements associated with renewal works	-	-	-	-	-	-	-
108.341	Road widening associated with - Rehab	153,694	254,260	159,484	296,417	288,087	290,118	406,633
108.341	Road widening associated with - Reseal	547,306	342,299	535,503	565,127	762,854	604,273	794,325
108.341	Environmental impact resilience - Climate change	-	-	-	-	-	-	-
108.341	Rural storm water management strategy development	-	-	-	-	-	-	-
108.341	Rural stormwater management strategy Implementation	114,290	114,290	114,290	114,290	114,290	114,290	114,290
108.341	Safety Deficiency database progression	114,290	114,290	114,290	114,290	114,290	114,290	114,290
108.341	Speed management design and implementation	368,585	368,585	368,585	368,585	368,585	368,585	368,585
108.341	Identification and design of resilience improvements	45,716	45,716	45,716	45,716	45,716	45,716	45,716
108.341	Resilience works implementation	154,292	154,292	154,292	154,292	154,292	154,292	154,292
108.341	Bridge Replacement	-	-	-	-	-	-	-

108.341	Road legalization processing	-	-	-	-	-	-	-
108.341	Ōtorohanga Town Concept Plan	116,194	321,202	222,774	364,982	356,332	358,441	479,444
108.357	Resilience improvements	-	-	-	-	-	-	-
110.251	Impact fee funded capacity improvements	236,000	236,000	236,000	236,000	236,000	236,000	236,000
110.324	Sealed smoothing Road (local share funding only value)							
110.428	Ōtorohanga Footpath Construction - physical works	-	-	-	-	-	-	-
110.429	Sundry Ōtorohanga community expenses	20,000	20,000	20,000	20,000	20,000	20,000	20,000
110.448	Kawhia Footpath Construction	-	-	-	-	-	-	-
110.449	Sundry Kawhia/Aotea community expenses	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Total capital expenditure		**7,228,112**	**6,834,586**	**6,512,721**	**7,322,397**	**7,662,579**	**7,409,326**	**8,222,766**
Total expenditure		**13,208,468**	**12,817,142**	**12,248,705**	**13,232,268**	**13,559,823**	**13,226,677**	**14,257,116**

WAKA KOTAHI SUPPORTED ACTIVITIY FINANCIAL FORECASTS IN DETAIL FOR 2024/25 TO 2026/27

(Including annual inflation and administration value)

Work category	Activity	2024/25	2025/26	2026/27
108.003.001	Activity management planning	0	58,365	59,891
	Total transport planning expenditure		**182,098**	
111	Sealed pavement maintenance	1,197,391	1,282,283	1,318,329
112	Unsealed pavement maintenance	315,727	338,144	346,984
113	Routine drainage maintenance	723,885	775,281	795,550
114	Structures maintenance	325,826	255,576	262,258
121	Environmental maintenance	740,873	793,475	814,220
122	Traffic services maintenance	357,313	382,683	392,687
124	Cycle path Maintenance	64,141	68,695	70,491
125	Footpath maintenance	34,986	37,470	38,450
131	Level crossing warning devices	9,749	10,442	10,715
140	Minor events	481,431	521,450	541,071
141	Emergency works	217,982	233,459	239,562
151	Network & asset management	1,468,018	1,358,707	1,387,100
	Total maintenance expenditure(excludes 141)	**5,719,343**	**5,824,205**	**5,977,855**
432	Road safety Promotion, education & advertising	**263,213**	**281,901**	**289,271**
211	Unsealed road metaling	664,211	826,279	1,072,717
212	Sealed road resurfacing	2,067,932	2,368,334	2,015,329
213	Drainage renewals	481,080	508,283	388,422
214	Sealed road pavement rehabilitation	1,282,354	2,007,600	1,500,603
215	Structures component replacements	149,863	160,503	164,699
222	Traffic services renewals	137,953	192,680	205,699

225	Footpath renewals (new WC)	381,232	408,300	418,974
	Total Renewals expenditure	**5,164,626**	**6,471,980**	**5,766,444**
341	Minor improvements	2,178,449	1,798,740	1,953,138
	Total capital expenditure	***2,178,449***	***1,798,740***	***1,953,138***
	Total expenditure	***13,325,630***	***14,558,925***	***13,986,708***

WAKA KOTAHI SUPPORTED ACTIVITIY FINANCIAL FORECASTS IN DETAIL FOR 2027/28 TO 2033/34

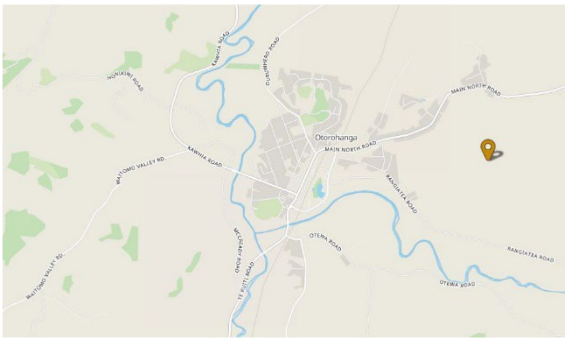
Work category	Activity	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
108.003.001	Activity management planning	0	194,000	0	0	200,631	0	0
Total transport planning expenditure		***0***	***194,000***	***0***	***0***	***200,631***	***0***	***0***
111	Sealed pavement maintenance	1,331,438	1,363,957	1,373,553	1,402,910	1,395,074	1,404,608	1,445,542
112	Unsealed pavement maintenance	354,246	360,245	365,297	369,401	372,558	375,084	377,610
113	Routine drainage maintenance	812,199	825,953	837,535	846,945	854,184	859,975	865,766
114	Structures maintenance	267,746	371,768	276,099	279,201	281,587	387,081	285,405
121	Environmental maintenance	831,260	845,336	857,190	866,822	874,231	880,157	886,084
122	Traffic services maintenance	400,906	407,695	413,412	418,057	421,630	424,488	427,347
124	Cyclepath Maintenance	71,966	73,185	74,211	75,045	75,687	76,200	76,713
125	Footpath maintenance	39,254	39,919	40,479	40,934	41,284	41,564	41,843
131	Level crossing warning devices	10,939	11,124	11,280	11,407	11,504	11,582	11,660
140	Minor events	558,509	574,185	588,542	601,531	613,102	623,733	634,451
141	Emergency works	244,576	248,718	252,205	255,039	257,219	258,963	260,707
151	Network & asset management	1,731,520	1,453,798	1,475,750	1,685,446	1,496,988	1,499,431	1,848,064
Total maintenance expenditure(exclude 141)		***6,409,984***	***6,327,164***	***6,313,347***	***6,597,699***	***6,437,829***	***6,583,904***	***6,900,487***
432	Road safety Promotion, education & advertising	***295,325***	***300,326***	***304,538***	***307,959***	***310,592***	***312,697***	***314,803***
211	Unsealed road metaling	964,212	994,755	768,492	902,658	1,151,780	1,020,930	1,042,706
212	Sealed road resurfacing	2,368,391	2,041,590	2,317,057	2,343,091	2,363,118	2,379,139	2,395,160
213	Drainage renewals	472,305	533,903	482,877	495,028	488,204	498,578	509,794
214	Sealed road pavement rehabilitation	1,667,495	1,387,438	1,033,096	1,575,120	1,555,581	1,574,581	2,046,539
215	Structures component replacements	168,146	170,993	173,391	175,339	176,838	178,037	179,236
222	Traffic services renewals	185,533	204,676	242,585	197,422	199,110	200,460	201,810
225	Footpath renewals (new WC)	427,743	434,986	441,086	446,042	449,854	452,904	455,954

Total Renewals expenditure		***6,253,824***	***5,768,342***	***5,458,585***	***6,134,701***	***6,384,486***	***6,304,629***	***6,831,198***
341	Low Cost Low Risk	1,940,429	2,093,658	2,123,017	2,525,827	2,771,148	2,597,470	3,151,392
Total capital expenditure		***1,940,429***	***2,093,658***	***2,123,017***	***2,525,827***	***2,771,148***	***2,597,470***	***3,151,392***
Total expenditure		***14,899,562***	***14,683,490***	***14,199,486***	***15,566,187***	***16,104,685***	***15,798,700***	***17,197,881***

(Including annual inflation and administration value)

ASSET MANAGEMENT PRACTICES

DATA MANAGEMENT AND SYSTEMS



Ōtorohanga District Council uses the New Zealand industry standard Road Assessment and Maintenance Management (RAMM) software as a repository for all roading asset information.
This software is prescribed by Waka Kotahi to standardise road asset information, and is used by all Road Controlling Authorities (RCA), including Waka Kotahi for their own roads.

Council's GIS system is used to supplement the information with property data from LINZ and is available online as the Maps Portal. The online map gives the user the ability to configure the cadastral maps with aerial maps, district plan information, utility locations and road information in a visual manner.

ROAD ASSESSMENT AND MAINTENANCE MANAGEMENT (RAMM)

As with any asset there is data captured to identify, classify, value and rate the asset's condition. All this information is stored in the RAMM software where it can be accessed when required in formats that satisfies Forward Works Programmes (FWP).

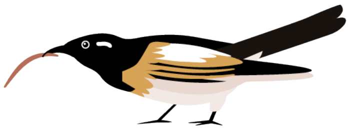
Condition surveys and validations are regularly undertaken to keep the data in RAMM as accurate as possible. This information is then used to determine treatment selection of road sections for maintenance, reseal sections and rehabilitation sites. It is important to select the best option, both for longevity and value for money, and for this reason it is necessary to provide a committed effort to update the data accurately.

RAMM data input consists of, but is not limited to:

- Road names
- Road centreline information and spatial data
- Treatment sections and lengths
- Inventory data for culverts, signs, pavement marking, street lights, etc.
- Asset value
- Data relating to maintenance requirements and costs
- Bridge physical and inspection data
- Traffic counts

What RAMM can provide as an output is:

- The specific area requiring maintenance based on condition, age and inspections
- Provide statistical information on physical characteristics of specific road sections based on the whole network and compared to other sections
- Historical data of physical attributes



CRASH ANALYSIS SYSTEM
The Crash Analysis System, or CAS, is a national data base that records all road crashes that occur that are reported. The system allows for the spatial presentation of crash hotspots. Crash data recorded provides an insight as to what the causes may have been, or contributed, and this information can be used to determine interventions to increase the safety for all road users.

DEFICIENCY DATA BASE
The interventions determined coming from the crash data are recorded in the Deficiency Data Base from where they are prioritised. The data base is also populated through the need to upgrade sections of road, for instance widening or smoothing, that are entered into the data base. This prioritisation process is updated regularly as new road safety issues are identified or resolved. Programming to complete the work is dependent on the actual work load and funding.

GIS
To visualise spatial data, together with asset information, Council utilises a Geographical Information System (GIS). The asset information is drawn from the RAMM data base. The GIS is useful to determine road corridor boundaries and who the land owner is of the adjacent property. Other tools are incorporated into the GIS, for instance measuring tools for area, length, angles and coordinates. It also provides a handy repository for aerial photographs that are overlaid on the cadastral data. Historical photos can be used to show progress and development of areas, as well as printing them in hard copy.

OPTIMISED DECISION MAKING

TOOLS AND TECHNIQUES
The following tools and techniques are used by Council and its consultants to ensure that the decisions on future road asset maintenance requirements are optimal both in terms of the intervention timing and the lowest whole-of-life solution.

TREATMENT SELECTION ALGORITHM (RAMM)
The decision making process for treatment selection is important to satisfy the identification, design and scheduling of the road asset. Activities that these decisions are based on are:
- Resealing
- Rehabilitation
- Realignment

The treatment selection output is entered into the National Land Transport Programme (NLTP) and LTP budgets for approval and then becomes the Forward Works Programme (FWP). This is an important step in the lifecycle of the roading asset.

A road is divided into several treatment lengths to make it easier to inspect and report on. These treatment lengths vary so that they are manageable and are usually around 500 m in length on rural roads.

PAVEMENT PERFORMANCE MODEL
dTIMS modelling is used to support the Treatment Selection. dTIMS stands for Deighton's Total Infrastructure Management System and is a software modelling package that Waka Kotahi relies on to provide a base for road maintenance interventions. The data is sourced from the RAMM data base from the maintenance history, maintenance costs and other treatment costs fields. Tests are completed on a sample selection of sealed roads and comprises of Falling Weight Deflectometer (FWD) readings for layer strength. The results are used to identify pavements with weaker substrata that require investment to strengthen them. Results can either be used outright in the case of imminent failure, or trended and programmed over a period of time.

dTIMS is used by the majority of Roading Authorities to standardise results and provide confidence that the correct treatment methodology is utilised.

CRASH ANALYSIS STUDIES (CAS)

Compared to some Local Authorities, Ōtorohanga District has fewer crashes relative to others. It must be noted that the CAS is based on reported crashes and some crashes go unreported for various reasons. These may include crashes that are of a minor nature and some where the drivers and occupants deliberately do not want to report them. Some of the unreported crashes become known through nearby residents recalling the incidents and these crashes are taken into account when looking at the road network holistically.
The CAS database has a spatial component that can display hotspots on a map, giving an easy visual overview of these hotspots.

TRAFFIC COUNTS

Traffic count information collected and stored in RAMM is to be used in the following aspects of road asset management:

- strategic transport planning
- assignment of network hierarchies
- risk management and the development of criticality plans
- treatment selection algorithm and pavement deterioration modelling
- pavement and surfacing design
- network safety analysis and design
- total transport costs, road user costs and BCR analysis.

BENEFIT COST RATIO (BCR)

Where capital works projects, such as realignments or pavement strengthening, require justification or prioritisation based upon a BCR calculation, then the latest version of the Waka Kotahi. Simplified Procedures and project economic evaluation software is used. Where a number of options are evaluated, the calculated BCR for each can assist in ranking and comparing these with other social and environmental considerations.

NET PRESENT VALUE (NPV)

Ōtorohanga District Council uses the Net Present Value method to determine the lowest whole of life option cost of renewals, as they are usually of a low enough value not to trigger the BCR method mentioned above. Waka Kotahi has a template that is used to determine whether a proposed intervention is economically viable. Several criteria are considered, for instance Do Nothing, Continue Maintenance or Rehabilitate.

MULTI-CRITERIA ANALYSIS (MCA)

Within the road sector land transport activity area, there is the opportunity to use MCA to rank options that are not easily quantified in terms of dollar values. Such situations are likely to arise where the road project will potentially have the following impacts:

- long-term environmental degradation
- non-renewable resource consumption
- long-term community/social disruption
- loss of amenity values
- loss of historical or cultural values.

The comparison or ranking of several road-related project options across economic, social, cultural and environmental assessment criteria, especially in sensitive situations where a narrow economic focus would not result in the most acceptable outcome, will enable a more balanced approach to the management of the road asset.

There is little scope for this method in terms of the Ōtorohanga requirements, as the values are usually low enough not to trigger this method.

APPLICATIONS

ROUTINE MAINTENANCE

Rates have been entered into RAMM against the maintenance activities. These rates are from the current maintenance contract. Joint routine maintenance inspections are completed with the contractor's staff and Council's own employees and planned for completion within the prescribed timeframes. The work, together with the timeframes, are from the agreed Levels of Service as specified in the Maintenance Contract. Once the work has been completed, inspections are performed to ensure that the work was done to standards and the monthly claim is then generated for payment. The timely submission of the claim allows for good financial control throughout the year for work completed and work still outstanding compared to overall budget and work.

RESURFACING

Council has invested large amounts of funding to create the best possible surfaced roads that can be afforded by the residents over many years. It is imperative to maintain this high standard for the current and future residents of the District. A well maintained road network allows for economic prosperity.

Generally, road wearing surfaces (chip and seal) last between 12 and 15 years. Accurate data is necessary to ensure that the best life can be achieved. The accurate maintenance costs recorded provides a yard stick when the time comes to resurface the road, as the maintenance costs will surpass the cost to reseal. By trending the upward cost of maintenance against time it is possible to predict the time for intervention, thus creating a resurfacing programme that can be budgeted for. dTIMS is also used to identify roads that may require reseal work.

As a minimum, local defects in the road surface will be repaired by removing a small section of seal. Where cracking occurs these cracks can be sealed by pouring bitumen into them to prevent water ingress. As defects become more prominent, larger areas are cut out and repaired and, if necessary, the base layer is also removed and refilled with new material and compacted prior to sealing.

At a point these surface and base layers become so close together and numerous that it becomes necessary to dig out large areas, stabilise the base layers with cement or lime and to seal them. There then comes a point where the surface, is not only cracked and deformed, but the seal is flushing (bleeding bitumen) and there is serious base failure to the point that a reseal is required to effectively seal the entire treatment area.

ONE NETWORK ROAD CLASSIFICATION

There is currently a transition from the One Network Road Classification (ONRC) to the One Network Framework (ONF). Whilst the ONRC identified different road classifications based on traffic volumes and breakdown the ONF uses the factors including the interactions of people with the environment adjacent to the road to add a “place” factor. The current resource management act reforms which give direction on the land use adjacent to roads has further complicated this exercise and it is anticipated that the joint development of these two changes will work hand-in-hand over time.

The current roading AMP refers to One Network Road Classification and ONF where possible since Council is still in transition phase. ONRC is a classification system that places each New Zealand road into one of six categories. These categories were developed by the Te Ringa Maimoa and completed in 2013 and are:

- National Roads
- Arterial Roads
- Regional Roads
- Primary Collector Roads
- Secondary Collector Roads
- Access Roads

Ōtorohanga District Council has one further subcategory that sits below the Access Roads, namely Low Volume Roads, that occur in the District for vehicle movements of less than 250 vehicles per day.

The roads are classified by their importance, connectivity, traffic volumes and strategic importance.

Previously using the ONRC, local authorities and NZ Transport Agency were able to compare the state of roads across the country, and direct investment where it is needed most. Road users will see an increase in the quality of some roads, and a decrease in others that have been over-specified in the past. Overall, New Zealanders will get the right level of road infrastructure where it is needed, determined by a robust, impartial, nationally consistent tool – the ONRC.

Ōtorohanga District Council currently employs the ONRC in the Maintenance Contract to set agreed levels of service. The current Maintenance Contract was written specifically around the ONRC standard and KPIs are measured in terms this standard. The new maintenance contract is expected to go out for tender in 2027 and shall be set under ONF classification.

ONE NETWORK FRAMEWORK

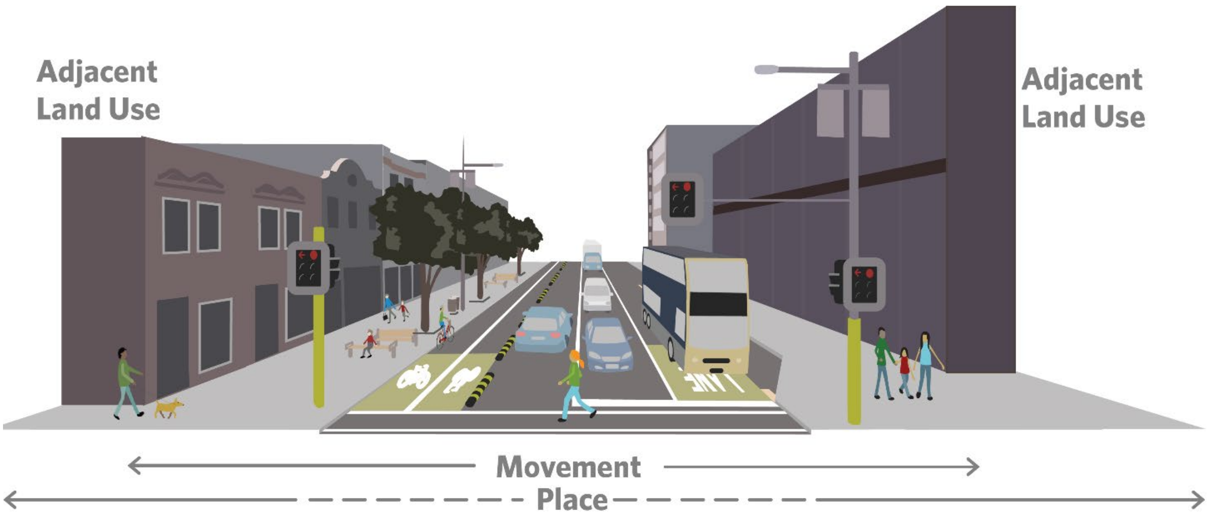
The ONRC is currently being enhanced to better include people that are walking, riding a bike or taking public transport. It will also reflect that transport corridors are not just for travelling through. They are also places where people stop, socialise, enjoy and do business.

This new framework is called the One Network Framework (ONF) project and includes other non-tangible attributes that classify roads and separates the rural roads from urban roads creating many more variations on the road theme, including people movement, as well as vehicle movements. The focus is more on the intention of the journey rather than just traffic count and includes why people travel.

The new ONF also determines the interaction between vehicles and people and can inform on what possible designs can help to minimise detrimental impacts on people vs cars in high traffic areas of urban centres for instance. This interaction is also between cyclists, scooters, mobility assisted and pedestrians.

ONRC VS ONF

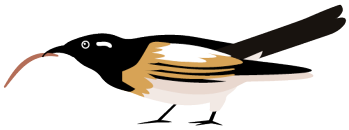
To easily understand the difference between ONRC and ONF is to see ONRC as movement of people and freight and ONF as adding a place in the journey. Within the new ONF, the 'Place function' is considered to be the extent to which a corridor (and its adjacent land use) is a destination in its own right. It incorporates lateral movement, where street activity increases demand for people wanting to cross carriageways. The place function is focused on attracting people to spend time. It is particularly important in urban environments where local economic activity and community needs mean that we need to design vibrancy and social connectedness into our built environments. In rural environments, places of importance may also include sites of cultural importance or tourism locations.



Ōtorohanga will not be hugely affected by the change from ONRC to ONF, as there are only two small urban centres that exist in the District, namely Ōtorohanga and Kawhia. However, it will influence any future projects envisaged for Maniapoto Street for instance. It will also guide how the Ōtorohanga and Kawhia town centres might look in the future and inform planning of parking areas, places of socialising and economic activity in these centres, as well as getting access to these with particular reference to the interaction between pedestrians and vehicles as mentioned before.

Cognisance is also given to public transport and how this will play a role in developing future road corridors. The current ONRC is based primarily around vehicle movements on roads, whereas ONF focuses more on why the journey occurs and the end goal.

ONRC will also still be the standard road classification for the short term future, whereas a transition to the ONF is envisaged for the medium term future (10 to 12 years). Work already planned is still done in terms of ONRC, but reference is already made to classify future work on the road in terms of the new ONF matrix.



NEW TECHNOLOGIES

New technology is inevitable and change is good if it can increase data accuracy, increase asset lifecycles, reduce costs and improve confidence. Road condition rating has recently seen the introduction of new technology in the form of laser crack measurement and high speed condition rating technology. This allows for more accurate data, resulting in more accurate predictions. It also allows for a larger condition rating sample much quicker.

In addition, an improved user interface is being developed that will change the way that data is entered into RAMM. The current methodology uses expensive laptops for field work, whereas the JunoViewer allows less expensive devices with a more user friendly interface, improving productivity at a lower cost.

STANDARDS AND GUIDELINES

The following technical standards are to be considered in the management of the land transport asset.

WORK COMPONENT	STANDARDS AND GUIDELINES
DESIGN	Compliance with all relevant technical standards including NZS 4404. National Roads Board guidelines for geometric design of rural roads. Austroads Pavement Design Manuals. Waka Kotahi guidelines for design.
MAINTENANCE & OPERATIONS	Compliance with Council's maintenance specifications. Compliance with relevant Rural Traffic Standards (RTSs) – e.g. RTS5 – delineation devices. Compliance with the Code of Practice for Temporary Traffic Management, and Health and Safety Act.
MATERIALS	Selection of materials to comply with industry best practice as well as all relevant standards including NZS4404, contract specifications and policies.

LIFE CYCLE MANAGEMENT

CAPITAL / NEW WORKS AND IMPROVEMENT PLAN

Capital / new works are those works that create a new asset which did not previously exist, or works that upgrade or improve an existing asset significantly beyond its existing capacity. They may result from growth, social or environmental needs. A good example is the resilience improvements for climate adjustment where roads may need to be raised, retaining walls constructed and stormwater capacity increased.

SELECTION PROCESS / CRITERIA

Knowing when and why to provide a new asset, or its component, is the key to successful capital/new programmes being sustainable through optimised decision making. The following typical process is followed in evaluating new/capital works:

PROCESS STEP	DESCRIPTION
SCOPE	Define the objectives and project scope in accordance with Council's strategies. Identify the criteria for the project selection.
RESEARCH	Define the need for the new asset in terms of: • nature of service • service level • location • timing/duration • cost/price.
NPV ANALYSIS	Justification and prioritisation based upon a NPV calculation, using latest version of the Waka Kotahi Simplified Procedures and project economic evaluation software is used. NPV to be calculated for each option being considered for comparison.
SELECT PREFERRED OPTION	Select preferred option and review full design and construction requirements.

Costs of new works are generally divided into those resulting in an improved LOS and capital activities:

WORK TYPE	DESCRIPTION
CHANGED LOS	Based on the ongoing review by Council staff of asset performance and community demand.
CAPITAL ACTIVITIES	Generally, service growth – including new assets and improved LOS to support increased demand. Generally based on Council staff assessments and through estimating levels of growth in the district and future needs

CAPITAL / NEW ASSETS STANDARDS

Required standards for all capital/new works will be determined at the time and will be based on best practice and relevant Council and other standards. Where new assets are provided, they are constructed to current legislative standards and relevant codes, with consideration for appropriateness in capacity and utilisation for the foreseeable future.

MAINTENANCE AND OPERATIONS

There are three types of maintenance applicable to this activity:

ROUTINE: Routine maintenance is the regular, ongoing day-to-day work that is necessary to keep assets operating (serviceable), including instances where portions of the asset fail and need immediate repair to make the asset safe and/or operational again. These include, but are not limited to, pothole repair, blocked culvert clearing, sign repair and / or replacement and slip clearing that do not inhibit vehicle access.

PLANNED: Planned maintenance is the programmed, itemised and prioritised work necessary to keep assets at their required standards and prevent asset failure. These are activities that include sign cleaning, road sweeping, roadside mowing and low priority marker post replacement.

REACTIVE: Reactive maintenance is on-demand works to correct asset malfunctions and failures or disruption to LOS on an as-required basis. The major form of reactive maintenance for land transport assets is emergency works following storm events.

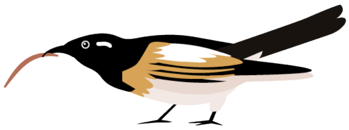
A risk-based approach will be taken to optimise maintenance across the different ONRC. On higher classification roads, a lower risk approach will be taken i.e. earlier intervention with renewal treatments and robust maintenance repairs. For lower classification roads, more risk may be taken by deferring renewals where possible and using holding repairs.

By accepting greater risks on lower classification roads, a higher percentage of work will be reactive compared to the preventative and planned strategies on higher classification roads. It is important to note that safety will not be compromised through this process, and intervention with routine maintenance will be completed as necessary to keep the road safe.

INSPECTIONS

Council's maintenance contractor and Roading Team staff are tasked to jointly inspect the land transport network on a monthly basis to identify routine maintenance needs. Enhancements are regularly introduced in consultation with Council in order to progressively correct deficiencies in the road network. As a need is identified and possible solutions are assessed, these are included in the ten-year FWP.

Experience in managing network maintenance contracts has shown contractors are not always best placed to identify and prioritise the needs of the network. In some instances, this behaviour is also driven by respective tendered rates that can motivate contractors to select/find certain work items that are commercially more favourable than the activities that are genuinely best for asset. Council is fortunate that the current Contractor has a history of good cooperation with Council and that both parties work on a basis of positive trust.



ROUTINE MAINTENANCE STANDARDS

Council has developed a series of standard specifications to cover road maintenance activities. This series of documents include the following:

SPECIFICATION NUMBER	DESCRIPTION
M1	General Specification – Land Transport
M2	Specification for Temporary Traffic Control
M3	Repair of Potholes – Sealed Roads
M4	Repair of Surface Defects – Sealed Roads
M5	Repair of Pavement Failures – Sealed and Unsealed Roads
M6	Repair of Edge Break
M7	Repair of Depressions, Rutting and Surface Openings – Sealed Pavements
M8	Adjustment of Service Boxes and Covers – Sealed Roads
M9	Maintenance of Unsealed Shoulders – Sealed Pavements
M10	Removal of High Berms – Sealed Pavement
M11	Unsealed Pavements – Maintenance Grading, Reshaping and Metalling
M14	Repair of Potholes – Unsealed Roads
M15	Culvert Maintenance
M16	Minor Culvert Replacement
M17	Kerb and Channel Repairs and Replacement
M18	Removal of Surface Detritus
M19	Cleaning of Cesspit Grates and Sumps
M20	Roadside Water Table Maintenance
M21	Routine Bridge Maintenance
M22	Emergency Work
M23	Vegetation Control
M25	Erection and Maintenance of Traffic Signs, Chevrons, Markers and Sight Rails
M27	Supply and Application of Dust Suppressants
M30	Materials
M31	Footpath Maintenance

In addition to these, relevant specifications from NZS4404: 2010 Land Development and Subdivision Infrastructure standards are applicable. Where new roads are constructed as part of a new development that will be vested in Council, the Regional Infrastructure Technical Specifications (RITS) will be required to be adhered to.

In addition to the above mentioned standards, Council has also adopted the District Plan that is adhered to.

All maintenance activities must comply with current PMS and this AMP. It is also intended to develop a Maintenance Intervention Strategy as part of a Pavement Management Strategy. A further development will be the preparation of an Environmental Management Strategy to accompany the other documents.

RENEWALS PLAN

The renewals plan is developed through the dTIMS modelling that is undertaken regularly. The model informs which roads require what treatment intervention. The process then allows for field validation of the results from the dTIMS model. A renewal / rehabilitation programme is then developed with funding constraints taken into account. This is reviewed on an annual basis as new, more accurate and informed information becomes available.

DISPOSAL PLAN

There are no plans at present to dispose of assets in the land transport activity. However, any future Asset disposal processes will comply with Council's legal obligations under the Local Government Act 2002, which covers:

- Public notification procedures required prior to sale
- Restrictions on the minimum value recovered
- Use of revenue received from asset disposal

ASSET VALUATION

The latest valuation was completed in June 2022. This valuation implements the RAMM valuation system and compares the quantum and value outcome with the valuation undertaken during 2020. It identifies where the Council asset register (RAMM) can be improved for the valuing of road assets.

Key outputs from this valuation are:

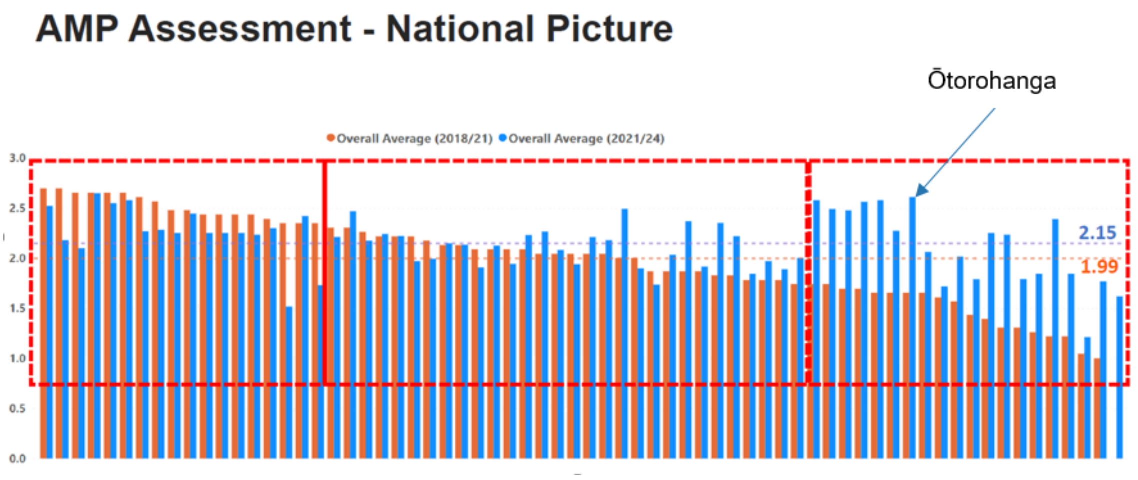
- Asset component schedules for each type of asset and comparison with the previous valuation
- A confidence assessment of the current information in the Asset Register
- Improvement recommendations for the Council asset register and associated valuation inputs
- Optimised Replacement Cost (ORC)
- Optimised Depreciated Replacement Cost (ODRC)
- Annual Depreciation (AD)
- Cumulative Depreciation (CD)

Asset valuation is provided elsewhere in this document - Appendix C.

IMPROVEMENT PROGRAMME

GENERAL

This edition of the Land Transport Activity Management Plan (2023) has involved a review and update of the 2021/31 document which was evaluated by Te Ringa Maimoa REG (Roading Efficiency Group, now re-branded as Te Ringa Maimoa – Transport Excellence Partnership) as being undoubtedly fit for purpose and having one of the highest evaluated scores in New Zealand. This evaluation is illustrated in the graph below.



This section first reports against the previous improvement programme and then identifies further areas for improvement, although the context of the previous plan these action focus more on maintaining the current level of achievement and adapting to the ever-changing macro-economic environment. -+

The Land Transport Activity Management Plan (2024-34) has been predominately prepared by consultant Chris Clarke (Clarke of Works) and is in essence a refresh and update of the 2021/31 in house document. RATA – our asset information partner – have continued their engagement to complete the asset valuation through RAMM.

The issues facing the Ōtorohanga District for land transport are not complex, the network is in a good and stable condition without need of significant changes in management practice. The plan was produced with the welcome assistance and advice from the Te Ringa Maimoa and the assistance of Waka Kotahi planning and investment staff. The benefits of the full development of the methodology and processes contained within the plan by the team responsible for the land transport network increases the level of buy-in and ownership of the document.

AMP REVIEWS

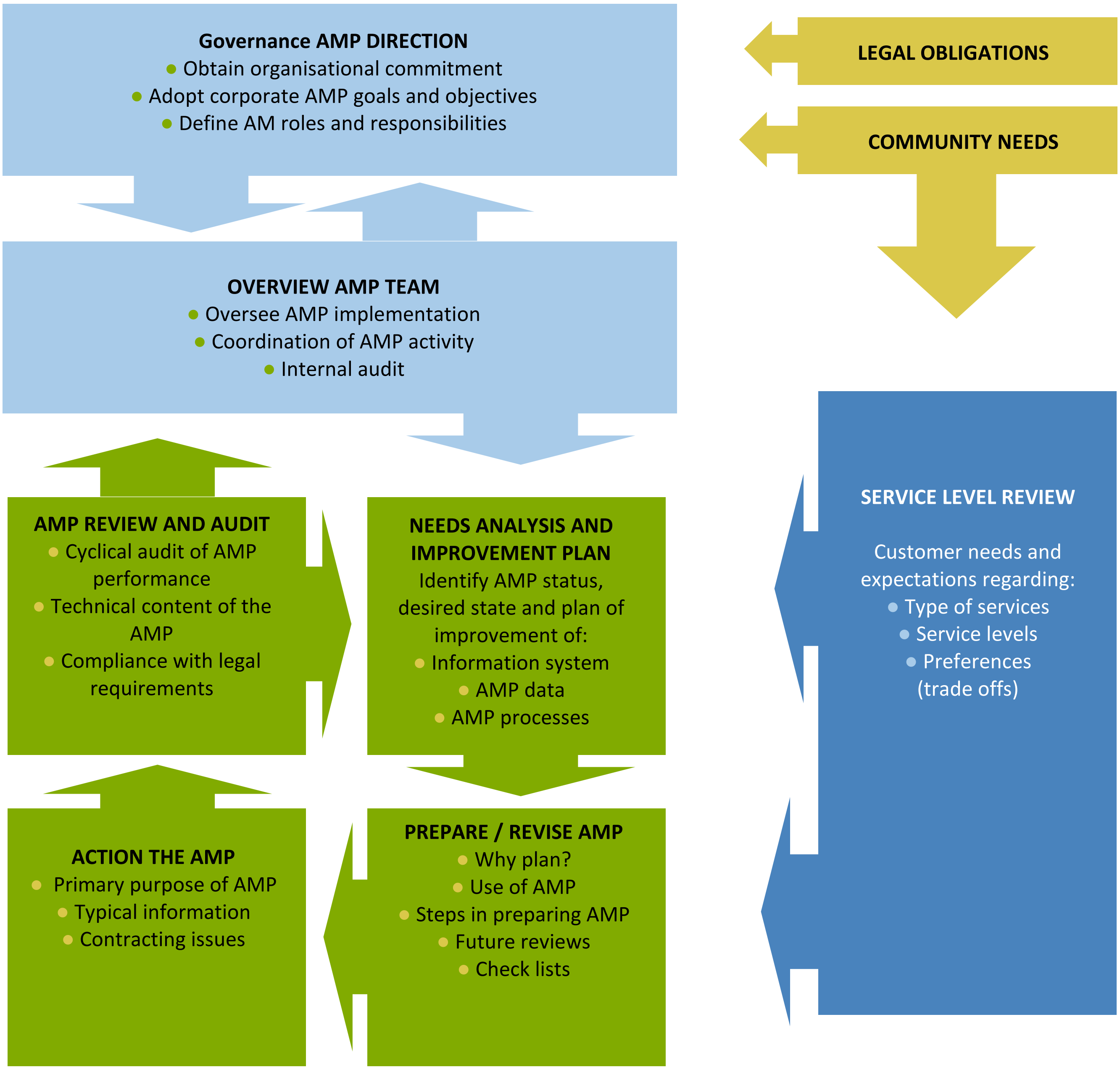
Recommendations of the previous reviews have been progressively included into new generations of the plan. The support of the Te Ringa Maimoa workshops and AMP reviews across the country has provided valuable input into the improvements incorporated in this AMP. This includes easy access to best practice examples and an improved understanding of activity management across the country.

The asset management planning process is none the less a continuous process of development, improvement and adaptation to the current financial and political environment.

The diagram on the following page illustrates the process of continual plan development.

ENGAGEMENT

Regional engagement was undertaken under the management and guidance of the Waikato Regional Council, culminating in presentations from regional and national organisations to all the Local Authorities. During development of the 2021/31 AMP, Council engaged a qualified facilitator to manage the process of the local community engagement and Investment Logic Mapping (ILM) process This was structured to provide high level strategic context across Councils assets to guide the direction of the 30 year infrastructure strategy and Activity Management Plans. Representatives were invited to attend a workshop but many of the invited organisations did not attend. It is likely that many did not appreciate the importance of their inputs. Discussion during community meetings would indicate that there hasn't been much change since then.



PROCESS FOR DEVELOPING AND IMPROVING ASSET MANAGEMENT PLANS

CONFIDENCE LEVELS

SUPPORTING INFORMATION

Significant staff effort and resource has been directed towards maintaining the data contained within the RAMM database since the last issue of the AMP, resulting in a continued high level of confidence in the results as published by the Te Ringa Maimoa (see Appendix D). 2020/21 94%, 2021/22 93%)

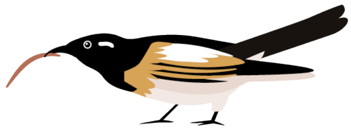
Some of the significant gains in data improvement has resulted in improvements in seal width data, traffic services, forward works programming, and footpath spatial data and condition rating. RATA - Co-Lab have started a project around standardised asset valuations and seal lives that will improve our depreciation projections.

The confidence level in the data to support this plan is medium to high. There are however some minor data gaps remaining, primarily road supporting walls and structures, which although not considered to have a high impact on the overall network value or activity management practices, are none the less planned to be improved.

The table below sets out the known shortcomings in the asset data in the previous AMP, and the plans to improve and results of the improvement plan.

Asset description	Assessed data weakness	Possible effects of data gaps	Improvement plan
Roadside structures (retaining)	Not included in the database	Incorrect valuation and depreciation provision Inaccurate renewal provision or planned maintenance inspection regime	Data collection during 2020/21, if resources allow. Now assessed at 90% (moderate importance)
Road marking	Inaccurate asset quantities and locations	Inaccurate contract scheduling and asset valuation	Digitising the line marking from aerials to improve to dataset
Seal age	Default seal lives not reflective of actual achieved lives	Incorrect valuation and depreciation provision Inaccurate renewal provision or planned maintenance inspection regime	Review findings of forwards works programme development and update RAMM as appropriate.
Reflective and raised pavement markers	Not accurately included in the database	Inaccurate renewal provision or planned maintenance inspection regime	Data collection to be considered

AMP DATA IMPROVEMENT DETAILS



INTERNAL PROCESS

As part of the production of this and the previous plan, many internal processes have been examined and an improved understanding of activity management within the roading staff has resulted. Internal processes are considered to be adequate for the district, but the importance of things such as timely completion of data inputs to RAMM have been highlighted for further improvement. The internal process remains constant however there have been a number of roading team staff leave to organisation with the majority of the work now outsourced to consultants. Whilst the institutional knowledge within the organisation may have reduced every effort has been made to ensure the level of asset management and associated decision making consistently remains at the same high level.

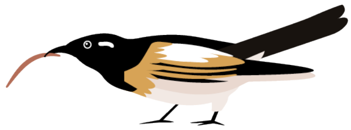
The ONRC has been an excellent catalyst to start conversations about desired levels of service, and while many small processes have been confirmed as fit for purpose for our network, focussing on the higher risk issues and more strategic sections is an interesting change. The emphasis for the next three years will be to build on this understanding and application of differential levels of service and fully incorporate the One Network Framework (ONF) into the strategic planning. This is identified as an improvement priority and will be done in harmony with the resource management reform and District Plan review.
The confidence level in the internal processes remains as previously assessed as medium, and in need of small levels of improvement to support the AMP in future.

APPROVAL PROCESS AND TIMETABLE

The following table sets out the steps and timetables for adoption, monitoring and review of the plan to ensure continued relevance and confidence in the plan.

Activity	Action	Timetable
Waka Kotahi review	Preliminary draft copy to Waka Kotahi to review for compliance and support funding application	31-August-23
Final issue	Final issue to incorporate Waka Kotahi requested immediate changes	Issue December 2023
Annual LOS reporting	Reporting on level of service achievement for the 2023/24 financial year, and annually thereafter.	August 2024
Prioritised work programmes review	Review the prioritisation of capital works for road improvements, renewals, footpath extensions and the deficiency database and adopt revised 10 year programmes with Council for inclusion in next AMP edition	During 2024/25
Improvements programme	Undertake improvements in accordance with the improvements plan in preparation for the next AMP review	During 2024-27
New strategies and policies	Undertake preparation of new formal documents as below and establish LOS values as defined by ONRC performance measures: Resilience – Rural stormwater management strategy Intersection priority policy Emergency Procedures and Response Plan	Target dates for adoption June 2024 June 2024

AMP ADOPTION, MONITORING AND REVIEW



IMPROVEMENT PLAN

The improvement plan shown on the following table 10.3 is a combination of the items from the previous AMP improvement plan not as yet fully implemented, opinions from the peer reviews by external consultants, REG and NZ Transport Agency Investment advisors and issues identified during the plan preparation.

The priorities included in the improvement plan are:

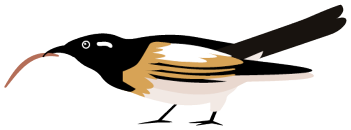
- Immediate - Works which need to be done to meet minimum requirements. To be commenced during year one of this plan and completed in year one if possible (2024/25) and resources are available. Definitely completed prior to July 2025

- Short term - Work to be undertaken when practical to do so. To be programmed to be undertaken during the three year term of this plan (2024/25).

- Medium term - Improvements or enhancements which are “desirable” but not critical. May be undertaken during 2025/26 but more likely to be differed till 2026/27 or later

- Long term - Items which are considered to be “constructive” but the resource to institute may not provide measurable enhancement. Unlikely to be undertaken during 2024/27

AMP section reference		Detail	Improvement desired	Estimated staff time resource	Additional external costs	Priority	Risk	Comments
	One Network Framework (ONF) integration	Update systems and processes to imbed ONF principles	Alignment of LOS measurement with new network categories once ONF has been formally adopted	20 days	$0	Immediate	KPI's unable to be compared against peer groups.	In progress ONF rollout has been delayed.
	Deficiency Database prioritised programme	Fieldwork to identify improvement opportunities. Workshop the programme with Council, and publish updated programme	Direct most beneficial Low Cost Low Risk implementation programme. Inform next AMP review	40 days	$0	Short term	Low Cost Low Risk programme otherwise may not prioritise most beneficial improvements	No action taken to date – low priority in light of other issues affecting local government.
	RAMM database improvements	Data collection and asset identification as per table 10.1 above	Inform next AMP review	60 days	$0	Medium term	Incorrect renewal provision and possible missed critical maintenance	RAMM data maintained at a high level – all renewals and capital works updated / included in RAMM.
	Investigate Risk of critical assets affecting lifelines assets and collector road reliability	Identify individual assets at elevated risk and formalise a short "fit for purpose" management / mitigation plan for each asset type	Improved risk management of critical assets during large unplanned events	40 days	$30,000	Medium term	Poor performance during a civil defence event	Two bridges were done in 2023/24 however others will require structural advice for critical bridges
	Formalise LoS reporting	Publish an annual Level of Service achievement report for public availability.	Improved road user information and subsequent engagement in ILM process	10 days	$0	Immediate	No risks to activity management	To be published on ODC website and reported to Council.



AMP ref		Detail	Improvement desired	Estimated staff time resource	Additional external costs	Priority	Comments	
	Pavement strength testing	Continued FWD pavement strength testing	Better data for dTIMS model	5 days	$45,000	Medium term	Ongoing – Annual programme.	
	Improved pavement loading understanding	Improved road specific HCV percentages in RAMM traffic module	Better data for dTIMS model	10 days	$0	Short term	Reducing risk of poor performance of dTIMs	Ongoing – Annual programme of traffic counting is uploaded into RAMM regularly .

AMP ref	Planned Improvement	Detail	Improvement desired	Estimated staff time resource	Additional external costs	Priority	Comments
	Growth costs	Separate out costs attributed to growth and LOS change	Improved investment decision making	10 days	$0	Short term	No or little growth occurring

AMP ref	Planned Improvement	Detail	Improvement desired	Estimated staff time resource	Additional external costs	Priority	Comments
	Funding and Revenue strategies	Incorporate information on funding strategies and revenue streams	Improved investment decision making	5 days	$0	Immediate	Information obtained from the finance team
	Depreciation projections	Incorporate projections of future asset values and future depreciation	Improved investment decision making	10 days	$0	Short term	Annual valuations are being undertaken to keep up with cost increases and providing for more accurate depreciation.
	2022 dTIMs modelling report	Validate recently received pavement modelling outputs and check alignment with preferred programme	Improved investment decision making	15 days	$0	Short term	A hit rate analysis between field based forwards programme and dTIMS trigger model is undertaken with each dTIMS round.
	Processes quality grades	Assign quality grades for key asset management processes	Meet generally accepted asset management guidelines	10 days	$0	Short term	Compare with Auditor General publication on effective management of public assets
	Programme confidence level	Assign a confidence rating for management, maintenance renewal and new asset programmes	Meet generally accepted asset management guidelines	10 days	$0	Long term	

AMP ref	Planned Improvement	Detail	Improvement desired	Estimated staff time resource	Additional external costs	Priority	Comments
	Seismic and Scour Screening of critical bridges	Identify critical bridge assets and plan for screening & implementation of improvements	Improved investment decision making	5 days	$0	Long Term	This will feed into the bridge renewal programme

	Improved Problem Statement linkages	Further refine problem statements and linkages to have a greater transport focus.	Stronger transport linkage to the strategic case	10 days	$0	Long Term	
	Risk linkages	Show how risk management links to the corporate framework for managing risk	Meet generally accepted asset management guidelines	10 days	$0	Medium term	
	Network Resilience – Rural stormwater management strategy	Drainage risk assessment of catchments to identify drainage facility upgrades in slip prone areas	Improved decision making, informs culvert renewal and upgrade programme	10 days	$70,000	Medium term	Rural storm water modelling to be completed by July 2024
	Capital Improvement prioritised programme	Update list of works including refinement of project extents and costs. Workshop the programme with Council, and publish programme	Inform next AMP review	20 days	$0	Short term	Capital improvements outside those associated with Rehabilitation have been put on hold during the covid pandemic and water reform changing priorities
	LOS adoption for 2027/30 AMP	Workshop levels of service with the Council and adopt levels for the next AMP	Improved political inputs to setting levels of service	10 days	$0	Long term	A component in improving the understanding and engagement of elected members in the AMP development

APPENDICES

Appendix A – ODC Te Ringa Maimoa differential levels of service
Appendix B – Road construction widths
Appendix C – ODC Roading Valuation report 2022
Appendix D – ODC Waka Kotahi report 2023
Appendix E – Customer satisfaction survey 2023
Appendix F – Ōtorohanga Town Concept Plan

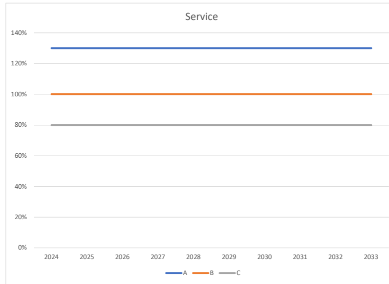
Operational Levels of Service

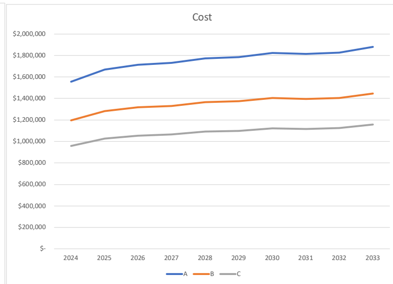
LoS ref	Level of Service	Service Outcome	Risk	Work Category	Performance Metric
Op01	Sealed Pavement Maintenance	Safety	Vehicle damage, travel time.	WC 111	% Faults responded to in time
Op02	Unsealed Pavement Maintenance	Liveability	Access restricted, vehicle damage, safety	WC 112	% Faults responded to in time
Op03	Footpath Maintenance	Health	Trip Hazards	WC 125	% Faults responded to in time
Op04	Routine Drainage Maintenance	Environmental Sustainability	Road condition is adversely affected	WC 113	Cost per km
Op05	Structures Maintenance	Service Sustainability	Structure condition deteriorates	WC 114	% Faults responded to in time
Op06	Network Management	Service Sustainability	Road closures, increased renewal and maintenance costs	WC 151	Cost per km
Op07	Traffic Services Maintenance	Risk	Safety impacted	WC 122	% Faults responded to in time
Op08	Cycle Path Maintenance	Health	Active travel discouraged	WC 124	% Faults responded to in time
Op09	Environmental Maintenance	Environmental Sustainability	Water quality is not managed at source, safety	WC 121	Cost per km
Op10	Public Transport Maintenance	Liveability	Public transport use decreases	WC 514	% Faults responded to in time

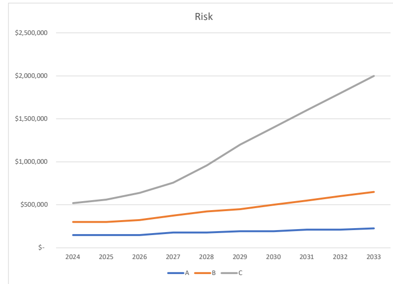
Enter data to green cells

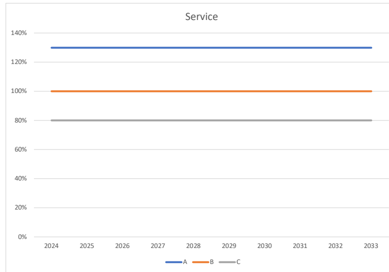
Costs used include 4.9% admin and BERL inflation

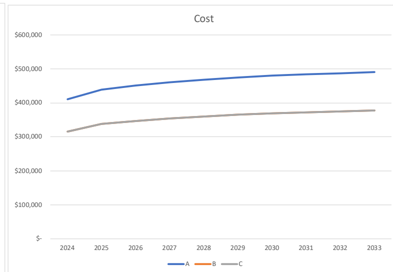
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
Op01	**Sealed Pavement Maintenance**			Rate	$ per km	$ 2,276	2,437.80	2,506.33	2,531.25	2,593.07	2,611.32	2,667.13	2,652.23	2,670.36	2,748.18	
	111			Emissions	tonnes/km	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
Op01	Sealed Pavement Maintenance	A	Sealed pavement faults are always responded to in a timely manner, proactive maintenance is enabled.	Programme	km	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526
				Service	%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	1
				Likelihood	1,2,3,4,5	1	1	1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1
				Consequence Cost	$	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	150,000
				Cost	$	$ 1,556,608	$ 1,666,968	$ 1,713,828	$ 1,730,869	$ 1,773,144	$ 1,785,619	$ 1,823,783	$ 1,813,597	$ 1,825,990	$ 1,879,205	1,756,961
				Risk Cost	$	$ 150,000	$ 150,000	$ 150,000	$ 180,000	$ 180,000	$ 195,000	$ 195,000	$ 210,000	$ 210,000	$ 225,000	184,500
				Emissions	tonnes	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	53
Op01	Sealed Pavement Maintenance	B	Sealed pavement faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	km	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	1.2	1.2	1.3	1.5	1.7	1.8	2	2.2	2.4	2.6	2
				Consequence Cost	$	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	250,000
				Cost	$	$ 1,197,391	$ 1,282,283	$ 1,318,329	$ 1,331,438	$ 1,363,957	$ 1,373,553	$ 1,402,910	$ 1,395,074	$ 1,404,608	$ 1,445,542	1,351,509
				Risk Cost	$	$ 300,000	$ 300,000	$ 325,000	$ 375,000	$ 425,000	$ 450,000	$ 500,000	$ 550,000	$ 600,000	$ 650,000	447,500
				Emissions	tonnes	53	53	53	53	53	53	53	53	53	53	53
Op01	Sealed Pavement Maintenance	C	Sealed pavement faults are not responded to in a timely manner, proactive maintenance is not done	Programme	km	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526.00	526
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	1.3	1.4	1.6	1.9	2.4	3	3.5	4	4.5	5	3
				Consequence Cost	$	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	400,000
				Cost	$	$ 957,913	$ 1,025,826	$ 1,054,664	$ 1,065,150	$ 1,091,165	$ 1,098,842	$ 1,122,328	$ 1,116,059	$ 1,123,686	$ 1,156,434	1,081,207
				Risk Cost	$	$ 520,000	$ 560,000	$ 640,000	$ 760,000	$ 960,000	$ 1,200,000	$ 1,400,000	$ 1,600,000	$ 1,800,000	$ 2,000,000	1,144,000
				Emissions	tonnes	53	53	53	53	53	53	53	53	53	53	53
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op02	**Unsealed Pavement Maintenance**			Rate	$ per km	$ 1,136	$ 1,216	$ 1,248	$ 1,274	$ 1,296	$ 1,314	$ 1,329	$ 1,340	$ 1,349	$ 1,358	
	112			Emissions	tonnes/km	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Op02	Unsealed Pavement Maintenance	A	Unsealed pavement faults are always responded to in a timely manner, proactive maintenance is enabled.	Programme	km	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278
				Service	%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	1
				Likelihood	1,2,3,4,5	1	1	1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1
				Consequence Cost	$	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	50,000
				Cost	$	$ 410,446	$ 439,587	$ 451,080	$ 460,520	$ 468,318	$ 474,885	$ 480,221	$ 484,326	$ 487,609	$ 490,893	464,789
				Risk Cost	$	$ 50,000	$ 50,000	$ 50,000	$ 60,000	$ 60,000	$ 65,000	$ 65,000	$ 70,000	$ 70,000	$ 75,000	61,500
				Emissions	tonnes	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	14
Op02	Unsealed Pavement Maintenance	B	Unsealed pavement faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	km	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	1.2	1.2	1.3	1.5	1.7	1.8	2	2.2	2.4	2.6	2
				Consequence Cost	$	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	70,000
				Cost	$	$ 315,727	$ 338,144	$ 346,984	$ 354,246	$ 360,245	$ 365,297	$ 369,401	$ 372,558	$ 375,084	$ 377,610	357,530
				Risk Cost	$	$ 84,000	$ 84,000	$ 91,000	$ 105,000	$ 119,000	$ 126,000	$ 140,000	$ 154,000	$ 168,000	$ 182,000	125,300
				Emissions	tonnes	14	14	14	14	14	14	14	14	14	14	14
Op02	Unsealed Pavement Maintenance	C	Unsealed pavement faults are not responded to in a timely manner, proactive maintenance is not done	Programme	km	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278.00	278
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	1.3	1.4	1.5	1.6	1.7	1.8	2	2.4	2.6	3	2
				Consequence Cost	$	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	100,000
				Cost	$	$ 315,727	$ 338,144	$ 346,984	$ 354,246	$ 360,245	$ 365,297	$ 369,401	$ 372,558	$ 375,084	$ 377,610	357,530
				Risk Cost	$	$ 130,000	$ 140,000	$ 150,000	$ 160,000	$ 170,000	$ 180,000	$ 200,000	$ 240,000	$ 260,000	$ 300,000	193,000
				Emissions	tonnes	14	14	14	14	14	14	14	14	14	14	14
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op03	**Footpath Maintenance**			Rate	$ per km	$ 992	$ 1,062	$ 1,090	$ 1,113	$ 1,132	$ 1,148	$ 1,161	$ 1,171	$ 1,178	$ 1,186	
	125			Emissions	tonnes/km	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	
Op03	Footpath Maintenance	A	Footpath faults are always responded to in a timely manner, proactive maintenance is enabled.	Programme	km	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35
				Service	%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	2
				Likelihood	1,2,3,4,5	1	1	1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1
				Consequence Cost	$	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	3,000
				Cost	$	$ 52,479.21	$ 56,205.24	$ 57,674.66	$ 58,881.68	$ 59,878.78	$ 60,718.45	$ 61,400.68	$ 61,925.47	$ 62,345.31	$ 62,765.14	59,427
				Risk Cost	$	$ 3,000	$ 3,000	$ 3,000	$ 3,600	$ 3,600	$ 3,900	$ 3,900	$ 4,200	$ 4,200	$ 4,500	3,690
				Emissions	tonnes	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0
Op03	Footpath Maintenance	B	Footpath faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	km	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	1.2	1.2	1.3	1.5	1.7	1.8	2	2.2	2.4	2.6	2
				Consequence Cost	$	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	5,000
				Cost	$	$ 34,986	$ 37,470	$ 38,450	$ 39,254	$ 39,919	$ 40,479	$ 40,934	$ 41,284	$ 41,564	$ 41,843	39,618
				Risk Cost	$	$ 6,000	$ 6,000	$ 6,500	$ 7,500	$ 8,500	$ 9,000	$ 10,000	$ 11,000	$ 12,000	$ 13,000	8,950
				Emissions	tonnes	0	0	0	0	0	0	0	0	0	0	0
Op03	Footpath Maintenance	C	Footpath faults are not responded to in a timely manner, proactive maintenance is not done	Programme	km	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	1.3	1.4	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.7	2
				Consequence Cost	$	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	10,000
				Cost	$	$ 34,986	$ 37,470	$ 38,450	$ 39,254	$ 39,919	$ 40,479	$ 40,934	$ 41,284	$ 41,564	$ 41,843	39,618
				Risk Cost	$	$ 13,000	$ 14,000	$ 16,000	$ 19,000	$ 22,000	$ 25,000	$ 28,000	$ 31,000	$ 34,000	$ 37,000	23,900
				Emissions	tonnes	0	0	0	0	0	0	0	0	0	0	0
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op04	**Routine Drainage Maintenance**			Rate	$ per Sum	$ 723,885	$ 775,281	$ 795,550	$ 812,199	$ 825,953	$ 837,535	$ 846,945	$ 854,184	$ 859,975	$ 865,766	
	113			Emissions	tonnes/Sum	29.0000	29.0000	29.0000	29.0000	29.0000	29.0000	29.0000	29.0000	29.0000	29.0000	
Op04	Routine Drainage Maintenance	A	Drainage faults are responded to in a timely manner, proactive maintenance is enabled.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	170.00%	170.00%	170.00%	170.00%	170.00%	170.00%	170.00%	170.00%	170.00%	170.00%	2
				Likelihood	1,2,3,4,5	1	1	1	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1
				Consequence Cost	$	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	100,000
				Cost	$	$ 1,230,605	$ 1,317,977	$ 1,352,434	$ 1,380,738	$ 1,404,120	$ 1,423,809	$ 1,439,807	$ 1,452,113	$ 1,461,958	$ 1,471,803	1,393,537
				Risk Cost	$	$ 100,000	$ 100,000	$ 100,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 140,000	$ 140,000	$ 140,000	120,000
				Emissions	tonnes	29	29	29	29	29	29	29	29	29	29	29
Op04	Routine Drainage Maintenance	B	Drainage faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	1
				Likelihood	1,2,3,4,5	1	1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1
				Consequence Cost	$	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	150,000
				Cost	$	$ 723,885	$ 775,281	$ 795,550	$ 812,199	$ 825,953	$ 837,535	$ 846,945	$ 854,184	$ 859,975	$ 865,766	819,727
				Risk Cost	$	$ 150,000	$ 150,000	$ 165,000	$ 165,000	$ 165,000	$ 165,000	$ 180,000	$ 180,000	$ 180,000	$ 195,000	169,500
				Emissions	tonnes	29	29	29	29	29	29	29	29	29	29	29
Op04	Routine Drainage Maintenance	C	Drainage faults are not responded to in a timely manner, proactive maintenance is not done	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	1
				Likelihood	1,2,3,4,5	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1
				Consequence Cost	$	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	250,000
				Cost	$	$ 579,108	$ 620,225	$ 636,440	$ 649,759	$ 660,762	$ 670,028	$ 677,556	$ 683,347	$ 687,980	$ 692,613	655,782
				Risk Cost	$	$ 275,000	$ 275,000	$ 300,000	$ 325,000	$ 350,000	$ 375,000	$ 400,000	$ 425,000	$ 450,000	$ 475,000	365,000
				Emissions	tonnes	29	29	29	29	29	29	29	29	29	29	29
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op05	**Structures Maintenance**			Rate	$ per sum	$ 325,826	$ 255,576	$ 262,258	$ 267,746	$ 371,768	$ 276,099	$ 279,201	$ 281,587	$ 387,081	$ 285,405	
	114			Emissions	tonnes/sum	15	15	15	15	15	15	15	15	15	15	
Op05	Structures Maintenance	A	Structures faults are all responded to in a timely manner, proactive maintenance is enabled.	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	1
				Likelihood	1,2,3,4,5	1	1	1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1
				Consequence Cost	$	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	50,000
				Cost	$	$ 390,991	$ 306,691	$ 314,710	$ 321,296	$ 446,121	$ 331,318	$ 335,041	$ 337,905	$ 464,498	$ 342,486	359,106
				Risk Cost	$	$ 50,000	$ 50,000	$ 50,000	$ 55,000	$ 55,000	$ 55,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	55,500
				Emissions	tonnes	15	15	15	15	15	15	15	15	15	15	15
Op05	Structures Maintenance	B	Structures faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	1	1	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1
				Consequence Cost	$	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	50,000
				Cost	$	$ 325,826	$ 255,576	$ 262,258	$ 267,746	$ 371,768	$ 276,099	$ 279,201	$ 281,587	$ 387,081	$ 285,405	299,255
				Risk Cost	$	$ 50,000	$ 50,000	$ 55,000	$ 55,000	$ 60,000	$ 60,000	$ 65,000	$ 65,000	$ 70,000	$ 70,000	60,000
				Emissions	tonnes	15	15	15	15	15	15	15	15	15	15	15
Op05	Structures Maintenance	C	Structures faults are not responded to in a timely manner, proactive maintenance is not done	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	1.1	1.2	1.2	1.4	1.4	1.6	1.6	1.8	1.8	2	2
				Consequence Cost	$	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000	70,000
				Cost	$	$ 325,826	$ 255,576	$ 262,258	$ 267,746	$ 371,768	$ 276,099	$ 279,201	$ 281,587	$ 387,081	$ 285,405	299,255
				Risk Cost	$	$ 77,000	$ 84,000	$ 84,000	$ 98,000	$ 98,000	$ 112,000	$ 112,000	$ 126,000	$ 126,000	$ 140,000	105,700
				Emissions	tonnes	15	15	15	15	15	15	15	15	15	15	15
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op06	**Network Management**			Rate	$ per Sum	$ 1,468,018	$ 1,358,707	$ 1,387,100	$ 1,731,520	$ 1,453,798	$ 1,475,750	$ 1,685,446	$ 1,496,988	$ 1,499,431	$ 1,848,064	
	151			Emissions	tonnes/Sum	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Op06	Network Management	A	Additional emphasis is given to collecting and applying good data to better inform asset management decision making, forward works programme and design.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	1
				Likelihood	1,2,3,4,5	0	0	0	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0
				Consequence Cost	$	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	250,000
				Cost	$	$ 1,468,018	$ 1,358,707	$ 1,387,100	$ 1,731,520	$ 1,453,798	$ 1,475,750	$ 1,685,446	$ 1,496,988	$ 1,499,431	$ 1,848,064	1,540,482
				Risk Cost	$	$ -	$ -	$ -	$ 50,000	$ 50,000	$ 75,000	$ 75,000	$ 100,000	$ 100,000	$ 125,000	57,500
				Emissions	tonnes	1	1	1	1	1	1	1	1	1	1	1
Op06	Network Management	B	Current scope of work is maintained for collecting and applying good data to inform asset management decision making, forward works	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0
				Consequence Cost	$	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	500,000

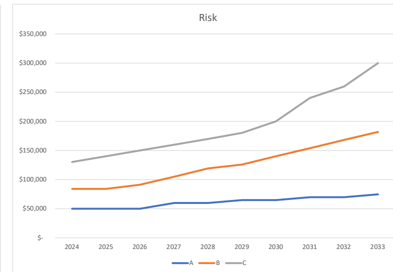


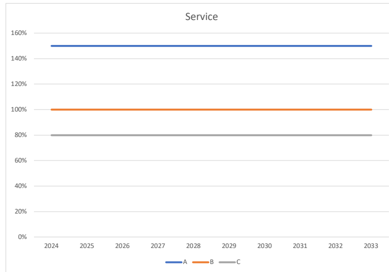


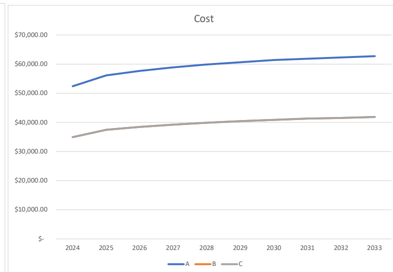


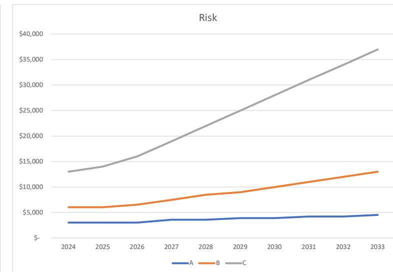


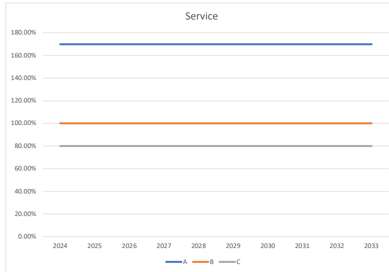


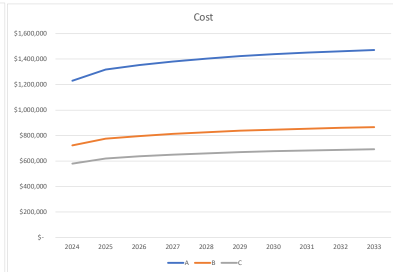


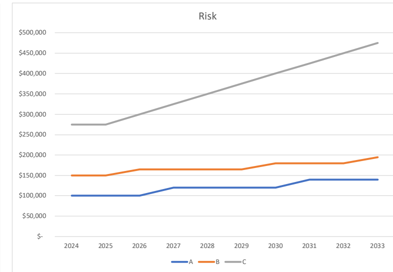


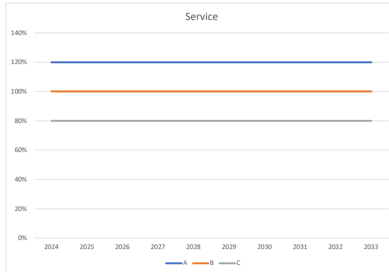


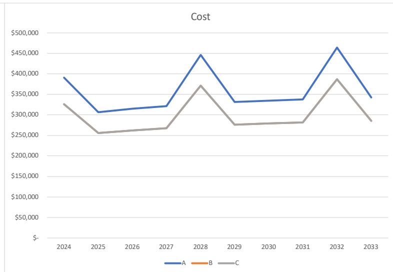


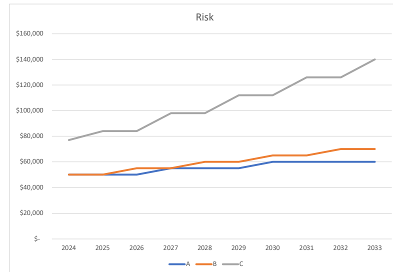


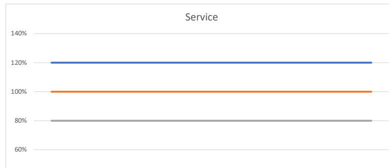


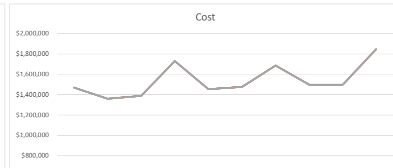


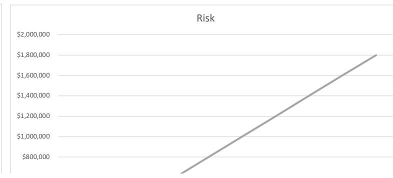




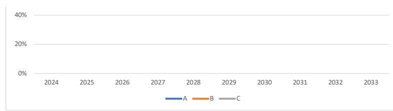
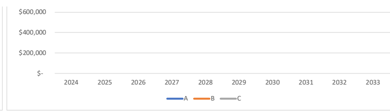
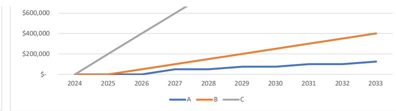
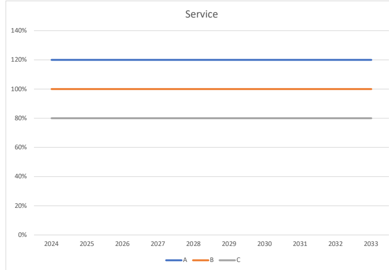


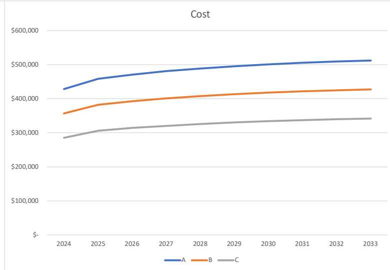


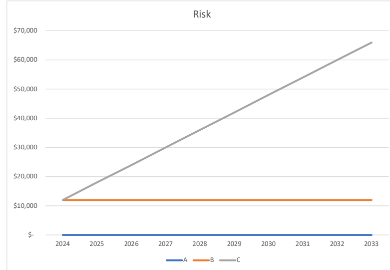


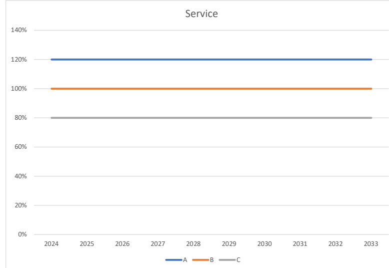


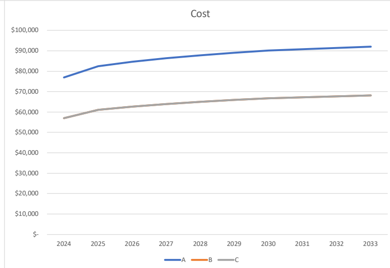
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
			management decision making, forward works programme and design	Cost	$	$ 1,468,018	$ 1,358,707	$ 1,387,100	$ 1,731,520	$ 1,453,798	$ 1,475,750	$ 1,685,446	$ 1,496,988	$ 1,499,431	$ 1,848,064	1,540,482
				Risk Cost	$	$ -	$ -	$ 50,000	$ 100,000	$ 150,000	$ 200,000	$ 250,000	$ 300,000	$ 350,000	$ 400,000	180,000
				Emissions	tonnes	1	1	1	1	1	1	1	1	1	1	1
Op06	Network Management	C	Less emphasis is given to collecting and applying good data to inform asset management decision making, forward works programme and design	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	0	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	1
				Consequence Cost	$	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	1,000,000
				Cost	$	$ 1,468,018	$ 1,358,707	$ 1,387,100	$ 1,731,520	$ 1,453,798	$ 1,475,750	$ 1,685,446	$ 1,496,988	$ 1,499,431	$ 1,848,064	1,540,482
				Risk Cost	$	$ -	$ 200,000	$ 400,000	$ 600,000	$ 800,000	$ 1,000,000	$ 1,200,000	$ 1,400,000	$ 1,600,000	$ 1,800,000	900,000
				Emissions	tonnes	1	1	1	1	1	1	1	1	1	1	1
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op07	**Traffic Services Maintenance**			Rate	$ per Sum	$ 357,313	$ 382,683	$ 392,687	$ 400,906	$ 407,695	$ 413,412	$ 418,057	$ 421,630	$ 424,488	$ 427,347	
	122			Emissions	tonnes/Sum	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
Op07	Traffic Services Maintenance	A	Network Services faults are all responded to in a timely manner, proactive maintenance is enabled.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	1
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0
				Consequence Cost	$	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	60,000
				Cost	$	$ 428,776	$ 459,219	$ 471,225	$ 481,087	$ 489,234	$ 496,094	$ 501,668	$ 505,956	$ 509,386	$ 512,816	485,546
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Emissions	tonnes	5	5	5	5	5	5	5	5	5	5	5
Op07	Traffic Services Maintenance	B	Network Services faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
				Consequence Cost	$	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	60,000
				Cost	$	$ 357,313	$ 382,683	$ 392,687	$ 400,906	$ 407,695	$ 413,412	$ 418,057	$ 421,630	$ 424,488	$ 427,347	404,622
				Risk Cost	$	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	12,000
				Emissions	tonnes	5	5	5	5	5	5	5	5	5	5	5
Op07	Traffic Services Maintenance	C	Network Services faults are not responded to in a timely manner, proactive maintenance is not done	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1
				Consequence Cost	$	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	60,000
				Cost	$	$ 285,851	$ 306,146	$ 314,150	$ 320,725	$ 326,156	$ 330,729	$ 334,445	$ 337,304	$ 339,591	$ 341,878	323,697
				Risk Cost	$	$ 12,000	$ 18,000	$ 24,000	$ 30,000	$ 36,000	$ 42,000	$ 48,000	$ 54,000	$ 60,000	$ 66,000	39,000
				Emissions	tonnes	5	5	5	5	5	5	5	5	5	5	5
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op08	**Cycle Path Maintenance**			Rate	$ per KM	$ 17,817	$ 19,082	$ 19,581	$ 19,991	$ 20,329	$ 20,614	$ 20,846	$ 21,024	$ 21,167	$ 21,309	
	124			Emissions	tonnes/KM	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	
Op08	Cycle Path Maintenance	A	Network Services faults are all responded to in a timely manner, proactive maintenance is enabled.	Programme	KM	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	4
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	1
				Likelihood	1,2,3,4,5	1	1	1	1	1	1	1	1	1	1	1
				Consequence Cost	$	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	3,000
				Cost	$	$ 76,970	$ 82,434	$ 84,589	$ 86,360	$ 87,822	$ 89,054	$ 90,054	$ 90,824	$ 91,440	$ 92,056	87,160
				Risk Cost	$	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	3,000
				Emissions	tonnes	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1
Op08	Cycle Path Maintenance	B	Network Services faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	KM	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	1	1	1	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1
				Consequence Cost	$	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	4,000
				Cost	$	$ 57,014	$ 61,062	$ 62,659	$ 63,970	$ 65,053	$ 65,966	$ 66,707	$ 67,277	$ 67,733	$ 68,189	64,563
				Risk Cost	$	$ 4,000	$ 4,000	$ 4,000	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 5,600	$ 5,600	$ 5,600	4,800
				Emissions	tonnes	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	1
Op08	Cycle Path Maintenance	C	Network Services faults are not responded to in a timely manner, proactive maintenance is not done	Programme	KM	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1
				Consequence Cost	$	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	6,000
				Cost	$	$ 57,014	$ 61,062	$ 62,659	$ 63,970	$ 65,053	$ 65,966	$ 66,707	$ 67,277	$ 67,733	$ 68,189	64,563
				Risk Cost	$	$ 6,600	$ 6,600	$ 7,200	$ 7,200	$ 7,800	$ 7,800	$ 8,400	$ 8,400	$ 9,000	$ 9,000	7,800
				Emissions	tonnes	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	1
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op09	**Environmental Maintenance**			Rate	$ per km	$ 960	$ 1,028	$ 1,055	$ 1,077	$ 1,095	$ 1,110	$ 1,123	$ 1,132	$ 1,140	$ 1,148	
	121			Emissions	tonnes/km	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	
Op09	Environmental Maintenance	A	Environmental faults are all responded to in a timely manner, proactive maintenance is enabled.	Programme	km	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772
				Service	%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	1
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0
				Consequence Cost	$	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	120,000
				Cost	$	$ 963,135	$ 1,031,518	$ 1,058,486	$ 1,080,638	$ 1,098,937	$ 1,114,348	$ 1,126,868	$ 1,136,500	$ 1,144,205	$ 1,151,910	1,090,654
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Emissions	tonnes	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	116
Op09	Environmental Maintenance	B	Environmental faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	km	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
				Likelihood	1,2,3,4,5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0
				Consequence Cost	$	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	120,000
				Cost	$	$ 740,873	$ 793,475	$ 814,220	$ 831,260	$ 845,336	$ 857,190	$ 866,822	$ 874,231	$ 880,157	$ 886,084	838,965
				Risk Cost	$	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	30,000
				Emissions	tonnes	116	116	116	116	116	116	116	116	116	116	116
Op09	Environmental Maintenance	C	Environmental faults are not responded to in a timely manner, proactive maintenance is not done	Programme	km	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772.00	772
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	1
				Likelihood	1,2,3,4,5	0.5	1	1.5	1.5	2	2	2	2.5	2.5	2.5	2
				Consequence Cost	$	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	120,000
				Cost	$	$ 740,873	$ 793,475	$ 814,220	$ 831,260	$ 845,336	$ 857,190	$ 866,822	$ 874,231	$ 880,157	$ 886,084	838,965
				Risk Cost	$	$ 60,000	$ 120,000	$ 180,000	$ 180,000	$ 240,000	$ 240,000	$ 240,000	$ 300,000	$ 300,000	$ 300,000	216,000
				Emissions	tonnes	116	116	116	116	116	116	116	116	116	116	116
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
Op10	**Public Transport Maintenance**			Rate	$ per Project	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
	514			Emissions	tonnes/Project	-	-	-	-	-	-	-	-	-	-	0
Op10	Public Transport Maintenance	A	Public Transport faults are responded to in a timely manner, proactive maintenance is enabled.	Programme	Project	-	-	-	-	-	-	-	-	-	-	0
				Service	%	-	-	-	-	-	-	-	-	-	-	0
				Likelihood	1,2,3,4,5	-	-	-	-	-	-	-	-	-	-	0
				Consequence Cost	$	-	-	-	-	-	-	-	-	-	-	0
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Emissions	tonnes	0	0	0	0	0	0	0	0	0	0	0
Op10	Public Transport Maintenance	B	Public Transport faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.	Programme	Project	-	-	-	-	-	-	-	-	-	-	0
				Service	%	-	-	-	-	-	-	-	-	-	-	0
				Likelihood	1,2,3,4,5	-	-	-	-	-	-	-	-	-	-	0
				Consequence Cost	$	-	-	-	-	-	-	-	-	-	-	0
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0
Op10	Public Transport Maintenance	C	Public Transport faults are not responded to in a timely manner, proactive maintenance is not done	Programme	Project	-	-	-	-	-	-	-	-	-	-	0
				Service	%	-	-	-	-	-	-	-	-	-	-	0
				Likelihood	1,2,3,4,5	-	-	-	-	-	-	-	-	-	-	0
				Consequence Cost	$	-	-	-	-	-	-	-	-	-	-	0
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	0
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0

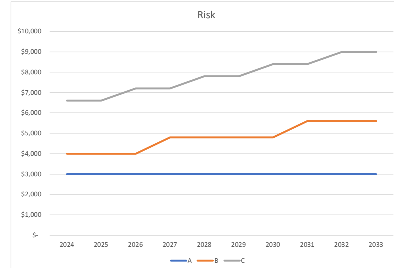





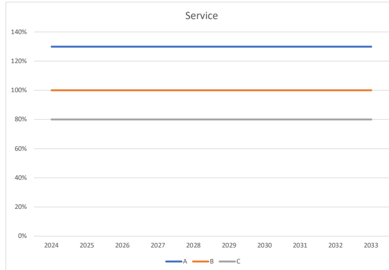


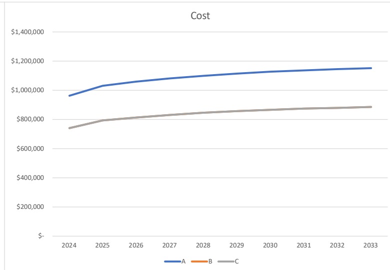


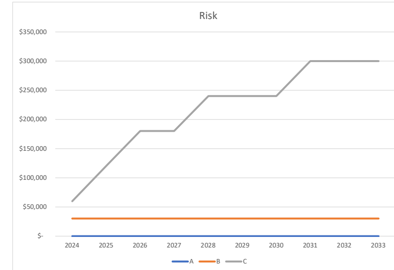


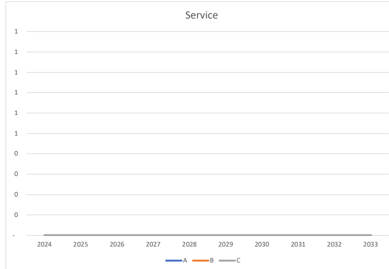


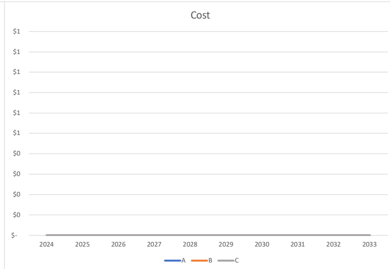


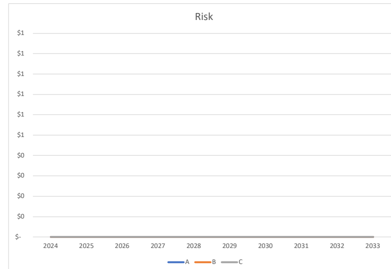












Scenario Map		LoS Grades				
LoS ref	Level of Service	ONE	TWO	THREE	FOUR	FIVE
S01	A safe local transport netwo	A	B	B	C	C
S02	Active Travel	A	B	B	C	C
S03	Connected Network	A	B	B	C	C
S04	Unsealed Roads	A	B	B	C	C
S05	Modal Shift	A	B	B	C	C
S06	Heavy Vehicle Capacity	A	B	B	C	C
S07	Resilient Network	A	B	B	C	C
S08	Heavy Vehicle Access	A	B	B	C	C
S09	Route Availability	A	B	B	C	C
S10	Travel Time Reliability	A	B	B	C	C
T01	Road Surface Condition	A	A	B	B	C
T02	Pavement Condition	A	A	B	B	C
T03	Footpath Condition	A	A	B	B	C
T04	Drainage Condition	A	A	B	B	C
T05	Structures Condition	A	A	B	B	C
T06	Unsealed Roads Condition	A	A	B	B	C
T07	Traffic Services Condition	A	A	B	B	C
T08	Cycleway Condition	A	A	B	B	C
T09	Environmental Asset Condit	A	A	B	B	C
T10	Public Transport Asset Cond	A	A	B	B	C
T11	Smooth Travel Exposure	A	A	B	B	C
Op01	Sealed Pavement Maintenan	A	A	B	B	C
Op02	Unsealed Pavement Mainte	A	A	B	B	C
Op03	Footpath Maintenance	A	A	B	B	C
Op04	Routine Drainage Maintenan	A	A	B	B	C
Op05	Structures Maintenance	A	A	B	B	C
Op06	Network Management	A	A	B	B	C
Op07	Traffic Services Maintenanc	A	A	B	B	C
Op08	Cycle Path Maintenance	A	A	B	B	C
Op09	Environmental Maintenance	A	A	B	B	C
Op10	Public Transport Maintenan	A	A	B	B	C

ONE

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	SERVICE	COST 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	RISK 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	emissions 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
S01A	Reduces the risk of a DSI happening by addressing more known safe	2450594.3	2544634.4	2983408.3	2553951.3	2891650.7	2788846.5	3484373.8	3769783.9	3567539	4417454.2	0	0	0	0	0	0	0	0	0	0	38.4	38.4	40.8	40.8	40.8	40.8	48	50.4	48	57.6
S02A	A substantial improvement in the proportion of active travel trips	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S03A	A significant improvement in network connectivity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S04A	Roads are sealed where population density or land use demands it	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S05A	A significant improvement in passenger numbers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S06A	Much improved capacity for Heavy Vehicles by increasing road qu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S07A	Lifeline routes and their catchment roads will remain open in a 1:1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S08A	Much improved connectivity for HPMV vehicles by increasing brid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S09A	Increased heavy vehicle capacity, reduced pavement maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S10A	Significant improvement in travel time reliability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T01A	Road Surface condition is improved, asset consumption is minimis	2481518.9	2842001.3	2418395.2	2842069	2449908.2	2780468.5	2811709.7	2835741.4	2854966.8	2874192.2	0	0	0	50000	50000	100000	100000	100000	150000	150000	91.2	97.2	81.6	93.6	79.2	87.6	87.6	87.6	87.6	87.6
T02A	Pavement condition is improved, asset consumption is minimised,	2564707.6	4015200.1	3001206	3334989.1	2774876.2	2066192.9	3150239.4	3111162.4	3149162	4093078	0	200000	400000	600000	800000	1000000	1200000	1400000	1600000	1800000	40	112	72	80	64	40	72	70	70	100
T03A	Footpath condition is improved, asset consumption is minimised, a	571848.69	612449.95	628461.71	641614.23	652479.36	661628.93	669062.97	674781.45	679356.24	683933.03	10000	10000	20000	20000	20000	20000	20000	20000	20000	20000	27	27	27	27	27	27	27	27	27	27
T04A	Drainage condition is improved, asset consumption is minimised, a	577296.12	609940.07	466106.46	566765.82	640684.02	579451.99	594033.6	585845.34	598293.24	611752.65	0	0	0	0	0	0	0	0	0	0	24	27.6	19.2	22.8	25.2	22.8	22.8	22.8	22.8	22.8
T05A	Structures condition is improved, asset consumption is minimised	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.5	47.25	60.75	52.65	54	40.5	47.25	60.75	52.65	54
T06A	Unsealed Roads condition is improved, asset consumption is minir	896685.06	1115477	1448168.3	1301685.7	1342919.6	1037464.6	1218588.3	1554903.2	1378255.4	1407652.8	0	0	7500	7500	15000	15000	22500	22500	30000	30000	40.5	47.25	60.75	52.65	54	40.5	47.25	60.75	52.65	54
T07A	Traffic Services condition is improved, asset consumption is minim	165543.74	231216.04	246838.7	222639.81	245610.82	291101.87	236906.94	238931.79	240551.67	242171.54	0	0	0	0	0	8000	8000	8000	8000	8000	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
T08A	Cycleway condition is improved, asset consumption is minimised,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T09A	Environmental Asset condition is improved, asset consumption is r	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T10A	Public Transport Asset condition is improved, asset consumption i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T11A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Op01A	Sealed pavement faults are always responded to in a timely manne	1556608.4	1666968	1713828.3	1730868.9	1773143.9	1785619	1823783.4	1813596.7	1825989.8	1879205.2	150000	150000	150000	180000	180000	195000	195000	210000	210000	225000	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Op02A	Unsealed pavement faults are always responded to in a timely mai	410445.53	439587.16	451079.64	460519.88	468318.35	474885.48	480221.27	484325.72	487609.29	490892.85	50000	50000	50000	60000	60000	65000	65000	70000	70000	75000	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Op03A	Footpath faults are always responded to in a timely manner, proac	52479.215	56205.239	57674.657	58881.679	59878.784	60718.451	61400.681	61925.473	62345.307	62765.141	3000	3000	3000	3600	3600	3900	3900	4200	4200	4500	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635
Op04A	Drainage faults are responded to in a timely manner, proactive ma	1230604.5	1317977.4	1352434.4	1380738.3	1404119.7	1423809.4	1439807.3	1452113.3	1461958.2	1471803	100000	100000	100000	120000	120000	120000	120000	140000	140000	140000	29	29	29	29	29	29	29	29	29	29
Op05A	Structures faults are all responded to in a timely manner, proactive	390991.33	306691.43	314709.5	321295.78	446121.11	331318.37	335041.05	337904.65	464497.7	342486.41	50000	50000	50000	55000	55000	55000	60000	60000	60000	60000	15	15	15	15	15	15	15	15	15	15
Op06A	Additional emphasis is given to collecting and applying good data t	1468018.1	1358706.8	1387099.6	1731520.3	1453797.7	1475749.9	1685446.2	1496987.8	1499430.7	1848063.6	0	0	0	50000	50000	75000	75000	100000	100000	125000	1	1	1	1	1	1	1	1	1	1
Op07A	Network Services faults are all responded to in a timely manner, p	428776.13	459219.24	471224.97	481086.82	489233.57	496093.98	501668.07	505955.83	509386.04	512816.25	0	0	0	0	0	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5
Op08A	Network Services faults are all responded to in a timely manner, p	76969.515	82434.35	84589.497	86359.796	87822.216	89053.729	90054.332	90824.027	91439.784	92055.54	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Op09A	Environmental faults are all responded to in a timely manner, proa	963135.3	1031517.9	1058485.7	1080637.8	1098937.4	1114347.5	1126868.3	1136499.7	1144204.7	1151909.8	0	0	0	0	0	0	0	0	0	0	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8
Op10A	Public Transport faults are responded to in a timely manner, proac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TWO

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	SERVICE	COST 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	RISK 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	emissions 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
S01B	Meet the DIA Mandatory target of 1 DSI saved per year	2042161.9	2120528.6	2486173.6	2128292.8	2409708.9	2324038.8	2903644.8	3141486.6	2972949.2	3681211.8	491600	491600	491600	491600	491600	491600	491600	491600	491600	491600	32	32	34	34	34	34	40	42	40	48
S02B	An improvement in the proportion of active travel trips	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S03B	An improvement in network connectivity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S04B	Roads are sealed where population density or land use demands it	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S05B	A significant improvement in passenger numbers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S06B	Improved capacity for Heavy Vehicles by increasing road quality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S07B	Lifeline routes and their catchment roads will remain open in a 1:1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S08B	Improved connectivity for HPMV vehicles by increasing bridge capacity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S09B	Maintain heavy vehicle capacity, no effect on pavement maintena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S10B	Improvement in travel time reliability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T01A	Road Surface condition is improved, asset consumption is minimis	2481518.9	2842001.3	2418395.2	2842069	2449908.2	2780468.5	2811709.7	2835741.4	2854966.8	2874192.2	0	0	0	50000	50000	100000	100000	100000	150000	150000	91.2	97.2	81.6	93.6	79.2	87.6	87.6	87.6	87.6	87.6
T02A	Pavement condition is improved, asset consumption is minimised,	2564707.6	4015200.1	3001206	3334989.1	2774876.2	2066192.9	3150239.4	3111162.4	3149162	4093078	0	200000	400000	600000	800000	1000000	1200000	1400000	1600000	1800000	40	112	72	80	64	40	72	70	70	100
T03A	Footpath condition is improved, asset consumption is minimised, a	571848.69	612449.95	628461.71	641614.23	652479.36	661628.93	669062.97	674781.45	679356.24	683933.03	10000	10000	20000	20000	20000	20000	20000	20000	20000	20000	27	27	27	27	27	27	27	27	27	27
T04A	Drainage condition is improved, asset consumption is minimised, a	577296.12	609940.07	466106.46	566765.82	640684.02	579451.99	594033.6	585845.34	598293.24	611752.65	0	0	0	0	0	0	0	0	0	0	24	27.6	19.2	22.8	25.2	22.8	22.8	22.8	22.8	22.8
T05A	Structures condition is improved, asset consumption is minimised	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.5	47.25	60.75	52.65	54	40.5	47.25	60.75	52.65	54
T06A	Unsealed Roads condition is improved, asset consumption is minir	896685.06	1115477	1448168.3	1301685.7	1342919.6	1037464.6	1218588.3	1554903.2	1378255.4	1407652.8	0	0	7500	7500	15000	15000	22500	22500	30000	30000	40.5	47.25	60.75	52.65	54	40.5	47.25	60.75	52.65	54
T07A	Traffic Services condition is improved, asset consumption is minim	165543.74	231216.04	246838.7	222639.81	245610.82	291101.87	236906.94	238931.79	240551.67	242171.54	0	0	0	0	0	8000	8000	8000	8000	8000	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
T08A	Cycleway condition is improved, asset consumption is minimised,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T09A	Environmental Asset condition is improved, asset consumption is r	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T10A	Public Transport Asset condition is improved, asset consumption i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T11A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Op01A	Sealed pavement faults are always responded to in a timely manne	1556608.4	1666968	1713828.3	1730868.9	1773143.9	1785619	1823783.4	1813596.7	1825989.8	1879205.2	150000	150000	150000	180000	180000	195000	195000	210000	210000	225000	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Op02A	Unsealed pavement faults are always responded to in a timely mai	410445.53	439587.16	451079.64	460519.88	468318.35	474885.48	480221.27	484325.72	487609.29	490892.85	50000	50000	50000	60000	60000	65000	65000	70000	70000	75000	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Op03A	Footpath faults are always responded to in a timely manner, proac	52479.215	56205.239	57674.657	58881.679	59878.784	60718.451	61400.681	61925.473	62345.307	62765.141	3000	3000	3000	3600	3600	3900	3900	4200	4200	4500	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635
Op04A	Drainage faults are responded to in a timely manner, proactive ma	1230604.5	1317977.4	1352434.4	1380738.3	1404119.7	1423809.4	1439807.3	1452113.3	1461958.2	1471803	100000	100000	100000	120000	120000	120000	120000	140000	140000	140000	29	29	29	29	29	29	29	29	29	29
Op05A	Structures faults are all responded to in a timely manner, proactive	390991.33	306691.43	314709.5	321295.78	446121.11	331318.37	335041.05	337904.65	464497.7	342486.41	50000	50000	50000	55000	55000	55000	60000	60000	60000	60000	15	15	15	15	15	15	15	15	15	15
Op06A	Additional emphasis is given to collecting and applying good data t	1468018.1	1358706.8	1387099.6	1731520.3	1453797.7	1475749.9	1685446.2	1496987.8	1499430.7	1848063.6	0	0	0	50000	50000	75000	75000	100000	100000	125000	1	1	1	1	1	1	1	1	1	1
Op07A	Network Services faults are all responded to in a timely manner, p	428776.13	459219.24	471224.97	481086.82	489233.57	496093.98	501668.07	505955.83	509386.04	512816.25	0	0	0	0	0	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5
Op08A	Network Services faults are all responded to in a timely manner, p	76969.515	82434.35	84589.497	86359.796	87822.216	89053.729	90054.332	90824.027	91439.784	92055.54	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Op09A	Environmental faults are all responded to in a timely manner, proa	963135.3	1031517.9	1058485.7	1080637.8	1098937.4	1114347.5	1126868.3	1136499.7	1144204.7	1151909.8	0	0	0	0	0	0	0	0	0	0	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8
Op10A	Public Transport faults are responded to in a timely manner, proac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

THREE

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	SERVICE	COST 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	RISK 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	emissions 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
S01B	Meet the DIA Mandatory target of 1 DSI saved per year	2042161.9	2120528.6	2486173.6	2128292.8	2409708.9	2324038.8	2903644.8	3141486.6	2972949.2	3681211.8	491600	491600	491600	491600	491600	491600	491600	491600	491600	491600	32	32	34	34	34	34	40	42	40	48
S02B	An improvement in the proportion of active travel trips	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S03B	An improvement in network connectivity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S04B	Roads are sealed where population density or land use demands it	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S05B	A significant improvement in passenger numbers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S06B	Improved capacity for Heavy Vehicles by increasing road quality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S07B	Lifeline routes and their catchment roads will remain open in a 1:1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S08B	Improved connectivity for HPMV vehicles by increasing bridge capacity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S09B	Maintain heavy vehicle capacity, no effect on pavement maintena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S10B	Improvement in travel time reliability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T01B	Road Surface condition is maintained, asset consumption is stabili:	2067932.4	2368334.4	2015329.3	2368390.8	2041590.1	2317057.1	2343091.4	2363117.9	2379139	2395160.1	0	100000	100000	200000	200000	300000	300000	400000	500000	600000	76	81	68	78	66	73	73	73	73	73
T02B	Pavement condition is maintained, asset consumption is stabilised	1282353.8	2007600.1	1500603	1667494.5	1387438.1	1033096.4	1575119.7	1555581.2	1574581	2046539	0	400000	800000	1200000	1600000	2000000	2400000	2800000	3200000	3600000	20	56	36	40	32	20	36	35	35	50
T03B	Footpath condition is maintained, asset consumption is stabilised,	381232.46	408299.96	418974.47	427742.82	434986.24	441085.96	446041.98	449854.3	452904.16	455954.02	15000	15000	30000	30000	45000	45000	60000	60000	75000	75000	18	18	18	18	18	18	18	18	18	18
T04B	Drainage condition is maintained, asset consumption is stabilised,	481080.1	508283.39	388422.05	472304.85	533903.35	482876.66	495028	488204.45	498577.7	509793.88	0	0	0	0	0	0	0	0	0	0	20	23	16	19	21	19	19	19	19	19
T05B	Structures condition is maintained, asset consumption is stabilisec	0	0	0	0	0	0	0	0	0	0	0	15000	30000	45000	60000	75000	90000	105000	120000	135000	30	35	45	39	40	30	35	45	39	40
T06B	Unsealed Roads condition is maintained, asset consumption is stal	664211.15	826279.27	1072717.3	964211.62	994755.27	768492.31	902658.03	1151780.2	1020930	1042705.8	0	15000	30000	45000	60000	75000	90000	105000	120000	135000	30	35	45	39	40	30	35	45	39	40
T07B	Traffic Services condition is maintained, asset consumption is stab	137953.12	192680.04	205698.92	185533.17	204675.69	242584.89	197422.45	199109.82	200459.72	201809.62	0	0	4000	4000	8000	8000	12000	12000	12000	12000	2	2	2	2	2	2	2	2	2	2
T08B	Cycleway condition is maintained, asset consumption is stabilised,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T09B	Environmental Asset condition is maintained, asset consumption i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T10B	Public Transport Asset condition is maintained, asset consumption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T11B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Op01B	Sealed pavement faults are mostly responded to in a timely manne	1197391.1	1282283	1318329.4	1331437.6	1363956.8	1373553.1	1402910.3	1395074.4	1404607.5	1445542.5	300000	300000	325000	375000	425000	450000	500000	550000	600000	650000	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Op02B	Unsealed pavement faults are mostly responded to in a timely ma	315727.33	338143.97	346984.33	354246.06	360244.88	365296.52	369400.98	372558.25	375084.07	377609.89	84000	84000	91000	105000	119000	126000	140000	154000	168000	182000	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Op03B	Footpath faults are mostly responded to in a timely manner, proac	34986.143	37470.159	38449.771	39254.453	39919.189	40478.968	40933.787	41283.649	41563.538	41843.427	6000	6000	6500	7500	8500	9000	10000	11000	12000	13000	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635
Op04B	Drainage faults are mostly responded to in a timely manner, proac	723885.01	775280.84	795549.62	812198.98	825952.79	837534.95	846945.46	854184.31	859975.39	865766.47	150000	150000	165000	165000	165000	165000	180000	180000	180000	195000	29	29	29	29	29	29	29	29	29	29
Op05B	Structures faults are mostly responded to in a timely manner, pro	325826.11	255576.19	262257.92	267746.48	371767.59	276098.65	279200.88	281587.21	387081.42	285405.34	50000	50000	55000	55000	60000	60000	65000	65000	70000	70000	15	15	15	15	15	15	15	15	15	15
Op06B	Current scope of work is maintained for collecting and applying go	1468018.1	1358706.8	1387099.6	1731520.3	1453797.7	1475749.9	1685446.2	1496987.8	1499430.7	1848063.6	0	0	50000	100000	150000	200000	250000	300000	350000	400000	1	1	1	1	1	1	1	1	1	1
Op07B	Network Services faults are mostly responded to in a timely mann	357313.44	382682.7	392687.47	400905.68	407694.64	413411.65	418056.73	421629.86	424488.37	427346.88	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	5	5	5	5	5	5	5	5	5	5
Op08B	Network Services faults are mostly responded to in a timely mann	57014.455	61062.482	62658.887	63970.219	65053.494	65965.725	66706.913	67277.057	67733.173	68189.289	4000	4000	4000	4800	4800	4800	4800	5600	5600	5600	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Op09B	Environmental faults are mostly responded to in a timely manner,	740873.31	793475.31	814219.76	831259.85	845336.44	857190.42	866821.77	874230.5	880157.49	886084.48	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8
Op10B	Public Transport faults are mostly responded to in a timely manne	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FOUR

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	SERVICE	COST 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	RISK 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	emissions 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
S01C	Do not make any safety improvements and thus maintain the sam	1633729.5	1696422.9	1988938.9	1702634.2	1927767.1	1859231	2322915.9	2513189.3	2378359.3	2944969.4	4916000	4916000	4916000	4916000	4916000	4916000	4916000	4916000	4916000	4916000	25.6	25.6	27.2	27.2	27.2	27.2	32	33.6	32	38.4
S02C	Current proportion of active travel trips maintained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S03C	Current network connectivity maintained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S04C	Maintain current length of unsealed road network	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S05C	Current passenger numbers maintained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S06C	No increase in length of HPMV approved routes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S07C	Decreased heavy vehicle capacity, increased pavement maintenan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S08C	No increase in length of HPMV approved routes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S09C	Decreased heavy vehicle capacity, increased pavement maintenan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S10C	No improvement in Travel time reliability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T01B	Road Surface condition is maintained, asset consumption is stabili:	2067932.4	2368334.4	2015329.3	2368390.8	2041590.1	2317057.1	2343091.4	2363117.9	2379139	2395160.1	0	100000	100000	200000	200000	300000	300000	400000	500000	600000	76	81	68	78	66	73	73	73	73	73
T02B	Pavement condition is maintained, asset consumption is stabilised	1282353.8	2007600.1	1500603	1667494.5	1387438.1	1033096.4	1575119.7	1555581.2	1574581	2046539	0	400000	800000	1200000	1600000	2000000	2400000	2800000	3200000	3600000	20	56	36	40	32	20	36	35	35	50
T03B	Footpath condition is maintained, asset consumption is stabilised,	381232.46	408299.96	418974.47	427742.82	434986.24	441085.96	446041.98	449854.3	452904.16	455954.02	15000	15000	30000	30000	45000	45000	60000	60000	75000	75000	18	18	18	18	18	18	18	18	18	18
T04B	Drainage condition is maintained, asset consumption is stabilised,	481080.1	508283.39	388422.05	472304.85	533903.35	482876.66	495028	488204.45	498577.7	509793.88	0	0	0	0	0	0	0	0	0	0	20	23	16	19	21	19	19	19	19	19
T05B	Structures condition is maintained, asset consumption is stabilisec	0	0	0	0	0	0	0	0	0	0	0	15000	30000	45000	60000	75000	90000	105000	120000	135000	30	35	45	39	40	30	35	45	39	40
T06B	Unsealed Roads condition is maintained, asset consumption is stal	664211.15	826279.27	1072717.3	964211.62	994755.27	768492.31	902658.03	1151780.2	1020930	1042705.8	0	15000	30000	45000	60000	75000	90000	105000	120000	135000	30	35	45	39	40	30	35	45	39	40
T07B	Traffic Services condition is maintained, asset consumption is stab	137953.12	192680.04	205698.92	185533.17	204675.69	242584.89	197422.45	199109.82	200459.72	201809.62	0	0	4000	4000	8000	8000	12000	12000	12000	12000	2	2	2	2	2	2	2	2	2	2
T08B	Cycleway condition is maintained, asset consumption is stabilised,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T09B	Environmental Asset condition is maintained, asset consumption i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T10B	Public Transport Asset condition is maintained, asset consumption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T11B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Op01B	Sealed pavement faults are mostly responded to in a timely manne	1197391.1	1282283	1318329.4	1331437.6	1363956.8	1373553.1	1402910.3	1395074.4	1404607.5	1445542.5	300000	300000	325000	375000	425000	450000	500000	550000	600000	650000	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Op02B	Unsealed pavement faults are mostly responded to in a timely ma	315727.33	338143.97	346984.33	354246.06	360244.88	365296.52	369400.98	372558.25	375084.07	377609.89	84000	84000	91000	105000	119000	126000	140000	154000	168000	182000	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Op03B	Footpath faults are mostly responded to in a timely manner, proac	34986.143	37470.159	38449.771	39254.453	39919.189	40478.968	40933.787	41283.649	41563.538	41843.427	6000	6000	6500	7500	8500	9000	10000	11000	12000	13000	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635
Op04B	Drainage faults are mostly responded to in a timely manner, proac	723885.01	775280.84	795549.62	812198.98	825952.79	837534.95	846945.46	854184.31	859975.39	865766.47	150000	150000	165000	165000	165000	165000	180000	180000	180000	195000	29	29	29	29	29	29	29	29	29	29
Op05B	Structures faults are mostly responded to in a timely manner, pro	325826.11	255576.19	262257.92	267746.48	371767.59	276098.65	279200.88	281587.21	387081.42	285405.34	50000	50000	55000	55000	60000	60000	65000	65000	70000	70000	15	15	15	15	15	15	15	15	15	15
Op06B	Current scope of work is maintained for collecting and applying go	1468018.1	1358706.8	1387099.6	1731520.3	1453797.7	1475749.9	1685446.2	1496987.8	1499430.7	1848063.6	0	0	50000	100000	150000	200000	250000	300000	350000	400000	1	1	1	1	1	1	1	1	1	1
Op07B	Network Services faults are mostly responded to in a timely mann	357313.44	382682.7	392687.47	400905.68	407694.64	413411.65	418056.73	421629.86	424488.37	427346.88	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	5	5	5	5	5	5	5	5	5	5
Op08B	Network Services faults are mostly responded to in a timely mann	57014.455	61062.482	62658.887	63970.219	65053.494	65965.725	66706.913	67277.057	67733.173	68189.289	4000	4000	4000	4800	4800	4800	4800	5600	5600	5600	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Op09B	Environmental faults are mostly responded to in a timely manner,	740873.31	793475.31	814219.76	831259.85	845336.44	857190.42	866821.77	874230.5	880157.49	886084.48	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8
Op10B	Public Transport faults are mostly responded to in a timely manne	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FIVE

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	SERVICE	COST 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	RISK 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	emissions 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
S01C	Do not make any safety improvements and thus maintain the sam	1633729.5	1696422.9	1988938.9	1702634.2	1927767.1	1859231	2322915.9	2513189.3	2378359.3	2944969.4	4916000	4916000	4916000	4916000	4916000	4916000	4916000	4916000	4916000	4916000	25.6	25.6	27.2	27.2	27.2	27.2	32	33.6	32	38.4
S02C	Current proportion of active travel trips maintained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S03C	Current network connectivity maintained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S04C	Maintain current length of unsealed road network	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S05C	Current passenger numbers maintained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S06C	No increase in length of HPMV approved routes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S07C	Decreased heavy vehicle capacity, increased pavement maintenan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S08C	No increase in length of HPMV approved routes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S09C	Decreased heavy vehicle capacity, increased pavement maintenan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S10C	No improvement in Travel time reliability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T01C	Pavement condition deteriorates, asset consumption accelerates,	1654345.9	1894667.5	1612263.4	1894712.7	1633272.1	1853645.7	1874473.1	1890494.3	1903311.2	1916128.1	400000	800000	1200000	1600000	2000000	2400000	2800000	3200000	3600000	4000000	60.8	64.8	54.4	62.4	52.8	58.4	58.4	58.4	58.4	58.4
T02C	Pavement condition deteriorates, asset consumption accelerates,	1282353.8	1606080.1	1200482.4	1333995.6	1109950.5	826477.16	1260095.7	1244465	1259664.8	1637231.2	0	1000000	2000000	3000000	4000000	5000000	6000000	7000000	8000000	9000000	20	44.8	28.8	32	25.6	16	28.8	28	28	40
T03C	Footpath condition deteriorates, asset consumption accelerates, a	304985.97	326639.97	335179.58	342194.26	347988.99	352868.77	356833.58	359883.44	362323.33	364763.22	30000	60000	90000	120000	150000	180000	210000	240000	270000	300000	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
T04C	Drainage condition deteriorates, asset consumption accelerates, a	384864.08	406626.71	310737.64	377843.88	427122.68	386301.32	396022.4	390563.56	398862.16	407835.1	0	0	0	0	0	0	0	0	0	0	16	18.4	12.8	15.2	16.8	15.2	15.2	15.2	15.2	15.2
T05C	Structures condition deteriorates, asset consumption accelerates,	0	0	0	0	0	0	0	0	0	0	0	60000	120000	180000	240000	300000	360000	420000	480000	540000	24	28	36	31.2	32	24	28	36	31.2	32
T06C	Unsealed Roads condition deteriorates, asset consumption acceler	531368.92	661023.42	858173.83	771369.3	795804.22	614793.84	722126.42	921424.13	816743.96	834164.63	0	60000	120000	180000	240000	300000	360000	420000	480000	540000	24	28	36	31.2	32	24	28	36	31.2	32
T07C	Traffic Services condition deteriorates, asset consumption accelera	110362.5	154144.03	164559.14	148426.54	163740.55	194067.91	157937.96	159287.86	160367.78	161447.7	4000	4000	8000	8000	12000	12000	16000	16000	20000	20000	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
T08C	Cycleway condition deteriorates, asset consumption accelerates, a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T09C	Environmental Asset condition deteriorates, asset consumption ac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T10C	Public Transport Asset condition deteriorates, asset consumption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T11C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Op01C	Sealed pavement faults are not responded to in a timely manner,	957912.88	1025826.4	1054663.6	1065150.1	1091165.5	1098842.5	1122328.2	1116059.5	1123686	1156434	520000	560000	640000	760000	960000	1200000	1400000	1600000	1800000	2000000	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Op02C	Unsealed pavement faults are not responded to in a timely manne	315727.33	338143.97	346984.33	354246.06	360244.88	365296.52	369400.98	372558.25	375084.07	377609.89	130000	140000	150000	160000	170000	180000	200000	240000	260000	300000	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Op03C	Footpath faults are not responded to in a timely manner, proactiv	34986.143	37470.159	38449.771	39254.453	39919.189	40478.968	40933.787	41283.649	41563.538	41843.427	13000	14000	16000	19000	22000	25000	28000	31000	34000	37000	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635	0.17635
Op04C	Drainage faults are not responded to in a timely manner, proactive	579108.01	620224.67	636439.7	649759.18	660762.23	670027.96	677556.37	683347.45	687980.31	692613.18	275000	275000	300000	325000	350000	375000	400000	425000	450000	475000	29	29	29	29	29	29	29	29	29	29
Op05C	Structures faults are not responded to in a timely manner, proacti	325826.11	255576.19	262257.92	267746.48	371767.59	276098.65	279200.88	281587.21	387081.42	285405.34	77000	84000	84000	98000	98000	112000	112000	126000	126000	140000	15	15	15	15	15	15	15	15	15	15
Op06C	Less emphasis is given to collecting and applying good data to info	1468018.1	1358706.8	1387099.6	1731520.3	1453797.7	1475749.9	1685446.2	1496987.8	1499430.7	1848063.6	0	200000	400000	600000	800000	1000000	1200000	1400000	1600000	1800000	1	1	1	1	1	1	1	1	1	1
Op07C	Network Services faults are not responded to in a timely manner,	285850.75	306146.16	314149.98	320724.55	326155.71	330729.32	334445.38	337303.89	339590.7	341877.5	12000	18000	24000	30000	36000	42000	48000	54000	60000	66000	5	5	5	5	5	5	5	5	5	5
Op08C	Network Services faults are not responded to in a timely manner,	57014.455	61062.482	62658.887	63970.219	65053.494	65965.725	66706.913	67277.057	67733.173	68189.289	6600	6600	7200	7200	7800	7800	8400	8400	9000	9000	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Op09C	Environmental faults are not responded to in a timely manner, prc	740873.31	793475.31	814219.76	831259.85	845336.44	857190.42	866821.77	874230.5	880157.49	886084.48	60000	120000	180000	180000	240000	240000	240000	300000	300000	300000	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8
Op10C	Public Transport faults are not responded to in a timely manner, p	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Strategic Levels of Service

LoS ref	Level of Service	Service Outcom	Risk	Work Category	Performance Metric
S01	A safe local transport network	Safety	DSIs do not reduce / people are injured or killed on the roads	WC 341	Maintain zero DSIs
S02	Active Travel	Health	Health is not improved through active travel	WC 451	% of active travel journeys
S03	Connected Network	Accessibility	Accessibility is adversely impacted	WC 323	% network connected
S04	Unsealed Roads	Liveability	Environmental and health is adversey impacted	WC 325	% network unsealed
S05	Modal Shift	Health	Roads remain congested due to traffic	WC 531	% journeys on public transport
S06	Heavy Vehicle Capacity	Efficiency	Economic growth is inhibited	WC 324	% network available to heavy
S07	Resilient Network	Resilience	Network is disrupted due to weather events	WC 357	% network vulnerable to
S08	Heavy Vehicle Access	Accessibility	Economic growth is inhibited	WC 322	% bridges available to
S09	Route Availability	Accessibility	Routes are not always available	WC 324	% network available during
S10	Travel Time Reliability	Efficiency	Customer travel time delays	WC 421	% network with reliable travel

Edit data in this table

Enter data to green cells

Costs used include 4.9% admin and BERL inflation

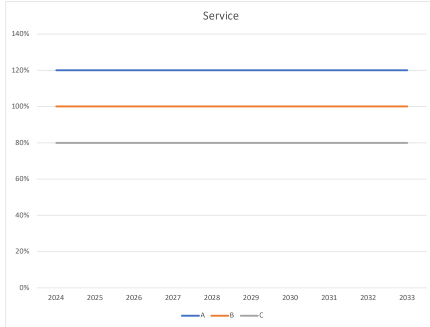
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S01	A safe local transport network provided for users and the community			Rate	$ per Sum	$ 2,042,162	$ 2,120,529	$ 2,486,174	$ 2,128,293	$ 2,409,709	$ 2,324,039	$ 2,903,645	$ 3,141,487	$ 2,972,949	$ 3,681,212	
	341			Emissions	tonnes/Sum	32	32	34	34	34	34	40	42	40	48	
S01	A safe local transport ne	A	Reduces the risk of a DSI happening by addressing more kown safety issues.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	1.20
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000
				Cost	$	$ 2,450,594.26	$ 2,544,634.37	$ 2,983,408.31	$ 2,553,951.33	$ 2,891,650.71	$ 2,788,846.52	$ 3,484,373.81	$ 3,769,783.88	$ 3,567,539.01	$ 4,417,454.17	$ 3,145,224
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	38.4	38.4	40.8	40.8	40.8	40.8	48	50.4	48	57.6	44
S01	A safe local transport ne	B	Meet the DIA Mandatory target of 1 DSI saved per year	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1.00
				Likelihood	1,2,3,4,5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.10
				Consequence Cost	$	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000
				Cost	$	$ 2,042,162	$ 2,120,529	$ 2,486,174	$ 2,128,293	$ 2,409,709	$ 2,324,039	$ 2,903,645	$ 3,141,487	$ 2,972,949	$ 3,681,212	$ 2,621,020
				Risk Cost	$	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600	$ 491,600
				Emssions	tonnes	32	32	34	34	34	34	40	42	40	48	37
S01	A safe local transport ne	C	Do not make any safety improvements and thus maintain the same current risk profile.	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	0.80
				Likelihood	1,2,3,4,5	1	1	1	1	1	1	1	1	1	1	1.00
				Consequence Cost	$	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000
				Cost	$	1,633,730	1,696,423	1,988,939	1,702,634	1,927,767	1,859,231	2,322,916	2,513,189	2,378,359	2,944,969	$ 2,096,816
				Risk Cost	$	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000	$ 4,916,000
				Emssions	tonnes	26	26	27	27	27	27	32	34	32	38	30

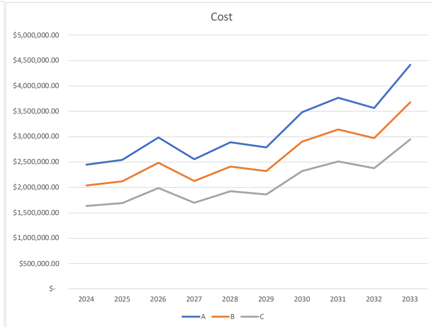
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S02	Active Travel			Rate	$ per km	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/km	-	-	-	-	-	400	-	-	-	-	
S02	Active Travel	A	A substantial improvement in the proportion of active travel trips	Programme	km	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S02	Active Travel	B	An improvement in the proportion of active travel trips	Programme	km	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S02	Active Travel	C	Current proportion of active travel trips maintained	Programme	km	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

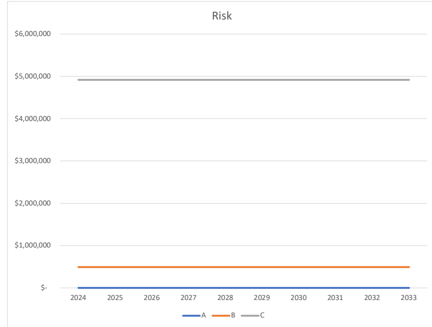
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S03	Connected Network			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
S03	Connected Network	A	A significant improvement in network connectivity	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S03	Connected Network	B	An improvement in network connectivity	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S03	Connected Network	C	Current network connectivity maintained	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

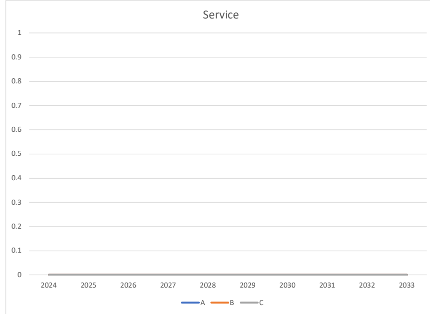
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S04	Unsealed Roads			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
S04	Unsealed Roads	A	Roads are sealed where population density or land use demands it on least life cycle cost basis, or where dust is causing harm	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S04	Unsealed Roads	B	Roads are sealed where population density or land use demands it on least life cycle cost basis	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S04	Unsealed Roads	C	Maintain current length of unsealed road network	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

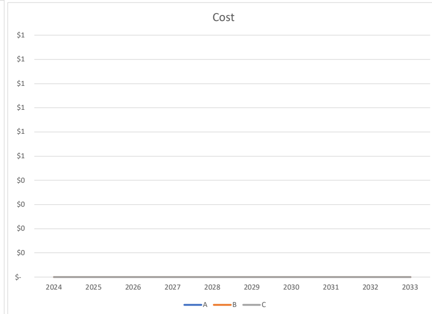
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S05	Modal Shift			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
S05	Modal Shift	A	A significant improvement in passenger numbers	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S05	Modal Shift	B	A significant improvement in passenger numbers	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S05	Modal Shift	C		Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

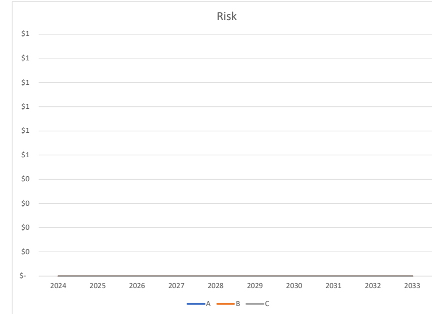


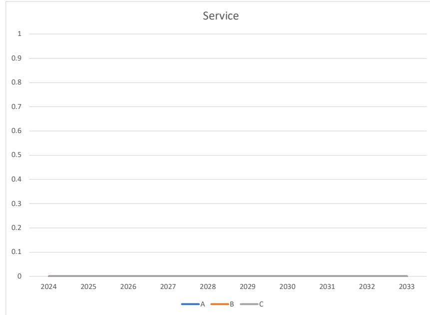


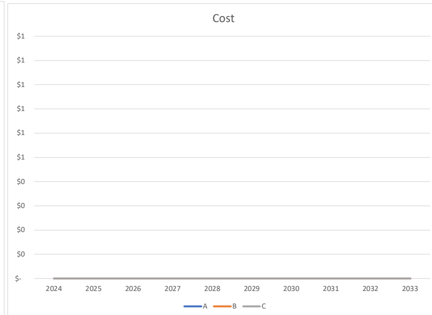


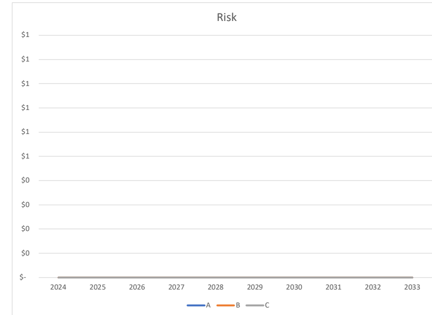


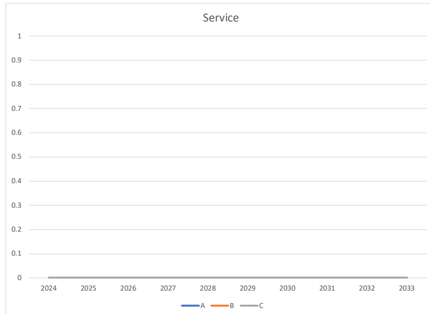


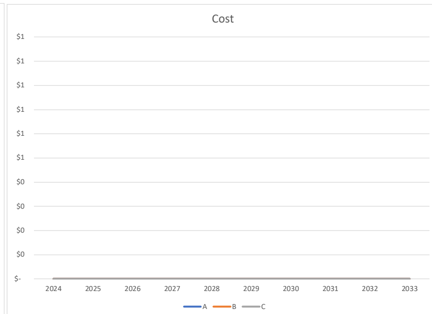


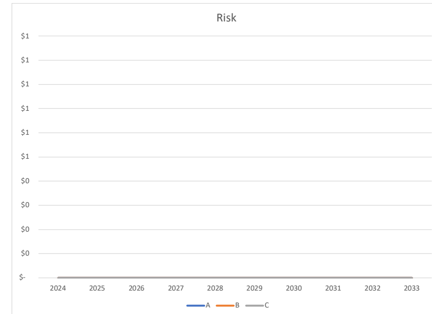




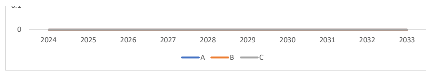
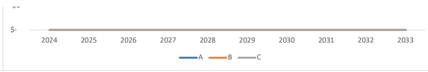
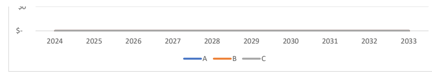




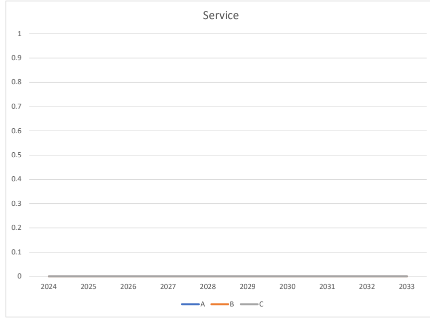


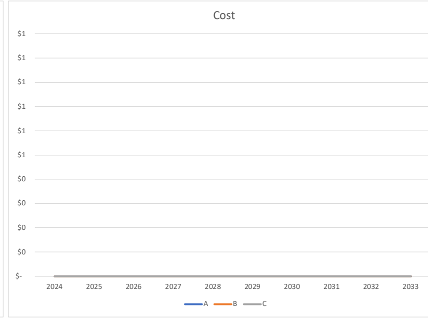


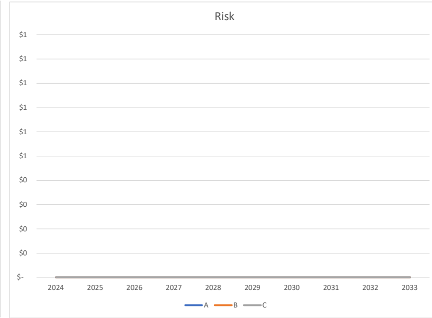
			Current passenger numbers maintained	Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

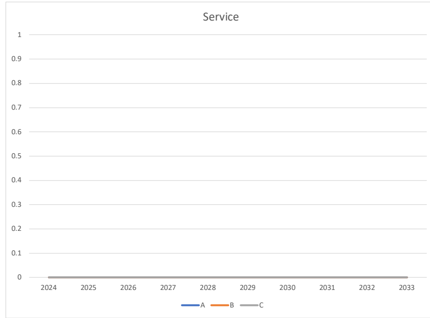
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S06	**Heavy Vehicle Capacity**			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
S06	Heavy Vehicle Capacity	A	Much improved capacity for Heavy Vehicles by increasing road quality	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S06	Heavy Vehicle Capacity	B	Improved capacity for Heavy Vehicles by increasing road quality	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S06	Heavy Vehicle Capacity	C	No increase in length of HPMV approved routes	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

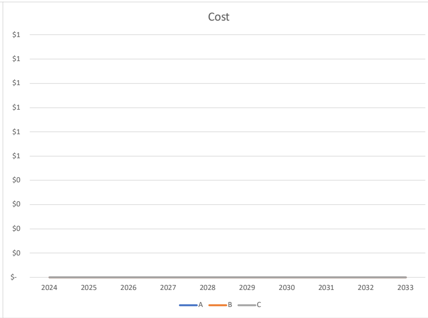


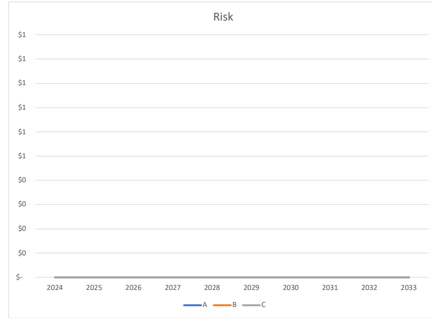




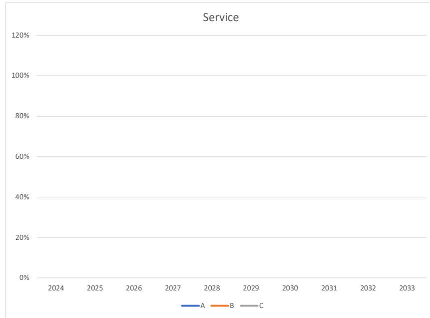
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S07	**Resilient Network**			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
S07	Resilient Network	A	Lifeline routes and their catchment roads will remain open in a 1:100 year flood event	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S07	Resilient Network	B	Lifeline routes and their catchment roads will remain open in a 1:100 year flood event	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S07	Resilient Network	C	Decreased heavy vehicle capacity, increased pavement maintenance expenditure, and worsening road user comfort	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

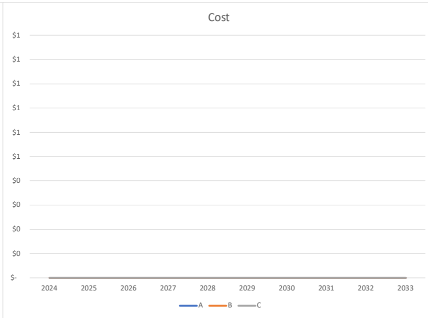


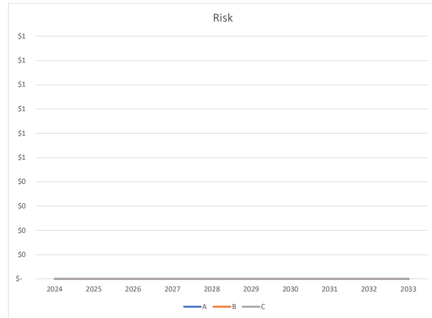




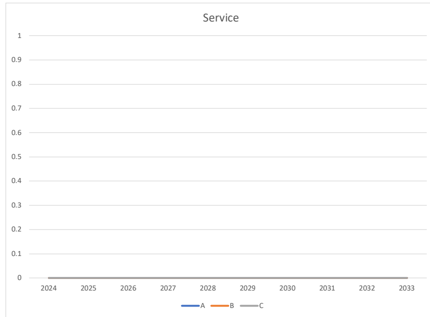
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S08	**Heavy Vehicle Access**			Rate	$ per Sum	$ -	$ -	$ -	$ -		$ -	$ -	$ -	$ -	$ -	
	322			Emissions	tonnes/Sum	-	-	-	-	-	-	-	-	-	-	
S08	Heavy Vehicle Access	A	Much improved connectivity for HPMV vehicles by increasing bridge capacity	Programme	Sum											0.00
				Service	%											0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S08	Heavy Vehicle Access	B	Improved connectivity for HPMV vehicles by increasing bridge capacity	Programme	Sum											0.00
				Service	%											0.00
				Likelihood	1,2,3,4,5											0.00
				Consequence Cost	$											$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S08	Heavy Vehicle Access	C	No increase in length of HPMV approved routes	Programme	Sum											0.00
				Service	%											0.00
				Likelihood	1,2,3,4,5											0.00
				Consequence Cost	$											$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

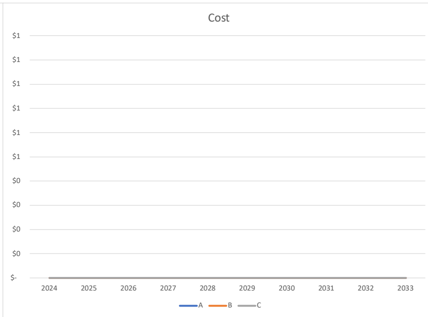


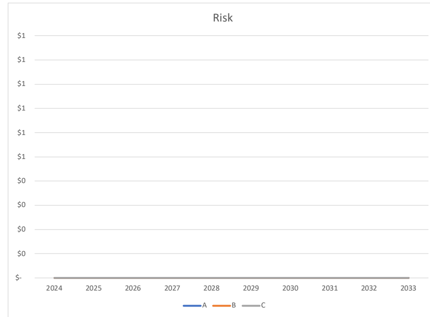




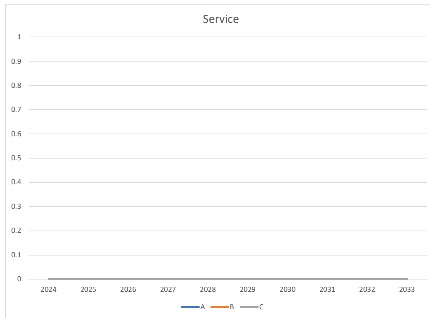
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S09	**Route Availability**			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
S09	Route Availability	A	Increased heavy vehicle capacity, reduced pavement maintenance expenditure, increased road user comfort	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S09	Route Availability	B	Maintain heavy vehicle capacity, no effect on pavement maintenance expenditure or road user comfort	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S09	Route Availability	C	Decreased heavy vehicle capacity, increased pavement maintenance expenditure, and worsening road user comfort	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0

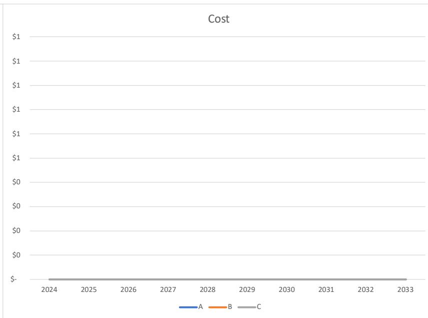


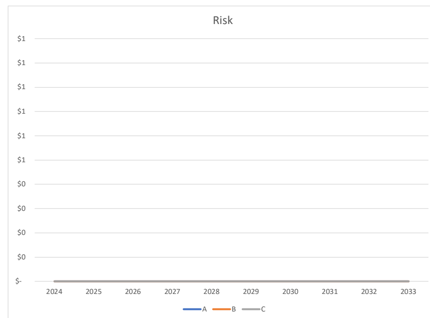




LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
S10	**Travel Time Reliability**			Rate	$ per Project	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
				Emissions	tonnes/Project	-	-	-	-	-	-	-	-	-	-	
S10	Travel Time Reliability	A	Significant improvement in travel time reliability	Programme	Project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	0	0	0	0	0	0	0	0	0	0	0
S10	Travel Time Reliability	B	Improvement in travel time reliability	Programme	Project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0
S10	Travel Time Reliability	C	No improvement in Travel time reliability	Programme	Project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emssions	tonnes	-	-	-	-	-	-	-	-	-	-	0



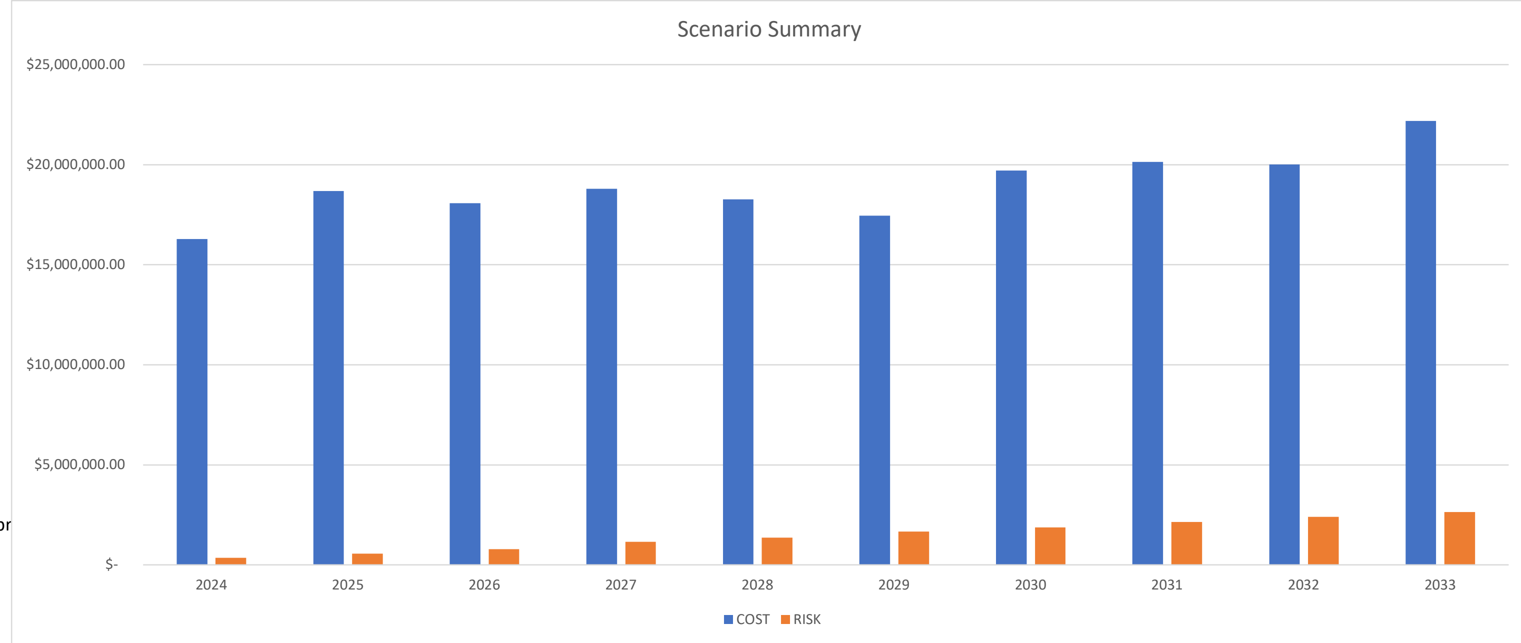




SCENARIO

ONE	SERVICE
A safe local transport network pro	Reduces the risk of a DSI happening by addressing more kown safety issues.
Active Travel	A substantial improvement in the proportion of active travel trips
Connected Network	A significant improvement in network connectivity
Unsealed Roads	Roads are sealed where population density or land use demands it on least life cycle cost basis, or where dust is causing harm
Modal Shift	A significant improvement in passenger numbers
Heavy Vehicle Capacity	Much improved capacity for Heavy Vehicles by increasing road quality
Resilient Network	Lifeline routes and their catchment roads will remain open in a 1:100 year flood event
Heavy Vehicle Access	Much improved connectivity for HPMV vehicles by increasing bridge capacity
Route Availability	Increased heavy vehicle capacity, reduced pavement maintenance expenditure, increased road user comfort
Travel Time Reliability	Significant improvement in travel time reliability
Road Surface Condition	Road Surface condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Pavement Condition	Pavement condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Footpath Condition	Footpath condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Drainage Condition	Drainage condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Structures Condition	Structures condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Unsealed Roads Condition	Unsealed Roads condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Traffic Services Condition	Traffic Services condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Cycleway Condition	Cycleway condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Environmental Asset Condition	Environmental Asset condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Public Transport Asset Condition	Public Transport Asset condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Smooth Travel Exposure	0
Sealed Pavement Maintenance	Sealed pavement faults are always responded to in a timely manner, proactive maintenance is enabled.
Unsealed Pavement Maintenance	Unsealed pavement faults are always responded to in a timely manner, proactive maintenance is enabled.
Footpath Maintenance	Footpath faults are always responded to in a timely manner, proactive maintenance is enabled.
Routine Drainage Maintenance	Drainage faults are responded to in a timely manner, proactive maintenance is enabled.
Structures Maintenance	Structures faults are all responded to in a timely manner, proactive maintenance is enabled.
Network Management	Additional emphasis is given to collecting and applying good data to better inform asset management decision making, forward works pr
Traffic Services Maintenance	Network Services faults are all responded to in a timely manner, proactive maintenance is enabled.
Cycle Path Maintenance	Network Services faults are all responded to in a timely manner, proactive maintenance is enabled.
Environmental Maintenance	Environmental faults are all responded to in a timely manner, proactive maintenance is enabled.
Public Transport Maintenance	Public Transport faults are responded to in a timely manner, proactive maintenance is enabled.

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
COST	$ 16,286,222.35	$ 18,690,226.32	$ 18,083,710.93	$ 18,795,624.18	$ 18,279,501.67	$ 17,456,751.16	$ 19,709,205.28	$ 20,151,282.71	$ 20,014,985.98	$ 22,182,230.22
RISK	$ 366,000.00	$ 566,000.00	$ 783,500.00	$ 1,149,100.00	$ 1,356,600.00	$ 1,659,900.00	$ 1,872,400.00	$ 2,137,700.00	$ 2,395,200.00	$ 2,640,500.00
EMISSIONS	537.56	632.66	598.06	605.46	580.16	535.16	587.86	615.26	596.66	638.96



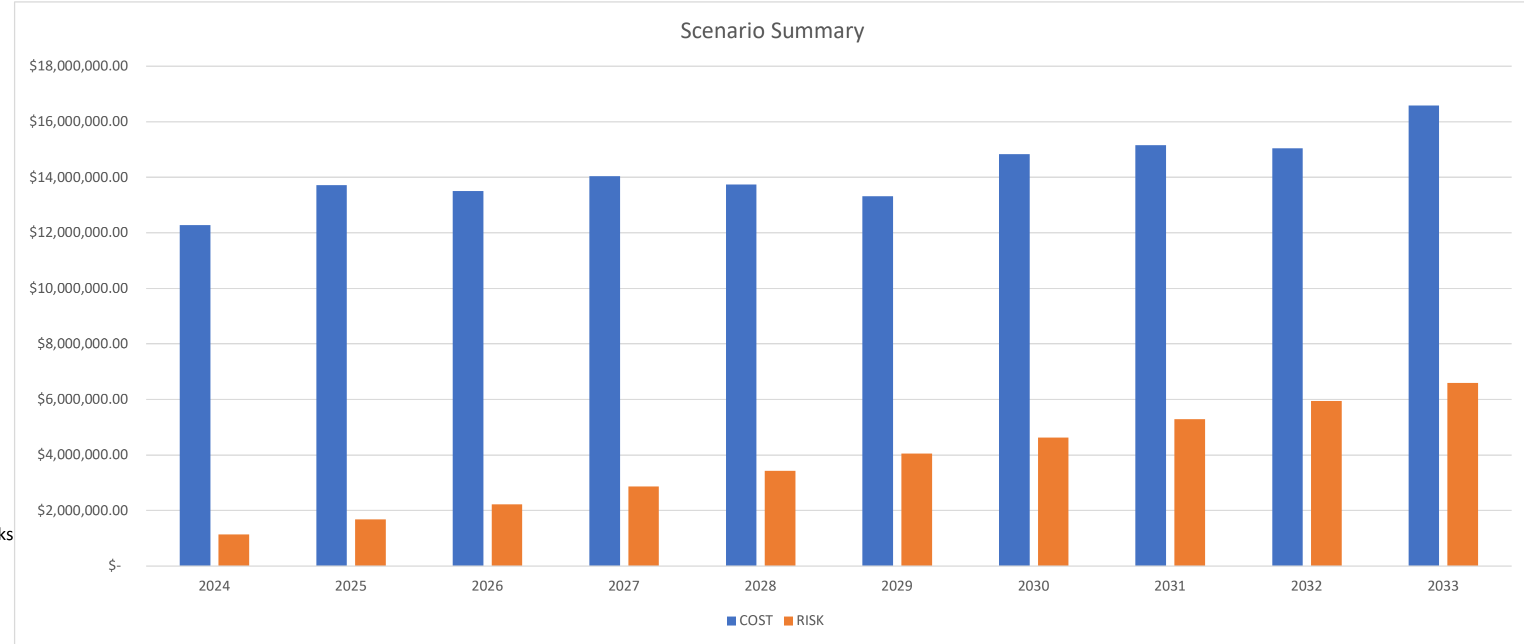
TWO	SERVICE
A safe local transport network pro	Meet the DIA Mandatory target of 1 DSI saved per year
Active Travel	An improvement in the proportion of active travel trips
Connected Network	An improvement in network connectivity
Unsealed Roads	Roads are sealed where population density or land use demands it on least life cycle cost basis
Modal Shift	A significant improvement in passenger numbers
Heavy Vehicle Capacity	Improved capacity for Heavy Vehicles by increasing road quality
Resilient Network	Lifeline routes and their catchment roads will remain open in a 1:100 year flood event
Heavy Vehicle Access	Improved connectivity for HPMV vehicles by increasing bridge capacity
Route Availability	Maintain heavy vehicle capacity, no effect on pavement maintenance expenditure or road user comfort
Travel Time Reliability	Improvement in travel time reliability
Road Surface Condition	Road Surface condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Pavement Condition	Pavement condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Footpath Condition	Footpath condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Drainage Condition	Drainage condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Structures Condition	Structures condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Unsealed Roads Condition	Unsealed Roads condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Traffic Services Condition	Traffic Services condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Cycleway Condition	Cycleway condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Environmental Asset Condition	Environmental Asset condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Public Transport Asset Condition	Public Transport Asset condition is improved, asset consumption is minimised, and effective asset stewardship is applied
Smooth Travel Exposure	0
Sealed Pavement Maintenance	Sealed pavement faults are always responded to in a timely manner, proactive maintenance is enabled.
Unsealed Pavement Maintenance	Unsealed pavement faults are always responded to in a timely manner, proactive maintenance is enabled.
Footpath Maintenance	Footpath faults are always responded to in a timely manner, proactive maintenance is enabled.
Routine Drainage Maintenance	Drainage faults are responded to in a timely manner, proactive maintenance is enabled.
Structures Maintenance	Structures faults are all responded to in a timely manner, proactive maintenance is enabled.
Network Management	Additional emphasis is given to collecting and applying good data to better inform asset management decision making, forward works pr
Traffic Services Maintenance	Network Services faults are all responded to in a timely manner, proactive maintenance is enabled.
Cycle Path Maintenance	Network Services faults are all responded to in a timely manner, proactive maintenance is enabled.
Environmental Maintenance	Environmental faults are all responded to in a timely manner, proactive maintenance is enabled.
Public Transport Maintenance	Public Transport faults are responded to in a timely manner, proactive maintenance is enabled.

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
COST	$ 15,877,789.97	$ 18,266,120.59	$ 17,586,476.21	$ 18,369,965.63	$ 17,797,559.89	$ 16,991,943.41	$ 19,128,476.32	$ 19,522,985.40	$ 19,420,396.15	$ 21,445,987.86
RISK	$ 857,600.00	$ 1,057,600.00	$ 1,275,100.00	$ 1,640,700.00	$ 1,848,200.00	$ 2,151,500.00	$ 2,364,000.00	$ 2,629,300.00	$ 2,886,800.00	$ 3,132,100.00
EMISSIONS	531.15635	626.25635	591.25635	598.65635	573.35635	528.35635	579.85635	606.85635	588.65635	629.35635

THREE	SERVICE
A safe local transport network pro	Meet the DIA Mandatory target of 1 DSI saved per year
Active Travel	An improvement in the proportion of active travel trips
Connected Network	An improvement in network connectivity
Unsealed Roads	Roads are sealed where population density or land use demands it on least life cycle cost basis

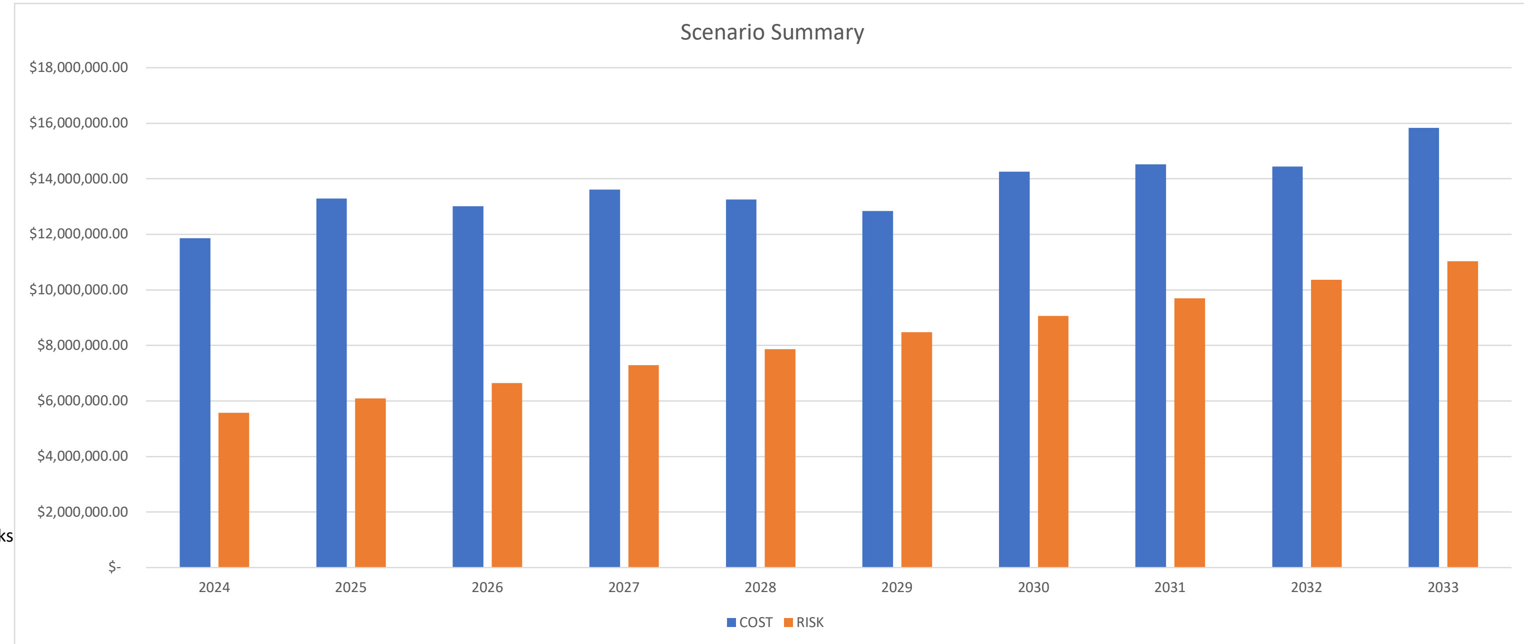
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
COST	$ 12,277,959.86	$ 13,716,687.22	$ 13,506,155.50	$ 14,046,510.25	$ 13,740,781.30	$ 13,314,511.94	$ 14,839,429.39	$ 15,153,947.40	$ 15,039,662.44	$ 16,579,026.12
RISK	$ 1,142,600.00	$ 1,672,600.00	$ 2,224,100.00	$ 2,869,900.00	$ 3,438,900.00	$ 4,051,400.00	$ 4,635,400.00	$ 5,281,200.00	$ 5,946,200.00	$ 6,606,200.00
EMISSIONS	461.43635	515.43635	497.43635	502.43635	486.43635	459.43635	491.43635	512.43635	498.43635	523.43635

Modal Shift	A significant improvement in passenger numbers
Heavy Vehicle Capacity	Improved capacity for Heavy Vehicles by increasing road quality
Resilient Network	Lifeline routes and their catchment roads will remain open in a 1:100 year flood event
Heavy Vehicle Access	Improved connectivity for HPMV vehicles by increasing bridge capacity
Route Availability	Maintain heavy vehicle capacity, no effect on pavement maintenance expenditure or road user comfort
Travel Time Reliability	Improvement in travel time reliability
Road Surface Condition	Road Surface condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Pavement Condition	Pavement condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Footpath Condition	Footpath condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Drainage Condition	Drainage condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Structures Condition	Structures condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Unsealed Roads Condition	Unsealed Roads condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Traffic Services Condition	Traffic Services condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Cycleway Condition	Cycleway condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Environmental Asset Condition	Environmental Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Public Transport Asset Condition	Public Transport Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Smooth Travel Exposure	0
Sealed Pavement Maintenance	Sealed pavement faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Unsealed Pavement Maintenance	Unsealed pavement faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Footpath Maintenance	Footpath faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Routine Drainage Maintenance	Drainage faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Structures Maintenance	Structures faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Network Management	Current scope of work is maintained for collecting and applying good data to inform asset management decision making, forward works
Traffic Services Maintenance	Network Services faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Cycle Path Maintenance	Network Services faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Environmental Maintenance	Environmental faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Public Transport Maintenance	Public Transport faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.



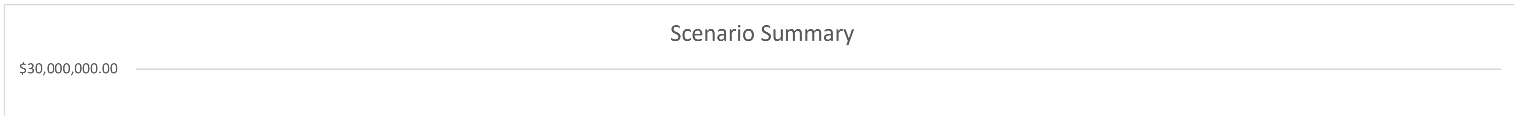
FOUR	SERVICE
A safe local transport network prov	Do not make any safety improvements and thus maintain the same current risk profile.
Active Travel	Current proportion of active travel trips maintained
Connected Network	Current network connectivity maintained
Unsealed Roads	Maintain current length of unsealed road network
Modal Shift	Current passenger numbers maintained
Heavy Vehicle Capacity	No increase in length of HPMV approved routes
Resilient Network	Decreased heavy vehicle capacity, increased pavement maintenance expenditure, and worsening road user comfort
Heavy Vehicle Access	No increase in length of HPMV approved routes
Route Availability	Decreased heavy vehicle capacity, increased pavement maintenance expenditure, and worsening road user comfort
Travel Time Reliability	No improvement in Travel time reliability
Road Surface Condition	Road Surface condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Pavement Condition	Pavement condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Footpath Condition	Footpath condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Drainage Condition	Drainage condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Structures Condition	Structures condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Unsealed Roads Condition	Unsealed Roads condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Traffic Services Condition	Traffic Services condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Cycleway Condition	Cycleway condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Environmental Asset Condition	Environmental Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Public Transport Asset Condition	Public Transport Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Smooth Travel Exposure	0
Sealed Pavement Maintenance	Sealed pavement faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Unsealed Pavement Maintenance	Unsealed pavement faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Footpath Maintenance	Footpath faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Routine Drainage Maintenance	Drainage faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Structures Maintenance	Structures faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Network Management	Current scope of work is maintained for collecting and applying good data to inform asset management decision making, forward works
Traffic Services Maintenance	Network Services faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Cycle Path Maintenance	Network Services faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Environmental Maintenance	Environmental faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.
Public Transport Maintenance	Public Transport faults are mostly responded to in a timely manner, proactive maintenance is partially enabled.

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
COST	$ 11,869,527.48	$ 13,292,581.49	$ 13,008,920.78	$ 13,620,851.70	$ 13,258,839.51	$ 12,849,704.18	$ 14,258,700.43	$ 14,525,650.09	$ 14,445,072.61	$ 15,842,783.76
RISK	$ 5,567,000.00	$ 6,097,000.00	$ 6,648,500.00	$ 7,294,300.00	$ 7,863,300.00	$ 8,475,800.00	$ 9,059,800.00	$ 9,705,600.00	$ 10,370,600.00	$ 11,030,600.00
EMISSIONS	455.03635	509.03635	490.63635	495.63635	479.63635	452.63635	483.43635	504.03635	490.43635	513.83635

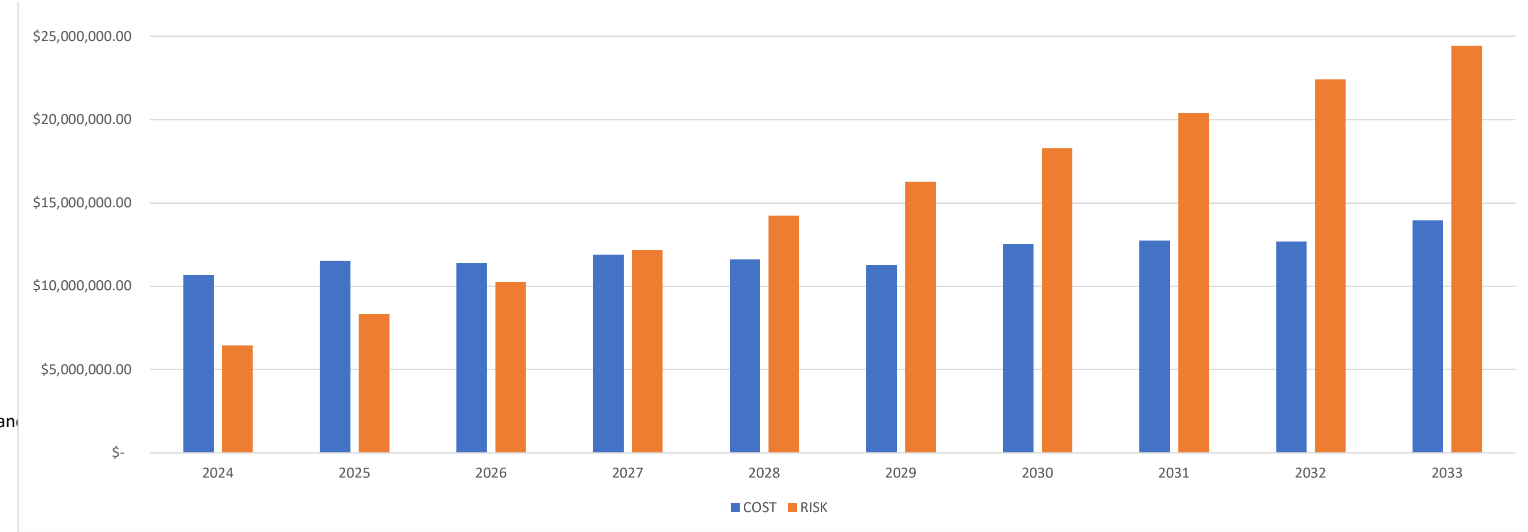


FIVE	SERVICE
A safe local transport network prov	Do not make any safety improvements and thus maintain the same current risk profile.
Active Travel	Current proportion of active travel trips maintained
Connected Network	Current network connectivity maintained
Unsealed Roads	Maintain current length of unsealed road network
Modal Shift	Current passenger numbers maintained
Heavy Vehicle Capacity	No increase in length of HPMV approved routes
Resilient Network	Decreased heavy vehicle capacity, increased pavement maintenance expenditure, and worsening road user comfort
Heavy Vehicle Access	No increase in length of HPMV approved routes
Route Availability	Decreased heavy vehicle capacity, increased pavement maintenance expenditure, and worsening road user comfort
Travel Time Reliability	No improvement in Travel time reliability

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
COST	$ 10,667,327.73	$ 11,542,236.75	$ 11,387,258.46	$ 11,894,807.68	$ 11,619,848.90	$ 11,267,765.58	$ 12,533,245.62	$ 12,749,942.82	$ 12,681,940.04	$ 13,964,660.10
RISK	$ 6,443,600.00	$ 8,317,600.00	$ 10,255,200.00	$ 12,183,200.00	$ 14,241,800.00	$ 16,289,800.00	$ 18,298,400.00	$ 20,396,400.00	$ 22,405,000.00	$ 24,443,000.00
EMISSIONS	419.83635	459.03635	444.63635	448.63635	435.83635	414.23635	439.83635	456.63635	445.43635	465.43635



Road Surface Condition	Pavement condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Pavement Condition	Pavement condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Footpath Condition	Footpath condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Drainage Condition	Drainage condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Structures Condition	Structures condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Unsealed Roads Condition	Unsealed Roads condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Traffic Services Condition	Traffic Services condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Cycleway Condition	Cycleway condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Environmental Asset Condition	Environmental Asset condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Public Transport Asset Condition	Public Transport Asset condition deteriorates, asset consumption accelerates, and asset stewardship is poor	
Smooth Travel Exposure		0
Sealed Pavement Maintenance	Sealed pavement faults are not responded to in a timely manner, proactive maintenance is not done	
Unsealed Pavement Maintenance	Unsealed pavement faults are not responded to in a timely manner, proactive maintenance is not done	
Footpath Maintenance	Footpath faults are not responded to in a timely manner, proactive maintenance is not done	
Routine Drainage Maintenance	Drainage faults are not responded to in a timely manner, proactive maintenance is not done	
Structures Maintenance	Structures faults are not responded to in a timely manner, proactive maintenance is not done	
Network Management	Less emphasis is given to collecting and applying good data to inform asset management decision making, forward works programme an	
Traffic Services Maintenance	Network Services faults are not responded to in a timely manner, proactive maintenance is not done	
Cycle Path Maintenance	Network Services faults are not responded to in a timely manner, proactive maintenance is not done	
Environmental Maintenance	Environmental faults are not responded to in a timely manner, proactive maintenance is not done	
Public Transport Maintenance	Public Transport faults are not responded to in a timely manner, proactive maintenance is not done	



Tactical Levels of Service

LoS ref	Level of Service	Service Outcome	Risk	Work Category	Performance Metric
T01	Road Surface Condition	Safety	Contribution to DSIs from road condition	WC 212	% Fair, Good or Very Good
T02	Pavement Condition	Service Sustainability	Life cycle costs increase	WC 214	% Fair, Good or Very Good
T03	Footpath Condition	Health	Trip Hazards	WC 225	% Fair, Good or Very Good
T04	Drainage Condition	Environmental Sustainability	Road condition is adversely affected	WC 213	% Fair, Good or Very Good
T05	Structures Condition	Service Sustainability	Roads closed due to structures	WC 216	% Fair, Good or Very Good
T06	Unsealed Roads Condition	Liveability	Access restricted	WC 211	% Fair, Good or Very Good
T07	Traffic Services Condition	Risk	Safety impacted	WC 222	% Fair, Good or Very Good
T08	Cycleway Condition	Health	Active travel discouraged	WC224	% Fair, Good or Very Good
T09	Environmental Asset Condition	Environmental Sustainability	Water quality is not managed at source	WC 221	% Fair, Good or Very Good
T10	Public Transport Asset Condition	Liveability	Public transport use decreases	WC 534	% Fair, Good or Very Good
T11	Smooth Travel Exposure	Efficiency	Vehicle user costs increase	WC214	% Fair, Good or Very Good

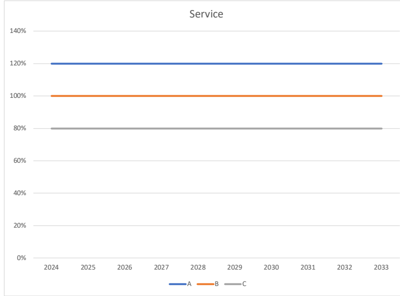
Edit data in this table

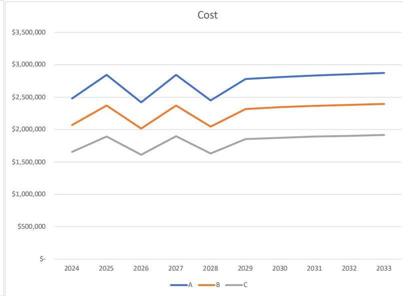
Alternate for WC 214

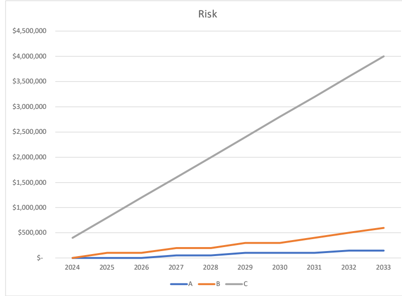
Enter data to green cells

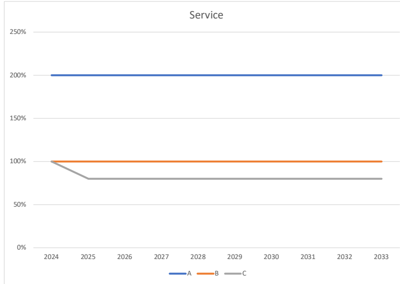
Costs used include 4.9% admin and BERL inflation

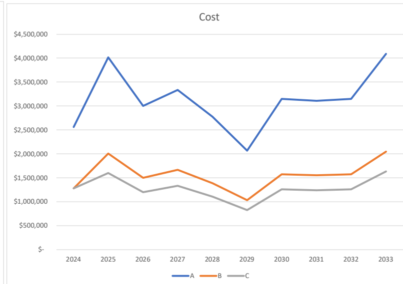
LoS ref	Level of Service	Option	Benefits/Consequences	Factor	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Avg
T01	**Road Surface Condition**			Rate	$ per sum	$ 2,067,932	$ 2,368,334	$ 2,015,329	$ 2,368,391	$ 2,041,590	$ 2,317,057	$ 2,343,091	$ 2,363,118	$ 2,379,139	$ 2,395,160	
	212			Emissions	tonnes/sum	76	81	68	78	66	73	73	73	73	73	
T01	Road Surface Condition	A	Road Surface condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	**1.20**
				Likelihood	1,2,3,4,5	0	0	0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.14
				Consequence Cost	$	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000
				Cost	$	$ 2,481,519	$ 2,842,001	$ 2,418,395	$ 2,842,069	$ 2,449,908	$ 2,780,469	$ 2,811,710	$ 2,835,741	$ 2,854,967	$ 2,874,192	**$ 2,719,097**
				Risk Cost	$	$ -	$ -	$ -	$ 50,000	$ 50,000	$ 100,000	$ 100,000	$ 100,000	$ 150,000	$ 150,000	**$ 70,000**
				Emissions	tonnes	91.2	97.2	81.6	93.6	79.2	87.6	87.6	87.6	87.6	87.6	**88**
T01	Road Surface Condition	B	Road Surface condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**1.00**
				Likelihood	1,2,3,4,5	0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.27
				Consequence Cost	$	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
				Cost	$	$ 2,067,932	$ 2,368,334	$ 2,015,329	$ 2,368,391	$ 2,041,590	$ 2,317,057	$ 2,343,091	$ 2,363,118	$ 2,379,139	$ 2,395,160	**$ 2,265,914**
				Risk Cost	$	$ -	$ 100,000	$ 100,000	$ 200,000	$ 200,000	$ 300,000	$ 300,000	$ 400,000	$ 500,000	$ 600,000	**$ 270,000**
				Emissions	tonnes	76	81	68	78	66	73	73	73	73	73	**73**
T01	Road Surface Condition	C	Pavement condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	**0.80**
				Likelihood	1,2,3,4,5	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2	1.10
				Consequence Cost	$	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000
				Cost	$	$ 1,654,346	$ 1,894,668	$ 1,612,263	$ 1,894,713	$ 1,633,272	$ 1,853,646	$ 1,874,473	$ 1,890,494	$ 1,903,311	$ 1,916,128	**$ 1,812,731**
				Risk Cost	$	$ 400,000	$ 800,000	$ 1,200,000	$ 1,600,000	$ 2,000,000	$ 2,400,000	$ 2,800,000	$ 3,200,000	$ 3,600,000	$ 4,000,000	**$ 2,200,000**
				Emissions	tonnes	61	65	54	62	53	58	58	58	58	58	**59**
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T02	**Pavement Condition**			Rate	$ per Sum	$ 1,282,354	$ 2,007,600	$ 1,500,603	$ 1,667,495	$ 1,387,438	$ 1,033,096	$ 1,575,120	$ 1,555,581	$ 1,574,581	$ 2,046,539	
	214			Emissions	tonnes/Sum	20	56	36	40	32	20	36	35	35	50	
T02	Pavement Condition	A	Pavement condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	**2.00**
				Likelihood	1,2,3,4,5	0	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	0.90
				Consequence Cost	$	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
				Cost	$	$ 2,564,708	$ 4,015,200	$ 3,001,206	$ 3,334,989	$ 2,774,876	$ 2,066,193	$ 3,150,239	$ 3,111,162	$ 3,149,162	$ 4,093,078	**$ 3,126,081**
				Risk Cost	$	$ -	$ 200,000	$ 400,000	$ 600,000	$ 800,000	$ 1,000,000	$ 1,200,000	$ 1,400,000	$ 1,600,000	$ 1,800,000	**$ 900,000**
				Emissions	tonnes	40	112	72	80	64	40	72	70	70	100	**72**
T02	Pavement Condition	B	Pavement condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**1.00**
				Likelihood	1,2,3,4,5	0	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	0.90
				Consequence Cost	$	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000
				Cost	$	$ 1,282,354	$ 2,007,600	$ 1,500,603	$ 1,667,495	$ 1,387,438	$ 1,033,096	$ 1,575,120	$ 1,555,581	$ 1,574,581	$ 2,046,539	**$ 1,563,041**
				Risk Cost	$	$ -	$ 400,000	$ 800,000	$ 1,200,000	$ 1,600,000	$ 2,000,000	$ 2,400,000	$ 2,800,000	$ 3,200,000	$ 3,600,000	**$ 1,800,000**
				Emissions	tonnes	20	56	36	40	32	20	36	35	35	50	**36**
T02	Pavement Condition	C	Pavement condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	80%	80%	80%	80%	80%	80%	80%	80%	80%	**0.82**
				Likelihood	1,2,3,4,5	0	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	0.90
				Consequence Cost	$	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 5,000,000
				Cost	$	$ 1,282,354	$ 1,606,080	$ 1,200,482	$ 1,333,996	$ 1,109,950	$ 826,477	$ 1,260,096	$ 1,244,465	$ 1,259,665	$ 1,637,231	**$ 1,276,080**
				Risk Cost	$	$ -	$ 1,000,000	$ 2,000,000	$ 3,000,000	$ 4,000,000	$ 5,000,000	$ 6,000,000	$ 7,000,000	$ 8,000,000	$ 9,000,000	**$ 4,500,000**
				Emissions	tonnes	20	45	29	32	26	16	29	28	28	40	**29**
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T03	**Footpath Condition**			Rate	$ per sum	$ 381,232	$ 408,300	$ 418,974	$ 427,743	$ 434,986	$ 441,086	$ 446,042	$ 449,854	$ 452,904	$ 455,954	
	225			Emissions	tonnes/sum	18	18	18	18	18	18	18	18	18	18	
T03	Footpath Condition	A	Footpath condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	**1.50**
				Likelihood	1,2,3,4,5	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.18
				Consequence Cost	$	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
				Cost	$	$ 571,849	$ 612,450	$ 628,462	$ 641,614	$ 652,479	$ 661,629	$ 669,063	$ 674,781	$ 679,356	$ 683,931	**$ 647,561**
				Risk Cost	$	$ 10,000	$ 10,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	**$ 18,000**
				Emissions	tonnes	27	27	27	27	27	27	27	27	27	27	**27**
T03	Footpath Condition	B	Footpath condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**1.00**
				Likelihood	1,2,3,4,5	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.30
				Consequence Cost	$	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
				Cost	$	$ 381,232	$ 408,300	$ 418,974	$ 427,743	$ 434,986	$ 441,086	$ 446,042	$ 449,854	$ 452,904	$ 455,954	**$ 431,708**
				Risk Cost	$	$ 15,000	$ 15,000	$ 30,000	$ 30,000	$ 45,000	$ 45,000	$ 60,000	$ 60,000	$ 75,000	$ 75,000	**$ 45,000**
				Emissions	tonnes	18	18	18	18	18	18	18	18	18	18	**18**
T03	Footpath Condition	C	Footpath condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	**0.80**
				Likelihood	1,2,3,4,5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	0.55
				Consequence Cost	$	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000
				Cost	$	$ 304,986	$ 326,640	$ 335,180	$ 342,194	$ 347,989	$ 352,869	$ 356,834	$ 359,883	$ 362,323	$ 364,763	**$ 345,366**
				Risk Cost	$	$ 30,000	$ 60,000	$ 90,000	$ 120,000	$ 150,000	$ 180,000	$ 210,000	$ 240,000	$ 270,000	$ 300,000	**$ 165,000**
				Emissions	tonnes	14	14	14	14	14	14	14	14	14	14	**14**
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T04	**Drainage Condition**			Rate	$ per Sum	$ 481,080	$ 508,283	$ 388,422	$ 472,305	$ 533,903	$ 482,877	$ 495,028	$ 488,204	$ 498,578	$ 509,794	
	213			Emissions	tonnes/Sum	20	23	16	19	21	19	19	19	19	19	
T04	Drainage Condition	A	Drainage condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	**1.20**
				Likelihood	1,2,3,4,5											0.00
				Consequence Cost	$											$ -
				Cost	$	$ 577,296	$ 609,940	$ 466,106	$ 566,766	$ 640,684	$ 579,452	$ 594,034	$ 585,845	$ 598,293	$ 611,753	**$ 583,017**
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Emissions	tonnes	24	27.6	19.2	22.8	25.2	22.8	22.8	22.8	22.8	22.8	**23**
T04	Drainage Condition	B	Drainage condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**1.00**
				Likelihood	1,2,3,4,5											0.00
				Consequence Cost	$											$ -
				Cost	$	$ 481,080	$ 508,283	$ 388,422	$ 472,305	$ 533,903	$ 482,877	$ 495,028	$ 488,204	$ 498,578	$ 509,794	**$ 485,847**
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Emissions	tonnes	20	23	16	19	21	19	19	19	19	19	**19**
T04	Drainage Condition	C	Drainage condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	**0.80**
				Likelihood	1,2,3,4,5											0.00
				Consequence Cost	$											$ -
				Cost	$	$ 384,864	$ 406,627	$ 310,738	$ 377,844	$ 427,123	$ 386,301	$ 396,022	$ 390,564	$ 398,862	$ 407,835	**$ 388,678**
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Emissions	tonnes	16	18	13	15	17	15	15	15	15	15	**16**
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T05	**Structures Condition**			Rate	$ per m	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
	216			Emissions	tonnes/m	-	-	-	-	-	-	-	-	-	-	
T05	Structures Condition	A	Structures condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	**0.00**
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	**0**
T05	Structures Condition	B	Structures condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	**0.00**
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	**0**
T05	Structures Condition	C	Structures condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	**0.00**
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	**0**
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T06	**Unsealed Roads Condition**			Rate	$ per Sum	$ 664,211	$ 826,279	$ 1,072,717	$ 964,212	$ 994,755	$ 768,492	$ 902,658	$ 1,151,780	$ 1,020,930	$ 1,042,706	
	211			Emissions	tonnes/Sum	30	35	45	39	40	32	35	48	39	40	
T06	Unsealed Roads Condition	A	Unsealed Roads condition is improved, asset consumption is minimised, and effective asset	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	135%	135%	135%	135%	135%	135%	135%	135%	135%	135%	**1.35**
				Likelihood	1,2,3,4,5	0	0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.20
				Consequence Cost	$	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000

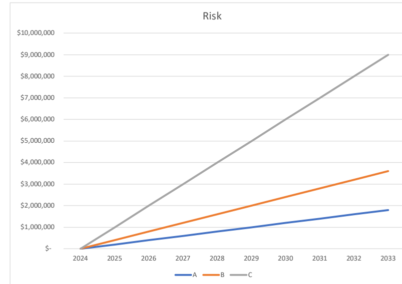


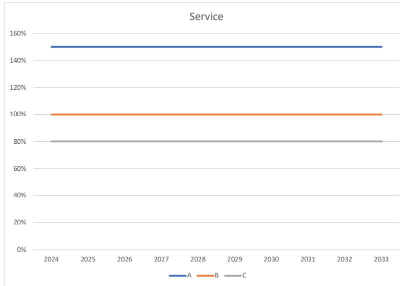


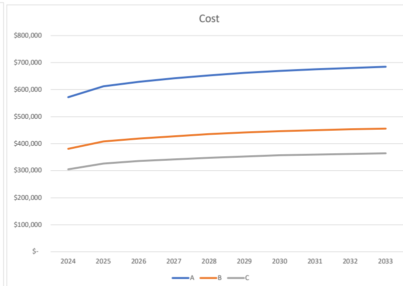


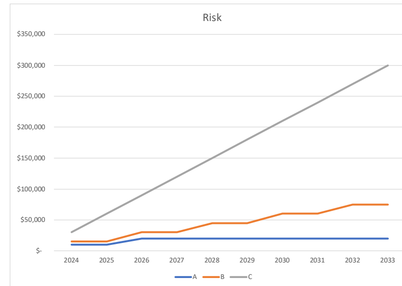


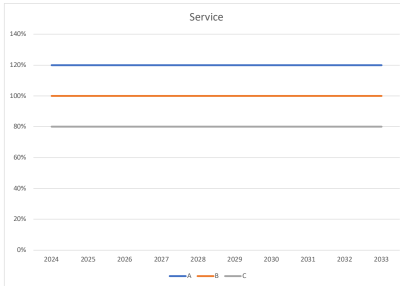


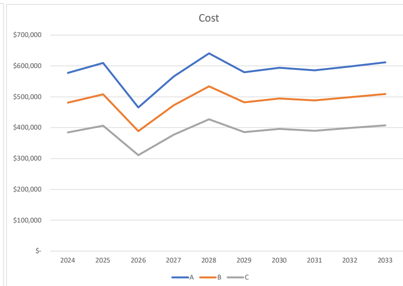


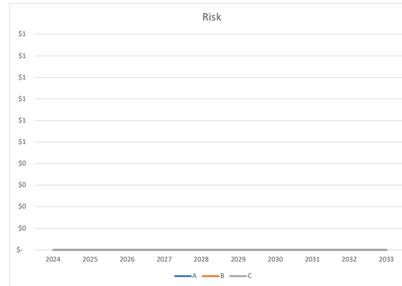


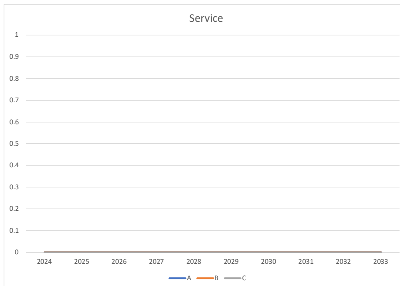


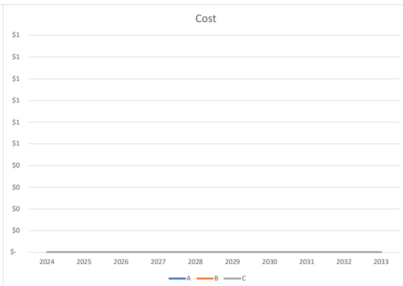


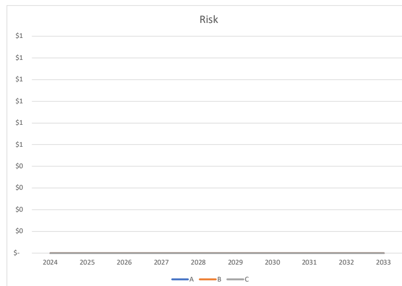


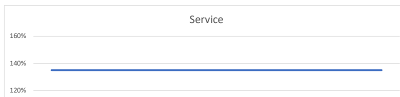


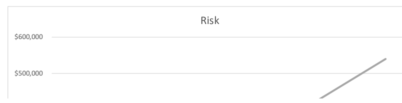




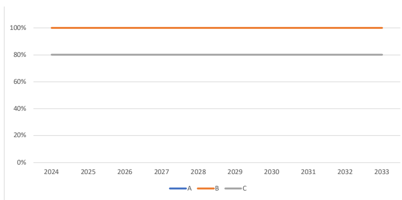
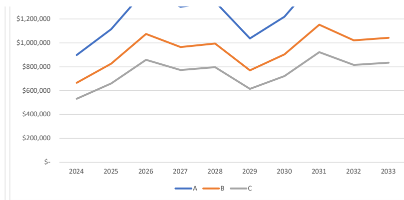
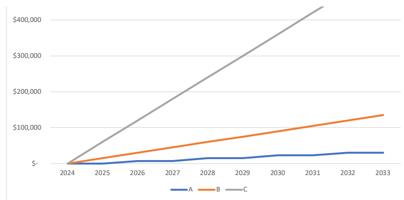
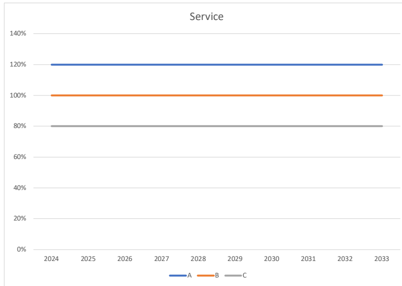


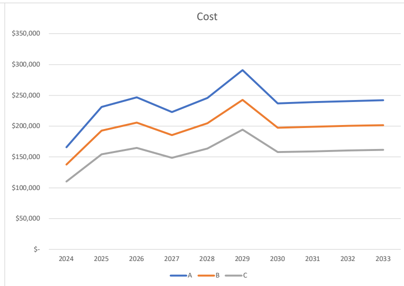


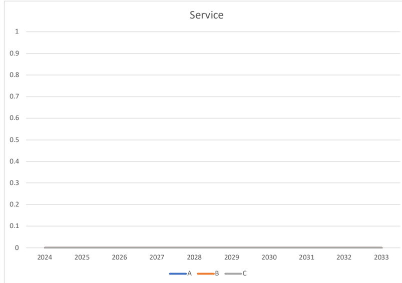


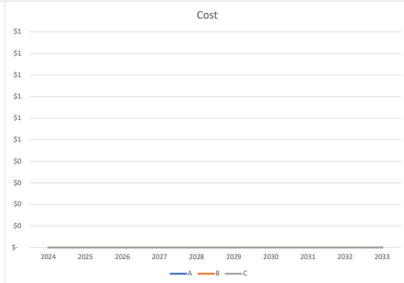


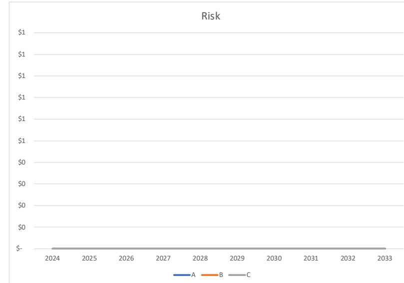
			stewardship is applied	Cost	$	$ 896,685	$ 1,115,477	$ 1,448,168	$ 1,301,686	$ 1,342,920	$ 1,037,465	$ 1,218,588	$ 1,554,903	$ 1,378,255	$ 1,407,653	$ 1,270,180
				Risk Cost	$	$ -	$ -	$ 7,500	$ 7,500	$ 15,000	$ 15,000	$ 22,500	$ 22,500	$ 30,000	$ 30,000	$ 15,000
				Emissions	tonnes	40.5	47.25	60.75	52.65	54	40.5	47.25	60.75	52.65	54	51
T06	Unsealed Roads Condition	B	Unsealed Roads condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1.00
				Likelihood	1,2,3,4,5	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.45
				Consequence Cost	$	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
				Cost	$	$ 664,211	$ 826,279	$ 1,072,717	$ 964,212	$ 994,755	$ 768,492	$ 902,658	$ 1,151,780	$ 1,020,930	$ 1,042,706	$ 940,874
				Risk Cost	$	$ -	$ 15,000	$ 30,000	$ 45,000	$ 60,000	$ 75,000	$ 90,000	$ 105,000	$ 120,000	$ 135,000	$ 67,500
				Emissions	tonnes	30	35	45	39	40	30	35	45	39	40	38
T06	Unsealed Roads Condition	C	Unsealed Roads condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	0.80
				Likelihood	1,2,3,4,5	0	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	0.90
				Consequence Cost	$	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000
				Cost	$	$ 531,369	$ 661,023	$ 858,174	$ 771,369	$ 795,804	$ 614,794	$ 722,126	$ 921,424	$ 816,744	$ 834,165	$ 752,699
				Risk Cost	$	$ -	$ 60,000	$ 120,000	$ 180,000	$ 240,000	$ 300,000	$ 360,000	$ 420,000	$ 480,000	$ 540,000	$ 270,000
				Emissions	tonnes	24	28	36	31	32	24	28	36	31	32	30
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T07	**Traffic Services Condition**			Rate	$ per sum	$ 137,953	$ 192,680	$ 205,699	$ 185,533	$ 204,676	$ 242,585	$ 197,422	$ 199,110	$ 200,460	$ 201,810	
	222			Emissions	tonnes/sum	2	2	2	2	2	2	2	2	2	2	
T07	Traffic Services Condition	A	Traffic Services condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	sum	1	1	1	1	1	1	1	1	1	1	1.00
				Service	%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	1.20
				Likelihood	1,2,3,4,5	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.10
				Consequence Cost	$	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	$ 40,000
				Cost	$	$ 165,544	$ 231,216	$ 246,839	$ 222,640	$ 245,611	$ 291,102	$ 236,907	$ 238,932	$ 240,552	$ 242,172	$ 236,151
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 4,000
				Emissions	tonnes	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2
T07	Traffic Services Condition	B	Traffic Services condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	sum	1	1	1	1	1	1	1	1	1	1	1.00
				Service	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1.00
				Likelihood	1,2,3,4,5	0.00	0.00	0.10	0.10	0.20	0.20	0.30	0.30	0.30	0.30	0.18
				Consequence Cost	$	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	$ 40,000
				Cost	$	$ 137,953	$ 192,680	$ 205,699	$ 185,533	$ 204,676	$ 242,585	$ 197,422	$ 199,110	$ 200,460	$ 201,810	$ 196,793
				Risk Cost	$	$ -	$ -	$ 4,000	$ 4,000	$ 8,000	$ 8,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 7,200
				Emissions	tonnes	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2
T07	Traffic Services Condition	C	Traffic Services condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	sum	1	1	1	1	1	1	1	1	1	1	1.00
				Service	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	0.80
				Likelihood	1,2,3,4,5	0.10	0.10	0.20	0.20	0.30	0.30	0.40	0.40	0.50	0.50	0.30
				Consequence Cost	$	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	$ 40,000
				Cost	$	$ 110,362	$ 154,144	$ 164,559	$ 148,427	$ 163,741	$ 194,068	$ 157,938	$ 159,288	$ 160,368	$ 161,448	$ 157,434
				Risk Cost	$	$ 4,000	$ 4,000	$ 8,000	$ 8,000	$ 12,000	$ 12,000	$ 16,000	$ 16,000	$ 20,000	$ 20,000	$ 12,000
				Emissions	tonnes	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	2
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T08	**Cycleway Condition**			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
	224			Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
T08	Cycleway Condition	A	Cycleway condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	0	0	0	0	0	0	0	0	0	0	0
T08	Cycleway Condition	B	Cycleway condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	0	0	0	0	0	0	0	0	0	0	0	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0
T08	Cycleway Condition	C	Cycleway condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T09	**Environmental Asset Condition**			Rate	$ per	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
	221			Emissions	tonnes/	-	-	-	-	-	-	-	-	-	-	
T09	Environmental Asset Condition	A	Environmental Asset condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	0	0	0	0	0	0	0	0	0	0	0
T09	Environmental Asset Condition	B	Environmental Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	0	0	0	0	0	0	0	0	0	0	0	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0
T09	Environmental Asset Condition	C	Environmental Asset condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0
LoS ref	**Level of Service**	**Option**	**Benefits/Consequences**	**Factor**	**Unit**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Avg**
T10	**Public Transport Asset Condition**			Rate	$ per Project	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
	534			Emissions	tonnes/Project	-	-	-	-	-	-	-	-	-	-	
T10	Public Transport Asset Conditio	A	Public Transport Asset condition is improved, asset consumption is minimised, and effective asset stewardship is applied	Programme	Project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	0	0	0	0	0	0	0	0	0	0	0
T10	Public Transport Asset Conditio	B	Public Transport Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal	Programme	Project	0	0	0	0	0	0	0	0	0	0	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0
T10	Public Transport Asset Conditio	C	Public Transport Asset condition deteriorates, asset consumption accelerates, and asset stewardship is poor	Programme	Project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Service	%	0	0	0	0	0	0	0	0	0	0	0.00
				Likelihood	1,2,3,4,5	0	0	0	0	0	0	0	0	0	0	0.00
				Consequence Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Risk Cost	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Emissions	tonnes	-	-	-	-	-	-	-	-	-	-	0

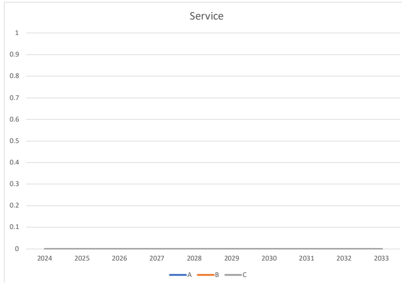





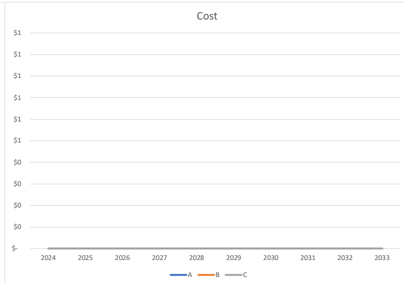


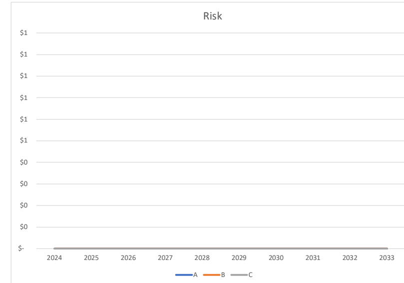


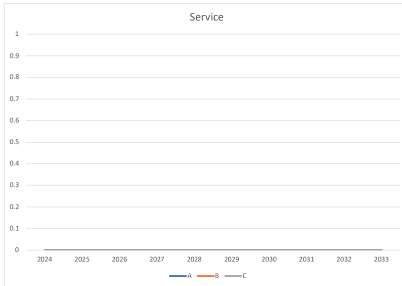


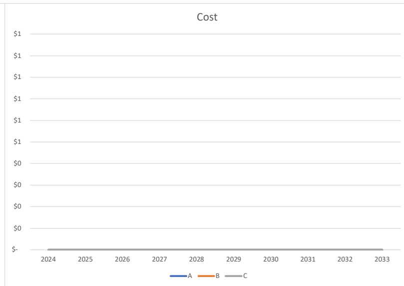


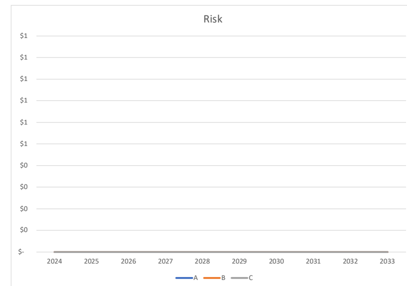




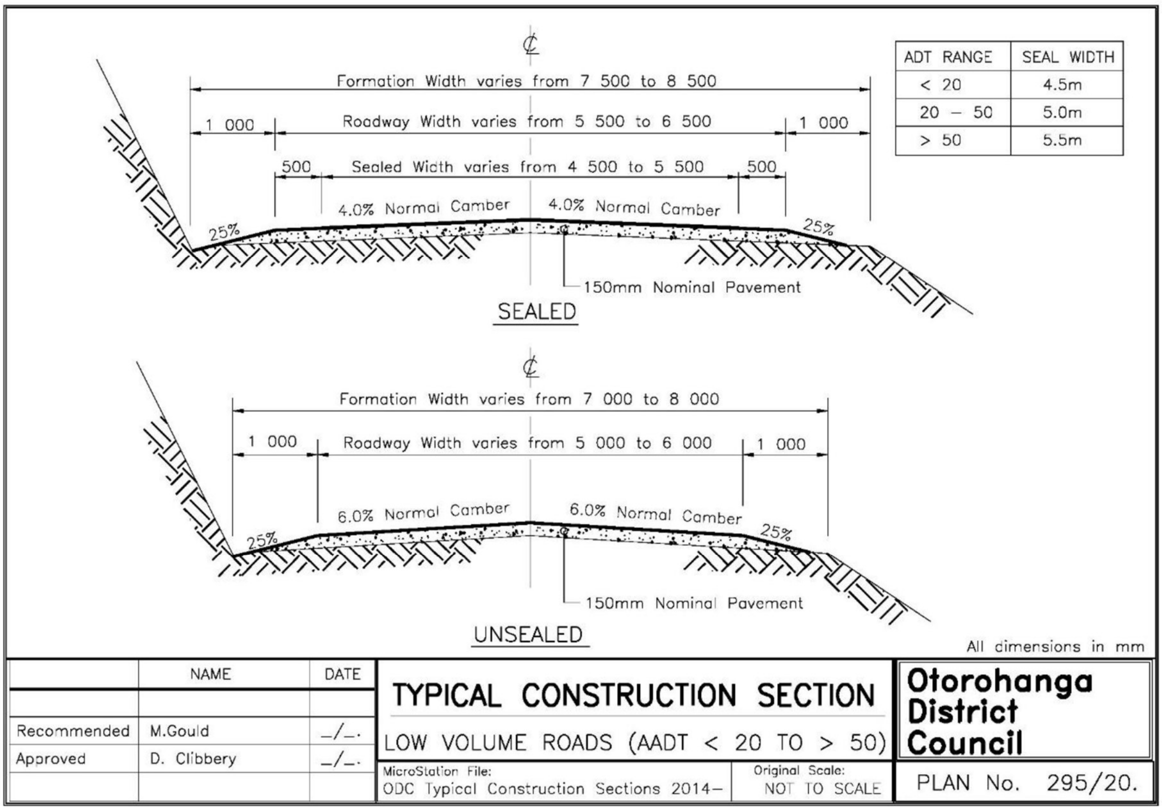


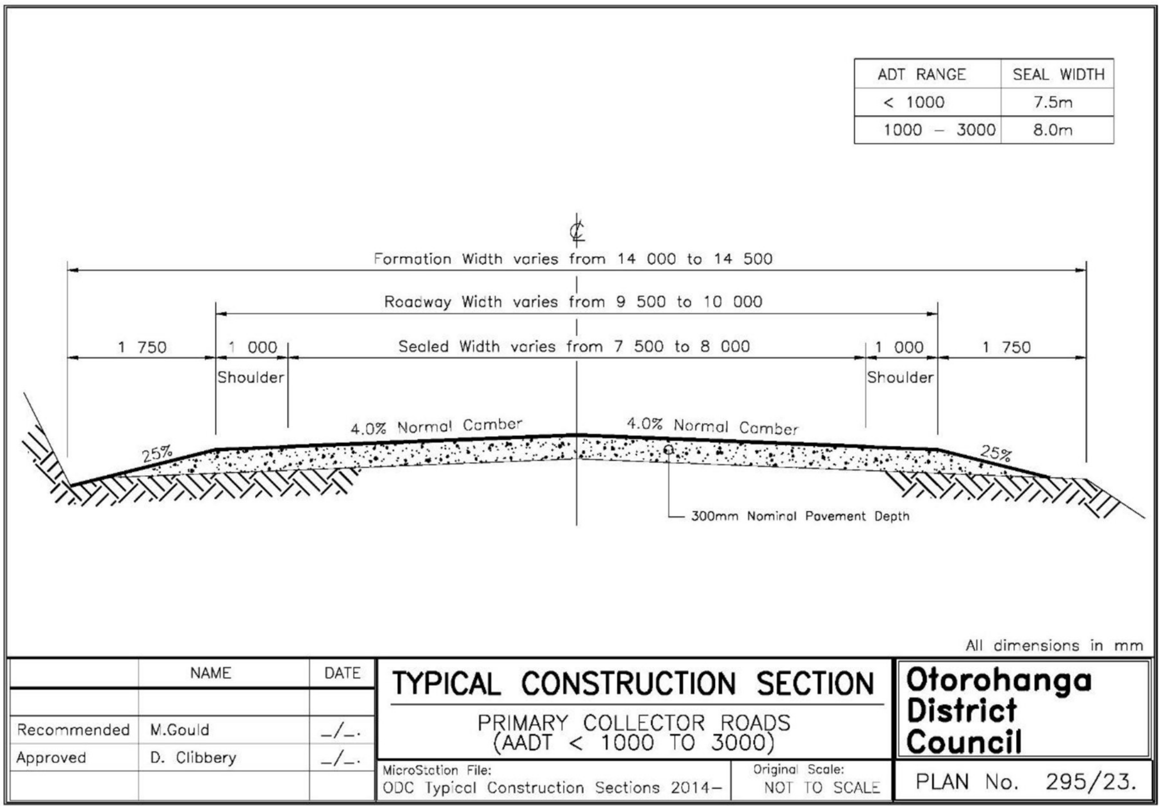






Appendix B: Rural Road Construction Profiles





ADT RANGE	SEAL WIDTH
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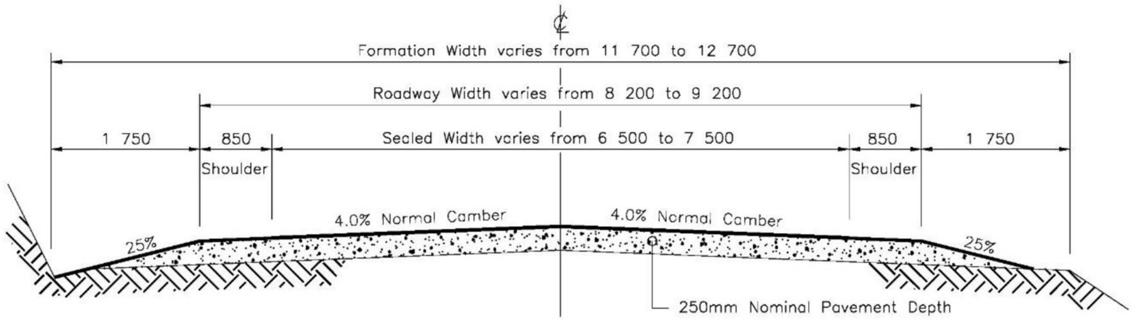
200 – 500	7.0m
> 500	7.5m



All dimensions in mm

	NAME	DATE
Recommended	M.Gould	_/_.
Approved	D. Clibbery	_/_.

TYPICAL CONSTRUCTION SECTION

SECONDARY COLLECTOR ROADS
(AADT < 200 TO > 1000)

MicroStation File: ODC Typical Construction Sections 2014–

Original Scale: NOT TO SCALE

Otorohanga District Council

PLAN No. 295/22.

ADT RANGE	SEAL WIDTH
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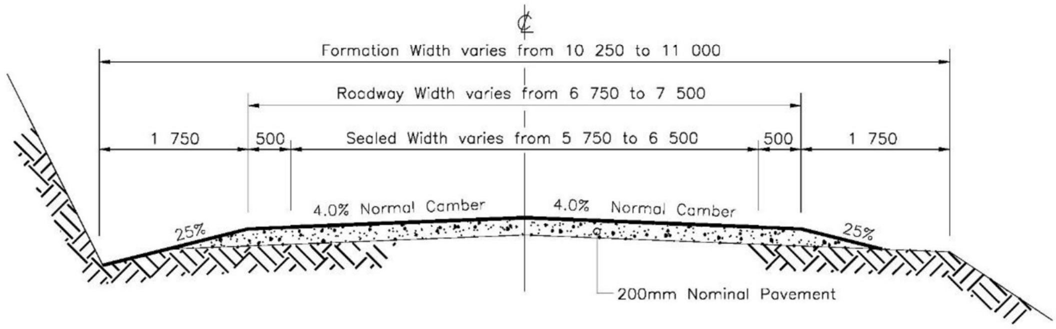
> 100 – 200	6.0m
> 200	6.5m



All dimensions in mm

	NAME	DATE
Recommended	M.Gould	11/14.
Approved	D. Clibbery	_/_.

TYPICAL CONSTRUCTION SECTION

RURAL ACCESS ROADS
(AADT < 50 TO > 200)

MicroStation File: ODC Typical Construction Sections 2014–

Original Scale: NOT TO SCALE

OTOROHANGA DISTRICT COUNCIL

Otorohanga- where kiwis can fly

PLAN No. 295/21.

Otorohanga District Council Roading Asset Valuation Report 2022

Prepared for Otorohanga District Council

Prepared by Beca Projects NZ Limited

14 November 2022

Creative people together transforming our world

Revision History

Revision Nº	Prepared By	Description	Date
1	Sanchit Shukla	Draft issue for Client comments	16/09/2022
2	Kevin Dunn	Final issue	30/09/2022
3	Kevin Dunn	Final issue with corrected land and footpath valuations and 2020 reported quantities	14/11/2022

Document Acceptance

Action	Name	Signed	Date
Prepared by	Sanchit Shukla		14/11/2022
Reviewed by	Kevin Dunn		14/11/2022
Approved by	Marvin Clough		14/11/2022
on behalf of	Beca Projects NZ Limited		

Contents

Appendices

1 Declaration of Valuation

Otorohanga District Council (ODC) commissioned Beca Projects NZ Limited (Beca) to conduct a valuation of the assets in the ODC road network using the RAMM Asset Valuation Module (RAVM).

The purpose of this valuation is to provide a valuation of the roading assets for ODC as at 30 June 2022 for financial reporting purposes.

We confirm that the valuation summarised below has been completed in accordance with the following standards and is suitable for inclusion in the financial statements for the year ended 30 June 2022.

- NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0
- Public Benefit Entity International Public Sector Accounting Standards (PBE IPSAS) 5, 17 and 21, and
- The Local Government Act 2002

Summary of Asset Valuation Results

The table below shows the total valuation results for the road network assets.

Table 1-1 Summary of 30/06/2022 Asset Valuation

Year	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
2022	$408,270,739	$306,992,743	$4,136,753

(Please note all values are in New Zealand dollars, have been rounded to the nearest whole number and exclude GST)

We are not aware of any reason why ODC auditors should not place reliance in the valuation prepared.

The valuation is based on accurate and substantially complete asset registers and appropriate replacement costs and effective lives. The basis of the data inputs used is described in detail in the attached report.

a) The lives are generally based upon NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0.
b) The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

The following personnel with relevant experience in road engineering and infrastructure valuations completed this valuation.

Name/Role	Qualifications	Years of Relevant Experience
Sanchit Shukla (Valuer)	BE (Civil), ME (Transport)	1
Kevin Dunn (Reviewer)	BEng (Hons) Civil, CEng MICE	22
Marvin Clough (Approver)	Registered Plant & Machinery Valuer	21

2 Introduction

2.1 Background

Otorohanga District Council (ODC) is a territorial local authority located in the centre of the North Island of New Zealand. It serves an estimated population of around 10,100 (2018 Census). Otorohanga is the main town in the Otorohanga District. The road network length as recorded in RAMM is approximately 808km long.

Table 2-1 provides a breakdown of the ODC network by pavement type and urban/rural environment as at 30 June 2022. The reported values are based on carriageway sections with a recorded asset owner of "Local Authority".

Table 2-1 Network Statistics

Pavement Type	Urban (km)	Rural (km)	Total (km)
Sealed Pavement	31.3	496.0	527.3
Unsealed Pavement	3.6	276.6	280.2
Bridges	-	1.0	1.0
Total	**34.9**	**773.6**	**808.5**

2.2 Scope

ODC engaged Beca to conduct a valuation of roading infrastructure assets owned by Council as at 30 June 2022 from the following asset classes, as listed in RAMM.

The asset classes include:

- Bridges
- Drainage
- Footpaths
- Large Culverts
- Markings
- Railings
- Signs
- Streetlights
  - Lights
  - Brackets
  - Poles
- SW Channel
- Treatment length
  - Surface Structure
  - Basecourse
  - Subbase
  - Land
  - Formation
  - Unsealed subbase
  - Unsealed basecourse

Assets have been valued by Beca using the RAMM Asset Valuation Module (RAVM). This valuation has included a field validation of a sample of the asset inventory data.

2.3 Basis of Valuation

This valuation was completed by Beca in accordance with Public Benefit Entity Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPSAS 17) where ODC is deemed to be a "Public Benefit Entity" for the purposes of PBE IPSAS 17. ODC is a public benefit entity and therefore the specialised roading assets are valued using a depreciated replacement cost basis as per PBE IPSAS 17.

2.3.1 Legislation

Local Government Act 2002 (LGA) requires that local authorities comply with standards of GAAP (Generally Accepted Accounting Practice) as prepared by the New Zealand Institute of Chartered Accountants (NZICA) and included in the New Zealand Accounting Standards.

LGA Section 100, (2b) requires local authorities, to have regard to the projected revenue available to fund the estimated expenses associated with maintaining the service capacity and integrity of assets throughout their useful life. This requires a formal system for condition monitoring and to pay attention to the concept of asset service lives.

Without accurate knowledge of the serviceability of assets, local authorities can only estimate levels of apportionment when applying the cost of infrastructure across present and future rate payers.

2.3.2 Public Benefit Entity International Public Sector Accounting Standard 17 (PBE IPSAS 17)

To meet statutory reporting requirements, ODC completes revaluations tri-annually for their roading assets. This period aligns with ODC's asset management planning processes and assesses if the carrying values do not differ materially from that which would be determined using fair value at reporting date. Accordingly, this revaluation is completed in accordance with Public Benefit Entity Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPSAS 17), that was enacted on 1 July 2014, for financial reporting purposes.

PBE IPSAS 17 applies to the general-purpose financial reports of all public benefit and groups, including all government departments, crown entities and local authorities.

PBE IPSAS 17 prescribes the principles for the initial and subsequent accounting for property, plant and equipment to ensure the financial statements reported to stakeholders, can discern information about its investment in its assets and changes in such investment at the end of the reporting period.

It is understood that PBE IPSAS 17 applies to ODC's assets considered in the scope of this valuation review. Property, Plant and Equipment are defined in PBE IPSAS 17 as tangible items that:

1. Are held by an entity for use in the production or supply of goods and services, for rental to others or for administrative purposes; and
2. Are expected to be used during more than one period.

PBE IPSAS 17 allows for property, plant and equipment to be valued on a revaluation model and describes the process as;

"After recognition as an asset, an item of property, plant and equipment whose fair value can be measured reliably shall be carried at a revalued amount, being its fair value at the date of the revaluation, less any subsequent accumulated depreciation, and subsequent accumulated impairment losses.

Revaluations shall be made with sufficient regularity to ensure that the carrying amount does not differ materially from that which would be determined using fair value at the reporting date."

Fair Value is defined as *"the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction."*

A different approach is used to value specialised and non-specialised assets for their existing use. Non-specialised assets are valued on a market basis, usually by way of sales comparison or income approaches. Specialised assets are seldom traded on an open market, so a depreciated replacement cost basis is applied.

2.3.3 Depreciated Replacement Cost

While not directly defining Depreciated Replacement Cost, PBE IPSAS 17 states *"The term depreciated replacement cost is often used to describe the application of the cost approach to property, plant and equipment. In the case of PBE IPSAS 17, depreciated replacement cost may be used to estimate the fair value of an asset."*

The standard continues: *"if depreciated replacement cost is used to estimate the fair value of property, plant and equipment:*

> *(a) The value of land shall reflect the fair value of the actual land held, in terms of both its size and location; and*
>
> *(b) The value of improvements to property, plant and equipment shall be estimated as the current replacement cost of the asset less deductions for all relevant forms of obsolescence, including physical deterioration."*

Depreciation was applied to depreciated assets on a "straight line" basis over the assessed total economic life of the asset.

3 Valuation Summary

3.1 2022 Summary

The overall summary of the 2022 valuation is shown in Table 3-1 below:

Table 3-1 2022 Valuation Summary

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Land	$53,709,700	$53,709,700	-
Formation	$121,151,515	$121,151,515	-
Unsealed Subbase	$9,631,400	$9,061,768	$128,419
Unsealed Basecourse	$14,120,208	$13,356,385	$172,198
Sub-base	$24,162,573	$13,538,912	$322,168
Basecourse	$35,423,779	$20,822,289	$442,797
Surface Structure	$21,326,665	$12,268,608	$1,439,934
Bridges	$56,556,194	$27,931,246	$541,373
Large Culverts	$60,852	$24,031	$676
Drainage	$48,125,846	$23,166,419	$654,410
Footpaths	$10,807,738	$5,882,157	$145,924
Markings	$508,567	$508,567	-
Railings	$1,493,531	$637,934	$42,526
Signs	$1,028,727	$257,960	$86,430
Street Lighting	$900,245	$624,400	$25,138
Surface Water Channel	$9,263,197	$4,050,851	$134,760
Total	**$408,270,739**	**$306,992,743**	**$4,136,753**

3.2 Comparison with 2020 Valuation

Overall results between the 2020 and 2022 valuations are shown in Table 3-2 below:

Table 3-2 Comparison of 2022 and 2020 Values

Year	ORC ($)	ODRC ($)	ADR ($)
2020	$329,877,513	$251,650,325	$3,267,229
2022	$408,270,739	$306,992,743	$4,136,753
% Change	24%	22%	27%

The above table shows that, since the previous valuation carried out in 2020, there has been increases in ORC, ODRC and ADR of 24%, 22% and 27% respectively.

The increases are the result of a combination of:

- Increases to replacement cost unit rates following a review against maintenance contract rates provided by ODC and Waka Kotahi NZ Transport Agency (NZTA) construction cost escalations;
- Asset growth between 1 July 2020 and 30 June 2022, and;
- Minor changes to the valuation methodology for some assets

Movements and factors at an asset class level are summarised as follows.

Land	Increase in ORC and ODRC due to an increase in replacement cost unit rates.
Formation	Increase in ORC and ODRC due to an increase in replacement cost unit rates.
Unsealed Subbase	Minor increase in ORC and ADR and larger increase in ODRC primarily due to an increase in replacement cost unit rates offset by a reduction in the asset quantity, which is likely due to database improvement.
Unsealed Basecourse	Minor increase in ORC and ADR and larger increase in ODRC primarily due to an increase in replacement cost unit rates offset by a reduction in the asset quantity, which is likely due to database improvement.
Sub-base	Increase in ORC, ODRC and ADR due to an increase in replacement cost unit rates.
Basecourse	Increase in ORC, ODRC and ADR due to an increase in replacement cost unit rates.
Surface Structure	Notable increase in ORC, ODRC and ADR due to an increase in replacement cost unit rates which are based on current maintenance contract rates.
Bridges	Increase in ORC, ODRC and ADR due to an increase in replacement cost unit rates.
Large Culverts	Increase in ORC, ODRC and ADR due to an increase in replacement cost unit rates. The smaller increase in ODRC is the result of a decrease in overall RUL for this asset class.
Drainage	Significant increase in ORC, ODRC and ADR due to an increase in replacement cost unit rates for culvert assets which are based on current maintenance contract rates
Footpaths	Significant Increase in ORC, ODRC and ADR due to an increase in the asset base and replacement cost unit rates which are based on maintenance contract rates.
Markings	Significant increase in ORC and ODRC due to an increase in replacement cost unit rates which are based on current maintenance contract rates.
Railings	Significant increase in ORC, ODRC and ADR due to an increase in the asset base and replacement cost unit rates.
Signs	Increase in ORC, ODRC and ADR due to an increase in the asset base and replacement cost unit rates.
Street lighting	Increase in ORC, ODRC and ADR due to an increase in the asset base and replacement cost unit rates. The smaller increase in ODRC is the result of a decrease in overall RUL for this asset class.
Surface Water Channel	Notable increase in ORC, ODRC and ADR due to an increase in the asset base and replacement cost unit.

A comparison of the 2022 and 2020 valuation quantities is shown in Table 3-3, and values in Table 3-4.

Table 3-3 2022 Roading Asset Components – Comparison of 2022 and 2020 Quantities

Asset Groups	Unit	2022	2020	Change
Land	ha.	1,584.5	1,597	-0.8%
Formation	m^2	792,232	798,700	-0.8%
Unsealed Subbase	m^3	171,301.6	201,004	-14.8%
Unsealed Basecourse	m^3	131,770.5	154,618	-14.8%
Sub-base	m^3	429,749.4	436,729	-1.6%
Basecourse	m^3	330,576.5	335,945	-1.6%
Surface Structure	m^2	3,344,783.7	3,359,451	-0.4%
Bridges	m	2,468	2,562	-3.7%
Large Culverts	m	30.7		-
Drainage	ea.	6,900	6,834	1.0%
Footpaths	m^2	53,089	50,538	5.0%
Markings	ea.	1,953	1,912	2.1%
Railings	m	9,504	9,093	4.5%
Signs	ea.	3,016	3,002	0.5%
Street Lighting	ea.	1,325	1,192	11.2%
Surface Water Channel	m	918,884	864,472	6.3%

The above table shows an increase in footpaths, railings, signs, streetlights and surface water channel assets since the previous valuation.

There has been a decrease in the unsealed network quantities which is expected to be the result of data improvement activities.

Table 3-4 2022 Roading Asset Components – Comparison of 2022 and 2020 Values

Asset Groups	ORC		ODRC		ADR		% Change 2020-2022		
	2022	2020	2022	2020	2022	2020	ORC	ODRC	ADR
Land	$53,709,700	$45,044,378	$53,709,700	$45,044,378	$-	$-	19%	19%	-
Formation	$121,151,515	$102,125,940	$121,151,515	$102,125,940	$-	$-	19%	19%	-
Unsealed Subbase	$9,631,400	$9,447,168	$9,061,768	$7,767,338	$128,419	$125,962	2%	17%	2%
Unsealed Basecourse	$14,120,208	$13,849,951	$13,356,385	$11,597,479	$172,198	$168,902	2%	15%	2%
Sub-base	$24,162,573	$20,287,836	$13,538,912	$11,770,934	$322,168	$270,505	19%	15%	19%
Basecourse	$35,423,779	$30,092,346	$20,822,289	$18,265,642	$442,797	$376,154	18%	14%	18%
Surface Structure	$21,326,665	$16,601,044	$12,268,608	$7,946,472	$1,439,934	$1,128,065	28%	54%	28%
Bridges	$56,556,194	$47,634,367	$27,931,246	$24,535,852	$541,373	$456,123	19%	14%	19%
Large Culverts	$60,852	$54,937	$24,031	$22,916	$676	$610	11%	5%	11%
Drainage	$48,125,846	$28,251,856	$23,166,419	$14,038,045	$654,410	$417,566	70%	65%	57%
Footpaths	$10,807,738	$5,914,576	$5,882,157	$3,407,822	$145,924	$84,330	83%	73%	73%
Markings	$508,567	$332,058	$508,567	$332,058	$-	$-	53%	53%	-
Railings	$1,493,531	$1,190,848	$637,934	$544,490	$42,526	$33,807	25%	17%	26%
Signs	$1,028,727	$868,153	$257,960	$256,434	$86,430	$76,154	18%	1%	13%
Street Lighting	$900,245	$755,784	$624,400	$566,559	$25,138	$21,051	19%	10%	19%
Surface Water Channel	$9,263,197	$7,426,269	$4,050,851	$3,427,963	$134,760	$108,000	25%	18%	25%
Total	**$408,270,739**	**$329,877,513**	**$306,992,743**	**$251,650,325**	**$4,136,753**	**$3,267,229**	**24%**	**22%**	**27%**

4 Valuation Methodology and Process

4.1 Process

The New Zealand Infrastructure Asset Valuation and Depreciation Guidelines provide a basis for performing the DRC valuation for infrastructural assets. The following step by step process was applied to each asset component;

- Asset Component Split – Component split of assets were completed to account for differing useful lives.
- Optimisation (Adjustment for obsolescence) – Adjustment may be identified for various forms of obsolescence in accordance with PBE IPSAS 17.
- Replacement Cost – The replacement costs were assessed based on unit rates or lump sum amounts. Costs were based on present day replacement costs using modern construction methods and modern materials.
- Useful or Base Lives – The Guidelines provide lives for many infrastructure assets. Those not included are likely to be contained in the NZ Infrastructure Asset Management Manual. As a range of lives is provided by the Guidelines, the reviewer considered the factors which may influence the appropriate base life.
- Remaining Useful Lives – These were calculated from the base life and age of the asset. Where the remaining life has been determined from age, the Guidelines recommend predictive modelling of the remaining life and describe a method using impact factors. Alternatively, the NZ Infrastructure Asset Management Manual describes a method based on condition and performance.
- DRC Method – The use of the Depreciated Replacement Cost methodology and its derivation were used for each component type, based on the replacement cost, total life and assessed remaining life of the assets.
- Annual Depreciation – calculation of annual depreciation from the DRC and remaining life was completed.
- Depreciation to date – PBE IPSAS 17 requires that the accumulated depreciation, (the depreciation to date), be shown. This was calculated by subtraction of the DRC from the Replacement Costs.

4.2 Asset Data

4.2.1 Information Source

The following table outlines which roading assets were valued and the source of the data used in the valuation.

Table 4-1 Data Sources

Asset Group	Data Source	RAMM Table
Formation	RAMM	Treatment Length
Sealed Structure	RAMM	Treatment Length
Land	RAMM	Treatment Length
Sealed Basecourse	RAMM	Treatment Length
Sealed Subbase	RAMM	Treatment Length
Unsealed Basecourse	RAMM	Treatment Length
Unsealed Subbase	RAMM	Treatment Length
Drainage	RAMM	Drainage
Surface Water Channel	RAMM	Surface Water Channel

Asset Group	Data Source	RAMM Table
Footpaths	RAMM	Footpath
Markings	RAMM	Markings
Streetlight Light	RAMM	Streetlight Light
Streetlight Bracket	RAMM	Streetlight Bracket
Streetlight Pole	RAMM	Streetlight Pole
Signs	RAMM	Sign
Railings	RAMM	Railings
Bridge	RAMM	Bridge
Large Culvert	RAMM	Drainage

4.2.2 Data Confidence

All RAMM data used in this valuation has been reviewed by Beca staff to determine that the quality and consistency of the data is acceptable for the valuation process.

Table 4-3 shows the confidence we have in the data supplied for this valuation. This is based on the data confidence grading system in table 4.2.7.2 of the International Infrastructure Maintenance Manual (IIMM) 2020. This is shown in table 4-2.

Prior to completing this valuation, any issues with the RAMM or other applicable data (i.e. assumptions, rates, non-RAMM data to be valued), were brought to the attention of Council. This includes treatment lengths that had been set as disabled where they were to be valued. Any issues that prevented the processing of the valuation were resolved by the Council.

Issues that were identified as not being critical to the running of this valuation and could not be resolved within the time-frame allowed for the valuation, have been entered as recommendations as an improvement for future valuations.

Table 4-2 Data Confidence Grading System

Confidence Grade	General Meaning
A Very High	**Highly Reliable <2% uncertainty** Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment
B High	**Reliable ± 2-10% uncertainty** Data based on sound records, procedure, investigations and analysis which is properly documented but has minor short comings; for example, the data is old, some documentation is missing, and reliance is placed on unconfirmed reports of some extrapolation
C Medium	**Reasonably Reliable ± 10-25% uncertainty** Data based on sound records, procedure, investigations and analysis which is properly documented but has shortcomings for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or significant extrapolation
D Low	**Uncertain ± 25-50% uncertainty** Data based on uncertain records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B is available.
E Very Low	**Very Uncertain >50% uncertainty** Data based on unconfirmed verbal reports and/or cursory inspection and analysis

Table 4-3 Data Confidence Assessment

Asset Group	Type/Material	Dimension(s)	Construction/ Installation Date
Formation	B	A	A
Sealed Structure	A	A	A
Land	A	A	A
Sealed Basecourse	A	A	A
Sealed Subbase	A	A	A
Unsealed Basecourse	-	A	A
Unsealed Subbase	-	A	A
Drainage	A	A	C
Surface Water Channel	A	A	B
Footpaths	A	A	A
Markings	A	-	A
Streetlight Light	B	-	A
Streetlight Bracket	A	-	A
Streetlight Pole	B	-	E
Signs	A	-	A
Railings	A	A	B
Bridge	A	A	A

Note: Some assets above have a '-' denoted against the asset dimensions confidence. This is to indicate valuation for these assets is performed on a unit level. Therefore, dimension confidence for these assets does not apply. Similarly for type/material confidence.

4.3 Data Verification

To verify the accuracy and completeness of the ODC asset data, a field audit was undertaken. This field audit covered a cross-section of the network including visiting both urban and rural sites.

Assets on the following roads were included in this field audit; Some roads only had a partial section included while others had their full extents included:

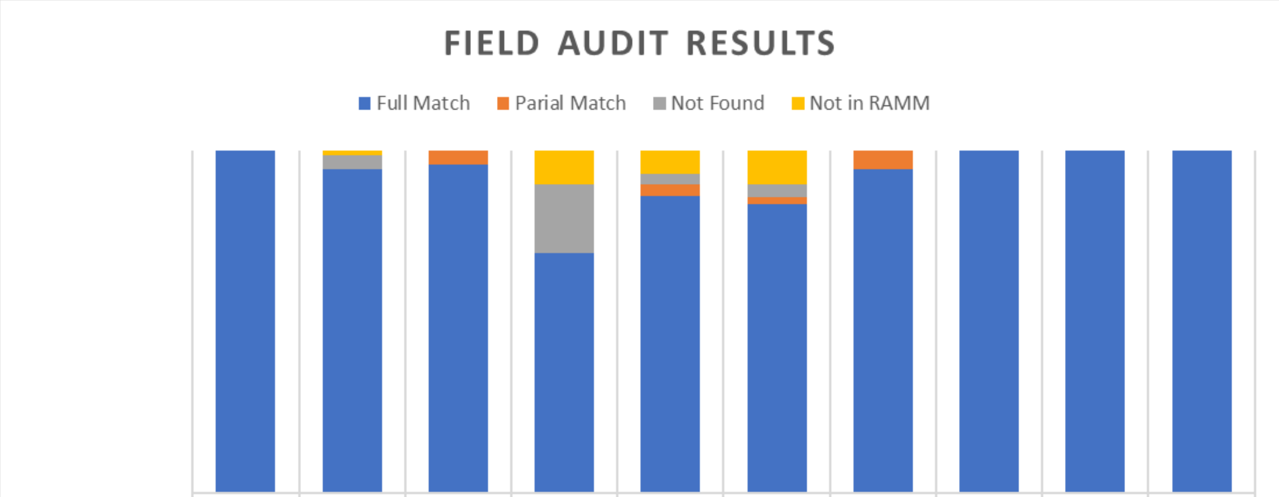
- Haerehuka St
- Gradara Ave
- Long View Cres
- Mangaorongo Road
- Maihihi Road
- Ngahape (bridge and railing)

Table 4-4 Field Audit Notes

Asset Category	Component	Field Audit Notes
Bridge	Bridge	Bridge data was complete and representative of what was on site.
Drainage	Culverts Catchpits/sumps	Drainage data was mostly complete and representative of what was on site. A small number of culverts were listed in RAMM but not found on site, or were missing from RAMM.
Footpath	Footpath	Footpath data was complete and mostly representative of what was on site. One out of the 24 footpath records had the incorrect width.
Railing	Railing	Railing data was moderately complete and representative of what was on site. A number of railings were not found on site or missing from RAMM.
Sign	Sign	Good data for most sign assets. A small number of signs were missing from RAMM, could not be found, or had incorrect displacement.
Marking	Marking	Marking data was mostly complete and representative of what was on site. A small number of markings were missing from RAMM or missing from site. One line was incorrectly assigned as continuous, instead of broken.

Asset Category	Component	Field Audit Notes
Streetlight	Streetlight Light	Streetlight data was mostly complete and representative on site. One pole was marked incorrectly to be owned by ODC, instead of Power Company.
	Streetlight Bracket	
	Streetlight Pole	
SW Channel	SW Channel	Surface water channel data was complete and representative of what was on site.
Pavement	Earthworks	Surfacing data that was in RAMM appeared representative of what was on site. Pavement layers and formation were not verified in this field audit as It is not possible to sight these assets.
	Surface	
	Pavement	

Figure 4-1 Field Audit Results



	Bridge	Drainage	Footpath	Railing	Sign	Marking	Streetlight	SW Channel	Pavement	Treatment Length
Not in RAMM	0	1	0	2	2	5	0	0	0	0
Not Found	0	3	0	4	1	2	0	0	0	0
Parial Match	0	0	1	0	1	1	1	0	0	0
Full Match	5	68	23	14	26	43	18	4	13	13

4.4 Asset Component Split

Valuation of an asset has been applied at component level where possible and practical.

4.5 Unit Replacement Costs, Replacement Cost and On-cost

The 2020 rates have been reviewed against current and recent contract rates provided by ODC. Changes at an asset level are discussed in Section 5.

The remaining rates where no corresponding recent contract rate was available have been increased according with the Waka Kotahi NZ Transport Agency's infrastructure cost indices.

The indexes used were December 2020 to June 2022. These include:

- 14.61% increase applied to pavement surface assets based on the Reseal Cost Index
- 16.15% increase applied to sign and marking assets based on the Network Outcomes Cost Index

- 17.80% increase applied to bridges based on the Structures Cost Index
- 19.62% increase applied to all other assets based on the Construction Cost Index

The indexed rates were reviewed against the new maintenance contract rates provided by ODC as well as against other comparable New Zealand Road Controlling Authorities. This was to confirm that the rates being used are reflective of typical market rates. The following asset classes had rates adjusted based on this review:

- Surface Structure
- Markings
- Footpaths
- Drainage

The replacement cost unit rates used in the valuation are exclusive of on-costs, overheads, design, etc. An 8% allowance for all asset classes has been allowed for. Therefore:

Replacement Cost (RC) = (Unit Replacement Cost + On-cost) x Quantity

Covid-19 Impact

There is a risk that infrastructure costs may fluctuate as a result of the impact of Covid-19 on the economy.

It is expected that the impact of Covid-19 will be minimal on the value of horizontal assets. Based on this we estimate the level of risk when assessing the valuation of roading assets is low. It is possible that replacement cost rates may be subject to short-term changes due to shortages of materials or specialist labour. However, the replacement costs that are used in Optimised Depreciated Replacement Costs (DRC) calculations should reflect typical and sustainable market conditions. Beca are therefore comfortable that the valuation is a reasonable estimate of the roading infrastructure asset values.

4.6 Optimisation

Adjustment for obsolescence (optimisation) can be applied to the replacement and depreciated replacement costs to reflect asset obsolescence or relevant surplus capacity in accordance with PBE IPSAS 17.

- There are no instances of optimisation for ODC.

4.7 Residual Value

As there are virtually no opportunities for component resale, the residual value (RV) is set at nil for all depreciated assets.

4.8 Total Useful Life (TUL) & Remaining Useful Lives (RUL)

TUL is the period of time the asset will be in service prior to replacement/renewal or decommissioning.

TUL = RUL + Asset Age

For depreciable assets RUL has been calculated by deducting asset age from TUL. Where the RUL has been determined from age, the guidelines recommend predicative modelling of RUL and describe a method using impact factors. Also, the NZ Infrastructure Asset Management Manual describes a method based on condition and performance. For non-depreciable assets RUL is not calculated.

A minimum remaining life has been assigned to all depreciable assets reaching the end of the expected life. A minimum remaining life between 1 and 3 years has been allowed based on asset type. Details of the life used by asset type are attached in Appendix A.

4.9 Annual Depreciation (ADR)

ADR was applied to depreciable assets on a “straight line” basis over the assessed total useful life of the asset. The earthworks (formation and subbase) component is not depreciated.

ADR = (DRC – RV) / RUL

The term is also described as Annual Financial Depreciation, as it is financial type depreciation.

4.10 Depreciated Replacement Cost (DRC)

*Depreciated Replacement Cost (DRC) = ((RC – RV) * RUL / (RUL + Asset Age) + RV)*

where RUL is subjected to adjustment, as explained above. This is the method used to derive “Fair Value”.

PBE IPSAS 17 requires that the accumulated depreciation be calculated for financial reporting. This can be calculated by subtraction where Accumulated Depreciation = RC - DRC.

4.11 Impairment

Accounting Standard PBE IPSAS 21 applies to the impairment of non-cash generating assets. The Standard does not require the application of an impairment test to non-cash generating Plant, Property and Equipment and intangible asserts that are measured at revalued amounts.

No assets have been identified as impaired by ODC for the 2022 valuation.

5 Methodology by Asset Class

This section details the valuation methodology and approach for each asset class. It includes any assumptions made during the valuation. The valuation results for each asset are reported in Section 3.

Replacement cost unit rates, base life cycles, minimum remaining useful lives and default construction/installation dates for each asset class are attached in Appendix A.

5.1 Land

Data and Integrity

Land type, dimensions and construction dates are fully populated.

Valuation Methodology

Land has been assessed per hectare and is not depreciated.

The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.2 Formation

Data and Integrity

Formation dimensions and construction dates are fully populated. There is some data missing in the material type field. This asset type is not depreciated.

Valuation Methodology

Formation has been valued on a linear metre basis. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.3 Unsealed Subbase

Data and Integrity

Unsealed subbase dimensions and construction dates are fully populated. Type/material confidence does not apply to unsealed subbase valuation and has been left blank.

Valuation Methodology

Unsealed subbase has been valued on a cubic metre basis. The average depth is assumed to be 130mm. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.4 Unsealed Basecourse

Data and Integrity

Unsealed basecourse dimensions and construction dates are fully populated. Type/material confidence does not apply to unsealed subbase valuation and has been left blank.

Valuation Methodology

Unsealed basecourse has been valued on a cubic metre basis. The average depth is assumed to be 100mm. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.5 Sealed Subbase

Data and Integrity

Sealed subbase type, dimensions and construction dates are fully populated.

Valuation Methodology

Sealed subbase has been valued on a cubic metre basis. The average depth is assumed to be 130mm. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.6 Sealed Basecourse

Data and Integrity

Sealed basecourse type, dimensions and construction dates are fully populated.

Valuation Methodology

Sealed basecourse has been valued on a cubic metre basis. The average depth is assumed to be 100mm. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.7 Surface Structure

Data and Integrity

Surface structure type, dimensions and construction dates are fully populated.

Valuation Methodology

Surface structure has been values on a square metre basis. There are considerable changes to the replacement cost unit rate compared to those used in the 2020 valuation. Rates have been updated based on the provided 2022/23 maintenance cost rates with an allowance for preliminary and general and traffic management.

5.8 Bridges

Data and Integrity

Bridge type, dimensions and construction dates are fully populated.

Valuation Methodology

Bridges have been valued on a meter basis. The 2020 replacement cost unit rates have been indexed up by 17.80% as per the Waka Kotahi Construction structures cost Index for the 2022 valuation.

5.9 Large Culverts

Data and Integrity

This is a small asset group with only three recorded assets. The type and dimensions of large culverts is known.

Valuation Methodology

Large culverts have been valued on a linear metre basis alongside Drainage assets. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.10 Drainage

Data and Integrity

Drainage types and dimensions are fully populated. There are gaps construct/install date fields with 19.7% of the construction dates missing. This would be a recommended improvement task.

Valuation Methodology

Drainage assets have been valued both on a per unit and linear metre basis. The 2020 replacement cost unit rates for drainage structures have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation. Majority of the culvert replacement cost unit rates have also been adjusted to reflect recent contract rates using Taupae Rd contract rate as a baseline.

5.11 Footpaths

Data and Integrity

Footpath type, dimensions and construction dates are fully populated.

Valuation Methodology

Footpaths have been valued on a square metre basis. The majority of the unit rates have been updated to reflect provided 2022/23 maintenance cost rates with a 4% establishment fees. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.12 Markings

Data and Integrity

Marking type and construction dates are fully populated. The dimension completeness is difficult to determine as this asst group is valued by both per unit and linear metre basis. 135 records valued on a linear metre basis have no recorded length and have therefore valued at $0.00. It is recommended these are validated and this dimension recorded in RAMM.

Valuation Methodology

Markings are valued by both per unit and linear meter basis. There are seven asset types that have been changed from a linear meter to an ‘each’ unit of measure in the 2022 valuation. These are listed below.

Majority of the replacement cost unit rates have been updated in 2022 to reflect the provided current maintenance cost rates. The remainder have been indexed up by 16.15% as per the Waka Kotahi Network Outcomes Cost Index.

Assets changed from meter basis to per unit for valuation
Give Way
Intersection Continuity Lines (150mm 1 x
School
Speed Circle
Stop
Stop Ahead
Straight Arrow

5.13 Railings

Data and Integrity

Railing type and dimensions are fully populated. Installation dates are missing for 3.5% of records.

Valuation Methodology

Railings have been valued on a linear metre basis. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.14 Signs

Data and Integrity

Signs type and installation dates are fully populated.

Valuation Methodology

Signs have been valued on a per unit basis. The 2020 replacement cost unit rates have been indexed up by 16.15% as per the Waka Kotahi Network Outcomes Cost Index for the 2022 valuation.

5.15 Street Lighting

Data and Integrity

Streetlight light model is missing for 2.8% of light records and installation dates are fully populated

Streetlight brackets type and installation dates are fully populated.

Streetlight pole make is missing for 5% of pole records and installation dates missing for 58% of records. This is recommended as an improvement initiative.

Valuation Methodology

Streetlight components have been valued on a per unit basis. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

5.16 Surface Water Channels

Data and Integrity

Surface water channel type and dimensions fully populated. The construction date data is missing for 10% of records.

Valuation Methodology

Surface water channels have been valued on a linear metre. The 2020 replacement cost unit rates have been indexed up by 19.62% as per the Waka Kotahi Construction infrastructure cost index for the 2022 valuation.

6 Recommendations

The following recommendations have been identified to enhance future revaluation of ODC's roading assets. These are summarised in Table 6-1.

Table 6-1 Summary of Recommendations

Asset Class	Description	Priority
All	Construction and installation dates for new assets are recorded in the database	High
All	Replacement cost unit rates are reviewed and updated as part of future revaluations to confirm they are reflective of current typical market rates	High
Drainage, Marking Streetlight	Asset type, dimension and construction date data review and improvement initiatives as required	Medium

A

Appendix A – Replacement Cost Unit Rates and Useful Lives

Standard Replacement Cost Unit Rates, Base Lives and Minimum Remaining Useful Lives

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Basecourse	Sealed Basecourse	m³	treatment_length.tl_area*0.100	$99.22	8	80	Straight Line over the TUL	2
Basecourse	Sealed Basecourse - Non LA	m³	treatment_length.tl_area*0.100	$0.00	8	80	Straight Line over the TUL	2
Basecourse	Sealed Basecourse - not sealed nil value	m³	treatment_length.tl_area*0.100	$0.00	8	80	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Box Girder	m	br_bridge.length_m	$18,386.90	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Comp Beam and Slab	m	br_bridge.length_m	$25,744.03	8	130	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Other	m	br_bridge.length_m	$20,928.50	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Slab	m	br_bridge.length_m	$26,295.39	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Steel Beam and Timber	m	br_bridge.length_m	$6,333.32	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Under Pass	m	br_bridge.length_m	$19,767.27	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridge - Woodstave Culvert	m	br_bridge.length_m	$23,539.92	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridges - Concrete	m	br_bridge.length_m	$9,850.88	8	130	Straight Line over the TUL	2
Bridge (Deck)	Bridges - Non LA	m	br_bridge.length_m	$0.00	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridges - Precast Units Only	m	br_bridge.length_m	$15,913.03	8	100	Straight Line over the TUL	2
Bridge (Deck)	Bridges - Through Arch	m	br_bridge.length_m	$16,580.19	8	100	Straight Line over the TUL	2
Drainage	1000 - 1050 Armco	m	drainage.drain_length	$1,550.71	8	30	Straight Line over the TUL	2
Drainage	1050 Dia Drop Structure	Each	1	$2,583.93	8	75	Straight Line over the TUL	2
Drainage	1200 Armco	m	drainage.drain_length	$2,663.24	8	30	Straight Line over the TUL	2
Drainage	1200 Concrete	m	drainage.drain_length	$3,022.64	8	90	Straight Line over the TUL	2
Drainage	1200 Dia Drop Structure	Each	1	$2,583.93	8	75	Straight Line over the TUL	2
Drainage	1200 Timber	m	drainage.drain_length	$3,022.64	8	70	Straight Line over the TUL	2
Drainage	1500 Dia Drop Structure	Each	1	$3,229.91	8	75	Straight Line over the TUL	2
Drainage	1500 Steel	m	drainage.drain_length	$5,344.91	8	60	Straight Line over the TUL	2
Drainage	1500 Timber	m	drainage.drain_length	$5,344.91	8	70	Straight Line over the TUL	2
Drainage	1800 Concrete	m	drainage.drain_length	$7,427.59	8	90	Straight Line over the TUL	2

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Drainage	300 Dia Drop Structure	Each	1	$374.67	8	75	Straight Line over the TUL	2
Drainage	375 Armco	m	drainage.drain_length	$442.34	8	30	Straight Line over the TUL	2
Drainage	375 Earthenware	m	drainage.drain_length	$553.05	8	75	Straight Line over the TUL	2
Drainage	375 PVC	m	drainage.drain_length	$553.05	8	70	Straight Line over the TUL	2
Drainage	450 AC	m	drainage.drain_length	$553.05	8	70	Straight Line over the TUL	2
Drainage	450 Armco	m	drainage.drain_length	$553.05	8	30	Straight Line over the TUL	2
Drainage	450 Dia Drop Structure	Each	1	$775.18	8	75	Straight Line over the TUL	2
Drainage	450 Earthenware	m	drainage.drain_length	$553.05	8	75	Straight Line over the TUL	2
Drainage	500 PVC	m	drainage.drain_length	$387.68	8	70	Straight Line over the TUL	2
Drainage	600 Armco	m	drainage.drain_length	$829.38	8	30	Straight Line over the TUL	2
Drainage	600 Dia Drop Structure	Each	1	$1,291.96	8	75	Straight Line over the TUL	2
Drainage	600 PVC	m	drainage.drain_length	$829.38	8	70	Straight Line over the TUL	2
Drainage	750 Armco	m	drainage.drain_length	$1,290.15	8	30	Straight Line over the TUL	2
Drainage	750 Dia Drop Structure	Each	1	$1,291.96	8	75	Straight Line over the TUL	2
Drainage	750 Steel	m	drainage.drain_length	$1,290.15	8	60	Straight Line over the TUL	2
Drainage	900 - 950 Dia Drop Structure	Each	1	$1,866.89	8	75	Straight Line over the TUL	2
Drainage	<400 Steel	m	drainage.drain_length	$553.05	8	60	Straight Line over the TUL	2
Drainage	<= 300 AC	m	drainage.drain_length	$442.34	8	70	Straight Line over the TUL	2
Drainage	<= 300 Concrete	m	drainage.drain_length	$442.34	8	90	Straight Line over the TUL	2
Drainage	<=300 Aluminium	m	drainage.drain_length	$442.34	8	30	Straight Line over the TUL	2
Drainage	<=300 Armco	m	drainage.drain_length	$442.34	8	30	Straight Line over the TUL	2
Drainage	<=300 PVC	m	drainage.drain_length	$442.34	8	70	Straight Line over the TUL	2
Drainage	<=350 Earthenware	m	drainage.drain_length	$442.34	8	75	Straight Line over the TUL	2
Drainage	>1200 <1500 Concrete	m	drainage.drain_length	$4,543.18	8	90	Straight Line over the TUL	2
Drainage	>300 <400 Concrete	m	drainage.drain_length	$442.34	8	90	Straight Line over the TUL	2
Drainage	>=1500 <1800 Concrete	m	drainage.drain_length	$5,344.91	8	90	Straight Line over the TUL	2
Drainage	>=1500 Armco	m	drainage.drain_length	$5,344.91	8	30	Straight Line over the TUL	2

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Drainage	>=400 <600 Concrete	m	drainage.drain_length	$553.05	8	90	Straight Line over the TUL	2
Drainage	>=400 <=600 Steel	m	drainage.drain_length	$534.49	8	60	Straight Line over the TUL	2
Drainage	>=450 <600 PVC	m	drainage.drain_length	$553.05	8	70	Straight Line over the TUL	2
Drainage	>=600 <700 Concrete	m	drainage.drain_length	$829.38	8	90	Straight Line over the TUL	2
Drainage	>=700 <900 Concrete	m	drainage.drain_length	$1,290.15	8	90	Straight Line over the TUL	2
Drainage	>=900 <1200 Concrete	m	drainage.drain_length	$2,663.24	8	90	Straight Line over the TUL	2
Drainage	>=900 <=1050 Armco	m	drainage.drain_length	$2,663.24	8	30	Straight Line over the TUL	2
Drainage	Default Drop Structure	Each	1	$1,435.51	8	75	Straight Line over the TUL	2
Drainage	Default Feature	Each	1	$645.98	8	60	Straight Line over the TUL	2
Drainage	Default Pipeline	m	drainage.drain_length	$534.49	8	60	Straight Line over the TUL	2
Drainage	Drainage not owned by Council	Each	1	$0.00	8	50	No Depreciation	
Drainage	Flume Down Batter	Each	1	$2,325.53	8	25	Straight Line over the TUL	1
Drainage	Large Culverts	m	drainage.drain_length	$3,588.79	8	90	Straight Line over the TUL	2
Drainage	Manhole	Each	1	$3,876.77	8	75	Straight Line over the TUL	2
Drainage	Soak Pit	Each	1	$3,229.91	8	25	Straight Line over the TUL	1
Drainage	Subsoil Drain	m	drainage.drain_length	$331.75	8	25	Straight Line over the TUL	1
Footpath	Catch All Footpath	m²	footpath.total_area	$116.28	8	50	Straight Line over the TUL	2
Footpath	Cobble Path	m²	footpath.total_area	$139.77	8	40	Straight Line over the TUL	2
Footpath	Concrete Footpath	m²	footpath.total_area	$214.27	8	75	Straight Line over the TUL	2
Footpath	Default Footpath	m²	footpath.total_area	$87.76	8	30	Straight Line over the TUL	2
Footpath	Metal Path	m²	footpath.total_area	$151.76	8	10	Straight Line over the TUL	2
Footpath	Sealed Footpath	m²	footpath.total_area	$121.87	8	50	Straight Line over the TUL	2
Formation	Formation - Aotea Urban	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$154.92	8	100	No Depreciation	
Formation	Formation - Catch All	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$138.81	8	100	No Depreciation	
Formation	Formation - Kawhia Community Urban	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$133.57	8	100	No Depreciation	
Formation	Formation - Kawhia Rural	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$150.09	8	100	No Depreciation	

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Formation	Formation - Kio Kio / Korakonui Rural	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$121.18	8	100	No Depreciation	
Formation	Formation - Non LA	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$0.00	8	100	No Depreciation	
Formation	Formation - Otorohanga Community Urban	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$176.26	8	100	No Depreciation	
Formation	Formation - Tihiroa Rural	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$128.06	8	100	No Depreciation	
Formation	Formation - Waipa Rural	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$139.07	8	100	No Depreciation	
Formation	Formation - Wharepuhunga Rural	m	treatment_length.tl_end_m-treatment_length.tl_start_m	$155.60	8	100	No Depreciation	
Land	Land - Aotea Urban	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$164,922.62	8	100	No Depreciation	
Land	Land - Catch All	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$16,466.54	8	100	No Depreciation	
Land	Land - Kawhia Community Urban	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$602,423.03	8	100	No Depreciation	
Land	Land - Kawhia Rural	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$5,106.84	8	100	No Depreciation	
Land	Land - Kio Kio / Korakonui Rural	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$32,259.59	8	100	No Depreciation	
Land	Land - Non LA	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$0.00	8	100	No Depreciation	
Land	Land - Otorohanga Community Urban	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$271,644.71	8	100	No Depreciation	
Land	Land - Tihiroa Rural	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$21,093.68	8	100	No Depreciation	
Land	Land - Waipa Rural	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$15,857.64	8	100	No Depreciation	
Land	Land - Wharepuhunga Rural	Hectares	(treatment_length.tl_end_m-treatment_length.tl_start_m)*20.00/10000	$12,841.87	8	100	No Depreciation	
Marking	Bus Stop	Each	1	$2,067.00	8	4	No Depreciation	1
Marking	Centreline 100mm 3 x 7	m	markings.length_m	$0.19	8	3	No Depreciation	1

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Marking	Centreline 100mm Continuous	m	markings.length_m	$0.36	8	3	No Depreciation	1
Marking	Default Marking /m Rate	m	markings.length_m	$0.19	8	2	No Depreciation	1
Marking	Disabled Parking	m	markings.length_m	$0.18	8	2	No Depreciation	1
Marking	Edgeline 100mm Wide Continuous	m	markings.length_m	$0.35	8	3	No Depreciation	1
Marking	Edgeline 75mm Wide Continuous	m	markings.length_m	$0.22	8	3	No Depreciation	1
Marking	Fire Hydrant	Each	1	$14.84	8	2	No Depreciation	1
Marking	Fire Hydrant with Blue RRPM	Each	1	$43.90	8	3	No Depreciation	1
Marking	Flush Median	Each	1	$10,035.46	8	4	No Depreciation	1
Marking	Give Way	Each	1	$100.70	8	3	No Depreciation	1
Marking	Intersection Continuity Lines (150mm 1 x	Each	1	$530.00	8	3	No Depreciation	1
Marking	Island Pre Warn	Each	1	$112.92	8	3	No Depreciation	1
Marking	Keep Clear	m	markings.length_m	$0.22	8	3	No Depreciation	1
Marking	Lane 100mm 3 x 7	m	markings.length_m	$0.12	8	3	No Depreciation	1
Marking	Loading Zone	Each	1	$367.97	8	3	No Depreciation	1
Marking	No Entry	m	markings.length_m	$0.16	8	3	No Depreciation	1
Marking	No Overtaking 100mm continuous	m	markings.length_m	$0.26	8	3	No Depreciation	1
Marking	No Overtaking Advance 100mm 13 x 7	m	markings.length_m	$0.26	8	3	No Depreciation	1
Marking	No Parking	m	markings.length_m	$0.63	8	3	No Depreciation	1
Marking	No Stopping Line (Yellow) 100mm 1 x 1	m	markings.length_m	$0.74	8	3	No Depreciation	1
Marking	Non LA marking	Each	1	$0.00	8	4	No Depreciation	
Marking	Other Zone	Each	1	$250.89	8	3	No Depreciation	1
Marking	Painted Island	Each	1	$313.61	8	3	No Depreciation	1
Marking	Painted Speed Hump	m	markings.length_m	$0.12	8	3	No Depreciation	1
Marking	Park Bays Angle	Each	1	$10.07	8	3	No Depreciation	1
Marking	Park Limit Lines Parallel	m	markings.length_m	$5.51	8	3	No Depreciation	1
Marking	Parking Bays	Each	1	$17.02	8	3	No Depreciation	1

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Marking	Pedestrian Crossing	Each	1	$132.50	8	3	No Depreciation	1
Marking	Pedestrian Crossing Diamond	Each	1	$68.99	8	3	No Depreciation	1
Marking	RPM Non Reflective	Each	1	$11.62	8	4	No Depreciation	1
Marking	RRPM White Bi-Directional	Each	1	$16.24	8	4	No Depreciation	1
Marking	RRPM White Mono-Directional	Each	1	$16.24	8	4	No Depreciation	1
Marking	RRPM White/Yellow Bi-Directional	Each	1	$16.24	8	4	No Depreciation	1
Marking	RRPM Yellow Bi-Directional	Each	1	$16.24	8	4	No Depreciation	1
Marking	RRPM Yellow Mono-Directional	Each	1	$16.24	8	4	No Depreciation	1
Marking	Railway Crossing	m	markings.length_m	$0.34	8	3	No Depreciation	1
Marking	Right Turn Bay	Each	1	$250.89	8	3	No Depreciation	1
Marking	School	Each	1	$95.40	8	3	No Depreciation	1
Marking	Speed Circle	Each	1	$47.70	8	3	No Depreciation	1
Marking	Stop	Each	1	$111.30	8	3	No Depreciation	1
Marking	Stop Ahead	Each	1	$143.10	8	3	No Depreciation	1
Marking	Straight Arrow	Each	1	$47.70	8	3	No Depreciation	1
Railing	Guardrail	m	railings.length_m	$206.71	8	40	Straight Line over the TUL	1
Railing	Hand rail	m	railings.length_m	$47.85	8	20	Straight Line over the TUL	1
Railing	Railing Catch All	m	railings.length_m	$206.71	8	40	Straight Line over the TUL	1
Railing	Railing not owned by Council - nil cost	m	railings.length_m	$0.00	8	15	Straight Line over the TUL	
Railing	Sight rail	m	railings.length_m	$51.68	8	20	Straight Line over the TUL	1
SW Channel	Barrier Kerb & Channel	m	sw_channel.length_m	$96.90	8	90	Straight Line over the TUL	2
SW Channel	Concrete Slot Channel	m	sw_channel.length_m	$109.82	8	60	Straight Line over the TUL	2
SW Channel	Default SWC	m	sw_channel.length_m	$96.90	8	90	Straight Line over the TUL	2
SW Channel	Dish Kerb & Channel	m	sw_channel.length_m	$71.06	8	60	Straight Line over the TUL	2
SW Channel	Kerb Only	m	sw_channel.length_m	$83.98	8	70	Straight Line over the TUL	2
SW Channel	Mountable Kerb & Channel	m	sw_channel.length_m	$90.44	8	80	Straight Line over the TUL	2
SW Channel	Poured Dish Channel	m	sw_channel.length_m	$90.44	8	60	Straight Line over the TUL	2

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
SW Channel	SWC - deep, to metal feather	m	sw_channel.length_m	$7.75	8	55	Straight Line over the TUL	2
SW Channel	SWC - deep, to seal edge	m	sw_channel.length_m	$3.88	8	55	Straight Line over the TUL	2
SW Channel	SWC - sealed shallow channel	m	sw_channel.length_m	$67.18	8	55	Straight Line over the TUL	1
SW Channel	SWC - shallow, to metal feather	m	sw_channel.length_m	$1.94	8	55	Straight Line over the TUL	2
SW Channel	SWC - shallow, to seal edge	m	sw_channel.length_m	$2.58	8	55	Straight Line over the TUL	2
SW Channel	SWC Non LA	m	sw_channel.length_m	$0.00	8	50	No Depreciation	
SW Channel	Sealed Dish Channel	m	sw_channel.length_m	$67.18	8	55	Straight Line over the TUL	1
Sign	Catch All Signs	Each	1	$338.70	8	12	Straight Line over the TUL	1
Sign	Guide signs group	Each	1	$985.15	8	15	Straight Line over the TUL	1
Sign	Hazard Marking Signs group	Each	1	$100.75	8	10	Straight Line over the TUL	1
Sign	Information General signs group	Each	1	$239.74	8	10	Straight Line over the TUL	1
Sign	Information Miscellaneous signs group	Each	1	$220.69	8	15	Straight Line over the TUL	1
Sign	Information signs group	Each	1	$220.69	8	10	Straight Line over the TUL	1
Sign	Miscellaneous signs group	Each	1	$474.68	8	15	Straight Line over the TUL	1
Sign	Motorists services signs group	Each	1	$1,085.62	8	15	Straight Line over the TUL	1
Sign	Permanent Warning signs group	Each	1	$341.61	8	10	Straight Line over the TUL	1
Sign	Regulatory General signs group	Each	1	$483.96	8	10	Straight Line over the TUL	1
Sign	Regulatory Parking signs group	Each	1	$235.83	8	15	Straight Line over the TUL	1
Sign	Tourist signs group	Each	1	$2,114.66	8	20	Straight Line over the TUL	1
Street Light (Bracket)	Non LA Brackets	Each	1	$0.00			Straight Line over the TUL	2
Street Light (Bracket)	ODC Bracket	Each	1	$299.07	8	50	Straight Line over the TUL	2
Street Light (Light)	150 Watt Lamps INACTIVE	Each	1	$450.66	0	25	Straight Line over the TUL	1
Street Light (Light)	Non LA lights	Each	1	$0.00			Straight Line over the TUL	1
Street Light (Light)	ODC Street Light	Each	1	$717.76	8	25	Straight Line over the TUL	1
Street Light (Pole)	SL Pole Not Owned by ODC	Each	1	$0.00			Straight Line over the TUL	

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Street Light (Pole)	SL Pole Owned by ODC	Each	1	$2,153.27	8	60	Straight Line over the TUL	2
Street Light (Pole)	Steel Ground Plant 9m INACTIVE	Each	1	$1,350.72	8	50	Straight Line over the TUL	2
Sub-base	Sealed Subbase	m³	treatment_length.tl_area*0.130	$52.06	8	75	Straight Line over the TUL	2
Sub-base	Sealed Subbase - Non LA	m³	treatment_length.tl_area*0.130	$0.00			Straight Line over the TUL	2
Sub-base	Sealed Subbase - not sealed nil value	m³	treatment_length.tl_area*0.130	$0.00			Straight Line over the TUL	2
Surface Structure	Asphalt	m²	treatment_length.tl_area	$43.67	8	15	Straight Line over the TUL	2
Surface Structure	G2 1st coat chip seal	m²	treatment_length.tl_area	$5.80	8	10	Straight Line over the TUL	1
Surface Structure	G2 2nd coat chip seal	m²	treatment_length.tl_area	$5.80	8	15	Straight Line over the TUL	1
Surface Structure	G2 chip re-seal	m²	treatment_length.tl_area	$5.80	8	16	Straight Line over the TUL	1
Surface Structure	G2/3 1st coat chip seal	m²	treatment_length.tl_area	$7.10	8	10	Straight Line over the TUL	1
Surface Structure	G2/3 2nd coat chip seal	m²	treatment_length.tl_area	$7.10	8	12	Straight Line over the TUL	1
Surface Structure	G2/3 chip re-seal	m²	treatment_length.tl_area	$7.10	8	15	Straight Line over the TUL	1
Surface Structure	G2/4 1st coat chip seal	m²	treatment_length.tl_area	$7.10	8	10	Straight Line over the TUL	1
Surface Structure	G2/4 2nd coat chip seal	m²	treatment_length.tl_area	$7.10	8	13	Straight Line over the TUL	1
Surface Structure	G2/4 chip re-seal	m²	treatment_length.tl_area	$7.10	8	17	Straight Line over the TUL	1
Surface Structure	G3 1st coat chip seal	m²	treatment_length.tl_area	$5.20	8	10	Straight Line over the TUL	1
Surface Structure	G3 2nd coat chip seal	m²	treatment_length.tl_area	$5.20	8	14	Straight Line over the TUL	1
Surface Structure	G3 chip re-seal	m²	treatment_length.tl_area	$5.20	8	14	Straight Line over the TUL	1
Surface Structure	G3/5 1st coat chip seal	m²	treatment_length.tl_area	$6.10	8	10	Straight Line over the TUL	1
Surface Structure	G3/5 2nd coat chip seal	m²	treatment_length.tl_area	$6.10	8	12	Straight Line over the TUL	1
Surface Structure	G3/5 chip re-seal	m²	treatment_length.tl_area	$6.10	8	16	Straight Line over the TUL	1
Surface Structure	G4 1st coat chip seal	m²	treatment_length.tl_area	$4.70	8	10	Straight Line over the TUL	1
Surface Structure	G4 2nd coat chip seal	m²	treatment_length.tl_area	$4.70	8	12	Straight Line over the TUL	1

Description	SRC Description	SRC Unit of Measure	Calculation	RC Unit Cost	RC Overhead Percentage	Total Useful Life	Depreciation Method	Minimum RUL
Surface Structure	G4 chip re-seal	m²	treatment_length.tl_area	$4.70	8	15	Straight Line over the TUL	1
Surface Structure	G4/5 1st coat chip seal	m²	treatment_length.tl_area	$5.80	8	10	Straight Line over the TUL	1
Surface Structure	G4/5 2nd coat chip seal	m²	treatment_length.tl_area	$5.80	8	13	Straight Line over the TUL	1
Surface Structure	G4/5 chip re-seal	m²	treatment_length.tl_area	$5.80	8	16	Straight Line over the TUL	1
Surface Structure	G4/6 1st coat chip seal	m²	treatment_length.tl_area	$5.80	8	10	Straight Line over the TUL	1
Surface Structure	G4/6 2nd coat chip seal	m²	treatment_length.tl_area	$5.80	8	13	Straight Line over the TUL	1
Surface Structure	G4/6 chip re-seal	m²	treatment_length.tl_area	$5.80	8	15	Straight Line over the TUL	1
Surface Structure	G5 1st coat chip seal	m²	treatment_length.tl_area	$4.60	8	8	Straight Line over the TUL	1
Surface Structure	G5 2nd coat chip seal	m²	treatment_length.tl_area	$4.60	8	10	Straight Line over the TUL	1
Surface Structure	G5 chip re-seal	m²	treatment_length.tl_area	$4.60	8	10	Straight Line over the TUL	1
Surface Structure	G6 1st coat chip seal	m²	treatment_length.tl_area	$4.60	8	8	Straight Line over the TUL	1
Surface Structure	G6 2nd coat chip seal	m²	treatment_length.tl_area	$4.60	8	10	Straight Line over the TUL	1
Surface Structure	G6 chip re-seal	m²	treatment_length.tl_area	$4.60	8	10	Straight Line over the TUL	1
Surface Structure	Non LA surface	m²	treatment_length.tl_area	$0.00	8	10	Straight Line over the TUL	
Surface Structure	default chip seal	m²	treatment_length.tl_area	$6.10	8	15	Straight Line over the TUL	1
Unsealed Basecourse	Unsealed Basecourse	m³	treatment_length.tl_area*0.100	$99.22	8	82	Straight Line over the TUL	2
Unsealed Basecourse	Unsealed Basecourse - Non LA	m³	treatment_length.tl_area*0.100	$0.00	8	82	Straight Line over the TUL	2
Unsealed Basecourse	Unsealed Basecourse - sealed nil value	m³	treatment_length.tl_area*0.100	$0.00	8	82	Straight Line over the TUL	2
Unsealed Subbase	Unsealed Subbase	m³	treatment_length.tl_area*0.130	$52.06	8	75	Straight Line over the TUL	2
Unsealed Subbase	Unsealed Subbase - Non LA	m³	treatment_length.tl_area*0.130	$0.00			Straight Line over the TUL	2
Unsealed Subbase	Unsealed Subbase - sealed nil value	m³	treatment_length.tl_area*0.130	$0.00			Straight Line over the TUL	2

INVESTMENT AUDIT REPORT

Procedural Audit of Ōtorohanga District Council

Monitoring Investment Performance

Report of the investment audit carried out under Section 95(j)(ii)(iii) of the Land Transport Management Act 2003.

Caroline Reddie

23 March 2023

FINAL

WAKA KOTAHI NZ TRANSPORT AGENCY

New Zealand Government

Approved Organisation (AO):	Ōtorohanga District Council
Waka Kotahi NZ Transport Agency Investment (2021 – 2024 NLTP):	$17,244,698.00 (budgeted programme value)
Date of Investment Audit:	20 - 24 March 2023
Auditor(s):	Caroline Reddie - Senior Investment Auditor
Report No:	RACRI-2262

AUTHORITY SIGNATURES

Prepared by: CReddie

Caroline Reddie, Senior Investment Auditor

Approved by: 2/5/2023

Yuliya Gultekin, Practice Manager Audit & Assurance Date

EXECUTIVE SUMMARY

Waka Kotahi NZ Transport Agency (hereafter Waka Kotahi) funds the Ōtorohanga District Council`s (the Council) land transport activity through its National Land Transport Programme (NLTP). The Ōtorohanga District has a road network of 804km that comprises of 526km of sealed road and 278km of unsealed road.

Claims for funding assistance for the three financial years to 30 June 2022 were reconciled against Council's final TIO claim submissions. Ōtorohanga District Council has a current Waka Kotahi endorsed Procurement Strategy which expires on 29 June 2023. The Procurement Strategy has not been published the website. Council must ensure that its current Procurement Strategy, endorsed by Waka Kotahi, is publicly available and accessible through its website as per Section 10.6 of the Procurement Manual.

Two road safety audits were reviewed (Otewa Road Stage 4) and (Wharepuhunga Road Stage 4). Both road safety audit report Designer Response, Safety Engineer, and Action taken had not been fully completed and both audit reports had not been signed by all parties.

Five contracts were reviewed for compliance with waka Kotahi Procurement Manual requirements. During the audit not all documents were available for the audit review. As per Section 11.5 of the Procurement Manual Council should include at a minimum: relevant documentation including evidence of procurement decisions and their rationale. The audit identified a contract where a variation was implemented with no variation agreement or approval, minutes of the meeting/s held to discuss the variation or outcomes were available.

A review of the in-house professional services cost was completed and the methodology for calculating administration and overheads costs was tested. Council is applying a calculation that accounts for actual costs with a multiplier of 2.25% when calculating administration and overheads costs. This is within the acceptable limit.

AUDIT RATING ASSESSMENT

Subject Areas		Rating Assessment*
1	Previous Audit Issues	N/A
2	Financial Processes	Effective
3	Procurement Procedures	Effective
4	Contract Management	Effective
5	Professional Services	Effective
Overall Rating		**Effective**

** Please see Introduction for Rating Assessment Classification Definitions*

RECOMMENDATIONS

The table below captures the audit recommendations. Agreed dates are provided for the implementation of recommendations by the approved organisation.

We recommend that Ōtorohanga District Council:		**Implementation Date**
R2.1	Ensures that TIO claims for funding assistance are uploaded monthly.	Complete. Only December has been missed this financial year.
R3.1	Ensures Road safety audit reports for Designer Response, Safety Engineer , and Action taken responses are completed and are attached to the TIO funding application or, an exemption declaration is completed by the Road Controlling Authority's project manager and is attached to the TIO funding application.	Complete. RSA tables were populated only signatures were missing. These have been added to the filed document. ODC is committed to building safer roads.
R3.2	Ensure the current Procurement strategy is published on the Council`s website as per the section 10.6 of the Waka Kotahi Procurement Manual.	Complete. The current Procurement Strategy is available on the Council web site. There is reference in the document to being available on the web site.
R4.1	Ensures all relevant documentation, including evidence of procurement decisions and their rationale for funded activities are available as per the Section 11.5 of the procurement manual.	This occured on the Okupata contract. Email correspondence around the variations were available.

1. INTRODUCTION

1.1. Audit Objective

The objective of this audit is to provide assurance that the Waka Kotahi NZ Transport Agency's (hereafter Waka Kotahi) investment in Council's land transport programme is being well managed and delivering value for money. We also seek assurance that the Council is appropriately managing risk associated with Waka Kotahi investment. We recommend improvements where appropriate.

1.2. Assessment Ratings Definitions

	Effective	Some Improvement Needed	Significant Improvement Needed	Unsatisfactory
Investment management	Effective systems, processes and management practices used.	Acceptable systems, processes and management practices but opportunities for improvement.	Systems, processes and management practices require improvement.	Inadequate systems, processes and management practices.
Compliance	Waka Kotahi and legislative requirements met.	Some omissions with Waka Kotahi requirements. No known breaches of legislative requirements.	Significant breaches of Waka Kotahi and/or legislative requirements.	Multiple and/or serious breaches of Waka Kotahi or legislative requirements.
Findings/ deficiencies	Opportunities for improvement may be identified for consideration.	Error and omission issues identified which need to be addressed.	Issues and/or breaches must be addressed, or on-going Waka Kotahi funding may be at risk.	Systemic and/or serious issues must be urgently addressed, or on-going Waka Kotahi funding will be at risk.

1.3. Council Comments

We would like to thank Caroline Reddie for the efficient and professional way she carried out the Investment Audit. Her focus was always to minimise disruption to our day to day activities whilst being able to fulfil the requirements of the audit.

The findings of the audit we consider to be minor in nature and feel that the overall rating should be revised to "effective" based on the descriptions tabulated above. The audit period covered a particularly challenging time through disruptions caused by COVID. The results make Councils achievement through these times as particularly notable.

We look forward to your favourable consideration of the points raised by ODC and again thank Caroline for her input.

Commented [YG1]: I suggest we remove this and just say that Council`s comments have been considered.

2. ASSESSMENT FINDINGS

Our findings relating to each subject area are presented in the tables below. Where necessary, we have included recommendations and/or suggestions.

1. Previous Audit Issues	
There were no outstanding recommendations from the previous audit of September 2019.	
Ōtorohanga District Council's comment	Agreed

* * *

2. Financial Processes	Effective
Claims for funding assistance for the three financial years to 30 June 2022 were reconciled against the Council's final TIO claim submissions. The structure of the General Ledger is well laid out, easy to follow and is clearly mapped to Waka Kotahi work categories. Council's General Ledgers transactions provided for the audit matched the final TIO claim amounts for each of the years. Transactions testing was completed for the different work categories, and we verified that for Work category 113 – there is a 30%:70% split applied for cleaning of kerbed water channels, sumps and cesspits in urban areas (30% of total cost). The Low Risk–Low Cost (LR-LC) Improvement's activity list has been updated with the actual cost of the project and, there are no outstanding retentions. TIO claims are uploaded periodically, and Council has agreed to upload these on a regular monthly basis.	
Recommendation	We recommend that Council: R2.1 Ensures TIO claims for funding assistance are uploaded monthly.
Ōtorohanga District Council's comment	Only December 2022 has been missed this financial year. There have been 2 or 3 months missed in each year of the audit period.

* * *

3. Procurement Procedures	Effective
Ōtorohanga District Council has a current Waka Kotahi endorsed Procurement Strategy. This Strategy expires on the 29th of June 2023. Council has contacted Waka Kotahi Procurement team to start working through a new Procurement Strategy. The Strategy was not able to be found on the Council`s website and this is a funding requirement as per the section 10.6 of the Waka Kotahi Procurement Manual. Ōtorohanga District Council was only using Tenderlink to advertise procurement activities, but is now advertising using GETS as per the section 10.6 of the Procurement Manual as of 2023. A Road safety audit is a formal, robust technical assessment of transport safety risks associated with transport improvement and renewal projects with the objective or minimising death and serious injury on the network. Two road safety audits were reviewed (Otewa Road Stage 4 – 3 Minor and 3 Moderate concerns reported) and (Wharepuhunga Road Stage 4 – 1 Minor and 1 Moderate concern reported). Both Road safety audits Designer Response, Safety Engineer, and Action taken had not been fully completed and both audit reports had not been signed by all parties. The amended Oct 2022 Safety Systems Guideline now requires the audit safety report and the managers responses to be attached to the TIO funding application or an exemption declaration must be completed by the Road Controlling Authority's project manager and must be attached to any TIO funding application.	
Recommendations	We recommend that Ōtorohanga District Council: R3.1 Ensures Road safety audit reports for Designer Response, Safety Engineer, and Action taken responses are completed and are attached to the TIO funding application or, an exemption declaration is completed by the Road Controlling Authority's project manager and is attached to the TIO funding application. R3.2 Ensures the Council`s Procurement Strategy is published to its website as per the section 10.6 of the Waka Kotahi Procurement Manual.
Ōtorohanga District Council's comment	The current procurement strategy is available on the Councils web site. Comments were added into the RSA report. The only omission were signatures which have now been completed. Recommend that consideration be given to changing evaluation to "effective" due to the minor nature of the findings
Auditor Response	The Auditor has considered the information provided and changed the evaluation score to "effective"

Commented [YG2]: We can remove this as the final report is what matters not the process of getting to this point.

* * *

4. Contract Management	Effective
Five (5) Contracts were reviewed for compliance with Waka Kotahi Procurement Manual requirements. The contracts review noted that for Contract 1100 a new retention amount was added to this contract on top of the original amount due to a variation in the agreement. However, the contract file did not contain meeting minutes or a variation agreement for the changes to the contract term. Council needs to ensure all documentation justifying funded activity amounts are included with all contracts and are available at the time of audit.	
Recommendation	We recommend that Council:

	R4.1 Ensures all relevant documentation, including evidence of procurement decisions and their rationale for funded activities are available as per Section 11.5 of the Procurement Manual.
Ōtorohanga District Council's comment	This occurred on the Okupata contract only (contract 1100). Email correspondence around the variations were available and accepted by the contractor. Retentions were applied and deducted from claims by the contractor for the revised amounts. COVID had an impact on the ability to finalise these sorts of issues with the remote nature of communications. A single occurrence of such an issue and that the only issue was that communications were not translated into an NTC is a good outcome overall. For this reason we would request that consideration be given to changing the evaluation score to "effective".
Auditor Response	The Auditor has considered the information provided and changed the evaluation score to "effective"

Commented [YG3]: And the same here

* * *

5. Professional Services	Effective
A review of the in-house professional services cost was completed and the methodology for calculating administration and overheads costs was tested. Council is applying a calculation that accounts for actual costs with a multiplier of 2.25% when calculating administration and overheads costs. This is within the acceptable limit.	
Ōtorohanga District Council's comment	Agreed

* * *

3. APPENDICES

APPENDIX A

Council Feedback

Refer sections above

APPENDIX B

Audit Programme

1. Previous audit September 2019
2. Land Transport Disbursement Account (GL)
3. Final Claims for 2019/20, 2020/21, 2021/22
4. Transactions (accounts payable)
5. Retentions Account
6. Procurement Procedures
7. Contract Variations
8. Contract Management & Administration
9. Professional Services
10. Transport Investment On-line (TIO) Reporting
11. Other issues that may be raised during the audit
12. Close-out meeting

APPENDIX C

Contracts Audited

Contract Number	Tenders Received	Date Let	Description	Contractor		
			Physical Works			
1103	4	1/7/2021	Unsealed Road Metalling 2021-2024	Inframax Construction	Estimate Let Price Final Cost	$1,594,270.14 $1,822.287.58 Ongoing
1100	5	30/6/2020	Okupata Road Traction Seal	Schick Civil Construction	Estimate Let Price Final Cost	$200,000.00 $156.605.85 $185,528.85
1095	5	6/8/2020	Reseals and Second Coat Sealing 2020-2022	Higgins Contractors	Estimate Let Price Final Cost	$2,758,460.16 $2,861,229.35 $2,833,113.67
1097	1	27/11/2020	Otewa Road Pavement Rehabilitation	Inframax Construction	Estimate Let Price Final Cost	$698,451.68 $624,934.39 $619,741.98
1109	1	1/7/2020	Tapuae /Road Widening 2020 -2021	Inframax Construction	Estimate Let Price Final Cost	$248,617.13 $199,559.38 $172,954.90

RATA

Waikato Roading Survey
May 2023

Versus
RESEARCH

CONTENTS

PROJECT OVERVIEW

EXECUTIVE SUMMARY

Project Overview

The Road Asset Technical Accord (RATA) was initially formed to facilitate co-operation on road maintenance and spending for Waikato councils. Since its inception RATA has been absorbed by a broader entity (Co-Lab Solutions) however, the Waikato Roading Survey has continued.

The survey is completed biennially and provides RATA with an understanding of:
- The relative importance customers place on road condition, safety, cycling lanes, footpaths etc.
- How adequate customers think the roads and footpaths are based on a number of attributes, e.g., conditions, safety, crossing safety etc.
- Any improvements that customers would like to see made to roads in their area.

A survey of n=1,350 respondents from across the Waikato region was undertaken between the 6th of March and the 12th of April. Data collection was completed via an online survey (n=1,100 responses) and a telephone survey (n=250 responses).

It should be noted that this survey was conducted immediately after a period of extreme weather in the Waikato region including Cyclone Hale and Cyclone Gabriel. Readers of the report should be aware of this when reviewing the results.

Roading

Roading attributes with the highest adequacy ratings are signage clarity (68%), cleanliness (60%), and road markings (64%). Attributes with the lowest ratings are repair time (32%) and repair quality (37%). Overall satisfaction with roads in the region now sits at 53% which is the lowest it has been since monitoring commenced in 2015.

This year saw a decline in perceived adequacy for all roading attributes since the 2021 measures. The most significant decrease is observed for attributes relating to roadside verges (46%, previously 57% in 2021), repair quality (37%, previously 46%), roadside markings (64%, previously 72%), and cleanliness (60%, previously 68%). Smaller decreases were observed for road condition (44%, previously 50%), signage clarity (68%, previously 74%), and road safety (54%, previously 60%).

A decline in roading attribute ratings is observed across all districts with repair quality and drainage consistently experiencing the biggest declines. The area with the most stable results is Hauraki District where most results remained relatively similar to the 2021 results, with no significant changes.

With regards to importance, the attributes rated most important are road condition, road safety, and repair quality. These attributes are all positioned in the low performance, high importance quadrant of the map and there has been shift for most attributes to a lower performance rating. In particular, road safety has moved from the high performance, high importance quadrant to the low performance, high importance quadrant.

The primary drivers of these shifts relate to perceptions of poor road conditions (23%), slow and constant repairs (14%), substandard repairs (12%), and roads needing improvement generally (12%).

Footpaths

The footpath attribute with the highest adequacy rating is the number of footpaths (73%), while the lowest rating is afforded to the response and quality of footpath repairs (56%). A new measure was included this year to address the provision of kerb ramps for accessibility which resulted in a 59% adequacy rating. Overall satisfaction with the footpaths is at 65%.

Most footpath attribute ratings are similar to those from 2021 and have remained relatively consistent since 2015. The exception to this is footpath condition which has declined slowly since 2015 and the subsequent measure of overall satisfaction with footpaths which has also declined slightly (75% in 2015, now 65% in 2023).

The attribute ratings for footpaths in most districts remained the same as 2021 with very few changes noted. Interestingly, the attributes which are rated the lowest are for the Thames-Coromandel district, while Hamilton City received some of the highest ratings.

When looking that the importance of different footpath attributes, the condition of the footpath and the provision of safe road crossings are the elements which respondents place the greatest importance upon. This is followed by the response and quality of repairs and the provision of kerb ramps for accessibility. Attributes which are considered of lower importance are the cleanliness of the footpaths and the number of footpaths.

Most attributes are in a similar position to that of 2021 however, the inclusion of a new attribute (provision of kerb ramps for accessibility) this year has changed the prioritisation of attributes slightly.

The attribute that this has mostly affected is the response and quality of repairs which has moved from the low performance, high importance quadrant to the low performance, low importance quadrant.

The primary concerns respondents have about footpaths are the need for better maintenance (13%), uneven surfaces or trip hazards (11%), overgrown vegetation

EXECUTIVE SUMMARY

(6%), a lack of suitability for people with a disability or access issues (6%), and a lack of safe road crossings (5%). However, 42% of respondents state there are no issues with the footpaths, and these are generally adequate.

Cycle Lanes and Public Transport

New questions were included this year regarding the use of, and satisfaction with, cycle lanes in the region. Overall, 20% of respondents use off-road cycle lanes and 18% use on-road cycle lanes in their area. Satisfaction with off-road cycle lanes is high with 79% of off-road users satisfied with the off-road cycle lanes.

The main improvements that off-road cycle lane users would like made to this infrastructure is around increasing the number of lanes (49%) and making the tracks wider (36%) and smoother (24%).

Satisfaction with on-road cycle lanes is slightly lower than for off-road cycle lanes, with only 55% of users satisfied with these. The primary improvements on-road cycle lane users would like made relate to increasing the number of cycle lances (36%) and creating buffer zones between cars and cycle lanes (34%).

Support for cycle lanes (both on-road and off-road is high), with 60% of all respondents supportive of having these in their area, and 60% saying the number of cycle lanes in their district is about right.

This year 6% of respondents indicate they use public transport with 1% stating this is their main mode of transport. Satisfaction with public transport is moderate with 44% of all respondents stating they are either satisfied or very satisfied with the public transport in their area. Interestingly, satisfaction levels are much higher amongst public transport users (69% satisfaction) than amongst non-users (42% satisfaction).

BACKGROUND AND METHOD

Background

The Regional Asset Technical Accord (RATA) was formed to facilitate co-operation on the strategic planning of road maintenance and renewals, and aims to deliver efficiencies to the councils involved. As part of this role, RATA required an understanding of the level of customer satisfaction with the current road network and has commissioned biennial research to determine:

- The relative importance customers place on road condition, safety, cycling lanes, footpaths etc.?
- Customers' level of satisfaction with the current road conditions, safety, cycling lanes, footpaths etc.?
- If customers feel that roads, footpaths and cycle lanes are 'fit for' purpose overall given the level of use they receive.

Since the survey's inception, RATA became part of a larger entity (Co-Lab Solutions) however, the Waikato Roading Survey has been retained as a monitoring tool.

Method

The 2023 survey a repeat of the survey used in previous years. As with 2021's project both online and computer-assisted telephone interviewing (CATI) were used with the aim of continuing to achieve a representative sample across the region. In line with previous years a total of n=1,350 surveys were collected from across the region (n=150 surveys collected from each district included within the project). Online interviewing was the primary method of data collection this year with n=1,100 collected via third party panel provider and further n=250 collected via CATI.

It should be noted that this survey was conducted immediately after a period of extreme weather in the Waikato region, specifically Cyclone Hale (7 - 12 January, 2023) and Cyclone Gabriel (6 - 11 February, 2023). This weather had a significant impact on the roads across the region, particularly with regards to flooding and washouts. While a number of the affected roads were state highways, such events are likely to have had a negative impact on the roading results. Readers of the report should be aware of this when reviewing this year's results.

Previous years' surveys had a specific focus on key user groups. This year this focus was removed in favour of questions relating to cycling infrastructure and cycling habits in the region.

Sample

In line with previous years a set number of surveys were collected from each district included within the project, this ensures a sufficient number of responses are collected from the smaller areas within the district to run sub-group analysis. Gathering an even number of responses from across the districts means that the final results will not represent the region at the total level, as those areas that are smaller will be over-represented in the final sample and those which are larger will be under-represented. To correct this skew we have applied post-collection weights to the final dataset at the total level.

The final, unweighted sample profile is shown on the following pages. Demographic tables of the final sample shown by district are included in the appendix.

Questionnaire

This year's questionnaire was largely similar to that used in previous years with the primary focus on the adequacy of different roading/footpath features, the overall satisfaction with roads/footpaths, and improvements for roads/footpaths.

The survey this year also included questions about cycling and public transport satisfaction.

Given the weather events this year, and the damage caused to state highways, additional steps were taken to ensure respondents were clear about the roads that they were evaluating.

The online survey included maps which differentiated between local roads (shown in blue) and state highways (shown in red) in a district. Separate images were shown for each district. For CATI surveys, interviewers were instructed to reinforce the survey was evaluating the local roads in the respondent's district, and not the state highways.

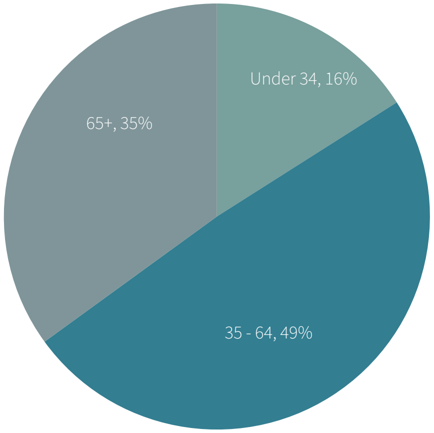
While there is no way to truly know what roads respondent's consider to be 'local roads', these actions will go some way to help clarifying the confusion between state highways and roads.

RESPONDENT PROFILE

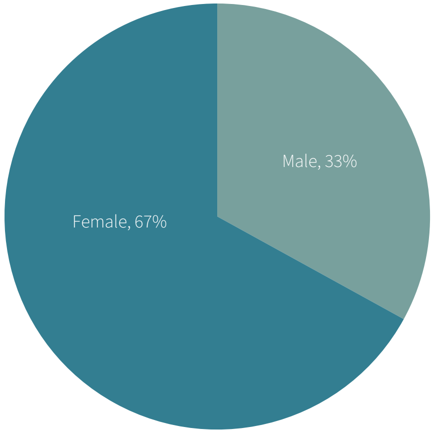
The charts to the right show the unweighted sample at the total level. Tables showing the distribution of these variables by district are included in the appendix.

The sample for 2023 has a slightly greater number of the women in the sample than in the population. Similarly, there are fewer people under the age of 34 than would be represented in the population. However, these proportions are the same as previous years so year on year comparisons are unlikely to be affected.

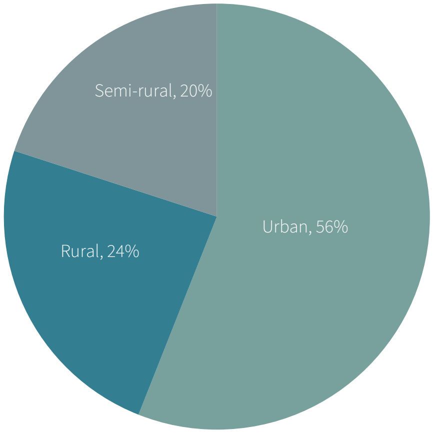
Age Unweighted



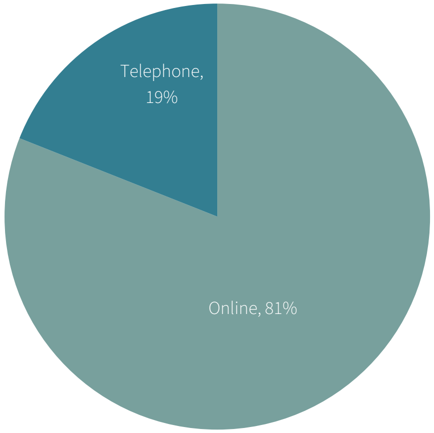
Gender Unweighted



Area Unweighted



Source Unweighted



NOTES ON REPORTING

Margin of Error (MOE)

MOE is a statistic used to express the amount of random sampling error present in a survey's results.

- Total sample size n=1,350 MOE of +/- 2.67%
- Area sample size n=150 MOE of +/- 8.0%

This means that if the observed result on the total resident sample of n=1,350 is 50% (point of maximum margin of error), then there is a 95% probability that the true answer falls between 47.33% and 52.67%. If the observed result on the area sample of n=150 is 50% then there is a 95% probability that the true answer falls between 42% and 58%.

Statistical Significance

Statistical testing is applied to the year on year results at the total level and for each district to highlight any differences between subgroup results and the result for the total sample/ area sample.

Statistical testing of the results is undertaken at the 95% confidence interval, which means that if the survey was repeated 100 times, we would expect a similar result at least 95 times out of 100.

Any user group differences have been highlighted within the text of each section and are referred to as are more/ less likely to be satisfied/ dissatisfied with specific measures.

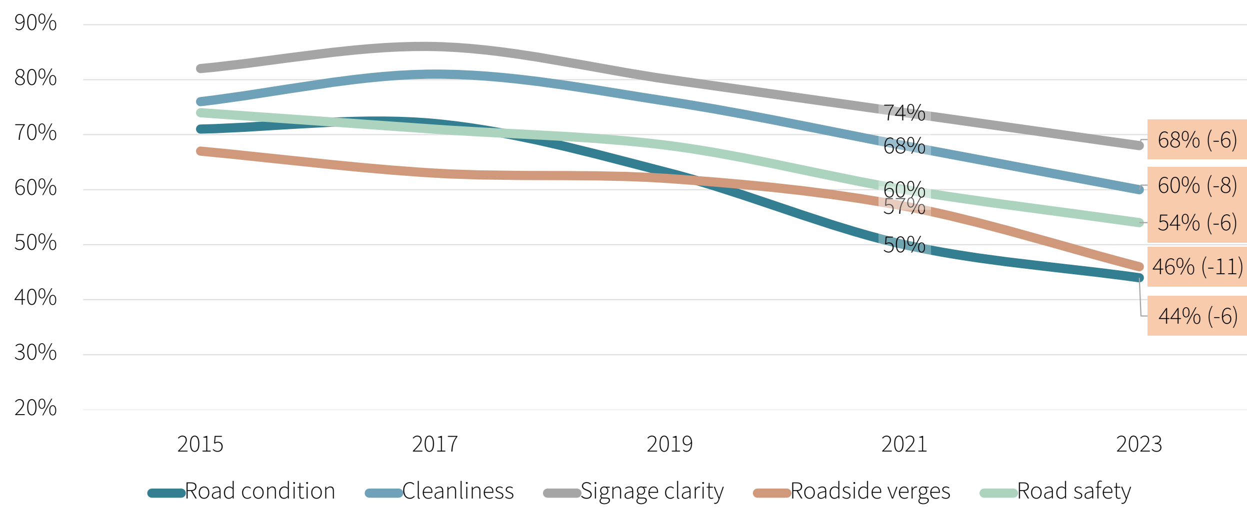
HOW TO READ THE REPORT

This year the results for the roading and footpath attributes are shown in a line chart (example chart shown to the right). This displays the total adequacy rating for each year of monitoring for a given attribute.

Any statistically significant changes between the 2021 and 2023 measures are highlighted by orange shading (lower rating in 2023 than 2021) or green shading (higher rating in 2023 than 2021).

The change between 2021 and 2023 are shown in parentheses after the 2023 figure when the change is statistically significant.

2015 - 2023 Results

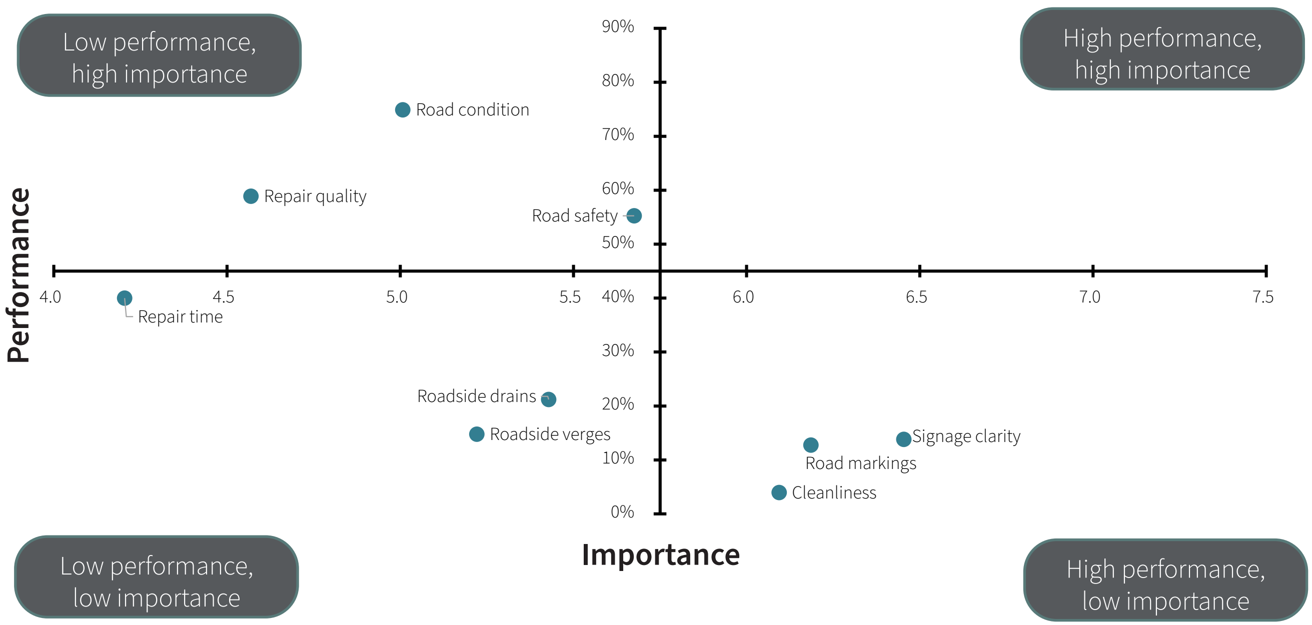


Ratings for adequacy (performance) and importance are displayed on this grid (example shown to the right). The X axis (horizontal) displays the mean rating for adequacy; the average rating given out of 10.

The Y axis (vertical) displays the percentage of respondents who ranked this measure in their top three for importance.

Therefore, if an aspect is high on the Y axis it has been rated as important and aspects positioned to the right on the X axis demonstrate measures that are performing well.

2023 Importance and Performance Results



ROADING: ADEQUACY AND IMPORTANCE

YEAR ON YEAR RESULTS: TOTAL

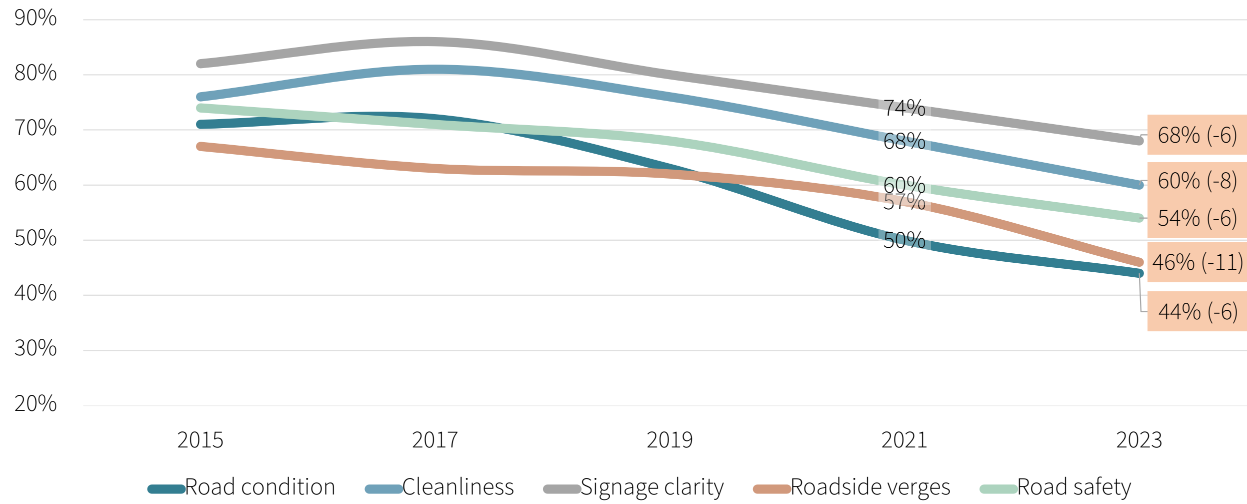
The charts to the right show the results for the roading measures from 2015 to 2023. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

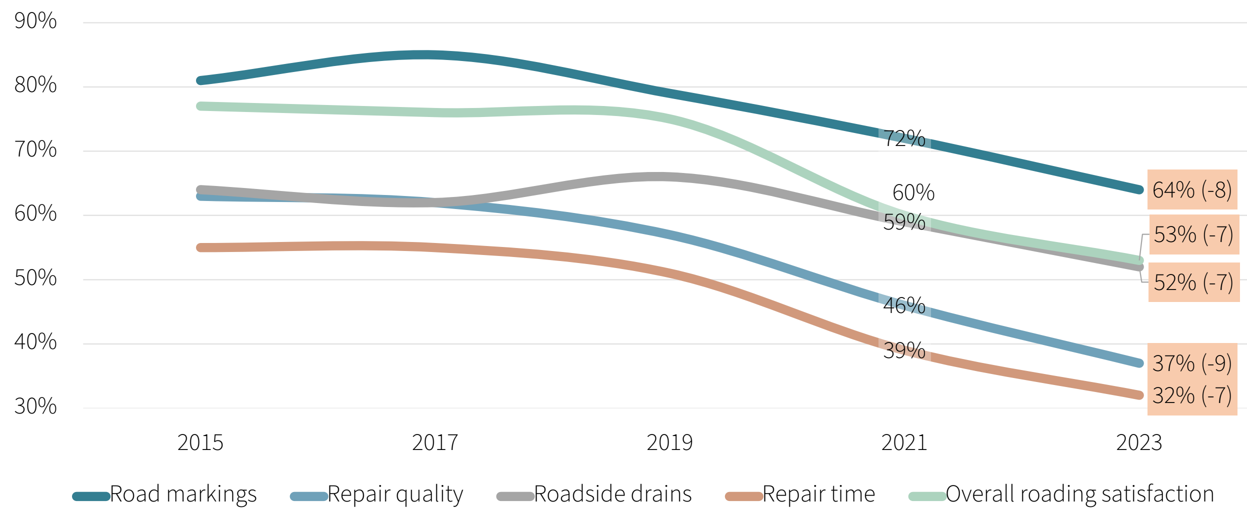
This year sees a continued decline in all roading measures. In 2023, the attributes with the highest levels of adequacy are signage clarity (68%) and road markings (64%). The attributes with the lowest adequacy ratings are repair time (32%) and repair quality (37%). Overall satisfaction is at 53%, a decrease of 7% since 2021.

All results show a significant decline since 2021 with the average decrease approximately 7%. The largest declines are seen for roadside verges (decrease of 11% since 2021) and repair quality (decrease of 9% since 2021).

Attributes with the smallest decline are road condition, signage clarity, and road safety, all of which decreased 6% since 2021.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: TOTAL RESULTS 2023

The grids to the right show the importance ratings for each roading attribute (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

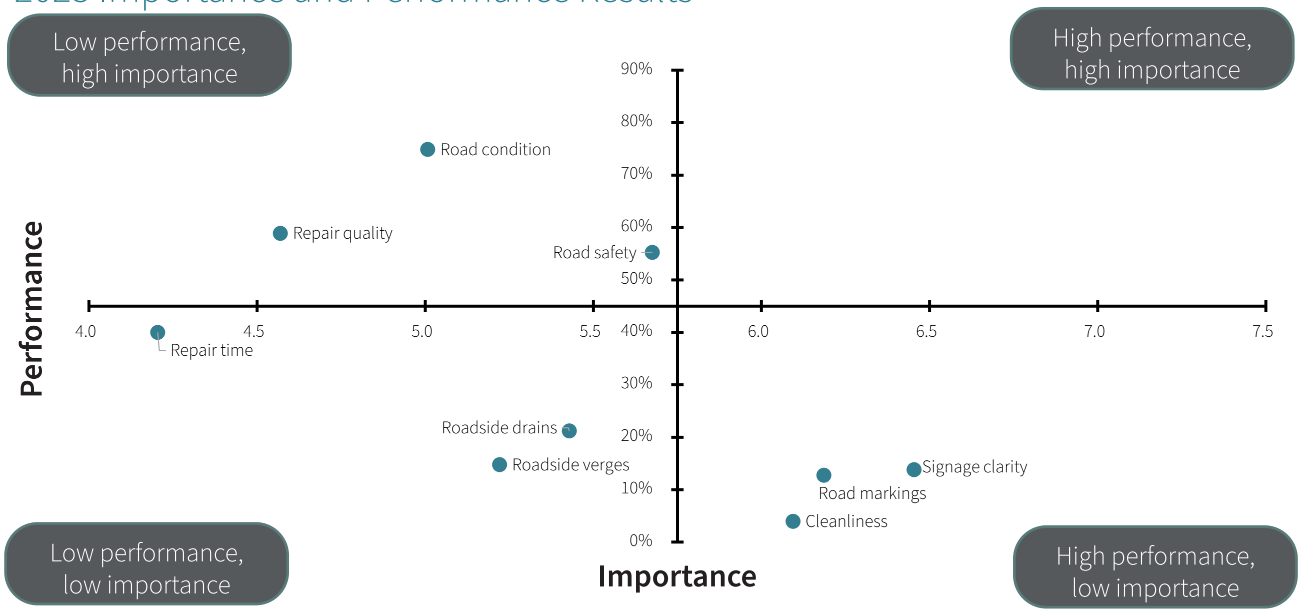
Attributes which are considered to be most important this year are road condition, road safety, repair quality, and repair timings. Attributes which are considered less important are signage clarity, road markings, cleanliness, roadside verges, and roadside drains.

Most features have shifted to the left of the grid since 2021, indicating a decline in performance. In particular, road safety is no longer in the high performance, high importance quadrant.

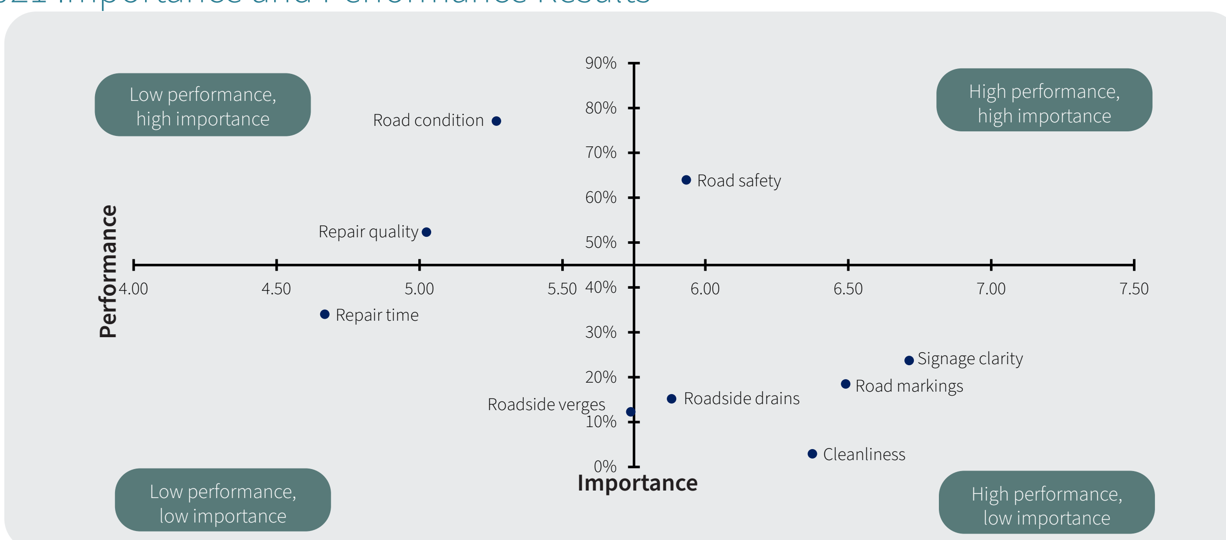
These results appear to be driven by perceptions of the roads being in poor condition (23%), slow and constant repairs (14%), substandard repairs and roads needing improvement (12% each), and a feeling of general dissatisfaction with the roads (11%). Just under one third (32%) of respondents note the roads are generally okay.

Rural residents are less likely to include road safety in their top three attributes (45%), while those who cycle as their main mode of transport are more likely to include road cleanliness (22%).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: THAMES-COROMANDEL

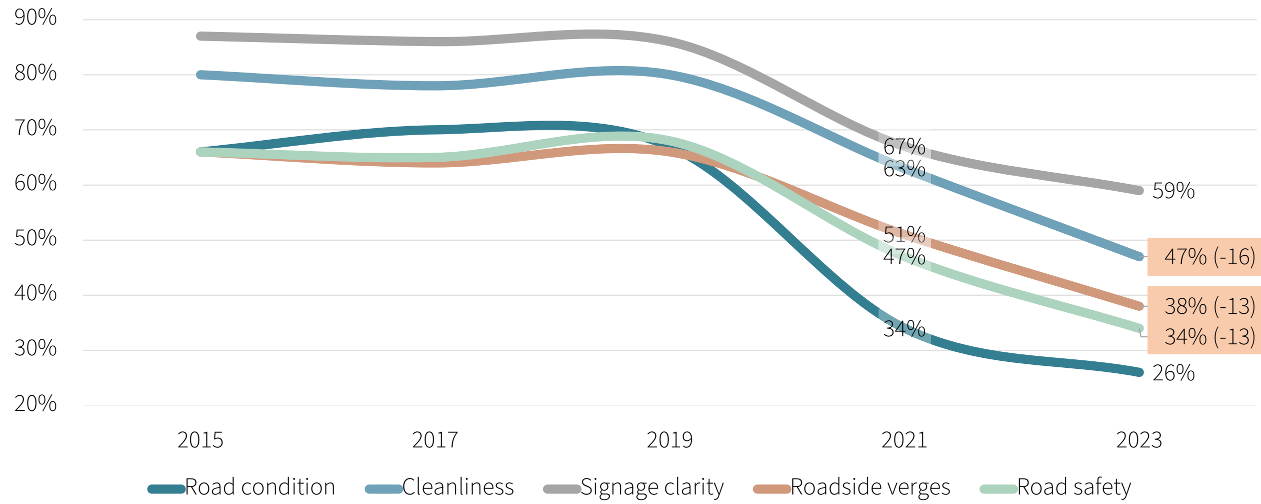
The charts to the right show the results for the roading measures from 2015 to 2023 for the Thames-Coromandel district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

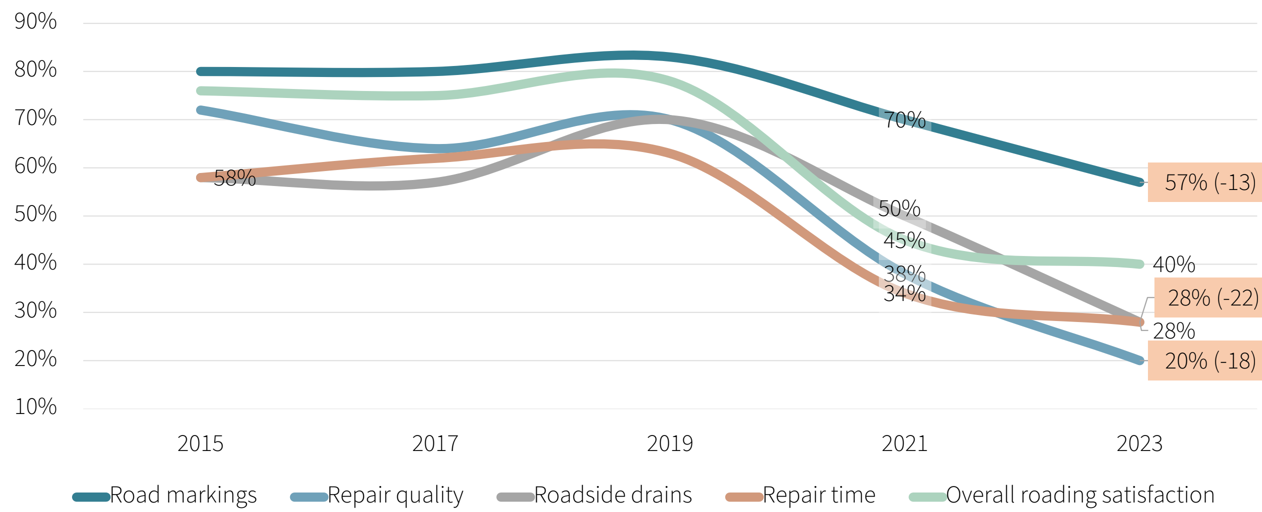
Within this district, adequacy results remained relatively consistent until 2019 but have declined since then.

In 2023, the attributes with the highest levels of adequacy are signage clarity (59%) and road markings (57%). Attributes with the lowest adequacy ratings are repair quality (20%) and road condition (26%). Overall satisfaction is at 40%, which is a 5% decline from 2021.

All measures for the Thames-Coromandel district have declined this year. The most significant declines are seen amongst ratings for roadside drainage (decrease of 22% since 2021), repair quality (decrease of 18% since 2021), and roadside cleanliness (decrease of 16% since 2021). However, significant decreases are also seen for measures relating to roadside verges, safety, and markings, all of which declined 13% since 2021.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: THAMES-COROMANDEL RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Thames-Coromandel district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

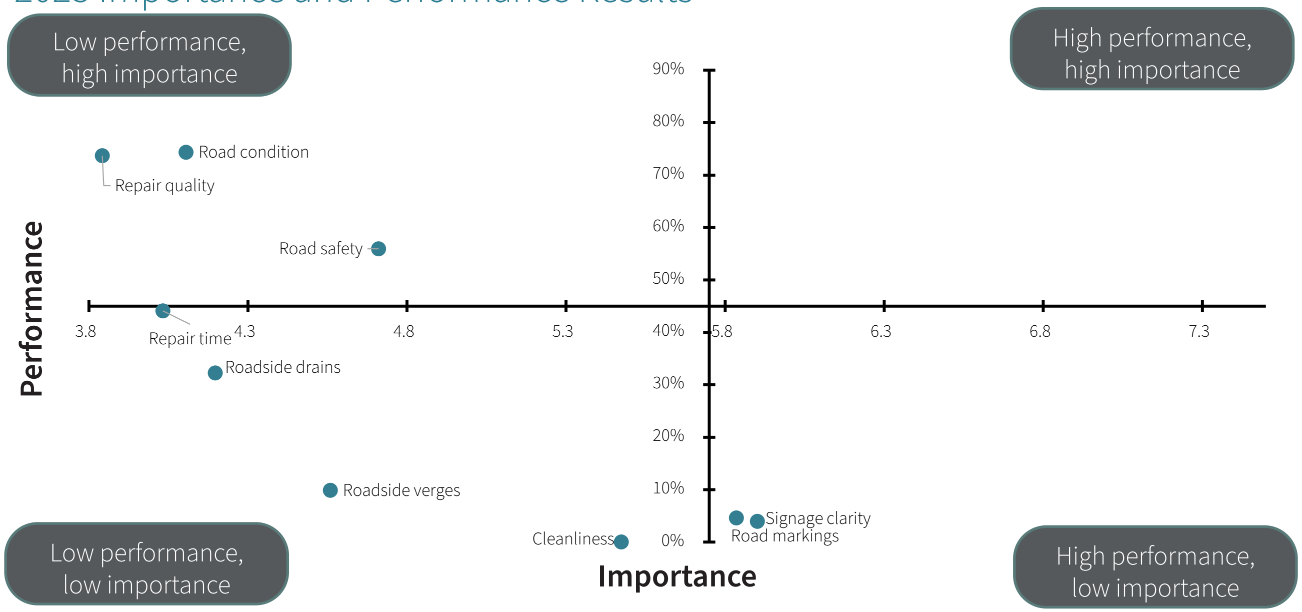
Attributes which are considered the most important are road condition, repair quality, road safety, and repair time. Roadside drains are also quite important but sit lower on the grid than the aforementioned attributes. Attributes which are considered less important are roadside verges, cleanliness, road markings, and signage clarity. Repair quality and roadside drains are much more likely to be considered important in this district than in other districts.

Most attributes have shifted to the left indicating a decline in performance however, signage clarity and road markings remain in the high performance, low importance quadrant. Repair quality, repair time, and roadside drains have all increased slightly in importance since 2021.

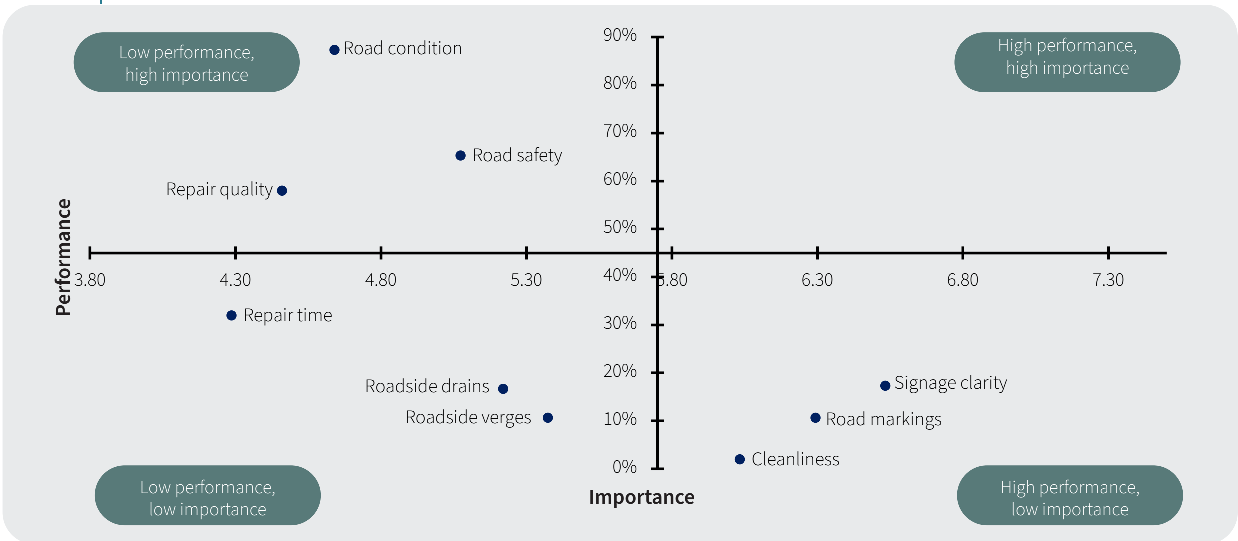
Twenty six percent of respondents from the Thames-Coromandel district state the roads are average and 16% note there is room for improvement. Sixteen percent of respondents think the roads are in poor condition and 14% are generally dissatisfied. Ten percent of respondents in this area state the roads are not fit for purpose which is significantly higher than any other district.

There are no differences observed between user groups within this area.

2023 Importance and Performance Results*



2021 Importance and Performance Results



*Different anchors required in 2023 to allow all measures to be shown.

YEAR ON YEAR RESULTS: HAURAKI

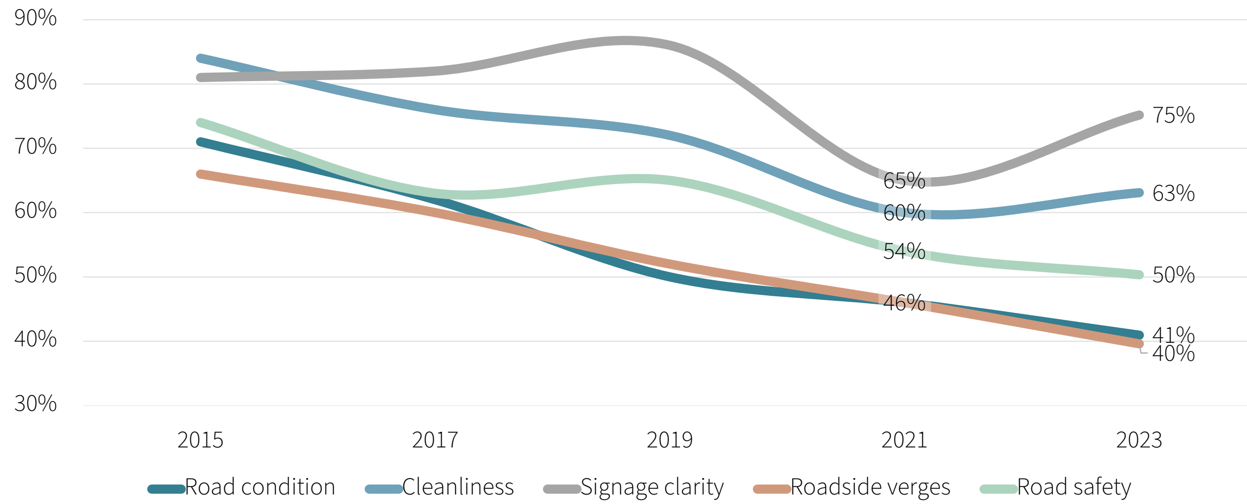
The charts to the right show the results for the roading measures from 2015 to 2023 for the Hauraki district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

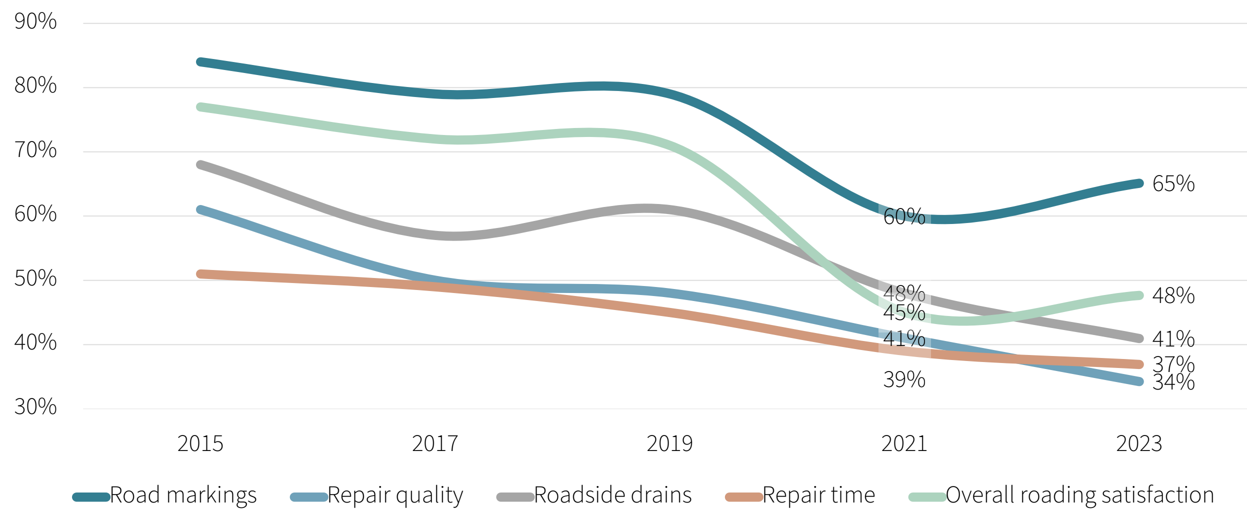
Within this district adequacy results have declined consistently since 2015 however, this year sees increases in a few measures.

In 2023, the attributes with the highest levels of adequacy are signage clarity (75%), road markings (65%), and roadside cleanliness (63%). The lowest levels of adequacy are observed for repair quality (34%) and repair time (37%). Overall satisfaction is at 48% this year which is a 3% increase from the 2021 result.

There are no significant differences between the results for 2021 and 2023 however, there have been some shifts in the results this year. The largest change is observed for signage clarity which has increased 10% since 2021. Increases are also seen for road markings (5% increase since 2021), roadside cleanliness, and overall satisfaction (both 3% increases since 2021). Most other results declined slightly or remained consistent with the 2021 result.

2015 - 2023 Results





ROADING: HAURAKI RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Hauraki district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

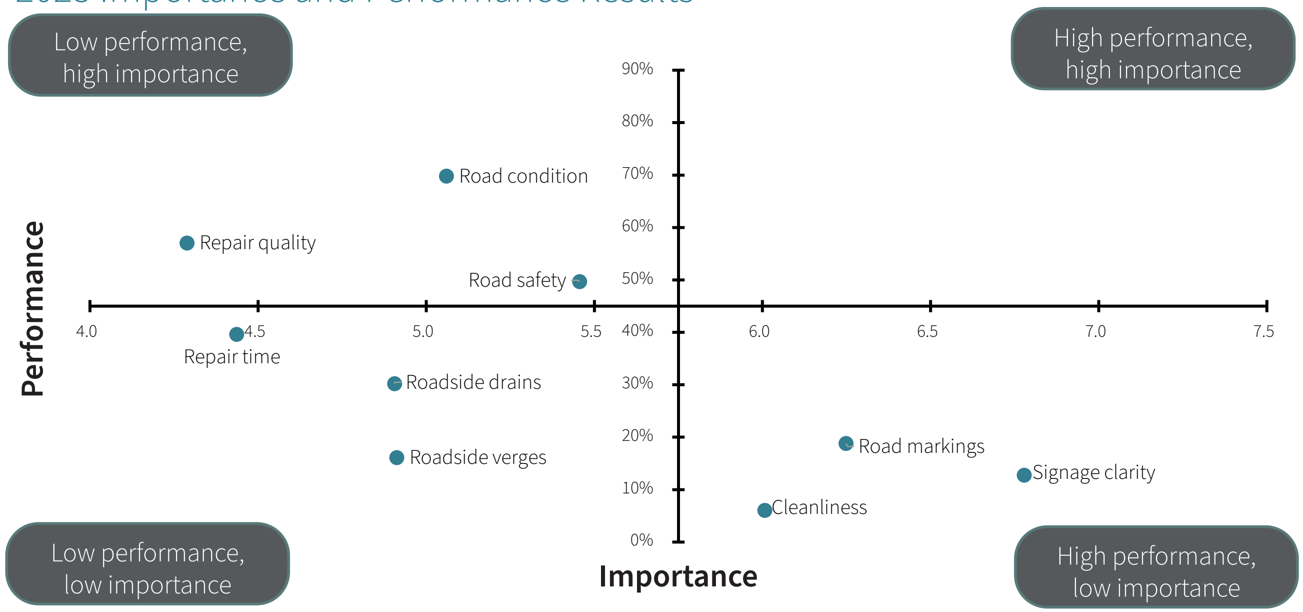
Roading attributes which are considered the most important are road condition, repair quality, and road safety. Repair time and roadside drains are quite important but sit lower than the top three attributes. Attributes which are less important in this area are roadside verges, road marking, cleanliness, and signage clarity.

All roading attributes are placed in a similar position to that of 2021.

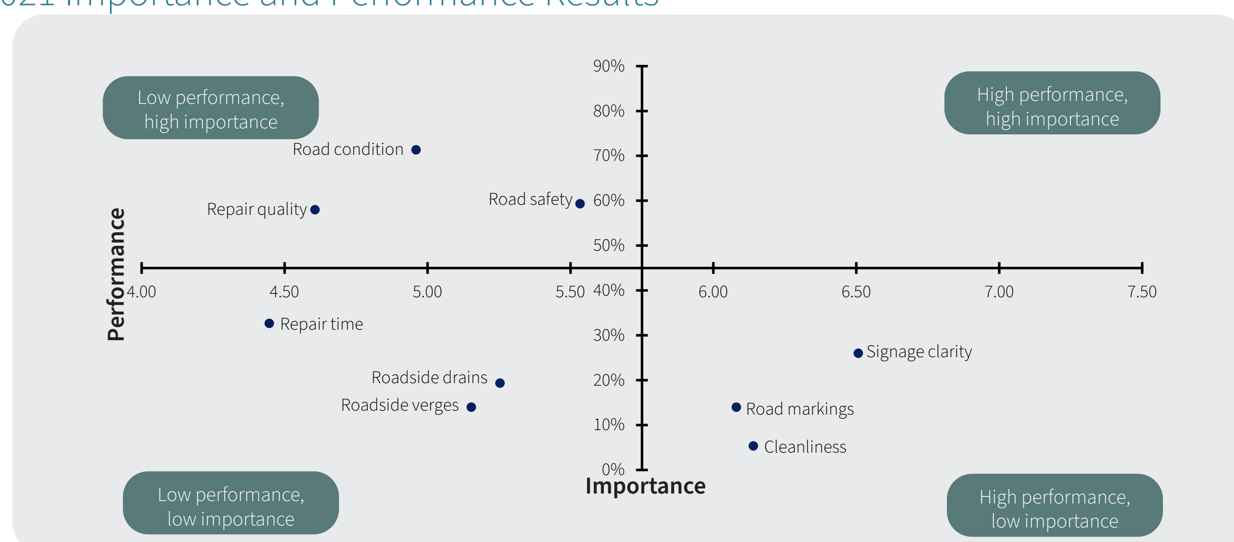
The primary issues that Hauraki respondents note about the roads in their district relate to the poor condition of the roads (28%), the substandard repairs (16%), and the slow and constant repairs (12%). Only 24% of respondents feel that the roads are generally acceptable.

Roadside maintenance issues appear to be a challenge for some user groups in the Hauraki district. Respondents who walk as their primary mode of transport are more likely to note there is poor roadside drainage or excessive flooding (30%, 4% all Hauraki District). Similarly, those who use an electric scooter are more likely to note poor maintenance or overgrown roadside vegetation (50%, 4% all Hauraki District).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: WAIKATO

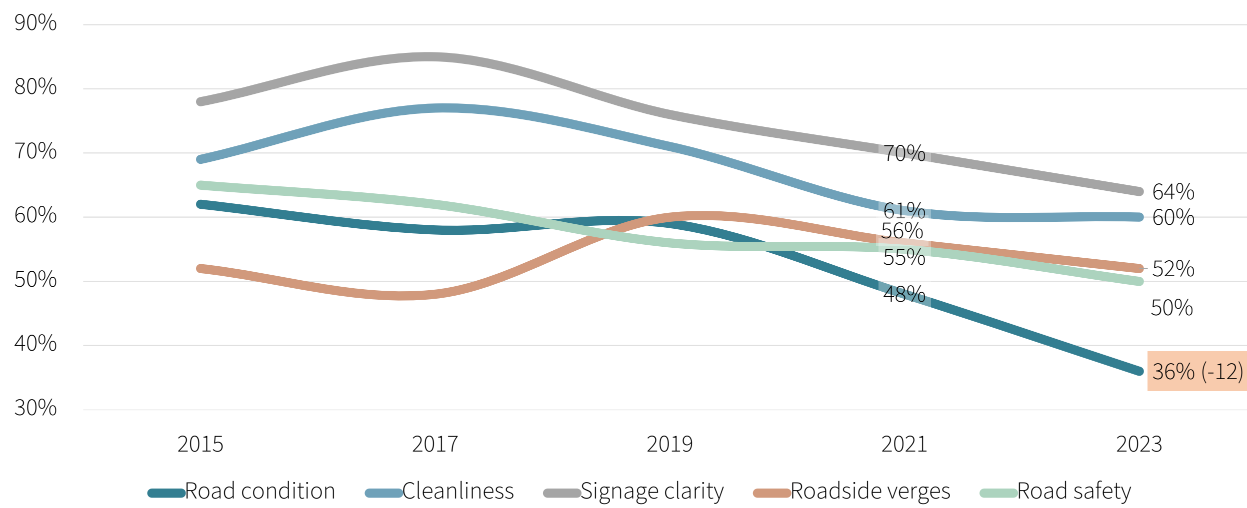
The charts to the right show the results for the roading measures from 2015 to 2023 for the Waikato district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

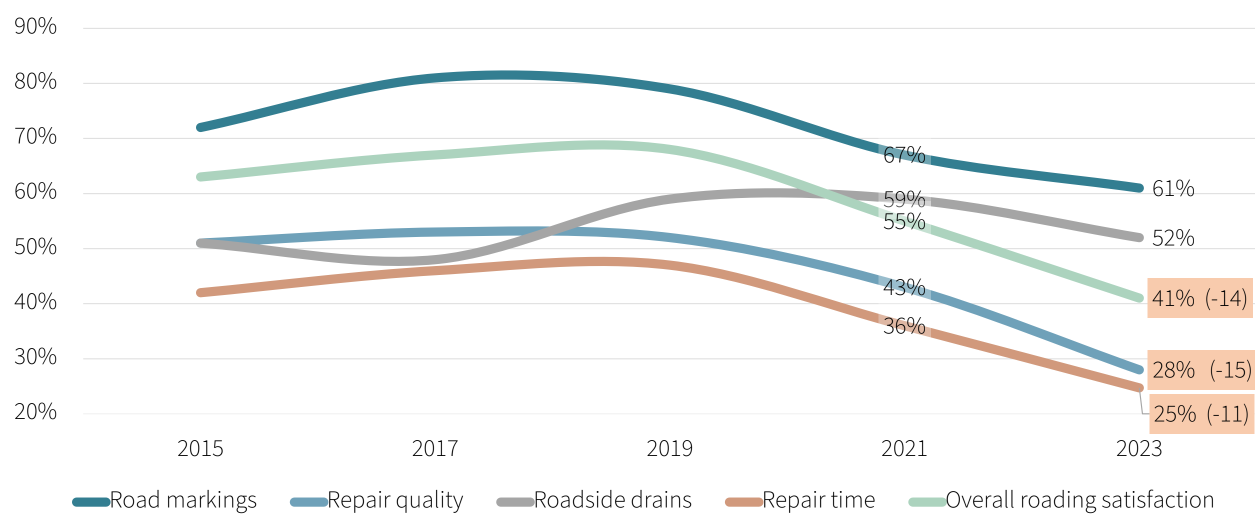
Most results for this district peaked in 2017 and have experienced a very gradual decline since. The results for 2023 are similar to the 2021 results with significant declines only observed for three measures.

In 2023, the attributes with the highest levels of adequacy in the Waikato district are road markings (61%) and signage clarity (64%). The attributes with the lowest results are repair time (25%) and repair quality (28%). Overall satisfaction is at 41% and has declined significantly since 2021 (decrease of 14%).

The levels of adequacy for road safety, roadside verges, roadside drains, and road markings are similar to that observed in 2021. However, significant declines are observed for repair quality (decrease of 15% since 2021), road condition (decrease of 12% since 2021), and repair time (decrease of 11% since 2021). Other measures have declined but not to a significant degree.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: WAIKATO RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Waikato district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

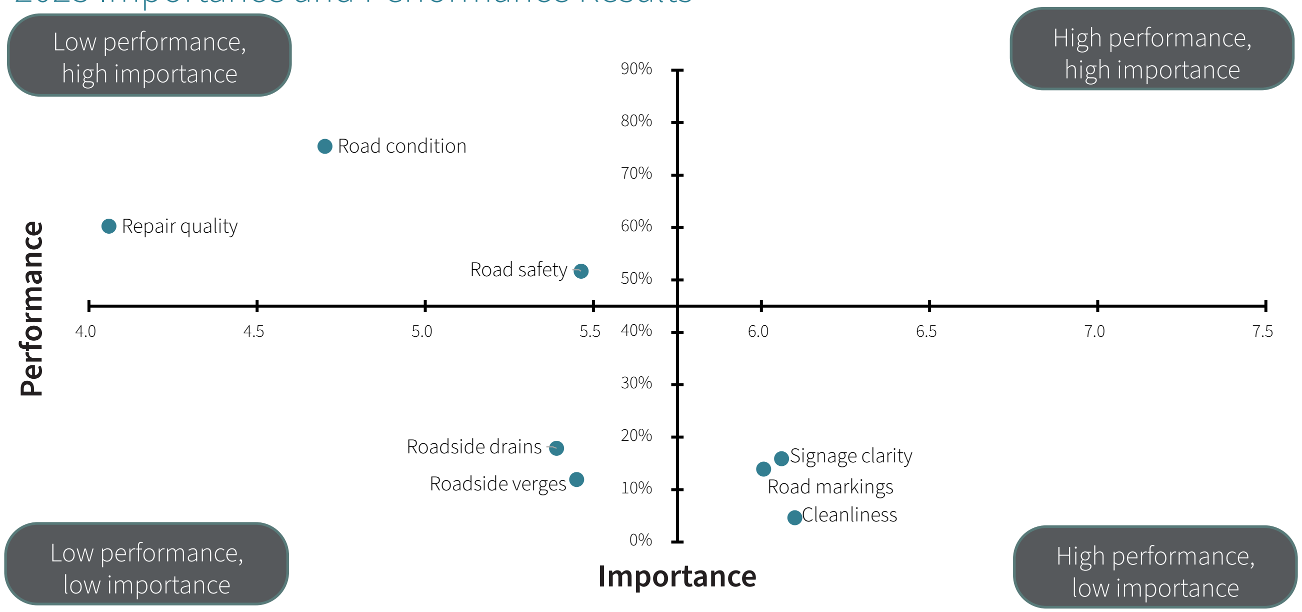
The most important roading attributes for respondents in the Waikato district are repair quality, road condition and road safety. Attributes which are less important are roadside drains, roadside verges, signage clarity, road markings, and cleanliness.

Road safety has declined in performance since 2021 and now sits in the low performance, high importance quadrant. Roadside condition and repair quality are also in this quadrant, and have declined slightly in performance since 2021. The attributes of signage clarity, road markings, and cleanliness are now more closely clustered in the high performance, low importance grid, which is mostly driven by a decline in performance for signage clarity and road markings.

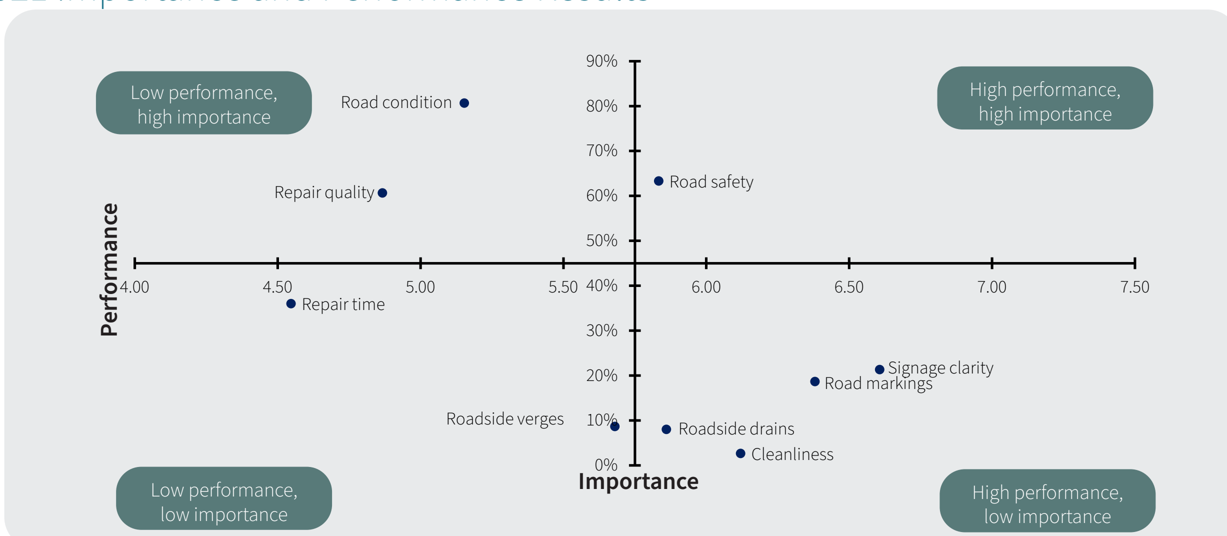
Thirty two percent of respondents in the Waikato district state the roads are in poor condition with too many potholes and uneven surfaces. Fifteen percent (each) are generally dissatisfied with the roads or think the repairs are substandard and do not last. A further 13% state the road repairs are slow and constantly taking place, while 11% note the poor maintenance of the roadside verges. Only 21% of respondents in this area think the roads are generally suitable.

Rural respondents in the Waikato district are more likely to place greater importance on the maintenance of roadside vegetation, while those respondents who primarily use public transport as a mode of transport are more likely to say the cleanliness of the roads is important.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: MATAMATA-PIAKO

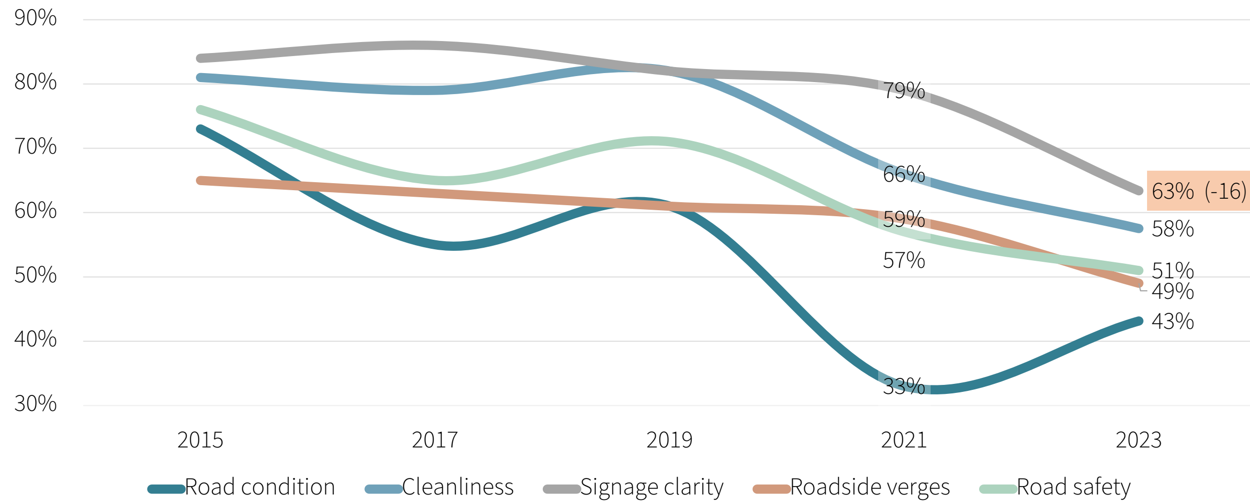
The charts to the right show the results for the roading measures from 2015 to 2023 for the Matamata-Piako district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

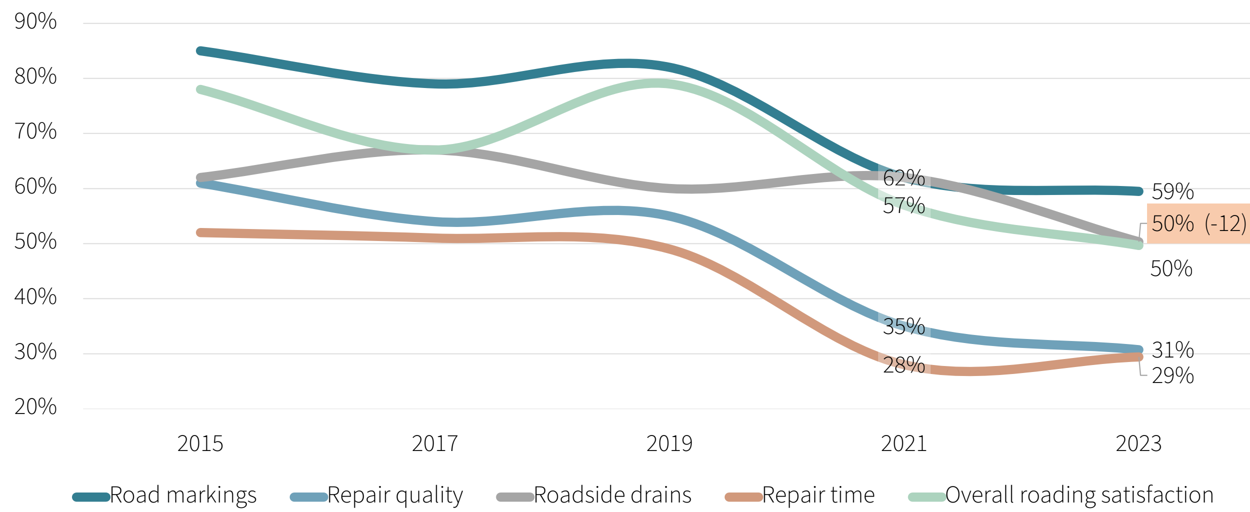
Most results for the Matamata-Piako district have declined since 2015, with only a few changes between the 2021 and 2023 years.

This year the attribute with the highest adequacy rating is signage clarity (63%), while the attributes with the lowest adequacy ratings are repair quality (31%) and repair time (29%). Overall satisfaction is at 50%, which is a 7% decline from 2021 however, this is not a significant change.

Significant declines are observed for signage clarity (decrease of 16% since 2021) and roadside drains (decrease of 12% since 2021). Although not a significant change, the level of adequacy with road conditions has increased 10% since 2021. Most other results have experienced moderate declines or remained similar to 2021.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: MATAMATA-PIAKO RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Matamata-Piako district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

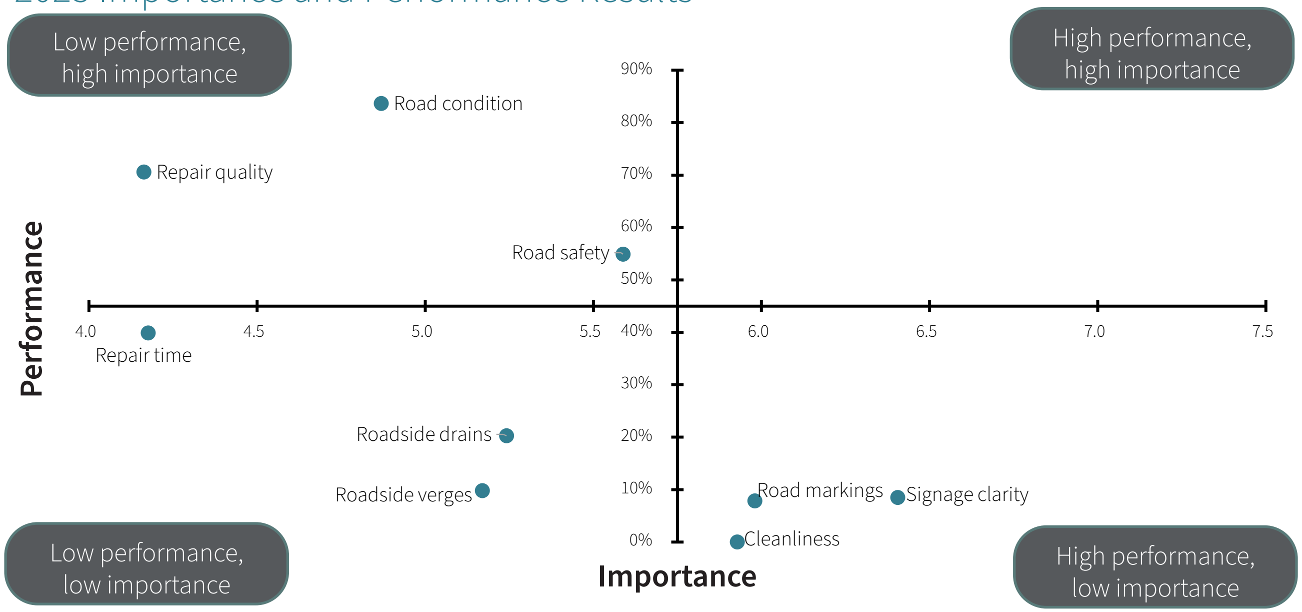
Road condition, repair quality, road safety, and repair time are the most important attributes for respondents in this district. Roadside drains, roadside verges, road markings, signage clarity, and cleanliness are considered less important attributes. The quality of the repairs is more important for respondents from Matamata-Piako district than for respondents in other areas.

Most attributes are in the same quadrant as 2021, although there has been a shift to the left for many indicating perceptions of a decline in performance. The largest shifts are for roadside drains and roadside verges which now sit in the low performance, low importance quadrant.

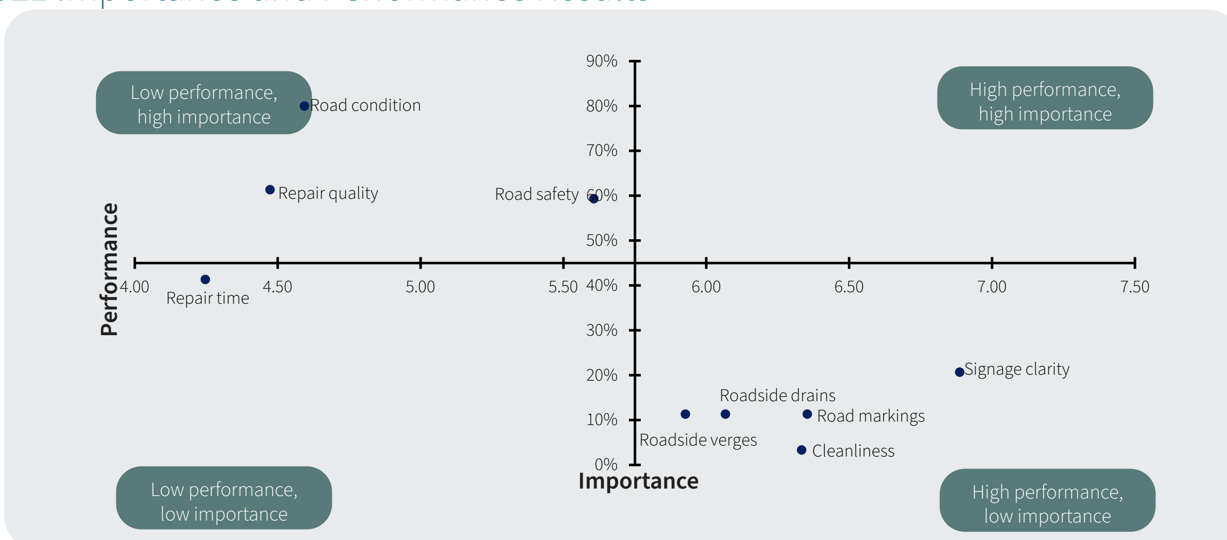
Twenty seven percent of Matamata-Piako respondents state the roads are in poor condition and there are too many potholes and uneven surfaces, while 11% state there is room for improvement. Sixteen percent of respondents note the road repairs are substandard and do not last, while 12% think the repairs in the district are slow and constant.

There are no differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: HAMILTON

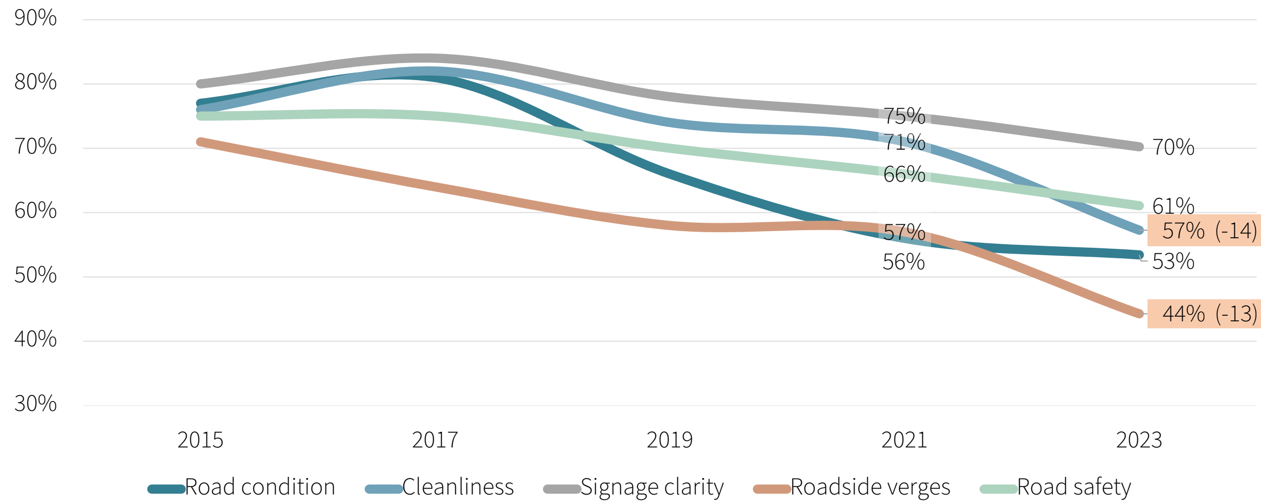
The charts to the right show the results for the roading measures from 2015 to 2023 for Hamilton City. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

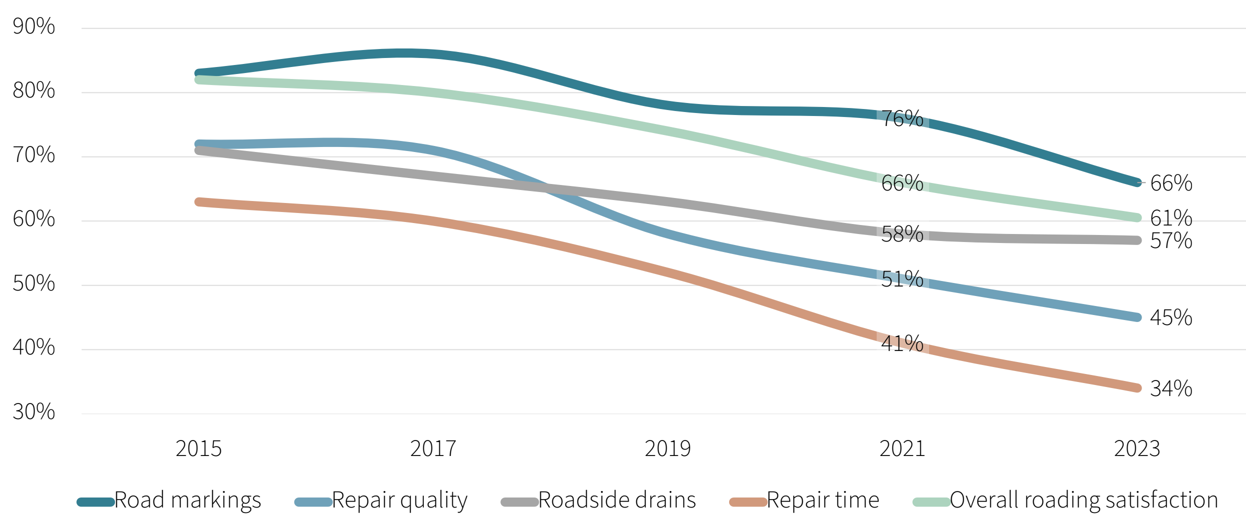
The results for Hamilton City peaked in 2017 with most measures declining since.

The attribute with the highest level of adequacy in 2023 is signage clarity (70%), while the attribute with the lowest level of adequacy is repair time (34%). Most other attributes sit between 45% and 61%. Overall satisfaction is at 61% which is a 5% decline from the 2021 result.

Significant declines were observed for cleanliness (decrease of 14% since 2021) and roadside verges (decrease of 13% since 2021). Most other measures declined only slightly (between 3% and 7%) in 2023.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: HAMILTON RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in Hamilton City (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

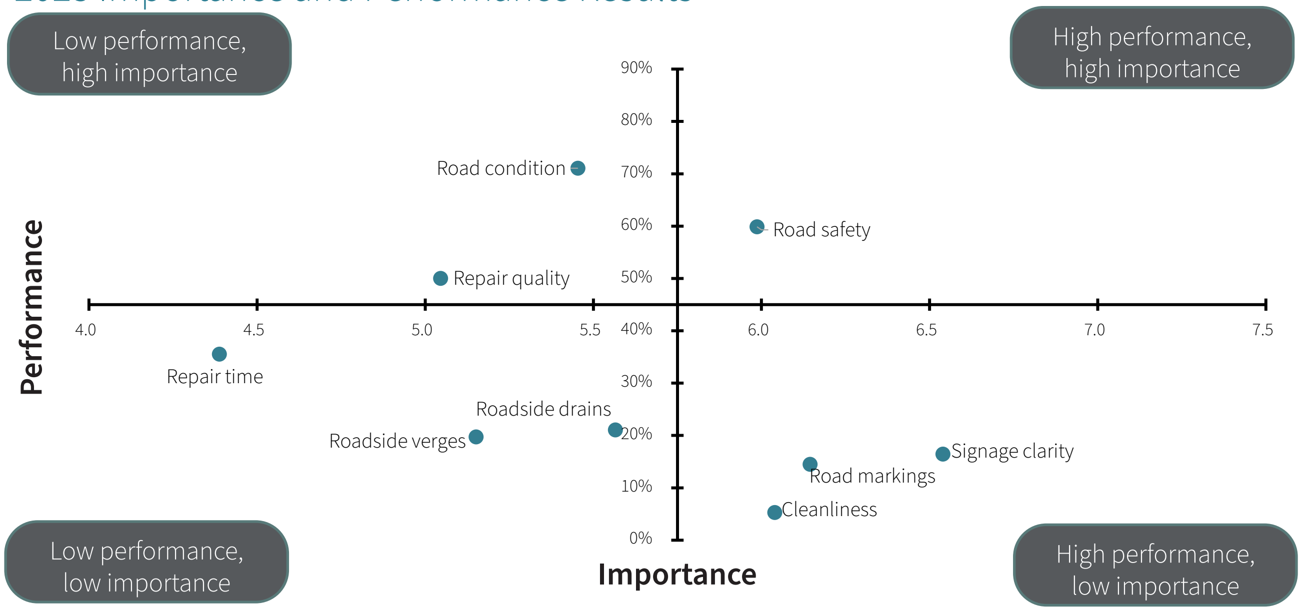
Attributes which are considered most important by Hamilton City respondents are road condition, repair quality, and road safety. Attributes which are considered less important are repair time, roadside drains, roadside verges, signage clarity, road markings, and cleanliness. Respondents from Hamilton City place higher importance on the maintenance of roadside verges, trees, or vegetation than respondents in other districts.

The placement of the attributes on the grid is similar to 2021, with road safety continuing to remain in the high performance, high importance quadrant, with repair quality increasing in importance slightly. Repair time, roadside verges, and roadside drains have moved left slightly indicating a slight decline in perceived performance.

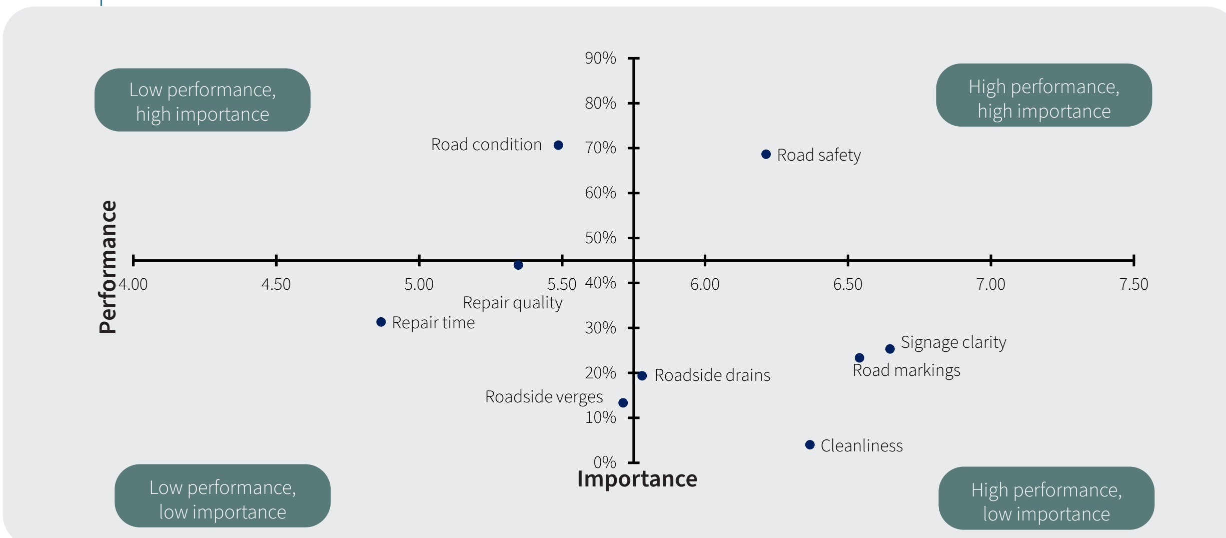
Thirty six percent of Hamilton City respondents state the roads are generally adequate. Twenty two percent of respondents note that the roads are in poor condition with 14% stating the repairs are slow and ongoing and 12% stating there is room for improvement. Nine percent (each) think the roadside vegetation is overgrown, the repairs are substandard, and they are generally dissatisfied with the roads.

Respondents who use public transport as their main mode of transport in Hamilton are more likely to say the roads have poor signage or a lack of signage (33%, 2% for all Hamilton City).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: WAIPĀ

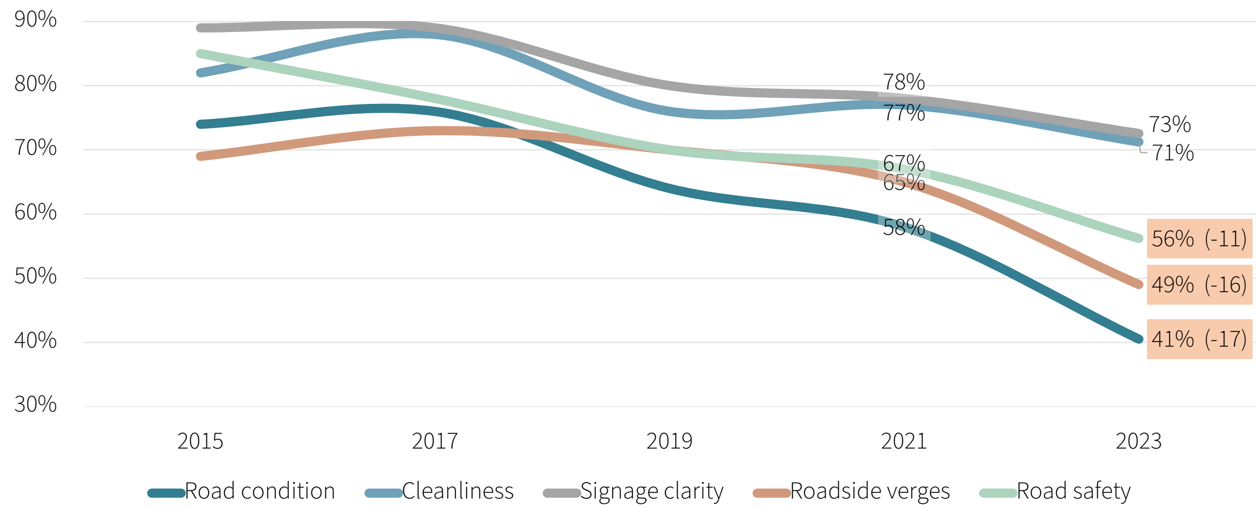
The charts to the right show the results for the roading measures from 2015 to 2023 for the Waipā district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

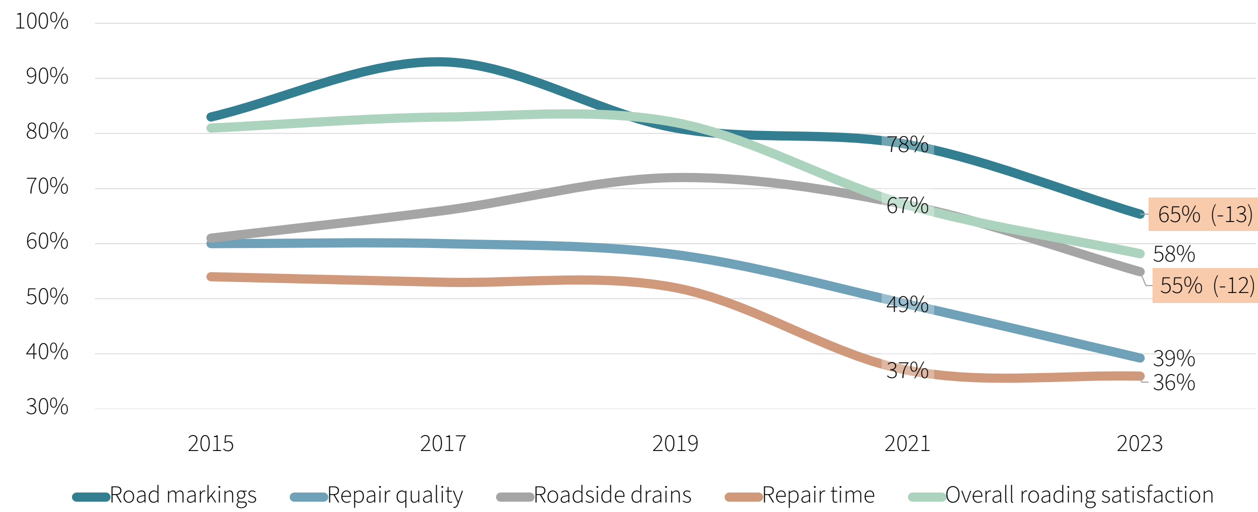
The results for the Waipā district have declined over time with the highest results seen in 2017. This year sees further declines in most measures.

The highest level of adequacy is seen for signage clarity (73%) and cleanliness (71%), with both results only slightly lower than the 2021 measures. The attributes with the lowest adequacy ratings are repair time (36%), repair quality (39%), and road condition (41%). Overall satisfaction is at 58% and has declined from 67% in 2021, although this is not a significant change.

Significant decreases are observed for the road condition (decrease of 17% since 2021), roadside verges (decrease of 16% since 2021), road markings (decrease of 13% since 2021), roadside drains (decrease of 12% since 2021), and road safety (decrease of 11% since 2021).

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: WAIPĀ RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Waipā district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

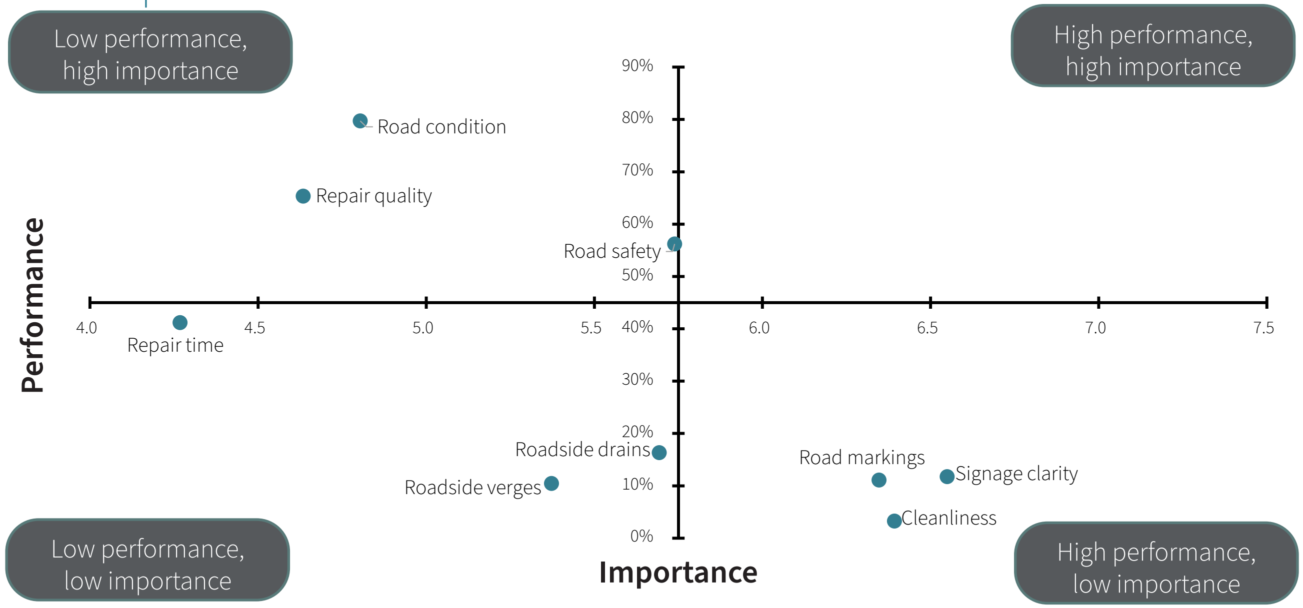
The attributes Waipā respondents consider to be most important are road condition, repair quality, and road safety. Repair time is also important but sits slightly lower on the grid than the other attributes. Attributes which are considered less important are roadside drains, road verges, road markings, signage clarity, and cleanliness.

When compared to 2021, most attributes have moved to the left of the grid indicating a decline in performance. In particular, road safety, roadside drains, and roadside verges have seen a move to the left hand quadrants suggesting lower performance than in 2021. However, road markings, signage clarity, and cleanliness continue to perform well.

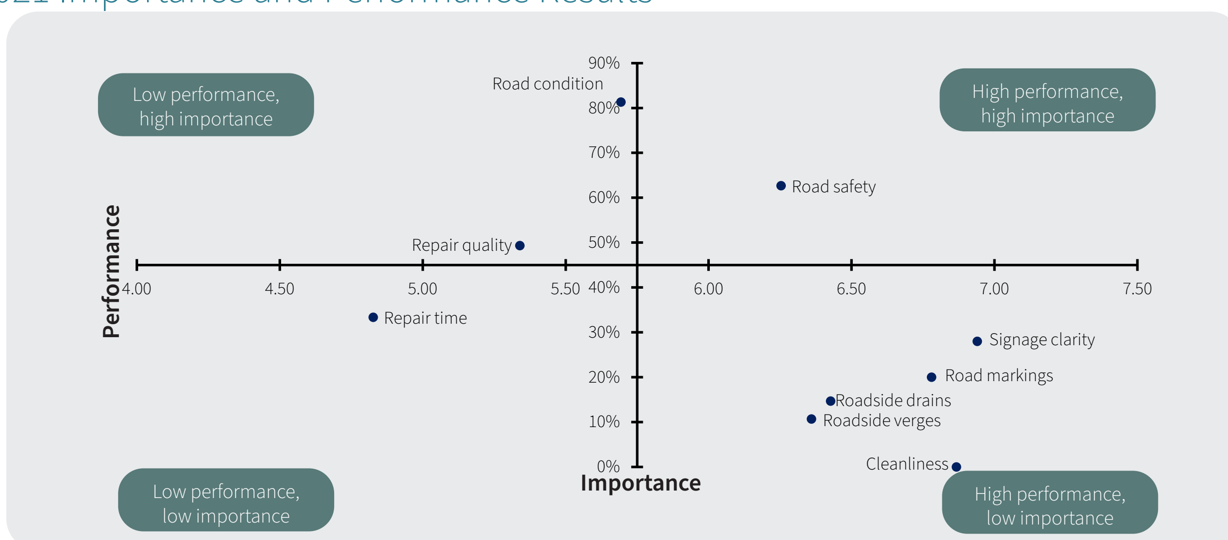
The primary drivers for these shifts appear to be perceptions of poor road conditions (22%) and slow and constant repairs (17%). There seems to be a general dissatisfaction with the roads in the district with 17% of Waipā respondents stating there is room for improvement and 12% stating they are generally dissatisfied. Thirty five percent of respondents state that the roads are generally adequate.

There are no differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: ŌTOROHANGA

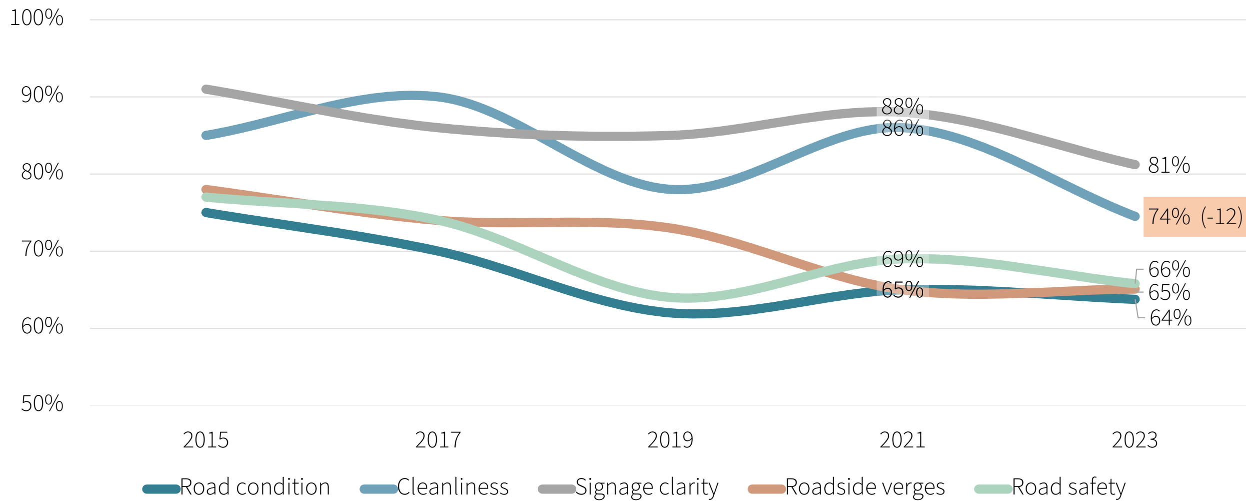
The charts to the right show the results for the roading measures from 2015 to 2023 for the Ōtorohanga district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

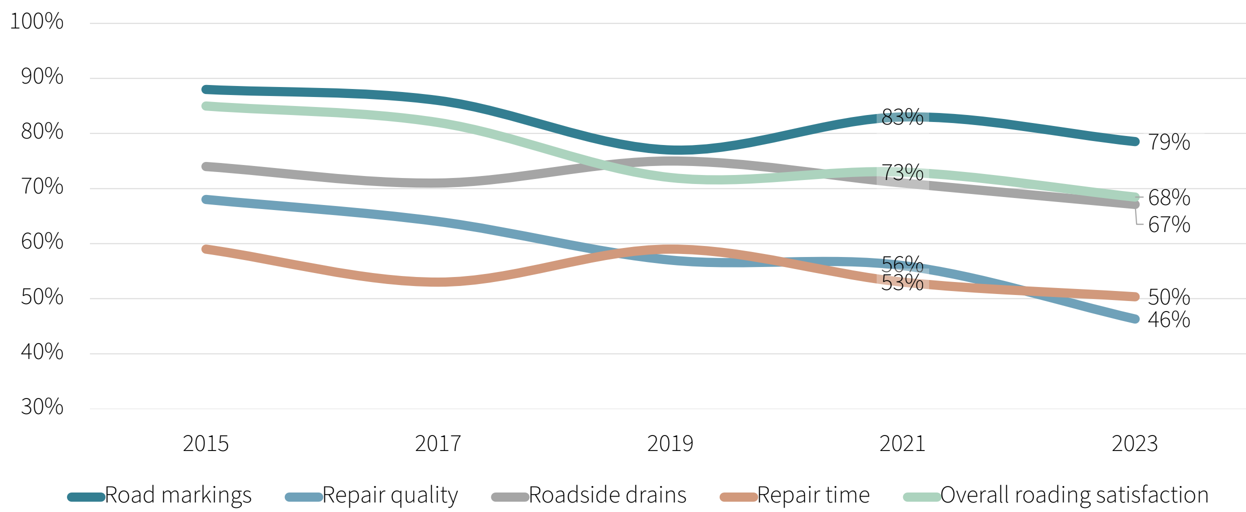
The results for the Ōtorohanga district remain relatively similar to 2023 with few significant changes observed this year. While the results for this district have declined over time, the rate of decline has been slower than in other districts.

In 2023 the attributes with the highest adequacy ratings are signage clarity (81%) and road markings (79%). The roading attributes with the lowest adequacy ratings are repair quality (46%) and repair time (50%). Overall adequacy is at 68% and is 5% lower than in 2021.

Large declines are observed for cleanliness (decrease of 12% since 2021) and repair quality (decrease of 10% since 2021) however, only the decline for clealiness is significant. Most other results for this year have declined however, all are within 5% of the 2021 results.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: ŌTOROHANGA RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Ōtorohanga district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

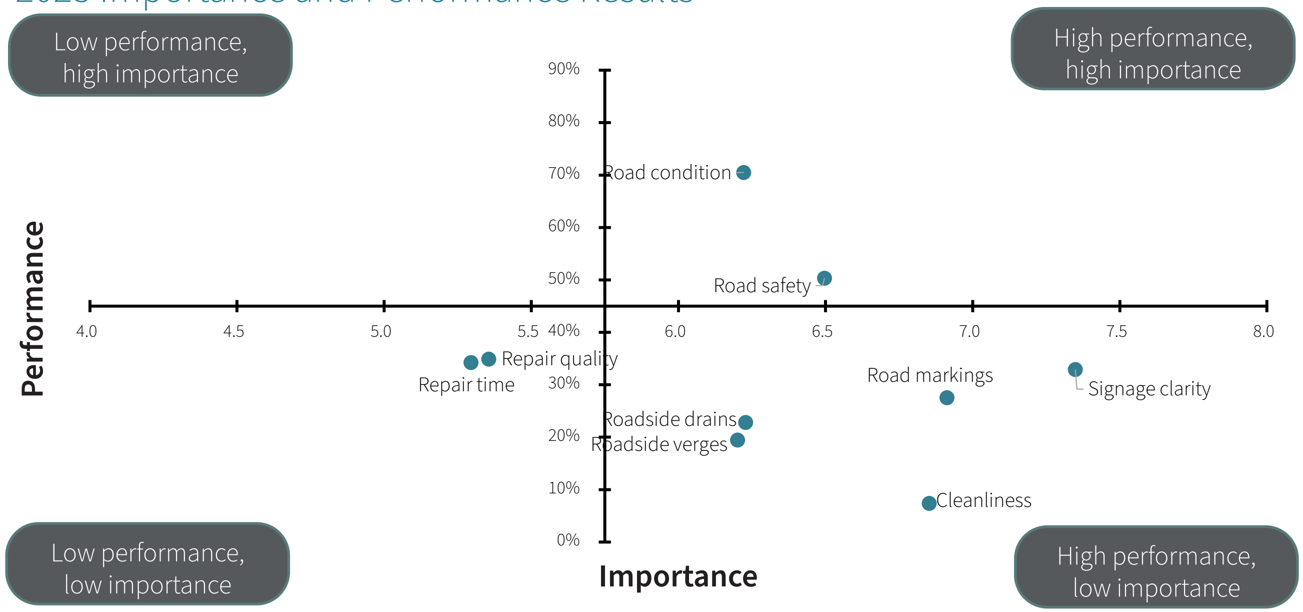
The key attributes that Ōtorohanga respondents place importance on are road condition and road safety. Repair quality, repair time, road markings, and signage clarity are also important but sit slightly lower than road condition and road safety on the grid. Roadside drains, roadside verges, and cleanliness are the attributes which are considered less important. Respondents from Ōtorohanga appear to place higher importance on signage clarity and road markings than to respondents in other districts.

Attribute placement in 2023 is similar to that of 2021 with all attributes in the same quadrant as the previous measure. Cleanliness and roadside drains appears to have both declined slightly in performance, and road safety has increased slightly in importance.

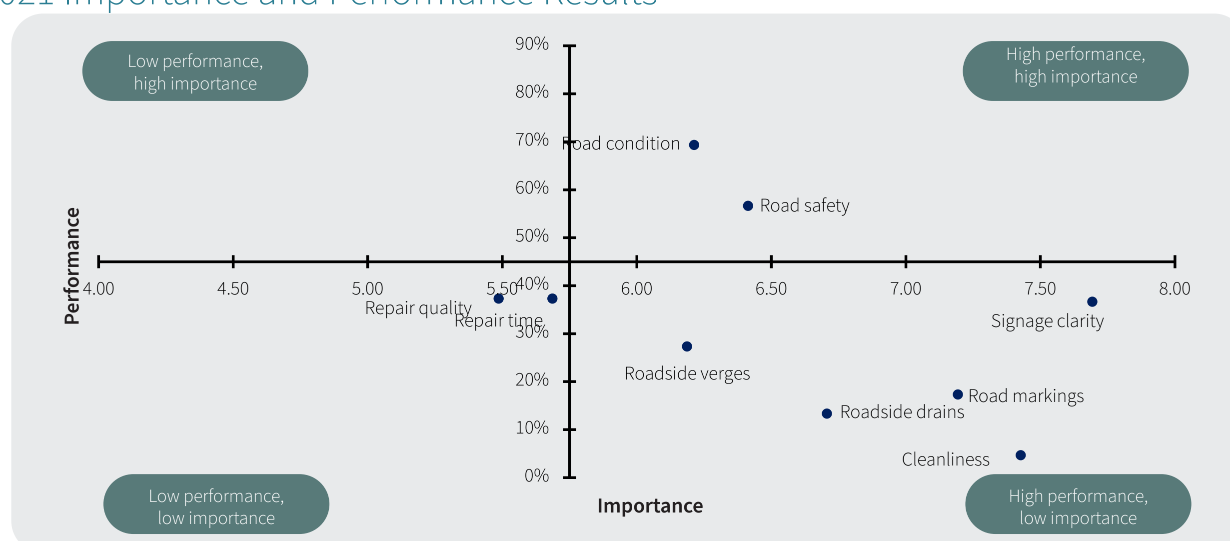
Forty four percent of Ōtorohanga respondents state that the roads are generally adequate. However, 9% of respondents say there are too many potholes and 12% (each) state that road repairs are substandard and are slow to complete.

Respondents who walk as their primary mode of transport are much more likely to say that there is overgrown vegetation and poor maintenance of roadside verges (43%, 3% for all Ōtorohanga District).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: SOUTH WAIKATO

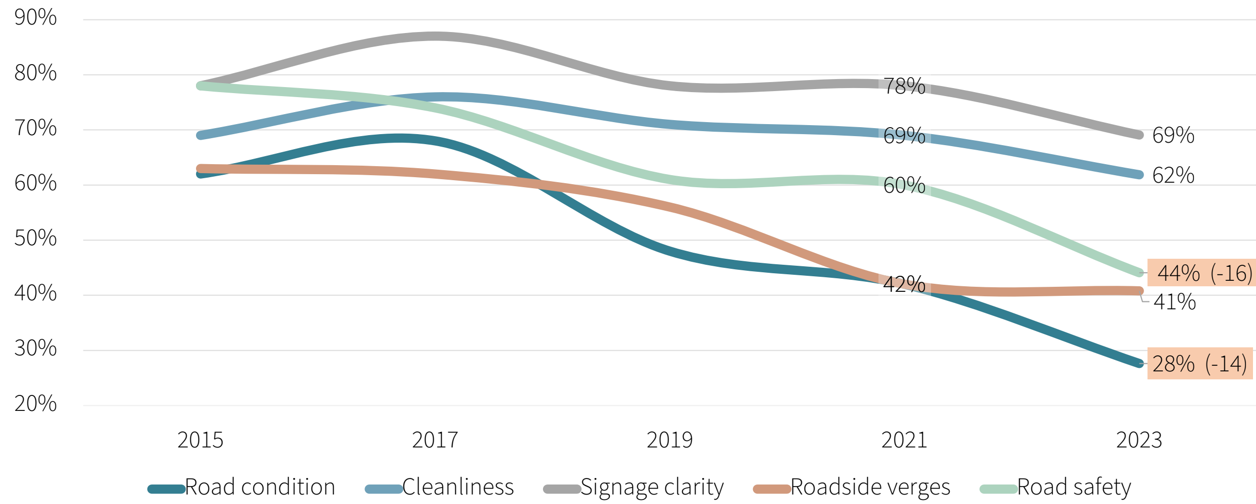
The charts to the right show the results for the roading measures from 2015 to 2023 for the South Waikato district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

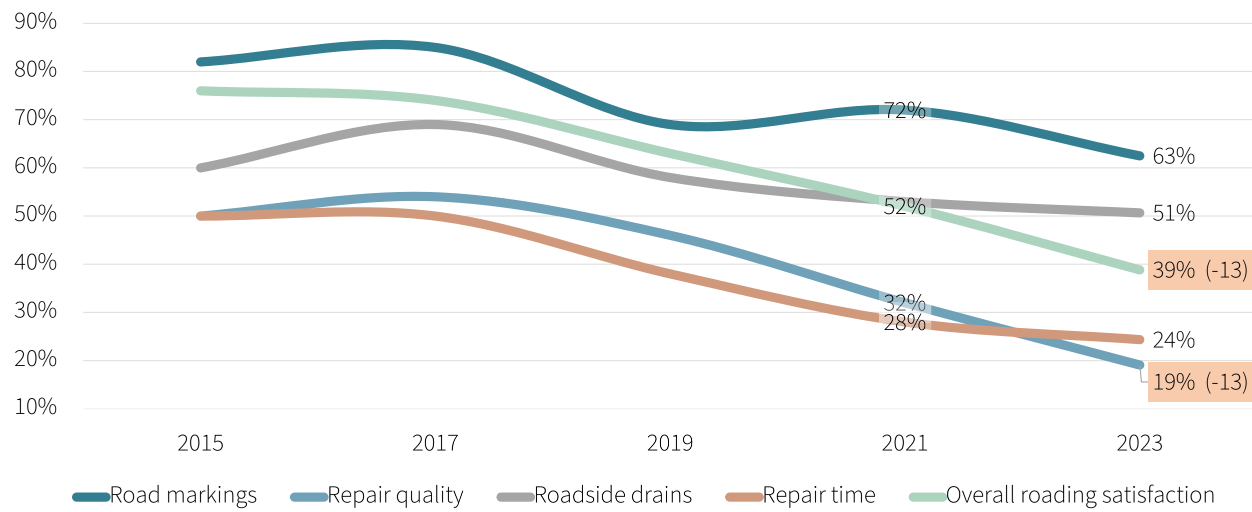
The results for the South Waikato district show a steady decline since 2017 with most measures around 10% - 20% lower than the 2017 results. This year, the results for the district continued to decline with significant decreases seen across four measures.

This year the attribute with the highest adequacy rating is signage clarity (69%), while the attribute with the lowest adequacy rating is repair quality (19%). Overall satisfaction is 39% and this is a significant decline from the previous measure (decrease of 13% since 2021).

Significant decreases are seen for road safety (decrease of 16% since 2021), road condition (decrease of 14% since 2021), and repair quality (decrease of 13% in 2021). While other measures also declined, their decreases are not significant changes.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: SOUTH WAIKATO RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the South Waikato district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

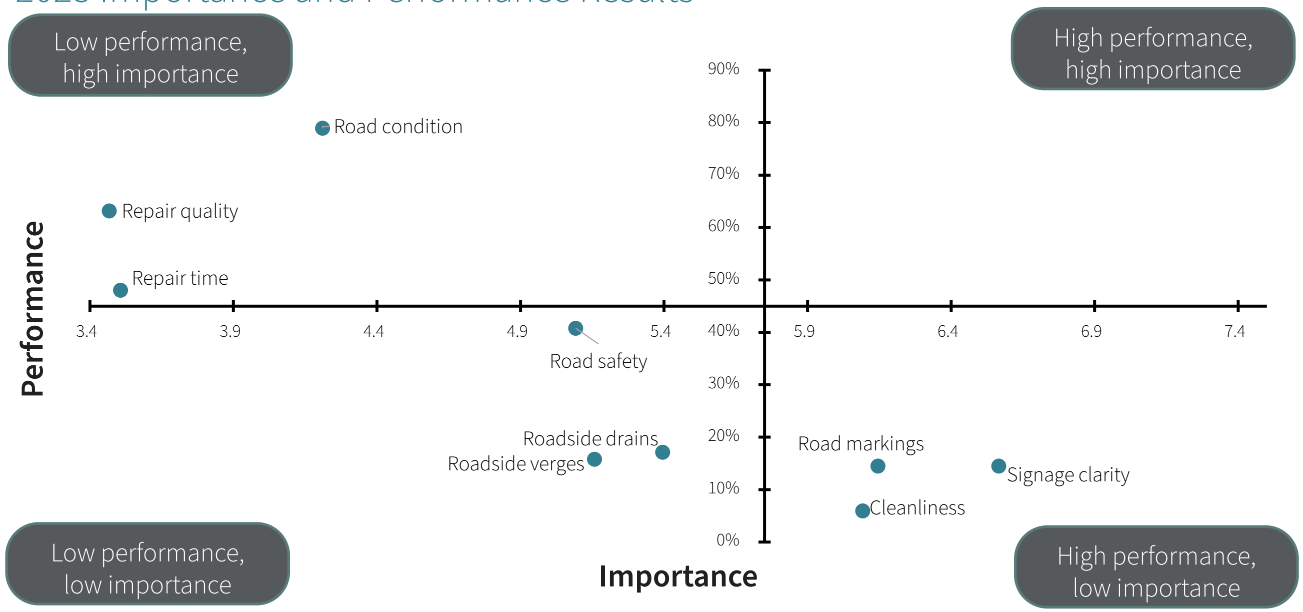
South Waikato respondents place high importance on road condition, repair quality, and repair time, with road safety slightly lower than these attributes. Roadside drains, roadside verges, road markings, cleanliness, and signage clarity are the attributes which South Waikato respondents place less importance upon. Interestingly, South Waikato respondents appear to rate road safety lower than most other districts, but place the greater importance on time taken to repair the roads.

The roading attributes are placed in a similar location to that of 2021 however, road safety has moved left indicating a decline in performance. Most other attributes are placed in a similar position to the previous measure.

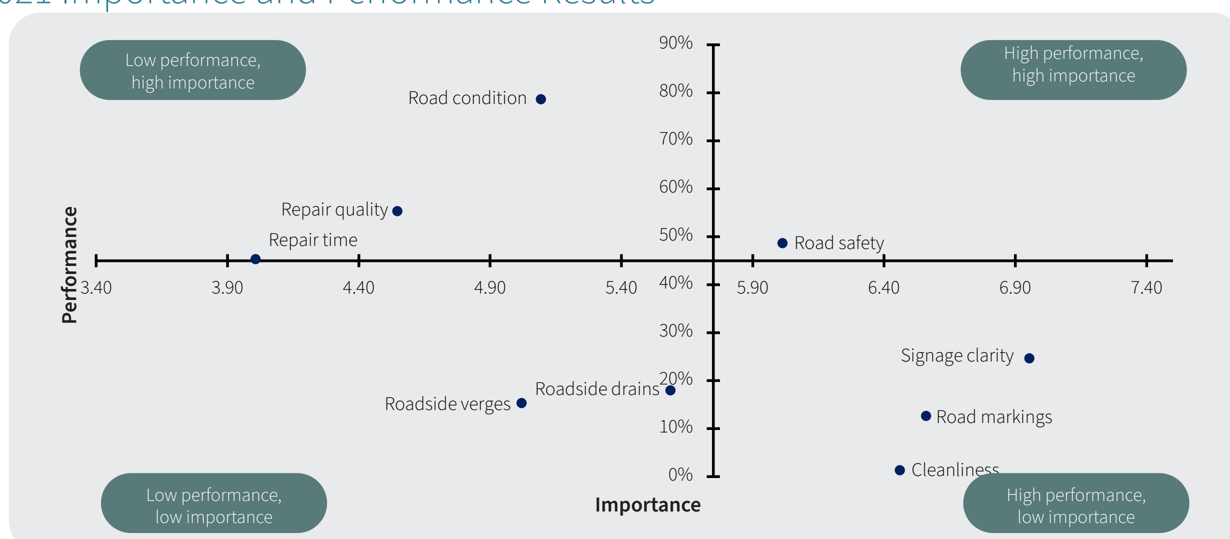
Just 29% of South Waikato respondents think the roads in their area are adequate. The primary concerns amongst respondents in this area relate to the poor condition of the roads and the number of potholes (30%), substandard repair jobs (20%), and slow and constant repairs (13%). Although not significant, respondents from South Waikato have one of the highest responses for poor road conditions when compared to other districts.

South Waikato respondents who live in a semi-rural area place higher importance on the maintenance of roadside verges and vegetation (43%, 16% for all South Waikato District).

2023 Importance and Performance Results*



2021 Importance and Performance Results



*Different anchors required in 2023 to allow all measures to be shown.

YEAR ON YEAR RESULTS: TAUPŌ

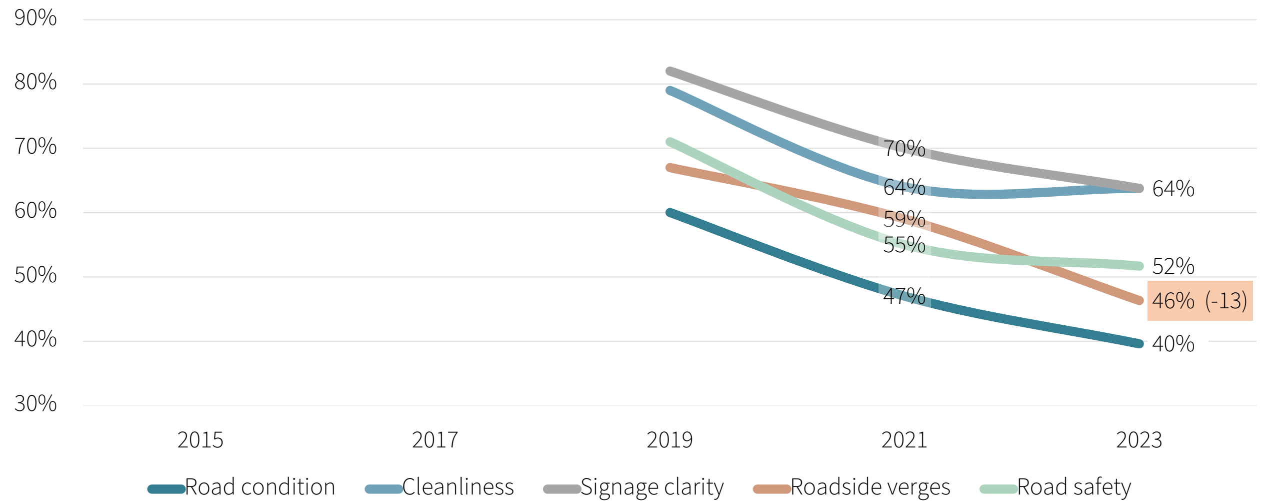
The charts to the right show the results for the roading measures from 2019 to 2023 for the Taupō district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

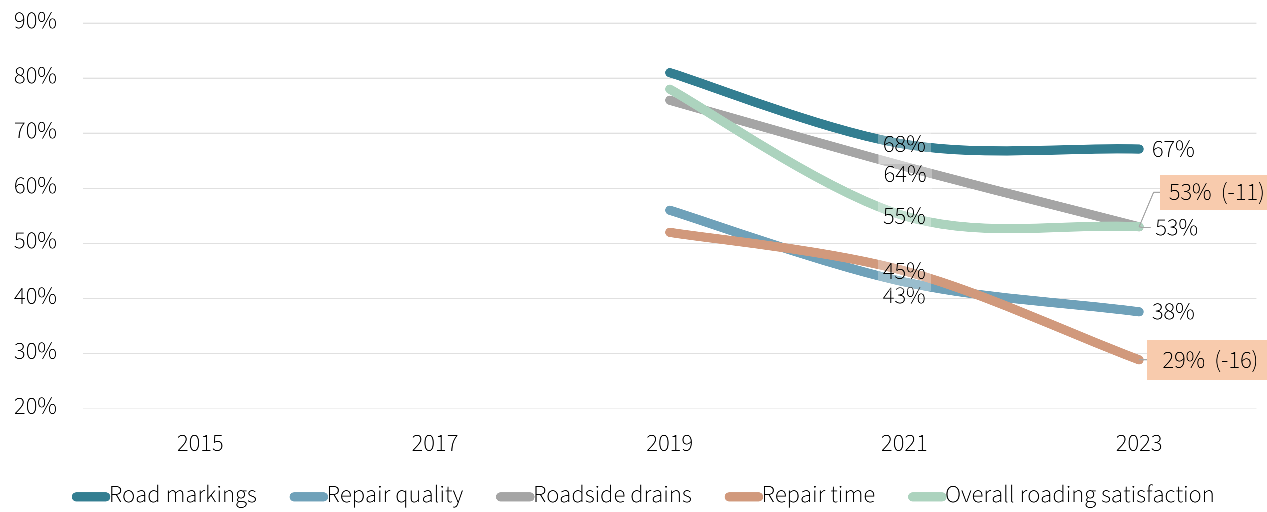
Measurement for the Taupō district only commenced in 2019 however, most results have declined since measurement began.

The roading attributes with the highest adequacy ratings this year are road markings (67%), signage clarity and cleanliness (64% each). The attribute with the lowest level of adequacy is repair time (29%). Overall satisfaction is 53% and is on par with the result from 2021, but is a significant decline from the 2019 result.

This year there are significant declines in adequacy of repair times (decrease of 16% since 2021), roadside verges (decrease of 13% since 2021), and roadside drains (decrease of 11% since 2021). Most other measures have remained within 6% of the 2021 results.

2019 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

ROADING: TAUPŌ RESULTS 2023

The grids to the right show the importance ratings for each roading attribute in the Taupō district (% who stated the attribute was one of the most important roading features to have adequate roads in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

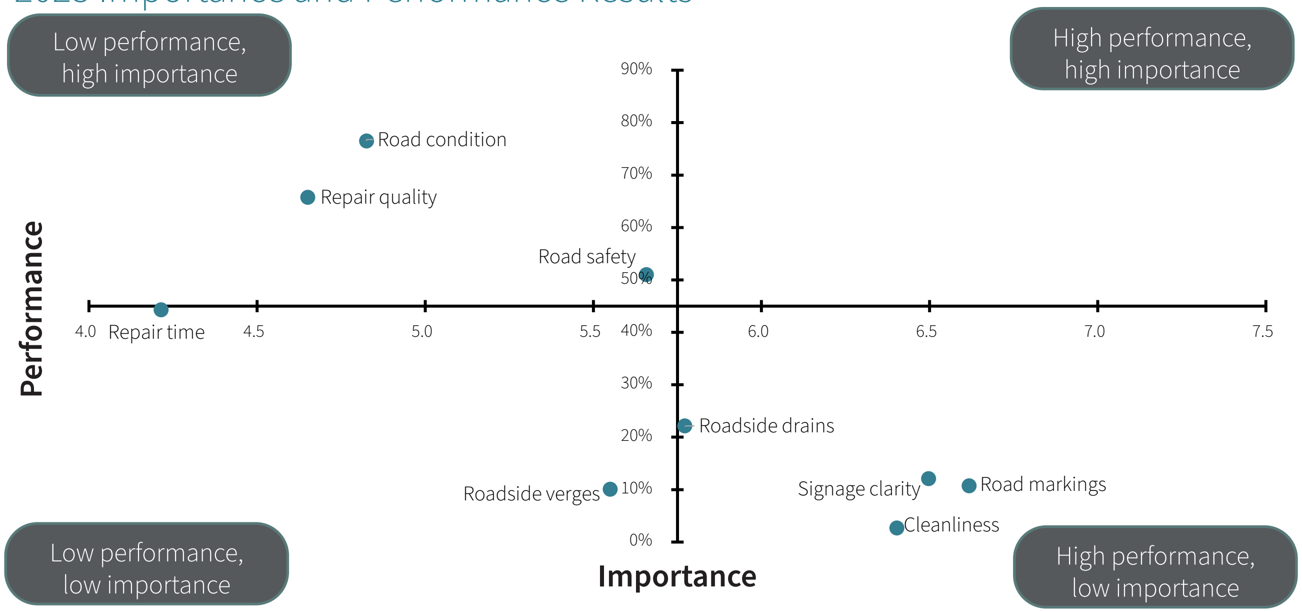
Taupō respondents place importance on road condition, repair quality, road safety, and repair time. Less importance is placed on roadside drains, roadside verges, signage clarity, road markings, and cleanliness.

Most attributes are positioned in a similar location to 2021 however, repair time has increased in importance and decreased in performance. Road safety has also increased in importance. Roadside drains and roadside verges have decreased in performance but are rated similarly to 2021 in terms of importance.

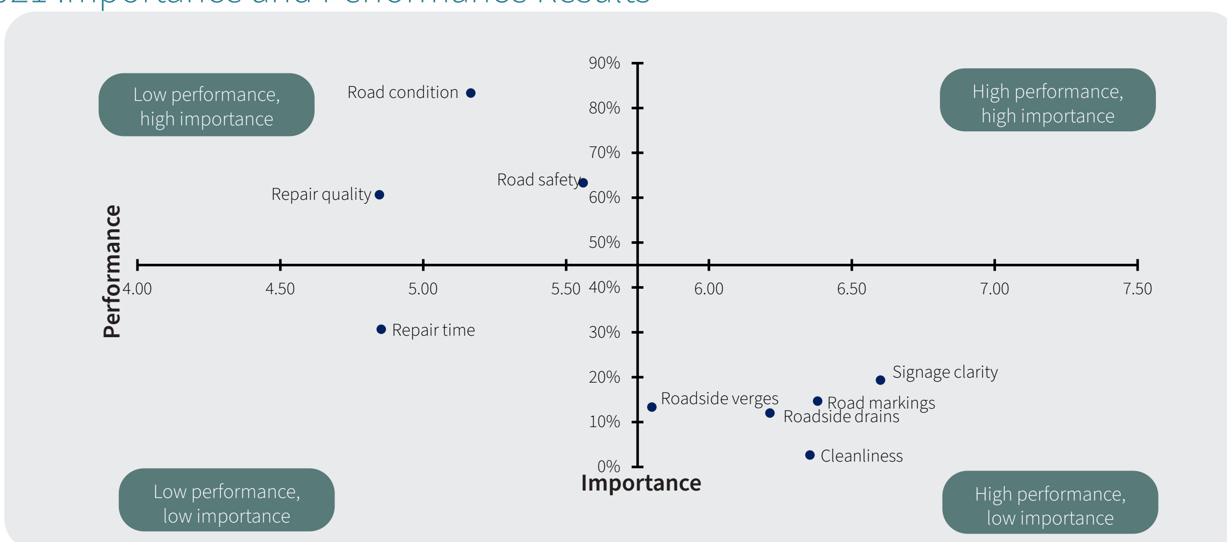
Just under one third (31%) of Taupō respondents think the roads are adequate. The key concerns with the roads relate to substandard repairs (16%), poor condition and potholes (15%), and slow and constant repairs (15%). Twelve percent of respondents are dissatisfied with the roads generally and 9% state there is room for improvement.

Taupō respondents who walk as their primary mode of transport are more likely to state there is poor road signage (11%, 1% for all Taupō District) and that the placement of pedestrian crossings is inappropriate (11%, 1% for all of Taupō District). Respondents who live in rural area Taupō are more likely to state there are issues with poor signage or say signage is lacking (8%, 1% for all Taupō District).

2023 Importance and Performance Results



2021 Importance and Performance Results



FOOTPATHS:
ADEQUACY AND IMPORTANCE

YEAR ON YEAR RESULTS: TOTAL

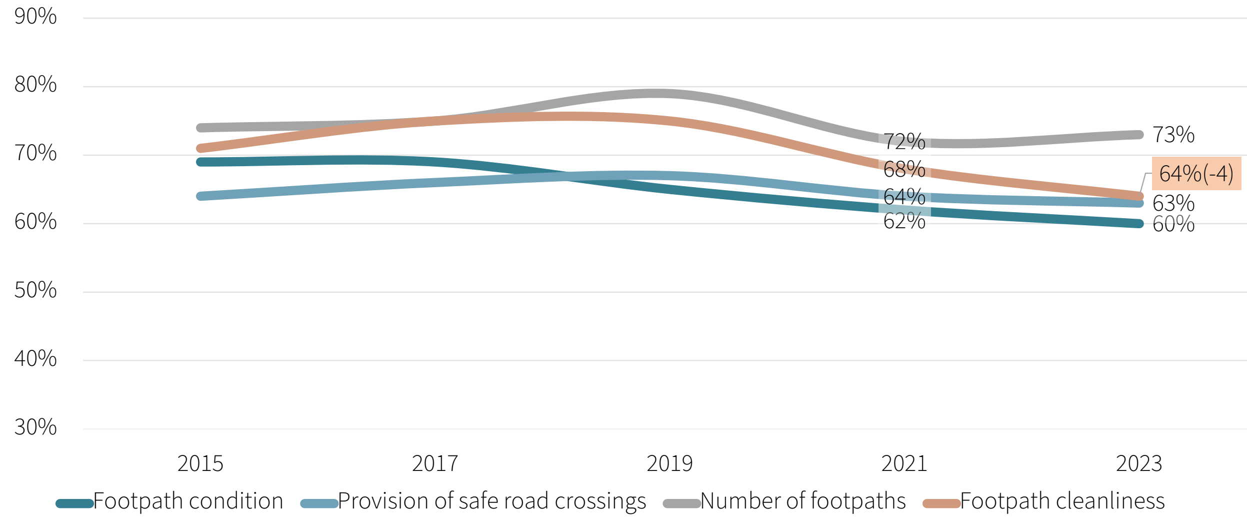
The charts to the right show the results for the footpath measures from 2015 to 2023. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

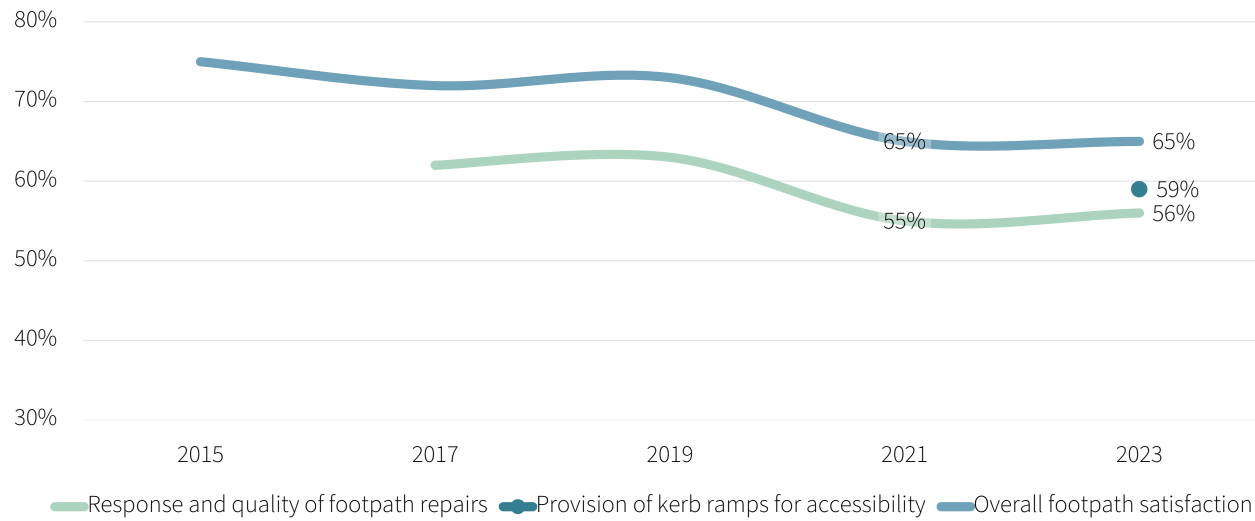
Overall respondents provide the highest adequacy rating for the number of footpaths in their area (73%) while the lowest rating is attributed to the response and quality of footpath repairs (56%). In a new measure for 2023, 59% of respondents rate the provision of kerb ramps for accessibility as adequate. The overall satisfaction with the footpaths remains consistent at 65%.

There are very few changes with regards to the results for the footpath measures, with most attributes within 1% - 2% of the 2021 results. The exception to this is the decrease for footpath cleanliness which has declined significantly (decrease of 4% since 2021).

Over time, most measures have stayed relatively consistent. However, there have been very slow declines since 2015 in footpath condition and the subsequent overall satisfaction rating.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

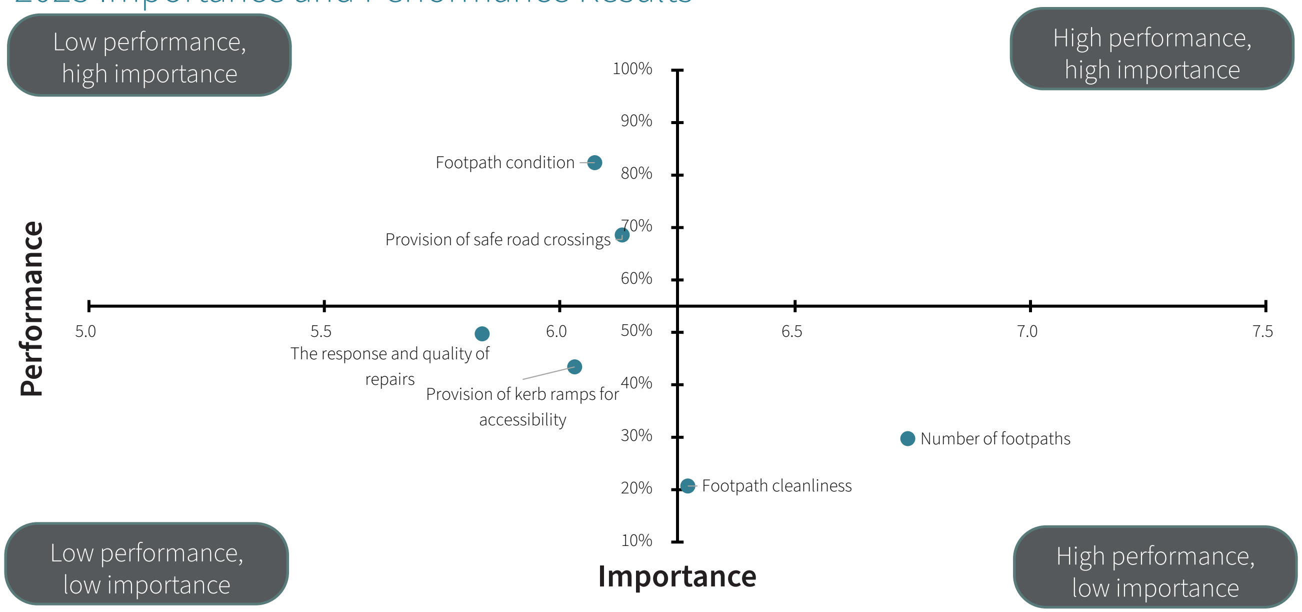
FOOTPATHS: TOTAL RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

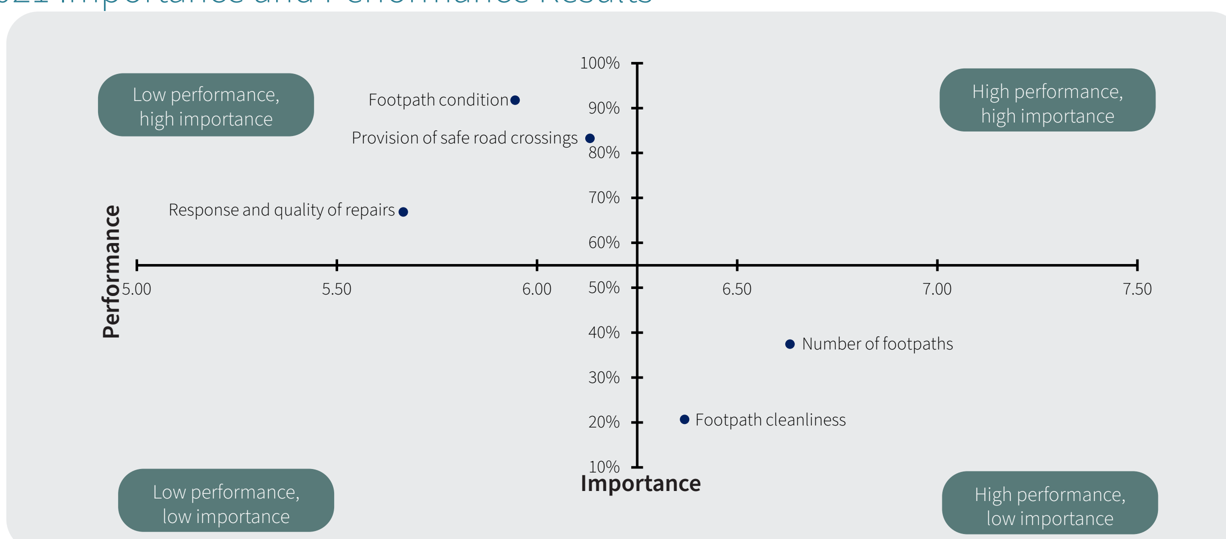
This year the attributes which respondents rate as important are the condition of the footpath and the provision of safe road crossings. There has been a slight decline in the importance of the response and quality of repairs as a result of the inclusion of the provision of kerb ramps for accessibility. Attributes which respondents rate of less importance are the number of footpaths and footpath cleanliness. Most attributes are in a similar position to 2021 with performance on most measures relatively stable.

Forty two percent of respondents state that the footpaths are generally adequate. The main concerns suggested by respondents are better maintenance or repairs (13%), uneven surfaces or trip hazards (11%), or overgrown vegetation (6%), access for those with a disability or access issues (6%), and safe road crossings (5%). Nine percent of respondents note a lack of footpaths available in their area. This point is particularly noted amongst rural (19%) and semi-rural (14%) respondents, while urban respondents are more likely to note that footpaths require maintenance or repair (15%).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: THAMES-COROMANDEL

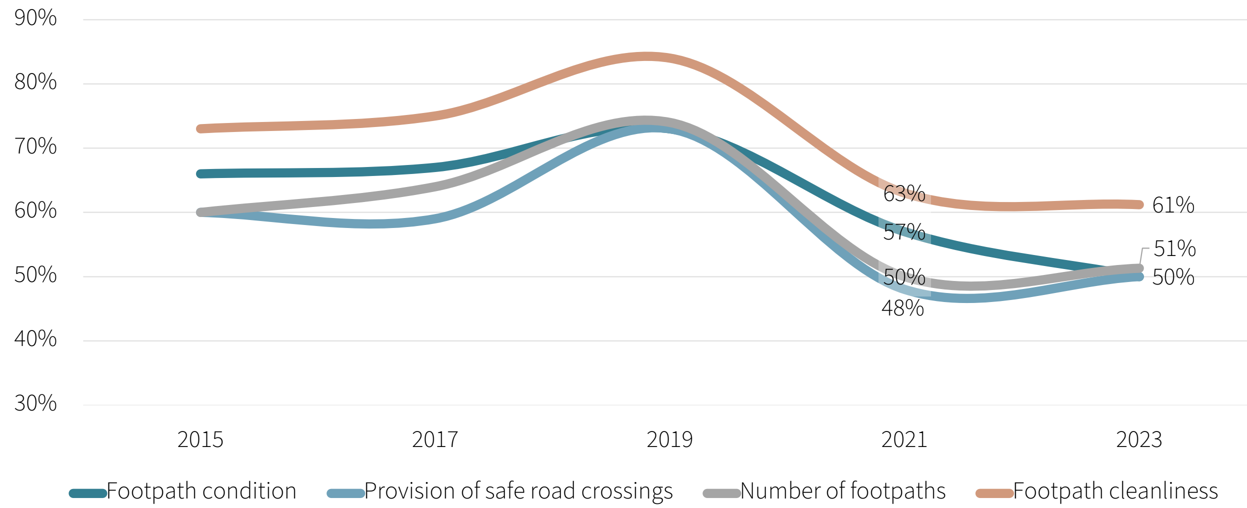
The charts to the right show the results for the footpath measures from 2015 to 2023 for the Thames-Coromandel district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

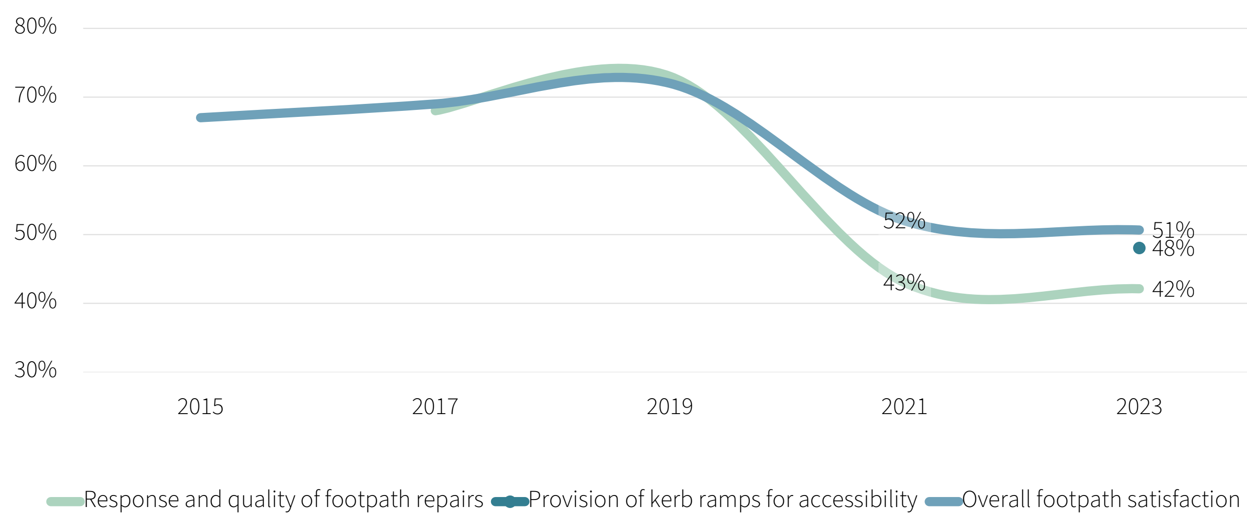
Respondents from Thames-Coromandel provide the highest adequacy ratings for footpath cleanliness (61%) and the lowest for response and quality of footpath repairs (42%). The overall footpath satisfaction result is at 51%, similar to 2021.

The largest change in results for Thames-Coromandel is footpath condition (decline of 6% since 2021). However, this is not a significant decrease and the results for the footpath measures are similar to those seen in 2021.

Over time, there has been a slow decrease across most measures, with the largest of these pertaining to the response and quality of footpath repairs.

2015 - 2023 Results





FOOTPATHS: THAMES-COROMANDEL RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the Thames-Coromandel district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

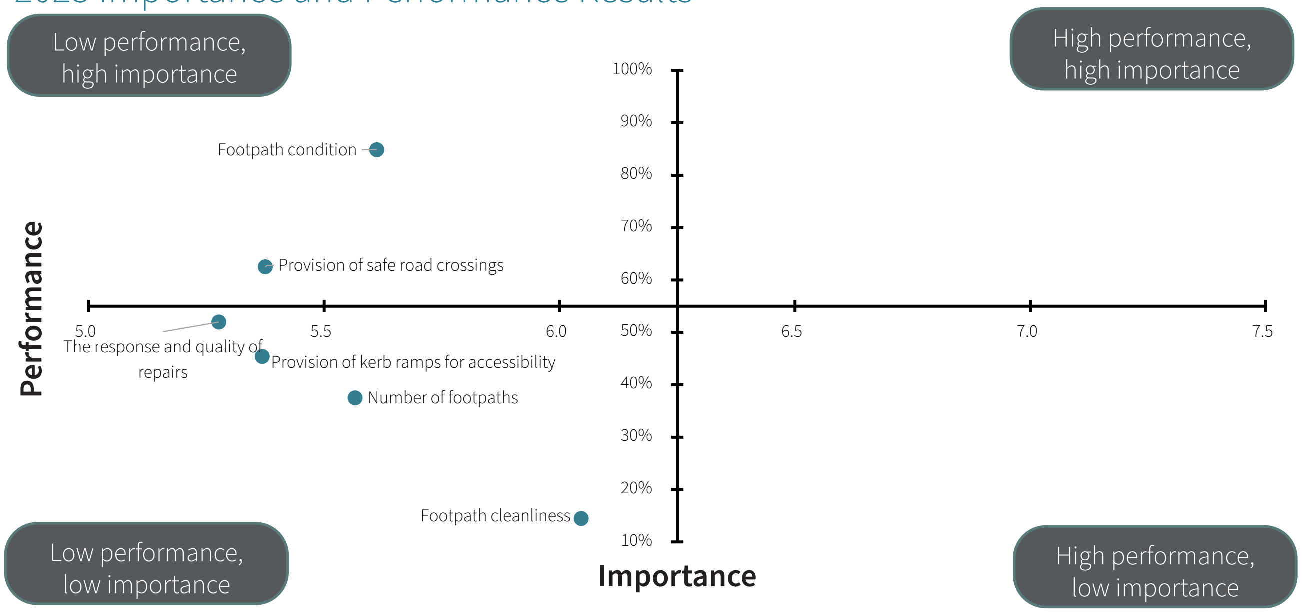
Respondents in the Thames-Coromandel district rate the footpath condition and the provision of safe road crossings as the most important attributes this year. This is followed by the response and quality of repairs, the provision of kerb ramps for accessibility, and the number of footpaths. The cleanliness of footpaths is considered the least important attribute.

Most attributes have similar performance positions to that of 2021.

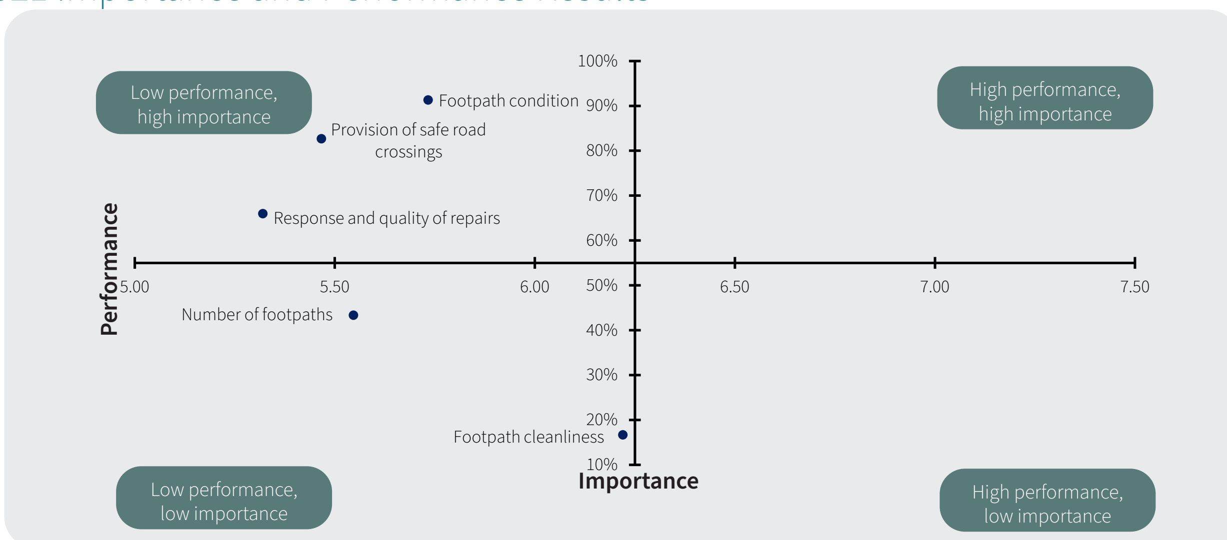
Thirty nine percent of Thames-Coromandel respondents think the footpaths are generally adequate in their area. Twenty four percent of respondents note the lack of foot-paths in their area; this result is significantly higher in this district than in others. Other concerns about footpaths in the Thames-Coromandel area relate to the need for better maintenance (11%), uneven surfaces (7%), lack of safe crossings, and overgrown vegetation (5% each).

There are no significant differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: HAURAKI

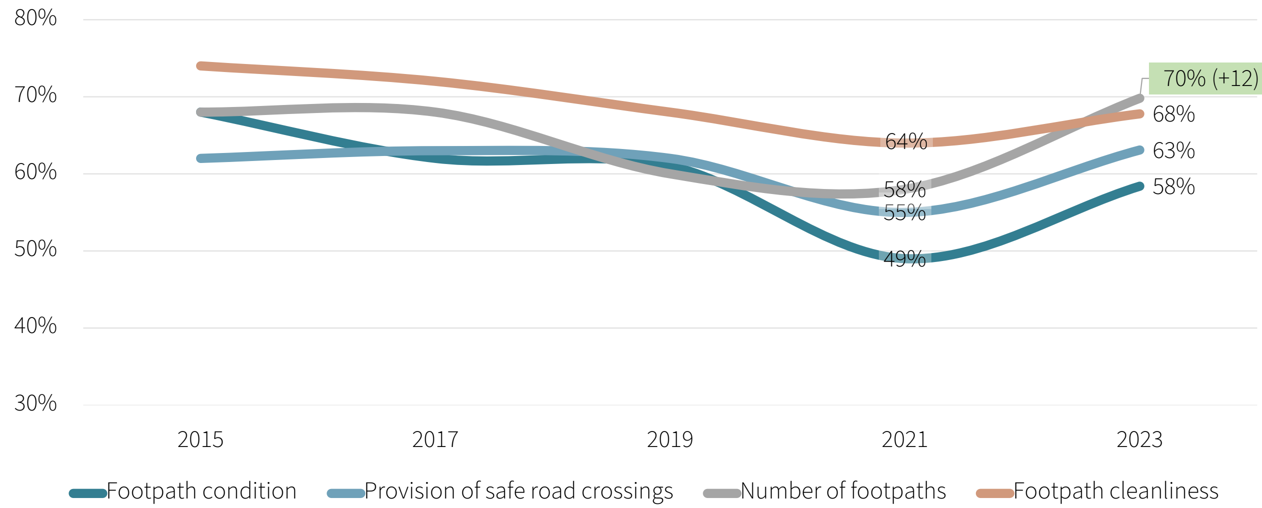
The charts to the right show the results for the footpath measures from 2015 to 2023 for the Hauraki district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

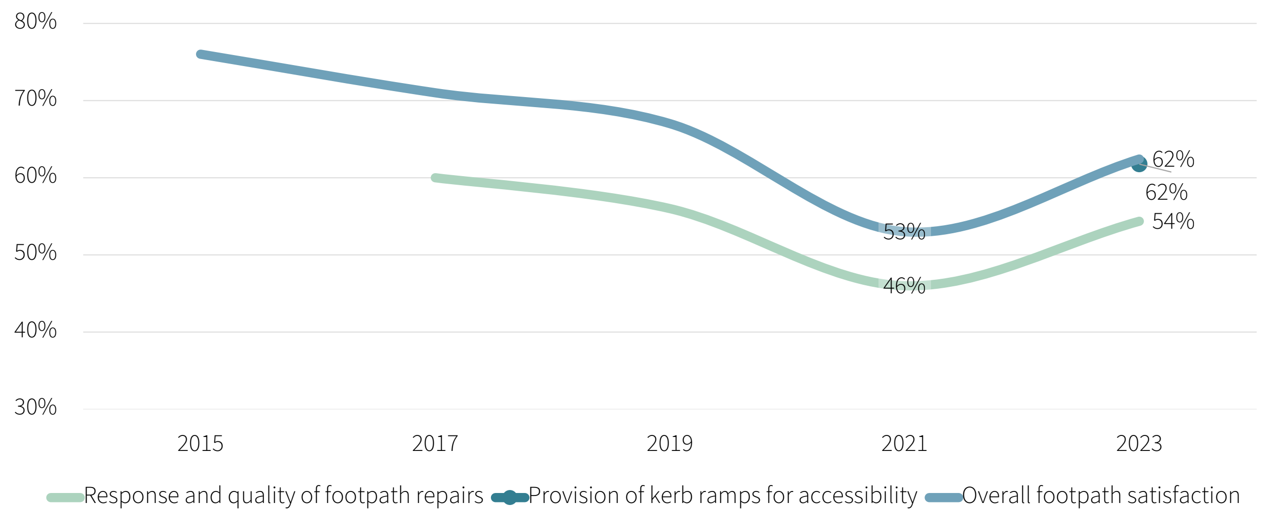
The footpath attributes Hauraki respondents rate highest are the number of footpaths (70%), and the footpath cleanliness (68%). The lowest rating is for the response and quality of footpath repairs (54%) with most other measures between 58% and 63%. The overall satisfaction rating for footpaths in Hauraki is 62%.

All results for Hauraki increased this year with the largest increase seen for the number of footpaths which is a significant change of 12% since 2021. Footpath condition, provision of safe crossings, and response and quality of repairs all increased between 8% and 9% since 2021, with the overall satisfaction rating increasing by 9%. A smaller increase is observed for footpath cleanliness (increase of 4% since 2021).

This year's results show strong increases for all footpath measures, most of which have been in decline since measurement commenced in 2015. Indeed, the number of footpaths, and the provision of safe crossings are now at the highest points of measurement.

2015 - 2023 Results





Green shading indicates this year's result is significantly higher than last year's result.
Orange shading indicates this year's result is significantly lower than last year's result.
All year on year data is available in the document provided with this report.

FOOTPATHS: HAURAKI RESULTS 2023

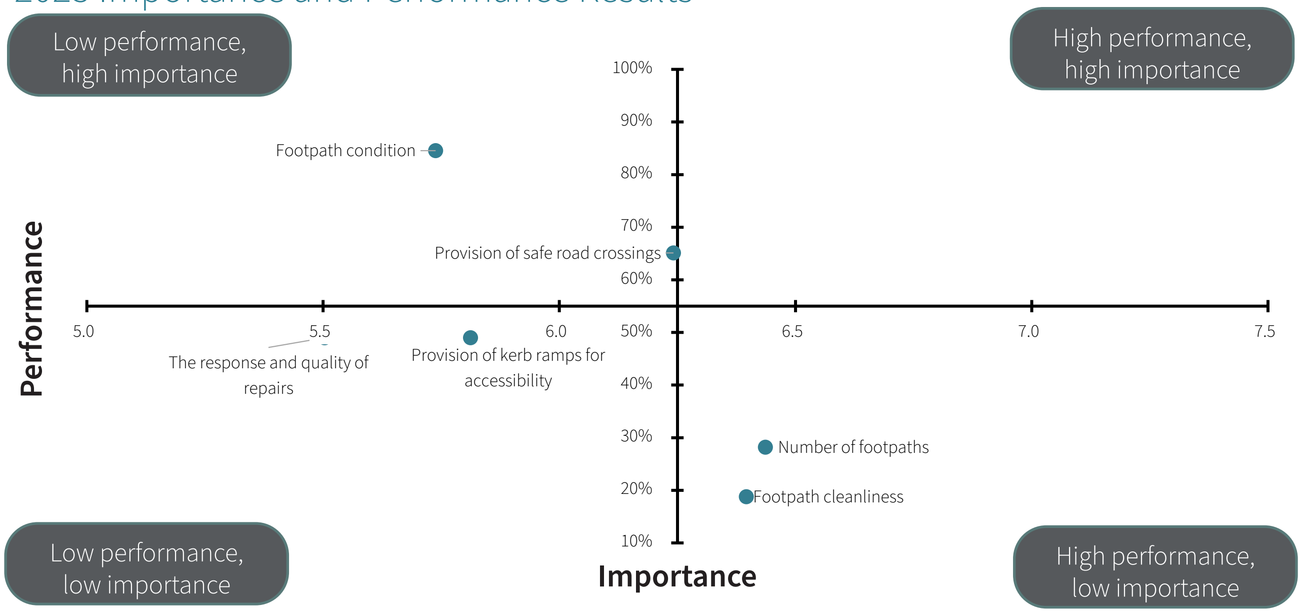
The grids to the right show the importance ratings for each footpath attribute for the Hauraki district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

This year respondents from the Hauraki district rate footpath condition and the provision of safe road crossings as important. The response and quality of repairs and the provision of kerb ramps for accessibility are also relevant, but are seen as slightly less important than the aforementioned variables. Less important attributes are the number of footpaths and footpath cleanliness.

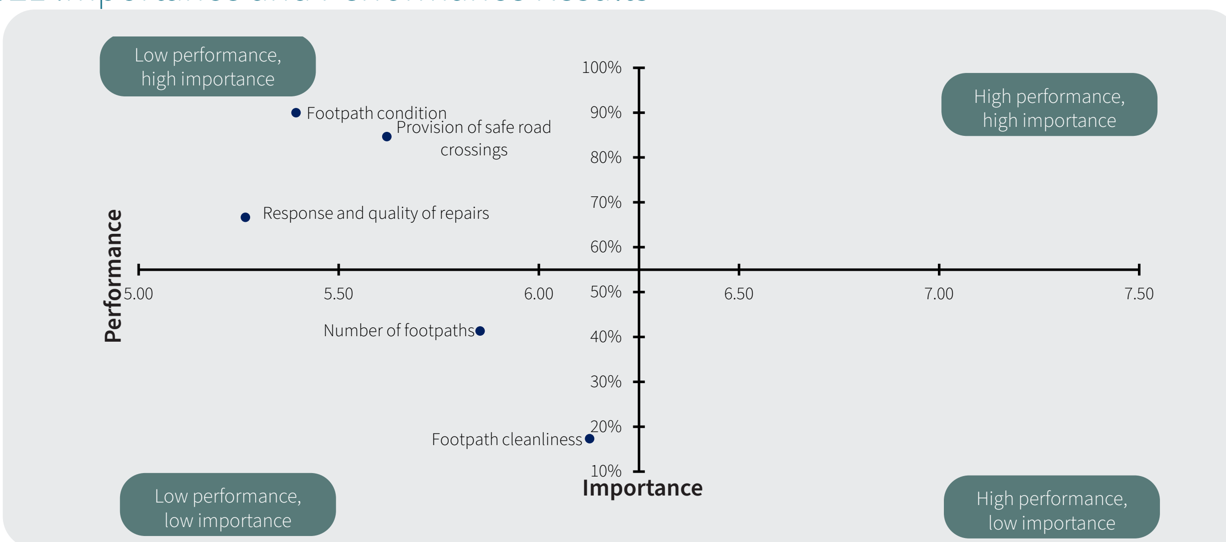
A number of attributes have moved to the right, suggesting an improvement in service. In particular, the number of footpaths and footpath cleanliness are now in the high performance, low importance quadrant.

Thirty nine percent of respondents from the Hauraki district believe the footpaths are adequate however, 15% note there is room for improvement. The main aspects that require attention relate to improved maintenance or repairs (17%), uneven surfaces causing trip hazards (14%), and improving footpath access for people with disabilities or access challenges (6%). Thirteen percent of respondents in Hauraki district also note there is a lack of footpaths in their area and, while not significant, this is higher amongst rural residents (19%).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: WAIKATO

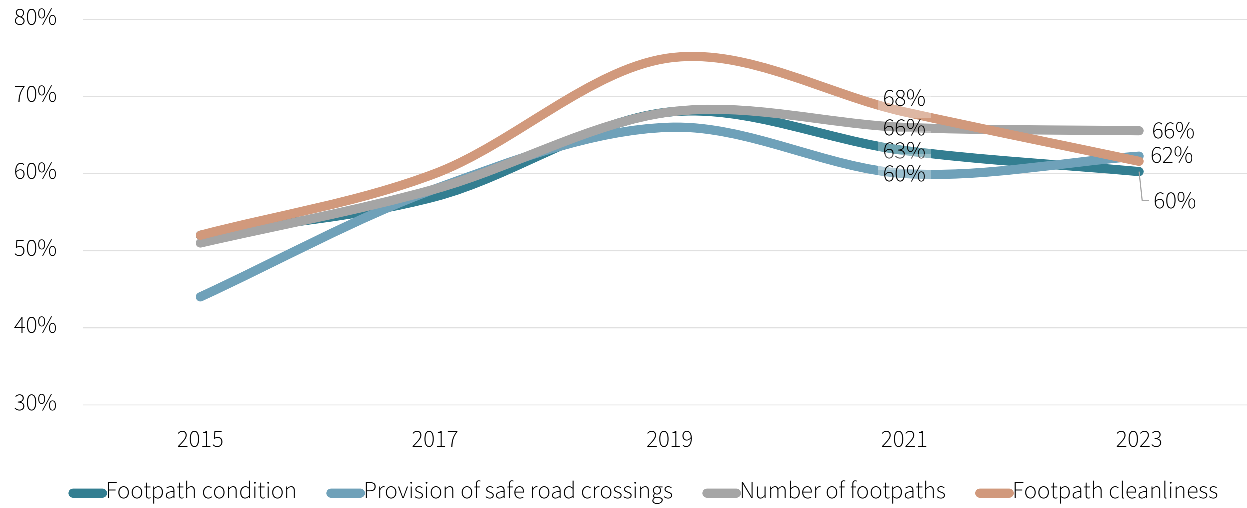
The charts to the right show the results for the footpath measures from 2015 to 2023 for the Waikato district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

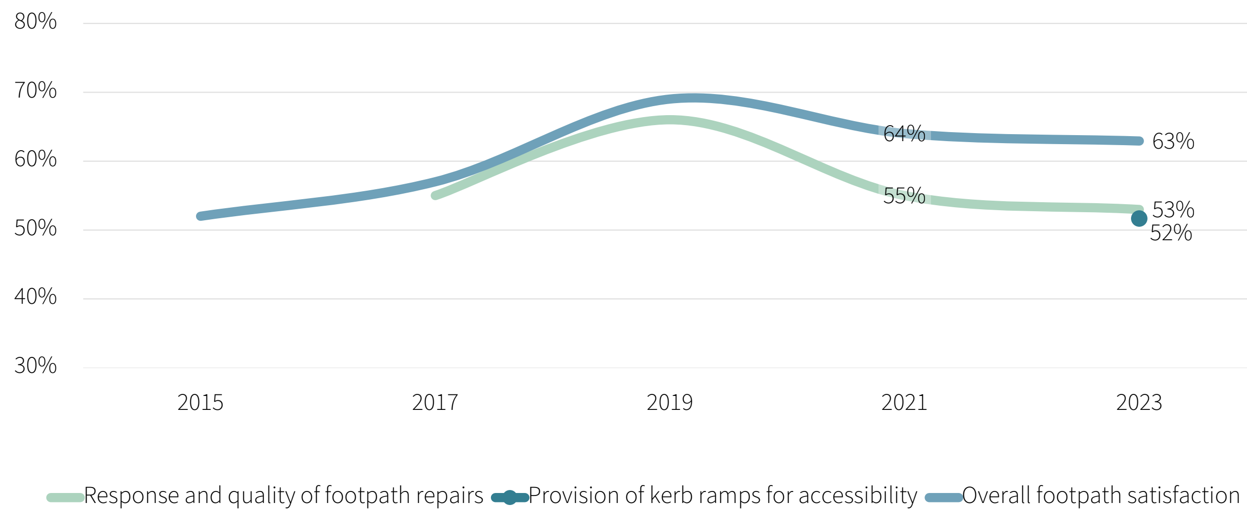
The highest rating footpath attribute for the Waikato district is the number of footpaths (66%), while the lowest rating is for the provision of kerb ramps for accessibility (52%) and the response and quality of footpath repairs (53%). All other measures are just above 60% with overall footpath satisfaction rated at 63%.

The results for the Waikato district have remained constant this year with most changes between 1% and 2%. The largest change is observed for footpath cleanliness (decrease of 8% since 2021) however, this is not a significant change.

Over time there has been a steady increase in most results with ratings peaking in 2019. This year's results maintain the results from 2021 and all sit significantly higher than the initial measures of 2015.

2015 - 2023 Results





FOOTPATHS: WAIKATO RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the Waikato district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

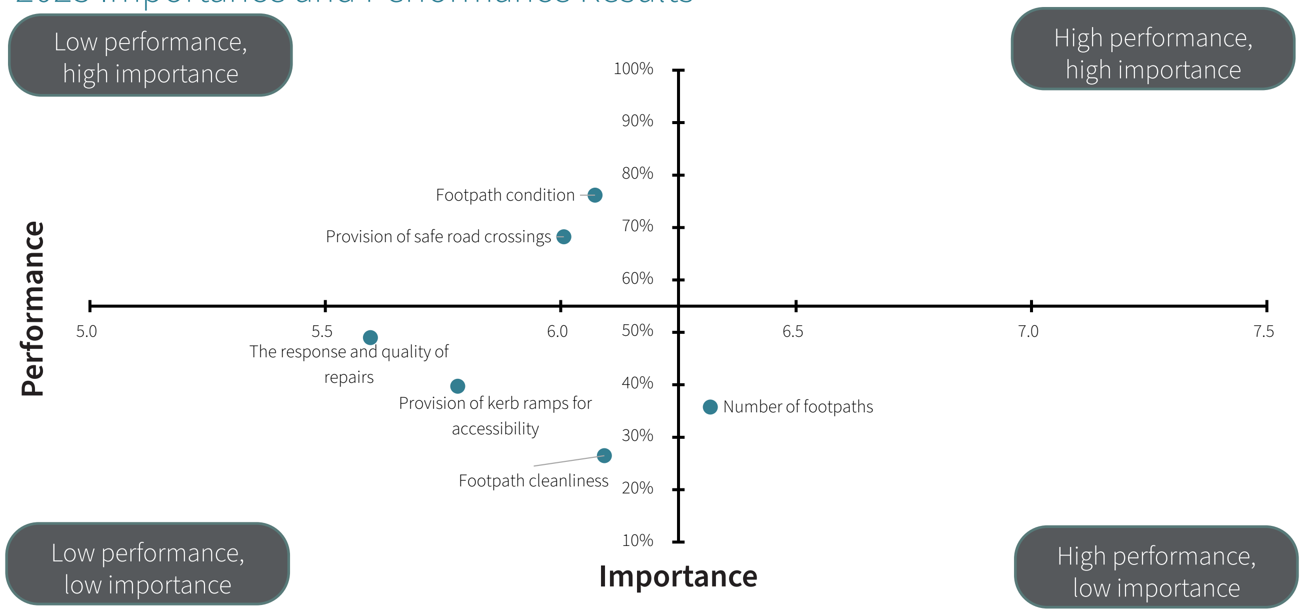
Attributes that are important to respondents from the Waikato district are footpath condition and the provision of safe road crossings. The response and quality of repairs is also rated highly but sits lower on the grid than the other two attributes. The provision of kerb ramps for accessibility, footpath cleanliness, and the number of footpaths are of slightly less importance to Waikato respondents.

These results largely reflect those from 2021 with most attributes in very similar positions on the grid, suggesting a stable performance.

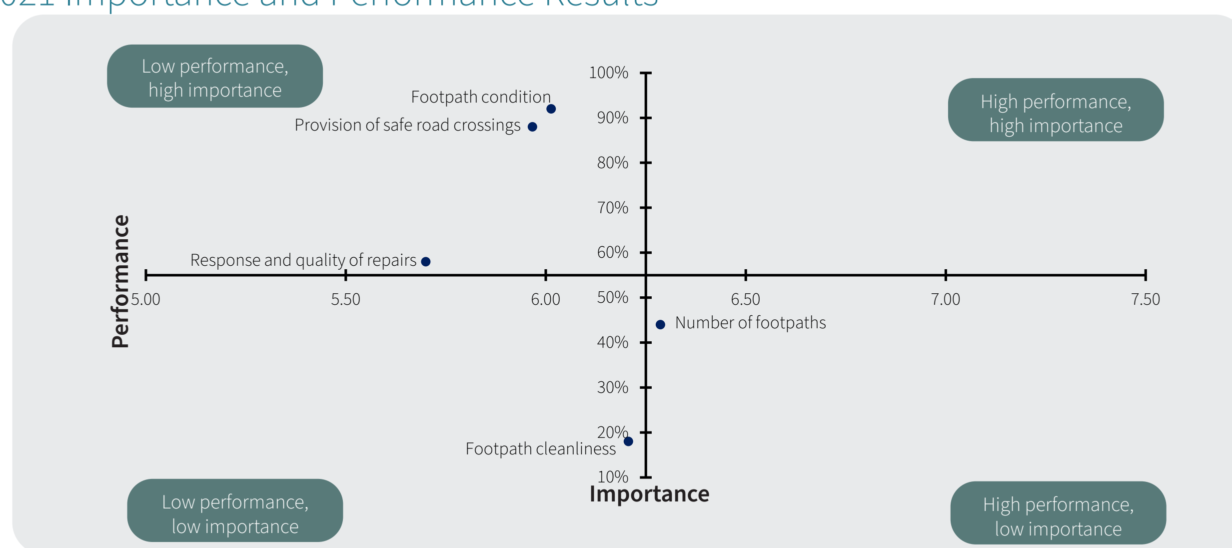
Thirty six percent of respondents state the footpaths in the Waikato district are adequate, while 9% suggest there is room for improvement. When considering improvements for the footpaths in the Waikato district, 15% of respondents note there is a lack of footpaths available and 11% state the footpaths require better maintenance. A further 8% of respondents are concerned about the uneven surfaces or trip hazards and 5% (each) note the lack of safe crossing areas and overgrown vegetation.

There are no significant differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: MATAMATA-PIAKO

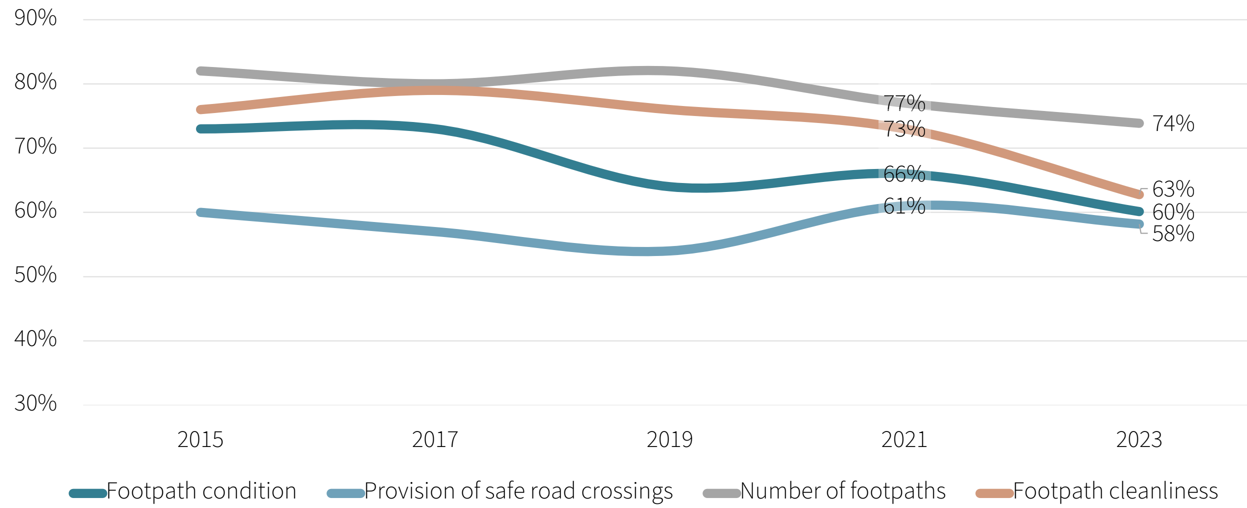
The charts to the right show the results for the footpath measures from 2015 to 2023 for the Matamata-Piako district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

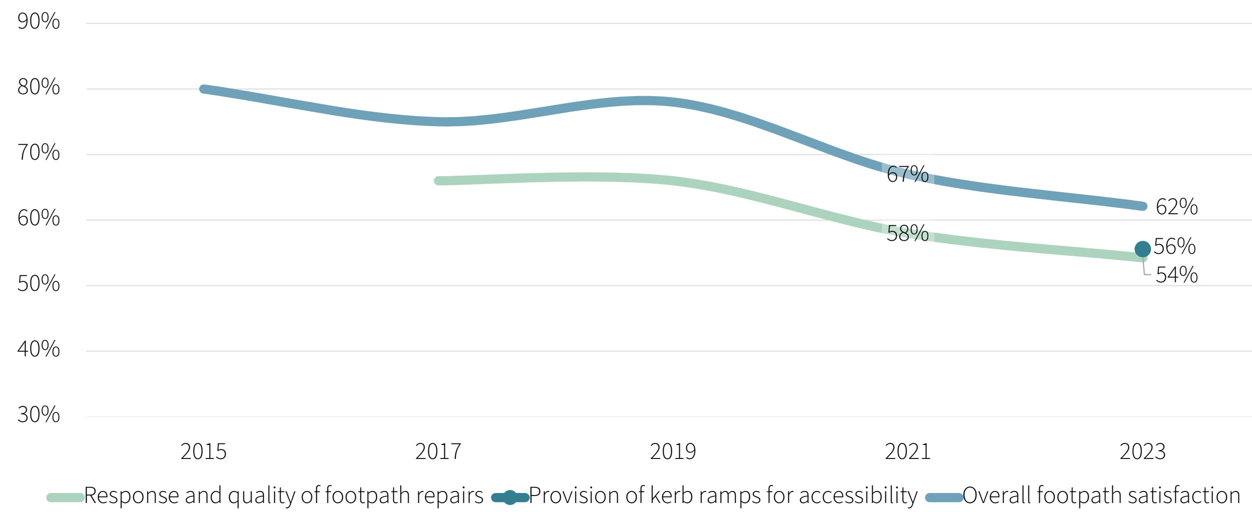
The footpath results for the Matamata-Piako district show the highest rating is for the number of footpaths in the area (74%), while the lowest ratings are for the response and quality of footpath repairs (54%) and the provision of kerb ramps for accessibility (56%). Most other measures are around 60%, with the overall satisfaction rating of 62%.

Most footpath results for Matamata-Piako district declined in 2023, although none of these decreases are significant. The biggest declines are seen for footpath cleanliness which decreased 10% since 2021 and footpath condition which declined 6%.

Generally, these results show a slow decline since monitoring commenced in 2015. The most significant changes over time are seen for footpath cleanliness, the response and quality of footpath repairs, and subsequent overall satisfaction.

2015 - 2023 Results





FOOTPATHS: MATAMATA-PIAKO RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the Matamata-Piako district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

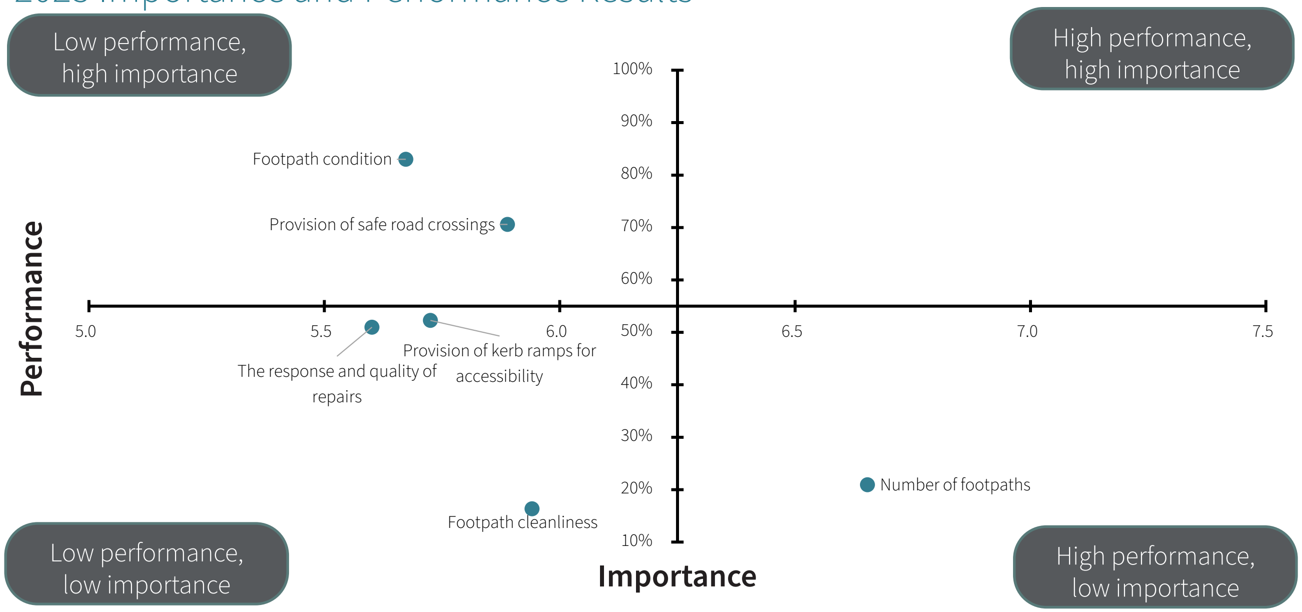
Footpath condition and the provision of safe road crossings are the attributes which respondents from the Matamata-Piako district rate as most important. This is followed by the response and quality of repairs and the provision of kerb ramps for accessibility. Footpath cleanliness and the number of footpaths are considered to be less important attributes.

The 2023 placement shows that a number of attributes have moved to the left indicating a decline in performance since 2021. Specifically, footpath condition, the provision of safe road crossings, and the response and quality of repairs have all shifted since 2021.

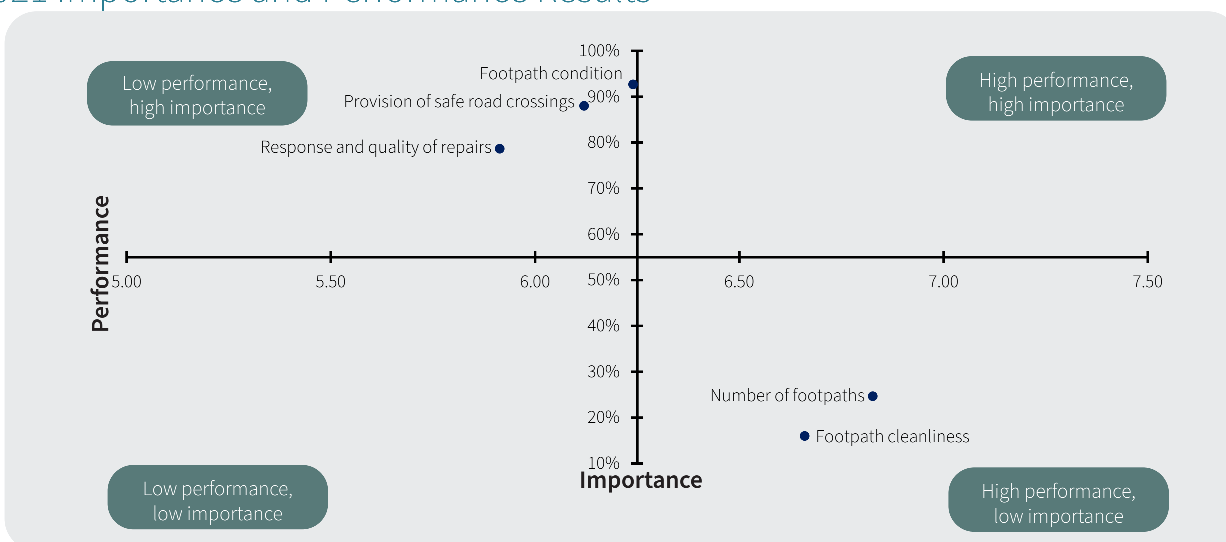
Thirty seven percent of respondents state the footpaths are generally adequate in the Matamata-Piako district. The primary issues respondents note about footpaths in this area relate to uneven surfaces and trip hazards (16%) and the need for repairs and maintenance (13%), with 14% of respondents stating improvements are needed generally. Although not significant the Matamata-Piako district has a higher proportion of respondents who think there are issues with uneven footpath surfaces than other districts.

There are no significant differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: HAMILTON

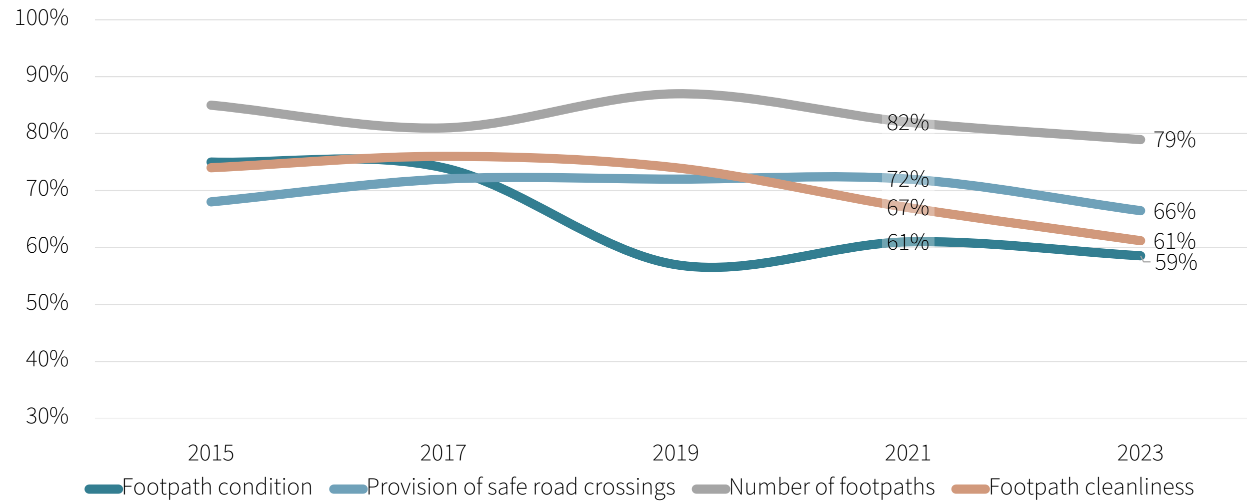
The charts to the right show the results for the footpath measures from 2015 to 2023 for Hamilton City. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

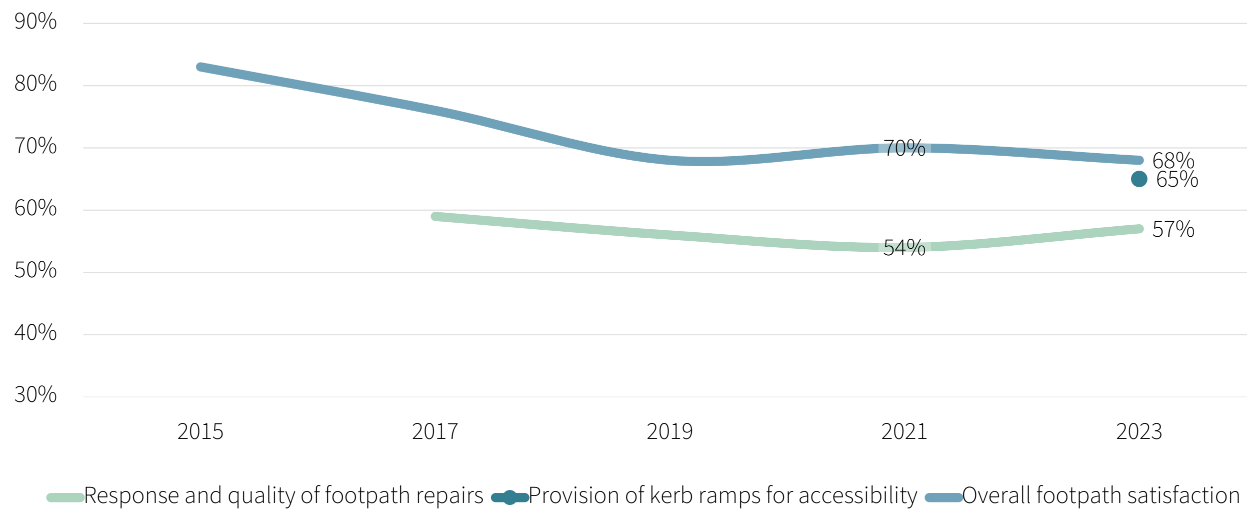
Respondents from Hamilton City provide the highest rating for the number of footpaths in the area (79%). The lowest rating is for the response and quality of footpath repairs (57%) however, footpath condition receives a similar rating (59%). The overall satisfaction with the footpaths is 68%.

Nearly all footpath results declined in 2023 however, none of these changes are significant. The largest declines are seen for the provision of safe crossings (decrease of 6% since 2021) and footpath cleanliness (decrease of 6% since 2021). The measure for the response and quality of footpath repairs increased 3% since the previous measure in 2021.

Since monitoring commenced the results for footpath safety, repair response and quality, and the amount of footpaths have remained relatively stable. The largest change is observed for overall footpath satisfaction which has decreased over 15% since 2015. It is likely that this is related to slow declines in footpath cleanliness and footpath condition over the same period.

2015 - 2023 Results





FOOTPATHS: HAMILTON RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for Hamilton City (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

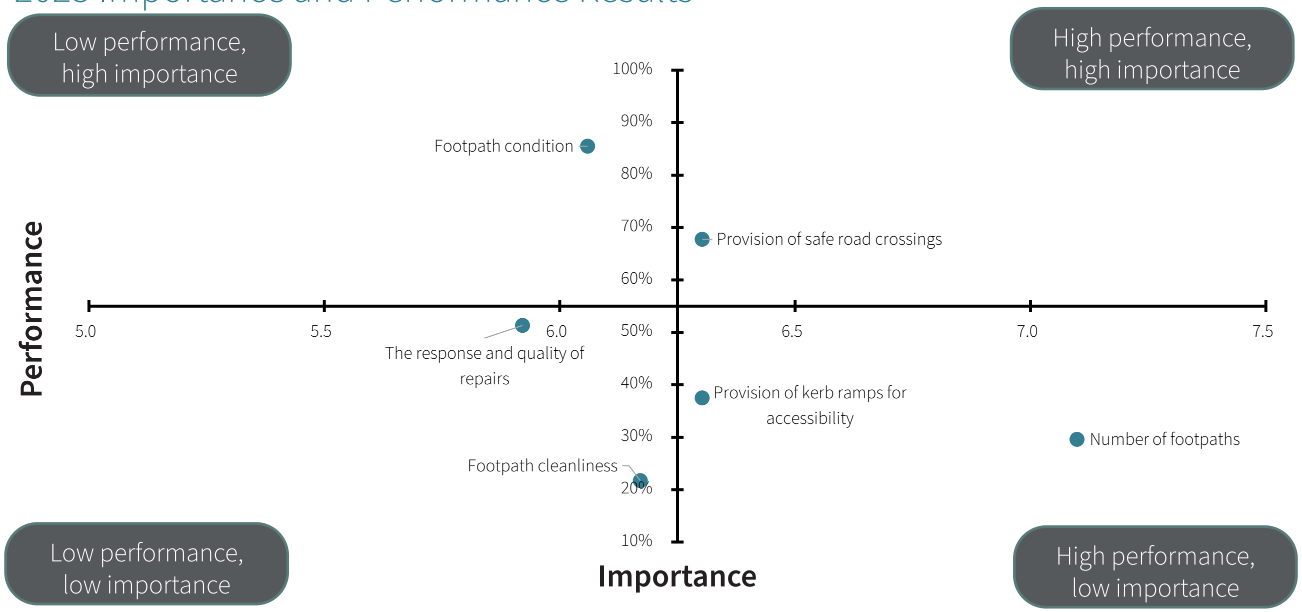
Respondents from Hamilton City consider footpath condition and the provision of safe road crossings as the most important attributes. This is followed by the response and quality of repairs. Attributes that respondents from Hamilton City place less importance upon are the provision of kerb ramps for accessibility, footpath cleanliness, and the number of footpaths.

The attributes are in a similar place to 2021 with the provision of safe road crossings continuing to sit in the high performance, high importance quadrant. Response and quality of repairs has moved to a lower importance quadrant with the introduction of the provision of kerb ramps for accessibility.

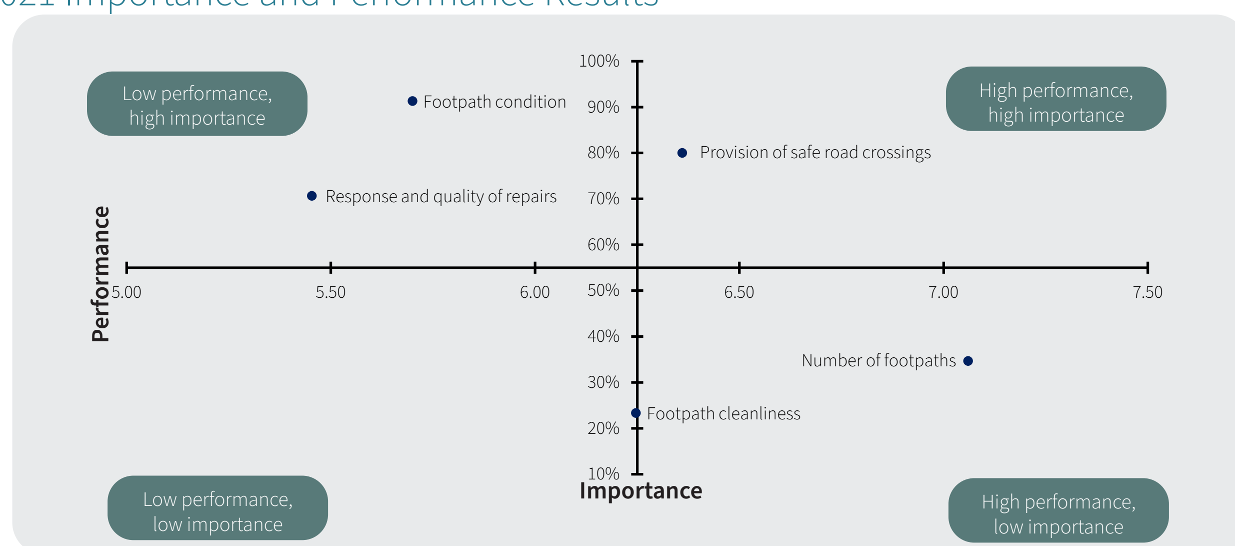
Forty percent of respondents from Hamilton City state the footpaths are generally adequate, with 16% stating the footpaths need improvement. The issues that cause the largest concern are the requirement for repairs and maintenance (14%) and uneven surfaces or trip hazards (12%). At a lower level 7% of respondents note overgrown vegetation needs to be addressed and 6% (each) state there is a lack of safe road crossings and the footpaths lack access for those with a disability or access issues.

Those who drive a car as their primary mode of transport are more likely to consider footpaths to be adequate (47%).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: WAIPĀ

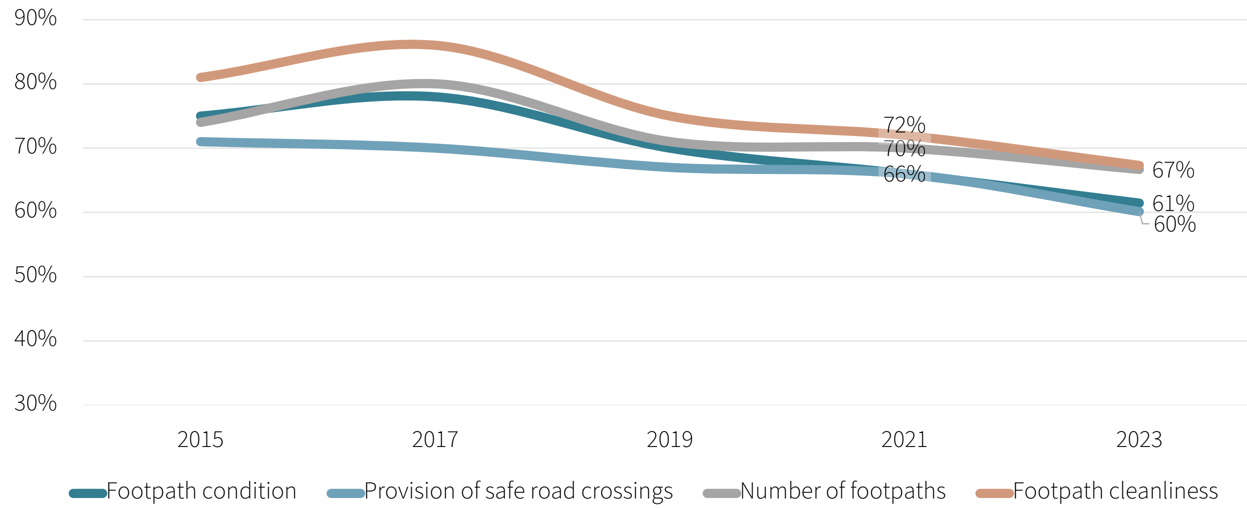
The charts to the right show the results for the footpath measures from 2015 to 2023 for the Waipā district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

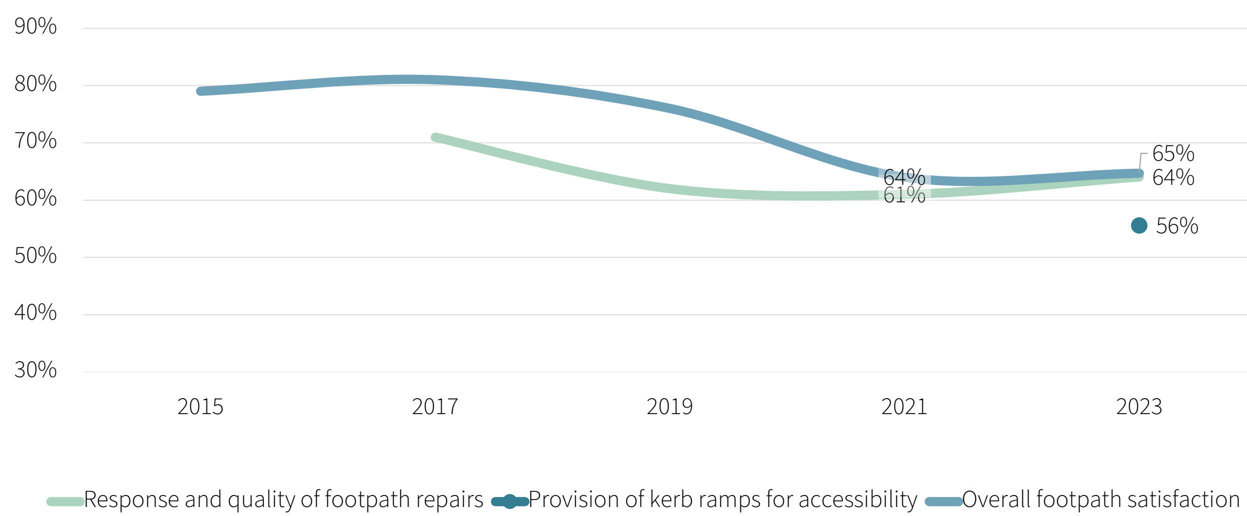
The footpath results for the Waipā district show relatively close ratings. The highest rated attribute is footpath cleanliness and the number of footpaths in the area (67% each). The lowest rated attribute is the provision of kerb ramps for accessibility (56%). The remaining results are within 4% of one another with overall satisfaction sitting at 65%.

Four of the Waipā district footpath attributes declined this year although none of these decreases are significant. The largest decline is observed for the provision of safe road crossings which decreased 6% since 2021. The response and quality of footpath repairs and the overall satisfaction rating both increased this year, although neither of these increases are significant changes.

Despite a small lift in ratings in 2017, footpath attributes for Waipā have declined over time. The largest decrease since 2015 is seen for overall footpath satisfaction which has declined around 15% since monitoring started.

2015 - 2023 Results





FOOTPATHS: WAIPĀ RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the Waipā district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

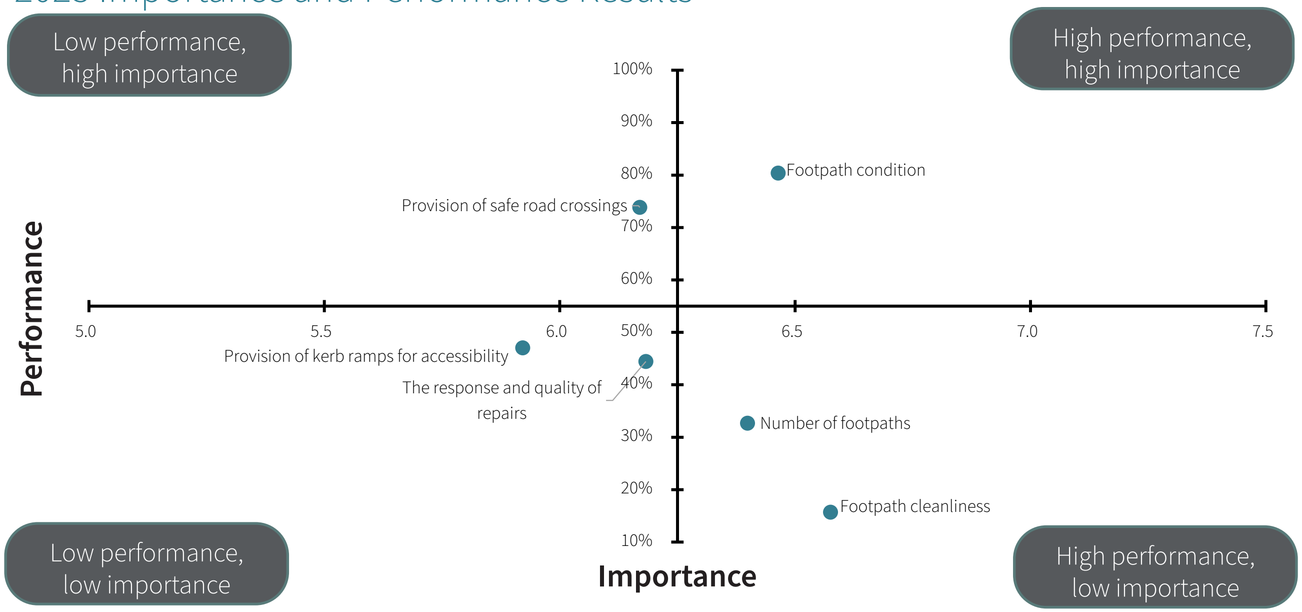
This year Waipā respondents place the highest importance on footpath condition and the provision of safe road crossings. This is followed by the provision of ramps for accessibility and the response and quality of repairs. Less importance is placed on the number of footpaths and footpath cleanliness.

Footpath condition remains in a similar position to that of 2021 and continues to sit in the high performance, high importance quadrant. The provision of safe road crossings has moved to the top left hand quadrant (low performance, high importance), suggesting a decrease in performance while still being considered important by Waipā respondents. Other attributes have remained in a similar position to 2021.

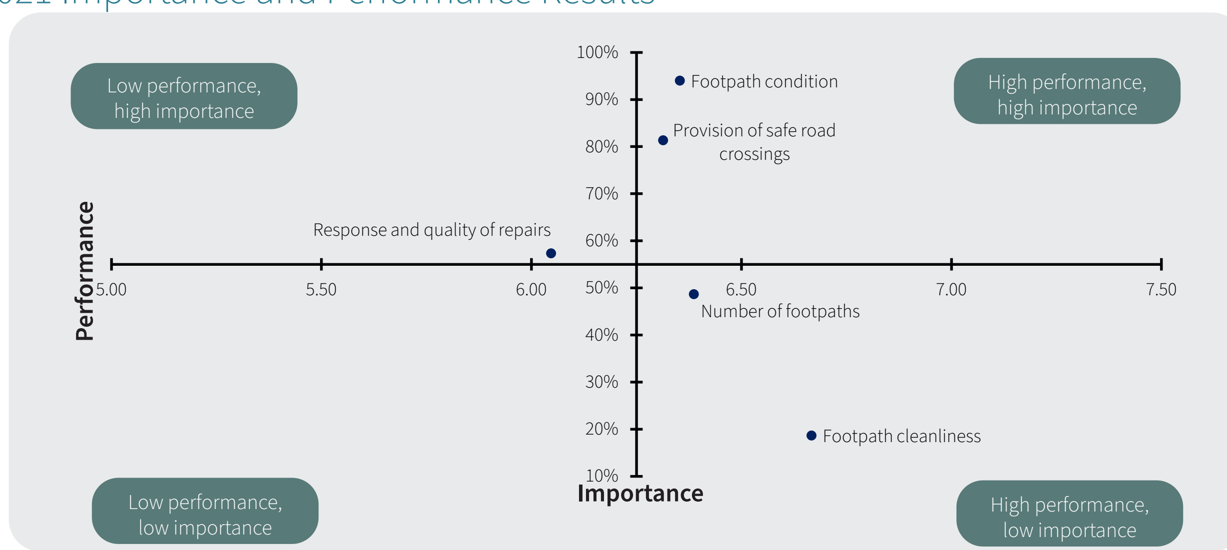
Nearly half of Waipā respondents think the footpaths are generally adequate (46%). However, 18% note there is a lack of footpaths available; this result is significantly higher than the result for other districts. Regarding concerns about footpaths in the district, 14% of respondents note there is room for improvement and 12% state the footpaths require better maintenance and repairs. Eight percent (each) note the footpaths have uneven surfaces and trip hazards or footpaths are not suitable for people with a disability or access issues.

There are no significant differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: ŌTOROHANGA

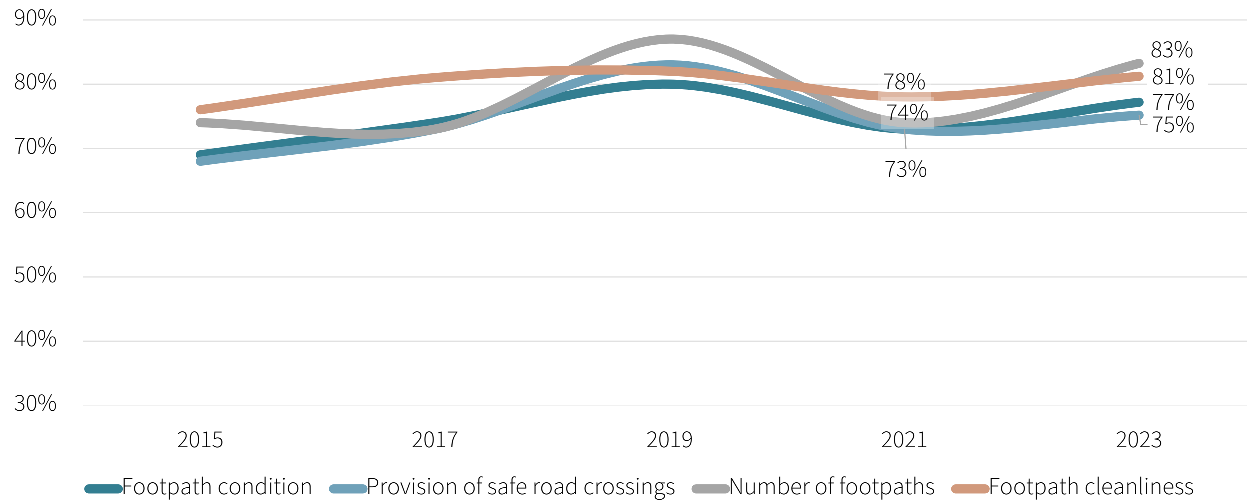
The charts to the right show the results for the footpath measures from 2015 to 2023 for the Ōtorohanga district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

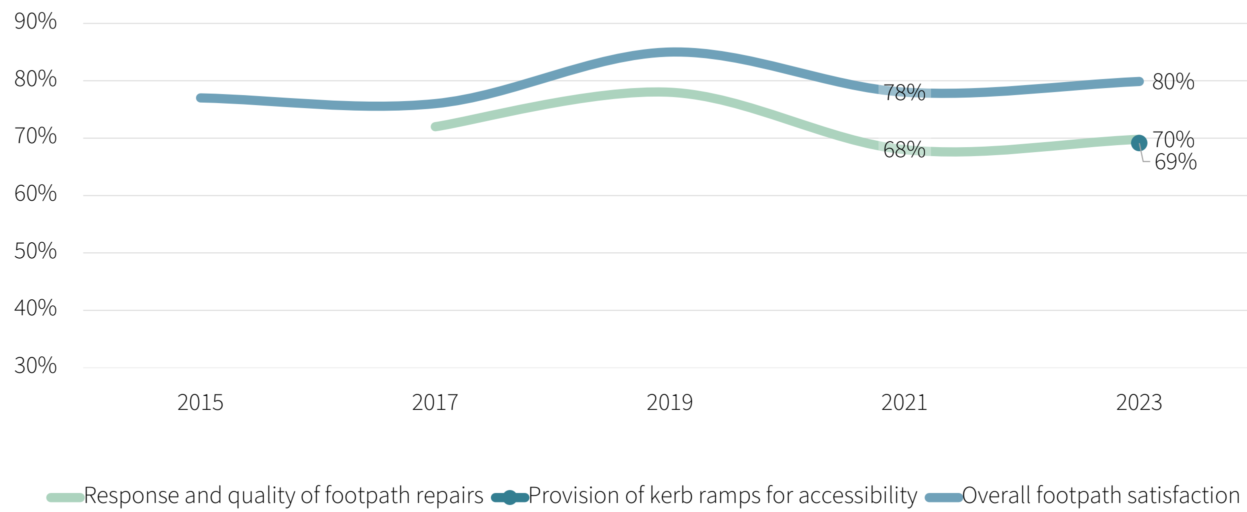
Respondents from Ōtorohanga provide the highest adequacy rating for the number of footpaths in the area (83%), and this is closely followed by footpath cleanliness (81%). The lowest ratings are provided for the provision of kerb ramps for accessibility (69%) and response and quality of the footpath repairs (70%). The overall satisfaction rating for footpaths in Ōtorohanga is 80%.

Ratings for all footpath attributes in Ōtorohanga increased this year, although none of these changes are significant. The largest increase is seen for the number of footpaths in the district (increase of 9% since 2021), with all other measures increasing between 2% and 4%.

The results for the footpath attributes have shown a slow increase over time with all results ahead of the initial 2015 measures. Results dipped in 2021, but have returned this year to levels similar to those of 2019.

2015 - 2023 Results





FOOTPATHS: ŌTOROHANGA RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the Ōtorohanga district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

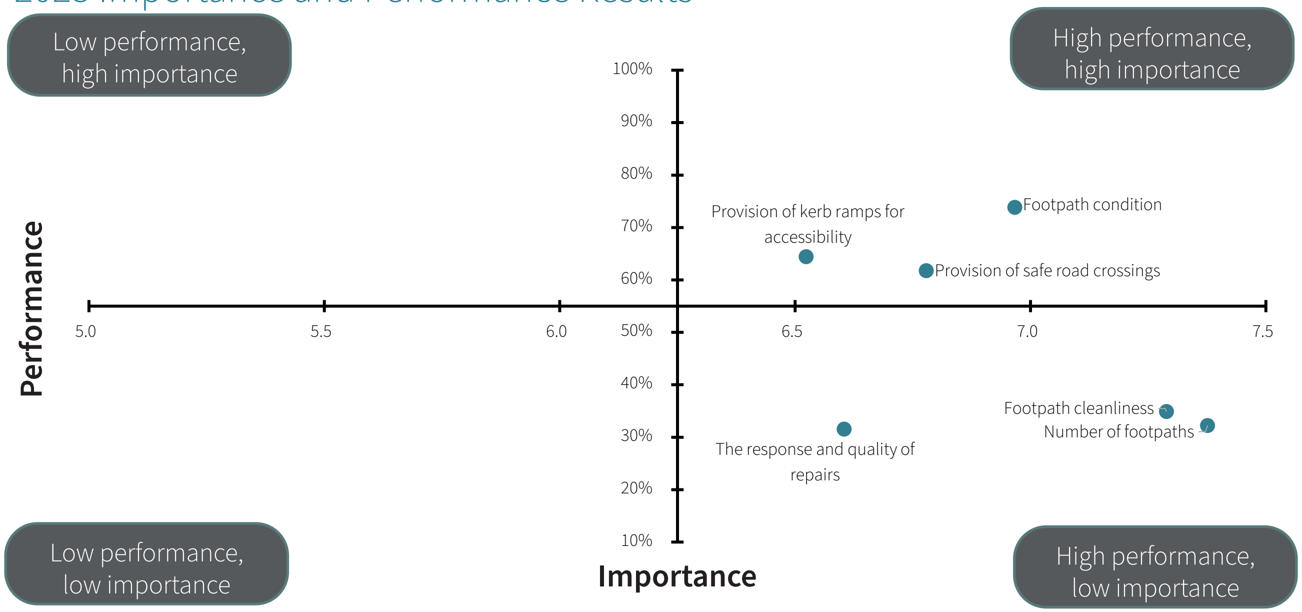
Respondents from the Ōtorohanga district place high importance on footpath condition, provision of kerb ramps for accessibility, and the provision of safe road crossings. Less importance is placed on footpath cleanliness, the number of footpaths, and the response and quality of repairs.

Most attributes remain in a similar position to 2021 however, the importance for response and quality of repairs has declined with the introduction of the provision of kerb ramps for accessibility. Interestingly, Ōtorohanga respondents place significantly greater importance upon the provision of kerb ramps for accessibility than respondents from other districts. However, they place significantly less importance on the response and quality of repairs than respondents in other districts.

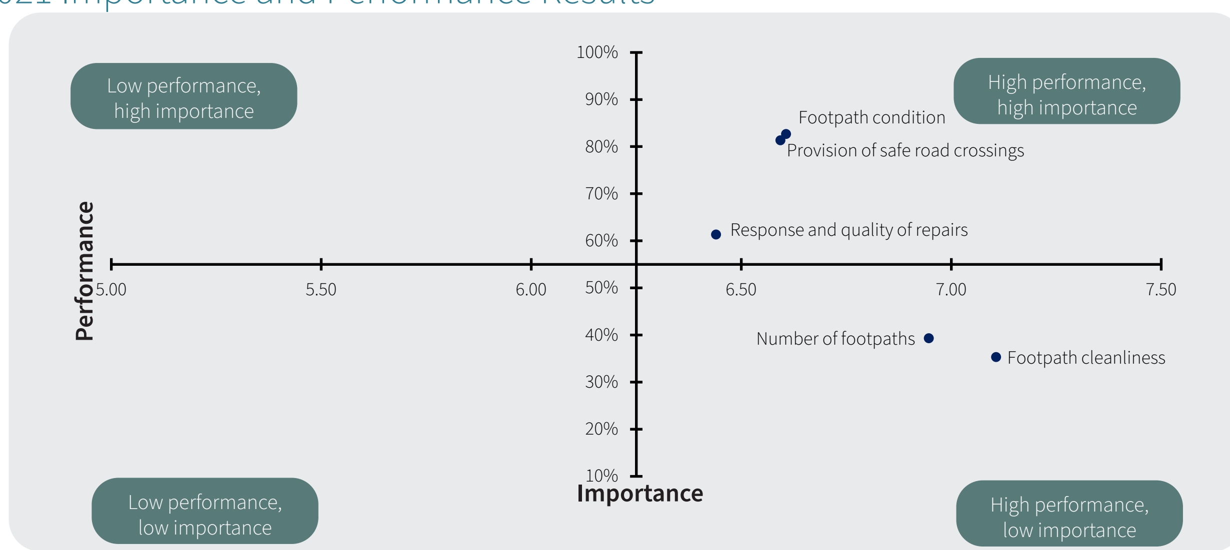
Fifty two percent of Ōtorohanga respondents think the footpaths in the district are generally adequate. The largest concerns about footpaths relate to uneven surfaces (8%), the need for improved maintenance (7%), and not being suitable for people with disabilities or access issues (6%).

Respondents in the district who walk as their primary mode of transport are significantly more likely to mention issues with overgrown vegetation (14%, 1% for all Ōtorohanga District). Those who primarily use an electric scooter are significantly more likely to state footpath surfaces are uneven (50%, 8% for all Ōtorohanga District) and the footpaths are not suitable for people with disabilities or access issues (50%, 6% for all Ōtorohanga District).

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: SOUTH WAIKATO

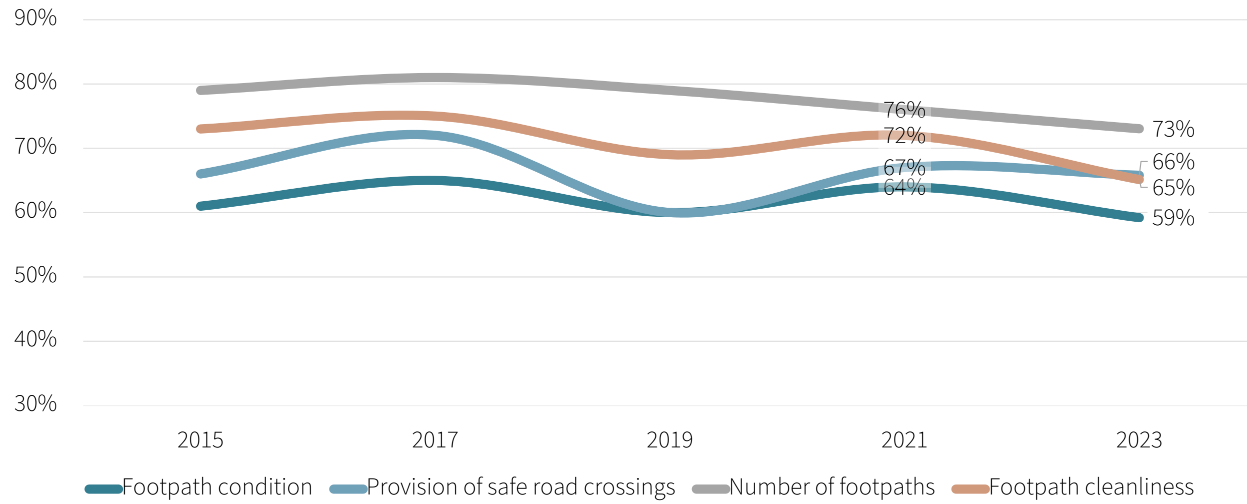
The charts to the right show the results for the footpath measures from 2015 to 2023 for the South Waikato district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

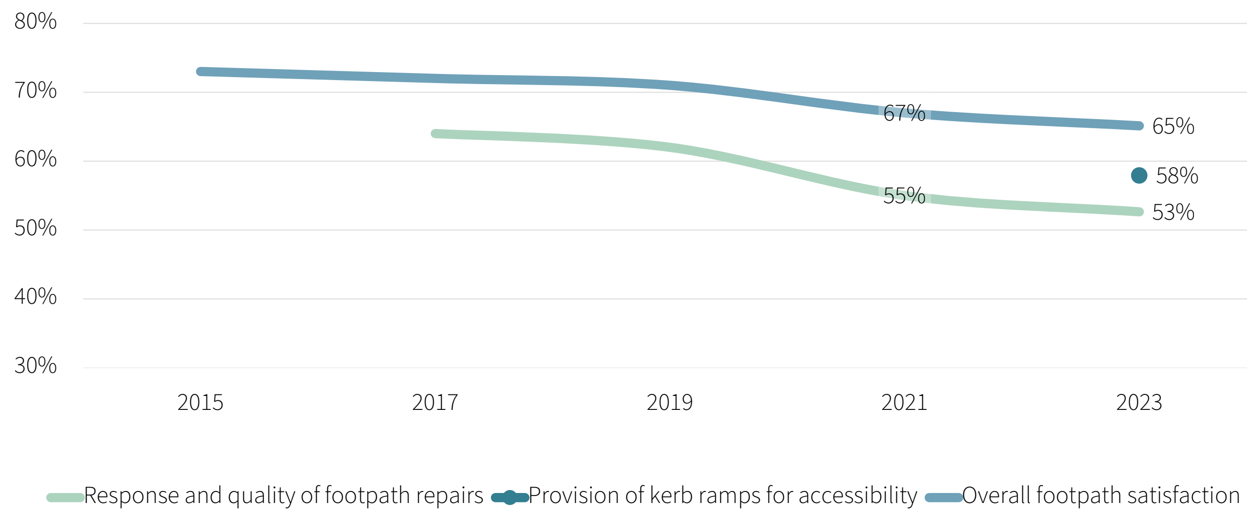
Respondents from South Waikato provide the highest rating for the number of footpaths (73%) and the lowest rating for the response and quality of footpath repairs (53%). All other attributes are rated between 58% and 66% with the overall satisfaction currently at 65%.

The ratings for all footpath attributes in the South Waikato district have declined slightly this year, although none of these changes are significant. The largest decreases are seen for foothpath cleanliness (decline of 7% since 2021) and footpath condition (decline of 5% since 2021) however, all other changes are minimal.

While results have fluctuated over time, most are at a fairly similar level to the measures seen in 2015. The biggest shift is seen for overall satisfaction which has declined around 10% since 2015. This is possibly driven by perceptions relating to the quality of footpath repairs, which has declined a similar proportion since 2017.

2015 - 2023 Results





FOOTPATHS: SOUTH WAIKATO RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the South Waikato district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

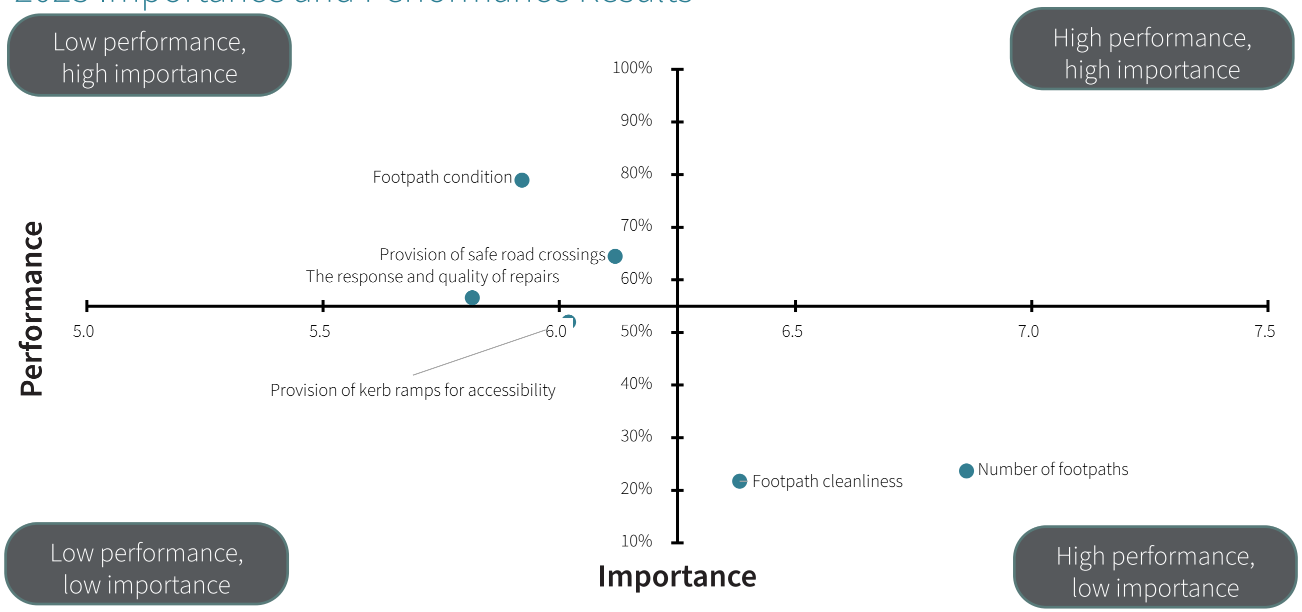
South Waikato respondents place the greatest importance on footpath condition, the provision of safe road crossings, and the response and quality of repairs. This is closely followed by the provision of kerb ramps for accessibility. Footpath cleanliness and the number of footpaths are the attributes respondents from the South Waikato district place the least importance upon.

Attributes are in a similar position to 2021 however, there has been a decline in the perceived importance of the provision of safe road crossings in this area. This attribute moved from the high performance, high importance quadrant to the low performance, high importance quadrant.

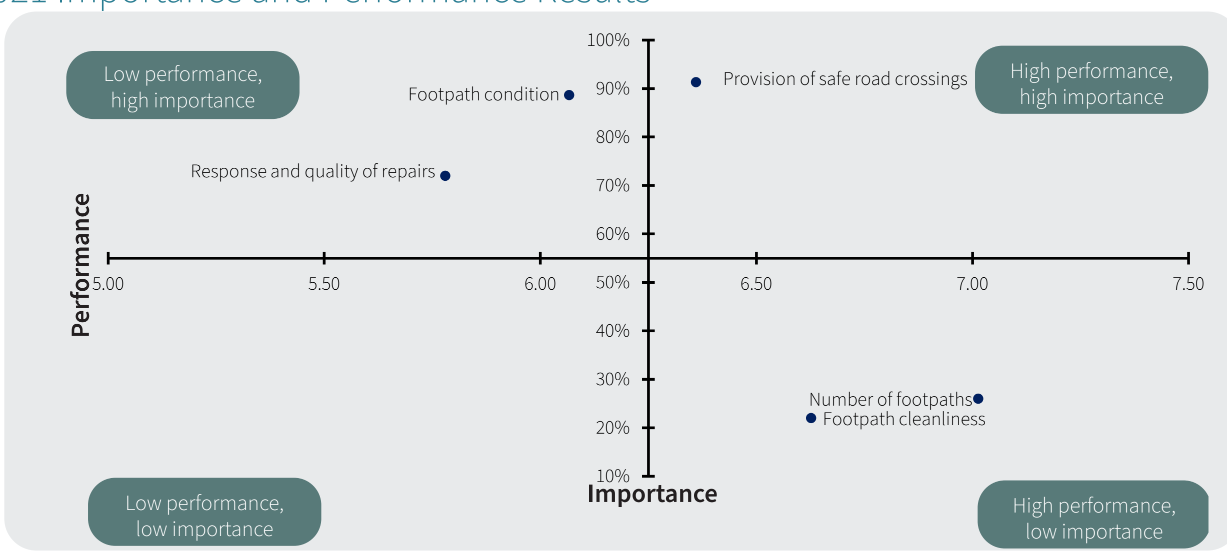
Half of South Waikato respondents think the footpaths in the district are generally adequate. The primary concerns relate to better maintenance and repairs needed (14%) and uneven surfaces and trip hazards (13%). At a lower level, 5% (each) of respondents note an issue with overgrown vegetation or the suitability of the footpaths for people with a disability or access issues.

There are no significant differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



YEAR ON YEAR RESULTS: TAUPŌ

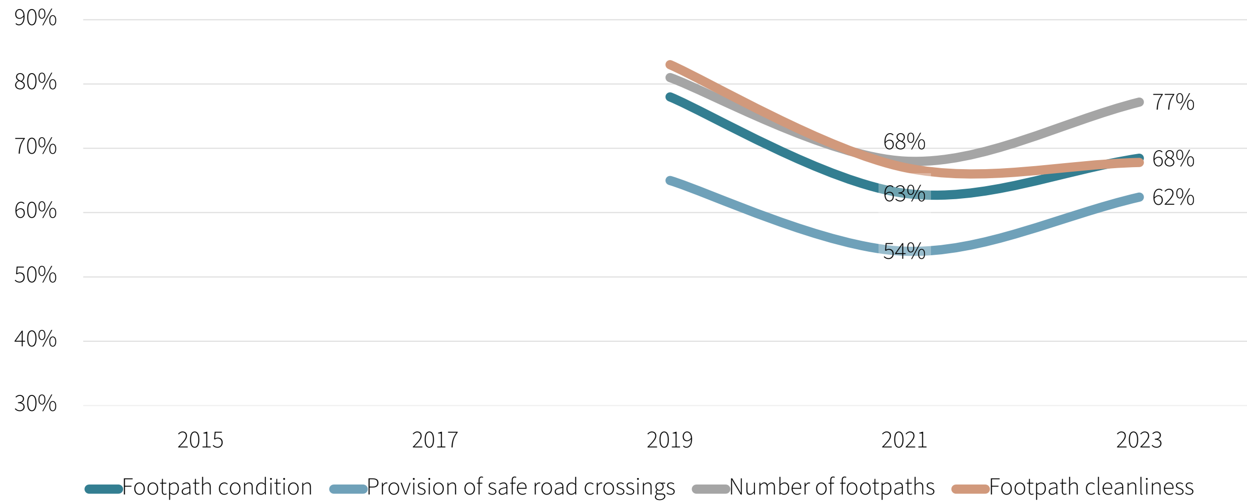
The charts to the right show the results for the footpath measures from 2019 to 2023 for the Taupō district. Adequacy is based on the proportion of respondents who rated the attribute as 6 or higher on a 0 - 10 rating scale.

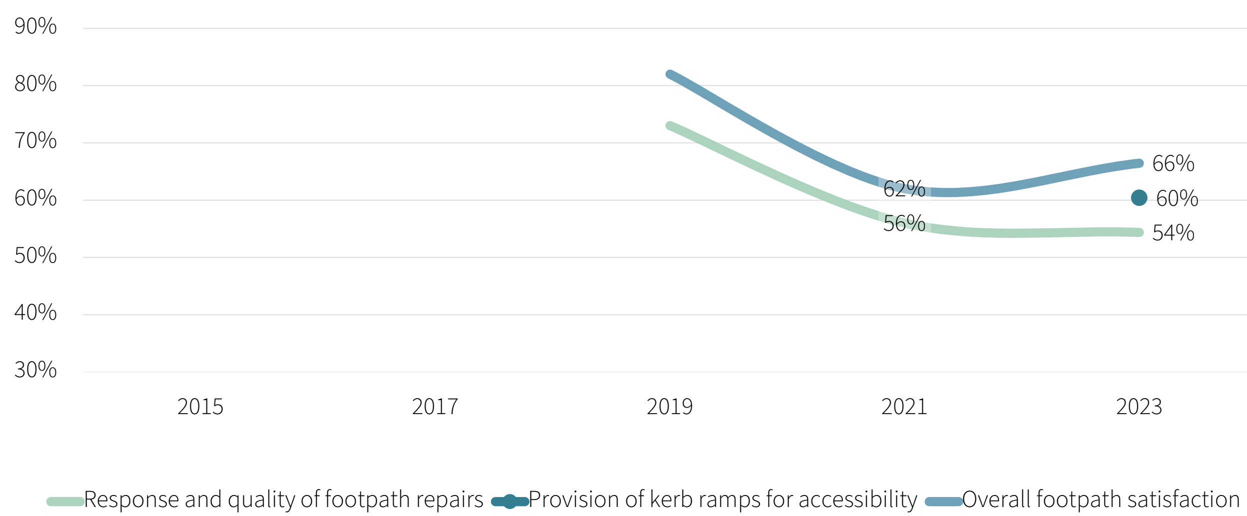
The highest rated attribute in the Taupō district is the number of footpaths (77%), while the lowest rating is provided for the response and quality of footpath repairs (54%). The remaining attributes sit between 60% and 68%, with overall footpath satisfaction at 66%.

The majority of footpath ratings have increased this year with the largest changes observed for the number of footpaths (increase of 9% since 2021), and the provision of safe road crossings (increase of 8% since 2021). The only decrease observed this year is for the response and quality of footpath repairs (decrease of 2% since 2021). None of the changes between the 2021 and 2023 measures are significant.

Monitoring for the Taupō district only commenced in 2019 with the 2021 results showing a decline across all measures. The results this year have seen a rebound to stronger levels with most attributes in a similar or better position than the 2019 results. The exception to this is the overall satisfaction rating which has declined over 10% since 2019. However, this result is possibly related to the decrease in the rating for the response and quality of footpath repairs which has declined in a similar fashion over the same period.

2019 - 2023 Results





FOOTPATHS: TAUPŌ RESULTS 2023

The grids to the right show the importance ratings for each footpath attribute for the Taupō district (% who stated the attribute was one of the most important features to have adequate footpaths in the region). This is plotted against the performance rating for each attribute (average rating for the attribute based on a 0 - 10 rating scale). The top grid shows the placement for 2023 and the bottom grid shows the 2021 results for comparison.

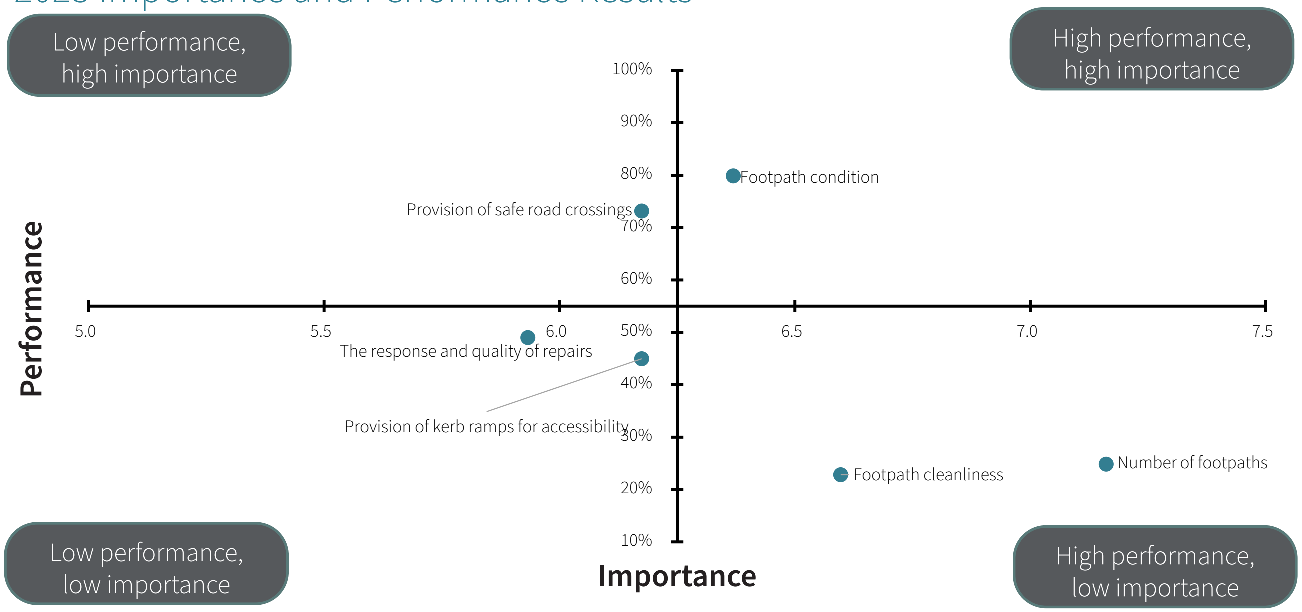
Taupō respondents place the greatest importance on footpath condition and the provision of safe road crossings. This is followed by the response and quality of repairs and the provision of kerb ramps for accessibility, although these sit slightly lower than the aforementioned attributes. Footpath cleanliness and the number of footpaths are considered less important.

Footpath condition and the provision of safe road crossings have both shifted to the right since 2021, with footpath condition now in the high performance, high importance quadrant. The response and quality of repairs has moved to low performance, low importance quadrant (with the inclusion of the provision of kerb ramps for accessibility). However, the performance of this attribute has remained consistent. Improvements are also seen for the number of footpaths, with this attribute shifting to the right slightly.

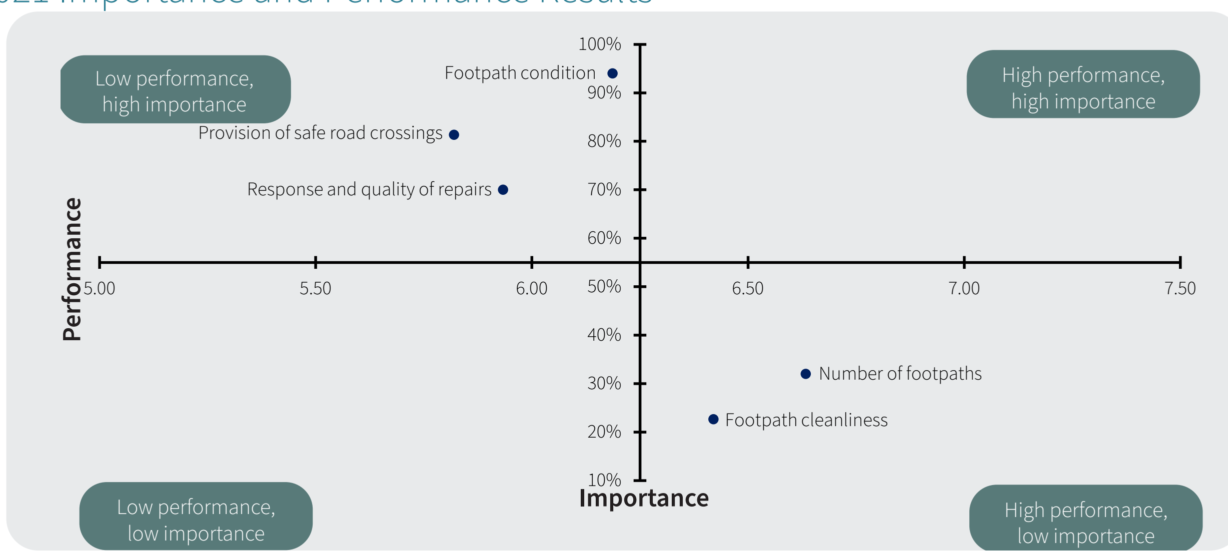
Fifty percent of Taupō respondents state the footpaths in their area are generally adequate however, 20% note there is still room for improvement. The primary issues that respondents from the Taupō district raise are concerns about better maintenance and repairs (10%), overgrown vegetation and roots breaking the paths (9%), uneven surfaces and trip hazards (9%), and a lack of safe crossings (7%).

There are no significant differences observed between user groups within this area.

2023 Importance and Performance Results



2021 Importance and Performance Results



CYCLING IN THE REGION

OFF-ROAD CYCLING LANES

This year the project included questions about cycling in the district.

At a total level, 20% of respondents use off-road cycle lanes. Off-road cycle lane use is significantly higher amongst users from the Waipā district (27%) and lowest amongst users from the Ōtorohanga district (11%) and the South Waikato district (7%).

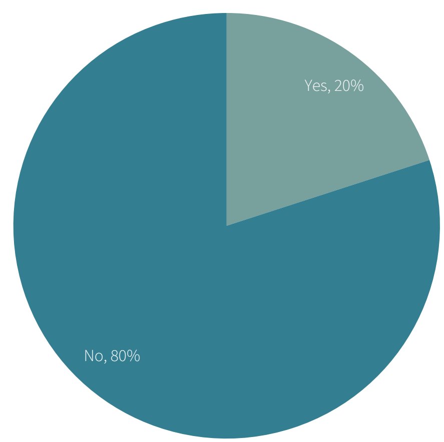
Off-road cycle lane users are more likely to be aged between 35 and 64 years (74%, 60% for all respondents) and are more likely to use cycling (12%, 3% for all respondents) or an electric scooters (3%, 1% for all respondents) as their main mode of transport. This group are less likely to use a car as their main mode of transport (80%, 90% for all respondents).

Amongst off-road cycle lane users, 79% are satisfied or very satisfied with the cycle lanes and only 11% are dissatisfied or very dissatisfied with the cycle lanes. Ten percent of users provided a neutral rating. There are no significant differences between user satisfaction ratings across the different districts.

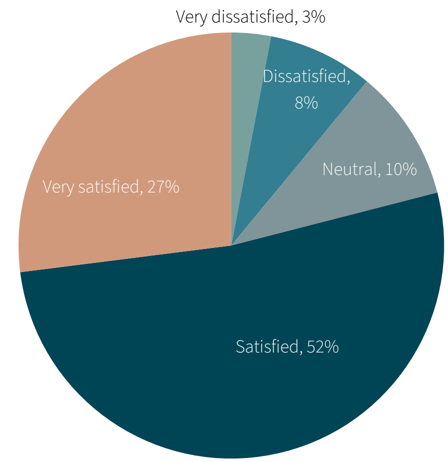
The main improvements off-road cycle lane users think need to be made to the cycle lanes relate to increasing the number of lanes (49%), widening the tracks (36%), and smoothing the tracks (24%).

Results for off-road cycling lanes for each district are included in the appendix.

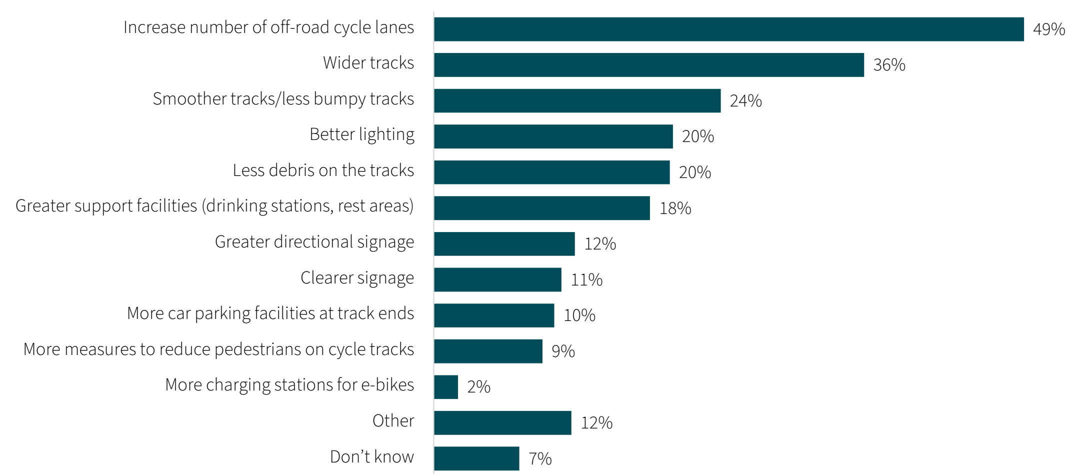
Off-Road Cycle Lane Use



Off-Road Cycle Lane Satisfaction



Off-Road Cycle Lane Improvements



ON-ROAD CYCLING LANES

When addressing on-road cycle lane use, 18% of respondents use the on-road cycle lanes. Use was significantly higher amongst respondents from Hamilton City (26%) and lower amongst respondents from the Thames-Coromandel (11%), Waikato (10%), Hauraki (8%), Matamata-Piako (6%), Ōtorohanga (5%), and South Waikato (5%) districts.

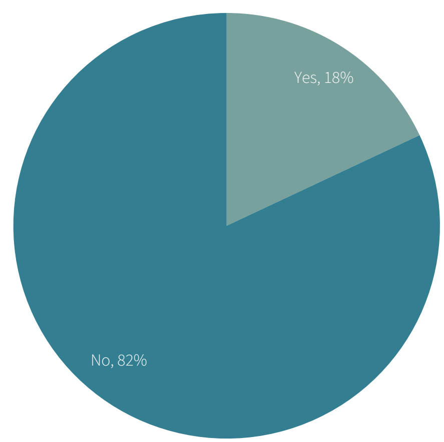
On-road cycle lane users are less likely to be over the age of 65 (14%, 21% for all respondents) and are less likely to live in rural areas (9%, 17% for all respondents). They are also more likely to use cycling as an their primary mode of transport (12%, 3% for all respondents) and are less likely to use a car or van (80%, 90% for all respondents).

Amongst on-road cycle lane users, 55% are either satisfied or very satisfied with the cycle lanes, while 21% are dissatisfied or very dissatisfied with the on-road cycle lanes. Twenty three percent of users provided a neutral rating. Dissatisfaction is significantly higher amongst on-road cycle lane users from Ōtorohanga (38% of users in this area are very dissatisfied).

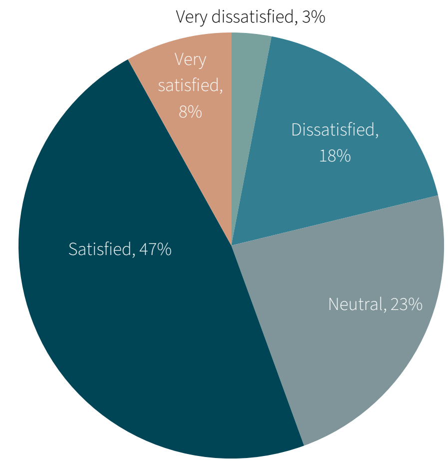
The main improvements that on-road cycle lane users would like to see made to the cycle lanes are an increase in the number of cycle lanes (36%) and buffer zones between cars and cycle lanes (34%). There are no significant differences between the improvements users would like to see across the districts.

Results for on-road cycling lanes for each district are iincluded in the appendix.

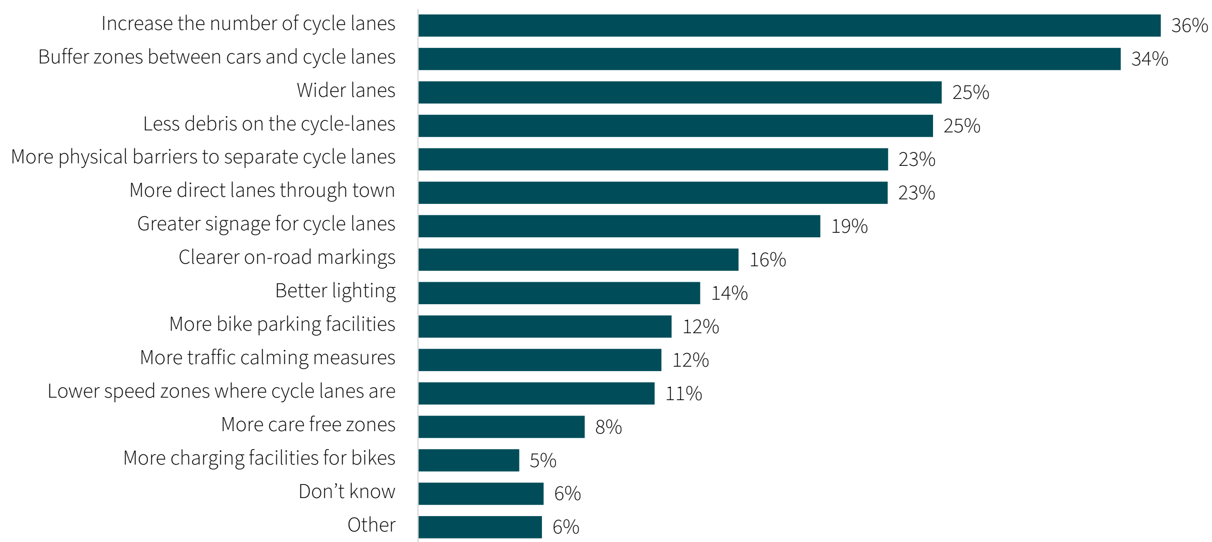
On-Road Cycle Lane Use



On-Road Cycle Lane Satisfaction



On-Road Cycle Lane Improvements



CYCLING HABITS

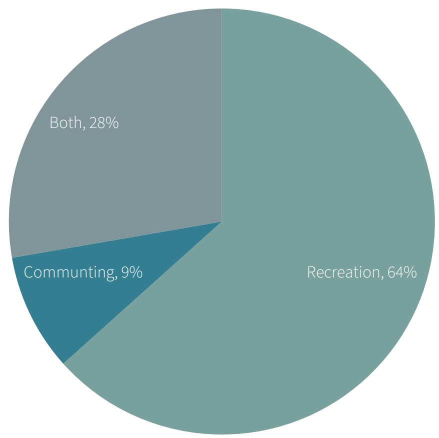
All respondents who used on-roads or off-road cycle lanes were asked about their cycling habits.

Amongst users, 64% of cycle lane users cycle for recreation, 9% cycle for commuting, while 28% cycle for both. With regards to frequency of cycling, 33% of cycle lane users cycle less often than monthly, 28% cycle monthly, and 27% cycle weekly. Only 12% of cycle lane users cycle most days during the week.

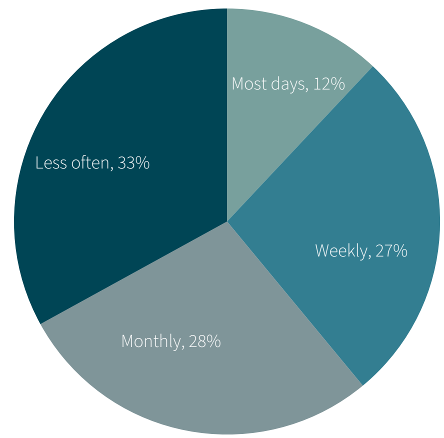
Not surprisingly there is a relationship between frequency of cycling and the type of cycling that is undertaken. Recreational riders are more likely to cycle less frequently (42% cycle less than monthly), while those who cycle for commuting purposes cycle more frequently (44% cycle most days).

Results for cycling type and cycling frequency for each district are included in the appendix.

Type of Cycling



Frequency of Cycling



Type by Frequency

	TOTAL	Recreational riding	Commuting	Both
Most days	12%	3%	44%	22%
Weekly	27%	23%	41%	33%
Monthly	28%	32%	11%	25%
Less often	33%	42%	4%	20%

Green shading indicates a subgroup's result is significantly higher than other subgroup's results.
Orange shading indicates a subgroup's result is significantly lower than other subgroup's results.

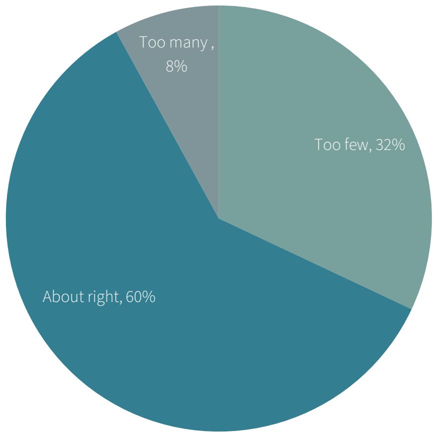
CYCLING LANES PERCEPTIONS

All respondents were asked about their views on the number of cycling lanes in the district and their support for cycle lanes.

At an overall level, 60% of respondents think the number of cycle lanes in their district is about right, 32% think there are too few, and 8% think there are too many. There are no significant differences across the responses for each district.

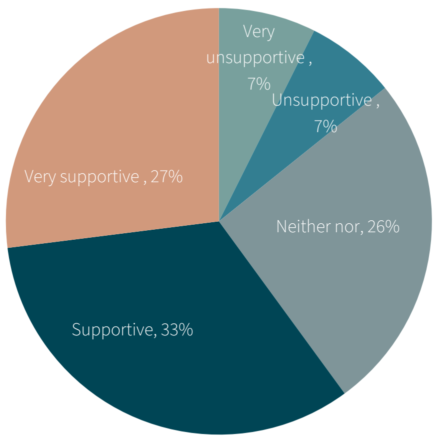
With regards to support for cycle lanes, 60% of respondents are either supportive or very supportive of having cycle lanes in their district, while 14% are either unsupportive or very unsupportive. Twenty six percent of respondents feel neutral about the cycle lances in their area. There are no significant differences across the responses for each district.

Number of Cycling Lanes



District	Total about right
Thames-Coromandel	53%
Hauraki	66%
Waikato	58%
Matamata-Piako	61%
Hamilton	62%
Waipā	58%
Ōtorohanga	56%
South Waikato	55%
Taupō	64%

Support for Cycle Lanes



District	Total support
Thames-Coromandel	59%
Hauraki	60%
Waikato	58%
Matamata-Piako	58%
Hamilton	59%
Waipā	65%
Ōtorohanga	65%
South Waikato	59%
Taupō	65%

PUBLIC TRANSPORT: USE AND SATISFACTION

PUBLIC TRANSPORT

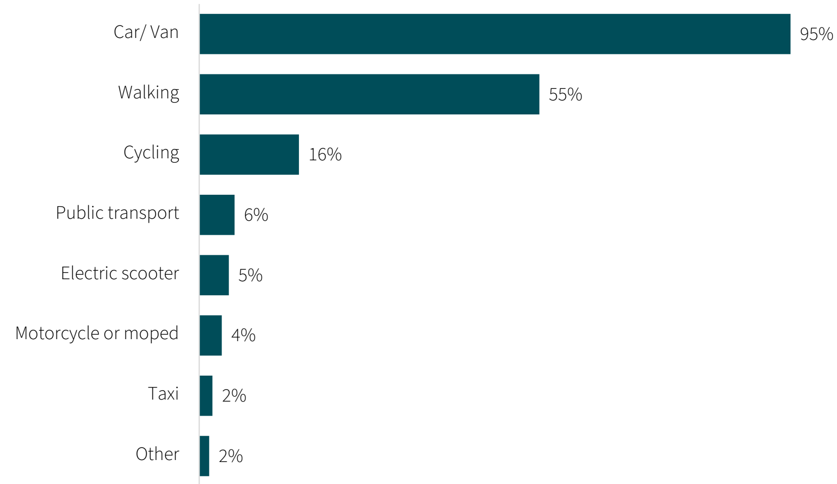
Respondents were asked to identify the modes of transport they use regularly and also their main mode of transport.

Cars (95%), walking (55%), and cycling (16%) are the most common forms of transport. These results are similar across all districts with no significant differences noted between the districts.

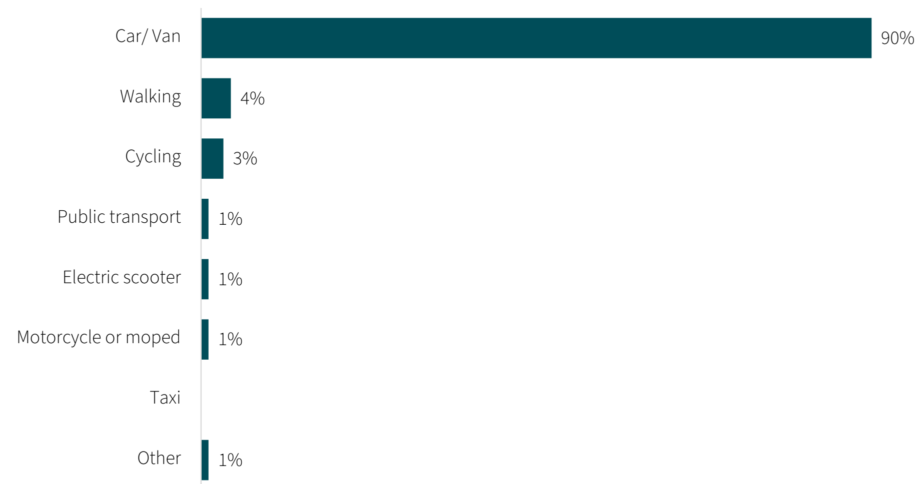
The primary transport mode respondents use is the car (90%), with only a few respondents noting other forms of transport. Respondents from Hamilton City are significantly more likely to say cycling is their primary mode of transport (5%) and are less likely to use a car (85%).

Results for transport use for each district are included in the appendix.

Type of Transport Used



Main Mode of Transport



PUBLIC TRANSPORT

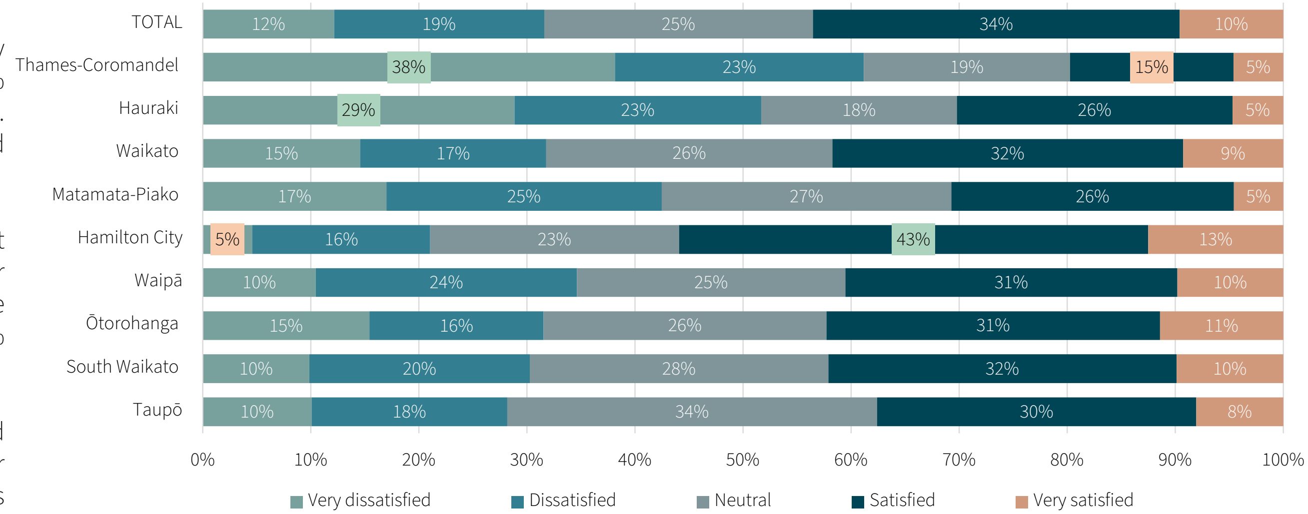
The chart to the right show the levels of satisfaction with the public transport in their district.

Overall, 44% of respondents are either satisfied or very satisfied with the public transport in their district, while 31% of respondents are either dissatisfied or very dissatisfied. Twenty five percent of respondents are neither satisfied nor dissatisfied.

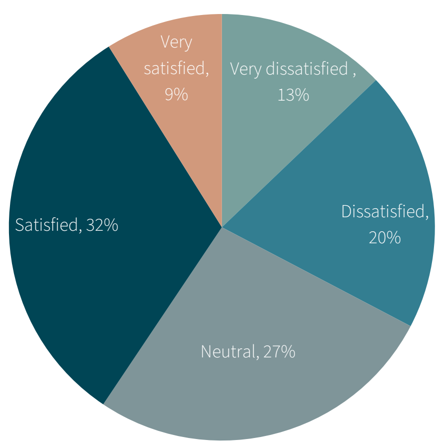
Satisfaction with public transport is highest amongst respondents in Hamilton City (56% are either satisfied or very satisfied) and lowest amongst respondents from the Thames-Coromandel and Hauraki districts (61% and 52% are dissatisfied respectively).

When satisfaction with public transport is compared between users and non-users, users have higher satisfaction levels (69%) than non-users (42%). Non-users also have a higher level of dissatisfaction (33%) than users (18%).

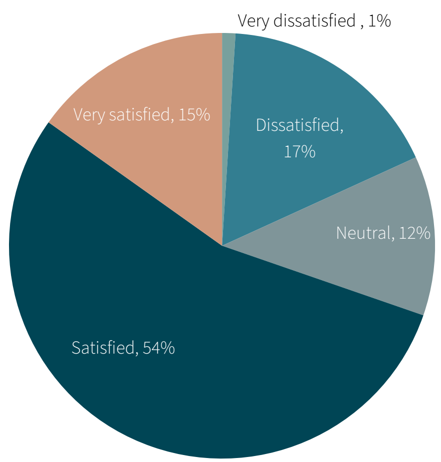
Satisfaction with Public Transport



Non-User Satisfaction



User Satisfaction



Green shading indicates a district's result is significantly higher than other districts' results.
Orange shading indicates a district's result is significantly lower than other districts' results.

APPENDIX

RESPONDENT PROFILE

Age by District Unweighted

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Under 34	16%	2%	11%	44%	14%	25%	16%	11%	11%	7%
35 - 64	49%	49%	36%	46%	50%	65%	63%	32%	53%	41%
65+	35%	49%	54%	10%	36%	10%	21%	56%	36%	52%

Gender by District Unweighted

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Male	33%	29%	34%	26%	25%	38%	23%	50%	36%	34%
Female	67%	70%	65%	73%	75%	60%	77%	50%	64%	65%
Gender Diverse	0%	0%	1%	1%	0%	1%	0%	0%	0%	1%
Prefer not to say	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%

Green shading indicates a district's result is significantly higher than other districts' results.
Orange shading indicates a district's result is significantly lower than other districts' results.

RESPONDENT PROFILE

Location by District Unweighted

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Urban	56%	48%	46%	42%	52%	87%	60%	32%	60%	75%
Rural	24%	24%	28%	27%	28%	6%	18%	53%	26%	8%
Semi-rural	20%	28%	26%	30%	20%	7%	21%	15%	14%	17%
Prefer not to answer	0%	1%	0%	1%	0%	1%	1%	0%	1%	0%

Method by District Unweighted

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Online	81%	99%	63%	83%	99%	99%	99%	19%	74%	90%
Telephone	19%	1%	37%	17%	1%	1%	1%	81%	26%	10%

Green shading indicates a district's result is significantly higher than other districts' results.
Orange shading indicates a district's result is significantly lower than other districts' results.

OFF-ROAD CYCLING LANES BY DISTRICT

Off-Road Cycle Lane Use

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Yes	20%	16%	15%	13%	12%	23%	27%	11%	7%	23%
No	80%	84%	85%	87%	88%	77%	73%	89%	93%	77%

Off-Road Cycle Lane Satisfaction

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Very dissatisfied	3%	8%	5%	5%	0%	3%	0%	6%	0%	3%
Dissatisfied	8%	17%	14%	5%	0%	9%	10%	6%	27%	3%
Neutral	10%	8%	18%	5%	26%	11%	5%	0%	0%	6%
Satisfied	52%	46%	55%	60%	53%	51%	48%	50%	55%	62%
Very satisfied	27%	21%	9%	25%	21%	26%	38%	38%	18%	26%

Green shading indicates a district's result is significantly higher than other districts' results.
Orange shading indicates a district's result is significantly lower than other districts' results.

OFF-ROAD CYCLING LANES BY DISTRICT

Off-Road Cycle Lane Improvements

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Increase number of off-road cycle lanes	49%	50%	23%	22%	26%	53%	57%	44%	36%	61%
Wider tracks	36%	29%	32%	56%	11%	41%	26%	6%	9%	45%
Smoother tracks/ less bumpy tracks	24%	33%	45%	33%	11%	24%	17%	6%	36%	27%
Less debris on the tracks	20%	21%	14%	28%	42%	21%	17%	0%	18%	9%
Better lighting	20%	8%	0%	17%	11%	29%	14%	0%	9%	15%
Greater support facilities (drinking stations, rest areas)	18%	17%	14%	39%	16%	12%	36%	6%	18%	6%
Greater directional signage	12%	8%	0%	17%	21%	12%	14%	0%	0%	9%
Clearer signage	11%	21%	14%	22%	11%	9%	5%	6%	9%	15%
More car parking facilities at track ends	10%	17%	9%	22%	11%	6%	19%	6%	18%	0%
More measures to reduce pedestrians on cycle tracks	9%	13%	5%	28%	5%	9%	7%	0%	0%	6%
More charging stations for e-bikes	2%	4%	0%	0%	0%	3%	2%	0%	0%	0%

ON-ROAD CYCLING LANES BY DISTRICT

On-Road Cycle Lane Use

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Yes	18%	11%	8%	10%	6%	26%	18%	5%	5%	21%
No	82%	89%	92%	90%	94%	74%	82%	95%	95%	79%

On-Road Cycle Lane Satisfaction

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Very dissatisfied	3%	19%	8%	7%	0%	3%	0%	38%	13%	0%
Dissatisfied	18%	31%	25%	13%	11%	18%	18%	0%	25%	22%
Neutral	23%	25%	17%	13%	33%	28%	14%	0%	13%	19%
Satisfied	47%	13%	42%	53%	56%	48%	50%	50%	25%	50%
Very satisfied	8%	13%	8%	13%	0%	5%	18%	13%	25%	9%

Green shading indicates a district's result is significantly higher than other districts' results.
Orange shading indicates a district's result is significantly lower than other districts' results.

ON-ROAD CYCLING LANES BY DISTRICT

On-Road Cycle Lane Improvements

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Increase the number of cycle lanes	36%	31%	58%	21%	22%	38%	36%	38%	25%	34%
Buffer zones between cars and cycle lanes	34%	25%	8%	50%	44%	33%	43%	25%	13%	28%
Wider lanes	25%	38%	17%	36%	33%	21%	39%	38%	0%	25%
Less debris on the cycle-lanes	25%	19%	0%	21%	33%	31%	14%	0%	13%	19%
More physical barriers to separate cycle lanes	23%	13%	8%	29%	33%	21%	25%	0%	13%	34%
More direct lanes through town	23%	19%	8%	21%	22%	23%	29%	0%	13%	22%
Greater signage for cycle lanes	19%	19%	0%	21%	22%	21%	18%	0%	25%	19%
Clearer on-road markings	16%	31%	8%	14%	11%	13%	18%	0%	50%	19%
Better lighting	14%	19%	0%	7%	11%	15%	11%	0%	0%	16%
More bike parking facilities	12%	13%	8%	14%	33%	10%	11%	0%	13%	19%
More traffic calming measures to slow cars down, e g , speed bumps	12%	31%	8%	14%	0%	10%	11%	0%	13%	16%
Lower speed zones where cycle lanes are	11%	25%	8%	14%	0%	13%	11%	0%	13%	3%
More care free zones	8%	19%	0%	7%	0%	10%	7%	0%	0%	0%
More charging facilities for bikes	5%	6%	8%	0%	0%	8%	0%	13%	0%	0%

CYCLING HABITS BY DISTRICT

Type of Cycling

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Recreation	64%	78%	83%	76%	73%	54%	63%	70%	71%	76%
Commuting	9%	0%	0%	12%	5%	11%	11%	10%	7%	2%
Both	28%	22%	17%	12%	23%	35%	26%	20%	21%	22%

Frequency of Cycling

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Most days	12%	16%	0%	8%	14%	17%	2%	19%	0%	7%
Weekly	27%	31%	17%	24%	23%	20%	39%	33%	50%	44%
Monthly	28%	19%	46%	32%	36%	24%	37%	10%	14%	32%
Less often	33%	34%	38%	36%	27%	39%	22%	38%	36%	17%

PUBLIC TRANSPORT BY DISTRICT

Type of Transport Used

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Car/ Van	95%	99%	96%	96%	99%	91%	99%	95%	96%	97%
Walking	55%	65%	52%	44%	56%	55%	61%	26%	43%	61%
Cycling	16%	19%	12%	11%	11%	16%	22%	5%	8%	25%
Public transport	6%	0%	1%	7%	2%	10%	5%	1%	3%	1%
Electric scooter	5%	3%	3%	3%	3%	9%	3%	3%	1%	1%
Motorcycle or moped	4%	6%	6%	4%	3%	4%	2%	5%	2%	3%
Taxi	2%	1%	0%	4%	0%	3%	1%	1%	1%	3%
Other	2%	0%	2%	0%	2%	2%	2%	2%	4%	1%

Main Mode of Transport

	TOTAL	Thames-Coromandel	Hauraki	Waikato	Matamata-Piako	Hamilton City	Waipā	Ōtorohanga	South Waikato	Taupō
Car/ Van	90%	93%	91%	95%	95%	85%	95%	91%	93%	88%
Walking	4%	6%	7%	0%	3%	3%	4%	5%	3%	6%
Cycling	3%	0%	0%	1%	1%	5%	1%	1%	1%	3%
Public transport	1%	0%	0%	1%	0%	2%	0%	0%	0%	0%
Electric scooter	1%	1%	1%	1%	1%	1%	0%	3%	0%	1%
Motorcycle or moped	1%	0%	0%	1%	0%	1%	1%	0%	1%	1%
Other	1%	0%	1%	0%	1%	1%	0%	1%	2%	1%

Green shading indicates a district's result is significantly higher than other districts' results.
Orange shading indicates a district's result is significantly lower than other districts' results.

WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

ŌTOROHANGA TOWN CONCEPT PLAN

SUMMARY DOCUMENT

REVISION A | OCTOBER 2022

PREPARED BY

RESILIOSTUDIO wsp

PREPARED FOR

Ōtorohanga District Council

WEAVING THE FUTURE, TOGETHER

KOTAHITANGA

Ōtorohanga
District Council
Where kiwi can fly

WHAKATAUKI

Extract from Ko te Torohanga o ngā Ringa - na Tom Roa, Taarewanga Marae, Ōtorohanga

Ōtorohanga

[the place] of stretching [the hands] in greeting [with the provision of food/resources]

E ai ki ngā kōrero, he whenua mōmona, he takiwā makuru tēnei wāhanga o te riu o Wapiā, he wāhi manaaki i te tangata. Nō reira ia i tapaia ai ki te ingoa O-torohanga, ko te torohanga o ngā ringa tērā, hei tauawhi i ngā iwi ka pā mai ki roto i a ia.

Heoi anō, kei ngā tuhinga a Reed tētehi kōrero anō. Ki tāna, hoki atu ana tētehi tohunga o Ngāti Tūwharetoa ki tōna kāinga, ki Taupō, ka tū ki tēnei wāhi. I te āhua matekai ia, ēngari kua tata te pau o āna 'ō', arā, āna kai. Ka karakia, ā, ka 'torona' āna kai ki tana karakia, ka mākona, ka haere anō.

He wāhi kōrero tuatoru mai i te kaumātua o Ngāti Koroki-Kahukura, i a Te Kāpō Tūwhakaaea. Ko tāna kōrero, ko ia nei te wāhi i tū ai a Tāwhao ki te tohutohu i āna tama e rua i a Tūrongo rāua ko Whatihua me te toro atu i ōna ringa - ki kō ko Whatihua me āna uri (ki te raki, ki tai), ki kō ko Tūrongo me āna (ki te tonga, ki uta).

Ko wai ka hua, ko wai ka tohu. Heoi anō mā te kaipānui hei whakaaro mai ko tēwhea o ēnei kōrero te mea tika!!

Nohoia ai te wāhi nei e ngā uri o te waka nei o Tainui, heoi anō e ngā hapū huhua o Ngāti Maniapoto.

The fertile valley of this part of the Waipā, Ōtorohanga, was first inhabited by a branch of the Tainui people who later became known as Ngāti Maniapoto.

Taarewanga elders say that it was given this name because it is such a welcoming place - as if its 'hands' are stretched out in greeting ('te torohanga o ngā ringa - ō torohanga').

Another story asserts that a certain tohunga from Ngāti Tūwharetoa returning home to Taupō, through prayer, stretched (torohanga) his provisions (ō) here.

Yet a third states that it was here that the Tainui Ariki Tāwhao indicated by stretching out his hands (ō torohanga) that one son Turongo and his descendants would inhabit the inland and southern areas, and his other son Whātihua with his descendants, the seaward and northern areas.

Extract from Ko te Torohanga o ngā Ringa - nā Tom Roa, Taarewanga Marae, Ōtorohanga

MESSAGE FROM THE MAYOR AND COMMUNITY BOARD CHAIR

Tēnā koutou katoa - Greetings

Ōtorohanga District is growing and our community has told us they want to see more vibrancy and investment, to make the district an even better place to live, work and play.

We need to plan for this growth and invest in the future, ensuring our community has access to good quality facilities and that our public spaces are more attractive and functional. Planning for the future means understanding the past and present. Our heritage is unique, and we want to acknowledge and celebrate that - now and into the future. We also want to acknowledge that, while Ōtorohanga has generally prospered through development, some historical decisions have had a detrimental impact on mana whenua, resulting in loss of whenua (land) and displacement of hapū (families).

As part of the 2021-2031 Long Term Plan, Council committed to working with our communities, and partnering with mana whenua, to develop three concept plans (blueprints for the future). These will cover the entire Ōtorohanga district – Ōtorohanga urban, Kāwhia township, and our rural areas. We have started with the Ōtorohanga Town Concept plan and will move on to the Kāwhia and Rural Areas plans early in 2023.

The draft Ōtorohanga Town Concept Plan presented for public feedback in July 2022 reflected the ideas and views we'd heard from our community during the course of the plan's development. We've been pleased with the engagement from residents, business owners, community groups and other stakeholders throughout the project. We're particularly grateful for the support and input from our mana whenua partners.

The feedback we received on the draft Plan reflected deeper consideration of the concepts, opportunities and proposed actions. The submissions received have been given full consideration, and the Town Concept Plan has been amended having regard to the feedback.
This plan signals a bold direction for the future development of our town, and an action plan to keep us on course. This is a community plan, so Council, residents, businesses, groups, partners and other stakeholders all need to do their bit to bring the Plan to life.
Some of the key actions set out a pathway, meaning more analysis, assessment, investigation and community discussion is required. Some of the likely changes are significant, so we want to make sure these are right for the future of our community. We look forward to continuing engagement with local residents, business and property owners, community groups, mana whenua partners and other stakeholders.
Thank you to everyone who has contributed to this Plan and engaged in its development. It's a better Plan because of your input.
Together we can make Ōtorohanga THE place to live, work and play.

Ngā mihi/Thank you

Max Baxter
Mayor, Ōtorohanga District

Neville Gadd
Chair, Ōtorohanga Community Board

VISION

"Ōtorohanga – Te torohanga o ngā ringa"
"[the place] of stretching [the hands] in greeting
[with the provision of food/resources]"

In keeping with our whakatauki "Te torohanga o ngā ringa", Ōtorohanga 2050 embraces the spirit of welcome, hospitality and prosperity for all residents and visitors. It aspires to collective vibrance and colour, and combines the wealth of our natural surroundings with an enticing and cheerfully bustling town centre, and a carefully considered built environment.

Ōtorohanga 2050 aims to build on all that the town already offers with a cohesive town plan that celebrates our rich history of ancestors and settlement, to a present day and future landscape of restored pristine environment, of farming, trading, local growers, shops and cafes, and industry.

Ōtorohanga is the regions compass star where people want to live, where travellers and tourists enjoy our overnight hospitality, stop-over for a meal, visit the renown Kiwi House, gaze at the magnificent Māori carvings, delight upon the beautiful floral baskets, visit the historic Huipūtea Reserve, and for the kids – visit the very cool Jim Barker park. Ōtorohanga is a tourist destination and gateway to a myriad of other destinations in Te Rohe Pōtae.

"Te Torohanga o ngā ringa" – Ōtorohanga Town embodies the spirit of welcome, hospitality and prosperity – Nau mai, haere mai!

1. OVERVIEW / TIROHANGA WHĀNUI

INTRODUCTION

This 'lean' version of the Ōtorohanga Town Concept Plan (ŌTCP) is organised into 4 sections.

1. This section provides an overview of the project including background, project purpose, and core projet principles.
2. Presents a summary of the key findings of the technical investigations that underpin the ŌTCP.
3. Provides an overview of the engagement and consultation undertaken in developing the ŌTCP.
4. Presents the Development Strategy, the Town Centre Framework Plan and the ŌTCP Action Plan which identifies individual projects and actions in support of the outcomes sought in the ŌTCP.

BACKGROUND

The ŌTCP project came out of Council's Long Term Plan (LTP) process and the early community engagement (Ōtorohanga 2050). Councils are required to adopt and maintain the LTP covering a 10-year period. The current LTP for the Ōtorohanga District Council extends to 2031 and will be reviewed and updated through the required 3-yearly review cycle, with the next review in 2023/24, following local government elections in October 2022.

The 'town concept plan' is one of the strategic spatial planning approaches identified in the Waikato Regional Council strategies aimed at setting a 30-year strategy for a town, village, a place and its communities. The council's infrastructure planning also requires a 30-year view (currently to 2051).

The district is experiencing a period of strong growth. This growth needs to be planned for through an enabling legislative and infrastructure investment framework, so that this growth can be managed sustainably by:

- Enabling residential development in a compact, planned, walkable urban form providing more housing choices including affordable housing opportunities;
- Supporting current and new businesses to establish giving a greater choice of employment opportunities; and
- Providing resilient infrastructure that supports the sustainable development of Ōtorohanga.

In planning for development and revitalisation, the Council is positioning itself to be an enabler of change rather than a 'change leader'. The transformation for Ōtorohanga will come through a high-trust collaborative and partnered model, whereby 'change-partners' will work with the community to realise key outcomes identified in the ŌTCP.

1.1 | STATUTORY CONTEXT / HOROPAKI Ā-TURE

Living Document

The ŌTCP has a 30-year planning horizon to allow the land-use changes to evolve in a staged and considered manner.

This concept plan will be monitored, reviewed, and updated as required to ensure it remains current and continues to provide community and decision-makers with the information required to make informed decisions.

The relationship and integration of this concept plan with other planning processes is described in the diagram to the right. It shows contributing inputs resulting from this concept plan process. Inputs include processes such as the spatial plans followed by neighbourhood masterplans at block or village scales.

The outputs include the future district plan review or staged plan changes which enable outcomes identified through the ŌTCP. It shows the alignment and close relationship with infrastructure planning and delivery to advance the key upgrades required to enable the outcomes identified in this plan.

Exclusions and Assumptions

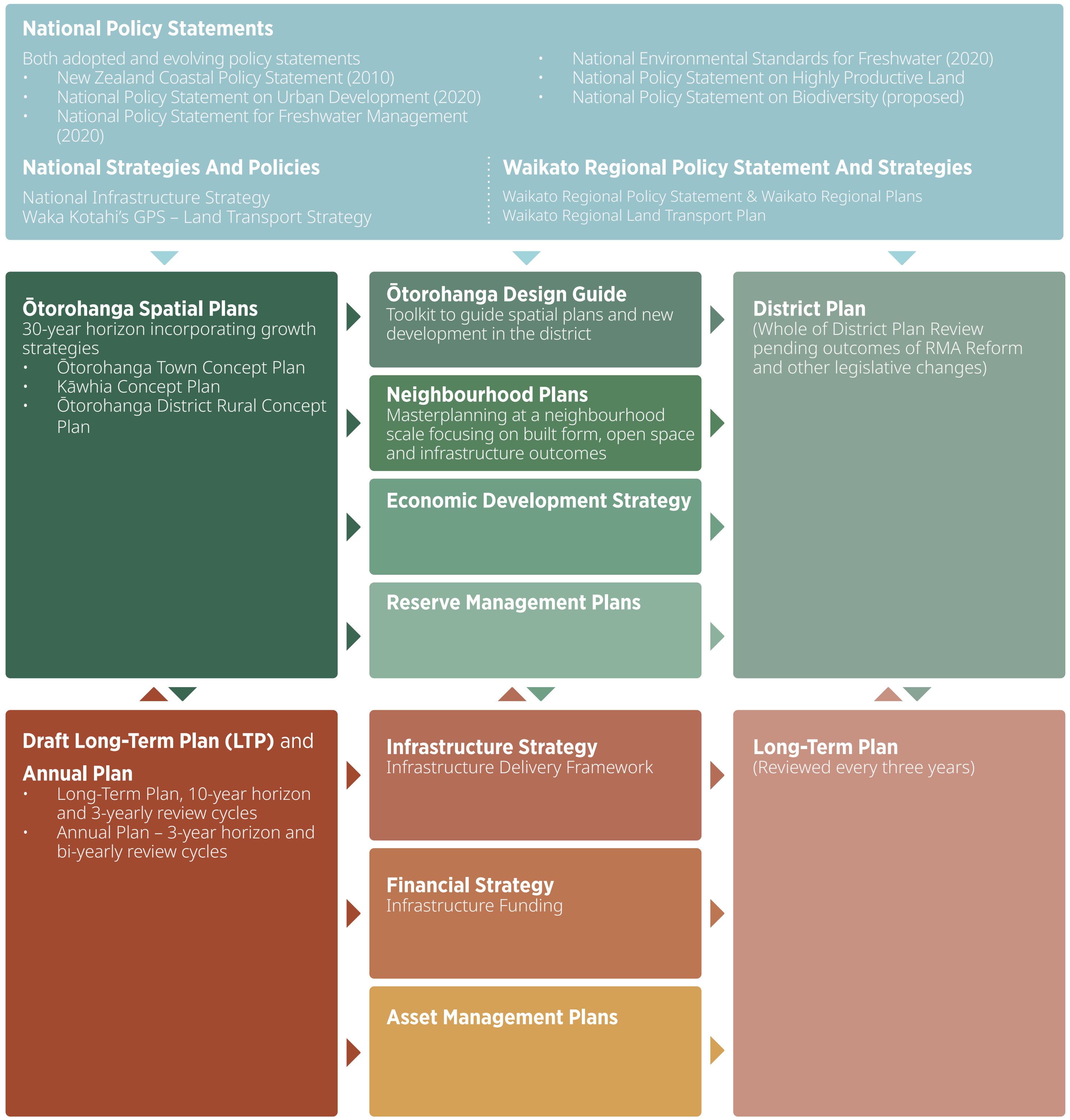
The ŌTCP has been prepared based on information, studies and data available at the time the work was undertaken. New information, research, and legislative requirements will continuously emerge, and these need to be considered in future decision-making processes and these need to be considered in future ŌTCP reviews and other decision-making processes.

Alignment with National Policy Framework

Ensure for development in Ōtorohanga is consistent with the 'national policy framework', with particular regard to:

- Enabling compact walkable urban form integrated with multi-mode transport infrastructure and supported by resilient 3-waters infrastructure.
- Avoiding inappropriate land-use and development on highly productive land and securing this resource for rural production.
- Protecting and enhancing the natural environment - freshwater, biodiversity, and air quality.

Relationship of ŌTCP to other council work streams and processes



1.2 | PROCESS / TUKANGA

The ŌTCP project methodology consisted of five phases over a 32 week period. The project followed a landscape planning and community focused approach involving a comprehensive engagement process with the Ōtorohanga community and stakeholders, in conjunction with the Council, the Ōtorohanga Community Board and in partnership with mana whenua.

Phase 1

Project Initiation / Establishment

February 2022

Ensure that clients, project partners including Ngāti Maniapoto Trust Board and community advisory group, key stakeholders such as Ōtorohanga Community Organisations, Ōtorohanga District Council Departments and Crown Agencies are aware of the project and are ready to engage.

Refine and confirm project brief and programme including key milestones, deliverables, roles and responsibilities.

Phase 2a

Early Engagement

March - May 2022

Listen and learn from the people who live, work, learn and play in Ōtorohanga to develop our understanding of needs and aspirations of the community and to develop insights into the constraints, challenges and opportunities that will help to drive and shape the ŌTCP.

Phase 2b

Investigation

March - May 2022

Gather, collate, interpret and synthesize environmental, societal, cultural, economic and infrastructure information across three scales - Waikato Region, Ōtorohanga Ward and Ōtorohanga Town Centre including community facilities and town entrances.

Phase 3

Draft Ōtorohanga Town Plan

April - July 2022

Utilising information and insights gathered through the previous phases to develop a draft strategy for growth of Ōtorohanga Ward and a framework for Ōtorohanga Town Centre, main street and entrances, including preferred outcomes and/or options as required.

Continue to engage and work with project partners, key stakeholders and the wider Ōtorohanga community. Develop an action plan that identifies and prioritizes short, medium and long term projects and initiatives.

Phase 4

Draft Ōtorohanga Town Plan

July - August 2022

Consult Key Stakeholders and Ōtorohanga community to ensure that their concerns and aspirations have been understood and considered and where appropriate reflected in the draft ŌTCP document.

Inform the wider Waikato community about the ŌTCP project.

Phase 5

Final Ōtorohanga Town Plan

September 2022

Submit the updated Ōtorohanga Town Concept Plan for review by elected members.

Update Ōtorohanga Town Concept Plan in response to any feedback Ōtorohanga District Council deem necessary before adoption.

Final Ōtorohanga Town Concept Plan is adopted by Ōtorohanga District Council.

Phase 6

Implementation

October 2022 onwards

Progressing the Action Plan

Work with the community/ stakeholders to deliver the 'early win' projects, as signalled in the action plans Commence the process required to deliver the key projects – undertake the analysis, assessment, investigation, scoping, stakeholder discussion and community engagement necessary prior to final proposals being signalled through proposed changes to reserve management plans, long term terms, district plans or other statutory documents. Monitor the implementation of the Ōtorohanga Town Concept Plan, and conduct reviews every 5-6 years to ensure the plan stays relevant and appropriate resourcing levels are maintained.

1.3 | PROJECT OBJECTIVES AND GUIDING PRINCIPLES / NGĀ WHĀINGA O TE KAUPAPA

Project Objectives

Environmental Health
Protect and enhance the natural environment so that it can sustainably support a healthy community life, such as air quality, clean fresh water, habitat for wildlife, uncontaminated land, control of pollution, and the reduction of carbon emissions.

Cultural Foundations
Work with Ōtorohanga's Mana Whenua Nehenehenui to promote and embrace the shared beliefs, values, customs, visual and performing arts, ceremonies and heritage that make up and enrich our communities, promote diversity and inclusivity, and revitalise our heritage through mātauranga Māori and tikanga - traditions.

Social Wellbeing
Support and enable healthy, safe and connected communities with access to education, health care, strong community networks, inclusiveness, pride of place, financial and personal security, equity of opportunity, rights and freedoms.

Economic Prosperity
Support and facilitate a sustainable economy that can provide local employment, prosperity, health, financial security, a skilled and resilient workforce, and equity of opportunity.

Sustainable and Resilient Land-use
Develop a sustainable approach to land use change providing for resilient land-use and infrastructure integration so that land-use activities, infrastructure, and community support are brought together at the right time, in the right sequence, and aligned to help move Ōtorohanga toward a 'critical mass' of residents and workers supporting an active local economy necessary to sustain a vibrant and thriving live work play learn community.

Design Principles

Design principles help to guide the future development of Ōtorohanga. The principles ensure best practice is followed, that there is a consistent approach to the development of Ōtoroghanga across a range of Council teams and departments and delivery partners and to provide guidance on what is essential to ensure project objectives are met. The design principles are organised into four themes, each reflecting a different dimension of the ŌTCP.

1. Te Aranga Design Principles

The key objective of Te Aranga Māori Design values and principles is to enhance the protection, reinstatement, development and articulation of Mana Whenua cultural landscapes and to enable all of us (Mana Whenua, matāwaka, tauiwi and manuhiri) to connect with and to deepen our collective appreciation of 'sense of place'.

- Mana Rāngatiratanga / *Authority*
- Whakapapa / *Names + Naming*
- Tohu / *The Natural Environment*
- Taiao / *Environmental Health*
- Mauri Tū / *Creative Expression*
- Mahi Toi / *The Wider Cultural Landscape*
- Ahi Kā / *The Living Presence*

2. Spatial Planning Principles

The following spatial planning principles have directed the way in which this town concept plan aligns with the objectives of the National Policy Statements and planning first-principles for establishing frameworks for sustainable quality urban growth supported by resilient sustainable infrastructure.

- Public Participatory Framework
- Highly Productive Land
- Freshwater and Indigenous Biodiversity
- Climate Change and Natural Hazards
- Rural Environments
- Urban Development and Growth

3. Landscape Planning Principles

The application of the landscape planning principles identifies the features critical to ensuring Ōtorohanga's natural environment is healthy and regenerative in perpetuity. These landscape features include overland flow paths, floodplains, wetlands, steep and erodible slopes, existing areas of vegetation, and highly fertile soils as well as sites of cultural significance and primary ridgeline systems.

- Design with Natural Systems
- Design with Water Catchments
- Respond to Existing Landscape Character
- Design for Climate Change

4. Community Design Principles

The community design principles guide the development of urban environments, ensuring that they reflect the scale, uses and needs of a vibrant, pedestrian friendly human scale urban form.

- Kaitiakitanga / Stewardship
- Engagement
- Diversity
- Integration of Uses
- Connectivity
- Safety
- Revitalisation
- Feasibility + Viability
- Live, Work, Play, Learn, Environments
- Legibility
- Accessibility
- Resilience + Adaptation
- Celebration
- Treasured

1.4 | WHO'S INVOLVED / NGĀ KAIURU?

The engagement strategy utilised the International Association for Public Participation spectrum of engagement to structure engagement with public sector, private sector and civil society, including indigenous communities as project and treaty partners to ensure that everyone involved in or impacted by the project is engaged authentically.

This diagram demonstrates the nested scales of influence and impact as well as degrees of participation.

Degrees of Participation

Decreasing participation

Inform - General Public
Provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.

Consult - Stakeholders
Obtain public feedback on analysis, alternatives and/ or decisions

Involve - Key Stakeholders
Work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered

Collaborate - Project Partner
Partner in each aspect of the process including the development of alternatives and the identification of the preferred solutions.

Empower - Project Team
Final decision making in the hands of this group.

Increasing participation

2. INVESTIGATIONS / RANGAHAU

This section captures and presents a summary of the key findings and insights gained through the investigation phase of the ŌTCP project.

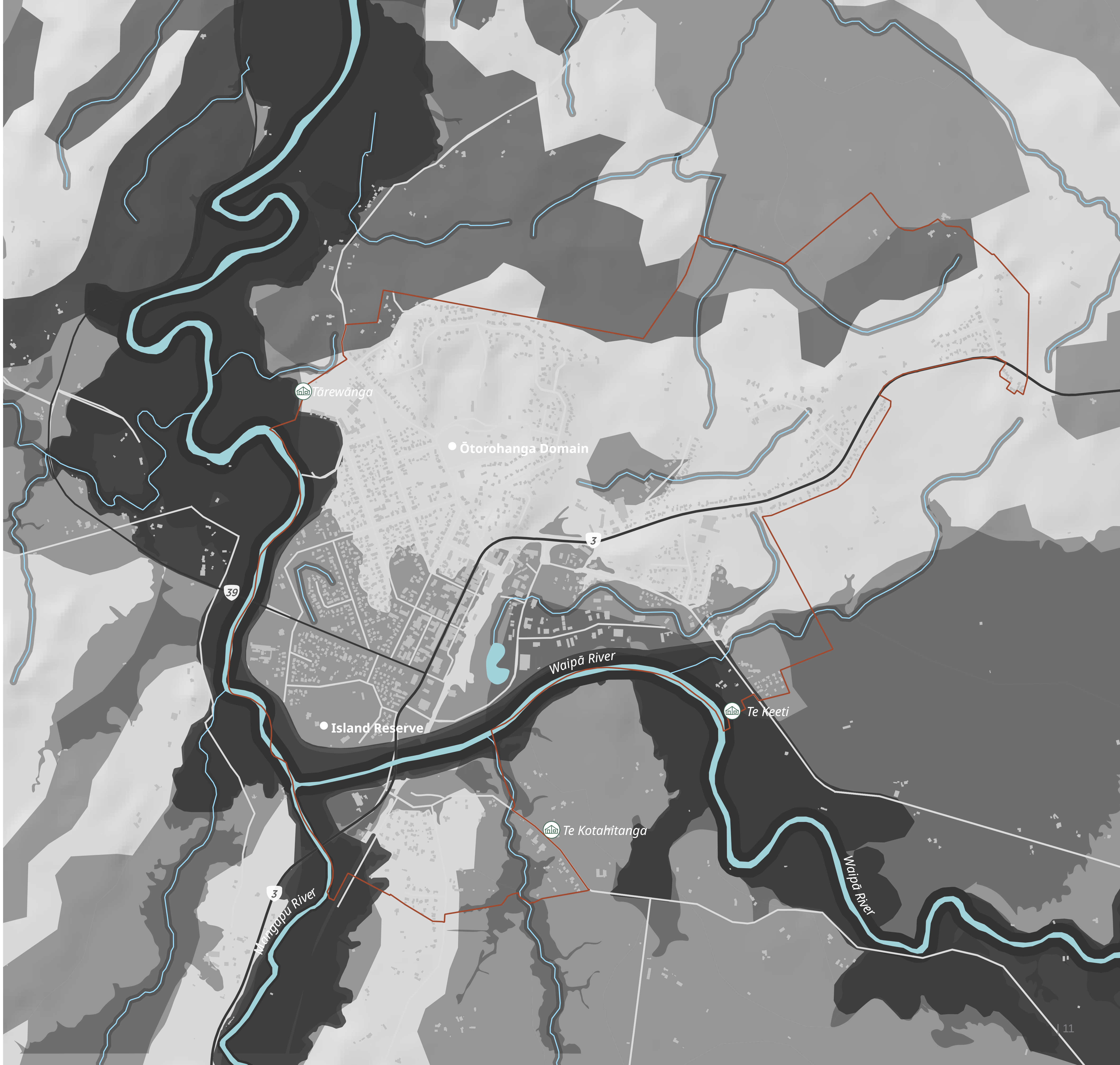
The purpose of the investigation phase was to learn and document as much relevant knowledge as possible about Ōtorohanga in order to help provide a rich picture and shared understanding of the historic and current states of the settlement for those involved in the ongoing implementation of the ŌTCP. It involved gathering knowledge from a range of sources including primary sources such as field research, direct observation, co-design workshops, interviews and focus groups, as well as secondary sources such as existing datasets, technical reports, literature reviews, and archives. The investigations are organised into the themes natural environment, people, existing land uses and facilities, built environment and infrastructure, transport and circulation and economic assessment.

Summary Document

Development Potential

This map summarises the biophysical constraints and opportunities of the Ōtorohanga Ward and surrounding landscape identified through the investigation phase.

It is a combination of the underlying landform, waterways and their associated riparian corridors, existing areas of vegetation, the productive potential of soils, steep and erodible slopes, overland flow paths, and areas affected by flooding - the lighter the area the more suitable the land is for development. This map forms the environmental basis for the Ōtorohanga development strategy.



KEY

- Waipā River
- State Highway 3
- Road
- Ward Boundary
- Building Footprint

DEVELOPMENT POTENTIAL

- Less Suitable for development
- More Suitable for development

Scale: 1_15 000 @A3

0 0.1 0.5 1KM

Ecological Network

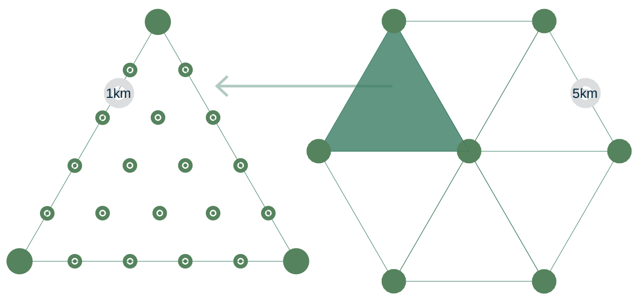
This map presents a potential ecological network for Ōtorohanga to restore the ecological function of the streams, improve landscape connectivity and protect and enhance biodiversity. If implemented, the ecological network will help to ensure the long term environmental sustainability of Ōtorohanga. It is composed of ecological corridors along streams and roads to link areas of ecological significance and between green spaces and patches of dense, multilayered forest large enough to support a range of habitats for native wildlife.

KEY

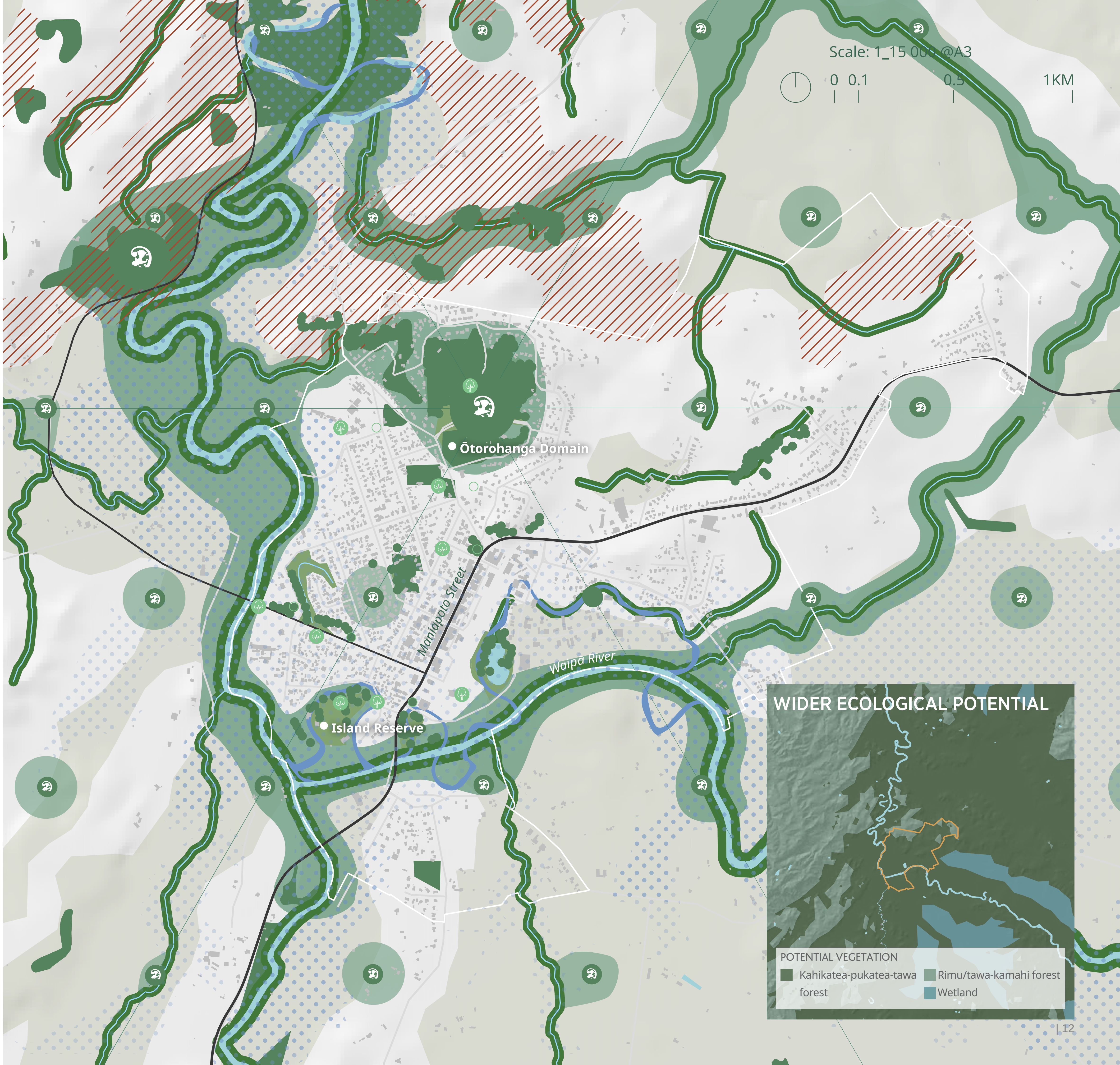
- Waipā River 1944
- Waipā River at present
- Overland Flowpath
- 1:10 year flood plain
- 1:100 year flood plain
- Riparian Corridor
- Steep slope (21-35)
- Existing Vegetation
- Notable Tree
- Open Space
- LUC 1, 2 & 3
- Potential Green Belt

FOREST PATCHES

- Primary Forest Patch (6.25 ha)
- Secondary Forest Patch (1.6 ha)



Establish a matrix of forest patches of 6.25ha areas for core sanctuaries 5km apart; 1.6ha areas for stepping stones 1km apart; and 0.01ha areas for stepping stone and feeding stations approximately 0.2km apart to ensure the generalised dispersal of seeds and pollen by birds and wind.



Transport and Movement

Transport and movement were consistently raised through the engagement and consultation process. The two main themes were vehicle and roading and walking and cycling.

Vehicle and Roading - Key themes included the volume and speed of heavy vehicles, Huiputēa Drive bypass, vehicle speeds, the safety and function of three key intersections and parking. Some interest in rail and for public transport and taxis were also expressed. Ōtorohanga is presently dependent on the road network to provide both local and inter-regional connections to access employment (including freight access), education, retail and services, social, and recreational activities. Comparatively, alternative modes of transport are not frequent or well-connected enough to be attractive.

Walking and Cycling - Feedback emphasised upgrading existing facilities to create an integrated network of safe and accessible paths for a range of transport modes including walking, cycling, micro mobility, mobility scooters and wheelchairs.

KEY

TRAFFIC AND ROADING

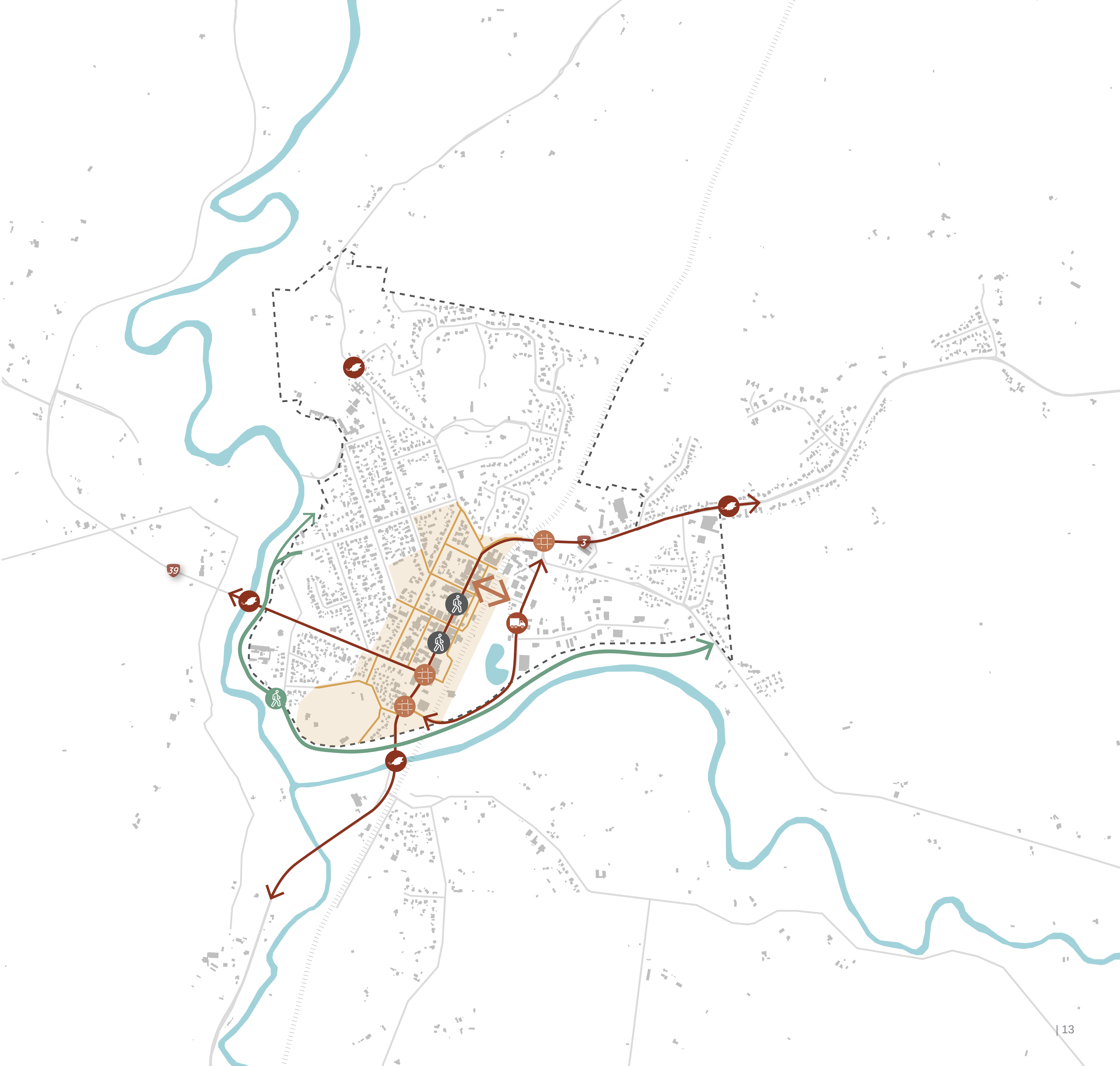
- Railway
- Bypass
- Vehicle speeding through town
- Key intersections
- Concerns about parking
- Potential Town Gateways

WALKING & CYCLING

- Existing pedestrian crossing
- Stopbank walkway
- Poor East-West connectivity

Scale: 1_15 000 @A3

0 0.1 0.5 1KM



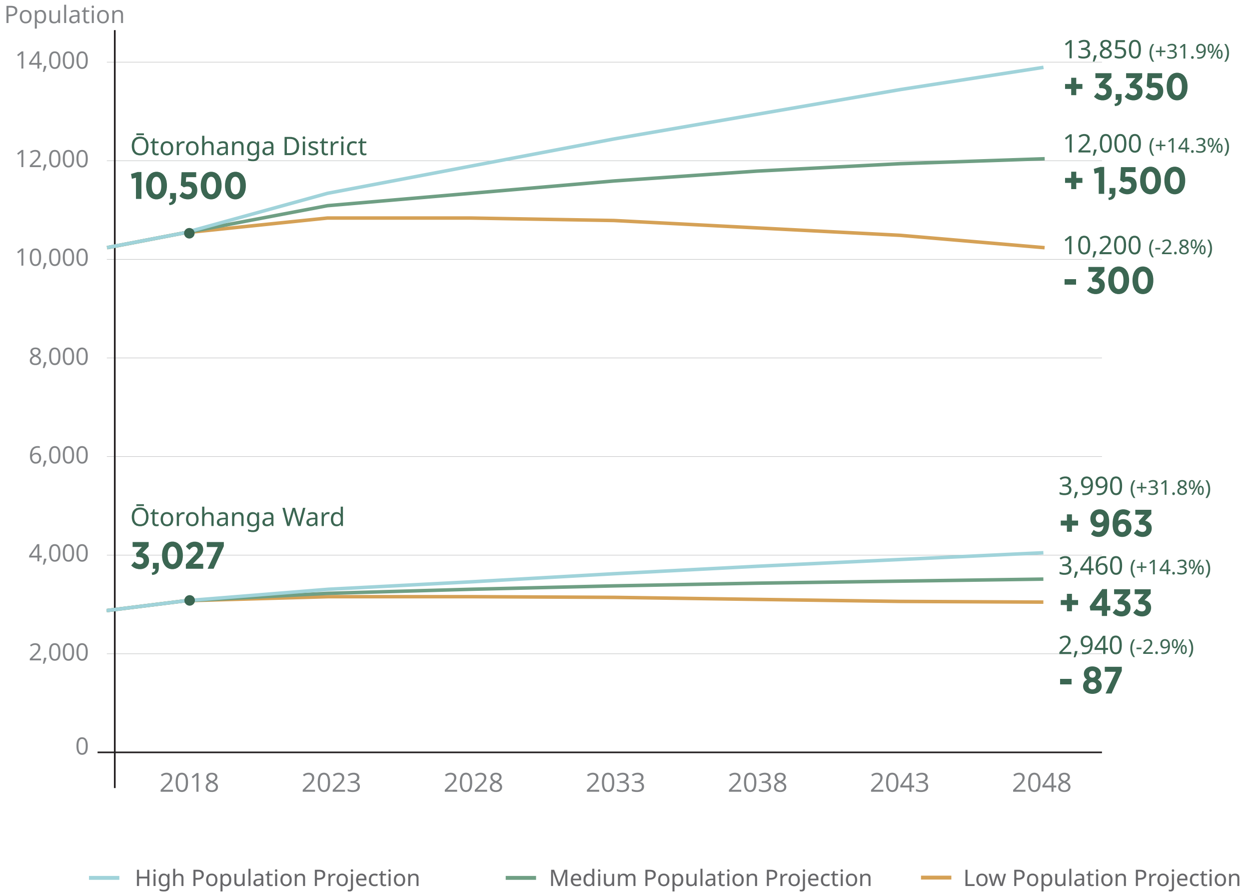
Ōtorohanga Population Projections

Statistics New Zealand population growth scenarios for Ōtorohanaga Ward for 2048 range from a low of negative 87 people, a medium growth of 433 people and a high growth rate of 963 people. Assuming an average parcel size for a new dwelling of 300m2, a medium to high population increase for the Ōtorohanga Ward will require between 4.8 to 10.7 additional hectares of land for residential development to accommodate the projected population growth by 2048. A 300m2 size lot will accommodate a standalone 160m2 3-bedroom house with garden space. Housing a similar population in urban centres would require far less land area as townhouses and apartments could be built.

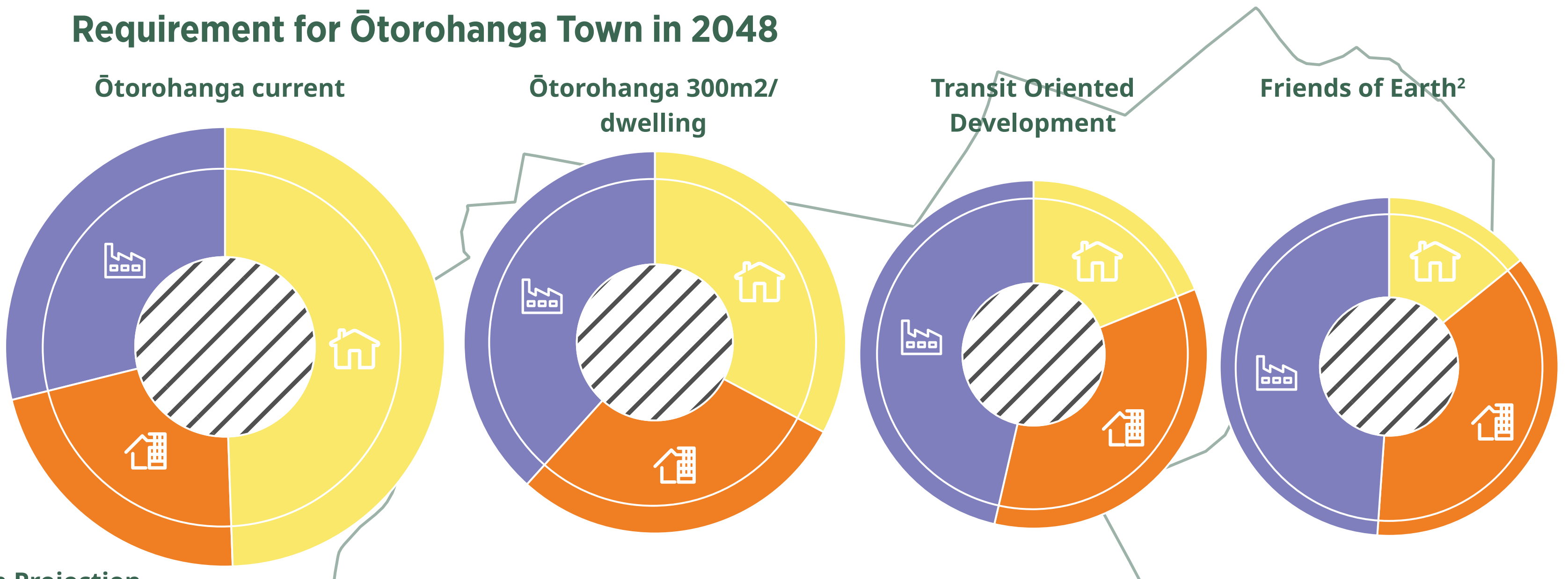
Based on economic forecasts, Ōtorohanga requires between 9 to 12 hectares for industrial use and 7-10 hectares for business use. Classifications are based on the Australian and New Zealand Standard Industrial Classification (ANZSIC06)1 system. The Business category includes professional services, retail, food and beverage, accommodation, whereas the industry category covers wholesale trade, manufacturing, electricity, gas and other utilities, and agriculture.

The pie graphs to the right present land area requirements for residential, business and industrial land use for the medium and high population growth scenarios. The different size circles reflect different residential densities. Note that the circles are to scale in relation to the Ōtorohanga Ward boundary which sits behind the pie graphs to give an indication of relative size.

Population projection[1]



Requirement for Ōtorohanga Town in 2048



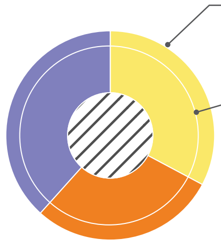
High Projection

	Ōtorohanga current	Ōtorohanga 300m2/ dwelling	Transit Oriented Development	Friends of Earth[2]
Dwellings (357)	*21.4 ha*	*10.7 ha*	*5.1 ha*	*3.6 ha*
Business	*9.94 ha*	*9.94 ha*	*9.94 ha*	*9.94 ha*
Industry	*12.39 ha*	*12.39 ha*	*12.39 ha*	*12.39 ha*

Medium Projection

	Ōtorohanga current	Ōtorohanga 300m2/ dwelling	Transit Oriented Development	Friends of Earth[2]
Dwellings (160)	*9.6 ha*	*4.8 ha*	*2.3 ha*	*1.6 ha*
Business	*8.61 ha*	*8.61 ha*	*8.61 ha*	*8.61 ha*
Industry	*10.74 ha*	*10.74 ha*	*10.74 ha*	*10.74 ha*

KEY



1. *https://figure.nz/chart/CLaMLJ4sqPsSQMCU-lH7NX0pXRpjDlrlN*
2. *Friends of the Earth is an environmental campaigning community dedicated to the wellbeing and protection of the natural world and everyone in it. For more information: https://foe.org: https://foe.org/*

3. ENGAGEMENT AND CONSULTATION / WHAKAWHITIWHITINGA KŌRERO

The approach taken for engagement and consultation for the ŌTCP has sought to engage with project partners, stakeholders and community early in the process and regularly to ensure their ideas, concerns, aspirations and insights have been factored into the project before key decisions have been made and as part of the development of the ŌTCP.

Engagement and consultation involved a range of methods to ensure multiple opportunities and ways of participating in the process - methods included co-design workshops, meetings, site hikoi, site observations, focus groups and interviews and in the case of the youth engagement - an interactive board game.

The feedback received shaped the concepts and proposals presented in the draft ŌTCP, and these were tested during a comprehensive engagement and consultation programme that ran from July-September 2022. The feedback and submissions received during this period have shaped this final version of the ŌTCP.

The following engagements occurred through the development of the ŌTCP:

5 x Hui with Nehenehenui Regional Management Committee

4x Mana Whenua Hui

4 x Workshops with elected members, community board, community reference group, Ōtorohanga District Development Board, and a group of representatives from the Social Sector in Ōtorohanga.

4 x Public drop in sessions.

3 x Workshops with local business owners and a group of representatives from sports clubs / recreation group in Ōtorohanga

2 x Online survey

1 x Youth interactive workshop with students from Ōtorohanga College.2 x Online surveys

1 x Youth interactive workshop with students from Ōtorohanga College.

Community Values and Key Themes

This page summaries the community values and the key themes and insights shared during the first phases of consultation and engagement.

Ōtorohanga Community Values

Small Town Life

- That being a town of small size has many positive aspects.
- The ease of connection to nearby towns and other regional attractions.
- How compact it is, with many facilities and services in easy reach.
- It is an easy, gentle, and caring place to live.

Community and People

- The joy of living somewhere where people are friendly and wave across the street when they recognise you.
- That people support each other, they know their culture and are interested in where they are from.

Attractive Main Street

- Having a main street which has bright, well cared for flower baskets that add colour and promote town pride.
- That spending locally helps retail and small businesses prosper.

Connection to Nature

- The environmental, aesthetic, recreational, and social positives of having the Waipā River so close to the town centre.
- Having a river you can swim in which is available for everyone to use.
- A stopbank walking track within the town centre that winds through neighbourhoods and is accessible for everyone.
- A town that has lots of different kinds of sports facilities to cater to many interests.

Tourist Destination

- Having a national tourist icon such as the Kiwi House within the town is a huge asset

Key Themes

Sports and Recreation - 15.1%

Sports Facilities
- Upgrade or replace pool (heated).
- Provide pump track and or bike park.
- Relocate sports club.
- Invest in new sports/recreation hub.

Parks, Greens, Reserves
- Focus on beautification and pest control.
- Revitalise Village green.
- Care for, and platform story of Huipūtea (and move truck wash).

Tourism - 7.4%

Tourism
- Create new facilities for tourism.
- Work with regional hot spots to piggyback on tourism identity.

Signage, Gateways
- Improved welcome signage.
- Bilingual signage.
- Stronger positioning of the Kiwis.

Traffic - 8.6%

Vehicle Speeds
- Slow down speeds through town to 40k.

Parking
- Make dedicated truck and long vehicle parking.
- Optimise current parking use to better suit town centre use.

Bypass
- Get the trucks off the main street.
- Move Truck wash.

Walking, Cycling & Shared Transport - 7.5%

Walking and Cycling
- More walk and cycleway options.
- Link connections to natural areas, such as River and Reserves.

Walking and Cycling Connections
- Upgrade and Connect up existing networks and grow network.

Public Transport and Taxis
- Need better PT and taxi options.

Youth and Education - 6.3%

Schools and Education
- Improve the college, focus on new buildings and growth.

Youth inclusion
- Focus on activities and social spaces for teenagers.

Infrastructure - 7.6%

Road Improvements
- T Intersection at the south end of town is dangerous.
- Re-route SH away from main street.
- Want more roundabouts and fewer intersections.

Drinking Water Infrastructure
- Improve the quality and taste of drinking water.

Waste Management
- Investigate resource recovery centre.
- Support education for waste reduction.

Council Services and Activities - 4.9%

Rates and Council Spending
- Keep rate increases to a minimum.
- Council to spend rates responsibly.

Council services
- Stronger focus on communication and engagement from council and elected members.

Built Environment - 11.3%

Built Environment
- Improve aesthetics of the town centre.
- Main Street upgrade plan.
- Create safe and enticing spaces to linger.

Housing
- Enable more housing development.
- Focus on affordable & social housing.

Safety
- Improve safety.
- Install security cameras in high profile areas.

Natural Environment - 6.3%

Awa/ River
- Develop river area for recreation.
- Form stronger connections to awa.
- Improve access.
- Improve native planting.

Plants and revegetation
- Focus on Native planting (replace exotic and expand native).

Business Development - 12.4%

Retail
- Create opportunities for greater retail options, focus on quality and local.
- Reuse empty shop spaces.
- Attract boutique and teenage focused retail.
- Want supermarket options.

Mixed Use
- Encourage innovation and investment.
- Improve industrial area.
- Encourage development.

Community and Culture - 12.7%

Arts, Culture and Heritage
- Strengthen historical celebration and storytelling
- Integrate the Museum more fully and create more space for art exhibitions and creative projects.
- Create an improved destination space for community events and to celebrate arts and culture.

Events
- Create events space and a programme of events to support activation of existing spaces.

Equity + Access
- Ensure equitable access to facilities.
- Strengthen social services.

4. ŌTOROHANGA DEVELOPMENT STRATEGY / RAUTAKI WHAKAWHANAKE MŌ ŌTOROHANGA

The Ōtorohanga Development Strategy sets out a blueprint for the next 30 years of growth and development of the Town. The strategy is organised into three interrelated parts - Land-use Strategy, Ecological Network, and Open Space Network. The development strategy seeks to:

- Enable sustainable development of a vibrant walkable community supported by resilient infrastructure.
- Protect, maintain and enhance the natural environment.
- Increase the focus and connection to the Waipā River.
- Guide sustainable infrastructure investment and partnership with the private sector and public organisations.
- Promote and increase the vibrancy and prosperity of the Ōtorohanga town centre.
- Support and promote cultural, sports, and educational facilities, activities and events.
- Allow for a range of new development types, including enabling provision of more affordable housing.
- Inform future Council policies, in particular the district plan review and reserve management plan.

In order to create a vibrant and resilient town with sustained commercial activity, a 'critical mass' of population is needed within 5 - 15 minutes walking distance from the town centre. In the context of Ōtorohanga this would result in approximately 800 - 900 dwellings being located within a walkable distance from the retail and commercial heart of the town. Assuming 1.6 - 1.8 persons per household, 800 - 900 dwellings could mean a usual resident population of 1,280 - 1,440 people within the town centre.

Summary Document

Ōtorohanga Neighbourhoods

In order to frame the different strategies outlined in this plan, Ōtorohanga is organised into nine neighbourhoods with distinctive histories, characteristics, qualities, outcomes, and infrastructure needs.

1. **Ōtorohanga Town Centre** - a mixed-use environment including retail and entertainment activities, community facilities, recreational areas, business and hospitality services for local residents and visitors.
2. **Ōhāhiri** - a diverse identity, providing community and education facilities, commercial activity, recreational areas, open spaces and a mixed density of residential dwellings.
3. **Haerehuka** - Medium density housing, some low density housing, community, education and healthcare facilities, recreational areas and open spaces.
4. **Kākāmutu** - L Low density residential housing, as well as community facilities, tourism, recreational areas and open spaces.
5. **Waikowhitiwhiti** - A mix of industrial activities co-located within Ōtorohagna servicing much of the wider district from here.
6. **Mohoaonui** - A mix of greenfield land currently used for farming activities and residential development of varying densities.
7. **Te Waireka** - Low density and large lot residential dwellings with some commercial businesses and culturally significant sites.
8. **Mangawhero** - an area of mixed land-uses including low density rural residential housing, a small area of medium density residential, commercial activities and sites of cultural significance.
9. **Mangamāhoe** - Large lot residential and commercial development.

KEY

Waipā River

Ward Boundary

Development Strategy / Rautaki Whakawhanake

See pages 123-141 of the Ōtorohanga Concept Plan for the full Development Strategy

The development strategy for Ōtorohanga is based on four key principles which underpin the methodology undertaken to produce the ŌTCP. These four key principles are:

Puts nature first - Protects fertile soils, avoids flood prone land, and sets natural limits to the extent and nature of urban developments.

Promotes a live, work, learn play community - Integrates transport and land-use planning to support a walkable mixed-use town centre with a 'critical mass' of population within 5 - 15 minutes walking distance from the town centre.

Intensifies Existing Urban Area - Future projected and potential development in Ōtorohanga is developed with the exciting urban boundary to support the development of a 'walkable, live work play learn, community' within the existing urban footprint through the intensification of the existing Neighbourhoods 1 - 4.

Focuses new development areas on the Waipā River - A new mixed use development to the south of Waipā river reinforces Ōtorohanga's existing strong relationship with the Waipā and Mangapu Rivers.

Sets the foundation for a district plan review - Support a future plan review that facilitates intensification and development through more proactive development provisions and enabling rules, policies and overlays to allow individual landowners, local businesses and the wider community to realise change and drive new development initiatives, including more affordable housing.

Aligns and coordinates infrastructure development and renewal and with national policy framework.

Open Space

Develop a management strategy for all of Ōtorohanga's parks and reserves.
Develop Huipūtea Reserve to transform it into a central park for Ōtorohanga.
Te Ara o Waiwaia - Waipā River Park - Create a new park along both sides of the Waipā River.

Mixed Use

Create mixed-use neighbourhoods with a focus on community life, retail, entertainment, business and services.
Allow more flexibility with building height and mixed-use density opportunities within the town centre core to facilitate intensification of uses including retail at ground with office and residential activities in the upper floors.

Residential

Provide density-enabling planning rules and conditions in existing urban neighbourhoods which increase housing supply, choice and affordability.
Support limited non-residential activities to enhance residential amenity.
Makes efficient use of green infrastructure for active transport links.

Industrial

Areas for future business and industrial development have not yet been identified. A separate project is included in the action plan to investigate options for future industrial growth beyond Neighbourhoods 5 and 9.
Locations for future business/industrial activity will need to cater for the needs of rural-based communities , including the freight industry, as well as for a growing town.
Activities need to be managed so as to avoid adverse effects on sensitive receivers.

Ecological Network - Key Moves

Develop, maintain and protect an ecological network and green belt for Ōtorohanga

Riparian corridor
Potential green belt
Existing vegetation

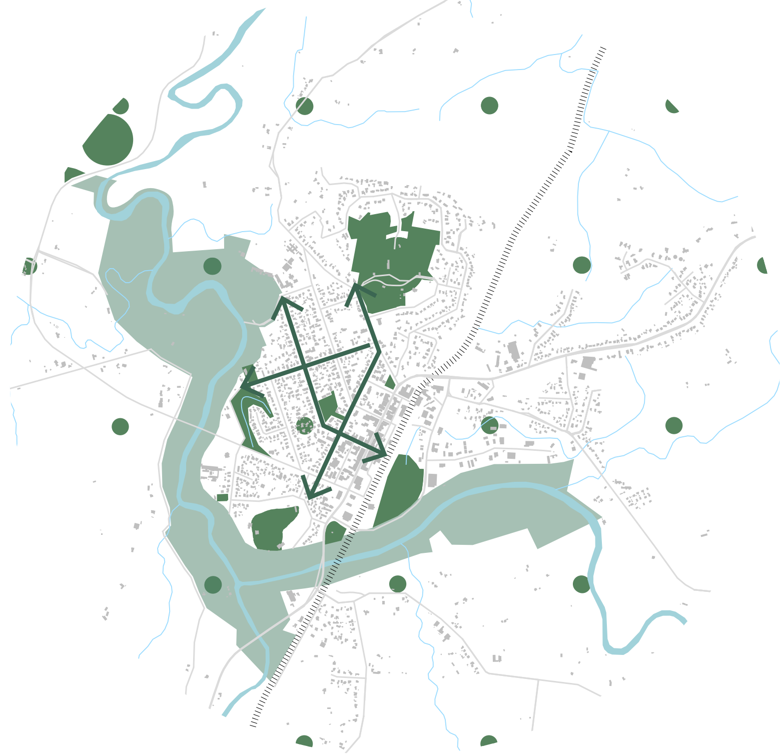
Enhance, maintain and protect Ōtorohanga's biodiversity through the creation of an interconnected ecological network composed of:

- Existing areas of ecological significance.
- Riparian corridors along the Waipā, Mangapu and Mangawhero rivers, unnamed ephemeral waterways and the margins of Huipūtea Lake.
- Patches of dense, multilayered forest habitats, distributed in a way that creates stepping stones for wildlife moving through the catchment, and improve landscape connectivity and ecological integrity.
- A greenbelt that ties together the above network and creates an ecological enclosure around Ōtorohanga township.

The ecological network will require:

- Identifying environmental targets to achieve core ecological outcomes to maintain and enhance the Ōtorohanga environment: e.g. achieve 30% canopy coverage in urban areas.
- Working with landowners to help implement the ecological network and green belt for Ōtorohanga.

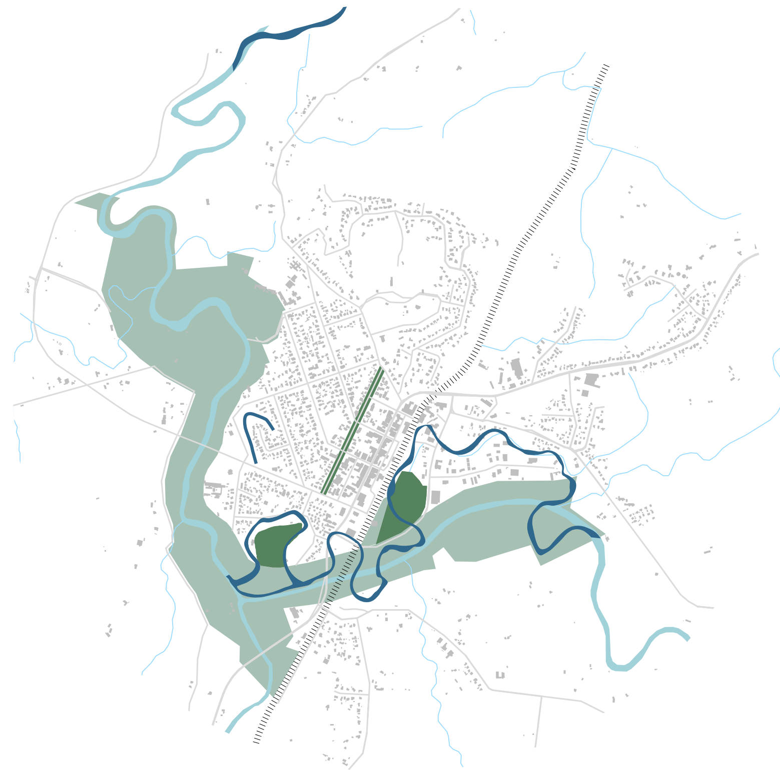
Weave nature through town



Existing Open Space
Open Space connections
Future Open Space

- Weave the ecological network for Ōtorohanga through its urban areas by integrating a wide variety of vegetation and water sensitive design features (green infrastructure) through parks, streets and in private gardens.
- Green infrastructure devices could include but should not be limited to street trees, rain gardens, pollinator pathways, stands of native trees and green roofs as well as roofing material that reduces zinc leachate and proprietary treatment devices on downpipes of buildings.
- Integrate mahinga kai and rongoā elements into plantings - these could include but may not be limited to harakeke and other fibrous native vegetation for weaving, medicinal or food plants etc.
- Incentivise landowners to significantly increase the amount of vegetation and native habitat in private gardens.
- Encourage and support Ōtorohanga residents to play an active role in the care, protection, restoration and regeneration of their parks, reserves and streets.

Celebrate Ōtorohanga's forgotten natural heritage

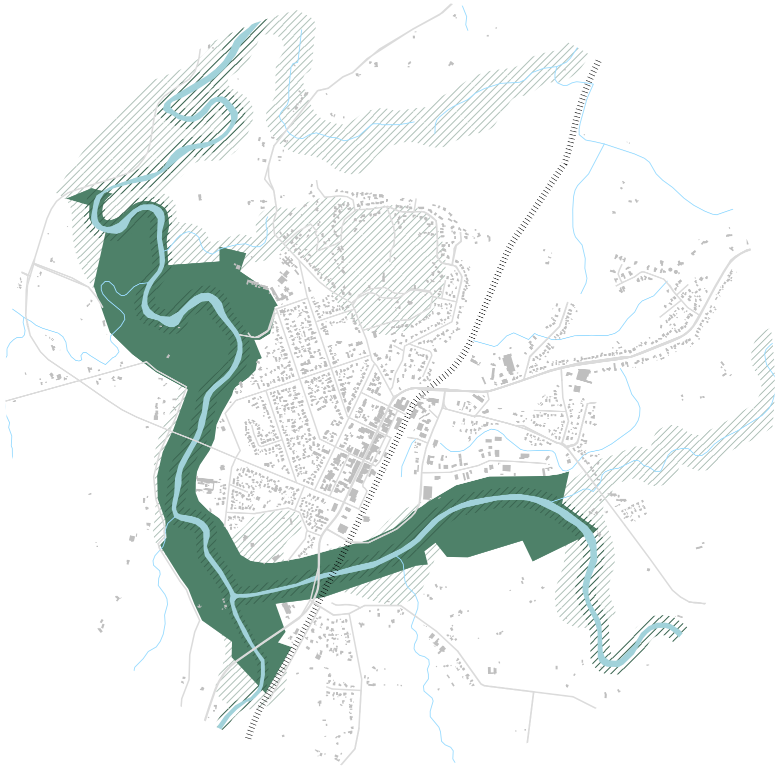


1944 Waipa river
Planting along Turongo Street

- Protect and enhance existing natural features including the kahikatea tree in Huipūtea Reserve and where possible, highlight and restore areas of the historic alignment of the Waipā River still visible through Ōtorohanga's parks, reserves and urban areas.
- Enable access and connection to valued water bodies - in particular the Waipā, Mangapu and Mangawhero rivers, and Huipūtea Lake.

Open Space Network
Key Moves

Te Ara o Waiwaia - Waipā River Park



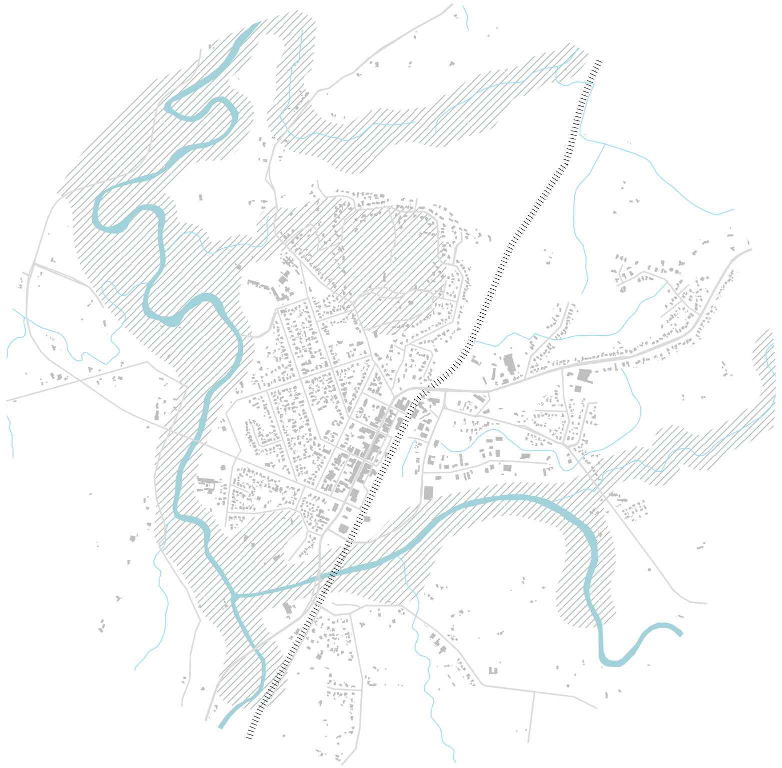
Te Ara o Waiwaia - Waipa River Park

Riparian Corridor

Create a new park along both sides of the Waipā River. Features and facilities within the park could include but should not be limited to:

- Upgraded walking and cycling facilities on the northern banks of the river, and established new walking and cycling facilities on the southern banks of the river. Establish new river crossing facilities, potentially aligned with historic swing bridges within the area.
- Ongoing ecological restoration, building on the work already underway as part of the Waipā Rerenoa River Restoration Project.
- Upgraded and new access points for swimming, kayaking and waka ama.
- Integrate additional uses into the park - including but not limited to off-leash dog areas, pump track and biking facilities, playgrounds, including areas for nature play and māra hūpara / traditional Māori play, planting for cultural harvest and areas for parking and picnicking close to the river.

Huipūtea Reserve



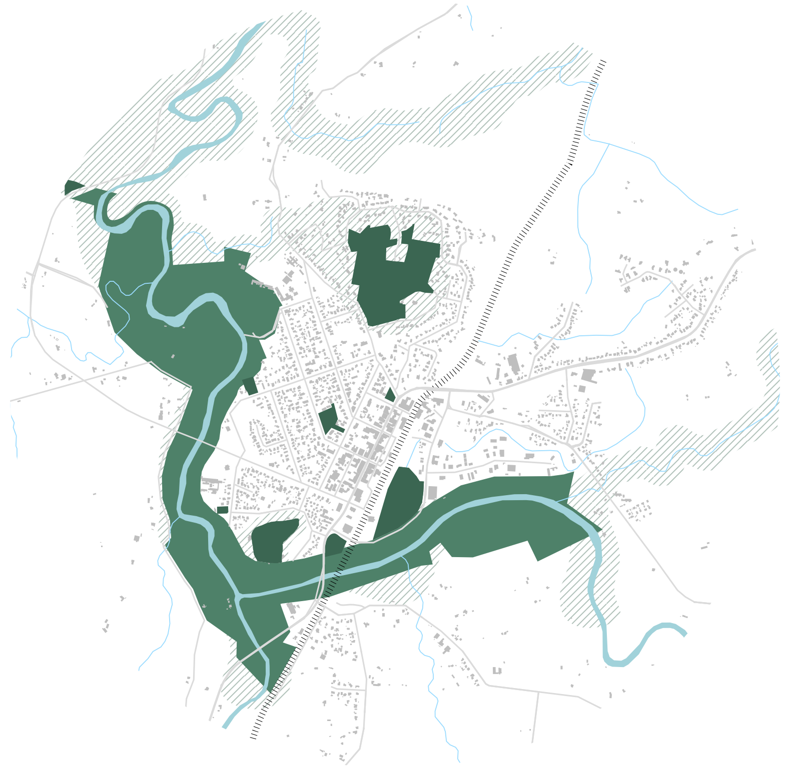
Existing Huipūtea Reserve

Proposed Extension

Develop Huipūtea Reserve to transform it into a central park for Ōtorohanga. Features and facilities within the park could include but should not be limited to:

- Identify, maintain, and where appropriate, reveal and celebrate the rich cultural history of the site.
- Restore and enhance Huipūtea Lake and overland flow paths and significantly increase the vegetation and wildlife habitat within the site.
- Work with KiwiRail to create a direct and safe connection between the town centre and Huipūtea Reserve and the town centre and to integrate KiwiRail held land into the overall design and use of the reserve.
- Unlock the reserve by relocating the existing truck wash and work with existing private landowners to find a new location within Ōtorohanga for that facility.
- Provide a space for tourists and locals to walk around Huipūeta Lake.

Ōtorohanga Reserves Management Strategy



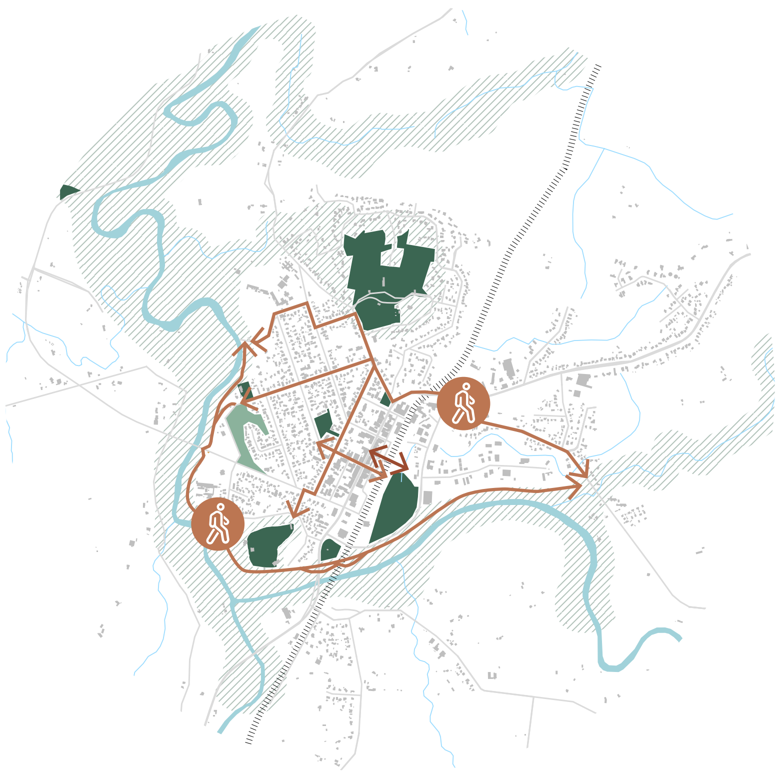
Existing Open Space

Proposed Open Space

- Develop a management strategy for all of Ōtorohanga's parks and reserves to ensure that there is a coordinated approach to the ongoing maintenance, renewal and adaptation of Ōtorohanga parks and reserves so that they are collectively responsive to the evolving needs of the community.
- The reserves management strategy should explore specific provisions for different types of open spaces - for example conservation for spaces with natural, ecological, landscape, and cultural and historic heritage values; informal recreation zones, activities and community uses; sport and active recreation zones for indoor and outdoor organised sports; and community zones to accommodate community buildings and activities, such as marae, libraries, arts and cultural centres, community houses, halls, early childhood learning facilities and recreation centres.
- The management strategy should cover existing parks as well as any new parks that emerge through the town plan process. This should include but not be limited to Ōtorohanga Domain, Rotary Park / Bob Horsfall Reserve, Windsor Park, Ōtorohanga Library Village Green, Huipūtea Reserve, Reg Brett Reserve, Island Reserve, Ōtorohanga Tennis Club, Ōtorohanga Outdoor Bowling Club and Ripley Jones Reserve.

Walking and Cycling Network Key Moves

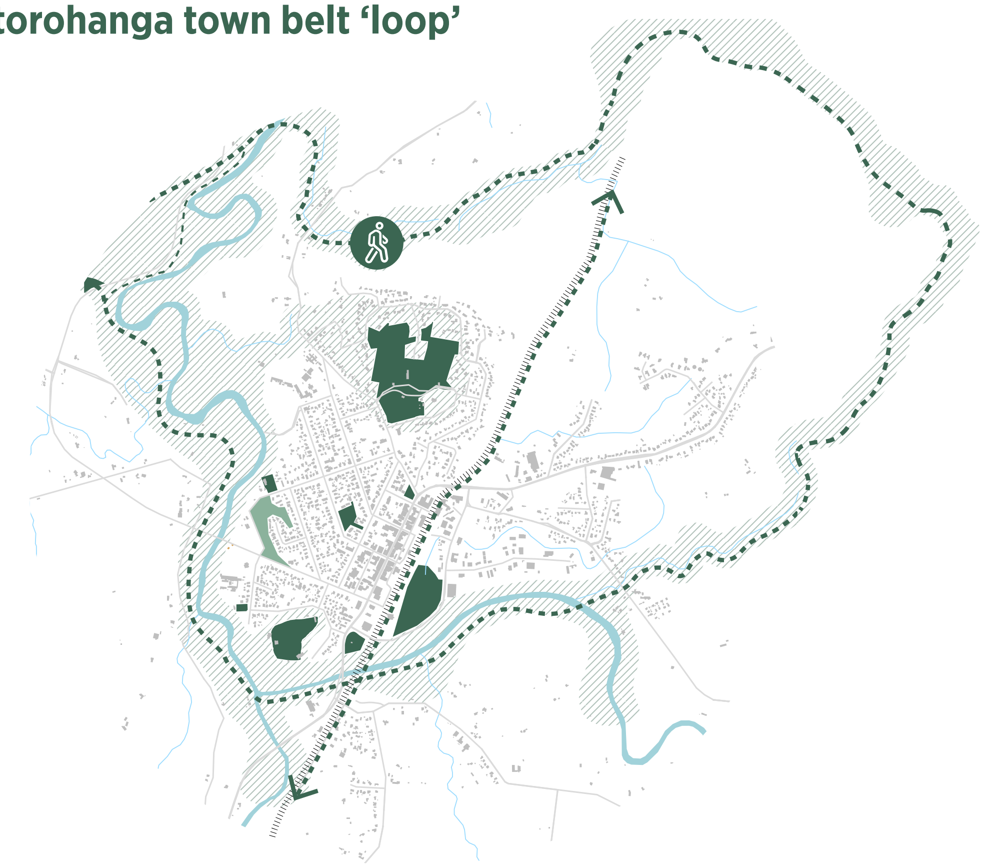
Create an urban 'loop'



Ōtorohanga Inner Loop
Railway crossing

- An urban 'loop' path that integrates the existing river walkway to allow people to walk and cycle the perimeter of the town, connecting key community facilities and destinations.
- Linking together key urban parks - Ōtorohanga Domain, Windsor Park, Island Reserve, Waipā River and Huipūtea Reserve - by increasing allocation for pedestrians and cyclists on Kakamutu Road, and Turongo, Tutunui and Tohoro streets.
- Working with KiwiRail to explore the opportunity to create safe and accessible rail crossing facilities to connect the town centre to Huipūtea Reserve.

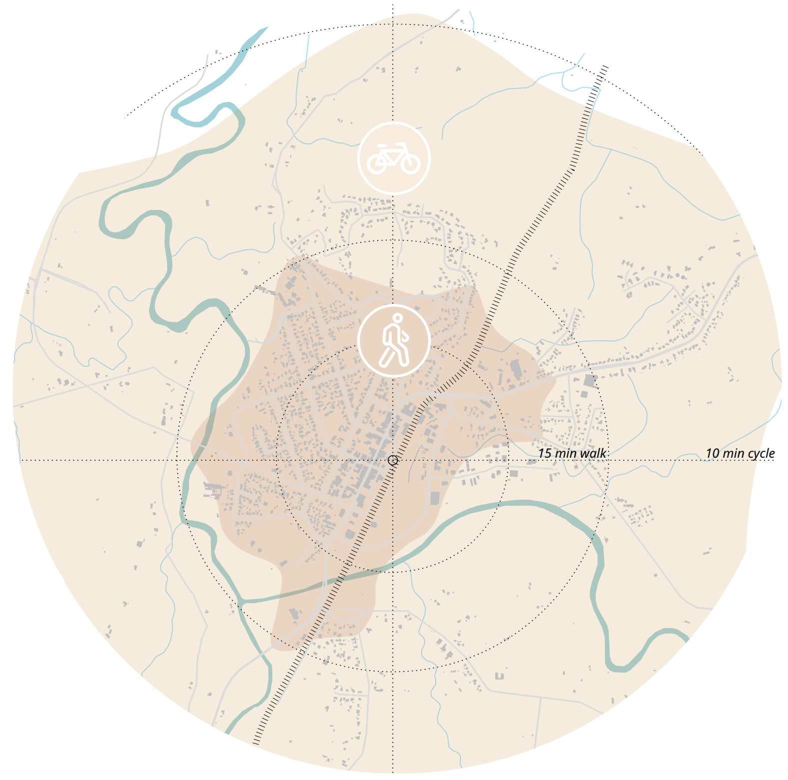
Ōtorohanga town belt 'loop'



Ōtorohanga Outer Loop

- Explore the creation of an 'outer loop' align with potential green belt for Ōtorohanga
- Working with KiwiRail to explore a shared path along the rail line to connect to the neighbouring regional centres of Te Kuiti and Te Awamutu.

Ōtorohanga walking and cycling network



10min and less bike time
15min and less walk time

- Assessing, prioritising and targeting upgrades and renewals of existing facilities to create a programme that systematically and incrementally improves the safety of Ōtorohanga walking and cycling facilities.

Ōtorohanga Town Centre Plan / Te Mahere Pokapū Tāone

See pages 142-153 of the Ōtorohanga Concept Plan for the full Ōtorohanga Town Centre Plan

The Ōtorohanga Town Centre Plan aims to address a wide range of issues raised through consultation and engagement including the tiredness of the town centre along with its building facades, verandas and heritage buildings, the incomplete mix of uses, insufficient legibility and wayfinding, lack of housing supply, and safety issues resulting from limited activity and activation.

The Ōtorohanga Town Centre Plan is organised into three interrelated parts - Built Environment, Transport and Circulation, and Catalyst Projects.

The Ōtorohanga 'Town Centre Plan' builds on the outcomes sought in the Ōtorohanga Development Strategy by providing additional detail to Neighbourhood 1 - Ōtorohanga Town Centre outlined above. The town centre plan:

- Contributes towards creating a live, work, play, learn community where residents have the opportunity to walk and cycle to meet their daily needs and there is a critical mass of people, disposable income and activity necessary to support a vibrant lively community.
- Creates a recognisable town centre that the community is proud of and enjoys visiting to spend time in and socialise - this in turn attracts visitors to stop, linger, spend time and enjoy the town centre spaces.
- Develop an enduring built environment that integrates and enhances built heritage while adapting to the needs of the community over time.
- Creates a public realm that is vibrant, attractive, comfortable, safe and accessible for people of all ages and abilities.
- Connects people to central parks and weaves nature into the centre of town.
- Celebrates Maniapoto Street is Ōtorohanga's 'mainstreet' - upgrades Maniapoto Street and Turongo Street to improve the safety for people of all ages and abilities, bringing pride to the town and allowing for a wider range of uses.

Recreate Water Edge

Playground / Playspace

Collective Medium Density

Medium Density

Cultural Facilities

Note: The images on this page are for concept only

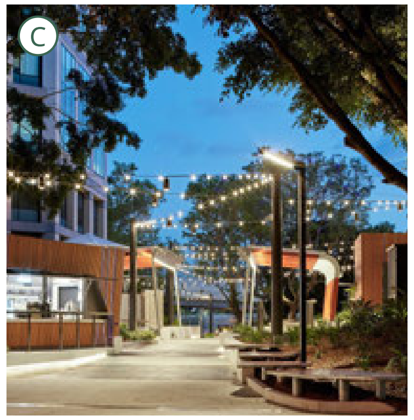
Ōtorohanga Town Core / Pokapū Tāone

Develop a recognisable and vibrant town core centred around Maniapoto Street and the public library, and 'anchored' by the train station and Windsor Park. The town core:

- Allows for up to four - six stories mixed-use development to increase the number of people and activity in the centre of the town. Vertical mixed uses within buildings with more public uses on the ground floor such as retail shops, restaurants, or commercial businesses, and private uses on the upper floors such as residential units, hotel rooms, art studios, or office spaces.
- Has continuous active building frontages with no or minimum setback from the street to allow flexibility and to create a strong, well-defined built edge. Building lines along laneways allow for desire-lines and legible wayfinding opportunities through the core.
- Internal spaces have a minimum ceiling height of 2.7 to 3.5m for upper floors to allow for flexibility for future adaptive uses, and 3.5 to 4.5m at ground floor for retail and commercial uses which is still suitable for residential uses at ground level.

Multi Purpose Community Facilities

Mixed Use Laneway + Pedestrian Link



Town Core - High Density

Note: The images on this page are for concept only

Transport and Circulation Strategy / Rautaki whakatika rerenga waka, rerenga tāngata

The transport and circulation strategy aims to address a wide range of issues raised through consultation and engagement. These included the speed of vehicles through town, the safety and efficiency of the three main intersections and the central streets, parking, a disconnected walking and cycling network, east-west connectivity across the township, rail crossing facilities, and a current lack of safe and easy access for people of all ages and abilities.

- Upgrade Maniapoto Street to slow traffic through town, particularly heavy vehicles, trucks and tractors, and improve the safety for people of all ages and abilities, bring pride to the town and allow for a wider range of uses.
- Upgrade Turongo Street to form the western edge of the town centre, improve the safety for people of all ages and abilities and as the central spine of a network linking together Ōtorohanga's central parks.
- Upgrade 3 key intersections to improve safety and access (See Upgrade three key intersections and manage heavy vehicles for more details)
- Link together key urban parks - Ōtorohanga Domain, Windsor Park, Island Reserve, Waipā River and Huipūtea Reserve - by increasing allocation for pedestrians and cyclists on Kakamutu Road, and Turongo, Tutunui and Tohoro streets.
- Create safe crossing facilities in key locations in the town centre - in particular, additional facilities on Maniapoto Street and Te Kanawa Street.
- Work with KiwiRail to create a safe and accessible rail crossing facility to connect the town centre to Huipūtea Reserve.
- Develop a parking strategy for Ōtorohanga that rationalises parking areas in Ōtorohanga.
- Develop gateway treatments at entry points to Ōtorohanga Township.
- Create a clear and direct east-west and north-south pedestrian connection through the town core linking Windsor Park, the village green and Huipūtea Reserve, and Lawrence Street to Ballance Street.

Upgrade three key intersections and manage heavy vehicles

Improve the safety of the three key intersections and manage heavy vehicles through the town through a series of staged interventions that methodically increase the balance of these spaces towards pedestrians. The intention of the staged approach is to ensure the right balance of place and movement function of the streets are achieved. The key stages are:

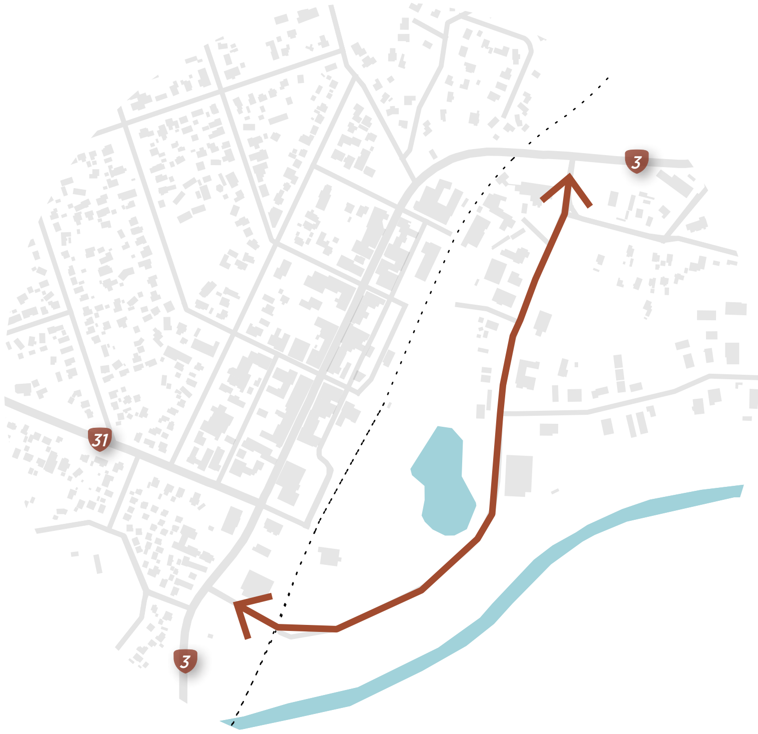
1a - Redirect heavy vehicles to Huipūtea Drive
Work with freight companies to redirect heavy vehicles to Huipūtea Drive.

1b - Upgrade the intersections on SH3, SH39 and Huipūtea Drive
Upgrade the intersections on SH3, SH39 and Huipūtea Drive to slow traffic, increase the safety and accessibility of these intersections for pedestrians, and create thresholds to the town centre.

2 - Purpose built truck facilities on Huipūtea Drive
Investigate the potential of creating purpose built truck facilities on Huipūtea Drive to take advantage of freight moving through town and to encourage truck drivers to use Huipūtea Drive. The facilities could include but should not be limited to a petrol station, accommodation, eateries and truck wash facilities.

3 - Downgrade Maniapoto street from a state highway and transfer this to Huipūtea Drive.
Downgrade Maniapoto street from a state highway and transfer this to Huipūtea Drive.

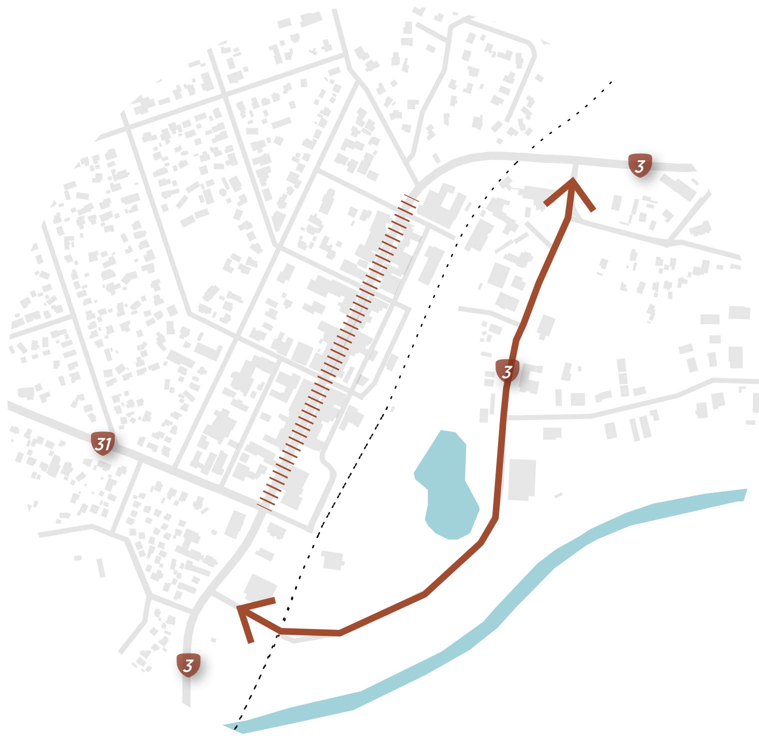
1a - Redirect heavy vehicles to Huipūtea Drive



1b - Upgrade the intersections on SH3, SH39 and Huipūtea Drive

2 - Purpose built truck facilities on Huipūtea Drive

3 - Downgrade Maniapoto street from a state highway and transfer this to Huipūtea Drive.



Catalyst Projects / Rautaki whakatairanga ake

A catalyst project is a transformational project that through its planning, design, delivery and operation revitalises an area by opening opportunities for employment, new investment and development, meeting genuine community needs and shifting the perception of towns' image and potential....

A range of specific projects were explored as part of the ŌTCP process. These included a town hall, the pool facilities and town gateways. Through the consultation and engagement process key insights were shared regarding these projects three key projects emerged as leading contenders for catalyst project aims.

KEY

- Create a safe and accessible rail crossing facily to connect the town to Huipūtea Reserve.
- Develop a Ōtorohanga Sports and Recreation Hub.
- Build a multipurpose Culture, Community and Arts Facility.

Actions for delivering Ōtorohanga Town Concept Plan

See pages 174-193 of the Ōtorohanga Concept Plan for the full Action Plan

The following action plan identifies individual projects and actions in support of the strategies and key moves outlined in the development strategy and town centre plan as well as a range of additional initiatives identified through the consultation and engagement process. The purpose of the action plan is to implement the Town Concept Plan and ensure that the Council, Community Board and other agencies and organisations can allocate the appropriate resources and funding to undertake these projects in a coordinated and integrated manner.

Ecological Network for Ōtorohanga

1. Develop, maintain and protect an ecological network and green belt for Ōtorohanga.

2. Weave nature through the town centre.

Ōtorohanga Open Space Network

3. Create Te Ara o Waiwaia - Waipā River Park.

4. Develop Huipūtea Reserve.

5. Create a Reserves Management Strategy for Ōtorohanga.

Planning / Regulatory Reform

6. Establish an Enabling Regulatory Framework to enable new development in advance of changes to the District Plan.

7. Review and update Planning / District Plan to align with and enable the outcomes sought through the ŌTCP.

8. Promote Sustainable Building Practices.

9. Develop a Zero Waste strategy including Feasibility study for a Resource Recovery Centre.

10. Investigate implication of Climate Change on Ōtorohanga township.

11. Investigate business and industrial land options.

Ōtorohanga Town Centre Plan

12. Upgrade Maniapoto Street.

13. Upgrade Turongo Street.

14. Implement CCTV Camera Network.

Transport and Circulation

15. Create a Street Network Plan for Ōtorohanga.

16. Upgrade three key intersections and manage heavy-vehicles.

17. Create an interconnected walking and cycling network for Ōtorohanga.

18. Create a safe and accessible rail crossing facily to connect the town to Huipūtea Reserve.

19. Develop a district wide cycle trail network.

20. Develop a Parking Strategy.

21. Upgrade Tuhoro Street, Ballance Street, Wahanui Crescent.

22. Secure Waka Kotahi Innovating Streets funding in support of streetscape projects.

23. Investigate Public transport for Ōtorohanga

Catalyst Projects

24. Develop a Ōtorohanga Sports and Recreation Hub.

25. Build a multipurpose Culture, Community and Arts Facility.

26. Establish Ōtorohanga Town Gateways.

27. Develop Swimming Pool Facilities.

Community, Culture and Heritage

28. Develop Ōtorohanga naming protocol.

29. Arts, Culture and Heritage Strategy.

30. Develop an Events Calendar for Ōtorohanga.

31. Rebrand Ōtorohanga.

32. Develop a signage strategy for Ōtorohanga.

WEAVING THE FUTURE, TOGETHER

KOTAHITANGA

Ōtorohanga District Council

Where kiwi can fly

WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

Water Supply Asset Management Plan

ŌTOROHANGA DISTRICT COUNCIL

FEBRUARY 2024

Te Kaunihera ā-Rohe o Ōtorohanga District Council
Where kiwi can fly

WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

RESPONSIBILITY	Group Manager Engineering
STATUS	DRAFT
NEXT REVIEW DATE	
REVIEW FREQUENCY	Three Years
ASSOCIATED DOCUMENTS	Water Safety Plans, Infrastructure Strategy

REVISION RECORD

Document

Revision	Revision Date	Issued By	Details	PDF Doc ID
Draft 1.0	15 January 2024	Emma Good	Initial issue for internal comment	
Draft 1.2	16 February 2024	Emma Good	Final Draft for Audit review	

Te Kaunihera ā-Rohe o
Ōtorohanga
District Council
Where kiwi can fly

1.0 Executive Summary

Ōtorohanga District Council's water supply networks, currently serve the Ōtorohanga and Kāwhia urban communities and the defined rural supply areas of Waipā, Tihiroa and Arohena. Council also administers a stock-water only rural scheme in the Ranginui area. These systems are provided as enablers of community wellbeing.

This Water Supply Asset Management Plan (AMP) aligns with the 30-year Infrastructure Strategy, and is one of the supporting documents for the 2024-2034 Long Term Plan (LTP), showing how Council proposes to:

- Provide affordable, well-designed and maintained water infrastructure to enable economic growth for households, commerce and industry across Ōtorohanga.
- Implement appropriate barriers as detailed in the approved Water Safety Plans against waterborne risks such as protozoa or E. coli to meet public health compliance requirements, through proactive upgrading of the rural and urban schemes.
- Increase resilience against risks such as loss of supply, enable fire-fighting demand to be met with adding new hydrants where required for growth, and managing longer term climate change impacts on surface water takes, through building additional storage to provide at least 36 hours average daily demand, along with replacing asbestos cement water mains that have a high failure rate.

1.1 - Significance of Water to Iwi/Māori

Council recognises the importance of wai (water) to iwi/Māori:

- That water carries a mauri (life force).
- That water has a wairua (spiritual significance).
- That water supports mahinga kai (traditional food gathering).
- That water tells the stories of tupuna (ancestors).

Council's relationship with iwi in our rohe (district) is developing, and Council expects to engage far more with iwi over the course of this Long Term Plan, particularly in relation to anything involving water.

1.2 - Proactive upgrading of treatment plants

Under the regulations of Taumata Arowai, Council as a water supplier must demonstrate that:

- The quality of the source water used is understood.
- The treatment plants have appropriate barriers to bacterial and protozoal contamination installed, operated and continuously monitored.
- Water for drinking must avoid breaching specified levels of chemical or cyanotoxin determinands known as (MAVs).

Measures are in place to prevent recontamination of water within a distribution system, such as backflow prevention and controls on accessing pipes and plants.

This is consistent with Council's goals of optimising performance and reducing costs for residents, ratepayers and businesses.

Within the treatment plants, getting the water to a suitable clarity to enable effective protozoa and microbiological risk barriers is essential to drinking water safety. In the case of the two urban water supplies, Ōtorohanga and Kāwhia, achieving compliance with the Drinking Water Quality Assurance Rules is well underway and has been consistently achieved over the last six months through a combination of relatively modest treatment process upgrading and improved monitoring processes.

1.3 - The Big Five Issues for Water Supply

Council has identified five issues that will have a significant impact on the way water supply is managed into the future. These are addressed in more detail throughout this document:

1. Climate Change – weather patterns, natural hazards and resilience.
2. Growth – the impact of a growing community.
3. Asset Data Capture – understanding what we have so we can make informed decisions.
4. Resourcing - to advance an ambitious capital works programme.
5. Affordability – meeting government expectations of compliance continues to increase cost to Council to operate water supplies, especially in the rural areas with small rating base. Assets reaching the end of useful life over the next 10 years will require continued investment now that reform is not taking place and assets remaining with councils.

2.0 Introduction

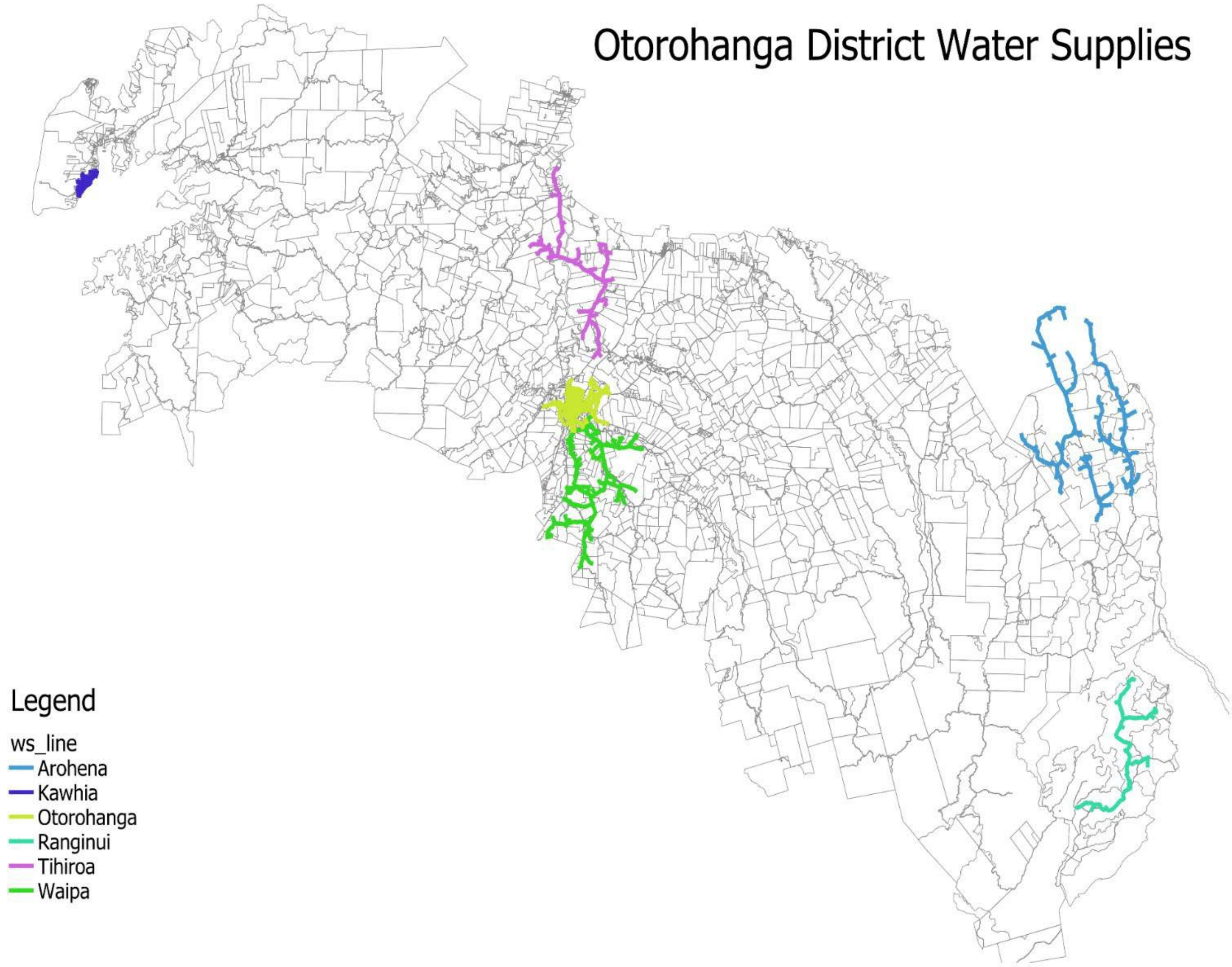


Figure 2.1 – Ōtorohanga District Water Supplies

2.1 Key Directions of Council

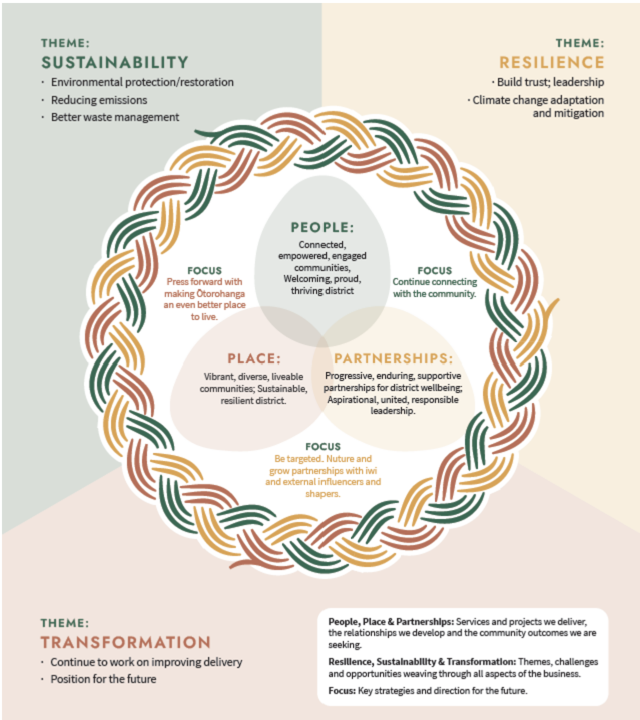
Three years ago, Council adopted a fresh approach to looking at its role and services. We began using the concept of wellbeing as our lens for examining what we did. This, in turn, has led to a much sharper focus on the outcomes wanted from our services and how these services are delivered.

Ōtorohanga is a fabulous district and we want to ensure that everyone who calls this place home is nurtured and enabled to be their best. We want the district to be dynamic, inclusive and unique - a place where kiwi can fly and this means focusing on people, place and partnerships to achieve the outcomes below:

The district vision for the 2021–2031 LTP is:

Ōtorohanga - 'where Kiwi can fly'; A Dynamic, Inclusive and Unique District

Council identified the following outcomes that will guide activities to promote the well-being of our community, and the function and performance of our assets and infrastructure:



2.3 Plan Purpose

The purpose of this Asset Management Plan is to ensure that all of the assets (in this case drinking water supply) are operated and maintained so that they provide the required level of service for present and future customers in a sustainable and cost effective manner through:

- Demonstrating sustainable operation of key strategic assets of the Ōtorohanga District, including funding requirements.
- Ensuring compliance with legislation including the Local Government Act 2002, Health and Safety at Work Act, Health Act, Resource Management Act 1991, Building Act 2004 and Drinking Water Quality Assurance Rules 2022
- Being consistent with key directions of Council and agreed levels of service.

Using a robust risk-assessment approach to identify and prioritise operational, maintenance, renewal and capital development needs.

This plan substantiates budget forecasts put forward in the Ōtorohanga District Council LTP (2024-2034) and associated long term (30) year capital replacement forecasts for water supply.

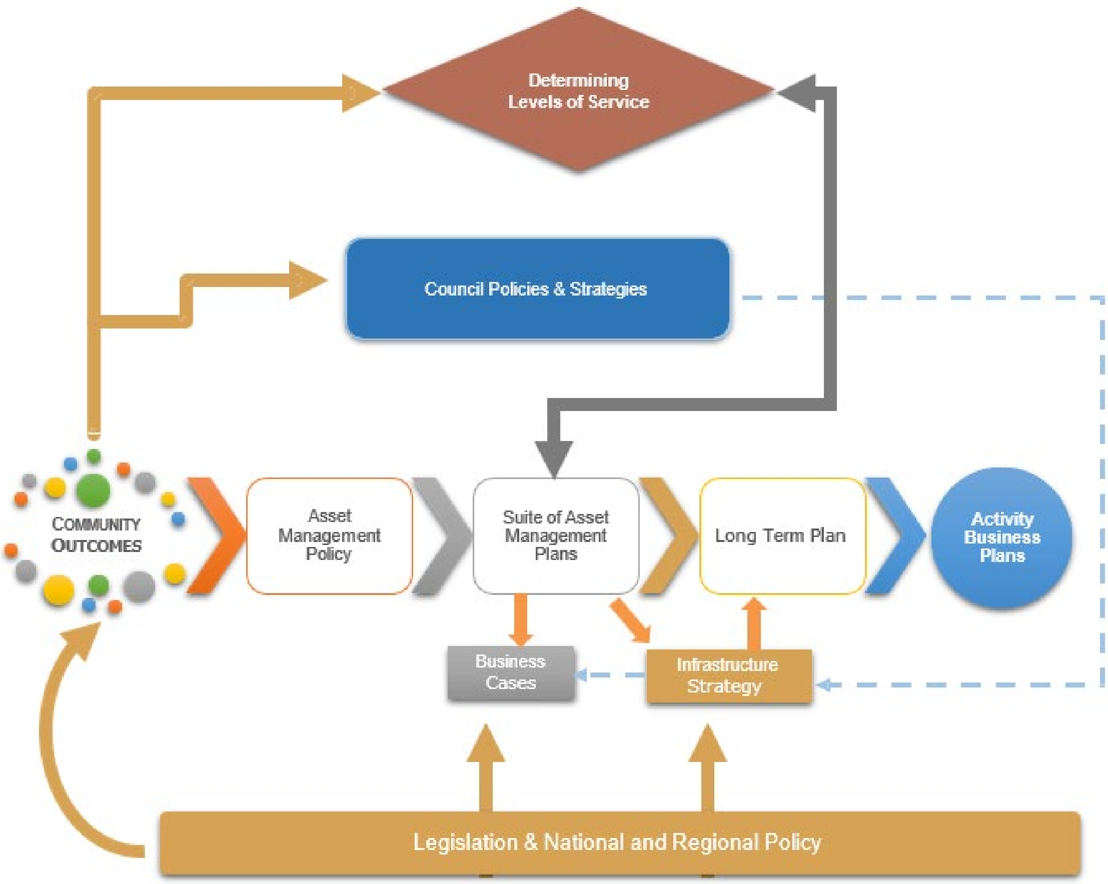
Ōtorohanga District Council will:

- Use the Water Safety Plans on a day-to-day basis as a 'working document', and note amendments to this Asset Management Plan arising from these Water Safety Plans on an annual basis.
- Conduct three-yearly rewrites of the Asset Management Plan in advance of the LTP annual amendments or updates will be undertaken if significant asset management changes occur.

2.4 Relationship with other Plans

In the diagram below are the linkages between Council's high level planning documents as they relate to the Asset Management Plan:

Figure 2.2 – Three-Yearly AMP Flowchart



2.5 Agreed Problem and Benefit Statements

As part of the development of the AMP, the current challenges were summarised to three key problem statements as below:

Table 2.1 – Three Key Problem Statements

	Problem Statements	Benefit Statements	
	Changing climatic conditions will impact both the availability and quality of raw water sourced	Council has invested in increased storage during the last LTP and explored the availability of ground water supply for Ōtorohanga and further raw water storage. Although ground water is not feasible, an earth dam is feasible at Honikiwi but unaffordable currently. The direction currently is to improve the management of our existing resource through metering, leak detection and renewals of pipes. A future water source for Kawhia is to be considered in the next 10 years depending on growth.	People Resilient district Responsible Leadership
	Non-compliance with drinking water quality assurance rules creates risks for users and Council as a supplier.	Council has invested into getting the urban drinking water plants capable of meeting compliance. Further investment is needed into rural plants but is unaffordable to the small rating bases. Council will continue to explore opportunities to meet compliance which will require external funding.	People Sustainable Partnerships
	The central location and attractiveness of the district is increasing growth, placing additional demand on infrastructure and resources.	Understand criticality of piped networks and progressively upgrade to enable customer connections and growth.	Place Resilient district Sustainable

Table 2.2 – What we are doing and how?

	What are we doing and how?
Improved Management of existing resources	Continued renewals programme for water mains $500K in year 1 $250K each year for years 2 - 10 Leak detection $0.16M
Compliance with Drinking Water Standards	**Ōtorohanga/Waipā and Kāwhia Plant:** Continual improvement on the operations and monitoring of the plants to meet compliance. **Arohena Rural Water Scheme** Although Council has been directed by Taumata Arowai to get the Arohena Plants of Huirimu and Kahorekau up to Protozoal compliance. Council cannot afford major upgrades at this time and will leave the schemes under permanent boil water notice until some further investigation is carried out to see how the plants can reach compliance. External funding may be available in the future and there will be some more clarity around the new governments "Local water done well" policy. **Tihiroa:** - Completing improvements to meet compliance.
Supporting Growth within the District	Continue to work with developers to enable development within district and identifying potential growth areas during the renewal program for any future demand.

2.6 Underlying Planning Assumptions

2.6.1 – District Overview and Growth Projections

DISTRICT OVERVIEW

Ōtorohanga District Council is a territorial local authority in the Waikato region of New Zealand. It covers an area of 1976 square kilometres that extends from the shores of the Tasman Sea in the West to the Waikato River in the East. It has diverse topography, productive farmland, extensive native vegetation, ocean beaches and protected harbours.

The principal township is Ōtorohanga, located centrally in the district, with a smaller urban settlement of Kāwhia located at the coast, which is a popular holiday destination.

Figure 2.3 – Ōtorohanga District Map

POPULATION AND GROWTH

District population in 2023 was estimated to be 10,900, up 0.9% from a year earlier. Figures for that same year show that the district's dependency ratio was 60.7% - higher than the New Zealand ratio (54%). This elevated ratio reflects both the slightly higher proportion of residents aged 65 years and older (17%; cf. New Zealand 16.5%) and higher proportion of young people aged under 15 years (20.6%; cf New Zealand 18.5%).

Nearly 30% of the district population identify as of Māori decent (cf. New Zealand – 16.5%) and 11.3% of residents were born overseas.

Population growth is expected to continue albeit gradually. By 2048, resident population is projected to be 12,656[4] with a corresponding growth in households from 3,872 in 2024 to 4,644 by 2048 (20% increase).

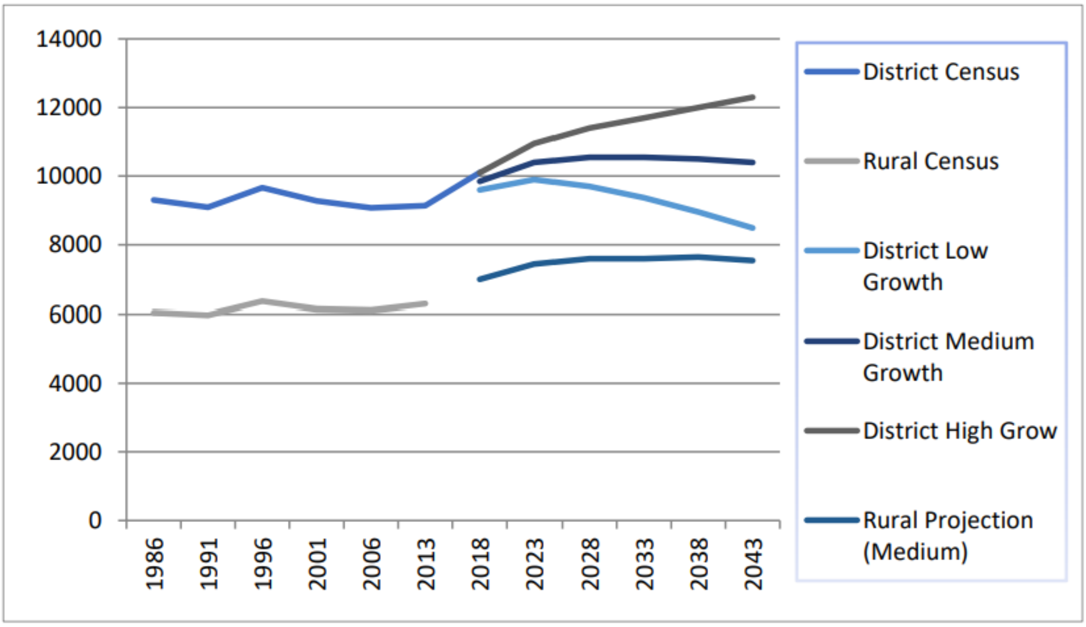


Figure 2.5: Population Growth Forecast

Population insights for Ōtorohanga District from 2022:

Ōtorohanga District's total population was 10,850 in 2022, up 0.5% from a year earlier. Total population grew by 0.2% in New Zealand over the same period.

- Population growth in Ōtorohanga District averaged 1.1%pa over the 5 years to 2022 compared with 1.2%pa in New Zealand.
- Since 1996 growth in Ōtorohanga District reached a high of 2.5%pa in 2016 and a low of -1.0%pa in 2001.

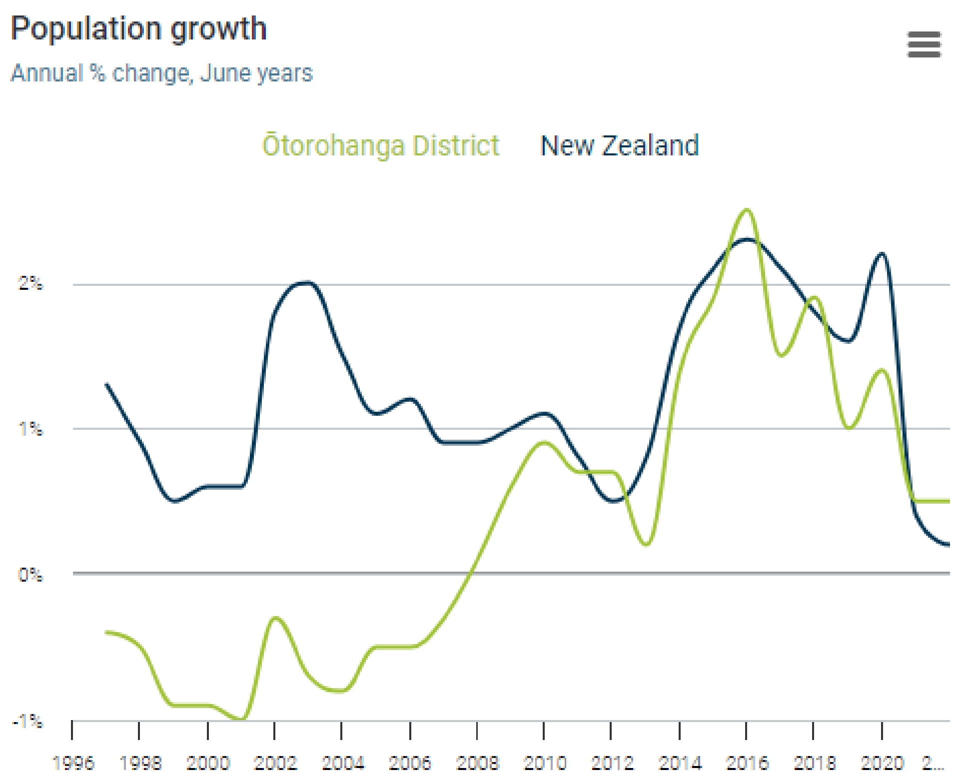


Figure 2.6: Population in Ōtorohanga District, 2006-18 Censuses

Two recent developments are expected to add to residential growth in Ōtorohanga including:

1. The completion of the Waikeria Prison expansion, this facility is to the north of Ōtorohanga and the District's comparably low land values, (against neighbouring Waipā District), will appeal to the new permanent workforce.
2. Completion of stage 1 and 2 of the NKC subdivision on Harper Ave will see the start of construction of an additional 80 dwellings and with the completion of stage 3 & 4 in 2024-25 an additional 40 homes will come online. This increase in demand for water and wastewater will be within existing plant capacities. Assets from stage 1 & 2 have been vested to Council which is the majority of the overall infrastructure for the larger subdivision.

On-going private subdivision activity is expected to yield up to 130 new housing lots within the community by 2025, which would represent an increase in housing stock of circa 10%. How quickly these new lots become occupied is uncertain. Council's previous experience has been that achieving full occupancy of new subdivisions can take 10 years.

However, offsetting the population growth potential with previous census data indicating the average number of occupants per dwelling is falling in comparison with increasing national aged demographic trends. Because of this decline in average household sizes it is estimated that the number of dwellings in the community would need to increase by approximately 0.4% per annum (5 houses per year) to maintain existing population levels.

It is these peak figures, (which are themselves limited by the accommodation capacity of the town), that effectively determine the services capacity requirements of the community.

For Kāwhia township, the number of permanent residents is estimated to be 384 people which has increased by 41 people since the 2013 census. Holiday season populations are however much higher. While accurate data is not currently available, the best assessment of the temporary peak population is in the order of 3,000 residents for the two to three weeks of Christmas, and often 2,000 during other holiday periods.

It is these peak figures, (which are themselves limited by the accommodation capacity of the town), that effectively determine the services capacity requirements of the community.

ECONOMY

Agriculture is the economic backbone of the district, with 34.8% of the district's employed population listing their occupation as relating to agriculture, forestry and fishing. It is still believed that upwards of 75% of all economic activity in the district is closely associated with the agricultural sector. The prevailing economic climate has been difficult for some of the smaller Ōtorohanga businesses, and there have been some changes to businesses in the retail and service sectors, though it is suspected that these changes have occurred without any substantial net loss or gain in total employee numbers.

Economic Insights for Ōtorohanga District from 2022:

- Among the broad economic sectors, primary industries accounted for the largest proportion of GDP (35.8%) in Ōtorohanga District, which was higher than in New Zealand (5.8%).
- Goods-producing industries accounted for the second largest proportion in Ōtorohanga District (12.2%) compared with 18.5% in New Zealand.
- High-value services accounted for the smallest proportion in Ōtorohanga District (9.1%) compared with 26.7% in New Zealand.

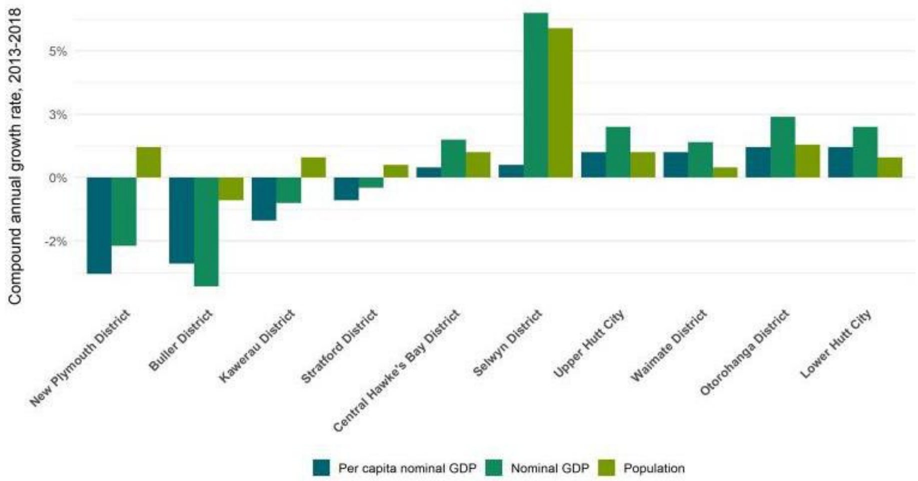


Figure 2.7 – Slowest Growing Territorial Authority Areas (2013-2018)

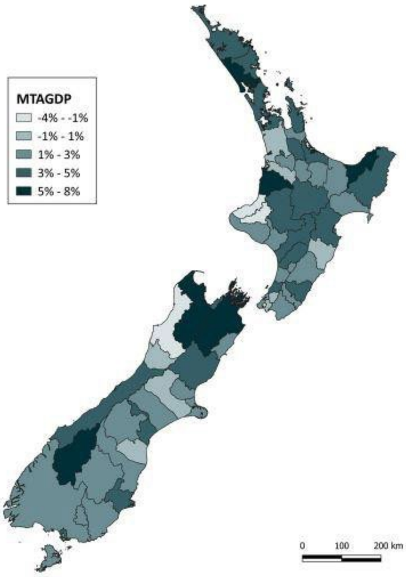


Figure 2.8 – Map of Territorial Authority GDP Per Capita Five-year Growth

2.6.2 - Water Allocation Framework

Since April 2012, Variation 6 to the Regional Plan adopted by the Waikato Regional Council, imposes a water allocation framework on the region that sets limits on how much water can be taken from both surface and sub-surface sources at certain times.

Applications to take water are processed under this framework on a 'first come first served' basis. For many areas of the region, the streams are considered "fully allocated", and as such new applications to take additional water from those sources are likely to be declined.

Council's Water Supply Bylaw, (being revised in 2024), reinforces the need for water abstracted to be used efficiently, focusing on maintaining health and enabling sustainable growth.

Water meters and volumetric charging have been in place for Ōtorohanga since 2017/18, and the 'trickle feed' Rural Water Schemes also have volumetric charging. The Kāwhia township water metering project was completed in 2023.

2.6.3 - Drinking Water Quality Assurance Rules

All significant community supplies are required to meet rigorous quality standards for potable water through the Drinking Water Quality Assurance Rules (established 2022). Previously this was the Drinking Water Standards NZ (DWSNZ), DWSNZ were replaced by the Drinking Water Quality Assurance Rules (DWQAR's) on 15 November 2022. Compliance was hard to measure against the DIA mandatory non-financial measures for the 2022/23 financial year due to the misalignment of the rules and the measures. Council is proactively upgrading treatment plants to ensure compliance with the new rules from the Water Regulator, Taumata Arowai.

Suppliers are required to ensure risk barriers are in place against microbiological, (such as *E. coli*), and protozoa, (such as Giardia).

Overall, the assessment of compliance against the Drinking Water Quality Assurance Rules 2022 has concluded that none of the six water supplies were fully compliant for all of the months from 14 November 2022 to June 2023. The Ōtorohanga Water Supply achieved full compliance at the Treatment Plant, though the two Distribution Zones of Ōtorohanga and Waipā were unable to meet the sampling requirements. This was due to not achieving the required number of free available samples per week. The correct sampling duration and number of samples per week was the cause of much of the non-compliance seen in both the Treatment Plants and Distribution Zones. These are considered technical non-compliances, rather than being due to improper overall water quality.

2.6.4 - Climate Change

Of New Zealand's 10 most significant climate change risks, based on the National Climate Change Risk Assessment, potable water supplies (availability and quality), due to changes in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise, scored as extreme. A similar score of extreme was given to risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.

Strategies for mitigation will include:

- Greater use of Business Intelligence using data captured from 24-hour plant monitoring to optimise pump run-times so they are only using energy when they need to, or mainly off-peak reducing energy consumption.
- Explore some water meters to 'internet of things' devices that provide large users with instantaneous usage information to help them proactively manage their demand wastage.
- Consider more use of renewable energy sources such as solar panels on treatment plant roofs to power non-critical assets and reduce total carbon footprint of operations.

Storage has increased to 36 hours, (mean daily average demand), across Ōtorohanga since the last LTP for urban supplies. Kāwhia currently has 72 hours storage during normal demand which is more than adequate.

Creation of 'source protection plans' in line with proposed Water Services Act 2021 are underway.

2.7 - Three Waters Reform - Local Water Done Well

Preparing our programmes for the wastewater, water supply and stormwater groups of activities have been a challenge for us in this Long Term Plan. We started the process with the expectation that our assets for the three waters would be transferred to one of the ten water management entities legislated for by the previous government and that this transfer would occur no later than July 2026. In late 2023 the incoming National Coalition Government clearly signalled that the three waters legislation would be repealed and replaced by a new regime – *Local Water Done Well*. Details of the new regime are still being worked on. To date we have been told that:

- Drinking water, stormwater and wastewater will remain in local control
- There will be stricter rules for water quality and investment in infrastructure
- Councils will need to ringfence money for water infrastructure
- New or replacement water infrastructure will be loan funded and paid back from either rates or user charges.

2.7.1 - What does this mean for us?

It's business as usual until there is more information on the government's intentions with respect to the three waters. We have updated our water asset management plans and our Infrastructure Strategy for the next 10 and 30 years respectively so we know what work needs to be done and when. We have also made provision in our Long Term Plan programmes for the ongoing management and operation of our water infrastructure by Council staff. This means re-engaging a water manager - we had left this position vacant when it was thought that the three waters would be transferred to one of the new water entities - and ensuring we have the right staff resources in place to operate and maintain the networks.

Overall, our water assets are in good shape although there is work needed in 2024 to ensure that some of our rural water supply schemes comply with government drinking water standards (Taumata Arowai). The accelerated programme of works we started in 2021 has been hugely important for the district. It has enabled us to catch-up on renewing assets that are worn out and increase the capacity of these assets to give us some head room for growth.

2.7.2 - Costs

At this stage, we are not anticipating having to build new assets or undertake any major improvement works of existing assets. However, we are budgeting for more loans to help pay for assets when they need replacing as our depreciation reserves are unlikely to be big enough to cover these costs. This will mean that we will have a bigger debt to service in the future for some water schemes.

Water use charges for Ōtorohanga residents will increase on average X% per annum for the next three years. This is to cover increased costs due to inflation for the treatment and supply of clean drinking water.

2.7.3 - Looking into the Future

Until we have more detail about *Local Water Well Done*, it is difficult to determine Council's future role in water management. However, once these details are made public, we will utilise the channels we have available nationally and regionally to participate in the discussions on your behalf to help ensure that the government's proposals are workable at the local level.

Roading is our backbone and water is our lifeblood - we know these things don't come cheaply. We expect that as the environmental and health standards for the delivery of quality water services continue to rise so too will the cost to customers. Finding efficient, affordable ways for the delivery of water services is an issue we share with our neighbours and we will be encouraging ongoing regional conversations around making improvements. This may mean joining with others to get better economies of scale in the delivery of services.

3.0 Asset Management Practices

3.1 - Asset Management Criteria

The six most important criteria for asset management planning, as identified in an NZIER study, are listed below along with Ōtorohanga District Council's current self-assessment:

Table 3.1: Criteria for Asset Management Planning

Objective	Information Summary	Self-Evaluation
1. Obtain financial information that accurately indicates the current investment in the potable water supply.	Financial information based on accurate records and independent review of valuations.	High degree of confidence. 'Highly Reliable'.
2. Obtain data that indicates the age, condition and performance of the potable water infrastructure services.	Age and performance records are good; information on the condition of the infrastructure is based on historical data and scientific research rather than in situ condition assessments.	Fair degree of confidence. 'Less Reliable'.
3. Obtain information on the setting, delivering and measuring levels of service and compliance for potable water infrastructure services.	Levels of service and compliance are stringently monitored by the Waikato District Health Board and Waikato Regional Council.	High degree of confidence. 'Highly Reliable'.
4. Obtain information on processes that forecast future demand for potable water infrastructure services.	Population forecasts suggest limited population growth in the district hence future water demand is based on current usage figures with any growth offset against savings in water usage and reducing unaccounted for water.	High degree of confidence. 'Highly Reliable'.
5. Identify the governance model adopted to oversee the delivery for potable water infrastructure services (including delegated authority).	Strong governance model is in place via Community Boards and Council.	High degree of confidence. 'Highly Reliable'.
6. Identify the service delivery mechanisms being used in the potable water infrastructure services.	Established water schemes with delivery methods and infrastructure clearly defined.	High degree of confidence. 'Highly Reliable'.

3.2 - Data Provision Process and Systems

Asset information is captured and stored in the AssetFinda software programme. AssetFinda is an advanced Asset Management System that utilises three key interfaces: Web, GIS and mobile devices e.g. iPad's and smart phones, to help us improve our asset management practices. AssetFinda is fully compliant with National Asset Management Standards (NAMS) and national asset accounting standards.

Ōtorohanga District Council has also invested in a dedicated Asset Team to ensure the asset management system and planning around it are fully utilised. The flow chart below shows the process used to check and capture information related to service requests for non-routine maintenance.

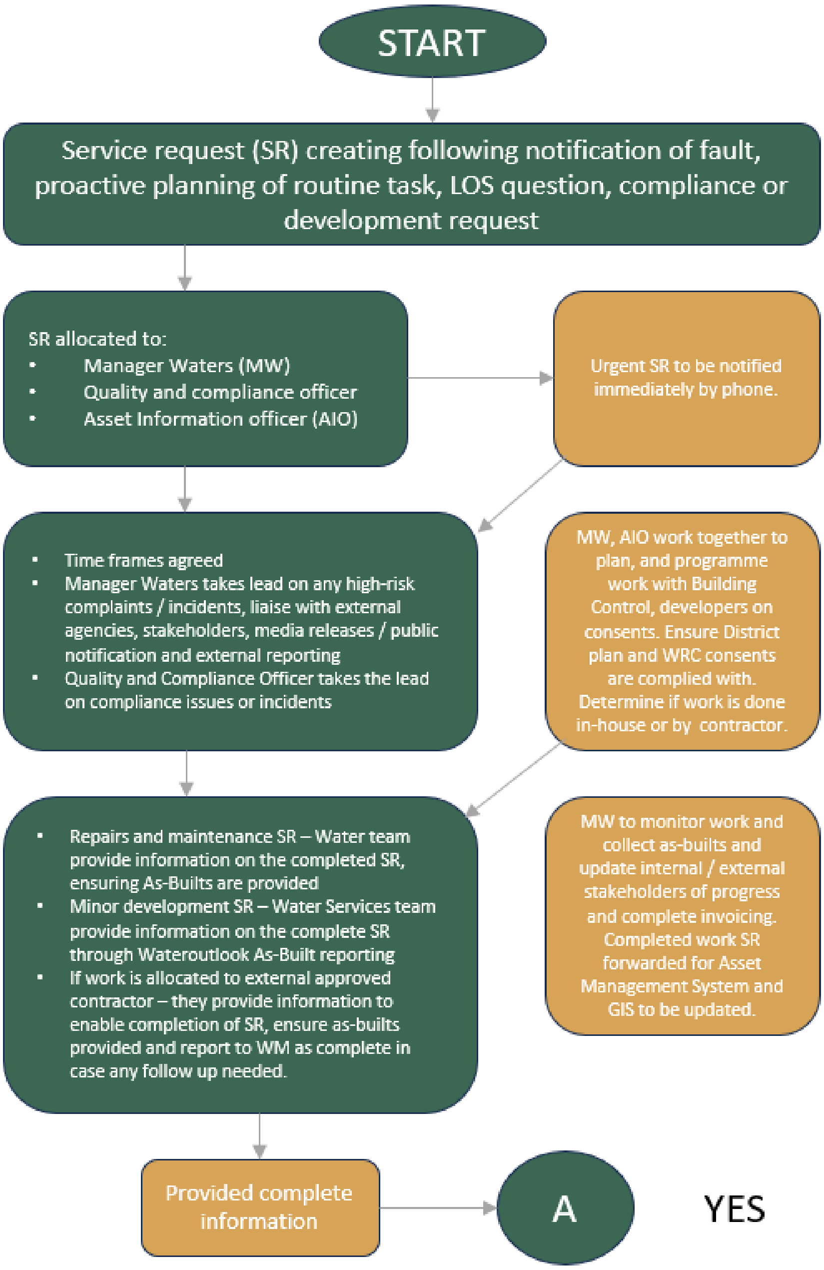


Figure 3.1 - Service Request Processing for Water Services

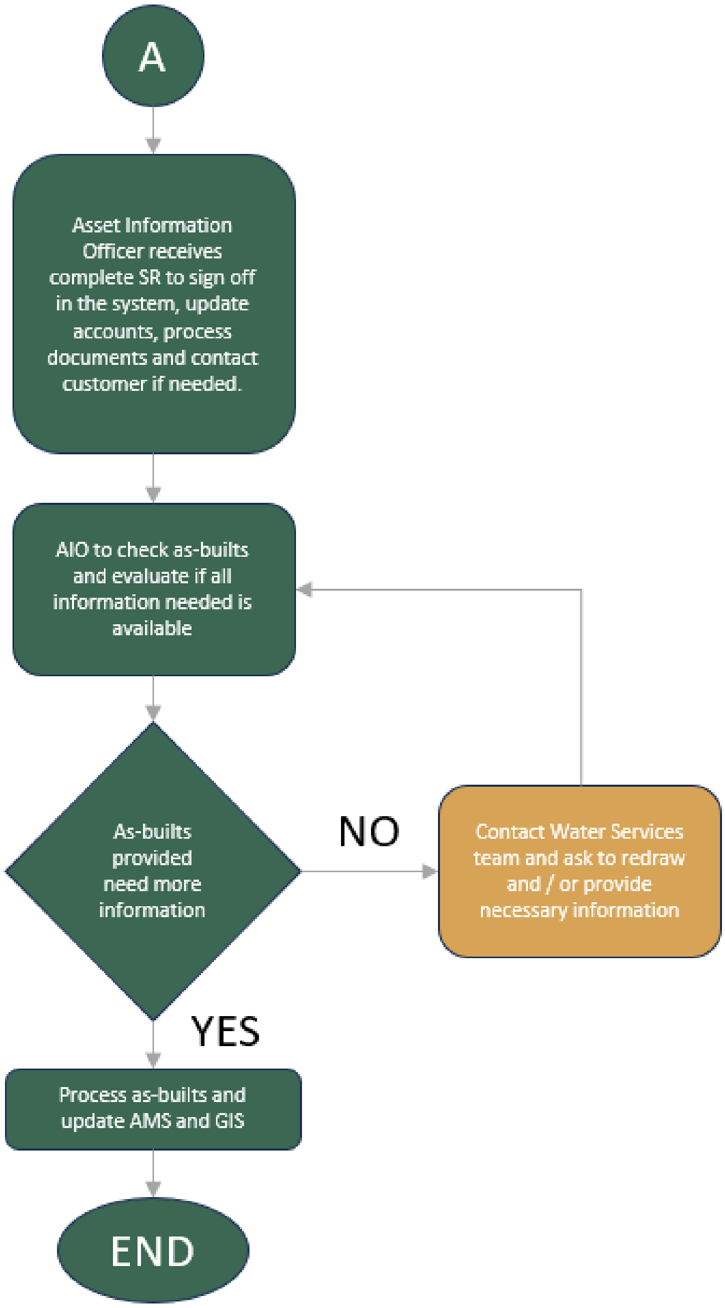


Figure 3.1 – Service Request Processing for Water Services (continued)

3.3 - Definition and Management of Critical Risks

3.3.1 - Critical Risks

Risks that would have a significant impact for the water supply, based on ability to meet published levels of service, and detrimental effect on users include:

Table 3.3.1.: Management of Critical Risks

Event	Controls in place or proposed
Breach of Drinking Water Quality Assurance Rules leading to contamination of either *E. coli* or Protozoa.	Continuous monitoring of water quality through plant, interventions in place for loss of protozoa controls or Chlorine effectiveness. External sampling carried out, results monitored by District Health Board.
Failure of raw water intake or supply line.	Increased water storage to 36 hours and critical infrastructure identified and replaced.
Failure of critical bulk water main from reservoir.	Assess feasibility of installing automated 'high flow' earthquake valves along with flexible connection to reservoir.
Backflow failure into reticulation, or leak on high use property.	Backflow Policy developed and improved carrier filling station
Poor quality raw water leading to inability to produce suitable quantities of compliant treated water.	Ability to run off storage for a period of time while river conditions improve
Loss of treatment plant operation due to natural hazard such as earthquake or significant power outage.	Increase treated water storage, ensure plants have 24 hour automated standby generator capacity especially for microbiological and protozoa risk barriers, that is tested annually.

3.4 - Programme / Project Prioritisation of Renewals

Council's process to programme and prioritise renewals is as set out below:

Figure 3.2 - Process Flow for Programming and Prioritising of Renewals

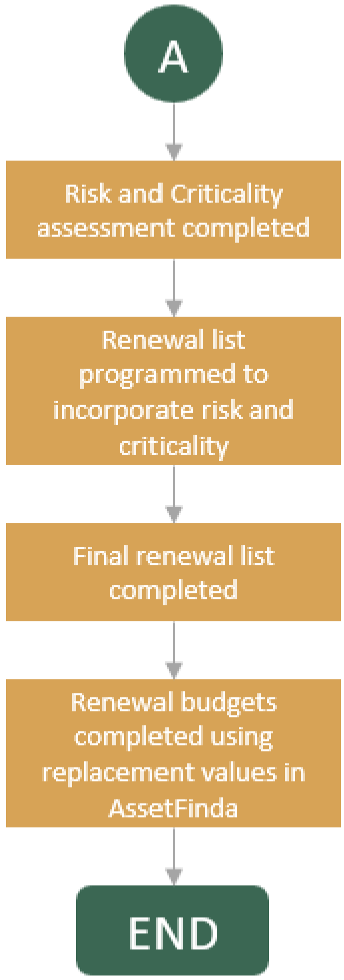


Figure 3.2 - Process Flow for Programming and Prioritising of Renewals (continued)

3.5 - Valuation Practices and Process

Valuations have been completed in accordance with the following standards:

- New Zealand International Accounting Standard No 16 (NZIAS 16).
- New Zealand Infrastructure Valuation and Depreciation Guidelines, issued by the National Asset Management Steering Group (NAMS) of Ingenium.

Process used for the valuations is as follows:

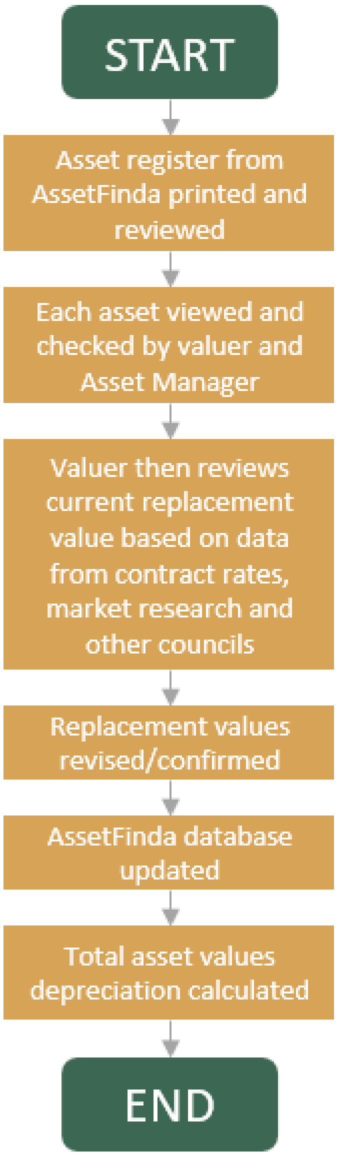


Figure 3.3 - Process Flow for Valuations

All asset records stored in the Univerus Assets database are subjected to a site verification to check that the asset exists and its key attributes are correct.

Regular auditing queries are run to check data in key attribute fields to enhance data integrity, this includes size/dimension, installation date and material type and to check for unit rate and base life consistency across each asset or component type. Unit rates are determined by analysing the previous valuation and applying inflation rates, analysing current contract rates and considering supplier cost increases over the period.

3.6 - Financial Forecasts

Financial forecasts of expenditures and revenues related to water supply activities are developed by Council staff within the NCS MagiQ financial management system.

Inputs to the forecasting process are provided by appropriately skilled Council staff, or where considered necessary, by appropriate external specialists.

The developed forecasts are scrutinised by both senior Council staff, Council's elected members and Council's auditors.

Previous evidence suggests that the forecasting process is robust, and has contributed to Council's water supply services being delivered in a cost-effective manner. See appendix 1 & 2 for OPEX and CAPEX budgets.

3.7 - Performance Measures

Council uses the mandatory performance measures in the Local Government Act to report annually to the community on the performance of water supplies.

Key performance measures can be split into three categories:

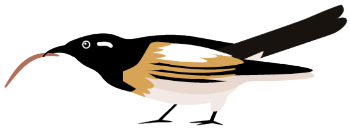
- Financial
- Health
- Environmental

Financial measures are initially assessed by the effect that expenditure has on rates and metered water charges to ensure budgeted expenditure is acceptable and then by measuring actual costs against budgeted costs. This is closely monitored internally on a monthly basis and by the Council's elected members on a quarterly basis.

Health impacts are annually audited by an independent external expert. Their 2022-23 report outlined several non-compliances due to technical interpretation of the DWAR's and their relation to the DIA mandatory measures.

Environmental performance is assessed annually by Waikato Regional Council staff, relating to consented abstraction. Increasing levels of usage by the Rural Water Schemes are resulting in 'letters of direction' to ensure daily limits are complied with. Greater compliance would require the Rural Water Committees to ensure they actively monitor their demands and ensure users have adequate storage on-site to avoid 'emergencies' to cater for stock drinking needs.

There are fully functional working relationships between Council staff and all of the above parties.



4.0 - Levels of Service

4.1 - Customer Expectations

Improved storage and reticulation systems and reticulation maintenance, (including regular flushing programmes), has reduced recorded complaints of 'dirty' water that previously occurred on the Kāwhia, Tihiroa and Ōtorohanga schemes. Improved reticulation management issues have solved some of the complaints of poor supply pressure in the RWS schemes, although there is an on-going need for users to ensure they have adequate on-site storage to reflect the 'trickle feed' supply.

Overall, very few complaints are received in respect of water supply or quality, the only significant exception being in the past to the taste and smell of water from the Ōtorohanga supply during very dry periods in summer when the Waipā River falls to low levels. During the last LTP, Council invested and installed an activated carbon plant to resolve the taste and odour issues.

4.2 - Technical Levels of Service

Table 4.1: Water Supply Technical Levels of Service

	Service Characteristic	Performance Indicator	Target Level of Service	Performance results
1	Safety of drinking water	DIA Mandatory measure: The extent to which the local authority's drinking water supply complies with: Part 4 of the drinking- water standards (bacteria compliance criteria); and Part 5 of the drinking- water standards (protozoal compliance criteria).	No public health Incidents related to drinking water quality	2022/23 result - Partially achieved. The year was split into two using both the DWS & DWQAR's. Ōtorohanga and Kāwhia were both partially non-compliant due to technical issues with the sampling schedule.
2	Maintenance of the reticulation network	DIA Mandatory measure: The percentage of real water loss from the local authority's networked reticulation system (including a description of the methodology used to calculate this).	Of the annual volume of water produced through the treatment plants, the volume that remains unaccounted for (whether leaks, unauthorised takes, flushing or firefighting), reduces year to year and <30%	Unaccounted water in Ōtorohanga and Kāwhia is still higher than expected. Water meters, plant upgrades and water main renewals are showing improvements in Kāwhia. Ōtorohanga requires leak detection methods to be implemented to understand the high levels of unaccounted water.

Table 4.1: Water Supply Technical Levels of Service (continued)

	Service Characteristic	Performance Indicator	Target Level of Service	Performance results
3	Fault response times:	DIA Mandatory measure: Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured: Time between call and site attendance for urgent and non-urgent call-outs: Time between call and actual resolution of urgent and non-urgent call-outs	Median response time to: Urgent call-outs (<3hr 55mins) Non-urgent call-outs (<26hr 20mins) Median resolution times for: Urgent call-outs (<18 hrs) Non-urgent call-outs (<31 hrs)	2022/23 results Response times: Urgent call-outs (1.05 hrs) Non-urgent call-outs (4.65 hrs) Median resolution times: Urgent call-outs (1.65 hrs) Non-urgent call-outs (4.95 hrs)
4	Customer satisfaction	DIA Mandatory measure: The total number of drinking water complaints per 1000 connections received by the local authority about any of water clarity; water taste; pressure or flow; continuity of supply; and the local authority's response to any of these issues	≤5 complaints	19 complaints for 2022/23 year
5	Demand Management	Average consumption of drinking water per day per resident within the Ōtorohanga District	390L per person per day	Ōtorohanga: 290L person/day Kāwhia: 193L person/day

5.0 - Council Administered Water Supplies – General Information

5.1 - Nature of Activity

Ōtorohanga District Council owns and administers two urban water supply schemes for Ōtorohanga and Kāwhia, and four Rural Water Supply (RWS) schemes (Arohena, Tihiroa, Ranginui and Waipā), mainly for agricultural purposes. Estimated usages of water produced by the various supplies are listed in the table below:

Table 5.1: Estimated Usage of Water (as % volume)

Estimated Usage of Water (as % volume)				
Water Supply	**Domestic**	**Industrial / Commercial**	**Farm Stock**	**Irrigation (sports fields)**
Ōtorohanga Community	70	23	5	2
Kāwhia Community	90	10	nil	nil
Waipā RWS	15	nil	85	nil
Tihiroa RWS	8	nil	92	nil
Arohena RWS (overall)	8	nil	92	nil
Ranginui RWS	nil	nil	100	nil

Issues discussed in this section are generally relevant to all of these supplies, though Ranginui is a non-potable supply, as reflected in the table above.

The urban and rural schemes differ in that the urban schemes are 'on-demand' pressure supplies, capable of providing adequate fire-fighting water flows direct from reticulation, whilst the rural schemes are designed to work on the flow restricted 'trickle feed' principle, whereby smaller continuous flows of water are provided, requiring use of on-site storage to meet instantaneous demand.

5.2 - Rationale for Delivery of Activity

Having established reticulated water services to the urban communities of Ōtorohanga and Kāwhia and to some rural areas, to enable growth and prosperity, the Local Government Act 2002 imposes significant obligations on Council to continue this activity.

Council's water supplies are relevant to the following broad desired community outcomes:

- Liveable
- Resilient
- Connected
- Prosperous
- Sustainable

5.3 - What is the Extent of Council's Responsibility?

With the establishment of Taumata Arowai and the Water Services Act 2021, there is a clear directive that with everything Council does in the water space, we must give effect to Te Mana o te Wai. Te Mana o te Wai is best described as the Korowai that sits above all things water, and Council services will need to have this message as part of our planning going into the future.

Overall, Council is responsible for ensuring a reliable and compliant supply of potable water to the urban communities of Ōtorohanga and Kāwhia, and being clear on the quality of the water to those rural areas where water supply schemes have been established. To do this, Council:

- Undertakes strategic planning, asset management, operations and associated supervision and administrative activity, including charging for water.
- Co-operates with Taumata Arowai as the mandated water regulator to ensure that treated water meets relevant standards.
- Ensures compliance with the operative Regional Plan for consents for this activity issued under the Resource Management Act 1991.

5.4 - Potentially Associated Negative Effects

Potential significant adverse effects of water supply activities are health (if the supply of potable water to the consumers' point of supply does not meet the Drinking Water Quality Assurance Rules), environmental (water abstraction, discharge of backwashed water), and economic (costs imposed annually on ratepayers to provide the required budgets for meeting legislative standards and resilient infrastructure).

To enable Council to give effect to Te Mana o te Wai, we must continuously seek efficiency in the usage of water and unaccounted for water.

As costs to deliver compliant water services increase, (as more obligations and reporting requirements are imposed on Council), some RWS customers may seek to withdraw from the schemes, which may make the existing supply schemes unaffordable in favour of other private supply arrangements. This would be a backward step in providing safe drinking water as some users may return to lesser quality of water as a result. The sustainability of the schemes relies heavily on volume of users.

5.5 - Water Source Chemistry

The water sources providing raw water to Council's supplies are variable, but testing has shown no significant chemical or radiological components that require monitoring or control. The Water Services Act 2021 adds to the level of monitoring, testing and reporting that Council must do, including developing 'source protection plans' to ensure the plants have the technical capacity to successfully 'treat' and supply water in compliance with standards.

5.6 - Asset Information

Information on Council water supply assets is reliant on two main sources - these being a GIS based 'AssetFinda' Asset Management System and a NCS MagiQ electronic document handling system. The quality of spatial information on water pipes is now considered to be good, with more than 95% of pipes accurately recorded.

5.7 - Asset Condition

The earliest reticulated community water supply infrastructure in the Ōtorohanga District was established in Ōtorohanga in the 1930s, but all elements of this first infrastructure have now been replaced.

The majority of current water treatment and supply infrastructure in Council's water schemes was established between 1959 and 1986, with the oldest remaining assets generally being asbestos cement ('AC') water mains in Ōtorohanga.

Most significant water supply assets are generally believed to be in good condition, but during the past two or 3 years a number of AC mains are reaching the end of their useful life and renewals of the older mains is underway with 5.8km of AC pipes renewed in the last 3 years.

5.8 - Rural Water Schemes (RWS) and Conditions of Supply

The rural supplies were established through intensive development in the 1980's by farmers taking advantage of central government subsidies that were available at that time. The areas supplied by the RWS schemes are limited to those properties for which an appropriate capital contribution has been paid, and these areas are formally defined through Gazetting.

Whilst the assets of the RWS schemes are vested in Council, farms connected paid significant capital contributions when the schemes were established. This creates a challenge where some supplied properties believe their contribution should equate to ownership rather than just being involved in the decision making process and making recommendations. Council will continue to involve the RWS committees in the management of the schemes. Discussions during the 3 waters reform process revealed that the committees were more concerned with input into the operations of the schemes rather than the ownership, with the responsibility of suppling water remaining with Council.

Some key terms and conditions of supply that apply to those connected for these schemes include:

- Available flows to all connections to be limited by orifice flow restrictors. Size of the orifice being based upon demand projections for individual properties at the time of scheme commissioning. The restrictions have been relaxed over many years and will need to be reintroduced over the next LTP.
- All private reticulation is to be isolated from public reticulation by an air gap or other approved backflow prevention device.
- All customers required to have on-site water storage capacity adequate for 24 hours' consumption at peak demand rates under restricted flow
- No assurance of continuity of supply is given; if a property requires continuous supply they are responsible for providing the necessary back-up arrangements.
- Customers required to notify Council of any substantial changes in demand for water; large increases in demand, combined with adjustment or removal of restrictors may result in localised water shortages.
- Defined range of measures in response to non-compliance with terms and conditions.

5.9 - Water Services Delivery

Ōtorohanga District Council uses an in-house team of five water services operators rather using contracted external suppliers. Whilst predominantly operators of the treatment plants, this team can deal with minor but urgent matters such as locating tobies, fixing small leaks and responding to service requests. Costs for the in-house service are lower than previously invoiced annually by contractors, and more importantly ratepayers value the 'ownership of the network' these staff provide.

In addition, there is greater supervision and management control over the daily tasks, responses to emergencies, flexibility and a decrease in administration in the absence of contract preparation and management. The latter allows engineering staff to apply time to the growing demands of the Drinking Water Quality Assurance Rules and the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

More and more the water services team are spending more time with plant operation than reticulation and this has led to a considerable amount of work being contracted out to local firms, such as the larger or more complex repairs, development and renewals. Traffic Management requirements has made repairing small leaks within the roads far more complex, more expensive and time consuming for the water services team to deal with within the normal daily tasks.

5.10 - Demand Trends

The 5% increase in housing numbers in Ōtorohanga recorded between 2013 and 2018 does not coincide with an increase in water consumption, mainly due to the installation of water meters and imposing volumetric charging in the same period. Over the next 10 years once Westridge subdivision is fully built up we could see an increase in demand of up to 150m^3 per day, the supplies are considered to have sufficient capacity to meet demand for the next 10 years.

5.11 - Drinking Water Quality Assurance Rules (DWQAR) Compliance

The externally provided 2022-23 DWQAR Compliance Report notes:

An official assessment of the performance of Ōtorohanga District Council as a 'water supplier', against the Drinking Water Quality Assurance Rules, and the Water Services Act 2021 has been completed for the period 1 July 2022 – 30 June 2023. This was a complicated reporting period due to the change from the Drinking Water Standards to the Drinking Water Quality Assurance Rules did not change until 15 November. This meant that there was the need to report against both sets of rules when the DIA mandatory measures reflect the DWSNZ.

5.11.1 - Drinking Water Standards NZ

Overall, the Council's performance over the compliance period is slightly worse than previous years in accordance to the DWSNZ, with the exception of the Ōtorohanga Water Treatment Plant, which through the hard work of council staff was able to achieve full compliance for six months of the compliance year. Unfortunately, Kāwhia, Tihiroa and Arohena Treatment Plants, could not achieve bacterial compliance with Criterion 2B, DWSNZ. This was due to turbidity events throughout the compliance year. Protozoa compliance also was not able to be demonstrated for these two treatment plants.

All distribution zones achieved full compliance in accordance with section 4.3.1: criterion 6A apart from Ōtorohanga zone due to sampling intervals.

The full compliance report is attached as Appendix 3

5.11.2 - Drinking Water Quality Assurance Rules

Overall, the assessment of compliance against the Drinking Water Quality Assurance Rules 2022 has concluded that none of the six water supplies were fully compliant for all of the months from 14 November 2023 to June 2023. The Ōtorohanga Water Supply achieved full compliance at the Treatment Plant, though the two Distribution Zones of Ōtorohanga and Waipā were unable to meet the sampling requirements. This was due to not achieving the required number of free available samples per week. The correct sampling duration and number of samples per week was the cause of much of the non-compliance seen in both the Treatment Plants and Distribution Zones. These are considered technical non-compliances, rather than being due to improper overall water quality.

Council has undertaken some significant work in the past few years to provide potable water to the residents of the district. The treatment in place is more than capable of producing high quality treated water, (apart from the Arohena treatment plants), and once the minor technical issues have been resolved, then Ōtorohanga, Kāwhia and Tihiroa water supplies can be fully compliant.

The situation regarding the rural water supplies is very different, as the treatment systems are effectively unable to meet compliance with the DWQAR's, particularly in respect of protozoa. As of February 2021 following a positive *E. coli* result in Arohena, the Arohena Rural Water Scheme are now under a permanent Boil Water Notice.

The full compliance report is attached as Appendix 4

For each of the schemes the options available to meet the Drinking Water Quality Assurance Rules are:

- Significantly upgrading existing treatment plant(s), or constructing entirely new treatment plant(s) recognising the equipment and staffing resource to reliably achieve DWQAR compliance would require central government funding to be achievable; or
- Restricting the use of the existing RWS supply(s) to the provision of non-potable water for agricultural purposes only.
- Cease operation of the supply entirely.

Pragmatically, Options 1 and 2 were most likely under the proposed reform of Drinking Water supplies in NZ, following the new government's 100 day plan to repeal the Three Waters Reform the RWS committees will need to revisit this.

In terms of decisions in the LTP, each RWS committee will be consulted on the plans going forward which may require significant investment over the next 3 years. The overall responsibility sits with Council as the network supplier.

Achieving compliance with the DWQAR's will undoubtedly place increased financial burdens on all Rural Council administered water schemes, and unless Council moves to district wide scheme funding, the impact will be greatest on the smaller rural schemes, regardless that they consume water primarily for farm stock. It is also unfortunate that for the rural treatment plants, achieving compliance with the DWQAR's will not eliminate all of the most significant health related risks associated with these supplies, since the issues of potential on-site contamination will not be addressed. The diagram below highlights the various ways houses in these rural water supply areas obtain their water:

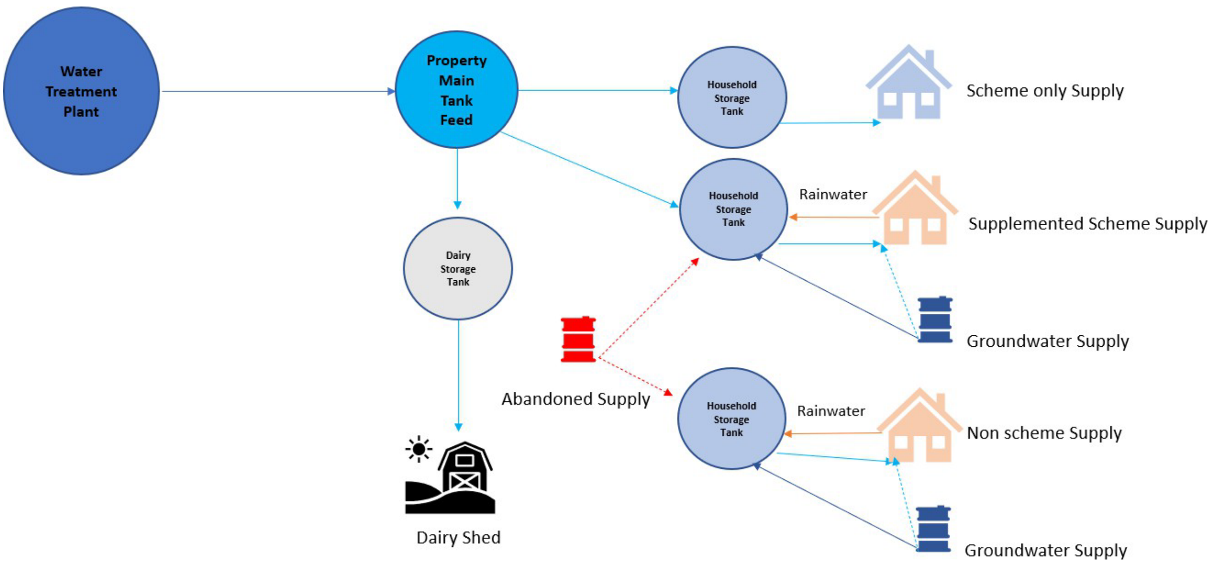


Figure 5.1: Various Ways Houses in these Rural Water Supply Areas Obtain their Water

It has been Council's experience that significant health related issues are more likely to arise within private reticulation on farms than in the 'public' water treatment and reticulation components that will be affected by imposition of the DWQAR's. Observed on-site contamination issues have included introduction of chemical stock dosing into household water supplies, insecure storage tanks (occasionally containing dead animals or birds), and cross-connection of cattle troughs to household supplies.

5.12 - Maintenance and Renewal Strategies

Council's strategy towards water supply asset maintenance and renewal can be summarised as follows:

Water treatment plant and pump station assets: These assets have been proactively upgraded to meet the Drinking Water Quality Assurance Rules through continued locally funded investment. All assets receive routine planned maintenance, and except for critical water safety assessment tools such as Chlorine Analysers or UV bulbs that are replaced as per manufacturers recommendations, components are replaced typically based upon evidence of impending failure, or other observed performance deficiencies.

The annual Drinking Water Compliance report notes enhancements to Protozoa compliance are required for Ōtorohanga Rural Water Schemes, which aligns with projects proposed in the draft LTP.

Water reticulation assets: Water mains and associated valves and hydrants receive programmed maintenance such as periodic flushing (pipes) and open-close operation (valves). Renewals of these items are based upon observed performance deficiencies (i.e. pattern of mains or lateral failures, valve leaks), or other evidence of advanced deterioration. An example of this latter criteria has been Council's on- going programme to replace all existing known old (circa 1930) concrete water mains in the Ōtorohanga community, which is now completed.

Since 2014, the water services team have used an Asset Information Officer (previously Technical Services Officer), whose principal role is to make use of asset management software to manage asset management and replacement in a more effective manner. This improvement has been driven by a desire to meet level of service requirements and more effectively manage operating and maintenance costs.

Increasing the use of this formal asset management system to reduce the risk associated with relying heavily upon the knowledge and experience of relevant staff and contractors to identify maintenance and renewal requirements is of strategic importance.

Verifying, correcting, and improving the data contained in the AssetFinda system has enabled staff to align renewal budgets with long-run averages in a scientific manner thus improving budgeting accuracy and confidence levels.

5.13 - Health Risk Assessments

Taumata Arowai requires a more proactive approach that requires significant water supplies to be fully characterised, risks identified, and a comprehensive strategy for managing those risks presented via Water Safety Plans (WSPs).

Council currently has two comprehensive WSPs, for the Ōtorohanga and Kāwhia supplies and are integral to this AMP. These are under review and updated by an external expert to ensure they are still relevant and fit for purpose.

For the rural water supplies, significant health risks have been previously identified, and many of these have been progressively resolved through improvements to infrastructure and operating practices. These include the introduction of chlorine disinfection to the Taupaki supply of the Arohena RWS, and the conversion of the Ranginui RWS to a non-potable supply. These rural schemes have smaller, less comprehensive WSPs. These will need to be updated to meet requirements of DWQAR's in the first year of this LTP.

Despite these improvements, none of Council's rural water supplies have the barriers against protozoa that are required by the DWQAR's, and it has been assessed as being impractical to modify the existing water treatment plants to provide protozoa barriers to the required standard without external funding support. As a result of these lack of barriers, the Waikato DHB imposed a permanent boil water notice on the Arohena Rural Water Schemes from February 2021.

5.14 - Adopted Processes and Standards for Work on Water Assets

The following general policies, processes and standards are routinely adopted to minimise health risks in relation to Council administered water supplies:

- Regional Infrastructure Technical Specification (RITS)

  Council requires developers to apply the Regional Infrastructure Technical Specification (RITS) developed jointly by councils in the Waikato region. This works well for greenfields development, and recognising that some development is of in-fill or intensification type, we also adopt the following processes:

- Authorisation to Work on Council Mains

  Work on Council water mains may only be conducted by contractors who have been approved by Council following agreement on Health and Safety processes along with having the equipment and competency to ensure the work is in accordance with standards specified by Council.

- Shut Down Procedures

  Any work or situation that very significantly interrupts Council's water services is managed in accordance with Council's water shut-down procedures. These specify requirements in respect of planning, application, approval, public notification, and management of the shutdown event. Any major shutdowns must be authorised by the Council's Chief Executive Officer. The Council holds a confidential list of properties requiring specific water needs, for example constant supply for kidney dialysis equipment.

- Testing and Disinfection – New Mains

  Inspection and testing of new water mains or completed major repairs to existing mains is undertaken by experienced Council services staff. Water mains are not connected or put into service until all tests and approvals are given by Council and supervised flushing of the service is undertaken.

- Backflow Prevention

  Council is updating its Water Bylaw to ensure the requirements on Backflow Devices will align with the Building Act 2004, Water Services Act 2021, and any future changes to legislation. Currently new or modified water connections requiring backflow prevention are addressed at the time of application/installation or through the Building Consent process.

  All rural water supply connections are required to have an air gap separation into a tank or another approved form of backflow prevention device, usually simple non return valves. These are inspected for compliance.

- Health and Safety, Signage and Security

  As required by the Health and Safety at Work Act 2015 and Council's Health and Safety Policy, health and safety inspections are integral to day to day operations. Staff receive training and support to enable identification and timely resolution of significant issues. Council has a Health, Safety and Wellbeing Advisor who works with Water Services staff to identify and manage risks.

  Plants and premises have a security lock system along with clearly visible warning signage. Only approved persons are permitted into treatment areas and must follow clear and well-documented procedures. Where possible valves and other accessible controls are installed in a manner that restricts potential for malicious tampering.

- Water Take Agreements

  A limited number of contractors currently have approval to take 'bulk' quantities of water from Council mains on a commercial basis. All applications for Permits to Take Water from Fire Hydrants are received and approved by the Assets Team. Such approval is reviewed annually and is governed by a strict set of conditions intended to reduce potential for associated hazards such as backflow or other contamination of the potable supply, as demand increases a designated fill point will be required.

- Infectious Diseases

  Council requires that persons working with sewerage are tested and inoculated for Hepatitis and other infectious diseases and that any contractor or staff member infected with such disease is excluded from contact with water services.

- Cross Contamination – Water and Wastewater

  Council requires all contractors working on water and wastewater services to follow the Hygiene Code of Practise to ensure contamination is not carried from sewage to the water system. This includes appropriate delays between working on the two services and use of separate sets of water and wastewater tools.

5.15 - Water Fluoridation

Fluoride is not currently added to any of the Council administered water supplies. Addition of fluoride is not simple and may be expensive but appears to have significant benefits in respect of dental health, but is also the subject of strong public contention, on the basis of other perceived possible adverse physical effects.

In November 2022 the Ministry of Health wrote to 27 Local Authorities outlining they were actively considering a potential directive to fluoridate, under section 116E of the Health Act 1956, Ōtorohanga District Council was one of those being considered. As at September 2023 this still remains under active consideration due to further considering the impact of several wider factors including Three Waters Reform and capacity across the sector.

Council has received a few requests from individual residents for fluoridation of water, but it is also known that there would be widespread opposition to such measures, and that surveys undertaken by other local authorities have shown a strong majority against the addition of fluoride. As such, Council does not at this time intend to pursue the issue further, unless directed to do so by central government.

Currently there is no consideration in the future plans to fluoridate the Council water supplies.

5.16 - Raw Water Allocation

All of Council’s water supplies are required to hold Resource Consents from the Waikato Regional Council (WRC) in respect of taking water from surface sources. Increasing development throughout the region has resulted in more demand to access raw water, and in response to this Waikato Regional Council has put in place a ‘water allocation’ framework that will ensure that available water resources are fairly and effectively allocated to the various parties requiring water.

The allocation model adopted by WRC considers that the quantity of water currently taken, (or proposed to be taken in the near future), from the upper Waipā River or its tributaries by existing users during the period between October and April is at the limit of what is sustainable without significant adverse environmental effects. As such it is not currently possible to obtain resource consents to take additional water from these sources during these months.

Whilst the quantities of water that Council is consented to take from the Waipā River for the Ōtorohanga and Tihiroa water supplies are sufficient for current and probable near-future needs, it is of concern that if there was substantial increased demand for water from either of these sources, the inability to take more water from the river during the October to April period would pose a significant constraint on the ability to meet this demand.

Government funding received in 2021 allowed Council to explore alternative water supplies for Ōtorohanga. The first was drilling for an underground source, this was not successful and abandoned at 200m. The second was to construct 380,000 m^3 earth dam on Te Raumauku Road on Council owned farmland. A feasibility study was carried out and it is feasible but determined to be unaffordable currently with early estimates between $5 - 8 million to construct. Although unaffordable it is still considered a viable option of additional water storage for Ōtorohanga in the long term.

Council has since built an additional 500m^3 reservoir on Mountain View Road and 2 additional 400m^3 reservoirs on the Waipā RWS to increase resilience in weather events.

5.17 - Unaccounted for Water

It is considered inevitable that some water will be unaccounted for from reticulated water supplies, either through leakage from mains or private lateral pipelines, unknown connections, meter faults or premature failure of connections such as tapping bands.

The magnitude is dependent on the extent and condition of public and private reticulation, the average working pressures in the reticulation, the standard of reticulation maintenance (potentially including leak detection surveys), and public attitudes towards water conservation, for example willingness to fix leaky taps etc. These losses or wastages in total typically account for between ten and forty percent of water produced by a treatment plant. It is generally accepted that leakage proportions below 10% are extremely difficult to achieve in anything but very small or very new public reticulation systems, urban community water losses are deemed acceptable between 15-20%.

For 2022/23 possible unaccounted for water has been assessed at 42% in Ōtorohanga, and 35% for Kāwhia. These estimates are based on a combination of comparing the water volume supplied by the water plant versus the total volume recorded by all of the water meters at the receiving properties, and measuring minimum night flows. Due to the large water loss increase for the Ōtorohanga community from 2021/22's 32% water loss, leak detection is a key project to ensure that in this 2024/34 LTP cycle the Ōtorohanga community achieves the levels of service for unaccounted for water.

Council's rural water supplies are more difficult to assess as meters tend to under-read in the very low flows at points of supply in 'trickle feed' connections. Current estimates are between 20% and 30% of the water produced by a given treatment plant is unaccounted for. These levels of losses are fairly typical of those found for 'trickle feed' supplies.

5.18 - Water Metering & Other Demand Control Measures

Council's rural water supplies have a significant element of demand control, with allocated quota of water delivered to particular properties on a metered trickle feed basis, with charges for water based wholly or in part on metered consumption, which is assessed at six-monthly intervals.

Escalating demand for water and other development issues on the rural supplies has however resulted in some circumvention of these controls, the most notable of which has been exceeding quotas and widespread removal of flow restrictors.

There has at times been elevated localised demand for water within some of the RWS schemes that has made effective supply management challenging, but it has generally been possible to resolve these issues informally without the need for stronger actions such as forcefully imposing the designed supply quotas and re-installation of flow restrictors as they were originally specified.

Installation of water meters in Ōtorohanga has been completed and volumetric charging is in place.

Demand issues in the Kāwhia community are very different, and centre on managing the peak demand over a brief period around Christmas and the New Year, when the population of the town increases dramatically. Kāwhia water meters installation were completed in 2022 but there is no volumetric charging for domestic use.

5.19 - Water Take Reporting

Since 2010 Council has been required to provide enhanced reporting of the quantities of raw water taken by its water supplies. The requirements are in essence to keep auditable daily records of the cubic metres taken using an accurate water measuring device or system that provides, or provides for, electronic storage of the data.

The measurement devices require calibration every five years. Council supplies are now fully compliant with these requirements.

5.20 - Significant Programmed Works

Below is a table identifying the significant CAPEX spend for all Water Supply Schemes for Ōtorohanga District Council planned for the 2024-34 LTP.

Project	Primary Driver	Year/s	Cost $M	Financial Data Confidence	Description and objectives of the project	Benefits/ Justification of the project	Project Stage
Renewals	End of service life/condition	2-10	$0.25 each year for years 2-10.	Staff cost estimate	Pipe renewals for all water schemes	Effective Infrastructure and service delivery	Execution
Renewals	End of service life/condition	1-10	$0.2	Staff cost estimate	Plant renewals for all RWS	Effective Infrastructure and service delivery	Execution
Renewals	End of service life/condition	1-10	$0.18	Staff cost estimate	Point renewals for all water schemes	Effective Infrastructure and service delivery	Execution
Water meter renewals	End of service life/condition	1-10	$0.3	Staff cost estimate	Renewals of water meters for all water schemes	Effective Infrastructure and service delivery	Execution
Water Main renewal	End of service life/condition	1	$0.5	Engineer estimate	Main replacements on Main North Road & Turongo St	Effective Infrastructure and service delivery	Execution
Development Sundry	Growth	1-10	$0.5	Estimate	Enable growth projects	Improvements that trigger through development	Execution
Leak Detection	Increasing water loss	1	$0.160	Consultant price	Identify issue areas for targeted renewals – Ōtorohanga scheme	Community wellbeing, complying with resource consent conditions	Execution
Tihiroa Resource Consent renewal	Resource Consent compliance	1	$0.15	Staff cost estimate	Application for resource consent expires 07/2026	Community health and wellbeing, ensuring as a water supplier we are	Initiation & Execution

						supplying safe drinking water	
Tihiroa smart meter project	Increasing water loss	1	$0.07	Staff cost estimate	Renewing water meters on Tihiroa RWS with smart meters	Community wellbeing, complying with resource consent conditions	Execution
Tihiroa high lift pumps	End of service life/condition	1	$0.06	Staff cost estimate	Renewal of Tihiroa Treatment plant high lift pumps	Effective Infrastructure and service delivery	Execution
Cannon Road Water main renewal	End of service life/condition	1	$0.1	Staff cost estimate	Pipe renewal – Tihiroa Rural Scheme	Effective Infrastructure and service delivery	Execution
Ōtorohanga Resource Consent Renewals	Resource Consent Compliance	3	$0.15	Staff cost estimate	Application for resource consent expires 10/2028	Community health and wellbeing, ensuring as a water supplier we are supplying safe drinking water	Initiation & Execution
MEICA renewals Network & Plant	End of service life/condition	1-10	$0.21	Staff cost estimate	Mechanical, Electrical, Instrumentation, Controls & Automation renewals for all water schemes	Effective Infrastructure and service delivery	Initiation & Execution
Ōtorohanga Water Treatment Plant – Clarifier Upgrades	LOS	4	$0.30	Staff cost estimate	Water Treatment plant Clarifier Brentwood Tubes upgrade.	Community health and wellbeing, ensuring as a water supplier we are supplying safe drinking water	Planning
Ōtorohanga Water Treatment Plant – staff facilities upgrade	End of service life/condition	1	$0.09	Staff cost estimate	Upgrade of the office facilities at the Ōtorohanga treatment plant	Improvements	Execution
Designated carrier fill station	LOS	2	$.05	Staff cost estimate	Upgrade of current water take hydrant to include backflow and monitoring	Community health and wellbeing, ensuring as a water supplier we are supplying safe drinking water	Execution
Ōtorohanga Treatment Plan – Filter media renewal	LOS	5 & 10	$0.2	Staff cost estimate	Replacement of Sand filter media in Y5 & filter roses in Y10	Effective Infrastructure and service delivery	Execution

Ōtorohanga & Kāwhia Treatment Plant Pump renewals	End of service life/condition	1-10	$0.175	Staff cost estimate	Renewal of pumps at Water Treatment Plants	Effective Infrastructure and service delivery	Execution
Sundry Renewals	End of service life/condition	1-10	$1.55	Staff cost estimate	General budget for renewal for all water schemes	Effective Infrastructure and service delivery	Execution
Sludge Pond Backwash discharge	LOS	2	$0.05	Staff cost estimate	Disposing of Backwash pond sludge	Community health and wellbeing, ensuring as a water supplier we are supplying safe drinking water	Execution
Treatment Plant H&S Improvements	End of service life/condition	1-10	$0.05	Staff cost estimate	General H&S improvements for Kawhia and Otorohanga Plants	Improvements	Execution
Building Improvements	End of service life/condition	1-10	$0.03	Staff cost estimate	General Building improvements for Kawhia and Otorohanga Plants	Improvements	Execution
Turbidity meter renewals	End of service life/condition	6	$0.04	Staff cost estimate	Renewal of turbidity meters	Effective Infrastructure and service delivery	Execution

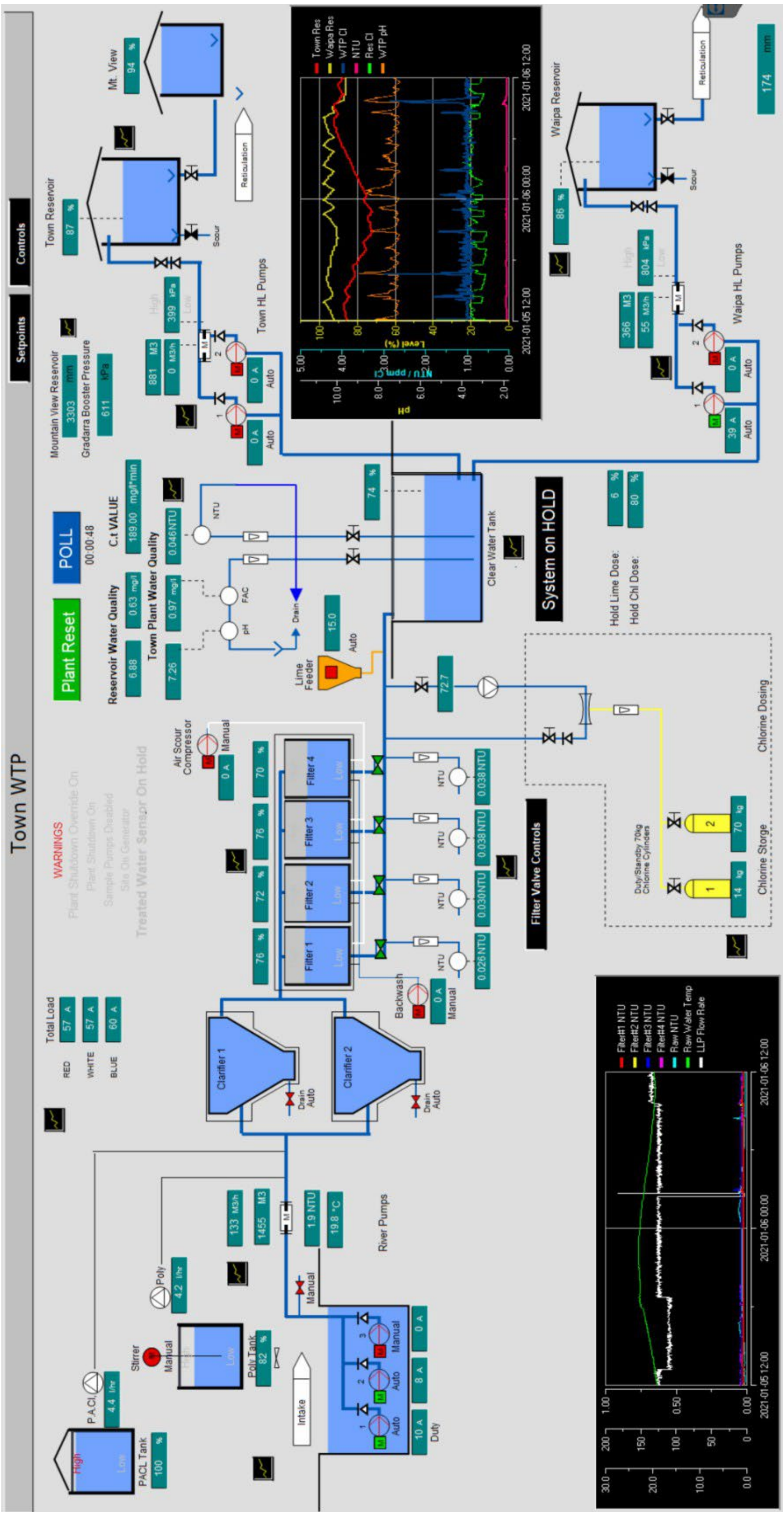
6.0 - Ōtorohanga Community Water Supply Scheme (including Waipā RWS)

6.1 - Description

The treatment plant that serves the Ōtorohanga community also supplies water to the Waipā RWS scheme area, the plant schematic is shown on the next page.

Table 6.1: Technical Description of Ōtorohanga/Waipā Water Scheme

Date Commissioned	1930's onwards; current treatment plant and much of reticulation from 1959 onwards.
Water Source	Waipā River above Ōtorohanga
Properties Connected	Circa 1,500 - Ōtorohanga 128 Waipā RWS
Significant Connected Properties	4 schools, 2 marae, rest home
Metered Connections	Ōtorohanga 1,612, 134 meters of the Waipā RWS as of January 2024.
Population Served	3,030 Ōtorohanga 175 Waipā RWS (estimated)
Water Take Quantity	Maximum circa 4300 m^3/day Average daily water take 2200 m^3/day Maximum Consented 5000 m^3/day (approximately 3% of Q5 flow)
Treatment Process Summary	River source, Activated Carbon Treatment, clarification, rapid sand filtration, pH correction, chlorine disinfection. Continuous monitoring of FAC and clear water turbidity automation of chemical disinfectant dosing, telemetric monitoring of operational parameters.
Treatment Plant Design Capacity	4,000 m^3/day
Supply Type	On-demand pressure supply in Ōtorohanga Community, Trickle Feed supply with on-site storage (Waipā RWS).
Pressure Systems	Generally pumped to storage, gravity feed to properties, but also two pumped supply zones in Ōtorohanga, one in Waipā RWS.
Storage Capacity (shared)	3,900 m^3, (3,100 m^3 in Ōtorohanga)
Worst Case Reticulation Failure	Major Failure of 200mm main on Thomson Avenue. Would drain reservoirs in approximately 3.5 hours if not isolated.
Extent of Reticulation	106.7km (57.1km Ōtorohanga, 49.6 Km Waipā RWS) pipes, 15 to 315mm diameter
Relevant Resource Consents	For water take (RC130076.01 expiry October 2028), discharge of process water (RC130076.02 expiry October 2028), disposal of sludge (RC10872 – currently being renewed), Land use bed structure (RC130076.03 expiry October 2028)



Town WTP
Setpoints
Controls
WARNINGS
Plant Reset
POLL
System on HOLD
Reservoir Water Quality
Town Plant Water Quality
C.t VALUE
Mountain View Reservoir
Gradarra Booster Pressure
Town Reservoir
Mt. View
Town HL Pumps
Waipa Reservoir
Waipa HL Pumps
Clear Water Tank
Lime Feeder
Chlorine Dosing
Chlorine Storge
Filter Valve Controls
Hold Lime Dose:
Hold Chl Dose:
Filter 1
Filter 2
Filter 3
Filter 4
Clarifier 1
Clarifier 2
Backwash
Air Scour Compressor
River Pumps
Intake
Poly Tank
PACL Tank
Total Load
RED
WHITE
BLUE
Reticulation

Figure 6.1: Ōtorohanga Water Treatment

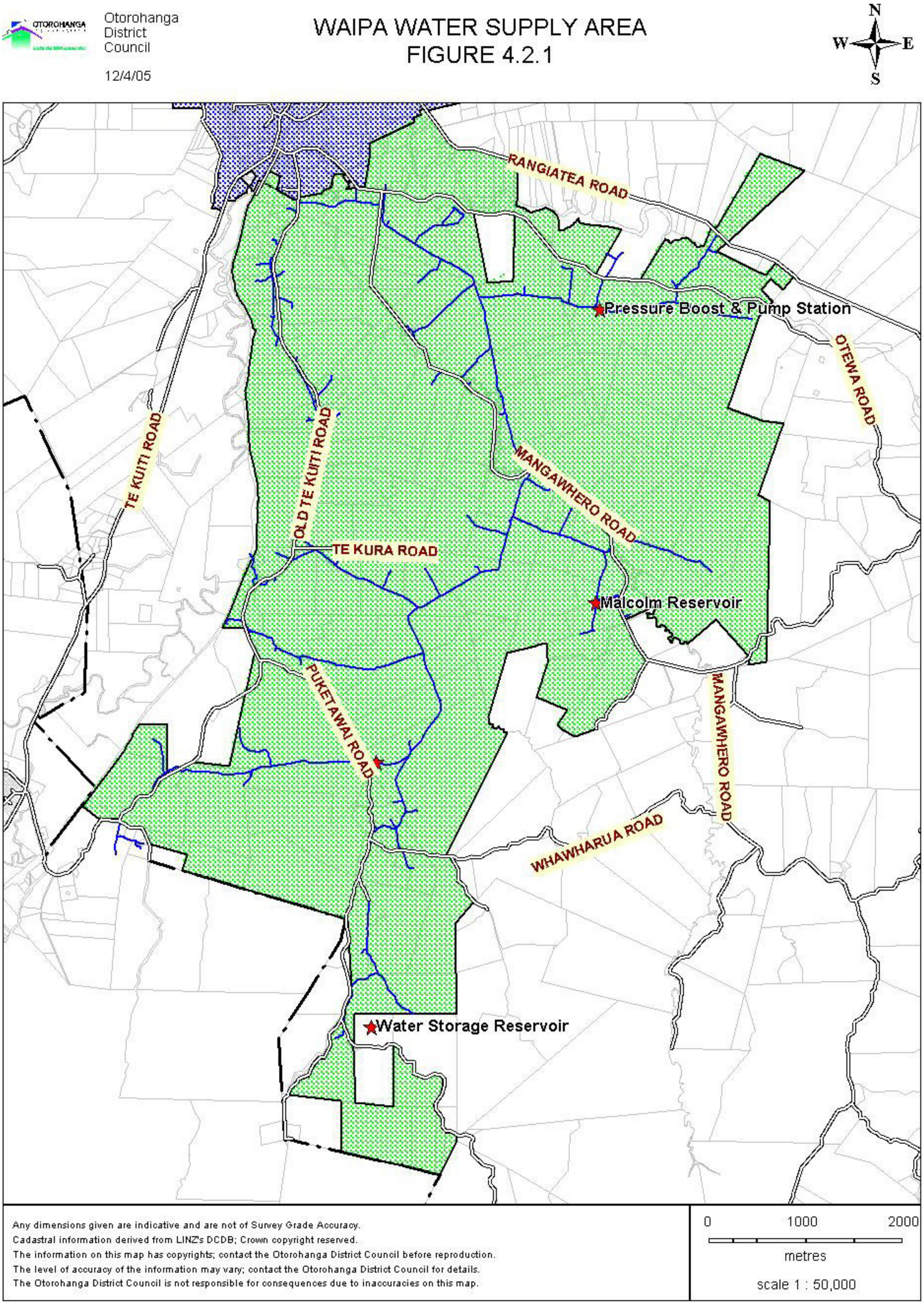


Figure 6.2: Waipā Water Supply Area

6.2 - Condition

While the water treatment plant is almost 60 years old, it was substantially constructed, has been well maintained, and has in more recent years received significant data and control technology upgrading the basic structure and configuration remains the same. As such it is in a sound condition, though some concrete components are beginning to display signs of deterioration.

As stated previously, all of the town's earliest water infrastructure dating back to the 1930s has now been replaced and the majority of remaining reticulation was installed between the late 1950's and early 1970s. Some of this reticulation, in particular asbestos cement pipes, are now approaching the end of their expected lives and hence some extensive renewal requirements are ahead, as indicated in the projection below for the next 30 years:

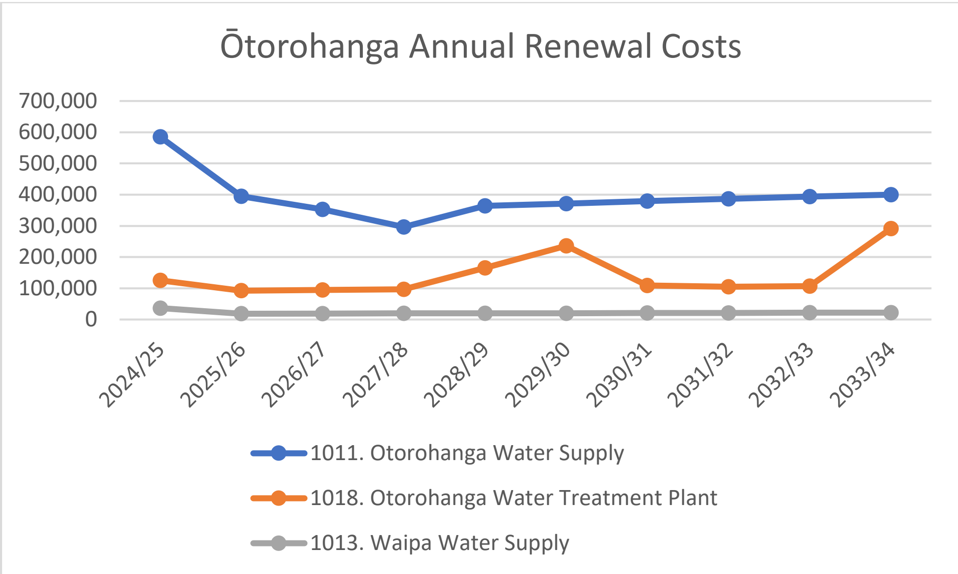


Figure 6.3 – Ōtorohanga Water Annual Renewal Cost Trend

The Waipā RWS comprises only reticulation and storage facilities, as shown on the map on the previous page. These were constructed in 1989 and are therefore relatively new and generally in excellent condition, with a remaining life of at least 50 years expected for the pipes. As part of the 2021-31 LTP two new 400m^3 reservoirs have been constructed to increase storage capacity within the scheme and bulk water meters were placed around the network for monitoring demand. No more substantial renewals are expected within the next 30 years.

6.3 - Performance

The Ōtorohanga Water Safety Plan (WSP) was submitted to the Taumata Arowai water supplier portal, Hinekorakau, in draft format when the regulator was established. This WSP is currently under review and this section will outline findings and recommendations when completed and adopted by council.

An assessment against this WSP will be done to ensure that it is meeting the Drinking Water Quality Assurance Rules set out by Taumata Arowai.

There are occasions where peak demand for water can exceed the treatment capacity of the plant, usually during prolonged periods of hot dry weather and high source water temperatures Such supply shortfalls are generally short-lived and can be supplied by drawing water from reservoir storage.

The reticulation systems in both Ōtorohanga and Waipā RWS are considered to be adequate, with few instances of inadequate water supply quantities or pressures.

Although water restrictions have been common during the summer in Kāwhia, they are very rare amongst all the other schemes.

6.4 - Risk Assessment

The potential health risks associated with the Ōtorohanga / Waipā water supply, and the approaches taken to managing those risks, are described in detail in the Ōtorohanga Water Safety Plan Document, which is separate to this AMP.

6.5 - Future Demand

Demand for water from the Ōtorohanga water treatment plant, (which includes water supplied to the Waipā RWS scheme), over the 2001-2020 period is shown below. For the Ōtorohanga township, the population increased over 500 people in three years to 3,027 in 2018. The current forecast is 3,240 for 2020, which is about a 7% increase in two years. The graphs below of mean Treatment Plant outflow in the period 2001 to 2019, show whilst the population increased, the introduction first of water meters, then volumetric charges from 2018, the township uses 25% less water now than in 2001. With 1,340 metered water connections in Ōtorohanga, similar levels of growth in the next 10 years could be catered for, with only minor improvements to water treatment processes such as additional coagulation and sand filter capacity.

During the summer months the demand from the Waipā RWS can account for up to 35% of the water produced by the town plant.

Overall demand is still within the treatment plant capacity, but improvements will be needed into the future to improve capacity of the plant, modifications to the clarifiers is signalled in year 4 to increase flow through the plant and help treat warmer water from the river.

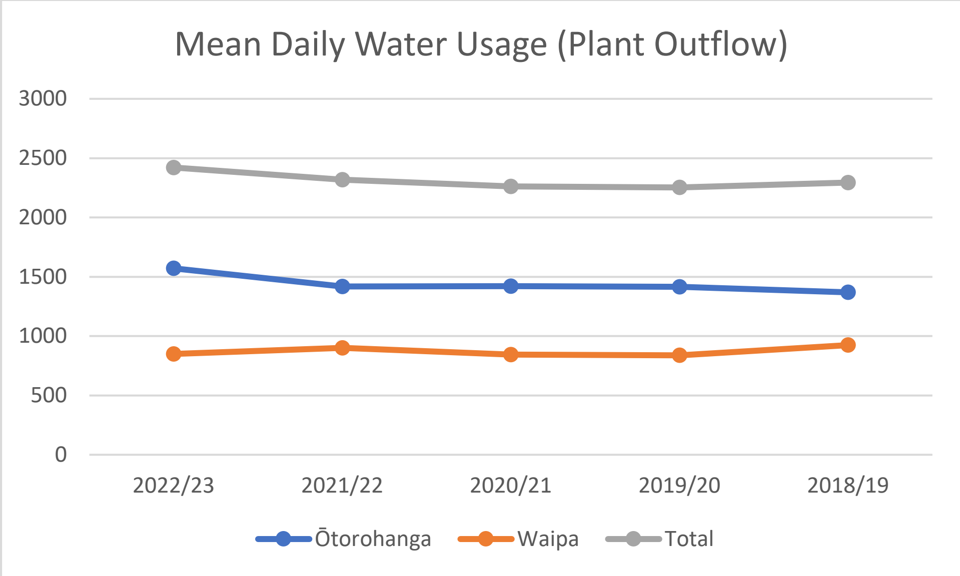


Figure 6.4 – Mean Daily Water Usage (Plant Outflow)

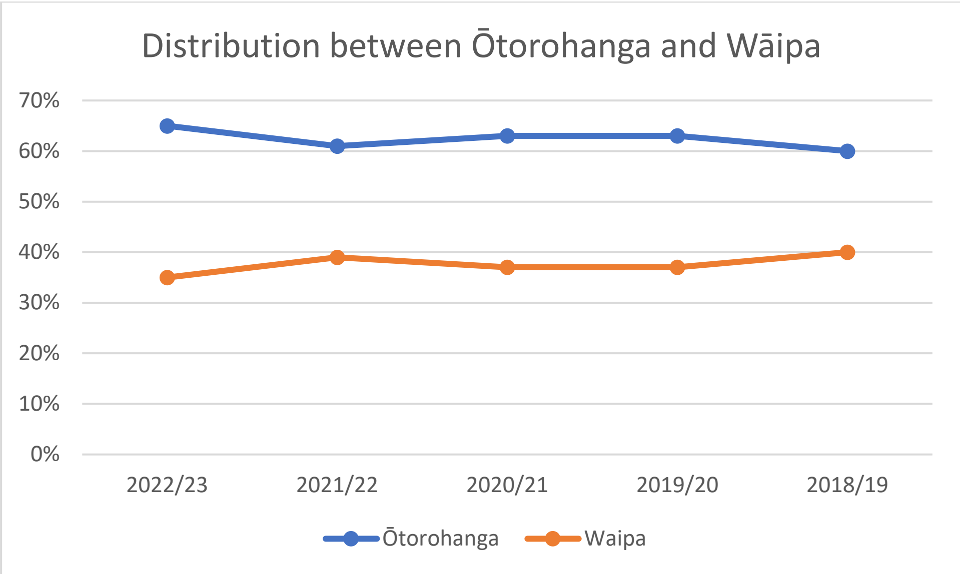


Figure 6.5 – Distribution between Ōtorohanga and Waipā

This water saving can then be allocated to new residential development or business ventures requiring water. Unless a substantial new water consuming business comes to the community, it seems unlikely that overall demand for water in Ōtorohanga will exceed current levels in the near future.

For the Waipā RWS area, limitations in respect of reticulation restrict potential for significant growth, compared to higher consumption by existing users. The intensification of farming activities in the Waipā RWS area is believed to be the driver for the red trend line in the graph above. This slow increase in consumption can be accommodated due to the 'trickle feed' nature of the scheme, but remains reliant on users ensuring they have at least 24 hours' storage on site. However, land use changes in the next District Plan review may trigger an increase in lifestyle property subdivisions close to town, within the Waipā RWS area that may result in an increase in request for connections.

After due consideration and discussion with the Waipā Rural Water Scheme committee, $750 000 was allocated to the construction of two additional reservoirs, nominally 400m^3 each, in order to double the scheme's water storage. The motivation for this was improving the resilience of the scheme and reducing the risk of water being unavailable to replenish the farmers 24hour storage tanks, this was completed in year 3 of the 2021-31 LTP

6.6 - Ability to Accommodate Demand Changes

The capacity of the treatment plant is currently sufficient to meet demand from the Ōtorohanga and Waipā RWS areas under any normal circumstances. At Mean Day, Maximum Month (MDMM) consumption levels at the maximum water treatment capacity is however more than 90% utilised, and the plant capacity may be exceeded during prolonged periods of dry hot weather when extensive use is made of water for gardening and leisure purposes.

Increased storage across Ōtorohanga and Waipā RWS has reduced this risk and Council can now feed the Thomson Ave reservoirs from the Mountain View reservoirs under controlled situations and has been done successfully on one occasion.

Replacement of the rising main from the plant to the reservoirs in 2022 has also improved resilience in the network. Replacement of the main trunk line into town in the future will improve resilience further. There are no indications at this time that this line needs replacing before its useful life.

The capacity of existing distribution reticulation in both the Ōtorohanga community and the Waipā RWS is currently considered to be adequate to meet likely demands within at least the next 10 years. If further significant residential development occurs in Ōtorohanga it is currently considered likely to occur in the vicinity of the main storage reservoirs at Thomson Ave, and such additional demand could be easily supplied and may in fact benefit the operation of the existing pumped pressure zone that serves part of this area. Depending on the location of the future development, an additional reservoir would be considered as part of any design.

The introduction of a water allocation framework by Waikato Regional Council that limits the amount of water that can be taken from the Waipā River has also caused a need for consideration to be given to what priorities should exist in respect of water supply to new developments in either the Ōtorohanga community or the Waipā RWS area, and an agreement has been reached between the two parties that places decisions regarding this in the hands of the Ōtorohanga Community Board.

6.7 - Alternative Supply Options

No consideration is being given at this point to replacing the Waipā River as the primary water source for the Ōtorohanga/Waipā RWS supply. Whilst it is sometimes subject to significant turbidity variations, these can be managed (including by temporarily shutting down the plant at times of extreme discoloration) and the river is otherwise a reliable source with adequate capacity.

Another possible alternative source for an augmenting source of water is from groundwater bores, but previous investigation has shown this is unlikely. As stated above the large storage dam on Te Raumauku Road is feasible but unaffordable at this time.

7.0 - Kāwhia Rural Water Supply Scheme

7.1 - Description

The treatment plant that serves the Kāwhia community and the scheme detail and plant schematic is shown below.

Figure 7.1 – Kāwhia Community Water Supply

Table 7.1: Technical Description of Kāwhia Rural Water Scheme

Date Commissioned	1970's onwards; current treatment plant and much of reticulation from 1970 onwards
Water Source	Kāwhia springs
Properties Connected	Circa 417 - Kāwhia
Significant Connected Properties	1 school, 1 marae.
Metered Connections	Kāwhia has 397 as of January 2024
Population Served	400 year-round and summer holiday 3000
Water Take Quantity	Maximum circa - 400m^3/day (2019/20) Average daily water take - 330m^3/day (2019/20) Maximum Consented - 600m^3/day effective from 20 December to 10 January & 450m^3/day for the balance of the calendar year
Treatment Process Summary	Spring source, clarification, rapid sand filtration, chlorine disinfection. Continuous monitoring of FAC and clear water turbidity automation of chemical disinfectant dosing, telemetric monitoring of operational parameters.
Treatment Plant Design Capacity	500m^3/day, the limiting factor here is the source which is spring feed.
Supply Type	Spring feed
Pressure Systems	Generally pumped to storage, gravity feed to properties.
Storage Capacity (shared)	Circa 1,180m^3, (comprising of 2 x 400m^3 and 1 x 380m^3 reservoir tanks) 100m3 at the plant
Worst Case Reticulation Failure	Failure of 150mm main from the 3 reservoirs, would drain reservoirs in 5 hours if not isolated
Extent of Reticulation	13.9km of pipes, 15 to 150mm diameter
Relevant Resource Consents	For water take (RC120401 expiry November 2030) and water use (RC120393 expiry November 2030)

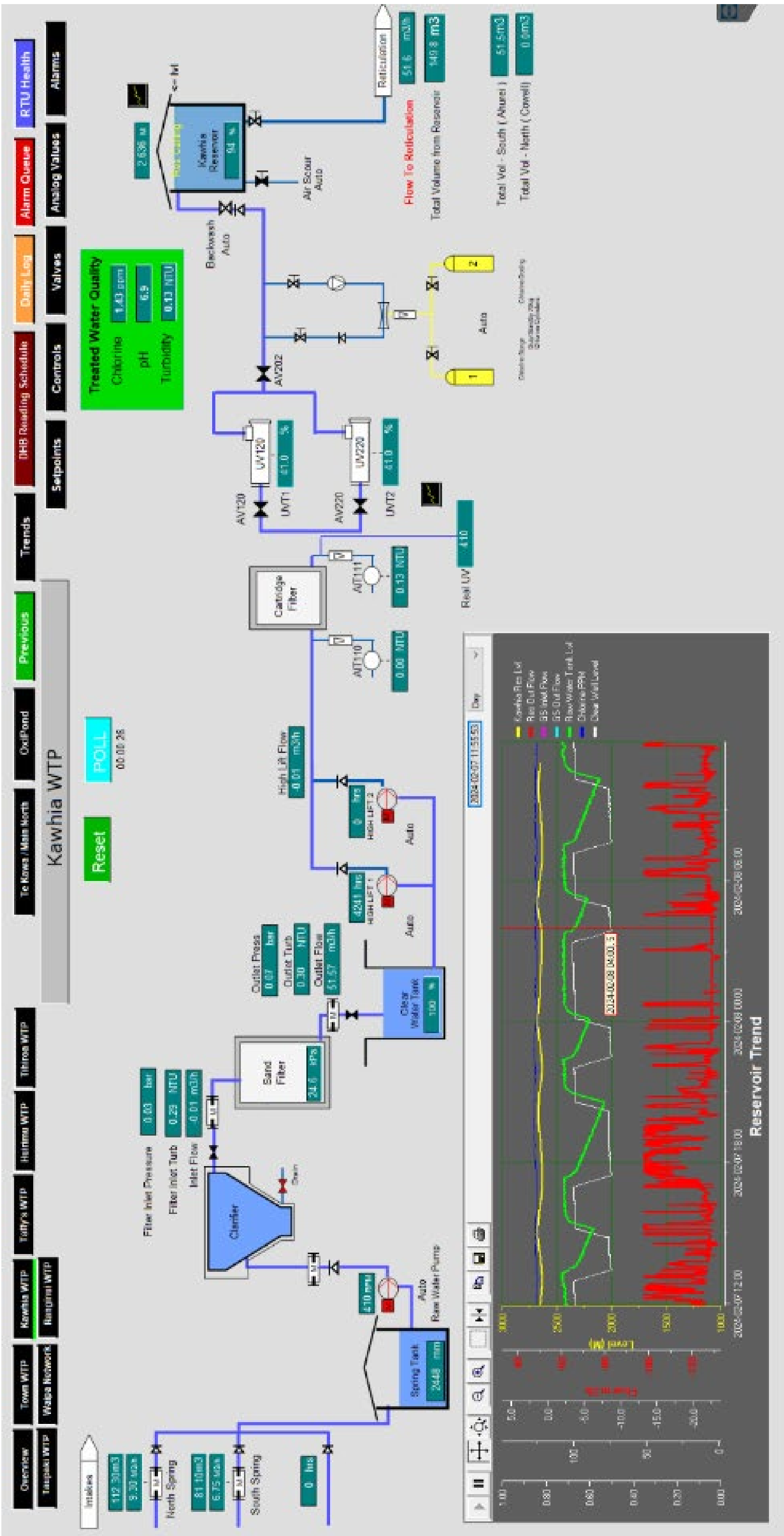


Figure 7.2: Kāwhia Water Treatment Plant

7.2 - Condition

The water treatment plant at Kāwhia is a relatively basic facility and received significant investment in the filtration system in 2022 with the removal of the old clarifier and sand filter and the installation of a new greensand filter. This investment has improved the reliability of the plant.

Whilst two UV units were installed in 2015, they are not utilised as they are not reliable and expensive to operate. The condition of the reticulation system is generally good.

Kāwhia has had significant water main renewals over the last 3 years and water meters installed on domestic properties.

A projection of required pipe and equipment renewal costs for the treatment plant and the Kāwhia reticulation is presented below, based on existing asset inventory data.

The pronounced peak renewal requirements commencing in around 2040 reflects that the majority of the Kāwhia supply was installed in the 1970's, and that there are as yet no indications that any substantial lengths of pipe will require premature replacement.

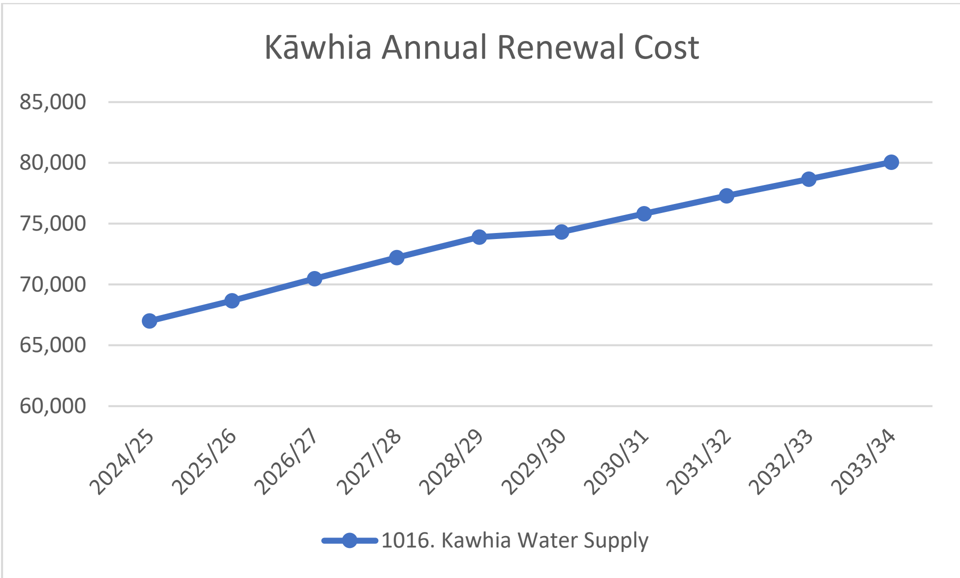


Figure 7.3 – Kāwhia Water Annual Renewal Cost Trend

7.3 - Performance

The water plant is the most efficient it has been for a number of years with the improvement during the last LTP.

This sound performance is in part due to the decommissioning of the bore source, the water from which was relatively high in iron and manganese and therefore more difficult to effectively treat than the water from the springs, which is apparently from a different aquifer, and has more favourable chemistry.

The 2022/23 Drinking Water Assessment showed compliance at the treatment plant was not met mainly due to 4 samples being of high pH level and misunderstanding of the new rules and the requirements for minimum duration between samples. During the time from November when the DWAR's came into force we sampled more then what was needed causing technical non-compliance for the second half of the 2022/23 financial year. Since this compliance report was completed council has altered the sample schedule to comply with the DWQAR's going forward.

The Kāwhia Water Safety Plan was assessed and approved in June 2018, this was then transferred into the template Taumata Arowai, made available to Local Authorities and submitted into their online portal, Hinekorakau.

7.4 - Risk Assessment

The potential health risks associated with the Kāwhia water supply and the approaches taken to managing those risks are described in detail in the Kāwhia Water Safety Plan Document, which is separate to this AMP.

7.5 - Future Demand

As a coastal community with a steadily increasing proportion of temporarily occupied dwellings, (now making up the majority in the community), Kāwhia has large seasonal variations in water consumption associated with tourism and holiday home occupation, with the extent of these variations being very dependent on weather conditions, particularly over the peak holiday periods.

An extended period of good or poor weather over the summer period can significantly affect both the peak and average annual water consumption for any year. This high level of variability is illustrated in the graph below, with annual MDMM water consumption exhibiting variations of more than 40% over the period considered, and as such it is extremely difficult to define any long term trends.

Since the installation of domestic water meters, improvements at the plant and the latest renewals there has been a reduction in water consumption over the year.

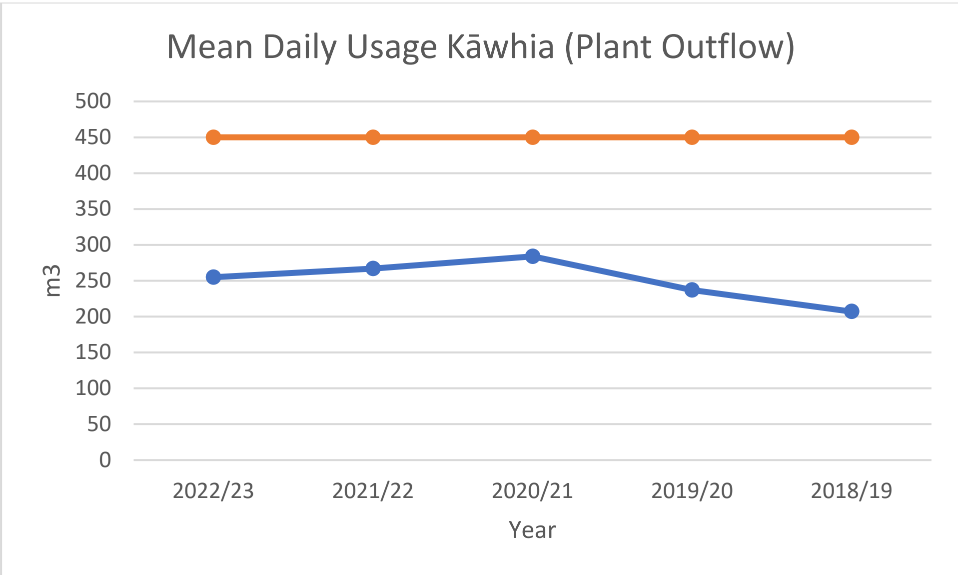


Figure 7.4 – Mean Daily usage (Plant outflow)

The trend graph of Figure 7.4 shows there is adequate capacity for growth. The largest challenge is catering for the peak demand over the Christmas-New Year’s holiday period as shown in *Figure 7.5* below:

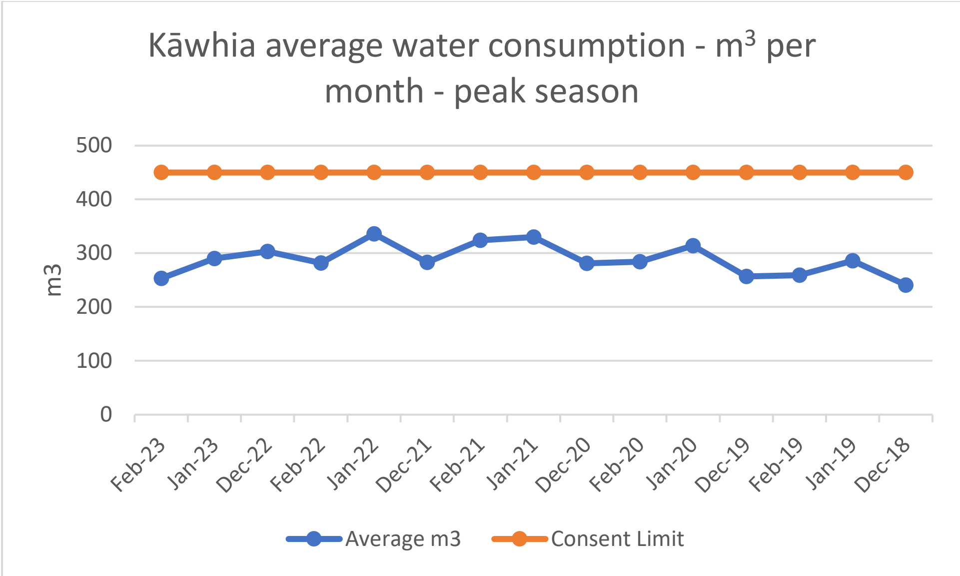


Figure 7.5 – Kāwhia Average Water Consumption Per Month

8.0 - Tihiroa Rural Water Supply Scheme

8.1 - Description

The Tihiroa Rural Water Scheme and treatment plant serves the Tihiroa community and the scheme details and plant schematic are shown below:

Table 8.1: Technical Description of Tihiroa Rural Water Scheme

Date Commissioned	1986
Water Source	Waipā River
Properties Connected	35
Significant Connected Properties	None
Metered Connections	60 (serving all connected properties)
Population Served	Circa 400 (majority of water used for farm stock)
Maximum Consent Water Take Quantity	1,500m³ May to October and 1,500m³ for the remainder of the year
Treatment Process Summary	River source, clarification, rapid sand filtration, chlorine disinfection. Minor automation, with telemetric monitoring of operational parameters.
Treatment Plant Design Capacity	1,800m³/day
Supply Type	Trickle Feed supply with 24 hours on-site storage, air-gap or other approved backflow protection at each property
Pressure Systems	Combined rising/falling main to storage, gravity/pumped pressure supply
Storage Capacity (shared)	400m³ = 8 hours at MDMM demand
Extent of Reticulation	34.7km of pipes, 15 to 125mm diameter
Relevant Resource Consents	RC114845 (Surface water take – expiry June 2026); RC121172 – expiry June 2026); RC114846 (Backwash water discharge – expiry June 2026)

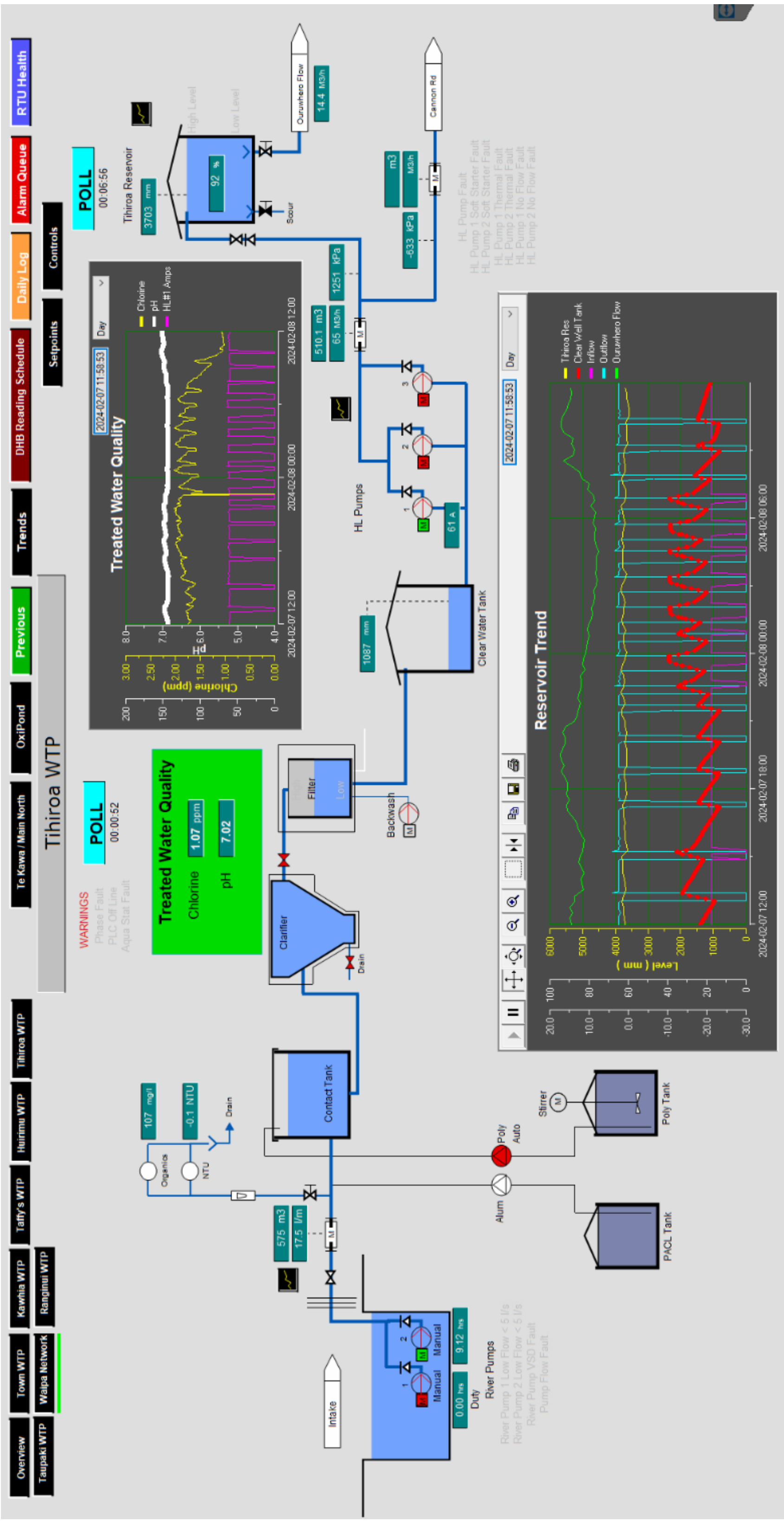


Figure 8.1 – Tihiroa Water Treatment Plant

8.2 - Condition

The condition of water treatment equipment is variable, whilst reticulation assets are generally in good condition.

Reticulation failures were common on the rising main from the plant and are common in the Cannon Road supply. The Rising main has been replaced and the Cannon Road line is planned for 2024.

These leaks are as a result of increased pressures from demand and incorrectly sized pipework during the original installation.

The sand filter was replaced in 2023 which has improved the quality of the water from the plant.

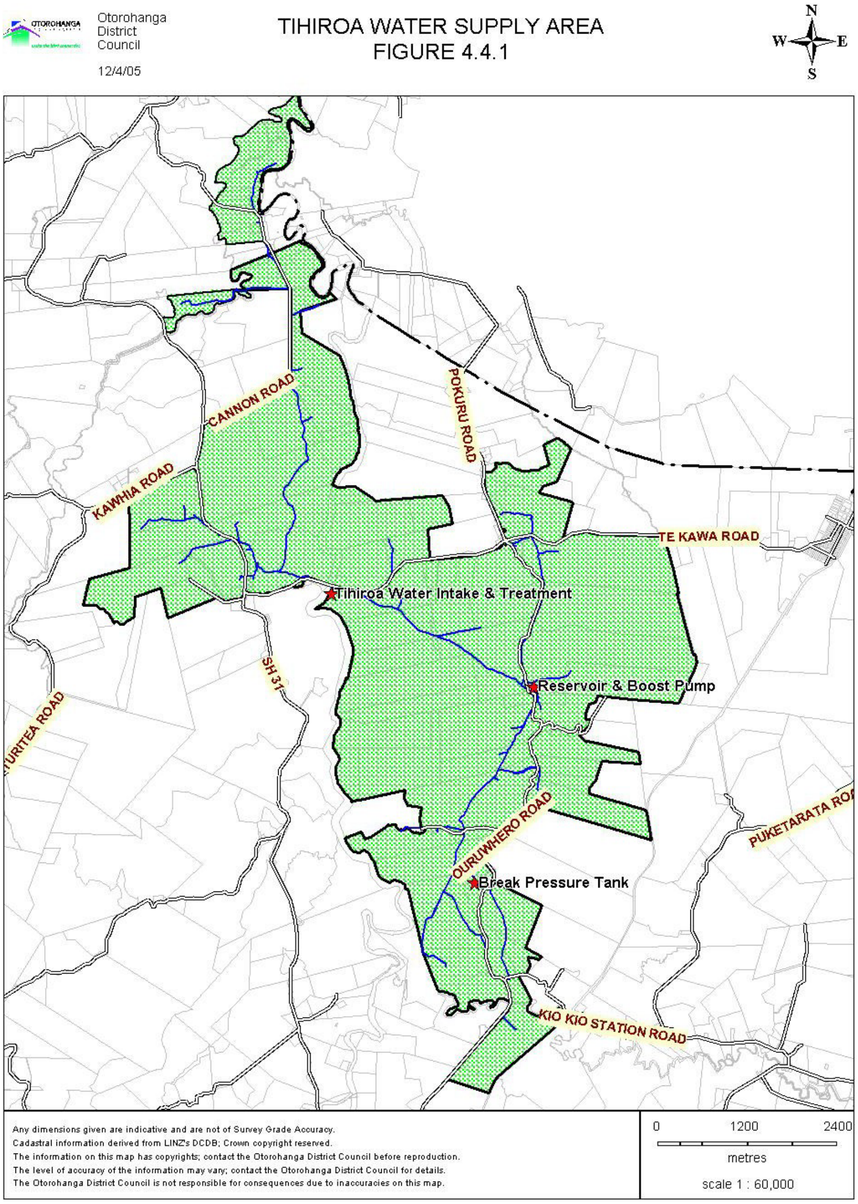


Figure 8.2 – Tihiroa Water Supply Area

A projection of required equipment renewal costs for the Tihiroa Scheme for the next 30 years is presented below, based on existing asset inventory data:

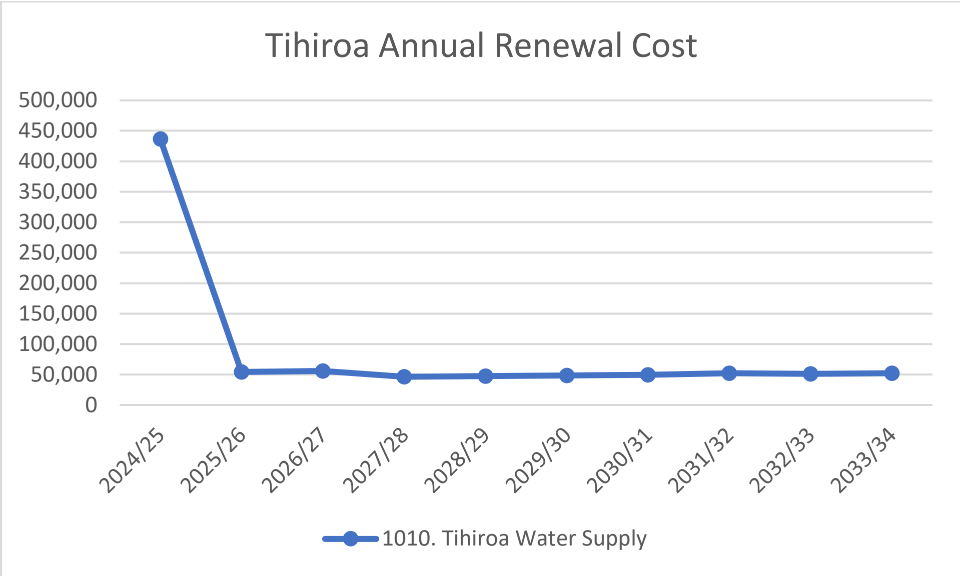


Figure 8.3 – Tihiroa Water Annual Renewal Cost Trend

The plant has had a new sand filter installed and apart from the replacement of the rising main and the Cannon Road main there are no substantial reticulation renewals expected to be required until after 2060.

8.3 - Performance

The Tihiroa Water Safety Plan was drafted into the template Taumata Arowai, made available to Local Authorities and submitted into their online portal, Hinekorakau in 2022.

The 2022/23 Drinking Water Assessment showed compliance at the treatment plant was not met mainly due to 4 samples showing high turbidity in January and February 2023 and misunderstanding of the new rules and the requirements for minimum duration between samples. During the time from November when the DWAR's came into force, we sampled more then what was needed causing technical non-compliance for the second half of the 2022/23 financial year. Since this compliance report was completed council has altered the sample schedule to comply with the DWQAR's going forward.

8.4 - Risk Assessment

Improvements to the plant and the new sand filter and monitoring equipment has reduced the risk to the supply presented by variable in turbidity and the plant is now considered a low if used as a drinking water supply. To maintain this risk assessment the plant does require more supervision and attendance by water services staff. This will have an increase in operational costs, however minor.

8.5 - Future Demand

Demand for water from this scheme has historically been variable over much of the scheme's life, ranging from little more than 130,000 m^3/year to over 250,000 m^3/year, as illustrated by the recent data in the graph below:

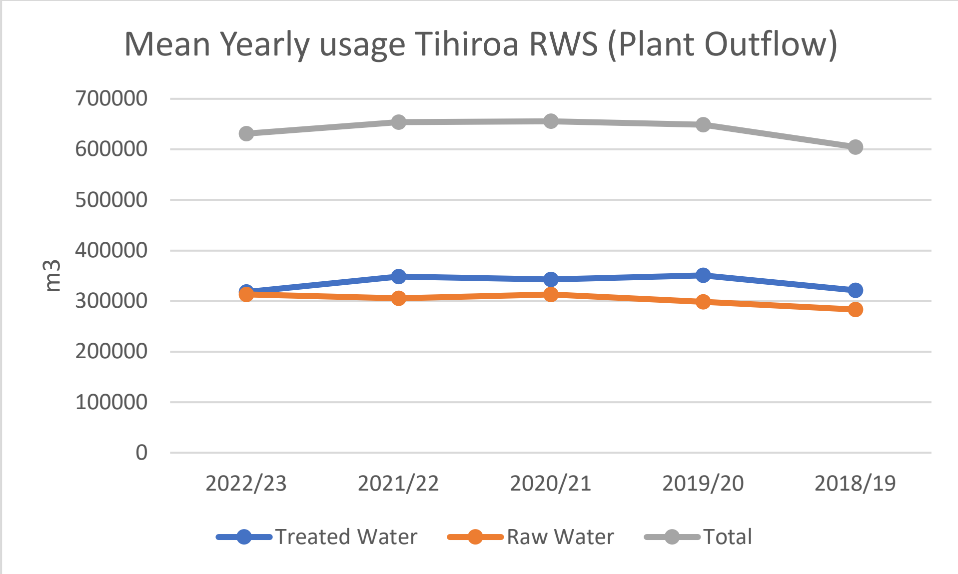


Figure 8.4 – Tihiroa Rural Water Supply

The reasons for this very variable pattern of demand variation are not clear since there has been little change in the extent and use of land supplied by the scheme, and the variations have often been out of step with those on the other rural schemes which are typically weather related. Tihiroa RWS is experiencing water loss issues similar to the Ōtorohanga Scheme, which have not been easy to locate, and unauthorised connections cannot be dismissed.

The Management Committee of the scheme has also adopted a strong stance that the scheme should be run primarily to provide water for farming rather than residential purposes, and as such it is considered unlikely that reticulation would be extended in the near future to serve areas such as Kio Station Road, where lifestyle block development is taking place.

That being said, if water losses can be reduced there is the potential for additional connections or extension of the scheme. Increasing the connections will help reduce the costs to users.

8.6 - Ability to Accommodate Demand Changes

The scheme in its current form is able to accommodate significant additional demand. If the capacity of the scheme was found to be inadequate a probable response would be stricter imposition of water quotas and flow restriction devices in accordance with the original design of the scheme.

A more significant concern for this scheme would be the potential for a significant decrease in demand to the levels previously seen in 2001/2 and 2008/9. If this was to occur a significant increase in water charges could be required, particularly if the decline in demand followed shortly after a significant investment in plant upgrading.

There is surplus supply available for around nine months every year. However, during the summer season peak demand is limited by low flow water take parameters and as such there is no surplus capacity at this time.

8.7 - Ability to Comply with Drinking Water Quality Assurance Rules

The Waipā River at Tihiroa is considered to be a higher risk source due to the confluence of the Mangapu River, and as such significant upgrades to the treatment plant have been completed to ensure the Tihiroa RWS is capable of complying with the DWQAR's

The plant in its current form is capable with reaching compliance with improved monitoring and increased supervision.

9.0 - Arohena Rural Water Supply Scheme

9.1 - Description

The Arohena RWS scheme consists of three separate water supplies, (Kahorekau, Huirimu and Taupaki), serving rural areas in the east of the district. Because these supplies are considered together for administrative and financial purposes, relevant information will be presented within a single section in this Asset Management Plan.

The areas served by the individual supplies are shown in the following maps. All of the Arohena water supplies were commissioned in 1982 and source water from small rocky streams flowing from predominantly native bush catchments. All supplies employ rapid sand filtration and chlorine disinfection.

All of the scheme supplies water on a trickle feed basis into tanks with 24 hours' on-site storage capacity, which are separated from the supply reticulation by an air-gap or other approved backflow protection device. In February 2021 the Ministry of Health, following a positive E-Coli test in Arohena, placed the scheme as a whole under a permanent boil water notice. The Arohena School was lifted out of this with installation of a point of use filter and UV unit which council maintain and test.

An outline technical description of the supplies within the Arohena scheme is presented in the table below:

Table 9.1: Technical Description of Arohena Rural Water Scheme

	Kahorekau	**Huirimu**	**Taupaki**
Water Source (Stream)	Manga Kouma	Makomako	Mangare
Properties Connected	13	14	7
Metered Connections	33	32	8
Population Served (approx.)	120	120	20
Treatment Plant Design Capacity (m^3/day)	1,037	1,037	216
Storage Capacity (m^3)	350	860	40
Extent of Reticulation (km)	27.8	23.2	9.2
Reticulation Diameter (mm)	25 to 150	25 to 125	25 to 100
Ministry of Health Grading – Water Source & Treatment Plant	Ungraded	Ungraded	Ungraded
Relevant Resource Consents	Water Take RC136074.02 Water Use RC136074.01 Expires 31/08/51	Water Use RC136074.01 Water Take RC136074.02 Expires 31/08/51	Water Take RC136074.02 Water Use RC136074.01 Expires 31/08/51

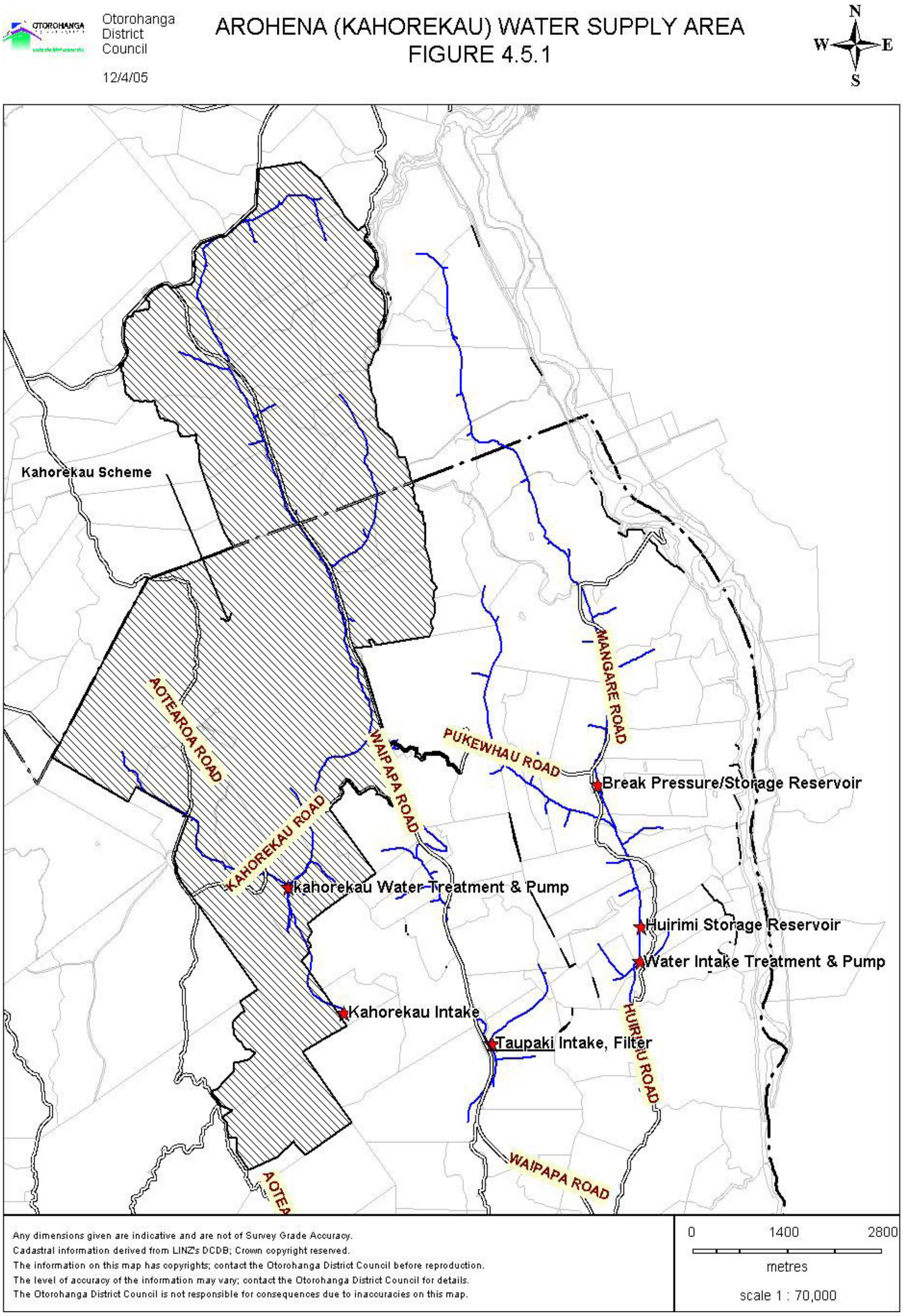


Figure 9.1 – Arohena (Kahorekau) Water Supply Area

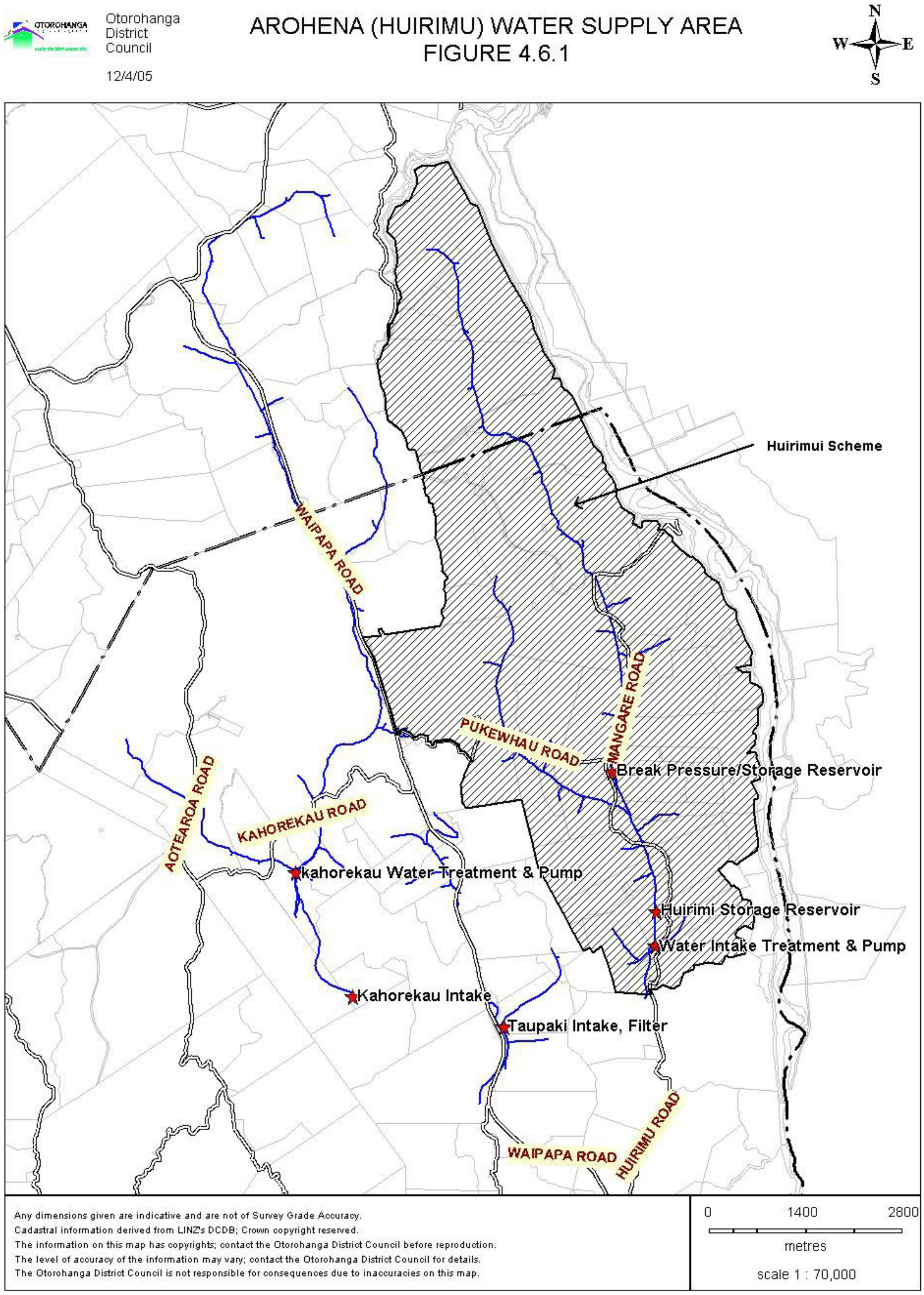


Figure 9.2 – Arohena (Huirimu) Water Supply Area

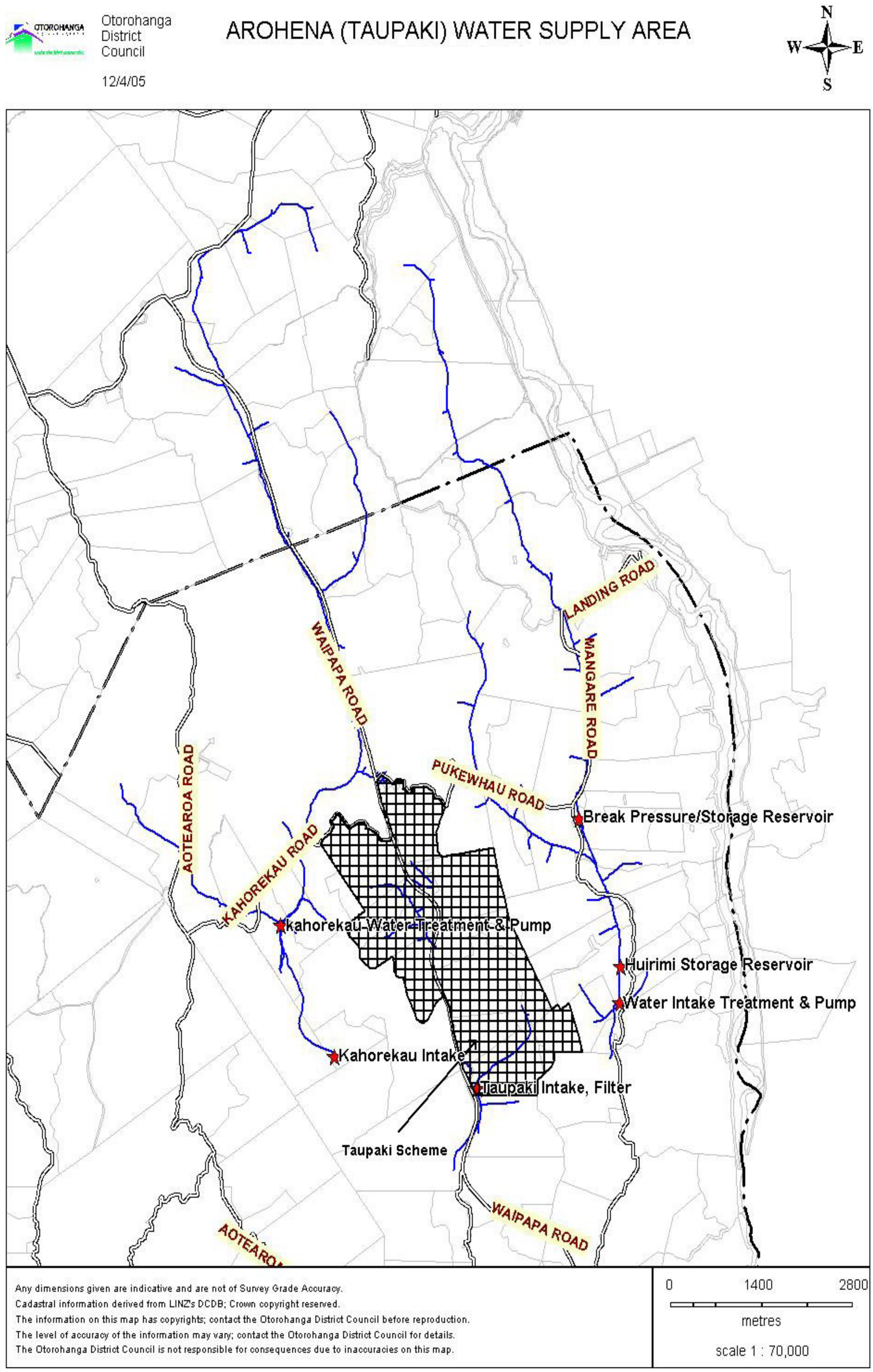


Figure 9.3 – Arohena (Taupaki) Water Supply Area

9.2 - Condition

The scheme is not particularly old, and its assets are generally in good condition. Reticulation failures, (including those resulting from accidental damage), are very rare, and little need for reticulation renewal is expected before 2060.

As such, the required renewals in the shorter term are mainly limited to water treatment, storage equipment and water meters. A projection of such required equipment renewal costs for the Arohena schemes over the next 30 years is presented below:

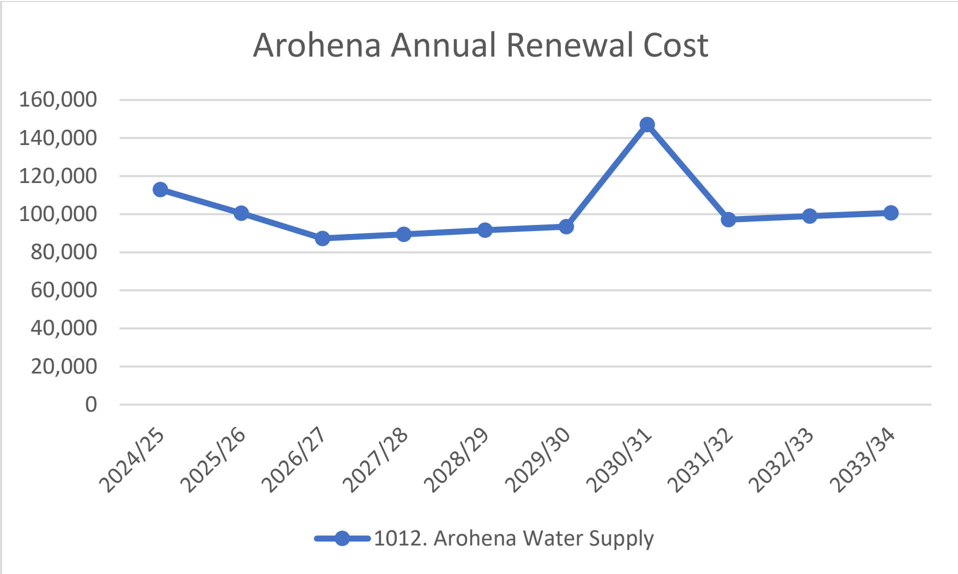


Figure 9.4 – Arohena Water Annual Renewal Cost Trend

As was the case for the other rural water supplies, virtually all of the renewal costs over the next 30 years are for plant items, as the reticulation is little more than halfway through its expected life.

9.3 - Performance

There are three separate water supplies which make up the Arohena water supply. They are referred to by their treatment plant names - Huirimu, Kahorekau and Taupaki.

Compliance with the DWQAR's can be seen in the 2022/23 Compliance report in appendix 4. The Arohena RSW did not achieve compliance for the three plants due to not having sufficient protozoa barriers and technical understanding of the DWQAR's. Due to high turbidity levels, a positive E-Coli sample, and the nature of the water take supply, the scheme was put onto a permanent boil water notice in February 2021. Refer to section 5.11.2 to understand work completed so far for upgrades of the Arohena treatment plants to ensure compliance is achieved with the DWQAR's.

A basic Water Safety Plan is in place for Taupaki from the template provided by Taumata Arowai. Development of a comprehensive WSP is planned for year 1.

The systems within the scheme are largely reliant on gravity for flow, resulting in low power costs and efficient operation. The only regular operational performance issues are blockages of the water intake structures, associated reticulation and/or the sand filter by silt and other water borne debris arising from very heavy rainfall in the steep, bush clad catchments. This has in the past resulted in both regular brief interruptions of supply (typically due to the sand filter requiring additional backwashing) and also some more extended loss of service when the intake structure and pipes have required substantial cleaning.

9.4 - Risk Assessment

Where RWS users do not have adequate on site storage for their peak demands, the cumulative demand can either cause a breach of the relevant resource consents covering abstraction limits or create backflow issues if their connections are not in compliance with Council's requirements. Compliance with consents is generally satisfactory on Huirimu and Taupaki but Kahorakau has had several challenges over the last few years with over abstraction. Council has now put controls in place to restrict over abstraction.

9.5 - Future Demand

Whilst the three individual water supplies within the Arohena scheme have displayed quite variable annual consumption, when considered as a whole, the scheme has a much better defined and more consistent recent trend in respect of water use, as can be seen from the graphs below. Since the scheme was commissioned there has been progressive conversion of dry stock farms to dairy units, with resultant increases in water consumption.

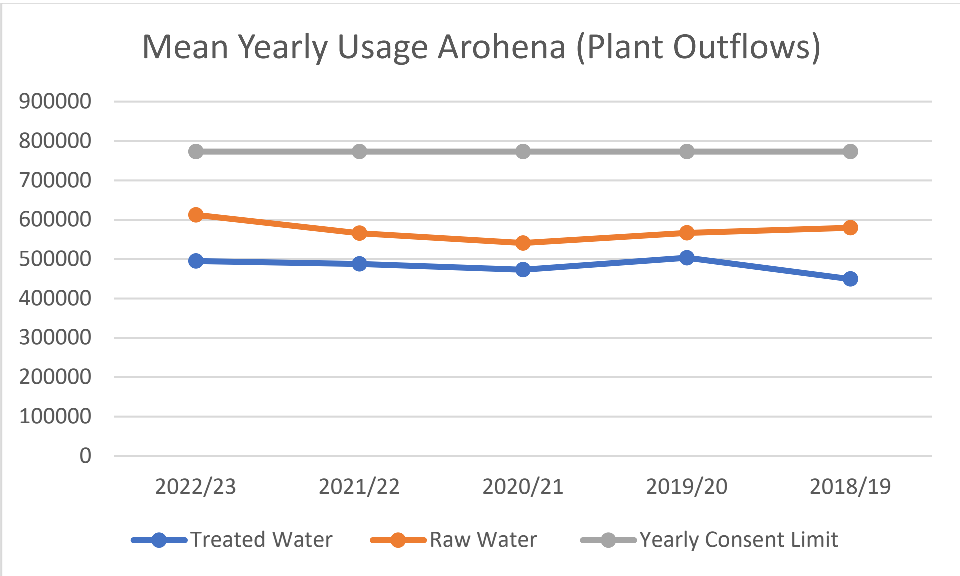


Figure 9.5 – Arohena Scheme Annual Consumption – All Supplies

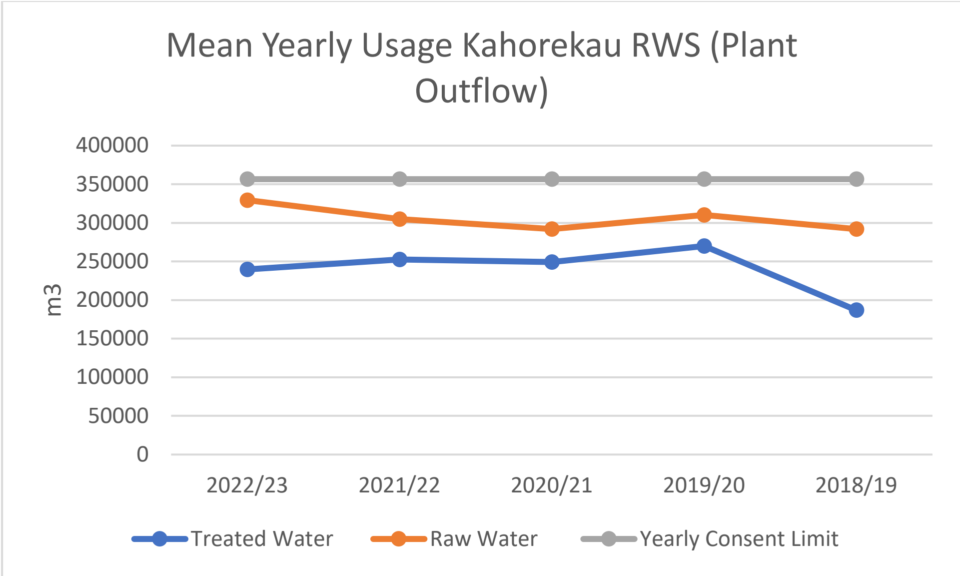


Figure 9.6 – Kahorekau Supply Annual Consumption

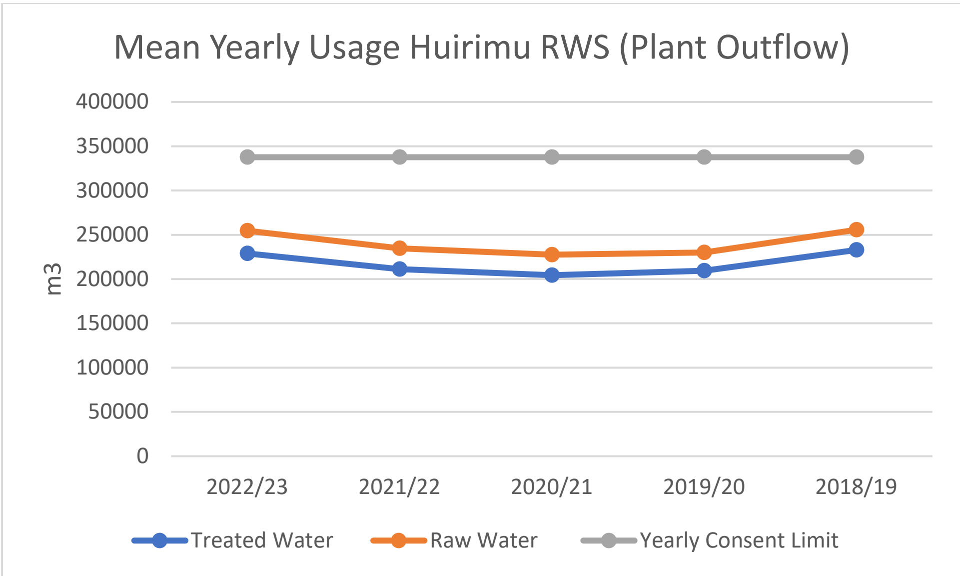


Figure 9.7 – Huirimu Supply Annual Consumption

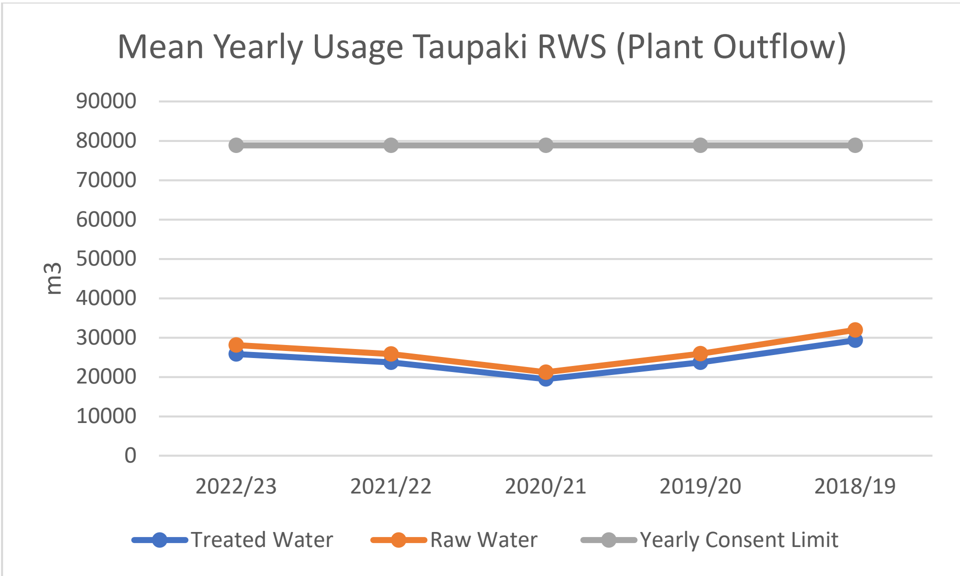


Figure 9.8 – Taupaki Supply Annual Consumption

Current best estimates for future consumption on the Kahorekau supply are an operating range between 200,000 - 250,000m^3 per year, which the current plant and infrastructure can handle without the need for increased capacity.

The underlying demand trend for Huirimu is relatively consistent at around +3% per annum and current best estimates for future consumption are around 200,000 – 250,000m^3 per year, which the current plant and infrastructure can handle without the need for increased capacity.

The pattern of demand from the Taupaki supply has been relatively consistent at around 20,000 – 30,000m^3 per annum. The area has already been fully developed for some time, any future increased demand will only be driven by water usage, and it is believed that a year like 2018/19 would represent something close to maximum demand. The current plant and infrastructure can handle the need for increased capacity.

In general, it is believed that most of the potential dairy conversions have now been completed, and this, combined with other economic factors will limit the potential for further increases of demand in the future. As such, it is believed that potential further increases in demand on all supplies are unlikely to exceed the current operating bands of the water treatment plants, and hence investments for additional capacity are unlikely to be required.

9.6 - Ability to Accommodate Demand Changes

The Kahorekau and Huirimu supplies within the Arohena Scheme are considered to be approaching the limits of their capacity.

There is very limited ability to meet any increases of demand with limitations on water taken from the very small streams being the most significant constraint. Additionally, the monitoring records indicate that at peak use months of the year, the Resource Consent limits are close to restrictive, and it could potentially be difficult to renew the existing consents.

There are no other readily available surface water sources to provide a ‘top up’ supply, and whilst it might be possible to develop groundwater source(s) for this purpose, the feasibility of doing so has not yet been investigated.

Council has taken steps to control further increases in water consumption through re-installation of flow restrictors on individual properties to ensure that properties do not take substantially more water from the scheme than was allocated to them when the supplies were commissioned.

9.7 - Ability to Comply with Drinking Water Quality Assurance Rules

In October 2023 Council received instruction to provide a funding plan to bring Kahorekau and Huirimu up to protozoa compliance. Council has adopted the position that no further action is to be taken on increasing the investment in these schemes given the small rating base and will continue to leave the schemes under permanent boil water notice indefinity.

However, we are currently investigating the required compliance needed to meet the DWQAR as there have been changes in the standards that need to be met for rural water supplies, which is different to the previous Drinking Water Standards.

9.8 - Alternative Supply Options

The only practical alternative to the existing water supply arrangements, (or variations of them), is for currently connected properties to develop their own water supply systems, generally relying on bore water sources, since there are very limited surface water resources in the area. Some properties have already developed productive bores as back-up supplies.

Such individual supplies could either be used to reticulate entire properties or to augment the existing RWS supply.

10.0 - Ranginui Rural Water Supply Scheme

10.0 - Description

The Ranginui RWS scheme has been for stock water only since 2018, and serves the area shown overleaf. An outline technical description of the scheme is presented in the table below:

Table 10.1: Technical Description of Ranginui Rural Water Scheme

Date Commissioned	1982
Water Source	Upper Waipapa River
Properties Connected	16 meters, 6 properties
Population Served	Nil - water used for farm stock only
Water Take Quantity	Maximum Consented 750m^3/day
Treatment Process Summary	Stream source, rapid sand filtration, and chlorine disinfection. No significant automation or remote monitoring / control.
Treatment Plant Design Capacity	1,000m^3/day
Supply Type	Trickle Feed supply with 24 hours on-site storage, air-gap or other approved backflow protection at each property
Pressure Systems	Generally pumped to storage, gravity feed to properties, but also pumped pressure supply to largest customer.
Storage Capacity (shared)	25m^3 at Plant = 8 hours at MDMM demand
Worst Case Reticulation Failure	Any significant failure of large trunk main has potential to drain reservoir before being detected
Extent of Reticulation	19.8km of pipes, 20 to 100mm diameter
MoH Water Grading	U (ungraded)
Relevant Resource Consents	RC142886 (Water Take) – expiry date May 2042

10.1 - Condition

The scheme is not particularly old, and its assets are generally in sound condition. A projection of required equipment renewal costs for the Ranginui scheme over the next 10 years follows, based on existing asset inventory data. Pipe replacement costs have not been included since no substantial reticulation renewals are expected to be required until after 2060.

Renewal costs are projected to be modest, with the only significant item being the renewal of the timber tank reservoir in 2023/24.

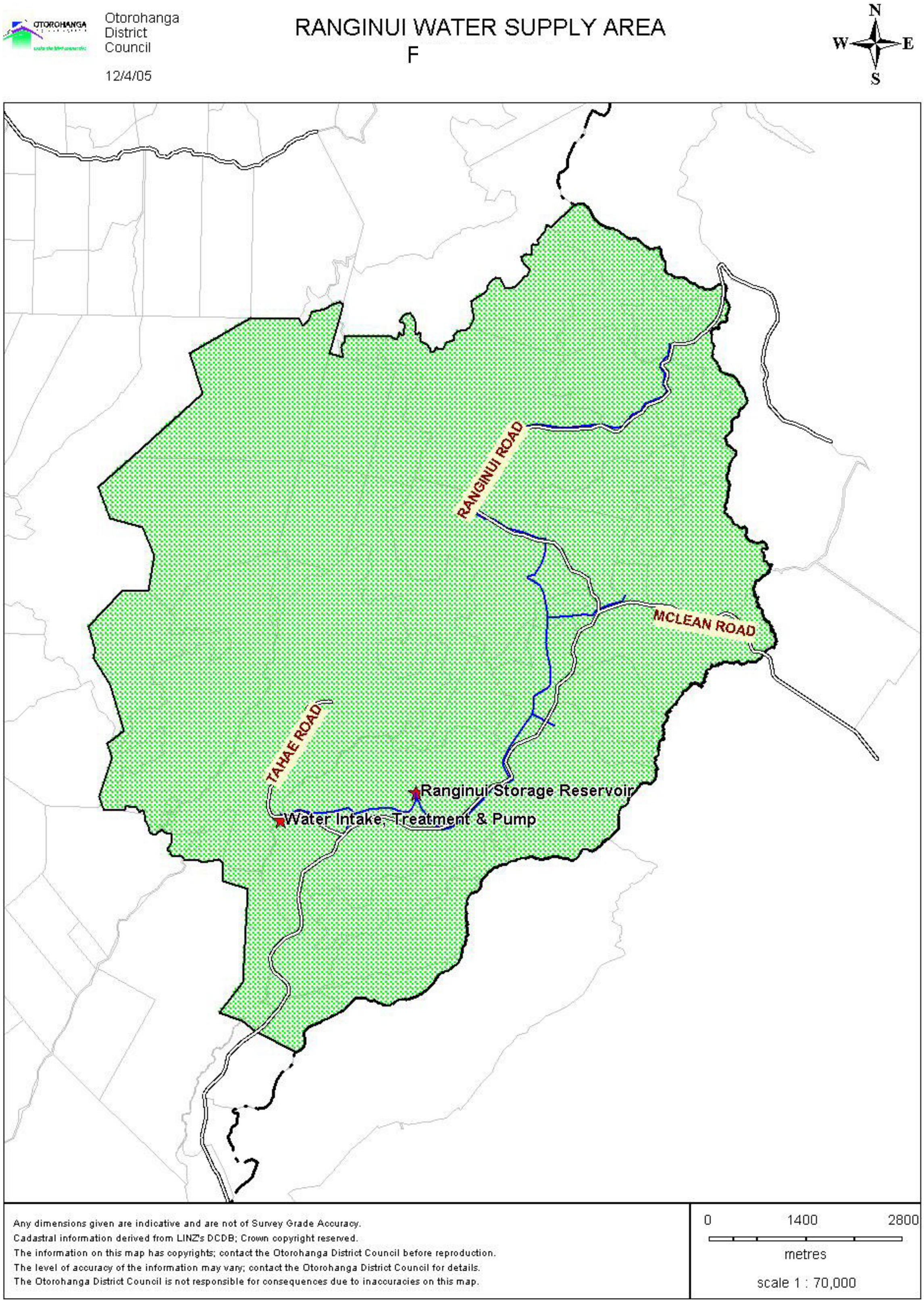


Figure 10.1 – Ranginui Water Supply Area

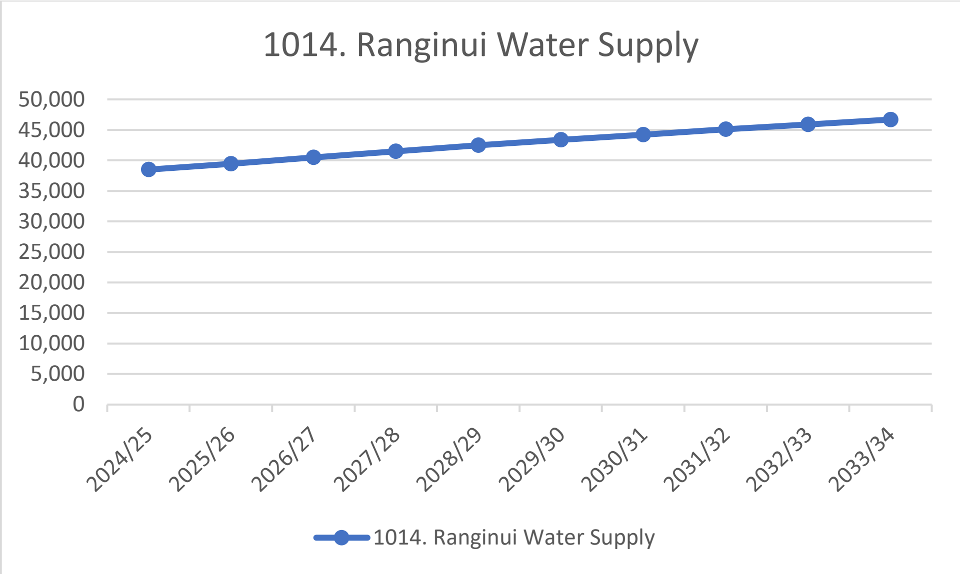


Figure 10.2 – Ranginui Water Annual Renewal Cost Trend

10.2 - Performance

As the RWS is non-potable (agricultural purposes only), there is no Water Safety Plan or compliance against DWQAR's.

Reticulation failures are rare, and usually result from accidental damage to pipes caused by farming operations. Lack of reliable location information for some parts of the scheme also contributes towards such incidents.

In May 2022 Ranginui RWS was granted a new water take consent from the Waikato Regional Council, all conditions have been met.

10.3 - Risk Assessment

As part of converting this RWS to agricultural use only, all connected properties signed statutory declarations agreeing to cease use of this water for potable purposes.

With these health risks removed, the largest risk to the scheme is users ceasing to utilise it due to costs, causing it to be financially unviable. The infrastructure is simple and reliable, and because of the requirement for on-site water storage as part of the trickle-feed approach, occasional temporary interruption of supply would not be expected to have serious consequences.

10.4 - Future Demand

The overall demand for water is heavily dependent on the consumption of a very few large water users, with one of these properties typically using more than 50% of the water produced. This can make demand for water very variable.

This variability was strongly evident during the early 2000's, when changes of management for the largest property saw a 60% increase in overall demand that was then followed by a decrease of similar proportions, bringing demand back to levels recorded in the early 1990's.

The level of charges for water has been a significant concern for this largest property, with the owners indicating that they might leave the scheme if charges were significantly raised in the future.

There has, at various time, been discussion amongst scheme members of closing the scheme as the majority of the members appear to have alternative bore supplies which might potentially be more cost effective.

Because of this dependence on a few large properties, future demand behaviour is relatively difficult to predict, and it is believed that little can be inferred from historical demand data. There is potential for increasing demand to arise from more intensive farming, but there is also potential for substantial decreases in demand if one or more major customers should choose to leave the scheme and utilise other means of water supply.

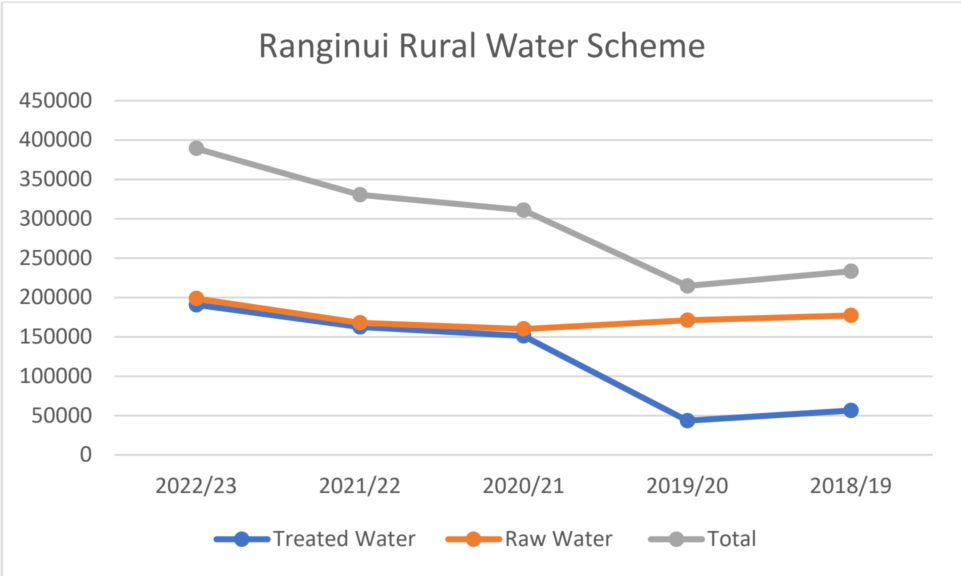


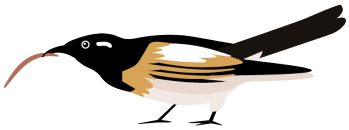
Figure 10.3 – Ranginui Rural Water Scheme Annual Consumption

10.5 - Ability to Accommodate Demand Changes

Increasing demand for water is not a concern for this scheme since the source, treatment plant and reticulation all have significant excess capacity at current levels of demand. Increasing demand would be beneficial for consumers since unit charges for water could be lowered.

Any significant decrease in demand could potentially be critical to the viability of the scheme since it could trigger a 'vicious circle' of increasing water charges to meet relatively fixed costs and further reduced demand if properties chose to leave the scheme. Such a process could quickly lead to a situation where the scheme was no longer financially viable.

There is considered to be little scope for restructuring water charges to offer further incentives for large water users to continue taking water from the scheme.



11.0 - Asset Management Improvement Plan

Several items were identified in the past three water asset management plans related to improvements to be pursued in the following years, and these items are listed below as they are still relevant to ongoing progress in asset management. Where these previous objectives have been achieved is also noted.

11.1 - Water Supply Scheme's DWQAR compliance

Ōtorohanga District Council will continue to work alongside Taumata Arowai, elected members and Drinking Water Compliance experts to develop a stance on how we manage all of our water supply networks' ability to comply with the Drinking Water Quality Assurance Rules.

11.2 - Continuing Emphasis on Collection of Work History Data

Recording of work history, (in particular pipe failures), within the asset management system is considered to have significant benefits and has recently been implemented in the day to day workflow systems. The goal over the forthcoming years is to build an accurate historical record of the maintenance, and feed this data into the condition assessment of the item in question and hence ensure that the renewals which take place are accurately prioritised. The desired outcome from this is continuity of services at the least possible cost. (Avoid costly emergency work due to unforeseen failure of equipment and infrastructure).

While on the flip side, this would also reduce the number of early renewals where assets still have significant useful life remaining.

11.3 - Forward Works Programme to inform Renewals

With the continued focus of working on understanding the condition of our water supply networks and ensuring this and the above work history data flows into our Asset Management System, a forward works programme will be created and maintained which will ensure our renewal budgets are spent on areas which need the investment.

11.4 - Leak Detection

With our water loss being identified as an issue for Ōtorohanga Water supply networks, money has been added into the budget to ensure problem areas are identified to ensure we are looking after our water and providing sustainable water delivery into the future.

Three Waters CAPEX Budgets

	2024/25 Long Term Plan Year 1	2024/25 Long Term Plan Year 2	2024/25 Long Term Plan Year 3
Grand Total	**2,516,000**	**1,982,351**	**1,687,408**
Resiliant Infrastructure: Stormwater	176,000	226,525	211,452
1040. Otorohanga Stormwater	150,000	199,875	194,620
Capital Expenditure	150,000	199,875	194,620
Capital Growth	75,000	51,250	52,600
Capital Level of Service	40,000	112,750	0
Capital Renewals	35,000	35,875	142,020
1041. Kawhia Stormwater	26,000	26,650	16,832
Capital Expenditure	26,000	26,650	16,832
Capital Renewals	26,000	26,650	16,832
Resiliant Infrastructure: Wastewater	798,500	879,963	503,382
1023. Otorohanga Sewerage	798,500	879,963	503,382
Capital Expenditure	798,500	879,963	503,382
Capital Growth	50,000	51,250	52,600
Capital Renewals	748,500	828,713	450,782
Resiliant Infrastructure: Water Supply	1,541,500	875,863	972,574
1010. Tihiroa Water Supply	436,500	54,325	55,756
Capital Expenditure	436,500	54,325	55,756
Capital Renewals	436,500	54,325	55,756
1011. Otorohanga Water Supply	635,000	445,875	405,020
Capital Expenditure	635,000	445,875	405,020
Capital Growth	50,000	51,250	52,600
Capital Renewals	585,000	394,625	352,420
1012. Arohena Water Supply	113,000	100,451	87,316
Capital Expenditure	113,000	100,451	87,316
Capital Renewals	113,000	100,451	87,316
1013. Waipa Water Supply	36,500	18,450	18,936
Capital Expenditure	36,500	18,450	18,936
Capital Renewals	36,500	18,450	18,936
1014. Ranginui Water Supply	38,500	39,462	40,502
Capital Expenditure	38,500	39,462	40,502
Capital Renewals	38,500	39,462	40,502
1016. Kawhia Water Supply	67,000	68,675	70,484
Capital Expenditure	67,000	68,675	70,484
Capital Renewals	67,000	68,675	70,484
1018. Otorohanga Water Treatment Plant	215,000	148,625	294,560
Capital Expenditure	215,000	148,625	294,560
Capital Level of Service	90,000	56,375	42,080
Capital Renewals	125,000	92,250	252,480

*Report Contains Filters

2024/25 Long Term Plan Year 4	2024/25 Long Term Plan Year 5	2024/25 Long Term Plan Year 6	2024/25 Long Term Plan Year 7	2024/25 Long Term Plan Year 8	2024/25 Long Term Plan Year 9
2,047,122	**1,614,791**	**1,754,308**	**1,669,498**	**1,685,653**	**1,672,376**
216,678	221,703	226,326	230,949	235,371	239,592
199,430	204,055	208,310	212,565	216,635	220,520
199,430	204,055	208,310	212,565	216,635	220,520
53,900	55,150	56,300	57,450	58,550	59,600
0	0	0	0	0	0
145,530	148,905	152,010	155,115	158,085	160,920
17,248	17,648	18,016	18,384	18,736	19,072
17,248	17,648	18,016	18,384	18,736	19,072
17,248	17,648	18,016	18,384	18,736	19,072
515,823	527,785	538,791	549,797	560,323	570,372
515,823	527,785	538,791	549,797	560,323	570,372
515,823	527,785	538,791	549,797	560,323	570,372
53,900	55,150	56,300	57,450	58,550	59,600
461,923	472,635	482,491	492,347	501,773	510,772
1,314,621	865,303	989,191	888,752	889,959	862,412
46,354	47,429	48,418	49,407	52,109	51,256
46,354	47,429	48,418	49,407	52,109	51,256
46,354	47,429	48,418	49,407	52,109	51,256
619,850	419,140	427,880	436,620	444,980	452,960
619,850	419,140	427,880	436,620	444,980	452,960
53,900	55,150	56,300	57,450	58,550	59,600
565,950	363,990	371,580	379,170	386,430	393,360
89,474	91,548	93,458	147,073	97,192	98,936
89,474	91,548	93,458	147,073	97,192	98,936
89,474	91,548	93,458	147,073	97,192	98,936
19,404	19,854	20,268	20,682	21,078	21,456
19,404	19,854	20,268	20,682	21,078	21,456
19,404	19,854	20,268	20,682	21,078	21,456
41,503	42,466	43,351	44,236	45,084	45,892
41,503	42,466	43,351	44,236	45,084	45,892
41,503	42,466	43,351	44,236	45,084	45,892
72,226	73,901	74,316	75,834	77,286	78,672
72,226	73,901	74,316	75,834	77,286	78,672
72,226	73,901	74,316	75,834	77,286	78,672
425,810	170,965	281,500	114,900	152,230	113,240
425,810	170,965	281,500	114,900	152,230	113,240
328,790	5,515	45,040	5,745	46,840	5,960
97,020	165,450	236,460	109,155	105,390	107,280

*Report Contains Filters

2024/25 Long Term Plan Year 10
1,926,245
243,813
224,405
224,405
60,650
0
163,755
19,408
19,408
19,408
580,421
580,421
580,421
60,650
519,771
1,102,011
52,159
52,159
52,159
460,940
460,940
60,650
400,290
100,680
100,680
100,680
21,834
21,834
21,834
46,700
46,700
46,700
80,058
80,058
80,058
339,640
339,640
48,520
291,120

*Report Contains Filters

Three Waters OPEX Budgets

	2024/25 Long Term Plan Year 1	2024/25 Long Term Plan Year 2	2024/25 Long Term Plan Year 3	2024/25 Long Term Plan Year 4
Grand Total	**6,259,199**	**6,327,904**	**6,574,681**	**6,765,542**
Resiliant Infrastructure: Stormwater	484,734	511,890	516,656	522,790
1040. Otorohanga Stormwater	310,184	333,793	342,736	352,366
Operating Expenditure	268,273	289,270	297,458	306,393
Finance Costs	10,304	9,303	8,454	7,518
Increase (decrease) in reserves	148,441	161,027	166,288	173,024
Internal charges and overheads applied	56,528	59,490	61,700	63,327
Other operating funding applications	24,500	25,112	25,774	26,411
Payments to staff and suppliers	28,500	34,338	35,242	36,113
1041. Kawhia Stormwater	73,266	77,462	79,154	80,678
Operating Expenditure	73,266	77,462	79,154	80,678
Finance Costs	5,476	4,935	4,661	4,407
Increase (decrease) in reserves	36,435	39,588	40,617	41,566
Internal charges and overheads applied	17,855	19,102	19,674	20,152
Other operating funding applications	6,500	6,663	6,838	7,007
Payments to staff and suppliers	7,000	7,174	7,364	7,546
Resiliant Infrastructure: Wastewater	1,423,530	1,258,933	1,291,152	1,348,882
1020. Otorohanga Sewerage Loan	143,195	145,158	140,044	135,719
Operating Expenditure	143,195	145,158	140,044	135,719
Finance Costs	138,225	139,947	134,704	130,265
Internal charges and overheads applied	4,970	5,211	5,340	5,454
1023. Otorohanga Sewerage	1,280,335	1,113,775	1,151,108	1,213,163
Operating Expenditure	1,280,335	1,113,775	1,151,108	1,213,163
Increase (decrease) in reserves	334,794	372,518	388,712	396,691
Internal charges and overheads applied	255,541	267,707	278,476	286,096
Other operating funding applications	30,500	31,263	32,086	32,879
Payments to staff and suppliers	659,500	442,287	451,834	497,497
Resiliant Infrastructure: Water Supply	4,494,130	4,702,239	4,906,917	5,029,589
1010. Tihiroa Water Supply	457,959	513,467	524,272	506,705
Operating Expenditure	457,959	513,467	524,272	506,705
Finance Costs	30,280	33,319	31,782	30,244
Increase (decrease) in reserves	88,433	103,596	103,513	104,313
Internal charges and overheads applied	162,446	169,708	176,683	181,558
Other operating funding applications	5,300	5,432	5,576	5,713
Payments to staff and suppliers	171,500	201,412	206,718	184,877
1011. Otorohanga Water Supply	807,126	799,368	823,076	851,872
Operating Expenditure	806,967	799,368	823,076	851,872
Increase (decrease) in reserves	329,082	303,530	310,148	325,447
Internal charges and overheads applied	268,885	281,613	293,060	301,123
Other operating funding applications	22,500	23,063	23,670	24,255
Payments to staff and suppliers	186,500	191,162	196,198	201,047
1012. Arohena Water Supply	391,152	413,673	431,050	446,279

Operating Expenditure	391,152	413,673	431,050	446,279
Finance Costs	159	0	0	0
Increase (decrease) in reserves	91,922	104,013	110,736	117,531
Internal charges and overheads applied	158,571	165,648	172,508	177,289
Other operating funding applications	12,500	12,812	13,150	13,475
Payments to staff and suppliers	128,000	131,200	134,656	137,984
1013. Waipa Water Supply	252,729	261,803	267,031	273,791
Operating Expenditure	252,729	261,803	267,031	273,791
Finance Costs	22,888	21,890	20,892	19,893
Increase (decrease) in reserves	57,222	61,863	62,656	63,044
Internal charges and overheads applied	52,919	55,357	57,559	59,122
Other operating funding applications	9,700	9,943	10,204	10,457
Payments to staff and suppliers	110,000	112,750	115,720	121,275
1014. Ranginui Water Supply	100,073	106,460	111,759	116,518
Operating Expenditure	100,073	106,460	111,759	116,518
Increase (decrease) in reserves	29,239	32,952	35,712	38,477
Internal charges and overheads applied	42,234	44,194	45,960	47,210
Other operating funding applications	2,600	2,665	2,735	2,803
Payments to staff and suppliers	26,000	26,649	27,352	28,028
1015. Otorohanga Water Loan	81,241	92,887	88,251	85,038
Operating Expenditure	81,241	92,887	88,251	85,038
Finance Costs	79,619	91,187	86,509	83,258
Internal charges and overheads applied	1,622	1,700	1,742	1,780
1016. Kawhia Water Supply	397,152	417,530	422,917	433,774
Operating Expenditure	397,152	417,530	422,917	433,774
Finance Costs	33,302	36,074	34,755	33,631
Increase (decrease) in reserves	98,556	108,122	105,268	109,781
Internal charges and overheads applied	157,944	165,351	172,066	176,795
Other operating funding applications	8,500	8,712	8,942	9,163
Payments to staff and suppliers	98,850	99,271	101,886	104,404
1018. Otorohanga Water Treatment Plant	652,450	683,547	764,232	799,575
Operating Expenditure	652,450	683,547	764,232	799,575
Finance Costs	29,669	32,763	31,217	29,670
Increase (decrease) in reserves	54,062	63,238	72,312	91,823
Internal charges and overheads applied	326,219	341,032	355,097	364,923
Other operating funding applications	5,500	5,638	5,786	5,929
Payments to staff and suppliers	237,000	240,876	299,820	307,230
Trusted Leadership & Relationships	1,354,407	1,413,504	1,474,329	1,516,037
1017. Water Services Department	1,354,407	1,413,504	1,474,329	1,516,037
Operating Expenditure	1,354,407	1,413,504	1,474,329	1,516,037
Internal charges and overheads applied	630,397	664,961	709,484	735,624
Other operating funding applications	2,200	2,246	2,295	2,341
Payments to staff and suppliers	721,810	746,297	762,550	778,072

2024/25 Long Term Plan Year 5	2024/25 Long Term Plan Year 6	2024/25 Long Term Plan Year 7	2024/25 Long Term Plan Year 8	2024/25 Long Term Plan Year 9	2024/25 Long Term Plan Year 10
6,940,915	**7,083,898**	**7,463,038**	**7,401,179**	**7,486,887**	**7,607,711**
540,825	543,075	545,400	560,399	563,014	566,139
375,981	385,251	394,320	416,035	425,430	435,303
326,482	334,994	343,588	362,091	370,668	379,705
6,466	5,487	4,507	3,616	2,744	2,031
191,368	198,258	205,453	222,758	230,231	237,837
64,674	65,941	66,986	67,799	68,557	69,483
27,024	27,587	28,150	28,690	29,204	29,718
36,950	37,721	38,492	39,228	39,932	40,636
84,918	86,331	87,396	91,206	92,548	93,951
84,918	86,331	87,396	91,206	92,548	93,951
4,171	3,935	3,700	3,464	3,228	2,992
45,328	46,322	47,032	50,480	51,534	52,606
20,528	20,873	21,153	21,453	21,694	21,978
7,169	7,319	7,469	7,611	7,748	7,885
7,722	7,882	8,042	8,198	8,344	8,490
1,366,542	1,389,360	1,646,701	1,463,039	1,480,492	1,508,302
129,425	121,750	114,416	107,102	99,798	92,483
129,425	121,750	114,416	107,102	99,798	92,483
123,865	116,091	108,685	101,279	93,890	86,502
5,560	5,659	5,731	5,823	5,908	5,981
1,237,117	1,267,610	1,532,285	1,355,937	1,380,694	1,415,819
1,237,117	1,267,610	1,532,285	1,355,937	1,380,694	1,415,819
437,306	448,949	470,488	508,057	522,149	540,939
292,431	298,449	303,457	306,878	310,225	314,474
33,641	34,343	35,045	35,715	36,356	36,997
473,739	485,869	723,295	505,287	511,964	523,409
5,162,973	5,273,213	5,385,353	5,484,843	5,543,179	5,625,753
519,866	524,618	531,995	541,868	547,699	554,077
519,866	524,618	531,995	541,868	547,699	554,077
28,707	27,170	25,632	24,095	22,558	21,020
110,502	108,829	110,436	115,827	117,343	118,842
185,646	189,542	192,784	194,913	197,052	199,757
5,846	5,968	6,090	6,206	6,318	6,429
189,165	193,109	197,053	200,827	204,428	208,029
903,549	924,466	951,097	983,770	1,001,028	1,022,556
903,549	924,466	951,097	983,770	1,001,028	1,022,556
365,202	374,948	385,720	410,121	419,388	431,937
307,820	314,184	319,491	323,055	326,552	331,037
24,817	25,335	25,853	26,347	26,820	27,293
205,710	209,999	220,033	224,247	228,268	232,289
466,679	477,271	491,655	508,955	514,397	525,115

466,679	477,271	491,655	508,955	514,397	525,115
0	0	0	0	0	0
130,416	133,961	141,934	154,080	154,495	159,616
181,291	185,107	188,287	190,349	192,426	195,073
13,788	14,075	14,362	14,638	14,900	15,162
141,184	144,128	147,072	149,888	152,576	155,264
281,734	285,499	288,870	298,302	299,442	302,766
281,734	285,499	288,870	298,302	299,442	302,766
18,895	17,896	16,898	15,900	14,901	13,903
67,619	68,327	68,851	72,952	71,763	72,591
60,433	61,679	62,713	63,427	64,136	65,010
10,699	10,922	11,146	11,358	11,562	11,767
124,088	126,675	129,262	134,665	137,080	139,495
123,324	126,348	130,881	136,892	136,425	140,951
123,324	126,348	130,881	136,892	136,425	140,951
43,519	44,890	47,942	52,751	51,124	54,351
48,258	49,254	50,079	50,649	51,210	51,909
2,868	2,928	2,987	3,045	3,099	3,154
28,679	29,276	29,873	30,447	30,992	31,537
83,319	80,206	75,773	71,449	67,163	62,871
83,319	80,206	75,773	71,449	67,163	62,871
81,505	78,360	73,903	69,549	65,235	60,920
1,814	1,846	1,870	1,900	1,928	1,951
449,395	456,350	465,528	460,943	462,918	471,439
449,395	456,350	465,528	460,943	462,918	471,439
32,507	31,382	30,258	29,134	28,009	26,885
119,954	121,870	126,630	118,757	117,581	122,382
180,732	184,474	187,593	189,687	191,751	194,383
9,376	9,571	9,766	9,954	10,132	10,310
106,826	109,053	111,281	113,411	115,445	117,479
784,311	814,468	837,653	853,861	868,018	877,025
784,311	814,468	837,653	853,861	868,018	877,025
28,123	26,577	25,030	23,483	21,937	20,390
117,789	136,143	148,823	157,029	163,422	163,479
373,129	380,945	387,464	391,725	395,983	401,428
6,066	6,193	6,320	6,440	6,556	6,672
259,204	264,610	270,016	275,184	280,120	285,056
1,550,796	1,583,987	1,611,901	1,628,803	1,646,089	1,668,953
1,550,796	1,583,987	1,611,901	1,628,803	1,646,089	1,668,953
1,550,796	1,583,987	1,611,901	1,628,803	1,646,089	1,668,953
755,548	774,671	788,519	791,389	795,375	804,941
2,385	2,427	2,468	2,510	2,550	2,589
792,863	806,889	820,914	834,904	848,164	861,423

Drinking-Water Standards for New Zealand 2005 (Revised 2018) (DWSNZ) Compliance Assessment of Ōtorohanga District Council Water Supplies for Quarter 3 – 2022 and Quarter 4 – 2022 (until November 13th 2022)

3 Waters Consulting Limited have been asked to be the independent external expert in providing specialist drinking water expertise. An independent review of the Ōtorohanga District Council (ODC) water supplies compliance against the Ministry of Health Drinking Water Standards for New Zealand has been undertaken. The compliance period reviewed is that of Quarter 3 – 2022 (1st July 2022 to 30th September 2022) and Quarter 4 – 2022 (1st October 2022 – 13th November 2022). Please note, the DWSNZ remained operative until the 14th of November 2022. From this date the new Water Services (Drinking Water Standards for New Zealand) Regulations 2022 and associated Drinking Water Quality Assurance Rules 2022 (DWQAR) became the operative requirements for water suppliers to meet.

This independent review only assesses the Ōtorohanga District Council water supplies against the DWSNZ from 1st July 2022 until the 13th of November 2022. A subsequent compliance assessment audit information and associated Letter of Compliance against the DWQAR, covers the time period of 14th November 2022 until 30th June 2023.

The system that has been used for this assessment is the identical system that was used by Drinking Water Assessors (DWA) prior to November 2021. The system is referred to as "DWA Function 1: Assessing drinking water supplier compliance with Drinking Water Standards New Zealand 2005/18".

The findings of this assessment and the method that was used are detailed in the below boxes.

DWSNZ 2005(revised 2018) Compliance Recording Sheet

Date	October 2023
Person completing assessment & experience	Mark Palmer - Drinking Water Compliance Specialist Mark Palmer has a Bachelor of Applied Science (Honours) degree in Environmental Management (University of Otago), Postgraduate Diploma in Health Sciences (with Distinction) endorsed in Hazard Assessment and Management (University of Otago), Graduate Diploma (With Distinction) in Environmental Health (Massey University) and a Diploma in Drinking Water Assessment (Opus). Mark has approximately eight years' experience in drinking water assessment, having worked as part of the Waikato Drinking Water Assessment Service of the Waikato Public Health Unit – Health NZ. Until November 2021 Mark was the only Public Health full-time employed Drinking Water Assessor (with a consultant assisting) for the Waikato Region. Mark uses his previous experience and knowledge to undertake independent expert verification and compliance assessments.

Council audited or drinking-water supply name	Ōtorohanga District Council Water supplies of: Otorohanga water supply Arohena water supply Kawhia water supply Tihiroa water supply
Information reviewed	ODC use the Water Outlook database for recording the overall compliance data of the water supplies. This includes all of the treatment plants' performance (criterion 2B), continuous monitoring data particularly for the Otorohanga Treatment Plant, and Distribution Zone results. The bacterial (*E. coli* and total coliform), manual turbidity and chlorine results; sample data for the water leaving the treatment plants was contained in each respective treatment plants' monthly Excel spreadsheets downloaded from Water Outlook. For Otorohanga Treatment Plant the continuous monitoring monthly results (showing the compliance monitoring period (CMP) 1-day) and turbidity results downloaded from SCADA and Water Outlook. These results were used to assess the compliance against section 4 – DWSNZ (Bacterial) and combined with the findings of the treatment plant for compliance against Section 5 – DWSNZ (protozoa). ODC sent through the compliance monthly reports which gave a conclusive record of the monthly compliance for each plant along with the downloaded SCADA 'raw' continuous monitoring data for the Otorohanga Water Treatment Plant for all months of both quarters. Obtaining all compliance 'raw' data meant that the auditor did not need to randomly select the 5 days 'raw' data, rather the external expert was able to review all of the months of continuous monitoring data for the Otorohanga Treatment Plant. The information and data obtained for this assessment is detailed below for each respective Treatment Plant. **Treatment Plants** <u>Otorohanga (TP00173) Water Treatment Plant</u> Otorohanga WTP - DWSNZ Compliance (Monthly) - 2022-07 Otorohanga WTP - DWSNZ Compliance (Monthly) - 2022-08 Otorohanga WTP - DWSNZ Compliance (Monthly) - 2022-09 Otorohanga WTP - DWSNZ Compliance (Monthly) - 2022-10 Otorohanga WTP - DWSNZ Compliance (Monthly) - 2022-11 Otorohanga WTP - DWSNZ Compliance (Monthly) RAW DATA - 2022-07 Otorohanga WTP - DWSNZ Compliance (Monthly) RAW DATA - 2022-08 Otorohanga WTP - DWSNZ Compliance (Monthly) RAW DATA - 2022-09 Otorohanga WTP - DWSNZ Compliance (Monthly) RAW DATA - 2022-10 Otorohanga WTP - DWSNZ Compliance (Monthly) RAW DATA - 2022-11

	2022 07 to 11 Otorohanga Retic <u>Huirimu (TP00689) Water Treatment Plant</u> 2022 07 to 11 Huirimu WTP DWS 2B_6A Compliance Report <u>Kahorekau (TP00690) Water Treatment Plant</u> 2022 07 to 11 Kahorekau WTP DWS 2B_6A Compliance Report <u>Taupaki, Arohena (TP00691) Water Treatment Plant</u> 2022 07 to 11 Taupaki WTP DWS 2B_6A Compliance Report <u>Kawhia (TP00169) Water Treatment Plant</u> Kawhia WTP DWS 2B_6A Compliance Report - 2022-07 Kawhia WTP DWS 2B_6A Compliance Report - 2022-08 Kawhia WTP DWS 2B_6A Compliance Report - 2022-09 Kawhia WTP DWS 2B_6A Compliance Report - 2022-10 Kawhia WTP DWS Protozoal Compliance Report - 10 Oct onward - 2022-10 Kawhia WTP DWS Protozoal Compliance Report - 10 Oct onward - 2022-11 2022 07 to 11 Kawhia WTP DWS 2B_6A Compliance Report <u>Tihiroa (TP00686) Water Treatment Plant</u> 2022 07 to 11 Tihiroa WTP DWS 2B_6A Compliance Report **Distribution Zones** The sample results that had been obtained by the water supplier were in the form of Water Outlook downloaded Excel spreadsheets. These samples were taken from the distribution zone and were analysed for *E. coli*, and total coliform. ODC do not have P2's in place in any distribution zone. Using the spreadsheet, the number of samples, maximum interval between samples and days of the week were calculated and the information checked for consistency. It is noted that the sampling and analysis is undertaken by CoLab which is an IANZ accredited and approved laboratory for the analysis of all required determinands by ODC. The Excel spreadsheets reviewed were part of the Criterion 2B, DWSNZ results for the respective Treatment Plant, and are therefore shown under the Treatment Plants above. The below distribution zones were assessed: Otorohanga (OTO001OT) Waipa (OTO001WA) Mangare Road, Arohena (ARO001MA)

	Aotearoa Road, Arohena (ARO001AO) Arohena (ARO001AR) Kawhia Township (KAW001KA) Tihiroa (TIH001TI)

GENERAL COMPLIANCE

Compliance assessment period	Quarter 3 – 2022 (1st July 2022 to 30th September 2022) Quarter 4 – 2022 (1st October 2022 – 13th November 2022)
What is risk category of supply audited eg high risk? – identifies priority for verification of data. Other comments on	The water supplies of Otorohanga, Tihiroa and Kawhia would not be deemed high risk due to appropriate bacterial (including chlorination) and protozoa treatment. However, the Arohena water supply would be considered medium to high risk due to inadequate protozoa removal which is rapid sand filtration without coagulation – if coagulation was in place, the risk would be reduced. This water supply is however chlorinated which does assist in decreasing the bacterial risk but not protozoan.
Method of data provision from water supplier to DWA (DWO/Alternative electronic/paper/in person during visit – detail dates and reason for visit)	Through electronic means of sample results, raw data and monthly compliance detail for the treatment plants downloaded from the monitoring database of Water Outlook and forwarded.
What data is audited over compliance assessment period? – Overview of: • What selection of data was chosen and why? • What parameters are audited • What timeframes will be audited • Which areas of compliance were chosen for audit and why? • Which supplies were chosen to select data from? Risk based approach used to determine this <u>Within each section below is details around selection of data</u>	All of the four water supplies compliance monitoring data was reviewed for the two Quarters of Quarter 3 – 2022 (1st July 2022 to 30th September 2022) and Quarter 4 – 2022 (1st October 2022 – 13th November 2022) For the treatment plants the audit reviewed for each individual plant: The monthly compliance reports (which had parameters as turbidity results, FACE, *E.* coli, total coliforms) and information indicating issues that had occurred at the plants on any particular month (s). For Otorohanga Treatment Plant the monthly compliance reports included the daily CMP filter results (for standard coagulation / sedimentation /filtration criteria) for all four filters, the minutes in service and whether the filter met the Section 5.4 requirement. The CMP daily FACE minutes, minimum FACE, minimum chlorine contact time and disinfection turbidity,

	Bacterial (*E. coli* and total coliform) sample results for the distribution zone were analysed, these downloaded from Water Outlook and forwarded from ODC.

Compliance assessment based on: a. Whole compliance data set. b. Audit of selection of data records (state %) Note: this may be determined by what criteria they are trying to comply with (e.g. secure groundwater and crypto monitoring requires whole compliance data set)	For the Otorohanga Treatment Plants the monthly compliance reports were viewed, with the raw SCADA minute by minute continuous monitoring data reviewed for all months of the Quarter 3 and Quarter 4 (until November 13th 2022) period. All bacterial, FACE and turbidity results for the criterion 2B treatment compliance were viewed for the five treatment plants using criterion 2B. For the distribution zones, the bacterial results were viewed via an Excel spreadsheet downloaded from Water Outlook database.

TREATMENT PLANTS

Bacterial Compliance

Record compliance criterion used. – and compliance periods for these criterion (e.g 1, 2A, 2B etc)	Compliance Criterion stated below, was for both Quarter 3 – 2022 (1st July 2022 to 30th September 2022) and Quarter 4 – 2022 (1st October 2022 – 13th November 2022) Criterion 2A – compliance requirements under Section 4.2.2 a of the DWSNZ Otorohanga (TP00173) Water Treatment Plant Criterion 2B - compliance requirements under Section 4.2.2 b of the DWSNZ Huirimu (TP00689) Water Treatment Plant Kahorekau (TP00690) Water Treatment Plant Taupaki, Arohena (TP00691) Water Treatment Plant Kawhia (TP00169) Water Treatment Plant Tihiroa (TP00686) Water Treatment Plant
What parameters and timeframe were audited and from which supplies? – if not full data set must be minimum 10 different sampling days	Continuous data for the days stated above were reviewed through both Quarter 3 and Quarter 4, 2022 (until November 13th 2022).

	All monthly compliance reports and sample results were forwarded using Excel spreadsheets that were downloaded from Water Outlook database and forwarded from ODC. For Otorohanga Treatment Plant the raw minute by minute SCADA results for both of the Quarter 3 and Quarter 4, 2022 were forwarded for assessment. The Parameters audited for Otorohanga Treatment Plant were: - Turbidity - Continuous FACE - Hydraulic retention time - Minimum C.t value For the other Treatment Plants, the parameters audited were: - *E. coli* / total coliforms - FACE - Turbidity
Comments on whether compliance criterion met / not met and reasons	Compliance Criterion 2A for Otorohanga Treatment Plant and Criterion 2B for the other Treatment Plants. **<u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u>** **Otorohanga (TP00173) Water Treatment Plant** Compliance Criterion 2A – was met for the full compliance Quarter 3, 2022 of 1st July 2021 to 30th September 2022. **Huirimu (TP00689) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 22 Minimum days of week to be used = 3 FACE Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 No sample <.20 mg/l Turbidity

	Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU Actual Obtained for Criterion 2B – Huirimu (TP00689) WTP for full compliance period: *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 21 Minimum days of week to be used = 5 FACE Minimum samples per compliance quarter = 28 Maximum interval between samples = 5 Minimum days of week to be used = 5 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance quarter = 27 Maximum interval between samples = 7 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 18 Number (none allowed) > 2.0 NTU - 9 Huirimu WTP bacterial criterion 2B not met for Quarter 3, 2022, due to turbidity exceedances outside of allowable. **Kahorekau (TP00690) Water Treatment Plant** DWSNZ Requirements *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 22 Minimum days of week to be used = 3 FACE Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 No sample <.20 mg/l Turbidity

	Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU Actual Obtained for Criterion 2B – Kahorekau (TP00690) WTP for full compliance period: *E. coli* Minimum samples per compliance quarter = 5 Maximum interval between samples = 27 Minimum days of week to be used = 5 FACE Minimum samples per compliance quarter = 27 Maximum interval between samples = 6 Minimum days of week to be used = 5 No sample <.20 mg/l Number = 2 samples below 20 mg/ Turbidity Minimum samples per compliance quarter = 25 Maximum interval between samples = 7 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 17 Number (none allowed) > 2.0 NTU - 5 Kahorekau WTP bacterial criterion 2B not met for Quarter 3, 2022 due to elevated turbidity samples and not enough *E. coli* / total coliform samples obtained, and maximum interval breached between samples. **Taupaki, Arohena (TP00691) Water Treatment Plant** DWSNZ Requirements *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 22 Minimum days of week to be used = 3 FACE Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 No sample <.20 mg/l

	Turbidity Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU Actual Obtained for Criterion 2B – Taupaki, Arohena (TP00691) WTP for full compliance period: *E. coli* Minimum samples per compliance year = 7 Maximum interval between samples = 21 Minimum days of week to be used = 5 FACE Minimum samples per compliance year = 28 Maximum interval between samples = 5 Minimum days of week to be used = 5 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance year = 27 Maximum interval between samples = 5 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 8 Number (none allowed) > 2.0 NTU - 1 Taupaki, Arohena WTP bacterial Criterion 2B not met for Quarter 3, 2022, due to turbidity exceedances outside of allowable. **Kawhia (TP00169) Water Treatment Plant** DWSNZ Requirements *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 22 Minimum days of week to be used = 3 FACE Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 No sample <.20 mg/l Turbidity

	Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU <u>Actual Obtained for Criterion 2B – Kawhia (TP00169) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 21 Minimum days of week to be used = 5 FACE Minimum samples per compliance quarter = 36 Maximum interval between samples = 7 Minimum days of week to be used = 5 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance quarter = 38 Maximum interval between samples = 7 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 0 Number (none allowed) > 2.0 NTU - 0 Kawhia WTP bacterial Criterion 2B <u>met</u> for Quarter 3, 2022. **Tihiroa (TP00686) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 7 Maximum interval between samples = 22 Minimum days of week to be used = 3 FACE Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 No sample <.20 mg/l Turbidity Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4

	>1.0 NTU Number (none allowed) > 2.0 NTU <u>Actual Obtained for Criterion 2B – Tihiroa (TP00686) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 9 Maximum interval between samples = 21 Minimum days of week to be used = 7 FACE Minimum samples per compliance quarter = 39 Maximum interval between samples = 5 Minimum days of week to be used = 5 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance quarter = 39 Maximum interval between samples = 5 Minimum days of week to be used = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 6 Number (none allowed) > 2.0 NTU - 6 Tihiroa WTP bacterial Criterion 2B <u>not met</u> for Quarter 3, 2022, due to turbidity exceedances outside of allowable. **<u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u>** **Otorohanga (TP00173) Water Treatment Plant** Compliance criterion 2A – was met for the full compliance Quarter 4, 2022 of 1st October 2022 to 13th November 2022. **Huirimu (TP00689) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 3 Maximum interval between samples = 22 FACE Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 No sample <.20 mg/l

	Turbidity Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU <u>Actual Obtained for Criterion 2B – Huirimu (TP00689) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 1 Maximum interval between samples = 32 FACE Minimum samples per compliance quarter = 13 Maximum interval between samples = 8 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance quarter = 13 Maximum interval between samples = 8 Number (exceedance according to Table A1.4 >1.0 NTU – 10 Number (none allowed) > 2.0 NTU - 3 Huirimu WTP bacterial Criterion 2B <u>not met</u> for Quarter 4, 2022, due to not *E. coli* / total coliforms minimum sampling not met, maximum interval between *E. coli* / total coliforms samples not met and turbidity exceedances outside of allowable. **Kahorekau (TP00690) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 3 Maximum interval between samples = 22 FACE Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance quarter = 5 Maximum interval between samples = 11

	Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU <u>Actual Obtained for Criterion 2B – Kahorekau (TP00690) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 1 Maximum interval between samples = 32 FACE Minimum samples per compliance year = 14 Maximum interval between samples = 6 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance year = 14 Maximum interval between samples = 6 Number (exceedance according to Table A1.4 >1.0 NTU – 8 Number (none allowed) > 2.0 NTU - 2 Kahorekau WTP bacterial Criterion 2B <u>not met</u> for Quarter 4, 2022, due to not *E. coli* / total coliforms minimum sampling not met, maximum interval between *E. coli* / total coliforms samples not met and turbidity exceedances outside of allowable. **Taupaki, Arohena (TP00691) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 3 Maximum interval between samples = 22 FACE Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 No sample <.20 mg/l Turbidity Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 Number (exceedance according to Table A1.4 >1.0 NTU

	Number (none allowed) > 2.0 NTU <u>Actual Obtained for Criterion 2B – Taupaki, Arohena (TP00691) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 1 Maximum interval between samples = 32 FACE Minimum samples per compliance year = 14 Maximum interval between samples = 6 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance year = 14 Maximum interval between samples = 6 Number (exceedance according to Table A1.4 >1.0 NTU – 4 Number (none allowed) > 2.0 NTU - 1 Taupaki, Arohena WTP bacterial Criterion 2B <u>not met</u> for Quarter 4, 2022, due to not *E. coli* / total coliforms minimum sampling not met, maximum interval between *E. coli* / total coliforms samples not met and turbidity exceedances outside of allowable. **Kawhia (TP00169) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 3 Maximum interval between samples = 22 FACE Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 No sample <.20 mg/l Turbidity Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU

	<u>Actual Obtained for Criterion 2B – Kawhia (TP00169) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 0 Maximum interval between samples = 42 FACE Minimum samples per compliance year = 19 Maximum interval between samples = 5 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance year = 19 Maximum interval between samples = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 0 Number (none allowed) > 2.0 NTU - 0 Kawhia WTP bacterial Criterion 2B <u>not met</u> for Quarter 4, 2022, due to not *E. coli* / total coliforms minimum sampling not met and maximum interval between *E. coli* / total coliforms samples not met. **Tihiroa (TP00686) Water Treatment Plant** <u>DWSNZ Requirements</u> *E. coli* Minimum samples per compliance quarter = 3 Maximum interval between samples = 22 FACE Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 No sample <.20 mg/l Turbidity Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 Number (exceedance according to Table A1.4 >1.0 NTU Number (none allowed) > 2.0 NTU <u>Actual Obtained for Criterion 2B – Tihiroa (TP00686) WTP for full compliance period:</u> *E. coli* Minimum samples per compliance quarter = 1

	Maximum interval between samples = 32 FACE Minimum samples per compliance year = 18 Maximum interval between samples = 5 No sample <.20 mg/l Number = 0 Turbidity Minimum samples per compliance year = 18 Maximum interval between samples = 5 Number (exceedance according to Table A1.4 >1.0 NTU – 0 Number (none allowed) > 2.0 NTU - 1 Tihiroa WTP bacterial criterion 2B not met due to turbidity exceedance above allowable, *E. coli* / total coliforms minimum sampling not met and maximum interval between *E. coli* / total coliforms samples not met.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Reviewed the monthly compliance reports and sample results that were forwarded using Excel spreadsheets that were downloaded from Water Outlook database. For Otorohanga Treatment Plant the raw minute by minute SCADA results for both Quarters were also reviewed.

Protozoa Compliance

Record Log Credit required - Catchment Risk Assessment or Crypto Monitoring used to achieve log credits?	Protozoa monitoring and CRA for Otorohanga WTP – 3-Log Catchment Risk Assessments for all supplies. Huirimu WTP - 4-Log Kahorekau WTP – 3-Log Taupaki, Arohena WTP – 3-Log Kawhia WTP – 3-Log Tihiroa WTP - 4-Log
List treatment processes in place that meet DWSNZ criteria – including compliance monitoring periods for those treatment processes.	Otorohanga Treatment Plant - Coagulation, sedimentation & Filtration (CMP – 1 Month) Huirimu Water Treatment Plant - Rapid Sand filtration (CMP – 1 Month)

	<u>Kahorekau Water Treatment Plant</u> - Rapid Sand filtration (CMP – 1 Month) <u>Taupaki, Arohena Water Treatment Plant</u> - Rapid Sand filtration (CMP – 1 Month) <u>Kawhia Water Treatment Plant</u> - Coagulation, sedimentation & Filtration (CMP – 1 Month) - Ultraviolet disinfection (CMP – 1 Month) <u>Tihiroa Water Treatment Plant</u> - Coagulation, sedimentation & Filtration (CMP – 1 Month)
What parameters and timeframe were audited and from which supplies? – if not full data set must be minimum 10 different sampling days	The continuous data for the days stated above were reviewed through both Quarter 3 and Quarter 4, 2022 (until 13th November 2022). The data reviewed was chosen based upon the Compliance monthly reports. Any possible discrepancies or perceived transgressions highlighted in the compliance monthly reports resulted in this Drinking Water Compliance Specialist requesting that particular day(s) of compliance data for assessment. <u>Otorohanga Treatment Plant</u> Parameters assessed: - Filter turbidity for all four filters - flow - Any missing data <u>Huirimu Water Treatment Plant</u> - No continuous monitoring data available <u>Kahorekau Treatment Plant</u> - No continuous monitoring data available <u>Taupaki, Arohena Treatment Plant</u> - No continuous monitoring data

	available <u>Kawhia Treatment Plant</u> Parameters assessed: - Filter turbidity - flow - Any missing data <u>Tihiroa Treatment Plant</u> - No continuous monitoring data available
What log credits are possible for each treatment process? – Which ones achieved those log credits and why? **Total log credits achieved:** all treatment processes combined	**Otorohanga Treatment Plant** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> Coagulation, sedimentation & filtration – 3-log Log credit possible – 3-log Achieved – 3-log *<u>Compliant with Section 5 (Protozoa), DWSNZ for Quarter 3, 2022</u>* <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> Coagulation, sedimentation & filtration – 3-log Log credit possible – 3-log Achieved – 0-log *<u>Compliant with Section 5 (Protozoa), DWSNZ for Quarter 4, 2022</u>* **Huirimu Water Treatment Plant** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> Rapid Sand filtration – 0-log Log credit possible – 0-log

	Achieved – 0-log <u>Reason for not meeting:</u> The treatment in place does not meet the required for inactivation or removal of protozoa. <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> Rapid Sand filtration – 0-log Log credit possible – 0-log Achieved – 0-log <u>Reason for not meeting:</u> The treatment in place does not meet the required for inactivation or removal of protozoa. **Kahorekau Water Treatment Plant** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> Rapid Sand filtration – 0-log Log credit possible – 0-log Achieved – 0-log <u>Reason for not meeting:</u> The treatment in place does not meet the required for inactivation or removal of protozoa. <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> Rapid Sand filtration – 0-log Log credit possible – 0-log Achieved – 0-log <u>Reason for not meeting:</u> The treatment in place does not meet the required for inactivation or removal of protozoa.

	Taupaki, Arohena Water Treatment Plant <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> Rapid Sand filtration – 0-log Log credit possible – 0-log Achieved – 0-log <u>Reason for not meeting:</u> The treatment in place does not meet the required for inactivation or removal of protozoa. <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> Rapid Sand filtration – 0-log Log credit possible – 0-log Achieved – 0-log <u>Reason for not meeting:</u> The treatment in place does not meet the required for inactivation or removal of protozoa. **Kawhia Water Treatment Plant** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> Coagulation, sedimentation & filtration – 3-log Log credit possible – 3-log Achieved – 0-log <u>Reason for not meeting:</u> Kawhia WTP did not achieve any log credits due to not meeting the turbidity requirements in July 2022. Turbidity was above 0.3 NTU for more than 5%, 0.50 NTU for more than 1% and 1 NTU for the duration of 3 minutes or more. <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u>

	Coagulation, sedimentation & filtration – 3-log Log credit possible – 6-log Achieved – 0-log <u>Reason for not meeting:</u> Kawhia WTP did not achieve any log credits due to not meeting the turbidity requirements in October and November 2022 (until 13th November). Turbidity was above 0.3 NTU for more than 5%, 0.50 NTU for more than 1% and 1 NTU for the duration of 3 minutes or more. **Tihiroa Water Treatment Plant** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> Coagulation, sedimentation & filtration – 3-log Log credit possible – 3-log Achieved – 0-log <u>Reason for not meeting:</u> Tihiroa WTP did not achieve any log credits due to no continuous monitoring data being available and forwarded for assessment. <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> Coagulation, sedimentation & filtration – 3-log Log credit possible – 3-log Achieved – 0-log <u>Reason for not meeting:</u> Tihiroa WTP did not achieve any log credits due to no continuous monitoring data being available and forwarded for assessment.

Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Reviewed the Otorohanga Treatment Plant the raw minute by minute SCADA results and monthly compliance reports for both Quarters of the compliance period.

Cyanotoxin Compliance

Cyanotoxin compliance applicable or not applicable? Complies?	Not officially assigned to the treatment plants, however, there is a cyanotoxin management protocol in place. Therefore, is compliant.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Not applicable

Chemical Compliance

Plumbosolvent compliance determined – notices sent out? – evidence?	Six monthly notices -Waitomo News
Does the treatment plant have P2's assigned? (list) – if applicable	Not applicable
Summary and comment on compliance monitoring gathered for report whether or not data was assessed for this. Justification either way	Not applicable
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Not applicable

Radiological Compliance

Radiological compliance applicable or not applicable? When was testing done	N/A – all surface water sources

DISTRIBUTION ZONE

Bacterial Compliance

Record compliance criterion used. – and compliance periods for these criterion	DWSNZ section 4.3.1: criterion 6A using *E. coli* monitoring and total coliforms only for all water supplies. **Otorohanga Distribution Zone** Quarter 3 – 2022 (1st July 2022 to 30th September 2022)

	<u>DWSNZ requirements</u> Minimum samples per compliance quarter = 13 Maximum interval between samples = 11 Minimum days of week to be used = 5 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 13 Maximum interval between samples = 14 Minimum days of week used = 5 <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 5 Maximum interval between samples = 11 Minimum days of week to be used = 5 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 5 Maximum interval between samples = 11 Minimum days of week used = 5 **<u>Waipa Distribution Zone</u>** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance year = 3 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 3 Maximum interval between samples = 38 Minimum days of week used = 2 <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 1 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u>

	Samples obtained = 7 Maximum interval between samples = 25 Minimum days of week used = 5 **<u>Mangare Road, Arohena Distribution Zone</u>** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 3 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 3 Maximum interval between samples = 38 Minimum days of week used = 2 <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 1 Maximum interval between samples = 45 Minimum days of week to be used = 1 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 1 Maximum interval between samples = 33 Minimum days of week used = 7 **<u>Aotearoa Road, Arohena Distribution Zone</u>** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 3 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 16 Maximum interval between samples = 38 Minimum days of week used = 3

	<u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 1 Maximum interval between samples = 45 Minimum days of week to be used = 1 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 1 Maximum interval between samples = 34 Minimum days of week used = 2 **<u>Arohena Distribution Zone</u>** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 3 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 7 Maximum interval between samples = 39 Minimum days of week used = 3 <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 1 Maximum interval between samples = 45 Minimum days of week to be used = 1 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 1 Maximum interval between samples = 34 Minimum days of week used = 1 **Kawhia Township Distribution Zone** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 3

	Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 3 Maximum interval between samples = 38 Minimum days of week used = 3 <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 1 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 6 Maximum interval between samples = 25 Minimum days of week used = 5 **<u>Tihiroa Distribution Zone</u>** <u>Quarter 3 – 2022 (1st July 2022 to 30th September 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 3 Maximum interval between samples = 45 Minimum days of week to be used = 2 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 6 Maximum interval between samples = 28 Minimum days of week used = 4 <u>Quarter 4 – 2022 (1st October 2022 – 13th November 2022)</u> <u>DWSNZ requirements</u> Minimum samples per compliance quarter = 1 Maximum interval between samples = 45 Minimum days of week to be used = 1 <u>Actual obtained for Zone for compliance quarter:</u> Samples obtained = 1 Maximum interval between samples = 34

	Minimum days of week used = 1
Summary of results completed for inclusion in report (eg download data via Excel) – What parameters and timeframe were audited?	Bacterial parameters of *E. coli* and total coliform – this for criterion 6A compliance using *E. coli* monitoring only for all water supplies. This data was for the Quarter 3 – 2022 and Quarter 4 – 2022 compliance periods of 1st July 2022 to 30th September 2022 (Quarter 3 – 2022), and 1st October 2022 to 13th November 2022 (Quarter 4 – 2022).
Comments on whether compliance criterion met / not met and reasons	All distribution zones apart from Otorohanga Distribution Zone in Quarter 3, 2022, met the number of samples, maximum intervals between samples and minimum days of the week. The Otorohanga Distribution Zone did not meet the required maximum interval between samples in Quarter 3, 2022. The number of samples and days of the week were met. **Overall, apart from the Otorohanga Distribution Zone in Quarter 3, 2022, full compliance with the bacterial section of the DWSNZ was demonstrated for the Otorohanga District Council Distribution Zones**.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Excel spreadsheet contained all of the sample results obtained from ODC. Analysis of the samples is undertaken the Co-Lab Water Services which is an IANZ accredited and approved laboratory for this analysis. This data was for the compliance quarters of Quarter 3, 2022 (1st July 2022 to 30th September 2022) to Quarter 4 (1st October 2022 to 13th November 2022).

<u>**Cyanotoxin Compliance**</u>

Does the distribution zone have P2 (Cyanotoxin) assigned?	None of ODC zones are assigned a cyanotoxin P2
Summary of monitoring results completed for report whether or not data was assessed for this. Justification either way	Not applicable
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Not applicable

<u>**Chemical Compliance**</u>

Does the distribution zone have any chemical P2's assigned? (list)	None of the ODC Distribution Zones have chemical P2's assigned.

Summary of monitoring results completed for report Whether or not data was assessed for this. Justification either way	Not applicable
Comment on compliance	Not applicable
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Not applicable

DATA AUDIT

Does the audited data align with data found in DWO?	I am confident that the audited data does align with both the continuous minute data and the monthly compliance reports.
If data doesn't align, what action is to be taken	N/A
Supplier informed of data audit result within 20 days?	Yes, the water supplier will be informed within 20 days.

Drinking Water Quality Assurance Rules 2022 Compliance Assessment of Ōtorohanga District Council Water Supplies for 14th November 2022 to June 2023.

3 Waters Consulting Limited have been asked to be the independent external expert in providing specialist drinking water expertise. An independent review of the Ōtorohanga District Council (ODC) water supplies compliance against sections of the Drinking Water Quality Assurance Rules 2022 has been completed. The reporting periods reviewed are those of the months of 14th November 2022 to June 2023.

The system that has been used for this assessment is the 3WC Audit Function: Assessing Drinking Water Supply Compliance which is predominately based upon the processes that were used by Drinking Water Assessors (DWA) prior to November 2021.

This assessment reviewed the overall compliance against the Drinking Water Quality Assurance Rules 2022, which meeting the Rules, indicates that a supplier is meeting the Water Services (Drinking Water Standards for New Zealand) Regulations 2022. The applicable sections of the Drinking Water Quality Assurance Rules 2022 assessed, include Section 1.5 (Categories of drinking water supply), Section 2 (Drinking water supply categories and Rule modules), Section 4.1 G (General Rules), Section 4.4 (T1-Treatment Rules), Section 4.5 (D1 – Distribution System Rules), Section 4.7 (T2 – Treatment Rules), Section 4.8 (D2 – Distribution System Rules), Section 4.10 (T3 Treatment Rules), and Section 4.11 (D3 Distribution System Rules). This assessment only used the applicable 1-month reporting 'Monitoring' Rules, with the exception being use of the Assurance Rules of G13 (for data separation), and G14 (data interruption).

It is to be noted that Taumata Arowai has not been forthcoming with guidance around interpretation of the Drinking Water Quality Assurance Rules 2022. Therefore, this assessment is based upon this Drinking Water Compliance Specialists interpretation of the Rules, using their experience as a past Drinking Water Assessor and their wealth of knowledge around water treatment.

The findings of this assessment and the method that was used are detailed in the below boxes.

Drinking Water Quality Assurance Rules 2022 Compliance Assessment Audit Information Recording Sheet

Date	October 2023
Person completing assessment & experience	Mark Palmer - Drinking Water Compliance Specialist Mark Palmer has a Bachelor of Applied Science (Honours) degree in Environmental Management (University of Otago), Postgraduate Diploma in Health Sciences (with Distinction) endorsed in Hazard Assessment and Management (University of Otago), Graduate Diploma (With Distinction) in Environmental Health (Massey University) and a Diploma in Drinking Water Assessment (Opus). Mark

	has approximately nine years' experience in drinking water assessment, having worked as part of the Waikato Drinking Water Assessment Service of the Waikato Public Health Unit – Health NZ. Until November 2021 Mark was the only Public Health full-time employed Drinking Water Assessor (with a consultant assisting) for the Waikato Region. Mark uses his previous experience and knowledge to undertake independent expert verification and compliance assessments.
Council audited or drinking-water supply name	Ōtorohanga District Council Water supplies of: Hurimu water supply Kahorekau water supply Kawhia water supply Otorohanga water supply Taupaki water supply Tihiroa water supply
Drinking water supply name, category and applicable Rule modules (as stated under Table 2, Section 2, DWQAR)	Water supplies: **Hurimu water supply** <u>Medium</u> Applicable Rule modules are G + S2 + T2 + D2 **Kahorekau water supply** <u>Medium</u> Applicable Rule modules are G + S2 + T2 + D2 **Kawhia water supply** <u>Medium</u> Applicable Rule modules are G + S2 + T2 + D2 **Otorohanga water supply** <u>Large</u> Applicable Rule modules are G + S3 + T3 + D3 **Taupaki water supply** <u>Small</u> Applicable Rule modules are G + S1 + T1 + D1

	Tihiroa water supply <u>Medium</u> Applicable Rule modules are G + S2 + T2 + D2
Information reviewed	ODC use the Water Outlook database for recording the overall compliance data of the water supplies. This includes all of the treatment plants' manual results, and continuous monitoring data particularly for the Otorohanga Treatment Plant, and Distribution Zone results. The bacterial (*E. coli,* total coliform), manual turbidity and chlorine results; sample data for the water leaving the treatment plants was contained in each respective treatment plants' Excel spreadsheets downloaded from Water Outlook. For Otorohanga Treatment Plant the continuous monitoring monthly results (showing the compliance monitoring period (CMP) 1-day) and turbidity results downloaded from SCADA and Water Outlook. ODC sent through the compliance monthly reports which gave a conclusive record of the monthly compliance for each plant along with the downloaded SCADA 'raw' continuous monitoring data for the Otorohanga Water Treatment Plant for all months assessed. Obtaining all compliance 'raw' data meant that the auditor did not need to randomly select the 5 days 'raw' data, rather the external expert was able to review all of the months of continuous monitoring data for the Otorohanga Treatment Plant. The information and data obtained for this assessment is detailed below for each respective Treatment Plant. **Treatment Plants** <u>Huirimu (TP00689) Water Treatment Plant</u> *- Huirimu WTP - T2 Quarterly Report - 2022-12* *- Huirimu WTP - T2 Quarterly Report - 2023-03* *- Huirimu WTP - T2 Quarterly Report - 2023-06* <u>Kahorekau (TP00690) Water Treatment Plant</u> *- Kahorekau WTP - T2 Quarterly Report - 2022-12* *- Kahorekau WTP - T2 Quarterly Report - 2023-03* *- Kahorekau WTP - T2 Quarterly Report - 2023-06* <u>Kawhia (TP00169) Water Treatment Plant</u> *- Kawhia WTP - T2 Quarterly Report - 2022-12* *- Kawhia WTP - T2 Quarterly Report - 2023-03* *- Kawhia WTP - T2 Quarterly Report - 2023-06*

	<u>Otorohanga (TP00173) Water Treatment Plant</u> *- Otorohanga WTP - 2022-11* *- Otorohanga WTP - 2022-12* *- Otorohanga WTP - 2023-01* *- Otorohanga WTP - 2023-02* *- Otorohanga WTP - 2023-03* *- Otorohanga WTP - 2023-04* *- Otorohanga WTP - 2023-05* *- Otorohanga WTP - 2023-06* *- Otorohanga DWQAR Continuous - 2022* *- Otorohanga DWQAR Continuous - 2023* <u>Taupaki, Arohena (TP00691) Water Treatment Plant</u> *- Taupaki WTP - T1 6-Monthly Report - 2022-12* *- Taupaki WTP - T1 6-Monthly Report - 2023-06* <u>Tihiroa (TP00686) Water Treatment Plant</u> *- Tihiroa WTP - T2 Quarterly Report - 2022-12* *- Tihiroa WTP - T2 Quarterly Report - 2023-03* *- Tihiroa WTP - T2 Quarterly Report - 2023-06* **Distribution Zones** The sample results that had been obtained by the water supplier were in the form of Water Outlook downloaded Excel spreadsheets. These samples were taken from the distribution zones and were analysed for parameters as *E. coli*, total coliforms and pH. Using the spreadsheet, the number of samples, maximum interval between samples, duration between samples, and days of the week were calculated and the information checked for consistency. It is noted that the sampling and analysis is undertaken by CoLab which is an IANZ accredited and approved laboratory for the analysis of all required determinands by ODC. The Excel spreadsheets submitted and reviewed are shown under each respective Distribution Zone and category of compliance below: <u>Arohena (ARO001AR) Distribution Zone</u> *- D1 Zones Report - 2022-12* *- D1 Zones Report - 2023-06* <u>Aotearoa Road, Arohena (ARO001AO) Distribution Zone</u> <u>Kawhia Township (KAW001KA) Distribution Zone</u> <u>Mangare Road, Arohena (ARO001MA) Distribution Zone</u> <u>Tihiroa (TIH001TI) Distribution Zone</u> *- D2 Zones Report - 2022-12* *- D2 Zones Report - 2023-03*

	- D2 Zones Report - 2023-06 <u>Otorohanga (OTO001OT) Distribution Zone</u> <u>Waipa (OTO001WA) Distribution Zone</u> *- D3 Zones Report - 2022-11* *- D3 Zones Report - 2022-12* *- D3 Zones Report - 2023-01* *- D3 Zones Report - 2023-02* *- D3 Zones Report - 2023-03* *- D3 Zones Report - 2023-04* *- D3 Zones Report - 2023-05* *- D3 Zones Report - 2023-06*

GENERAL COMPLIANCE

Compliance assessment period	From 14th November 2022 December 2022 January 2023 February 2023 March 2023 April 2023 May 2023 June 2023
What is risk category of supply audited eg high risk? – identifies priority for verification of data. Other comments on	The water supplies of Otorohanga, Tihiroa and Kawhia would not be deemed high risk due to appropriate bacterial (including chlorination) and protozoa treatment. However, the Huirimu, Kahorekau and Taupaki, Arohena water supplies would be considered medium to high risk due to inadequate protozoa removal which is rapid sand filtration without coagulation – if coagulation was in place, the risk would be reduced. This water supply is however chlorinated which does assist in decreasing the bacterial risk but not protozoan.
Method of data provision from water supplier to DWA (DWO/Alternative electronic/paper/in person during visit – detail dates and reason for visit)	Through electronic means of sample results, raw data and monthly compliance detail for the treatment plants downloaded from the monitoring database of Water Outlook and forwarded using Excel spreadsheets. Excel spreadsheets of bacterial (FAC, *E. coli* and total coliform) for the distribution zones.
What data is audited over compliance assessment period? – Overview of: • What selection of data was chosen and why? • What parameters are audited • What timeframes will be audited	All of the six water supplies compliance monitoring data was reviewed for the time period of 14th November 2022 to June 2023. For the treatment plants the audit reviewed for each individual plant:

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- Which areas of compliance were chosen for audit and why?
- Which supplies were chosen to select data from?

Risk based approach used to determine this

Within each section below is details around selection of data

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For Otorohanga Treatment Plant the monthly compliance reports included the daily CMP filter results (for standard coagulation / sedimentation /filtration criteria) for all four filters, the minutes in service and whether the filter met the requirement.

- the daily CMP filter results (for standard coagulation/flocculation/sedimentation /filtration for all filters with parameters as number of consecutive 15 min periods where turbidity was > 0.5 NTU, % of day where turbidity was <= 0.15 NTU, number of consecutive 15 min periods where turbidity was > 0.5 NTU, % of day where turbidity was <= 0.1 NTU, number of consecutive 15 min periods where turbidity was > 0.3 NTU. of day where turbidity was < 0.3 NTU

The CMP daily FACE minutes, minimum FACE, minimum chlorine contact time and disinfection turbidity,

- The CMP daily of chlorination, % of day C.t value is at least 15 min.mg/L, Minutes FACe is < 0.2mg/L, Minimum T_{10} contact time, % of day where the turbidity of water leaving WTP is < 1.0 NTU, and # consecutive 15 min periods where the turbidity of water leaving WTP is > 2.0 NTU.

For the other Treatment Plants, the Water Outlook monthly compliance reports (which had parameters as turbidity results, pH, FAC, *E.* coli, total coliforms).

Bacterial (*E. coli,* total coliform, FAC) sample results for the distribution zone were analysed, these downloaded from Water Outlook and forwarded from ODC.

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Compliance assessment based on:

a. Whole compliance data set.
b. Audit of selection of data records (state %)

Note: this may be determined by what criteria they are trying to comply with (e.g. secure groundwater and crypto monitoring requires whole compliance data set)

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For the Otorohanga Treatment Plants the monthly compliance reports were viewed, with the raw SCADA minute by minute continuous monitoring data reviewed for all months.

All manual bacterial, FACE and turbidity results for the T2 Treatment Plants’ compliance were reviewed viewed.

For the Distribution Zones, the bacterial results were viewed via an Excel spreadsheet downloaded from Water Outlook database.

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TREATMENT PLANTS

Category T1 Rule modules for compliance

Record Applicable Section of the Rules used for compliance of each water supply.	Taupaki, Arohena Treatment Plant *Compliance Monitoring Period = 6 Month* Compliance Section 4.4 – T1 monitoring Rules *All applicable Rules under Section 4.4 – Rule: T1.8*
What parameters and timeframe were audited and from which supplies?	compliance reports, laboratory samples were forwarded and reviewed for the D1 compliance. The time frame for the compliance audit was from November 14th 2022 to June 2023. Parameters reviewed for the D1 compliance included: - Manual turbidity samples - Bacterial samples (*E. coli* / total coliforms)
	Comments on whether compliance Rules met / not met. **Taupaki, Arohena Treatment Plant** Actual Obtained for water leaving the Treatment Plant *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained every 3 months (Note: as compliance began 14th November 2022, the two months of November and December 2022 were viewed)* *E. coli and Total coliform – 1 sample* *Turbidity samples – 1 sample* *Samples obtained every 3 months (January 2023 to March 2023)* *E. coli and Total coliform – 1 sample* *Turbidity samples – 1 sample*

	Samples obtained every 3 months (April to June 2023) *E. coli and Total coliform – 1 sample* *Turbidity samples – 1 sample* Compliance monitoring Period = 6 months Therefore, Taupaki, Arohena Treatment Plant is <u>compliant</u>
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Water Outlook Excel Treatment Plant bacterial / turbidity results supplied by ODC.

Category T2 Rule modules for compliance

Record Applicable Section of the Rules used for compliance of each water supply.	<u>Huirimu Treatment Plant</u> *Compliance Monitoring Period = 1 Month* Compliance Section 4.7.1 – T2 monitoring Rules *All applicable Rules under Section 4.7.1 – Rules: T2.1, T2.2* Compliance Section 4.7.2 – T2 Filtration Rules *Rule T2.9* Compliance Section 4.7.4 – T2 Chlorine Rules *All applicable Rules under Section 4.7.4 – Rules: T2.18, T2.19, T2.20, T2.21* *Compliance Monitoring Period = 1 Month* <u>Kahorekau Treatment Plant</u> *Compliance Monitoring Period = 1 Month* Compliance Section 4.7.1 – T2 monitoring Rules *All applicable Rules under Section 4.7.1 – Rules: T2.1, T2.2* Compliance Section 4.7.2 – T2 Filtration Rules *Rule T2.9*

	Compliance Section 4.7.4 – T2 Chlorine Rules *All applicable Rules under Section 4.7.4 – Rules: T2.18, T2.19, T2.20, T2.21* *Compliance Monitoring Period = 1 Month* <u>Kawhia Treatment Plant</u> *Compliance Monitoring Period = 1 Month* Compliance Section 4.7.1 – T2 monitoring Rules *All applicable Rules under Section 4.7.1 – Rules: T2.1, T2.2* Compliance Section 4.7.2 – T2 Filtration Rules *Rule T2.9* Compliance Section 4.7.4 – T2 Chlorine Rules *All applicable Rules under Section 4.7.4 – Rules: T2.18, T2.19, T2.20, T2.21* *Compliance Monitoring Period = 1 Month* *Note: Section 4.14 Varying Population Rules for increased monitoring required from 26th December 2022 to 8th January 2023.* <u>Tihiroa Treatment Plant</u> *Compliance Monitoring Period = 1 Month* Compliance Section 4.7.1 – T2 monitoring Rules *All applicable Rules under Section 4.7.1 – Rules: T2.1, T2.2* Compliance Section 4.7.2 – T2 Filtration Rules *Rule T2.9* Compliance Section 4.7.4 – T2 Chlorine Rules *All applicable Rules under Section 4.7.4 – Rules: T2.18, T2.19, T2.20, T2.21* *Compliance Monitoring Period = 1 Month*

What parameters and timeframe were audited and from which supplies?	Monthly compliance reports, operator readings and laboratory samples were forwarded and reviewed for the T2 compliance. The time frame for the compliance audit was from 14th November 2022 to June 2023. Parameters reviewed for the T2 compliance included: - Manual turbidity samples - Manual FAC samples - Manual pH samples - Bacterial samples (*E. coli* / total coliforms)
DWQAR compliance Rules monitoring requirements. **Huirimu Treatment Plant** DWQAR requirements **From 14th November 2022** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements	**Comments on whether compliance Rules met / not met.** **Huirimu Treatment Plant** Actual Obtained for water leaving the Treatment Plant **From 14th November 2022** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 3* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met*

Minimum samples per week = 2 *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, and Rule T2.20, from November 14th 2022.* *Treatment plant is non-compliant with Rule T2.21 from November 14th 2022.*
December 2022 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**December 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples outside of required = 4* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 1* *Treatment plant is compliant with Rule T2.2, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, and Rule T2.20, for December 2022.* *Treatment plant is non-compliant with Rule T2.1, Rule T2.9 and Rule T2.21 and for December 2022.*

January 2023	**January 2023**
Compliance Monitoring Period = 1 Month *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met** *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 1* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, and Rule T2.20, for January 2023.* *Treatment plant is non-compliant with Rule T2.21 for January 2023.* *Huirimu Treatment Plant is non-compliant with Section 4 of the Water Services (Drinking Water Standards for New Zealand) Regulations 2022. This was due to an E. coli positive result on 12th January 2023.*
February 2023	**February 2023**
Compliance Monitoring Period = 1 Month *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)*	*Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)*

DWQAR requirements *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 4* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for February 2023.* *Treatment plant is non-compliant with Rule T2.21 for February 2023.*
March 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below*	**March 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH

pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	<u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 1* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* <u>*Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, and Rule T2.20, for March 2023.*</u> <u>*Treatment plant is non-compliant with Rule T2.21 for March 2023.*</u>
<u>April 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* <u>*DWQAR requirements*</u> *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**<u>April 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* <u>*Actual Obtained for water leaving the Treatment Plant:*</u> *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met*

	Number of samples exceeding 5 NTU = 0 *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for April 2023.*
May 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**May 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 2* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 1* *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, and Rule T2.20 for May 2023.* *Treatment plant is non-compliant with Rule T2.9 and Rule T2.21 for May 2023.*
June 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)*	**June 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)*

<u>DWQAR requirements</u> *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples outside of required = 1* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20 for June 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 and Rule T2.21 for June 2023.</u>*
Kahorekau Treatment Plant <u>DWQAR requirements</u> **<u>From 14th November 2022</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC)	**Kahorekau Treatment Plant** <u>Actual Obtained for water leaving the Treatment Plant</u> **<u>From 14th November 2022</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u>

<u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 from November 14th 2022.</u>*
<u>December 2022</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity	**<u>December 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity

<u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU* **<u>January 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	<u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for December 2022.</u>* **<u>January 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for January 2023.</u>*

February 2023	February 2023
Compliance Monitoring Period = 1 Month *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for February 2023.*
March 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements	**March 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant:

Minimum samples per week = 2 *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule 2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for March 2023.</u>*
<u>April 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity	**<u>April 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity

DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.1, Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.20, Rule T2.21 for April 2023.*
May 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**May 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for May 2023.* *Treatment plant is non-compliant with Rule T2.1 for May 2023.*

June 2023	June 2023
Compliance Monitoring Period = 1 Month *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = not met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for June 2023.* *Treatment plant is non-compliant with Rule T2.1 for June 2023.*
Kawhia Treatment Plant DWQAR requirements **From 14th November 2022** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)*	**Kawhia Treatment Plant** Actual Obtained for water leaving the Treatment Plant **From 14th November 2022** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:*

DWQAR requirements *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU* **December 2022** 1st December to 25th December 2022 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2*	*Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 4* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, and Rule T2.20 from November 14th 2022.* *Treatment plant is non-compliant with Rule T2.1 and Rule T2.21 from November 14th 2022.* **December 2023** 1st December to 25th December 2022 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met*

Duration between samples = at least 2 days *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU* <u>Varying population rules (VP.3) required from 26th December to 31st December 2023</u> *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = weekly* *Duration between samples = at least 4 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples to be obtained = daily* *Duration between samples = 12 hours* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples to be obtained = daily* *Duration between samples = 12 hours* Turbidity <u>DWQAR requirements</u> *Minimum samples to be obtained = daily* *Duration between samples = 12 hours* *Turbidity no samples above 5 NTU*	*Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* <u>Varying population rules (VP.3) required from 26th December to 31st December 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained (weekly) = not met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples obtained = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (daily) = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (daily) = met* *Minimum duration between samples = not met*

January 2023 Varying population rules (VP.3) required from 1st January to 8th January 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = weekly* *Duration between samples = at least 4 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples to be obtained = daily* *Duration between samples = 12 hours* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples to be obtained = daily* *Duration between samples = 12 hours* Turbidity DWQAR requirements *Minimum samples to be obtained = daily* *Duration between samples = 12 hours* *Turbidity no samples above 5 NTU* From 9th January to 31st January 2023 *Compliance Monitoring Period = 1 Month*	*Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for December 2022.* *Treatment plant is non-compliant with Rule T2.1 and VP.3 for December 2022.* **January 2023** Varying population rules (VP.3) required from 1st January to 8th January 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for (weekly) = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples obtained = not met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (daily) = not met* *Minimum duration between samples = met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (daily) = not met* *Minimum duration between samples = met* *Number of samples exceeding 5 NTU = 0* From 9th January to 31st January 2023 *Compliance Monitoring Period = 1 Month*

E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number) *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = not met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for January 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 and VP.3 for January 2023.</u>*
<u>February 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u>	**<u>February 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met*

Minimum samples per week = 2 *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* <u>*Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for February 2023.*</u> <u>*Treatment plant is non-compliant with Rule T2.1 for February 2023.*</u>
<u>March 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* <u>*DWQAR requirements*</u> *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u>	**<u>March 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* <u>*Actual Obtained for water leaving the Treatment Plant:*</u> *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u>

Minimum samples per week = 2 *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for March 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 for March 2023.</u>*
<u>April 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**<u>April 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = not met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples =* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.20, Rule T2.21 for April 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 for April 2023.</u>*

May 2023	**May 2023**
Compliance Monitoring Period = 1 Month *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for May 2023.* *Treatment plant is non-compliant with Rule T2.1 for May 2023.*
June 2023	**June 2023**
Compliance Monitoring Period = 1 Month *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC)	*Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC)

<u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	<u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for June 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 for June 2023.</u>*
Tihiroa Treatment Plant <u>DWQAR requirements</u> **<u>From 14th November 2022</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH	**Tihiroa Treatment Plant** <u>Actual Obtained for water leaving the Treatment Plant</u> **<u>From 14th November 2022</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH

<u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	<u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 from November 14th 2022.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 from November 14th 2022.</u>*
<u>December 2022</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2*	**<u>December 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u>

Duration between samples = at least 2 days *Turbidity no samples above 5 NTU* **<u>January 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for December 2022.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 for December 2022.</u>* **<u>January 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 1* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for January 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 and Rule T2.9 for January 2023.</u>*

February 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**February 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 3* *Treatment plant is compliant with Rule T2.2, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for February 2023.* *Treatment plant is non-compliant with Rule T2.1 and Rule T2.9 for February 2023.*
March 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days*	**March 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met*

Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *<u>Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for March 2023.</u>* *<u>Treatment plant is non-compliant with Rule T2.1 for March 2023.</u>*
<u>April 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *<u>DWQAR requirements</u>* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u>	**<u>April 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *<u>Actual Obtained for water leaving the Treatment Plant:</u>* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u>

Minimum samples per week = 2 *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* <u>*Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.20, Rule T2.21 for April 2023.*</u> <u>*Treatment plant is non-compliant with Rule T2.1 for April 2023.*</u>
<u>May 2023</u> *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* <u>*DWQAR requirements*</u> *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity <u>DWQAR requirements</u> *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	**<u>May 2023</u>** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* <u>*Actual Obtained for water leaving the Treatment Plant:*</u> *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity <u>Actual Obtained for water leaving the Treatment Plant:</u> *Minimum samples (2) per week = met* *Minimum duration between samples = not met*

June 2023 *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies– therefore treated as same number)* *DWQAR requirements* *Minimum samples per month = 1* *Duration between samples = at least 12 days* Free Available Chlorine (FAC) DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *FAC > 0.50 mg/L = no samples below* pH DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *pH ≥ 6.5 and ≤ 8 = no samples outside* Turbidity DWQAR requirements *Minimum samples per week = 2* *Duration between samples = at least 2 days* *Turbidity no samples above 5 NTU*	*Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for May 2023.* *Treatment plant is non-compliant with Rule T2.1 for May 2023.* **June 2023** *Compliance Monitoring Period = 1 Month* *E. coli and total coliform samples (each to be obtained at same frequencies – therefore treated as same number)* *Actual Obtained for water leaving the Treatment Plant:* *Samples obtained for month = met* *Minimum duration between samples = met* Free Available Chlorine (FAC) Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples below 0.5 mg/L = 0* pH Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week =* *Minimum duration between samples = not met* *met* *Number of samples outside of required = 0* Turbidity Actual Obtained for water leaving the Treatment Plant: *Minimum samples (2) per week = met* *Minimum duration between samples = not met* *Number of samples exceeding 5 NTU = 0* *Treatment plant is compliant with Rule T2.2, Rule T2.9, Rule T2.12, Rule T2.13, Rule T2.14, Rule T2.18, Rule T2.19, Rule T2.20, Rule T2.21 for June 2023.* *Treatment plant is non-compliant with Rule T2.1 for June 2023.*

Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	WaterOutlook compliance Excel spreadsheets with the applicable Treatment Plant and bacterial results data supplied by ODC. This data was analysed for the overall compliance.

Bacterial Compliance for T3 Rules

Record Applicable Section of the Rules used for compliance of each water supply.	**Otorohanga Treatment Plant** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *All applicable Rules under Section 4.10.1.1 – Rules: T3.1, T3.2, T3.3, T3.4, T3.5, T3.6* The Compliance Monitoring Period (CMP) = 1 day for all of the above rules.
What parameters and timeframe were audited and from which supplies?	Monthly compliance reports were forwarded (see above). Continuous data was also received, this to ensure consistency with the monthly compliance reports. The time frame for the compliance audit was from 14th November 2022 to June 2023. Parameters reviewed for chlorination were: - Turbidity - Continuous FACE - Retention time - Minimum C.t value - pH
Comments on whether compliance Rules met / not met and reasons.	**Otorohanga Treatment Plant** **From November 14th 2022** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *Met all of the required monitoring Rules, for all 17 days compliance.* Bacterial compliance met for all 17 days of reporting period. **December 2022** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine

	<u>Met</u> all of the required monitoring Rules, for all 31 days compliance. Bacterial compliance <u>met</u> for all 31 days of reporting period. **January 2023** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *<u>Met</u> all of the required monitoring Rules, for all 31 days compliance.* Bacterial compliance <u>met</u> for all 31 days of reporting period. **February 2023** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *<u>Met</u> all of the required monitoring Rules, for all 28 days compliance.* Bacterial compliance <u>met</u> for all 28 days of reporting period. **March 2023** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *<u>Met</u> all of the required monitoring Rules, for all 31 days compliance.* Bacterial compliance <u>met</u> for all 31 days of reporting period. **April 2023** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *<u>Met</u> all of the required monitoring Rules, for all 30 days compliance.* Bacterial compliance <u>met</u> for all 30 days of reporting period.

	May 2023 Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *<u>Met</u> all of the required monitoring Rules, for all 31 days compliance.* Bacterial compliance <u>met</u> for all 31 days of reporting period. **June 2023** Compliance Section 4.10.1.1 – T3 Bacterial Rules for Water Disinfected with Chlorine *<u>Met</u> all of the required monitoring Rules, for all 30 days compliance.* Bacterial compliance <u>met</u> for all 30 days of reporting period.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Monthly compliance reports, raw minute by minute data was reviewed (minute by minute – for various parameters, as stated above).

<u>**Protozoa Compliance for T3 Rules**</u>

Record Log Credit required	Source Water Risk Assessment – 3-log allocated to the Otorohanga Treatment Plant.
List treatment processes in place to meet the DWQAR Rules – including compliance monitoring periods for those treatment processes.	**Otorohanga Treatment Plant** <u>Section 4.10.2.5</u> Coagulation, flocculation, sedimentation & filtration (CMP – 1 day).
What parameters and timeframe were audited and from which supplies? –	The compliance assessment audited the months from November 14th 2022 to June 2023. Monthly Compliance reports summaries were reviewed for each of the months. Raw minute by minute SCADA data was sought for any unusual discrepancies and supplied as part of the monthly compliance summaries spreadsheet. This Drinking Water Compliance Specialist reviewed the minute-by-minute data for that particular day of compliance data for assessment

	to ensure consistency with each individual month compliance summary and reports. This Drinking Water Compliance Specialist reviewed the minute-by-minute data for all months of the compliance reporting months. The parameters assessed are detailed below for each respective Treatment Plant. **Otorohanga Treatment Plant** Parameters assessed: - Filtration turbidity - Flow data - Any missing data
What log credits are possible for each treatment process? – Which ones achieved those log credits and why? **Total log credits achieved:** all treatment processes combined	**Otorohanga Treatment Plant** **<u>From November 14th 2022</u>** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log <u>Achieved - 3-log for 17 days.</u> <u>*All parameters assessed met the requirements of the DWAQR for all 17 days from November 2022 – achieved 3-log removal.*</u> **<u>December 2022</u>** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log <u>Achieved - 3-log for 31 days.</u> <u>*All parameters assessed met the requirements of the DWAQR for all 31 days for December 2022 – achieved 3-log removal.*</u> **<u>January 2023</u>** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log <u>Achieved - 3-log for 31 days.</u>

	All parameters assessed met the requirements of the DWAQR for all 31 days of January 2023 – achieved 3-log removal. **February 2023** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log Achieved - 3-log for 28 days. *All parameters assessed met the requirements of the DWAQR for all 28 days of February 2023 – achieved 3-log removal.* **March 2023** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log Achieved - 3-log for 31 days. *All parameters assessed met the requirements of the DWAQR for all 31 days of March 2023 – achieved 3-log removal.* **April 2023** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log Achieved - 3-log for 30 days. *All parameters assessed met the requirements of the DWAQR for all 30 days of April 2023 – achieved 3-log removal.* **May 2023** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log Achieved - 3-log for 31 days.

	All parameters assessed, met the requirements of the DWAQR for all 31 days of May 2023 – achieved 3-log removal. **June 2023** Coagulation, flocculation, sedimentation & filtration – maximum 3-Log. Log credit possible – 3-log Achieved - 3-log for 30 days. *All parameters assessed met the requirements of the DWAQR for all 30 days of June 2023 – achieved 3-log removal.*
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Monthly compliance summaries and raw data (minute by minute – for all months from the Treatment Plant) was analysed. This raw data was forwarded in the form of Excel spreadsheets. The parameters of minute-by-minute data, turbidity from each of the plants' filters, all checked for consistency and reliability.

DISTRIBUTION ZONES

Bacterial Compliance – D1 Distribution Zone Rules

Record compliance Rules used. – and compliance periods for these criterion	DWQAR – Section 4.5 (D1 Distribution System Rules) Rule D1.1: Water in the distribution system must be monitored for the determinands and at the frequencies set out in Table 11 (Are stated below for each individual zone). **Distribution Zone** **January 2023 – March 2023** *E. coli* and total coliform samples (each to be obtained at same frequencies) DWQAR requirements Minimum samples per 3 month period = 1 Actual Obtained for Zone:

	Samples obtained for 3 month period (January to March) = 9 samples Both *E. coli* and total coliforms met the requirement for the January to March 2023 period. **<u>April 2023 – June 2023 Microbiological monitoring</u>** *E. coli* and total coliform samples (each to be obtained at same frequencies) <u>DWQAR requirements</u> Minimum samples per 3 month period = 1 <u>Actual Obtained for Zone:</u> Samples obtained for 3 month period (April to June 2023) = 14 samples Both *E. coli* and total coliforms met the requirement for the April to June 2023 period. **Distribution Zone** **<u>January 2023 – March 2023</u>** *E. coli* and total coliform samples (each to be obtained at same frequencies) <u>DWQAR requirements</u> Minimum samples per 3 month period = 1 <u>Actual Obtained for Zone:</u> Samples obtained for 3 month period (January to March) = 1 sample Both *E. coli* and total coliforms met the requirement for the January to March 2023 period. **<u>April 2023 – June 2023 Microbiological monitoring</u>** *E. coli* and total coliform samples (each to be obtained at same frequencies) <u>DWQAR requirements</u> Minimum samples per 3 month period = 1 <u>Actual Obtained for Zone:</u> Samples obtained for 3 month period (April to June 2023) = 1 sample

	Both *E. coli* and total coliforms met the requirement for the April to June 2023 period.
Summary of results completed for inclusion in report – What parameters and timeframe were audited?	The timeframe was from January through to June 2023 to be monitored at a three month compliance period. The rule assessed was: DWQAR – Section 4.5 (D1 Distribution System Rules) Rule D1.1: Water in the distribution system must be monitored for the determinands and at the frequencies set out in Table 11 (Are stated below for each individual zone).
Comments on whether compliance Rules met / not met and reasons.	For the period of January to June 2023, the Distribution Zone met Rule D1.1, therefore was compliant. Note: as the DWQAR began on November 14th 2022, the sample period from this time was viewed and met.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	WaterOutlook Excel spreadsheet with bacterial results obtained from ODC which were from the IANZ accredited laboratory.

Bacterial Compliance – D2 Distribution Zone Rules

Record compliance Rules used. – and compliance periods for these criterion	DWQAR – Section 4.8 (D2 Distribution System Rules) Rule D2.1: Water in the distribution system must be monitored for the determinands and at the frequencies set out in Table 15 (Are stated below for each individual zone). Rule D2.5: A FAC of at least 0.2 mg/l must be maintained in the distribution system in at least 4 of every 5 samples. No sample should be less than 0.1 mg/L. DWQAR – Section 4.14 (VP Rules for Supplies with Varying Population) Rule VP 3: when population exceeds 500 people, monitoring must be undertaken at addition frequencies (these shown below). **Mangare Rd, Arohena Distribution Zone** **From November 14th 2022 – Residual Disinfection**

	DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **From November 14th 2022 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement from 14th November 2022.* Distribution Zone is compliant with Rule D2.1 and Rule D2.5 from 14th November 2022. **December 2022 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = not met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None

	<u>December 2022 – Microbiological monitoring</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for December 2022.* <u>Distribution Zone is compliant with Rule D2.5 for December 2022.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for December 2022.</u> **<u>January 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>January 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met

	Both E. coli and total coliforms <u>met</u> the requirement for January. <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for January 2023.</u> **<u>February 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>February 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for February 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for February 2023.</u> **<u>March 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month

	<u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>March 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for March 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for March 2023.</u> **<u>April 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>April 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u>

	Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for April 2023.* Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for April 2023. **May 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **May 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for May 2023.* Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for May 2023. **June 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none

	Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = not met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>June 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for June 2023.* <u>Distribution Zone is compliant with Rule D2.5 for June 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for June 2023.</u> **Aotearoa Road, Arohena Distribution Zone** **<u>From November 14th 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>From November 14th 2022 – Microbiological monitoring</u>**

	E. coli and total coliform samples (each to be obtained at same frequencies) <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement from 14th November 2022.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 from 14th November 2022.</u> **<u>December 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>December 2022 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for December 2022.*

	Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for December 2022. **January 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **January 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for January.* Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for January 2023. **February 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = met

	FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>February 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for February 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for February 2023.</u> **<u>March 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>March 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met

	Both E. coli and total coliforms <u>met</u> the requirement for March 2023. <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for March 2023.</u> **<u>April 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>April 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for April 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for April 2023.</u> **<u>May 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month

	Actual Obtained for Zone: Minimum samples (2) per week = not met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **May 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for May 2023.* Distribution Zone is compliant with Rule D2.5 for May 2023. Distribution Zone is non-compliant with Rule D2.1 for May 2023. **June 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = not met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **June 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days

	<u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for June 2023.* <u>Distribution Zone is compliant with Rule D2.5 for June 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for June 2023.</u> **Kawhia Township Distribution Zone** **<u>From November 14th 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>From November 14th 2022 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement from 14th November 2022.* <u>Distribution Zone is compliant with Rule D2.5 from 14th November 2022.</u>

	Distribution Zone is non-compliant with Rule D2.1 from 14th November 2022. **December 2022 – Residual Disinfection** *(1st December 2022 to 25th December 2022)* DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **December 2022 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for 1st December 2022 to the 26th December 2022.* **December 2022 – Residual Disinfection** *(26th December 2022 to 31st December 2022)* Varying population rules in place DWQAR requirements Minimum samples = daily Duration between samples = at least 12 hours FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Actual Obtained for Zone: Minimum sampling is daily = not met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L

	FAC < 0.1 = None **<u>December 2022 – Microbiological monitoring</u>** *(26th December 2022 to 31st December 2022)* <u>Varying population rules in place</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples = weekly Duration between samples = at least 4 days <u>Actual Obtained for Zone:</u> Samples obtained for VP period = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for the 26th December 2022 to 31st December 2022 period.* <u>Distribution Zone is compliant with Rule D2.5 for December 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1, and VP.3 for December 2023.</u> **<u>January 2023 – Residual Disinfection</u>** *(1st January 2023 to 8th January 2023)* <u>Varying population rules in place</u> <u>DWQAR requirements</u> Minimum samples = daily Duration between samples = at least 12 hours FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Minimum sampling is daily = not met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>January 2023 – Microbiological monitoring</u>** *(1st January 2023 to 8th January 2023)* <u>Varying population rules in place</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u>

	Minimum samples = weekly Duration between samples = at least 4 days <u>Actual Obtained for Zone:</u> Samples obtained for VP period = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for 1st January 2023 to 8th January 2023).* **<u>January 2023 – Residual Disinfection</u>** *(9th January 2023 to 31st January 2023)* <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>January 2023 – Microbiological monitoring</u>** *(9th January 2023 to 31st January 2023)* *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for 9th January 2023 to 31st January 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for January 2023.</u> <u>Distribution Zone is non-compliant with VP.3 for January 2023.</u>

	<u>February 2023 – Residual Disinfection</u> <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>February 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for February 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for February 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for February 2023.</u> **<u>March 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met

	FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>March 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for March 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for March 2023.</u> **<u>April 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>April 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met

	Both E. coli and total coliforms met the requirement for April 2023. Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for April 2023. **May 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **May 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for May 2023.* Distribution Zone is compliant with Rule D2.5 for May 2023. Distribution Zone is non-compliant with Rule D2.1 for May 2023. **June 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none

	Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>June 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for June 2023.* <u>Distribution Zone is compliant with Rule D2.5 for June 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for June 2023.</u> **Tihiroa Distribution Zone** **<u>From November 14th 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>From November 14th 2022 – Microbiological monitoring</u>**

	E. coli and total coliform samples (each to be obtained at same frequencies) <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement from 14th November 2022.* <u>Distribution Zone is compliant with Rule D2.5 from 14th November 2022.</u> <u>Distribution Zone is non-compliant with Rule D2.1 from 14th November 2022.</u> **<u>December 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>December 2022 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for December 2022.*

	Distribution Zone is compliant Rule D2.5 for December 2022. Distribution Zone is non-compliant with Rule D2.1 for December 2022. **January 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **January 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for January.* Distribution Zone is compliant with Rule D2.5 for January 2023. Distribution Zone is non-compliant with Rule D2.1 for January 2023. **February 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less

	FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>February 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for February 2023.* <u>Distribution Zone is compliant with Rule D2.5 for February 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for February 2023.</u> **<u>March 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None

	<u>March 2023 – Microbiological monitoring</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for March 2023.* <u>Distribution Zone is compliant with Rule D2.1 and Rule D2.5 for March 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for March 2023.</u> **<u>April 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>April 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met

	Both E. coli and total coliforms met the requirement for April 2023. Distribution Zone is compliant with Rule D2.5 for April 2023. Distribution Zone is non-compliant with Rule D2.1 for April 2023. **May 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **May 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per month = 1 Duration between samples = at least 12 days Actual Obtained for Zone: Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms met the requirement for May 2023.* Distribution Zone is compliant with Rule D2.5 for May 2023. Distribution Zone is non-compliant with Rule D2.1 for May 2023. **June 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 2 Duration between samples = at least 2 days FAC > 0.20 = no more than 1 sample out of 5 less FAC <0.1 = none

	Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (2) per week = met Minimum duration between samples = not met FAC > 0.20 = Yes all above 0.2 mg/L FAC < 0.1 = None **<u>June 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per month = 1 Duration between samples = at least 12 days <u>Actual Obtained for Zone:</u> Samples obtained for month = met Duration between samples = met *Both E. coli and total coliforms <u>met</u> the requirement for June 2023.* <u>Distribution Zone is compliant with Rule D2.5 for June 2023.</u> <u>Distribution Zone is non-compliant with Rule D2.1 for June 2023.</u>
Summary of results completed for inclusion in report – What parameters and timeframe were audited?	The timeframe was from November 14th 2022 through to June 2023 for monthly compliance of the Distribution Zones. The rules assessed were: DWQAR – Section 4.8 (D2 Distribution System Rules) – Rule D2.1: Water in the distribution system must be monitored for the determinands and at the frequencies set out in Table 15 (Are stated below for each individual zone). Rule D2.5: A FAC of at least 0.2 mg/l must be maintained in the distribution system in at least 4 of every 5 samples. No sample should be less than 0.1 mg/L. <u>DWQAR – Section 4.14 (VP Rules for Supplies with Varying Population)</u>

	(For Kawhia Distribution Zone – between 26th December 2022 and 8th January 2023). Rule VP 3: when population exceeds 500 people, monitoring must be undertaken at addition frequencies (these shown below).
Comments on whether compliance Rules met / not met and reasons.	For the period from 14th November 2022 to June 2023 Mangare Rd, Arohena (ARO001MA) Distribution met the D2.1 Residual disinfection monitoring for full Distribution Zone compliance in November 2022, January 2023, February 2023, March 2023, April 2023 and May 2023. Aotearoa Road, Arohena (ARO001AO) met the requirements from November 14th 2023, through to April 2023. Kawhia Township (KAW001KA) was complaint in March 2023 and April 2023, while Tihiroa (TIH001TI) was unable to achieve full compliance at all throughout the compliance periods. For the period from November 14th 2022 all of the four Distribution Zones met the D2.1 Microbiological Monitoring in all of the months. The Distribution Zones also met Rule D2.5 for all of the months from November 14th 2022 to June 2023.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	WaterOutlook Excel spreadsheet with the raw results obtained from ODC. The results were then for each zone and month individually assessed for compliance.

<u>Bacterial Compliance – D3 Distribution Zone Rules</u>

Record compliance Rules used. – and compliance periods for these criterion	<u>DWQAR – Section 4.11.4 (D3 Residual Disinfection)</u> Rule D3.19: A FAC of at least 0.2 mg/L must be maintained in 85% of samples (or 85% of the time if continuously monitored). Up to 15% of samples (or 15% of the time if continuously monitored) may have a FAC of less than 0.2 mg/L but must be greater than 0.1 mg/L. Rule D3.20: Samples must be collected for FAC at the frequencies outlined in table 35 (Are stated below for each individual zone). <u>DWQAR – Section 4.11.5 (D3 Microbiological Monitoring Rules)</u>

	Rule D3.29: *E. coli* and total coliforms must be monitored in each zone of the distribution system according to the frequencies set out in Table 39. **Otorohanga Distribution Zone** **<u>From November 14th 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **<u>From November 14th 2022 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms <u>met</u> the requirement* from 14th November 2022. <u>Distribution Zone is compliant with Rule D3.19, Rule D3.20 and Rule D3.29 from 14th November 2022.</u> **<u>December 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3

	Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **December 2022 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for December 2022.* Distribution Zone is compliant with Rule D3.19, Rule D3.20 and Rule D3.29 for December 2022. **January 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = not met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L

	FAC <0.1 = None **January 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for January.* Distribution Zone is compliant with Rule D3.19, and Rule D3.29 for January 2023. Distribution Zone is non-compliant with Rule D3.20 for January 2023. **February 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **February 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9

	Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for February 2023.* <u>Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for February 2023.</u> **<u>March 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = not met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **<u>March 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for March 2023.* <u>Distribution Zone is compliant with Rules D3.19, and D3.29 for March 2023.</u>

	<u>Distribution Zone is non-compliant with Rule D3.20 for March 2023.</u> **<u>April 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = not met Maximum interval between samples (4) per week = not met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **<u>April 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for April 2023.* <u>Distribution Zone is compliant with Rules D3.19, and D3.29 for April 2023.</u> <u>Distribution Zone is non-compliant with Rule D3.20 for April 2023.</u> **<u>May 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15%

	FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **May 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for May 2023.* Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for May 2023. **June 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None

	<u>June 2023 – Microbiological monitoring</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for June 2023.* <u>Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for June 2023.</u> **Waipa Distribution Zone** **<u>From November 14th 2022 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **<u>From November 14th 2022 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5

	Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement* from 14th November 2022. Distribution Zone is compliant with Rule D3.19, Rule D3.20 and Rule D3.29 from 14th November 2022. **December 2022 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = 1 sample **December 2022 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for December 2022.* Distribution Zone is compliant with Rule D3.20 and Rule D3.29 for December 2022.

	Distribution Zone is non-compliant with Rule D3.19 for December 2022. **January 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = not met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **January 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for January.* Distribution Zone is compliant with Rule D3.19, and Rule D3.29 for January 2023. Distribution Zone is non-compliant with Rule D3.20 for January 2023. **February 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15%

	FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None <u>**February 2023 – Microbiological monitoring**</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for February 2023.* <u>Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for February 2023.</u> <u>**March 2023 – Residual Disinfection**</u> <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None

	<u>March 2023 – Microbiological monitoring</u> *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for March 2023.* <u>Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for March 2023.</u> **<u>April 2023 – Residual Disinfection</u>** <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = not met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **<u>April 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met

	Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for April 2023.* Distribution Zone is compliant with Rules D3.19, and D3.29 for April 2023. Distribution Zone is non-compliant with Rule D3.20 for April 2023. **May 2023 – Residual Disinfection** DWQAR requirements Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month Actual Obtained for Zone: Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **May 2023 – Microbiological monitoring** *E. coli and total coliform samples (each to be obtained at same frequencies)* DWQAR requirements Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 Actual Obtained for Zone: Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for May 2023.* Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for May 2023.

	<u>June 2023 – Residual Disinfection</u> <u>DWQAR requirements</u> Minimum samples per week = 3 Maximum interval between samples = 4 Minimum days of week to be used = 5 FAC > 0.20 = no more than 15% FAC <0.1 = none Compliance Monitoring Period = 1 Month <u>Actual Obtained for Zone:</u> Minimum samples (3) per week = met Maximum interval between samples (4) per week = met Minimum days of week used (5) = met FAC > 0.20 = Yes all above 0.2 mg/L FAC <0.1 = None **<u>June 2023 – Microbiological monitoring</u>** *E. coli and total coliform samples (each to be obtained at same frequencies)* <u>DWQAR requirements</u> Minimum samples per week = 1 Maximum interval between samples = 9 Minimum days of week to be used = 5 <u>Actual Obtained for Zone:</u> Minimum samples (1) per week = met Maximum interval between samples (9) per week = met Minimum days of week used (5) = met *Both E. coli and total coliforms met the requirement for June 2023.* <u>Distribution Zone is compliant with Rules D3.19, Rule D3.20 and D3.29 for June 2023.</u>
Summary of results completed for inclusion in report – What parameters and timeframe were audited?	The timeframe was from November 14th 2022 through to June 2023 for monthly compliance of the two Distribution Zones of Otorohanga and Waipa. The rules assessed were: DWQAR – Section 4.11.4 (D3 Residual Disinfection) - Rule D3.19 (FAC concentration) and D3.20 (Residual Disinfection frequencies)

	DWQAR - Section 4.11.5 (D3 Microbiological Monitoring) - Rule D3.29 (*E. coli* and total coliform monitoring frequencies) for the months from November 14th 2022 to June 2023.
Comments on whether compliance Rules met / not met and reasons.	Overall summary of compliance findings shown below. Otorohanga Distribution Zone met the DWQAR – Section 4.11.4 (D3 Residual Disinfection) - Rule D3.19 (FAC concentration), D3.20 (Residual Disinfection frequencies) for the months from 14th November 2022, December 2022, February, May and June 2023. For January, March and April three samples were not obtained in the week throughout these months, meaning Otorohanga Distribution Zone did not meet Rule D3.20 throughout these months. Waipa Distribution Zone met the DWQAR – Section 4.11.4 (D3 Residual Disinfection) - Rule D3.19 (FAC concentration), D3.20 (Residual Disinfection frequencies) for the months from 14th November 2022, February, March, May and June 2023. In December 2022 a low FAC sample was obtained (0.05 mg/L) meaning the zone did not meet Rule D3.19. For January, and April three samples were not obtained in the week throughout these months, meaning Waipa Distribution Zone did not meet Rule D3.20 throughout these months. Both the Otorohanga and Waipa Distribution Zones met the DWQAR - Section 4.11.5 (D3 Microbiological Monitoring) - Rule D3.29 (*E. coli* and total coliform monitoring frequencies) from 14th November 2022 to June 2023.
Method of determining compliance eg checked all raw data, used excel to graph data, other method – where is this data recorded?	WaterOutlook Excel spreadsheet with raw results obtained from ODC and their IANZ accredited laboratory. The results were then for each zone and month individually assessed for compliance.

DATA AUDIT

Does the audited data align with monthly compliance?	Overall, I am confident that the data aligned and that there were no concerns.
If data doesn't align, what action is to be taken	N/A
Supplier informed of data audit result within 20 days?	Yes, the water supplier will be informed within 20 days.

Report

Arohena and Tihiroa Schemes Water Treatment Plants Protozoa Assessment

Prepared for Otorohanga District Council

By CH2M Beca Limited

29 June 2017

Revision History

Revision Nº	Prepared By	Description	Date
A	Dean Van Ingen	Draft	May 2017
B	Dean Van Ingen	Final	June 2017

Document Acceptance

Action	Name	Signed	Date
Prepared by	Dean Van Ingen		29/6/2017
Reviewed by	Andrew Watson		29/6/2017
Approved by	Shaun Hodson		29/6/2017
on behalf of	CH2M Beca Limited		

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Appendices

1 Introduction

1.1 Background

Otorohanga District Council (ODC) has commissioned CH2M Beca Ltd (Beca) to undertake a Protozoa Assessment for the Kahorekau, Huirimu, Taupaki and Tihiroa water sources and treatment plants within the Arohena and Tihiroa water supply schemes.

The supply designations and populations served are as follows.

Table 1: Designations and Populations Served

Component	Code	Name	Population
Community	ARO001	Arohena	260
Supply Category		Networked Supply	
Zone	ARO001AO	Aotearoa Road, Arohena	120
Plant	TP00690	Kahorekau	
Source	S00411	Mangakomua Stream, Arohena	
Zone	ARO001AR	Arohena	20
Plant	TP00691	Taupaki, Arohena	
Source	S00412	Mangare Stream, Arohena	
Zone	ARO001MA	Mangare Road, Arohena	120
Plant	TP00689	Huirimu	
Source	S00410	Makomako Stream, Arohena	

Component	Code	Name	Population
Community	TIH001	Tihiroa	400
Supply Category		Networked Supply	
Zone	TIH001TI	Tihiroa	400
Plant	TP00686	Tihiroa	
Source	S00407	Waipa River at Tihiroa	

1.2 Purpose

The purpose of the assessment is to perform a high level review of source protozoa log credit levels, and to determine what log credit compliance the existing treatment processes are achieving in accordance with the Drinking Water Standards for New Zealand 2005 (Revised 2008) (DWSNZ) requirements.

The results of the assessment will confirm the log removal requirement for the source waters, and whether upgrades to existing treatment processes are required.

Where required, improvements to the treatment operation and processes will be proposed including high level cost estimates.

1.3 Information Evaluated

In conducting the assessment, the following information was evaluated:

- Nature of source
- Land use in the catchment area
- Sources of contaminants and discharges within the catchment
- Historic monitoring data
- Treatment plant infrastructure
- Operational practices

2 Information Sources

Information was obtained from the following:

- Otorohanga District Council (ODC) staff
- Site visits
- Catchment maps
- Water supply area maps
- Treatment plant process diagrams, SCADA screen grabs, and pictures
- Water quality and quantity records held by Otorohanga District Council
- Water take consents
- District Health Board log credit requirement reports
- Identified improvements list
- Drinking Water for New Zealand website

3 Water Supply Scheme Overviews

3.1 Arohena

Kahorekau, Huirimu and Taupaki treatment plants contribute to serve the Arohena water supply scheme. The treatment plants and their respective distribution networks do not have interconnectivity.

Kahorekau plant, situated off Kahorekau Road - Wharepapa South, draws from the Mangakomua Stream. The gravity fed plant uses two stage treatment including rapid granular media filtration and residual disinfection using chlorine gas. The treated water is gravity fed to the network, and pumped to the treated water reservoirs.

Huirimu plant, situated off Huirimu Road - Wharepapa South, draws from the Makomako Stream. The plant uses two stage treatment including rapid granular media filtration and residual disinfection using chlorine gas. The raw water is pumped from the intake through the filter up to the treatment plant contact tank, where it is disinfected. The treated water is pumped from the contact tank to the reservoir from where it gravitates to the supply area.

Taupaki plant, situated off Waipapa Road – Wharepapa South, draws from the Mangare Stream. The gravity fed plant uses two stage treatment including rapid granular media filtration and soon to be commissioned residual disinfection using chlorine gas. The treated water is pumped to the treated water reservoirs.

3.2 Tihiroa

The Tihiroa water treatment plant is the sole supply for the Tihiroa water supply scheme.

Tihiroa plant, situated off Te Kawa Road – Tihiroa, draws from the Waipa River. The plant provides multi-stage treatment consisting of coagulation, sedimentation, rapid granular media filtration, and disinfection using chlorine gas. Treated water is pumped from the treatment site clear water tank to the network and Tihiroa Reservoir, from where it gravitates to the scheme.

4 Treatment Plants Final Water Quality

In the absence of protozoa monitoring and continuous online monitoring, results of grab sample tests for turbidity undertaken at the supplies during 2014 to 2017 were used to determine the protozoa treatment performance characteristics of the plants. Treated water turbidity, leaving the treatment plants, recorded during the monitoring period is summarised in Table 2.

Table 2: Treated Water Turbidity (NTU) Monitoring Data 2014 to 2017

Plant	Number of Samples	Minimum NTU	Average NTU	Maximum NTU
Kahorekau	252	0.6	2.2	10.8
Huirimu	230	0.7	3.2	38.5
Taupaki	128	0.25	2.0	7.2
Tihiroa	210	0.1	1.4	88.2

Table 5.2 of the DWSNZ provides the range of treatment technologies that can be used to achieve protozoal compliance, and the combinations of treatment processes for which log credits can be added. This table and the supporting document have been used to determine the protozoa treatment capabilities of the above treatment plants.

Kahorekau, Huirimu and Taupaki plants use rapid granular media filtration without coagulation for protozoa removal, which is a process that does not achieve any log credits.

The Tihiroa plant uses coagulation, sedimentation and filtration processes for protozoa removal, which theoretically can achieve 3.0 log credits (+1.0 log credit for enhanced individual filter performance). Proof of process effectiveness is required to achieve the potential log credits through continuous treated water turbidity monitoring. For 3.0 log credits each filter, while online, turbidity criteria cannot exceed:

1. 0.3 NTU for more than 5 % of monitoring period "Month" (DWSNZ 5.4.1.1d.i.A)
2. 0.5 NTU for more than 1 % of monitoring period "Month" (DWSNZ 5.4.1.1d.i.B)
3. 1.0 NTU for any 3 minute period (DWSNZ 5.4.1.1d.i.C)

For an additional 1.0 log credits for enhanced individual filter performance each filter, while online, turbidity criteria cannot exceed:

A. 0.1 NTU for more than 5 % of monitoring period "Month" (DWSNZ 5.8.1.2.a)

B. 0.3 NTU for more than 1 % of monitoring period "Month" (DWSNZ 5.8.1.2.b)

C. 0.5 NTU for any 3 minute period (DWSNZ 5.8.1.2.c)

Tihiroa does not have continuous final water turbidity monitoring, which means that it cannot prove the effectiveness of its protozoa treatment processes. To determine an understanding of how effective the treatment processes are at each of the sites, an evaluation of the final water turbidity results in Table 2 were compared against Criteria 1 to 3 above. The results are provided in Table 3 below.

Table 3: Treated Water Turbidity Compliance Results

Plant	Number of Samples	Samples >0.3 NTU	Samples >0.5 NTU	Samples >1.0 NTU
Kahorekau	252	100%	100%	96%
Huirimu	230	100%	100%	93%
Taupaki	128	99%	95%	80%
Tihiroa	210	96%	87%	41%

The sample test results show that the treatment plants are ineffective at achieving protozoa compliance.

5 Treatment Plant Observations

ODC operators generally visit each plant 1 to 2 times per week to undertake basic operations and maintenance functions.

ODC treatment plants are generally run irrespective of raw water conditions in order to meet supply demand.

No online turbidity monitoring is fitted with the exception of Tihiroa which monitors raw water turbidity.

Filter condition and performance characteristics at the ODC sites are difficult to ascertain due to their enclosed pressure vessel design, and the absence of continuous turbidity monitoring instrumentation.

Site visits were undertaken by Beca, in attendance with ODC operations and management staff in order to understand how the processes are currently performing and how they are run. A summary of observations is detailed below.

5.1 Kahorekau

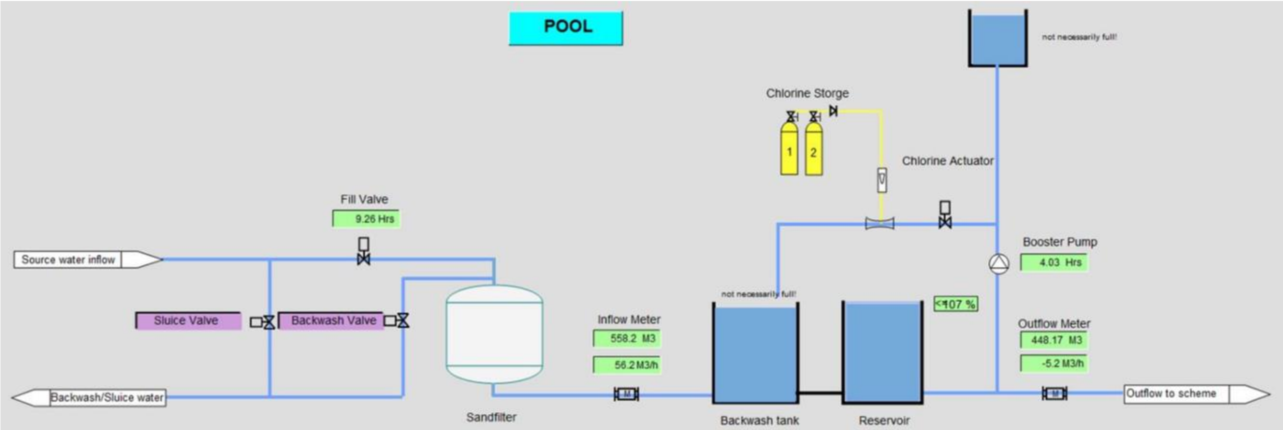


Figure 1: Kahorekau Process Diagram

The plant starts and stops based upon the backwash tank control set points. Raw water gravitates through the steel pressure filter until such time that the tank calls the filter to stop or a filter backwash is required.

Filter backwashes (no air scour facility) are triggered based on operator setpoints for frequency and duration, and backwash water is supplied from the backwash tank. The backwash control setpoints are set based on the operators' evaluation of the raw water condition, plant throughput, reservoir level, and filter performance. The water used for backwashing is chlorinated.

Figure 2: Kahorekau Filter

During periods when the raw water quality is poor, the operators can remotely trigger a raw water main (Bush Line) flush. This flush is used to remove settled debris or replace poor quality water in the raw water main prior to the filter with better quality water. During this flush, the filter does not run. A significant volume of pumice type material was noted beside the filter (not shown in above figure). This material was present in the raw water, during the last heavy rain event, and had been removed from the filter by the operators. Since the removal of the pumice, the operator commented that the quality of the filtered water had diminished.

Filter maintenance is not known to have occurred in the last seven years, and the type of filter media is not known.

Telemetry is fitted to this site.

Table 4: Kahorekau Water Take Figures

Resource Consent Conditions			Actual Take	
Maximum	**Maximum**	**Maximum during low flow conditions**	**Minimum**	**Average**
985 m^3/24hrs	11.4 l/s	1,674.5 m^3/48hrs	300 m^3/day	832 m^3/day*

*Maximum demand could exceed maximum water take if not monitored and managed accordingly.

5.2 Huirimu

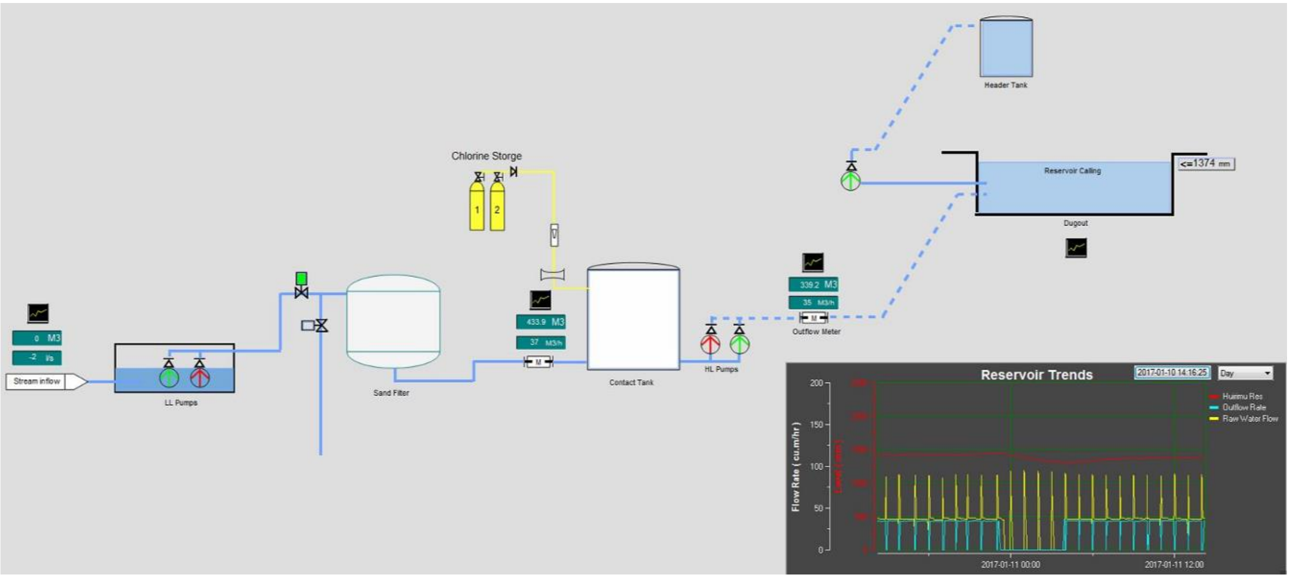


Figure 3: Huirimu Process Diagram

The plant starts and stops based upon the contact tank control set points. Raw water is pumped through the steel pressure filter until such time that the tank calls the filter to stop or a filter backwash is required.

Filter backwashes (no air scour facility) are triggered based on operator setpoints for frequency and duration, and backwash water is supplied from the contact tank. The backwash control setpoints are set based on the operators' evaluation of the raw water condition, plant throughput, reservoir level, and filter performance. The water used for backwashing is chlorinated.

Figure 4: Huirimu Filter

Filter media was replaced 6 to 7 months ago. The size and quantity of media used could not be verified. No work was undertaken on the filter floor, underdrains or nozzles at that time.

The ODC operator commented that the filter backwash rate was believed to be too low, and that an option to use treated water from the Dugout Reservoir was being considered because of the additional head it would provide.

Telemetry is fitted to this site.

Table 5: Huirimu Water Take Figures

Resource Consent Conditions			Actual Take	
Maximum	**Maximum**	**Maximum during low flow conditions**	**Minimum**	**Average**
925 m^3/24hrs	10.7 l/s	1,572.5 m^3/48hrs	300 m^3/day	705 m^3/day*

*Maximum demand could exceed maximum water take if not monitored and managed accordingly.

5.3 Taupaki

The plant starts and stops based upon the treated water reservoir control set points. Raw water gravitates through the fibreglass pressure filter until such time that the reservoir calls the filter to stop or a filter backwash is required.

Filter backwashes (no air scour facility) are triggered based on operator setpoints for frequency and duration, and backwash water is supplied from the treated water reservoir. The backwash control setpoints are set based on the operators' evaluation of the raw water condition, plant throughput, reservoir level, and filter performance. The water used for backwashing at the time of site visit was not chlorinated but a chlorine gas installation was in progress.

Figure 5: Taupaki Filter

The pressure filter was replaced approximately two years ago. The size and quantity of media used could not be verified.

If the plant is running when a power failure occurs, the plant will continue to filter water but it is unlikely that disinfection will continue due to the absence of power to the control solenoid. The plant will not start during the absence of power.

A private farm supply pump is fitted within the treatment plant shed. The pump draws water from the stream, and supplies the farm without any form of treatment. The private supply has been used to supplement the Council provided supply in emergency situations, although a permanent connection is not fitted.

Telemetry was not present at the time of site visit but installation was in progress.

It should be noted that until recently Council was of the understanding that this was purely for stock supply, but since learning that some water is being used for human consumption Council has initiated improvements.

Table 6: Taupaki Water Take Figures

Resource Consent Conditions			Actual Take	
Maximum	**Maximum**	**Maximum during low flow conditions**	**Minimum**	**Average**
150 m^3/24hrs	1.7 l/s	255 m^3/48hrs	30 m^3/day	131 m^3/day*

*Maximum demand could exceed maximum water take if not monitored and managed accordingly.

5.4 Tihiroa

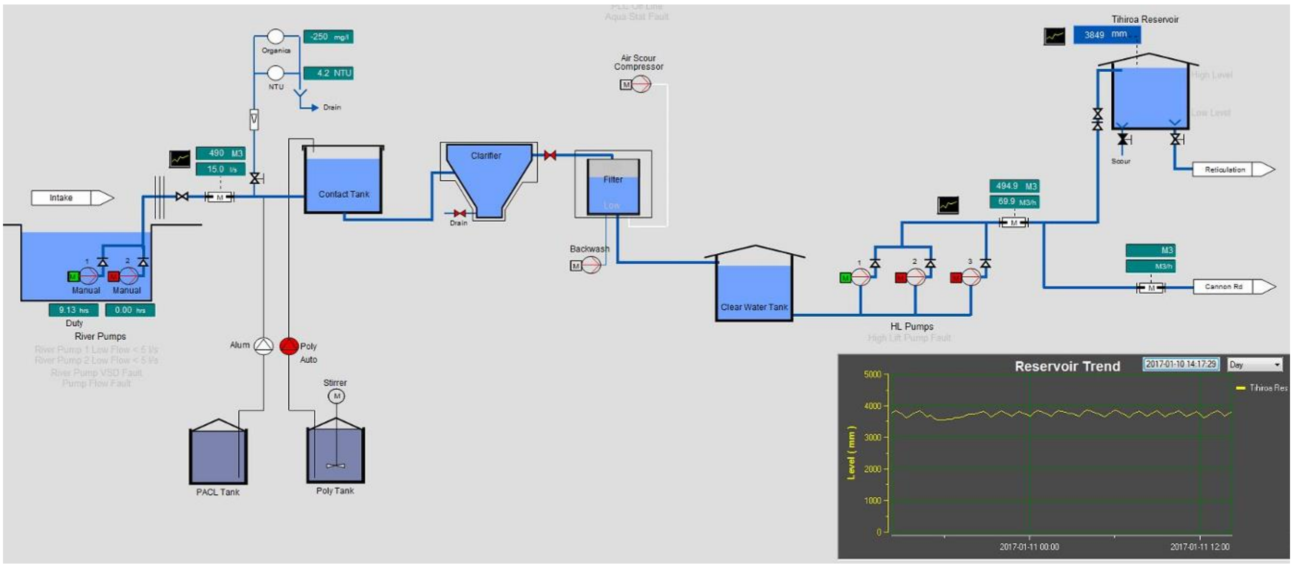


Figure 6: Tihiroa Process Diagram

The plant starts and stops based upon the clear water tank control set points. Raw water is pumped to the contact tank.

Alum is dosed neat into the raw water main prior to the contact tank, with dose being automatically adjusted flow proportional. No form of mechanical or static mixing is fitted.

Poly is dosed into the top of the contact tank as the water spills into the clarifier. The poly solution is mixed on site, with dose being automatically adjusted flow proportional. The poly solution strength can vary due to: the absence Standard Operating Procedures for mixing; mixing only occurring while the operator is on site to turn the mixer on / off; and new batches being made up in the day tank from which the poly is being drawn by the dose pump.

Refinement of alum and poly doses is based upon operator experience and understanding of the plant processes, rather than testing. The TOC (organics) control function shown in the process diagram above is not working, and is reported to have caused issues when it was running.

The plant was not running during the visit so assessment of the floc blanket was not possible. Clarifier sludge is drawn via a pipe which sits near the bottom of the clarifier. The frequency and duration of sludge removal is based upon the operator's visual clarifier performance assessment. The clarifier is not fitted with a sludge cone.

Leakage from the clarifier liner was noted but is not a contributing factor to the clarifier performance. Launder maintenance, to ensure launders are level and clear of vegetation, is difficult due to the fitted roof only having two access points.

Clarified water is filtered through an Automatic Valveless Gravity (AVG) filter. Filter backwashes (no air scour facility as shown in the above process diagram) are triggered based on filter headloss, and gravity fed backwash water (no backwash pump present as shown in the above process diagram) is supplied from the tank above the filter containing clarified water. The backwash control setpoints are not adjustable. The water used for backwashing is not chlorinated.

It is not known when the filter media was last changed or what type of media was installed. The filter has historically experienced mud balling and binding problems, but this is reported to have been largely addressed. The filter is reported to experience faults during the backwash process which leaves the filter in a permanent state of backwash or overflow. There is no remote monitoring of the filter.

Figure 7: Tihiroa Contact Tank, Clarifier and Filter

Table 7: Tihiroa Water Take Figures

Resource Consent Conditions			Actual Take	
Maximum	**Maximum**	**Maximum during low flow conditions**	**Minimum**	**Average**
1,500 m^3/24hrs	24 l/s	2,750 m^3/48hrs	400 m^3/day	793 m^3/day*

*Maximum demand could exceed maximum water take if not monitored and managed accordingly.

6 Treatment Plant Performance Summary and Requirements

The information observed and collated so far presents an overview of the current plants protozoa treatment capabilities, performance and requirements as tabled below.

Table 8: Log-Credit Removal for Treatment Plants

Plant	Credits Potentially Achievable Using Existing Fitted Processes	Credits Reliably Achieved	Credits Required by DHB
Kahorekau	0-log	0-log	Unknown*
Huirimu	0-log	0-log	4-log
Taupaki	0-log	0-log	3-log
Tihiroa	3-log	0-log	Unknown*

*The District Health Board (DHB) have not allocated log credits to the sources for Kahorekau and Tihiroa as ODC have not submitted catchment assessments from which to base this.

The catchments assessments used by the DHB to determine source log credit treatment requirements for Huirimu and Taupaki were undertaken in 2012, and are due for review in 2017. For the purpose of this report a high level review of all the catchments was undertaken to provide a basis from which to determine the log credits required, and any treatment plant improvements.

6.1 Huirimu and Taupaki Catchment Assessments

The Huirimu (Arohena) Water Supply Catchment Survey 2012 report, identifies that the source surface water is derived from largely pastoral catchment that always has low concentrations of cattle, sheep, horses or humans in immediate vicinity or upstream of the intake which aligns with the DWSNZ catchment risk categorisation description for 4 log credits. There have been no notable changes (land practices or development) to the Huirimu catchment characteristics identified by Council, and the assessment of 4 log treatment requirement (as defined in DWSNZ, Table 5.a) is appropriate.

An alternative to this assessment is to undertake Cryptosporidium monitoring, consisting of at least 26 samples over a 12 month period and costing in the order of $20,000. The results of which may determine the source water to be 3 log credits. The benefit of this approach, if successful, is reduced capital outlay for treatment plant upgrades. Verification of this designation can be achieved every 5 years thereafter through a comprehensive catchment risk assessment, for which Beca has recently completed for Waipa District Council.

The Taupaki (Arohena) Water Supply Catchment Survey 2012 report, identifies that the source surface water is derived from largely forest, bush, or scrub catchment in immediate vicinity or upstream of the intake which aligns with the DWSNZ catchment risk categorisation description for 3 log credits. There have been no notable changes (land practices or development) to the Taupaki catchment characteristics identified by Council, and the assessment of 3 log treatment requirement (as defined in DWSNZ, Table 5.a) is appropriate.

6.2 Kahorekau Catchment Assessment

The land use topographic map below shows the area of the catchment and the land use within that area.

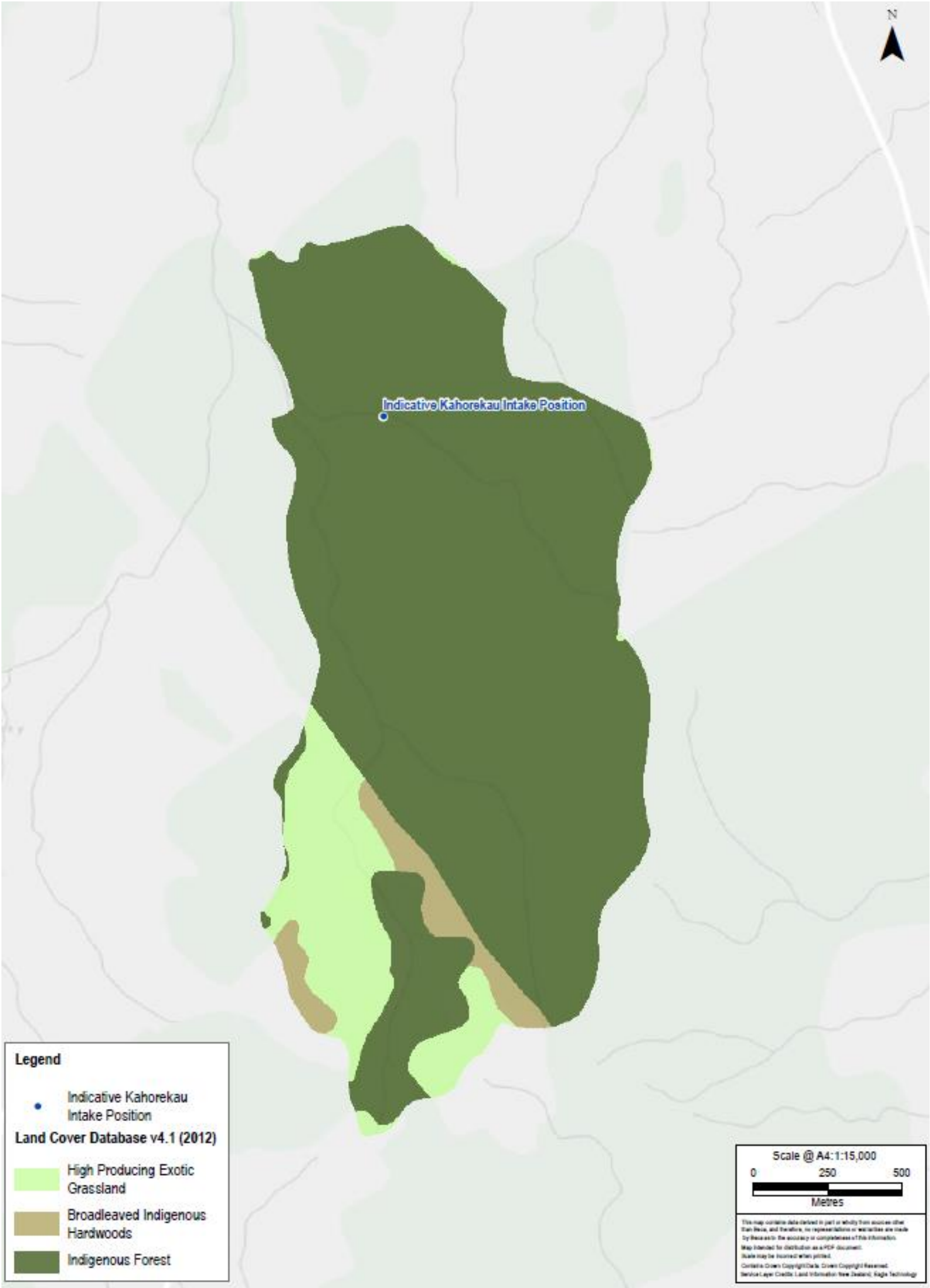


Figure 8: Kahorekau Catchment Use Topographical Map

The land use map above indicates that the catchment area is approximately 297 ha, consisting predominantly of native bush (88%), and a small proportion of upland pasture (12%).

There are no wastewater discharges, septic tanks, dairy effluent ponds or any other facilities or discharges associated with farming within the catchment. There may be feral animals such as goats, possums and possibly pigs within the catchment although the latter may be unlikely due to the relatively small area of the native bush. It is likely that feral animals would be reduced through local hunting in this relatively small native bush area.

The indications from the topographic and land use maps indicates that the catchment is native bush without an influence of agricultural activity and that the risk of microbial contamination is low.

Based on the above analysis the most appropriate protozoal risk category for the Kahorekau source water is:

- Water from forests, bush, scrub or tussock catchments with no agricultural activity

This category requires a log credit of 3 to reduce the risk of microbial contamination.

6.3 Tihiroa Catchment Assessment

The land use topographic map below shows the area of the catchment and the land use within that area.

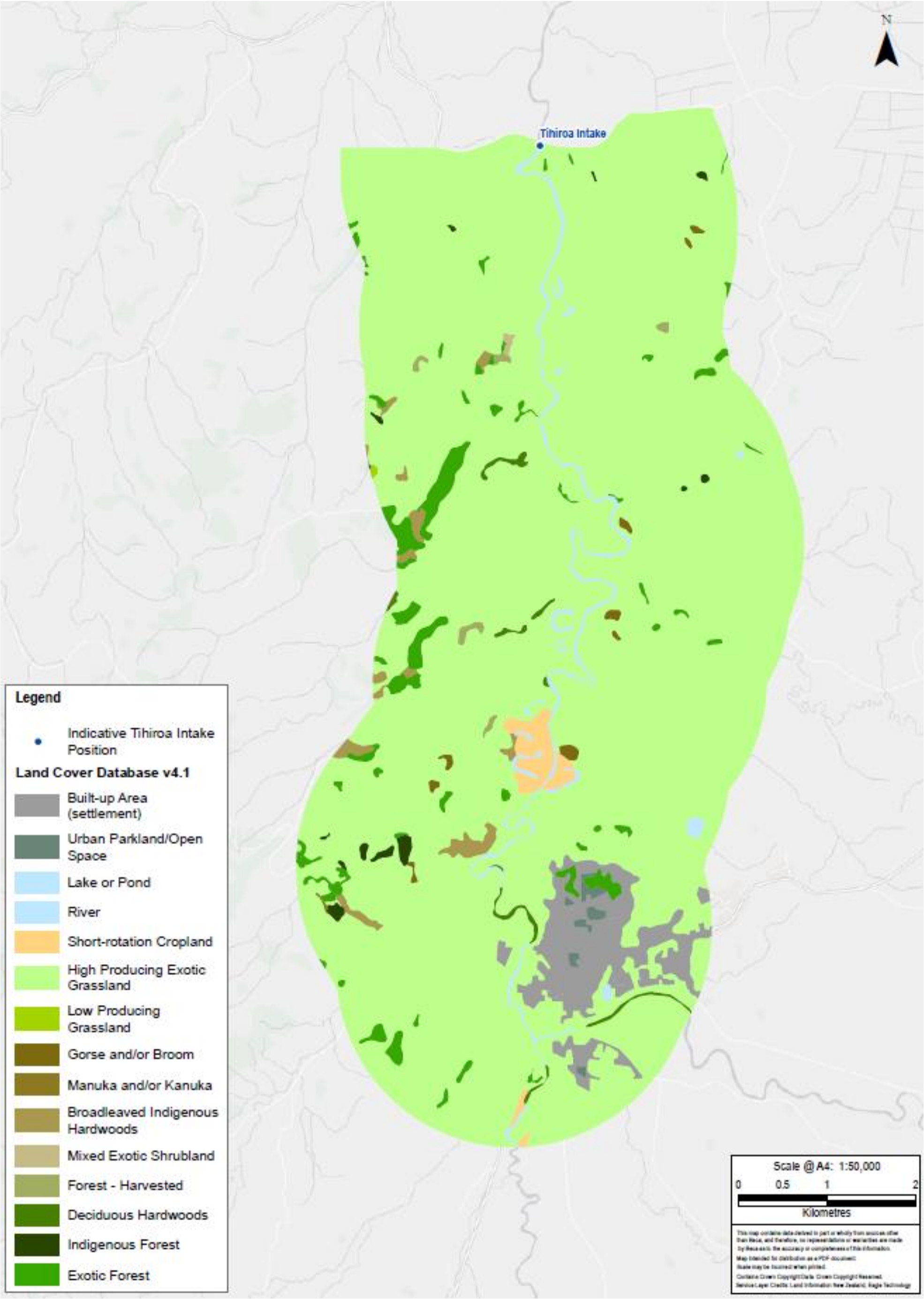


Figure 9: Tihiroa Catchment Use Topographical Map

For the purpose of this report the catchment survey area has been defined as 2km either side of the Waipa River, upstream of the intake, and 2km upstream of the nearest significant community which in this case is Otorohanga. This approach was taken as it is believed that this area is most likely to influence the Waipa River water characteristics at the Tihiroa water treatment plant intake.

The catchment has been assessed to cover an area of 4,880 hectares.

All parts of this reach of the Waipa River flow though farm pasture with the exception of relatively small bush and protected areas distributed throughout the catchment.

Riparian management is carried out by landowners and stock is excluded in this way from the waterways for approximately 50% of the waterways within this catchment area.

The land use is 89% upland pasture, 5% is native bush and protected catchment, 1% arable (cropping) land, and 4% urban.

The pasture land provides grazing for 1,300 beef cattle, 4,900 dairy cows, 200 deer/goats and 4,800 sheep over the whole of the pasture area which extends across 4,343 hectares.

The indications from the topographic and land use maps indicates that the catchment is a well-managed dry stock pasture and that the risk of microbial contamination is low to moderate.

Based on the above analysis the most appropriate protozoal risk category for the Tihiroa source water is a mixture of:

- Water from a pastoral catchment that has relatively low concentrations of cattle and sheep

This category requires a log credit of 4 to reduce the risk of microbial contamination.

An alternative to this assessment is to undertake Cryptosporidium monitoring, consisting of at least 26 samples over a 12 month period and costing in the order of $20,000. The results of which may determine the source water to be 3 log credits. The benefit of this approach, if successful, is reduced capital outlay for treatment plant upgrades. Verification of this designation can be achieved every 5 years thereafter through a comprehensive catchment risk assessment, for which Beca has recently completed for Waipa District Council.

7 Treatment Plant Operational and Capital Improvement Options

The options in this section are presented in the order in which they should be actioned.

7.1 Alternate Source Evaluation

Protozoa occurs in many New Zealand surface waters and non-secure bore waters. The risk associated with non-secure bore waters can be lower than that of surface waters. The risk associated with secure bore water is much lower than that of surface waters and non-secure bore waters. Consequently the capital outlay for non-secure and secure bore waters treatment equipment can be significantly less than surface water sources.

Bore water characteristics are also far less likely to be influenced by weather, which means the quality is consistent and requires less operational input.

The log credit requirements for groundwater categories are shown in Table 9.

Taking into consideration the above, and seasonal challenges for the schemes to meet the supply demands, we recommend that ODC undertake a desktop evaluation to determine whether groundwater sources are a viable option to replace the existing surface water sources.

The costs and treatment options for groundwater sources have not been considered in this report.

Table 9: Log Credit Requirements for Groundwater Categories

Groundwater Protozoal Risk Category	Log Credits
Springs and non-secure bore water 0 to 10 m deep are treated as requiring the same log credit as the surface water in the overlying catchment.	3 - 5
Bore water drawn from an unconfined aquifer 10 to 30 m deep, and satisfies groundwater security criteria 2.	3
Bore water drawn from deeper than 30 m, and satisfies bore water security criteria 2.	2
Secure, interim secure, and provisionally secure bore water.	0

7.2 Quick Improvements

Good operational practices are based upon good information from which to make decisions, and consistency in execution. This information comes in various forms, including online instrumentation and Standard Operating Procedures (SOPs). Appropriate instrumentation will provide the operators with information to make proactive operational adjustments to optimise water quality, and downstream instrumentation will provide verification of those decisions. Instrumentation also provides valuable data to aid in the selection of appropriate treatment upgrades or improvements. Instrument purchases will be recommended based upon this, and where equipment may be retrofitted into upgraded plants.

The following table details quick improvement options.

Table 10: Plant Operational and Minor Capital Improvement Measures and Actions to Address Protozoa Removal

Cause	Preventative Measures	What to Check	Signs that Action is Needed*	Corrective Action	Estimated Budget Cost
Inappropriate filter operation for source water characteristics	Determine and document acceptable flow rates, and check regularly. Determine and implement effective backwash cycle procedure. Consider: – Timing of water wash (duration and frequency). – A log to record identified problems, and what was done to rectify them. Ensure operators are trained in correct operational procedures for the specific filters in use.	Raw water turbidity meter.	Frequent backwashes. Mud balls and / or cracks in the filter media. Boil up and / or dead spots during backwashing. Loss of media.	Change trigger parameters for backwash. Change procedure for backwash cycles.	(Excl. Tihiroa) Purchase raw water turbidity meter and connect to SCADA system $10,000 per site. Staff time.
Media deficiencies	Ensure depth and type of media is suitable for the quality of water being filtered and flow rate.	Visual inspection of filter.		Change type, number and / or depth of filter media.	Staff time. Do not change type, number and / or depth of filter media until a plant improvement plan has been agreed.
Inappropriate flow rates	Determine and document acceptable flow rates, and check regularly. Include winter versus summer flows and ensure both can be matched to media specifications. Avoid sudden changes in flow rates in dirty filters. Ensure operators are trained in correct operational procedures for the specific filters in use.			Restrict maximum flow rate when possible. Modify operational practices. Identify staff training needs and provide training.	Staff time only.
Incorrect filter backwash procedure	Determine which parameter(s) will be used to start the backwash cycle, and implement these controls. Determine and implement effective backwash cycle procedure. Consider: – Timing of water wash (duration and frequency). – A log to record identified problems, and what was done to rectify them. – Implementation of a filter ripening operation. Make sure the operators are trained in correct maintenance and operation procedures for the specific filters in use.	Headloss. Time. Filter log.	Frequent backwashes. Mud balls and / or cracks in the filter media. Boil up and / or dead spots during backwashing. Loss of media.	Change trigger parameters for backwash. Change procedure for backwash cycles.	Staff time only.
Inadequate filter maintenance	Inspect media at least annually. Ensure operators are trained in correct maintenance procedures for the specific filters in use.	Maintenance log book. Headloss. Time.	Frequent backwashes. Mud balls and / or cracks in the filter media. Boil up and / or dead spots during backwashing. Loss of media.	Increase frequency of media and filter inspection if required. Identify staff training needs and provide training.	Staff time only.

Cause	Preventative Measures	What to Check	Signs that Action is Needed*	Corrective Action	Estimated Budget Cost
Inconsistent poly solution strength	Determine and implement effective poly make-up procedure. Consider: – Poly to water ratio. – How poly and water will be measured. – When poly is added to water. – Duration of mixing. Create a SOP for poly mixing. Make sure the operators are trained in correct procedure for mixing poly.	Visual inspection of clarifier to determine floc blanket performance.	Clarifier floc blanket too: – Low – High – Unstable Frequent backwashes. Mud balls and / or cracks in the filter media. Boil up and / or dead spots during backwashing. Loss of media.	Identify staff training needs and provide training.	(Tihiroa) Staff time only.
Inappropriate clarifier operation for source water characteristics	Determine and document acceptable flow rates, and check regularly. Determine and implement effective alum and poly dose rates. Create a SOP for determination of effective alum and poly dose rates. Consider: – Timing of desludging (duration and frequency). – A log to record identified problems, and what was done to rectify them. Ensure operators are trained in correct operational procedures for the specific clarifier in use.	Raw water turbidity meter. Clarified water turbidity meter.	Unstable clarifier floc blanket. Poor clarified water quality. Frequent backwashes. Mud balls and / or cracks in the filter media. Boil up and / or dead spots during backwashing. Loss of media.	Change alum and / or poly dose rates. Change procedure for clarifier desludging.	(Tihiroa) Purchase clarified water turbidity meter and connect to SCADA system $10,000. (Tihiroa) Purchase jar stirrer to enable operators to undertake tests to determine optimum chemical dose rates $5,000. Staff time.
Supply of untreated water	Discontinue use of the untreated farm supply.	Farm supply is not connected to scheme supply.			(Taupaki) Staff time.

*Signs that action is needed in respect to filter performance typically reference turbidity >0.5 NTU. Because filtered water turbidity is generally going to be >0.5 NTU, levels are not stated and should be taken as greater than what would be expected for the source characteristics and filter operating parameters at the time.

7.3 Foundations for Treatment Plant Upgrade Decisions

Treatment plant investment or significant change needs to be based on sound information to ensure that Council and its customers end up with robust processes that achieve the desired outcomes. The risk of not doing this is investment that may not achieve the desired outcomes, and for which the suppliers will have little liability.

A significant portion of the improvement options are reliant upon the above, which is why we recommend that upgrades are based upon DHB approved catchment assessments, and the results of a comprehensive source water analysis programme.

7.3.1 Catchment Assessments

Huirimu and Taupaki catchment assessments are nearing their due date for review in 2017. Kahorekau and Tihiroa catchment assessments need undertaking.

7.3.2 Source Water Analysis

There is no raw water analysis from which to base treatment plant design on. We suggest source water sampling and testing should be undertaken for all four sources.

We have broken down the suggested raw water analysis into a basic analysis, which we would suggest is undertaken monthly for a year from each source, plus a more extensive analysis, which we would suggest should be a one off initially, but could consider some additional samples – say two more over the next year.

Basic Analysis - Monthly

- Alkalinity
- pH
- Calcium
- Magnesium
- Turbidity
- Suspended solids
- Total dissolved solids
- UV absorbance (254 nm, filtered)
- Dissolved Organic Carbon
- Iron – dissolved
- Iron - total
- Manganese - dissolved
- Manganese – total
- E.coli and coliforms

The cost for sample testing (laboratory cost only) is likely to be in the order of $250 per sample per source.

Full Analysis

- Aluminium
- Antimony
- Arsenic
- Barium
- Beryllium
- Boron

- Bromine
- Cadmium
- Chromium
- Copper
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Nickel
- Potassium
- Dissolved Reactive Phosphorous
- Ammonia
- Nitrate
- Nitrite
- Selenium
- Silver
- Reactive Silica
- Sodium
- Tin
- Uranium
- Zinc

The cost for sample testing (laboratory cost only) is likely to be in the order of $650 per sample per source.

For Tihiroa we recommend a one-off pesticides screen. The results of this should be assessed against the Waikato Regional Council's environmental programme for the Waipa River, and decision made as to whether further sampling is warranted.

Tihiroa Only – One Off:

- Acid herbicides
- PCP
- Organo -nitrogen and Organo phosphorous pesticide
- Organo- chlorine pesticides

The cost for sample testing (laboratory cost only) is likely to be in the order of $750.

7.4 Treatment Plant Upgrade Options

Surface water treatment options that could be considered for treating the Arohena and Tihiroa Water Schemes are described below and then compared in Table 11.

7.4.1 Direct Filtration

Figure 10 shows a simplified flow schematic of a direct filtration process.

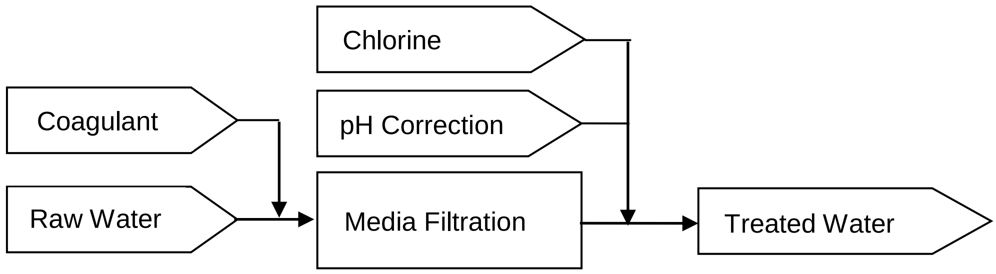


Figure 10: Direct Filtration Water Treatment Process

The following is a description of the conventional process:

- Raw water is dosed with a coagulant chemical (typically aluminium based), that causes the solids and organic matter in the water to clump together into larger particles.
- The majority of these particles are removed through a media filter – typically two layers – the upper layer being lighter anthracite or pumice, and the lower layer being sand.
- After filtration the filtered water is dosed with chlorine which kills any remaining pathogens in the filtered water and protects the water from any re-contamination when it is in the reticulation network.
- pH correction is typically applied following filtration to reduce the corrosivity of the treated water. Caustic soda or soda ash would be used.

For direct filtration to meet the treated water requirements of the DWSNZ, the raw water turbidity must not exceed 10 NTU.

7.4.2 Membrane

Figure 11 shows a simplified flow schematic of a membrane process.

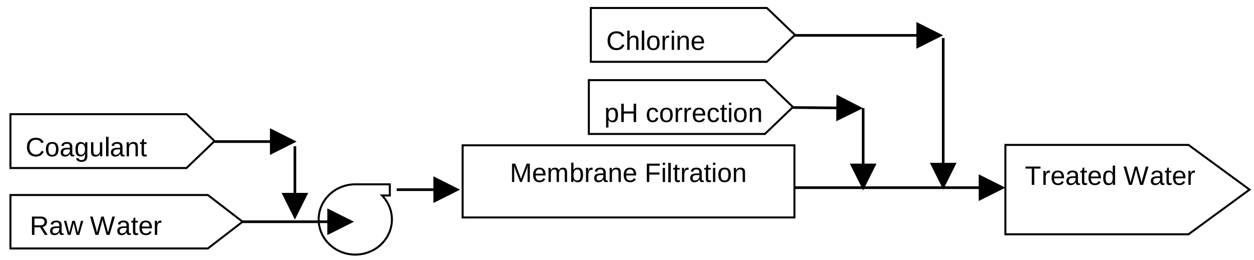


Figure 11: Membrane Water Treatment Process

The following is a description of the membrane process:

- Raw water may be dosed with a coagulant chemical (typically aluminium based). This is not necessary for particle removal (unlike conventional treatment), but would be recommended to remove organic matter if the water is to be chlorinated, minimising the formation of disinfection by products.
- The raw or coagulated water then flows through a membrane filter which has a pore size small enough to remove most particulate and some pathogenic matter.

- After filtration the filtered water is typically dosed with chlorine which kills any remaining pathogens in the filtered water and protects the water from contamination when it is in the reticulation network.
- pH correction is typically applied following filtration to reduce the corrosivity of the treated water. Caustic soda or soda ash would be used.
- Although the treatment process is less reliant on chemicals to perform, the membrane requires regular chemical cleaning to maintain the membrane.

7.4.3 Conventional

Figure 12 shows a simplified flow schematic of a conventional process.

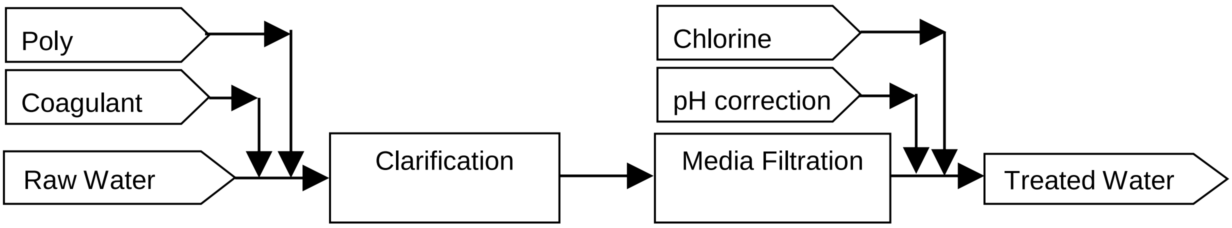


Figure 12: Conventional Water Treatment Process

The following is a description of the conventional process:

- Raw water is dosed with a coagulant chemical (typically aluminium based), that causes the solids and organic matter in the water to clump together into larger particles. Small doses of a flocculant polyelectrolyte are typically also dosed to aid the coagulation process.
- The majority of these particles settle in the clarification process and are discharged as a sludge waste stream.
- The clarified water then flows through a media filter – typically two layers – the upper layer being lighter anthracite or pumice, and the lower layer being sand.
- After filtration the filtered water is dosed with chlorine which kills any remaining pathogens in the filtered water and protects the water from any re-contamination when it is in the reticulation network.
- pH correction is typically applied following filtration to reduce the corrosivity of the treated water. Caustic soda or soda ash would be used.

7.4.4 Optimisation

As previously mentioned, the treatment processes used at Tihiroa achieve 3 and 4 logs at other plants in New Zealand. The most likely factors for Tihiroa not achieving this are:

- Limited monitoring and control equipment
- Inefficient chemical injection and mixing systems
- Chemical dose rates
- Filter condition
- Filter surface loading rate >10m/hr
- Clarifier loading rate >2-3 m/hr
- Inconsistency in plant operating practices

- Limited treated water storage to enable plant shutdown
- Limited maintenance
- Limited operator input

Addressing the above factors may enable the plant to achieve 3 log, but further investigation is required to determine whether the clarifier is fit for application. The reported filter condition, and its configuration are likely to be significant contributing factors in its replacement. The addition of UV treatment would enable the plant to achieve the estimated 4 log requirement, providing the preceding treatment systems are operating correctly. Operation of the plant most cost-effectively will require greater operational input than present.

For the direct filtration plants within the Arohena Scheme, compliance may be able to be met with the addition of coagulation, low cost upgrading of the filters (dependent on condition), installation of monitoring and control equipment, and addition of UV. Compliance would largely be dependent on the UV preceding treatment processes achieving <1 NTU. Operation of these plants is likely to be onerous due to the infrastructure, source water characteristics and limited operator resourcing.

7.4.5 Treatment Options Comparison

Detailed in Table 11.

Table 11: Options Comparison

Criteria	Existing Treatment Plant Optimisation (Coagulation, Direct Filtration) - Arohena Plants	Existing Treatment Plant Optimisation (Coagulation, Sedimentation, Rapid Gravity Filtration) - Tihiroa Plant	New Containerised Treatment Plant (Coagulation, Direct Filtration, UV – Taupaki Plant Only*	New Membrane Treatment Plant (Coagulation, Membrane Filtration) – All Plants	New Conventional Treatment Plant (Coagulation, Sedimentation, Rapid Gravity Filtration) – All Plants	New UV Treatment – All Plants
Operating Cost	Chemicals – Coagulant. – pH correction. Energy – The energy costs are relatively low compared with other options as the plant flow could continue to be driven by gravity; i.e. pumping not required. – Further investigation would be required to determine if the existing backwash system is suitable. An upgrade may be required including air scour and backwash pumps which would consume energy. Maintenance – Long asset life, if appropriate refurbishment of existing equipment is undertaken, reducing on-going maintenance costs. – Sand filter media replaced every 10 years.	Chemicals – Coagulant. – pH correction. – Poly. Energy – Raw water pump re-use, then energy consumption as per current situation. – Likely that the replacement filter will require air scour and backwash pumps, which will use more energy. Maintenance – New filter will be long asset life, if appropriate construction and materials are used, reducing on-going maintenance costs. – Existing clarifier re-use, will require immediate expenditure for leaking liner, and ongoing regular costs to maintain the timber tank and associated roof. – Condition of existing pipework, structures, dosing and control equipment may require expenditure depending on condition and performance. Sand filter media replaced every 10 years.	Chemicals – Coagulant. – pH correction. Energy – The energy costs are relatively low compared with other options as it is likely that the plant flow could be driven by gravity; i.e. pumping not required. – Backwash pumps are likely to be required, which will require further energy. Maintenance – Long asset life, if appropriate construction and materials are used, reducing on-going maintenance costs. – Sand filter media replaced every 10 years.	Chemicals – Coagulant. – Clean In Place (CIP) chemicals. Energy – Membrane plants are likely to require more energy than a conventional plant, as they normally require pumps to push the water through the microscopic pores of the membranes. Maintenance – The membrane fibres will have to be replaced, typically after 5-10 years, which is a significant cost.	Chemicals – Coagulant. – pH correction. – Poly. Energy – The energy costs for a conventional plant are relatively low compared with other options as it is likely that the plant flow could be driven by gravity; i.e. pumping not required, with the exception of Tihiroa. Maintenance – Long asset life, if appropriate construction and materials are used, reducing on-going maintenance costs. – Sand filter media replaced every 10 years.	Chemicals – N/A Energy – UV systems will require energy to power the lamps, but it is likely that they can be gravity fed water from the preceding process. Maintenance – The UV lamps will have to be replaced, frequency is dependent on frequency of use and equipment sizing, which is a significant cost. – Calibration of UV intensity sensor annually.
Removal of pathogens	Reasonable treated water quality, however will require operator intervention during storm events. This process may achieve 2.5 log, and will require support from a downstream process such as UV.	Reasonable treated water quality, however likely to require operator intervention during storm events.	Reasonable treated water quality, however likely to require operator intervention during storm events.	Reliable treated water quality, even during storm events.	Reasonable treated water quality, however likely to require operator intervention during storm events.	Reliable treatment process providing the preceding processes maintain turbidity <1.0 NTU.

Criteria	Existing Treatment Plant Optimisation (Coagulation, Direct Filtration) - Arohena Plants	Existing Treatment Plant Optimisation (Coagulation, Sedimentation, Rapid Gravity Filtration) - Tihiroa Plant	New Containerised Treatment Plant (Coagulation, Direct Filtration, UV – Taupaki Plant Only*	New Membrane Treatment Plant (Coagulation, Membrane Filtration) – All Plants	New Conventional Treatment Plant (Coagulation, Sedimentation, Rapid Gravity Filtration) – All Plants	New UV Treatment – All Plants
Chemical use	Coagulant would be dosed to remove natural organic matter in order to reduce the formation of DBPs. Chlorine would be dosed for treated water disinfection. Caustic soda or soda ash for pH correction.	Coagulant would be dosed to remove natural organic matter in order to reduce the formation of DBPs. Chlorine would be dosed for treated water disinfection. Caustic soda or soda ash for pH correction. Poly.	Coagulant would be dosed to remove natural organic matter in order to reduce the formation of DBPs. Chlorine would be dosed for treated water disinfection. Caustic soda or soda ash for pH correction.	Coagulant would be dosed to remove natural organic matter in order to reduce the formation of disinfection by-products. In addition to a coagulant, the membranes need to be washed with chemicals to remove the build-up of material from the raw water. This process is called Clean In Place (CIP) and the CIP system would also require additional pipework and potentially a storage tank where the CIP waste stream could neutralised before being discharged back to the environment.	Coagulant would be dosed to remove natural organic matter in order to reduce the formation of DBPs. Chlorine would be dosed for treated water disinfection. Caustic soda or soda ash for pH correction. Poly.	N/A
Operability	Operator will need to be on top of chemical dosing under typical conditions. Will require more operator invention during storm events.	Simple plant to operate under typical conditions. May require more operator invention during storm events.	Simple plant to operate under typical conditions. May require more operator invention during storm events.	High degree of automation, which may require more skilled operational and maintenance staff than a conventional plant.	Simple plant to operate under typical conditions. May require more operator invention during storm events.	Simple plant to operate, but will require more skilled operational and maintenance staff.
Waste stream	Liquid waste stream with a volume of about 10% of the plant output. Need to consider that a filter to waste function will be required to enable the filter to ripen, prior to bringing back online following backwash. This may impact on the overall daily production capability of the site.	Liquid waste stream with a volume of about 5% of the plant output.	Liquid waste stream with a volume of about 5-10% of the plant output.	Liquid waste stream with a volume of about 5 - 10% of the plant output.	Liquid waste stream with a volume of about 5% of the plant output.	N/A
Design capacity m^3 / day	Kahorekau – 1,000 Huirimu - 925 Taupaki - 150 Tihiroa – 1,500					
Budget costs	Kahorekau - $350,000 Excl. UV Huirimu - $350,000 Excl. UV Taupaki - $350,000 Excl. UV Tihiroa – N/A	N/A N/A N/A $600,000 Excl. UV	N/A N/A $250,000 Incl. UV N/A	$2.2M Excl. UV $2.1M Excl. UV $1.5M Excl. UV $2.4M Excl. UV	$2.1M Excl. UV $2.0M Excl. UV $1.5M Excl. UV $2.2M Excl. UV	$150,000 $120,000 $20,000 $180,000

*Containerised plant application cost prohibitive for sites other than Taupaki, due to the daily production requirements.

Overall a significant operational input will be required for any of the above surface water treatment options.

Membrane filtration is likely to be the most robust treatment process, possibly requiring no operator intervention during a storm event. It is comparable to conventional plants regarding capital but would have a slightly higher operating cost. The biggest risk of the membrane option is that it is a highly automated process and if something was to go wrong, it could require more specialised skills to fix in comparison to other options. The chemical use in the main process train is slightly less than for conventional treatment, but additional chemicals are used in the chemical cleaning process for the membrane.

Conventional clarification and filtration provides a robust treatment process; although during rainfall events operator intervention is likely to be required to keep the plant producing good quality water; or if the source water characteristics are typically very clear then coagulation/flocculation may be challenging. Conventional treatment has the lowest operating cost. The expected asset life of a conventional plant would be expected to exceed that of a membrane plant.

With improved treatment processes, it is likely that there will be increased contaminants within the waste stream, and possibly an increase in waste stream volume requiring improved management processes and operator input. A change to the waste stream may require discussion with the Regional Council Authority who may require changes to the current disposal methods. This has not been accounted for in this report.

8 Long Term Plan Proposed Budget Adjustments

Council's Long Term Plan budgets for the Arohena and Tihiroa water schemes are as follows:

Table 12: Arohena LTP Budgeting

	Yr1 17/18	**Yr 2 18/19**	**Yr 3 19/20**	**Yr 4 20/21**	**Yr 5 21/22**	**Yr 6 22/23**	**Yr 7 23/24**	**Yr 8 24/25**	**Totals**
Renewals									
Pumps	4,147	18,211	33,300		12,328				67,986
Electrical								2,372	2,372
Sundry	12,969	13,008	14,315	13,632	13,956	14,280	14,616	45,653	142,429
Sand filter		976			5,466			19,413	25,855
Building								26,161	26,161
Subtotal									**264,803**
DWS log credit upgrades									140,130
Total									**404,933**

Table 13: Tihiroa LTP Budgeting

	Yr1 17/18	Yr 2 18/19	Yr 3 19/20	Yr 4 20/21	Yr 5 21/22	Yr 6 22/23	Yr 7 23/24	Yr 8 24/25	Totals
Renewals									
Pumps		6,070				6,664			19,712
Meter	5,290								5,290
Reservoir			44,755						44,755
Filter refurbishment	55,016								55,016
Sundry	34,914	5,420		5,680		5,950	3,683	6,230	61,877
Pipeline	41,082								41,082
Intake		29,138							29,138
Subtotal									**256,870**
DWS log credit upgrades									118,332
Total									**375,202**

To recognise the work required to bring the Arohena and Tihiroa scheme treatment plants up to Drinking Water Standards New Zealand compliance, we suggest the following long term budget planning. The budget assumes that ODC has the resources to undertake the catchment assessments and ground water investigation in-house.

Table 14: Proposed LTP Budgeting for Treatment Plant Upgrades

Site		Yr1 17/18	Yr 2 18/19	Yr 3 19/20	Yr 4 20/21	Yr 5 21/22	Yr 6 22/23	Totals
Tihiroa	CapEx	$4,400 site assessment	$100,000 options study and design	$2.38m plant construction and commissioning				**$2.48m**
Kahorekau	CapEx	$3,650 site assessment		$100,000 options study and design	$2.25m plant construction and commissioning			**$2.35m**
Taupaki	CapEx	$3,650 site assessment			$100,000 options study and design	$1.52m plant construction and commissioning		**$1.62m**
Huirimu	CapEx	$3,650 site assessment				$100,000 options study and design	$2.12m plant construction and commissioning	**$2.22m**
	Totals	**$15,350**	**$100,000**	**$2.48m**	**$2.35m**	**$1.62m**	**$2.12**	**$8.69m**

9 Conclusion

The treatment plants surveyed within the Arohena and Tihiroa water supply schemes, in their current infrastructural and operational configuration, cannot achieve the protozoa treatment targets required by the Drinking Water Standards New Zealand. The options in this report will have significant financial impact, and will require considerably more operational input than what is currently assigned to the plants.

Council's best approach to addressing this is:

- evaluation of alternate water sources,
- comprehensive analysis of the selected source characteristics; and
- selection of robust treatment processes to meet design parameters

to ensure Council and its customers end up with infrastructure that will reliably achieve compliance over a long period.

Appendix A

Kahorekau and Tihiroa Catchment Survey Forms

Kahorekau Catchment Risk Categorisation Survey Result Form

WATER SUPPLY

	Kahorekau
WINZ SOURCE CODE	
Abstraction point	easting northing
Catchment area	297 ha

LAND USE

(estimate % of catchment area)

Protected catchment	-
Bush/forest	88
Arable (cropping) land	-
Upland pasture	12
Lowland pasture	-
Urban	-
River	-

LIVESTOCK

(estimate numbers in catchment) Source: Statistics NZ Census June 2012, Waikato Regional Council

Beef cattle	10
Dairy cows	40
Sheep	-
Deer/goats	-
Pigs	-

HUMAN WASTES	(estimate population served)	
Primary-treated sewage		(river/land discharge)
Secondary-treated sewage		(river/land discharge)
Septic tanks		

ANIMAL WASTES	(number in catchment)
Meatworks	
Cattle feedlot	
Piggeries	
Dairy effluent ponds	

MANAGEMENT PRACTICES	(yes/no)	Estimate of coverage/comment
Riparian management	N	
Tile drains	N	
Livestock access to waterway	N	
Animal bridge/ford crossings	N	

MANAGEMENT PRACTICES	(yes/no)	Data held by:
Faecal coliforms/*E. coli*		
Crytosporidium		
Giardia		

Provider’s contact details	

Tihiroa Catchment Risk Categorisation Survey Result Form

WATER SUPPLY	Tihiroa
WINZ SOURCE CODE	
Abstraction point	easting northing
Catchment area	4,880 ha

LAND USE	(estimate % of catchment area)
Protected catchment	-
Bush/forest	5
Arable (cropping) land	1
Upland pasture	89
Lowland pasture	-
Urban	4
River	1

LIVESTOCK	(estimate numbers in catchment) Source: Statistics NZ Census June 2012, Waikato Regional Council
Beef cattle	1,300
Dairy cows	4,900
Sheep	4,800
Deer/goats	200
Pigs	-

HUMAN WASTES

(estimate population served)

Primary-treated sewage		(river/land discharge)
Secondary-treated sewage		(river/land discharge)
Septic tanks		

ANIMAL WASTES

(number in catchment)

Meatworks	
Cattle feedlot	
Piggeries	
Dairy effluent ponds	

MANAGEMENT PRACTICES

	(yes/no)	Estimate of coverage/comment
Riparian management	Y	
Tile drains	N	
Livestock access to waterway	N	
Animal bridge/ford crossings	N	

MANAGEMENT PRACTICES

	(yes/no)	Data held by:
Faecal coliforms/*E. coli*		
Crytosporidium		
Giardia		

Provider's contact details

Sensitivity: General

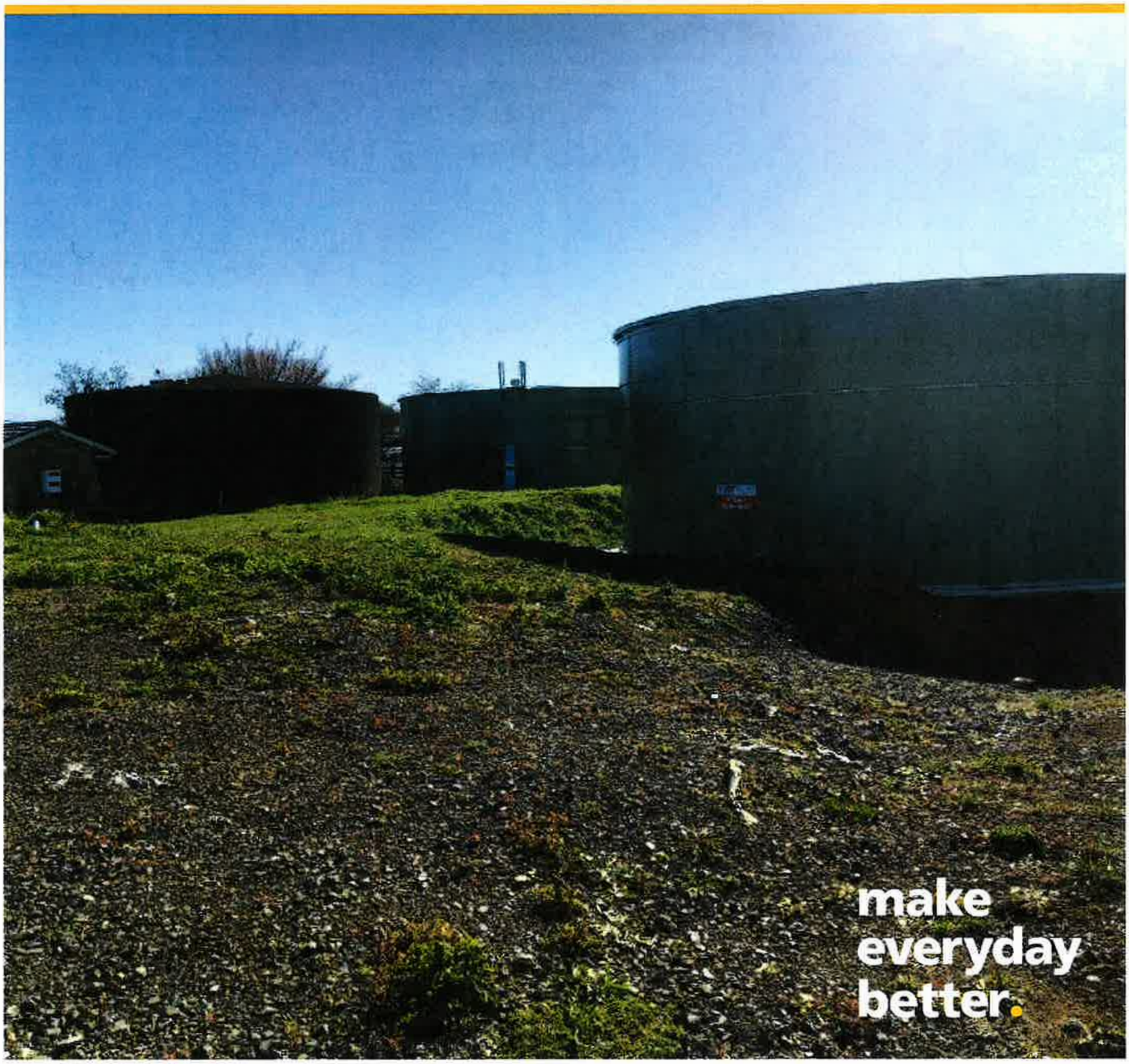
Beca

Peer Review of Otorohanga District Council Three Waters Infrastructure Valuation

Report

Prepared for Otorohanga District Council
Prepared by Beca Projects NZ Limited

5 October 2023



Revision History

Revision N°	Prepared By	Description	Date
1	Ryan Wong	Peer Review Report	05/10/2023

Document Acceptance

Action	Name	Signed	Date
Prepared by	Ryan Wong		05/10/2023
Reviewed by	Robert Berghuis		05/10/2023
Approved by	Marvin Clough		05/10/2023
on behalf of	Beca Projects NZ Ltd		

Contents

Appendices

1 Introduction

Beca Projects NZ Limited (Beca) was commissioned by Otorohanga District Council (ODC) to complete a Peer Review of their 2023 Three Waters Infrastructure Valuation for financial reporting purposes.

Three water asset information is recorded in the Univerus Asset Management System (Univerus) that holds asset information, records condition assessments, and produces detailed and summary valuations in spreadsheet formats. This information and ODC's financial reports were provided for this peer review.

Recognising that escalating construction costs since the 2022 valuation will influence fair value, ODC decided to complete a 2023 revaluation using the Univerus system. An escalation movement of 6.56% from 30 June 2022 to 30 June 2023 was determined using Stats NZ CGPI CEPQ indices code for systems for water and sewerage, and this movement was applied across all existing assets for assessment as at 30 June 2022.

Three waters valuation summaries reported are effective as at 30 June 2023.

2 Scope

The scope of work was to complete the peer review as three distinct activities:

1. Review ODC's unit rates CGPI escalation 2022-2023 for assets for the following asset groups and classes:

- Water Supply (WS) infrastructure line (ws_line), plant ws_plant), and point (ws_point) assets.
- Wastewater (WW) infrastructure line (ww_line), plant (ww_line), and point (ww_point) assets.
- Stormwater (SW) infrastructure line (sw_line), plant (sw_plant), and point sw_point) assets.

2. Complete peer reviews of ODC 2023 valuation to provide an assessment of the infrastructure revaluation processes and the degree of compliance against current valuations standards and industry guidelines.

3. Provide support for ODC's inputs and outputs including validations of the base data, formulae, valuation processes, and valuation draft and final reports

ODC supplied a valuation report detailing purpose, scope, movements, basis of valuation, valuation process, methodologies, data confidence, optimisation and residual values including assumptions for this peer review.

The valuation excludes roading, amenities, and property assets owned by Council. Some of these assets exist in the Univerus database as connections to the three waters systems are identified but are not valued.

3 Values Reported

The asset group values reported by ODC for financial reporting purposes as at 30 June 2023 are:

Asset Group	Replacement Cost	Fair Value (DRC)	Annual Depreciation
Water Supply	40,630,477	23,848,218	751,879
Wastewater	21,130,274	10,036,277	328,136
Stormwater	18,649,542	11,560,051	213,880
TOTALS	**80,410,293**	**45,444,546**	**1,293,895**

The values are in New Zealand dollars and exclude GST.

4 Basis of Peer Review

This peer review was completed in accordance with the PBE IPSAS17, an accounting standard published by External Reporting Board (XRB), and with references to the current industry guidelines as described below.

PBE IPSAS 17

PBE IPSAS17 Public Benefit Entity International Public Sector Accounting Standard 17 - Property Plant and Equipment, applies to public sector entities other than Government Business Enterprises that prepares and financial statements under the accrual basis of accounting in accounting for property, plant, and equipment. These assets include infrastructure. Infrastructure assets are described in PBE IPSAS 17 Section 21 as:

"Infrastructure Assets:

Some assets are commonly described as "infrastructure assets." While there is no universally accepted definition of infrastructure assets, these assets usually display some or all of the following characteristics:

a) They are part of a system or network;

b) They are specialized in nature and do not have alternative uses;

c) They are immovable; and

d) They may be subjected to constraints on disposal.

Although ownership of infrastructure assets is not confined to entities in the public sector, significant infrastructure assets are frequently found in the public sector Infrastructure assets meet the definition of property, plant and equipment and should be accounted for in accordance with this standard.

A different approach is used to value specialised and non-specialised assets for their existing use. Non-specialised assets are valued on a market basis, usually by way of sales comparison or income approaches. Specialised assets are seldom traded on an open market, so they are valued on a depreciated replacement cost (DRC) basis to account for age and deterioration and optimised depreciation replacement cost (ODRC) was calculated from the DRC valuation by allowing for asset obsolescence, over-capacity, or redundancy.

Industry Guidelines

The New Zealand Infrastructure Asset Valuation and Depreciation Guidelines 2006 (NZIAVD) published by the National Asset Management Support (NAMS) Group sets out the general principles of valuation of public entity infrastructure and provides guidance on acceptable methods and legislative requirements surrounding valuations and guidance on the assessment of useful lives and depreciation methods used to value assets.

The International Infrastructure Management Manual 2020 (IIMM) published by the Institute of Public Works Engineering Australasia (IPWEA) describes asset life cycle management principles including the monitoring of performance and condition and predictive modelling on such parameters for determining remaining useful lives and identifying optimised obsolescent assets.

The Inland Revenue IRD265 2020 (IRD265) General depreciation rates guidance document provides advice on calculating asset depreciation rates using diminishing value (DV) and straight line (SL) methods based on estimated useful life. The document includes different industry sector asset types estimated useful life tables.

5 Valuation Processes

The valuation reports were peer reviewed for content, and completeness with both the spreadsheet and report peer reviews completed independently and interactively with ODC to facilitate amendments.

NZIAVD defines valuation processes for performing depreciated replacement cost (DRC) methodologies used to determine infrastructure fair values at a set point in time. The following processes were peer reviewed with any inconsistencies found reported to ODC to review.

Define the Component Level

Componentisations of assets are typically at a level that an entity replaces them at differing times. Asset items may be treated individually or combined into a global process. Appropriate componentisations of assets having differing useful lives were checked.

Establish the Valuation Database

The valuation database should contain asset register data with dimensional and descriptive attributes and the various valuation factors including optimisation, condition, modern equivalent asset (MEA) and impairment for completing the DRC calculations. Asset database register attributes and valuation factors were checked.

Optimise Replacement Costs

Assets are generally normalised to a global unit to assess a representative unit rate for valuation purposes. Costing factors are then applied to the unit rate to be assets to assess and assets optimised replacement cost. Project overheads, MEA considerations, optimisation, availability of supply and demand factors that may affect an asset's replacement cost were checked.

Assess Useful and Remaining Useful Lives

Useful life represents the period an entity expects the asset to be available for use. It is generally taken as the lesser of physical life where an asset deteriorates to a point where it cannot be used or its economic life where an asset has been installed and used for a particular purpose with a definite timeframe.

Infrastructure assets are generally those with useful lives usually ranging between ten and one hundred years with varying asset types having their own useful life ranges, which may be extended outside the usual range. Useful lives were checked for consistency against applicable ranges in NZIAVD, IIMM and IRD265 guidelines.

Remaining useful life is generally assessed from useful life less asset age unless there are conditional or other remaining life limiting factors such as deterioration modelling, process changes or obsolescence to consider. Remaining useful lives were checked for consistency considering the varying remaining life limiting factors.

Calculate DRC and Annual Depreciation

Depreciated Replacement Cost assess the consumption of an asset at a set point in time using diminishing value (DV) or straight line (SL) depreciation methods considering current replacement cost, residual value, useful life, and remaining useful life. Residual value for infrastructure assets is usually set to zero as they are generally part of a network, specialised for their purpose and are generally not traded.

The DV method assumes initial rapid consumption that slows down to a plateau at end of life while SL assumes constant rate of consumption. As infrastructure assets have long useful lives compared to consumable assets, they are generally depreciated using the SL method. Aside from non-depreciating assets, annual depreciation is the rate applied using the SL method considering the current DRC and remaining useful life.

Both DRC and annual depreciation calculations were checked for consistency.

6 Council Documents

ODC documents provided for the purpose of this peer review included:

- business-price-indexes-march-2023-quarter-capital-goods-price-index
- 2023 ODC 3 Waters Valuation V1 Draft Spreadsheet
- 2023 ODC 3 Waters Valuation V2 Draft Spreadsheet
- 2023 ODC 3 Waters Valuation V3 Draft Spreadsheet
- 2023 ODC 3 Waters Valuation V4 Final Spreadsheet
- Otorohanga District Council 2023 Three Waters Revaluation Report Draft
- Otorohanga District Council 2023 Three Waters Revaluation Report Final

The Univerus data includes selected purchase costs from contracts across all asset classes since 2016.

7 Univerus Base Data

Univerus hierarchies are owner, status, community, category, class, map group, system, type, and sub-type.

Attributes and inputs used for this revaluation include material, diameter, quantity/length, width, area, install date, year (of valuation), purchase cost, base life, unit cost, residual value, depth, unit rate factor, minimum remaining life percentage, dep asset (Y/N), make, model, and size.

Univerus calculations and outputs include age, non-depreciated value, depreciated value, annual depreciation, remaining life adjusted, and age remaining life. Condition remaining life was not used.

The detailed Univerus report included 15,636-line items map grouped by Water, Wastewater, and Stormwater. Each group was subdivided into lines, points, and plant, with meters being included into the water map group. This included 664-line items that were zero-rated due to owner, status, or type (primarily nodes or map points).

The summary Univerus report included 68-line items that are selectable by community, asset class and status.

The following filters were applied to the following separable assets in this revaluation:

Owner - Local Authority assets separated from Crown, Private, Roading, and Waipa District Council.

Status - Existing assets separated from abandoned, private, removed, replaced, and Roading Asset.

It was noted that most filterable assets had zero values due to a zero-unit rate factor being correctly applied, however, the reviewer used spreadsheet-based owner and status filters to exclude all separable assets.

8 Financial Groups

The following financial groups were incorporated manually into the Univerus valuation using spreadsheets:

- Community Water – Otorohanga water assets.
- Rural Water Supplies - Huirimu, Kahorekau, Kawhia, Ranginui, Taupaki, Tihiroa, Waipa water assets.
- Sewerage - Otorohanga wastewater assets
- Drainage Network – Kawhia and Otorohanga stormwater assets.

Refer to Appendix A for the Univerus Outputs by Financial Group.

9 Observations

9.1 General

This review was completed independently, although interactively with ODC, as ODC wished to use the peer review process to provide timely feedback in order to complete the valuations.

9.2 Compliance

Compliance aspects relating to the basis of valuation, processes, and methodologies in terms of evidence, as determined by review, were considered in terms of PBE IPSAS 17 and industry guidelines as shown below.

High compliance scores have been attributed to criteria that have statements support with evidence, medium scores where evidence has not been provided to support statements and low scores to aspects expected to be included in the valuation but were not included.

Criteria / Compliance	Evidence
Valuation shall be conducted by an independent valuer, or the Entity employs a person sufficiently experienced to conduct a valuation, subject to review by an independent valuer. **Compliance:** High	The three waters infrastructure valuations were led by ODC Brendan O'Callaghan, Finance Manager, and his team are sufficiently experienced to conduct a valuation subject to review by an independent valuer. A desktop peer review of the valuation was carried by Beca as the independent valuer using the approaches described above.
DRC basis to be used for assets where reliable market evidence is not available. **Compliance:** High	As infrastructure assets are specialised and rarely sell, there is no reliable market evidence on which to base fair value. DRC was carried out within Univerus from asset data and the system to produce detailed valuation outputs. The report details the cost and lives inputs used for DRC calculations.
Asset Register should provide general data on assets. **Compliance:** High	Asset registers were compiled for this peer review from the Univerus Detailed Valuation output spreadsheets that holds general data for Infrastructure assets in the various tables. Assets in the Univerus inventory are entered at levels that allows for differing types and lives e.g., pump, valve, and tank. General data included asset type and general attributes e.g., install date, dimensions, and materials.
Valuation Database should provide specific data on assets. **Compliance:** Medium	Although ODC have populated condition grades for assets, condition indices were not used for adjusting remaining lives. This is accepted as condition remaining life adjustments are lesser defined compared with age based remaining lives.
Documented data quality processes **Compliance:** High	The valuation refers to data quality assurance processes to eliminate blank values and correct totalling inconsistencies. As the Univerus attribute data aligns with GIS, ODC can run mapping quality checks on captured assets to check for any inconsistencies. Data quality is an ongoing data activity.
Establishing Useful Lives **Compliance:** High	Useful lives are featured in Univerus as base lives as given to an asset to represent the period of time Council expects the asset to perform at defined levels of service. These base lives generally compare with this ranges in the NZIAVD guidelines.

Establishing Standard Replacement Costs **Compliance**: High	Standard Replacement Costs are represented in Univerus as Unit Costs. The costs are typically sourced from the market, local contracts, cost estimations, and inflationary sources. For the 2023 fair value assessment, the unit costs that were established for the 2022 valuation were escalated from June 2022 to June 2023 as described in Section 9 at 6.56%. A Unit Rate Factor of 0.5 has been consistently applied for rural pipes as compared to urban pipes for this assessment instead of the complicated unit rate factors approach applied to various Communities for the 2022 valuation having noted that resulting differences to fair value was not material.
Estimate of residual values **Compliance:** High	The valuation states that, assets are depreciated to a residual value of 2.5% of the replacement cost. This residual value is not comparable to a saleable or recoverable residual value as offered by the market. Accordingly, the residual value used by Univerus for recoverable purposes has been set at zero.
Assessing asset age **Compliance**: High	Installation dates were provided for all asset records for the purpose of assessing asset ages.
Estimating remaining lives **Compliance**: Medium	Univerus calculates age RUL from the useful life less age and condition RUL from condition index applied to base life. For the reasons explained above condition RUL is not used. Where age RUL calculates to zero or a negative amount due the asset exceeding its base life, an adjusted remaining life of 2.5% of base life is applied, however, for assets with base lives less than 40 years, this results in decimal RULs that could inflate annual depreciation higher than its fair value.
Optimisation Compliance: High	There has been no optimisation applied for over design or redundancy. However, lowest replacement cost optimisation has been applied by considering an assets replacement with a modern equivalent asset (MEA) that may be procured and installed at a lower cost.
Annual Financial Depreciation (AFD) Compliance: Medium	Using the above inputs Univerus calculates AFD using the financial formula AFD = DRC / RUL to calculate depreciation on any asset in service to its base life. As described above, the application of RULs less than one year generates AFDs exceeding the DRC. For assets exceeding its base life, AFD = 0 Beca has observed an immaterial variance when comparing Beca's depreciation calculation against the Univerus AFD.
Optimised Depreciated Replacement Cost (ODRC) Compliance: Medium	Refer sub-section 10.3 Optimised Depreciated Replacement Cost (ODRC) below.

9.3 Optimised Depreciated Replacement Cost (ODRC)

As stated above, fair value for infrastructure assets is equivalent to its depreciated replacement cost (DRC). Using the above inputs Univerus calculates DRC using the financial formula as:

DRC = (RC-RV) * RUL / (RUL + Age) + RV, and, for assets exceeding their base life, DRC = 2.5% x RC.

In line with Audit recommendations, ODC has adopted a "residual" depreciated value of 2.5% of replacement cost to recognise asset in service after the asset has exceeded its useful life. The DRC residual of 2.5% ORC and zero depreciation is applied when assets surpass useful life was checked and were consistently applied. Beca has observed an immaterial variance when comparing Beca's depreciation calculation with Univerus.

The reviewer noted that there were limited instances applied where assets that were not owned by Council or had a status other existing were had values applied. However, by using pivot queries, these assets were excluded from the valuation. The final fair value assessment result for the total three waters is $45,444,546.

The valuation summary as shown in Section 3 Valuation Summary and comparisons with the 2022 valuation movement summaries by group and asset type are shown in ODC's 2023 Three Waters Revaluation Report.

Final 2022-2023 ODRC (Fair Value) Summaries by Asset Group are:

Group	2022	2023	Difference	% Change
Water	20,525,575	23,848,218	3,302,643	16.1%
Wastewater	9,549,410	10,036,277	486,867	5.1%
Stormwater	10,733,379	11,560,051	826,672	7.7%
Three Waters	40,828,364	45,444,569	4,635,183	11.3%

10 Validated Values

Beca consulted with site staff to review the asset register, age, condition, utilisation and remaining useful economic life of the assets. Beca considers the asset register to be reliable and suitable for the valuation.

11 Conclusions

The infrastructure datasets used for the valuation are considered to be substantially complete and accurate.

The total fair value of the three waters assets calculated using Univerus as at 30 June 2023 is $45,445,589. This is an increase of 11.4% on the previous valuation undertaken in 2022.

The ODRC movements explained for the assets in the report are considered reliable considering changes to the network, vested asset additions, asset deletions, data improvements, and found assets.

As replacement cost, ODRC and annual depreciation calculations were based on derived asset replacement costs and the useful lives are consistent with the industry guidelines or were appropriately modified to meet certain conditions, Beca considers these values to be reliable and suitable for financial reporting purposes.

The reviewer observed a 7% variance when comparing peer review depreciation calculation with the ODRC produced by Univerus. This has primarily occurred on assets that have exceeded their base lives and, given that these assets will likely be replaced in the foreseeable future, the variance may be considered immaterial. Supporting spreadsheet *ODC 3 Waters Valuation 2023 RW Review Updated RB with ODC Input* has details.

12 Recommendations

The following recommendations are provided for ODC to consider. These include asset data validations and process improvements and are listed are in no particular order.

It is recommended that ODC:

Data Attributes

- Continue to develop and improve the data capture and verification processes to minimise unknowns.
- Continue to populate the size and notes fields to capture specific asset attributes and relevant information.
- Continue to develop record for retired assets and demolished assets.

Valuation Inputs

- Request Univerus check algorithms used to calculate age, and adjusted remaining lives are consistent.
- Investigate asset type condition grade index development for calculating condition remaining useful lives.

Valuation Outputs

- Run only Local Authority owned assets in Univerus to ensure Local Authority quantities are recorded.
- Request Univerus to check that their calculations for replacement cost, depreciated replacement cost, and annual depreciation are consistent with ODC's financial policies and valuation methodology.

13 Limitations

The following limitations apply to this valuation peer review:

- Reliance has been placed on the accuracy and completeness of information supplied by ODC.
- It has been assumed that assets are in proper working order and functioning for the purposes for which they were designed, and conform to current building, fire, health & safety regulations & codes.
- The report is on the basis that ODC owns the assets reviewed.
- This report has been prepared for the specific purpose stated herein. Any party that relies upon it for another purpose without reference to the writer does so at their own risk.
- Beca's responsibility in connection with this report is limited to the ODC to whom it is addressed. Beca disclaim all responsibility and accept no liability to any other party.
- Not the entire report nor any part of it may be referred to or included in any published document, circular or statement without our written approval of the form and context in which it may appear.
- Beca reserve the right but not the obligation to revise this report in the light of any information existing or additional information that comes to our attention after this report has been issued.

14 Declaration

Beca is aware that the auditors will be relying on Beca's knowledge of infrastructure valuations of this type.

Beca is not aware of any reason why ODC's auditors should not place reliance on the information provided by ODC and values in the valuation report, as provided by ODC, based on the above data.

This review was completed by Robert Berghuis and approved by Marvin Clough. Both Robert and Marvin are registered plant and machinery valuers experienced in the completion of public benefit entity valuations and peer reviews.

Please contact the undersigned if you have any questions regarding this peer review.

Robert Berghuis

Registered Plant and Machinery Valuer

Senior Valuer

Marvin Clough

Technical Director - Valuations

on behalf of

Beca Project NZ Ltd

Email: Robert.Berghuis@beca.com

A

Appendix A – Univerus Outputs by Financial Group

Community	Count	ORC	DRC	AFD
Community Water	**9090**	**18,816,050**	**10,263,527**	**391,842**
Otorohanga	9090	18,816,050	10,263,527	391,842
Drainage Network	**1184**	**18,649,542**	**11,560,051**	**213,880**
Kawhia	197	3,097,986	2,305,537	35,984
Otorohanga	987	15,551,556	9,254,514	177,896
Rural water Supplies	**2411**	**21,814,427**	**13,584,691**	**360,037**
Huirimu	191	2,363,139	1,405,962	39,822
Kahorekau	171	2,540,167	1,677,544	37,339
Kawhia	1200	4,958,695	2,201,045	108,771
Ranginui	73	1,945,350	1,093,031	27,897
Taupaki	95	771,800	434,409	11,473
Tihiroa	269	5,352,170	4,199,779	78,452
Waipa	412	3,883,106	2,572,921	56,284
Sewerage	**2303**	**21,130,274**	**10,036,277**	**328,136**
Otorohanga	2303	21,130,274	10,036,277	328,136
Grand Total	**14988**	**80,410,294**	**45,444,545**	**1,293,894**

Table Source: V4 Detailed Pivot excluding EXCLUSIONS.

2023 Activity	Replacement Cost	ODRC	Annual Depreciation
Water	40,630,477	23,848,218	751,879
Wastewater	21,130,274	10,036,277	328,136
Stormwater	18,649,542	11,560,051	213,880
Total Three Waters	80,410,293	45,444,546	1,293,895

V4 Detailed Pivot	**80,410,294**	**45,444,545**	**1,293,894**

2022 Activity	Replacement Cost	ODRC	Annual Depreciation
Water	36,057,534	20,545,575	671,244
Wastewater	19,687,229	9,549,410	304,816
Stormwater	17,179,246	10,733,379	202,235
Total Three Waters	72,924,008	40,828,364	1,178,294

Source: Copy of 2021-22 ODC 3 Water Valuation V12 Beca Review (3)

Difference	Replacement Cost	ODRC	Annual Depreciation
Water	4,572,943	3,302,643	80,635
Wastewater	1,443,045	486,867	23,320
Stormwater	1,470,296	826,672	11,645
Total Three Waters	7,486,285	4,616,182	115,601

Percentages	Replacement Cost	ODRC	Annual Depreciation
Water	12.7%	16.1%	12.0%
Wastewater	7.3%	5.1%	7.7%
Stormwater	8.6%	7.7%	5.8%
Total Three Waters	10.3%	11.3%	9.8%

WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

Wastewater & Stormwater Asset Management Plan 2024-34

ŌTOROHANGA DISTRICT COUNCIL

FEBRUARY 2024

Te Kaunihera ā-Rohe o
Ōtorohanga
District Council
Where kiwi can fly

WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

RESPONSIBILITY	Group Manager Engineering
STATUS	DRAFT
NEXT REVIEW DATE	1 July 2027
REVIEW FREQUENCY	Three Years
ASSOCIATED DOCUMENTS	Water Safety Plans, Infrastructure Strategy

REVISION RECORD

Document

Revision	Revision Date	Issued By	Details	PDF Doc ID
Draft 1.0	15 January 2024	Emma Good	Initial issue for internal comment	
Draft 2.0	19 February 2024	Emma Good	Final Draft for internal comment	

Te Kaunihera ā-Rohe o Ōtorohanga District Council
Where kiwi can fly

1.0 - Executive Summary

Ōtorohanga District Council provides a reticulated wastewater system serving Ōtorohanga, and stormwater systems for the Ōtorohanga and Kāwhia urban areas. These systems are provided as enablers of community wellbeing. This Asset Management Plan (AMP) aligns with the 2024-54 Infrastructure Strategy, and is a supporting document to the 2024-2034 Long Term Plan for these Drainage Activities.

The most significant changes since the 2021 AMP, include:

- Council had proposed $12.5M for construction of the reticulation and treatment system for Kāwhia in 2024/25 subject to further investigation into the need for a reticulated wastewater system. The investigation involved physical inspections of a sample of existing septic tank systems and testing of water quality of the stormwater network that entered into the harbour for contamination. Although the water testing did not show contamination levels outside of normal urban stormwater systems the physical inspections did show that reliance on onsite septic systems is not sustainable long term. It is still desirable to proceed with a reticulated system in the future but cannot progress any further without substantial external funding.
- Although early wastewater concept designs have been completed, the question of where to dispose of treated effluent is still not answered, and will need to be further explored before any future design or construction could proceed.
- Repealing of the 3 waters reform has meant that Council will continue to manage and fund 3 waters into the future instead of transferring to a new entity. However, preliminary investigations for a regional 3 waters models are now progressing.
- Significant investment in Ōtorohanga wastewater began in 2021 and will continue into 2025 with the 3 major wastewater network upgrades.
- Renewals will continue at a lesser pace and more focus will go on the treatment of influent and effluent at the wastewater plant, including exploring grit removal options to reduce inorganic sludge build up and redesign of the phosphorus removal plant from ponds to mechanical clarification.

For the wastewater network, it is proposed to continue with preventative maintenance such as:

- Scheduled wash-down of all wastewater pump stations, with bio protect industrial treatment (fat degreaser), which is applied by staff during inspections, to reduce fat build-up and potential odour issues; and
- CCTV of pipework when blockages occur to identify potential issues of infiltration and improvements to the network.
- Continue to introduce monitoring systems for early detection of issues within the network and model peak flows. This information will help inform the wastewater model for future development.
- Introduce a smoke testing regime to help identify stormwater infiltration and fractures in the network. Purchase of our own mobile smoke testing unit to enable staff to systematically work through the network and react to issues quickly.

For the stormwater network, preventative maintenance is focused on:

- Ensuring trade waste and commercial production or chemical storage premises comply with Council's Trade Waste Bylaw, which is being updated as part of the bylaw review; and
- Ensuring compliance with the Resource Consents applying to these stormwater discharges.
- Improving areas of stormwater retention with wetlands and planting

In terms of demand generated from growth, the District population has been steadily increasing since 2006, relatively evenly split between rural and urban. Based on the 2018 census, 10,104 are usually resident in the District, of which 3,027 (30%) are in Ōtorohanga town. Volumetric metering of water started in 2018, and the Water AMP shows demand for water dropped nearly 25% compared to 10 years earlier. This suggests that Council's wastewater services are capable of meeting growth needs over the next decade.

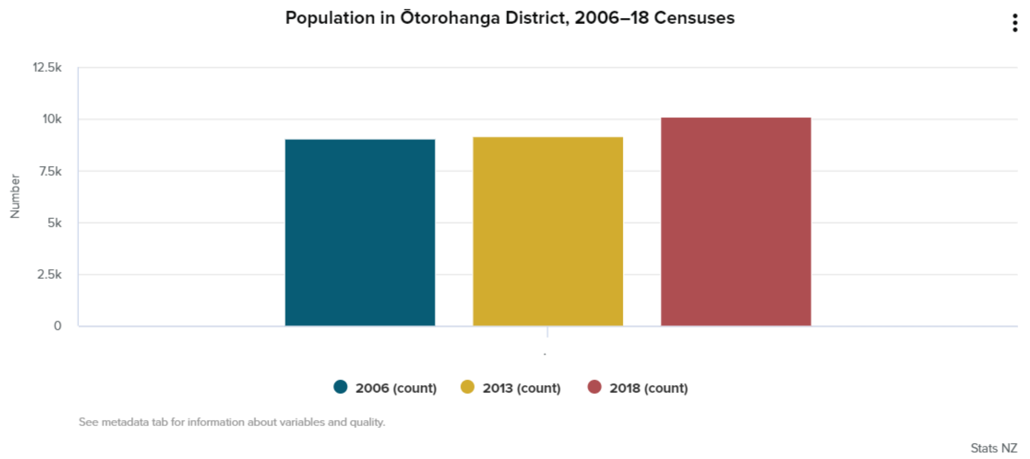


Figure 1.1: Population in Ōtorohanga District, 2006-18 Censuses

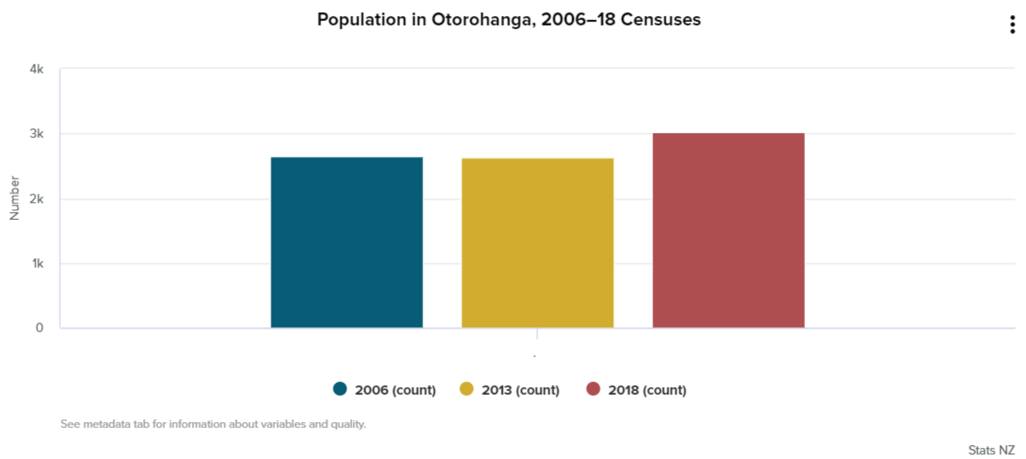


Figure 1.2: Population in Ōtorohanga, 2006-18 Censuses

The highest risks to provision of drainage services are environmental and climate change induced. With increasing legislation seeking avoidance of impacts to fresh water, renewals of the land-based discharge consents are expected to result in additional work to enhance water quality and reduce volumes.

Climate risks include more frequent dry spells, sea level rise and more intense storm/rainfall events. As the ground dries during drought, gravity networks such as the wastewater reticulation are at risk of pipes being displaced from soil contraction. This can lead to pipes moving away from manholes and laterals separating from gravity mains, increasing the amount of ground water infiltration into networks

Although longer dry periods reduce the wastewater and stormwater flows, the wastewater plant can become susceptible to algae growth and continued sludge removal will improve the water quality. Stagnant water sitting within the retention areas does result in bacteria growth and although the quality of the water is not necessarily affected, the visual appearance does increase public awareness of the less visual aesthetic water, which triggers service requests of potential contamination.

The other issue we have experienced in the past is reduced levels of dissolved oxygen in Lake Huipūtea; resulting in fish dying and creating a risk to the public and other wildlife that may eat the dead fish. Over the last two years this has not occurred given the weather events during the summer months and the oxygen being replenished in our retention areas.

Rising sea level puts both stormwater and wastewater disposal at risk in the low lying areas of Kāwhia, although this is a long term issue to be mindful of in the future especially around renewals, new developments or the ability for existing septic tanks to continue to operate effectively.

Council has started investing in major upgrades to wastewater as part of the accelerated programme agreed at the last 2021 LTP and will continue to carry out a renewal programme over the next 10 years for both wastewater and stormwater.

2.0 - Introduction

2.1 - Understanding Differences Between Household Wastewater and Stormwater Generation

Figure 2.1: Wastewater and Stormwater Examples

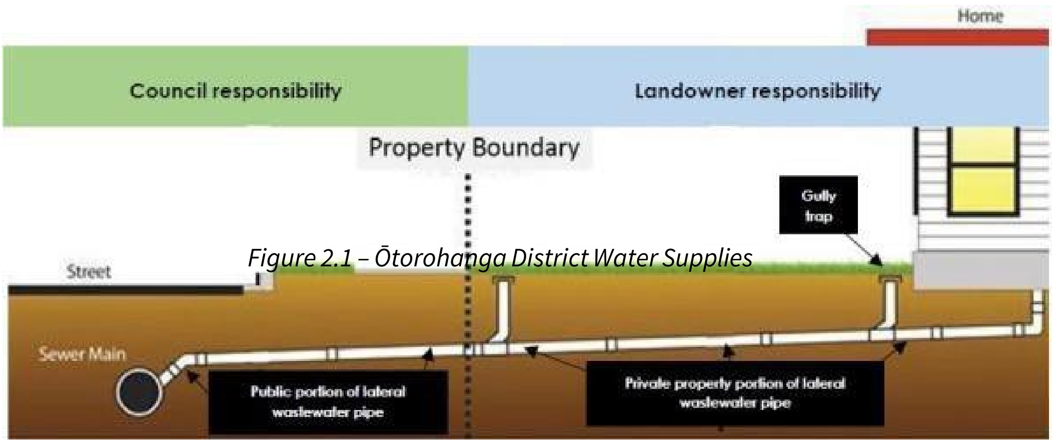


Figure 2.2: Definitions of Responsibilities of Council and Landowners

This Asset Management Plan (AMP) includes:

- The public portion of lateral wastewater pipes and wastewater from houses and businesses that lies within the roads.
- Wastewater (or sewer), mains reticulation and associated pumping stations between the township and the wastewater treatment plant.
- The wastewater treatment plant and land-based disposal system along with associated discharge consents issued by the Waikato Regional Council.
- Stormwater mains except for those pipes and drainage sumps included in the transportation AMP.

- Stormwater pumping stations. The flood protection assets including stopbanks are included in Council's asset register and administered under a service level agreement with the Waikato Regional Council. Depreciation is paid by the Regional Council.
- Refer to the Water Services Bylaw for definitions of the demarcation between council and private pipework when public reticulation runs through private property. The Water Services Bylaw is due for review.

2.2 - Key Directions of Council

While the Infrastructure Strategy sets the strategic direction to ensure the 3 waters assets continue to meet the needs of the district, the AMP aligns with the overall strategy and includes tactical planning in order to implement it. The AMP also defines the scope of work required and associated costs over the next 10 years. It is important that we also show how we will meet regulatory requirements and address current and future environmental challenges.

As part of the development of the 2024-34 Long Term Plan, Council has defined and agreed a set of Community Outcomes . This AMP, together with the Infrastructure Strategy, help contribute to the achievement of these outcomes

The purpose of this Asset Management Plan is to ensure that all assets are operated and maintained so that they provide the required level of service for present and future customers in a sustainable and cost effective manner through:

- Demonstrating sustainable operation of key strategic assets of the Ōtorohanga District, including funding requirements.
- Ensuring the wellbeing of Ōtorohanga District through compliance with all legislation including Local Government Act 2002, Water Services Act 2021, Health and Safety at Work Act, Health Act, Resource Management Act 1991 and Building Act 2004.
- Being consistent with key directions of Council and agreed levels of service.
- Using robust risk-assessment approach to identify and prioritise operational, maintenance, renewal and capital development needs.

This plan substantiates budget forecasts put forward in the Ōtorohanga District Council Long Term Plan (2024-2034) and associated long term (30) year capital replacement forecasts for the provided wastewater and stormwater networks.

Council will:

- Use the approved Operations and Maintenance Manual and Bio Solids Management Plan for the wastewater treatment plant as the day-to-day "working document".
- Conduct regular reviews of the Asset Management Plan in advance of Annual and Long Term Plans. Annual amendments or updates will be undertaken if significant asset management changes occur.
- Use the Annual Report process to outline variations in the actual costs against the original asset management plan forecasts and explain the level of service implications of budget variations.

2.3 - Relationship with Other Plans

In the diagram below are the linkages between Council's high level planning documents as they relate to the Asset Management Plan:

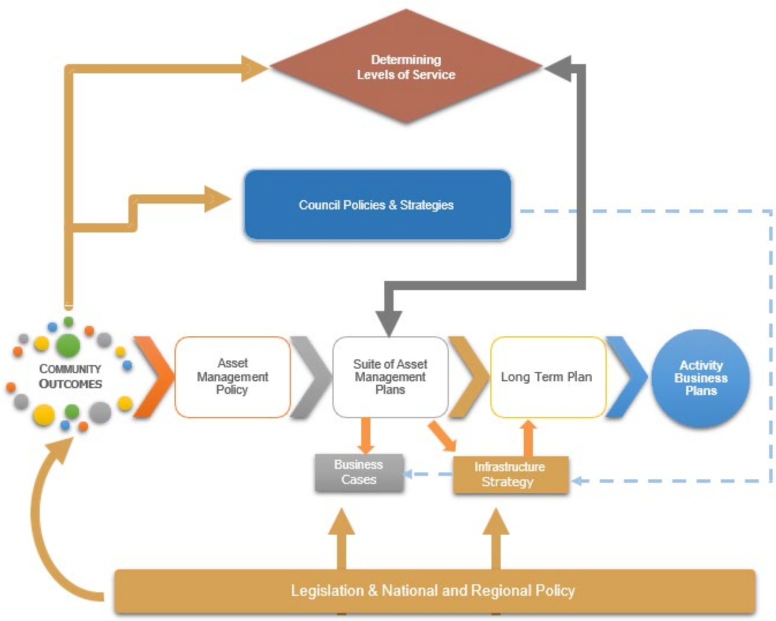


Figure 2.3: Three-Yearly AMP Review

2.4 - Agreed Problem and Benefit Statements

As part of the development of the AMP, the current challenges were summarised to three key problem statements:

Table 2.1: Three Key Problem Statements

	Problem Statements	**Benefit Statements**	**Council Vision**
	Increasing impacts from climate change and environmental rules require Council to minimise the "footprint" of operations whilst enabling capacity for residential and business growth.	Greater use of SCADA and "Business Intelligence" to optimise treatment plant performance and pump station operation to enable growth without significant increase in plant size.	People Place Resilience

	Non-compliance with discharge standards into fresh water creates risks for Council as owner of these reticulated assets.	Investing in equipment and systems to provide additional barriers to non-complying discharges, including identifying high contaminant loadings from trade waste suppliers. Increase proactive maintenance of assets such as regular cleaning of pump stations.	Sustainability Partnerships People
	The central location and attractiveness of the district is increasing growth placing additional demand on infrastructure and resources.	Continued investment in modelling tools to understand criticality of piped networks and progressively upgrade to enable customer connections and growth.	Resilience Sustainability Place

2.5 - Underlying Planning Assumptions

2.5.1 - District Overview and Growth Projections

DISTRICT OVERVIEW

Ōtorohanga District Council is a territorial local authority in the Waikato region of New Zealand. It covers an area of 1,976 square kilometres that extends from the shores of the Tasman Sea in the West to the Waikato River in the East. It has diverse topography, productive farmland, extensive native vegetation, ocean beaches and protected harbours.

The principal township is Ōtorohanga located centrally in the district, with a smaller urban settlement of Kāwhia located at the coast, which is a popular holiday destination.

Figure 2.4: Ōtorohanga District Location Map

POPULATION AND GROWTH

District population in 2023 was estimated to be 10,900, up 0.9% from a year earlier. Figures for that same year show that the district's dependency ratio was 60.7% - higher than the New Zealand ratio (54%). This elevated ratio reflects both the slightly higher proportion of residents aged 65 years and older (17%; cf. New Zealand 16.5%) and higher proportion of young people aged under 15 years (20.6%; cf New Zealand 18.5%).

Nearly 30% of the district population identify as of Māori decent (cf. New Zealand – 16.5%) and 11.3% of residents were born overseas.

Population growth is expected to continue albeit gradually. By 2048, resident population is projected to be 12,656 with a corresponding growth in households from 3,872 in 2024 to 4,644 by 2048 (20% increase).

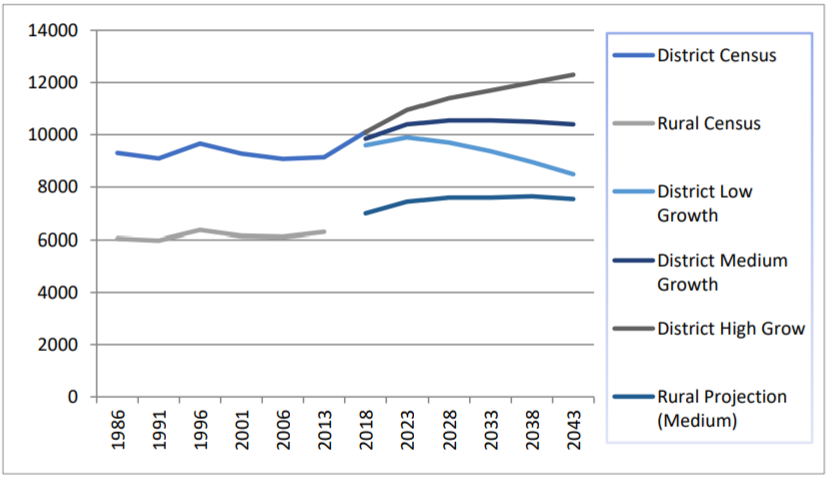


Figure 2.5: Population Growth Forecast

Population insights for Ōtorohanga District from 2022:

Ōtorohanga District's total population was 10,850 in 2022, up 0.5% from a year earlier. Total population grew by 0.2% in New Zealand over the same period.

- Population growth in Ōtorohanga District averaged 1.1%pa over the 5 years to 2022 compared with 1.2%pa in New Zealand.
- Since 1996 growth in Ōtorohanga District reached a high of 2.5%pa in 2016 and a low of -1.0%pa in 2001.

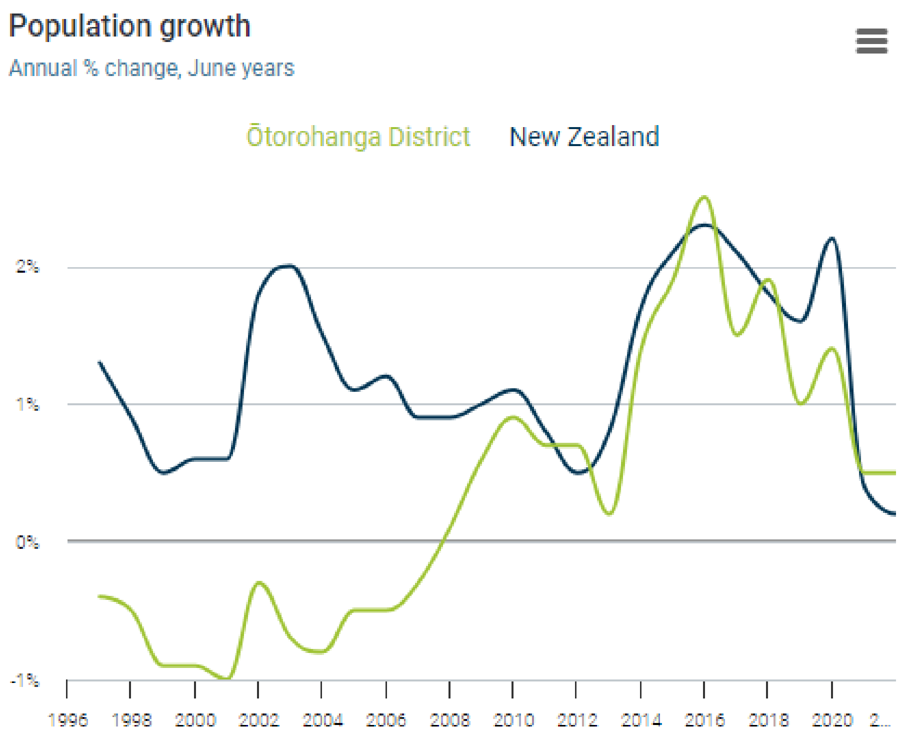


Figure 2.6: Population in Ōtorohanga District, 2006-18 Censuses

Two recent developments are expected to add to residential growth in Ōtorohanga town:

1. The completion of the Waikeria Prison expansion, this facility is to the north of Ōtorohanga and the district's comparably low property values, (against neighbouring Waipā District), will appeal to the new permanent workforce.
2. Completion of stage 1 and 2 of the NKC subdivision on Harper Avenue will see the start of construction of an additional 80 dwellings and with the expected completion of stage 3 and 4 in 2024-25 an additional 40 homes will be built. The associated increase in demand for stormwater and wastewater will be within existing network capacities. Assets from stage 1 & 2 have been vested to Council which is the majority of the overall infrastructure for the larger subdivision. How quickly these new lots become occupied is uncertain. Council's previous experience has been that achieving full occupancy of new subdivisions can take up to 10 years.

However, offsetting the population growth potential with previous census data indicates the average number of occupants per dwelling is falling in comparison with increasing national aged demographic trends. Because of this decline in average household sizes, it is estimated that the number of dwellings in the community would need to increase by approximately 0.4% per annum (5 houses per year) to maintain existing population levels.

In terms of reticulation, the priority is reducing loading on 1-2 key pump stations through diverting flows. This work has started with the installation of the new Harper Avenue pump station which will reduce load on the Main North Road pump station.

For Kāwhia township, the number of permanent residents is estimated to be 339 people which has decreased by 51 people (-13.1%) since the 2006 census. Holiday season populations are however much higher. While accurate data is not currently available, the best assessment of the temporary peak population is in the order of 3,000 residents for the two to three weeks of Christmas, and often 2,000 during other holiday periods.

It is these peak figures, (which are themselves limited by the accommodation capacity of the town), that effectively determine the services capacity requirements of the community.

ECONOMY

Agriculture is the economic backbone of the district, with 34.8% of the district's employed population listing their occupation as relating to agriculture, forestry and fishing. It is still believed that upwards of 75% of all economic activity in the district is closely associated with the agricultural sector. The prevailing economic climate has been difficult for some of the smaller Ōtorohanga businesses, and there have been some changes to businesses in the retail and service sectors, though it is suspected that these changes have occurred without any substantial net loss or gain in total employee numbers.

Economic Insights for Ōtorohanga District from 2022:

- Among the broad economic sectors, primary industries accounted for the largest proportion of GDP (35.8%) in Ōtorohanga District, which was higher than in New Zealand (5.8%).
- Goods-producing industries accounted for the second largest proportion in Ōtorohanga District (12.2%) compared with 18.5% in New Zealand.
- High-value services accounted for the smallest proportion in Ōtorohanga District (9.1%) compared with 26.7% in New Zealand.

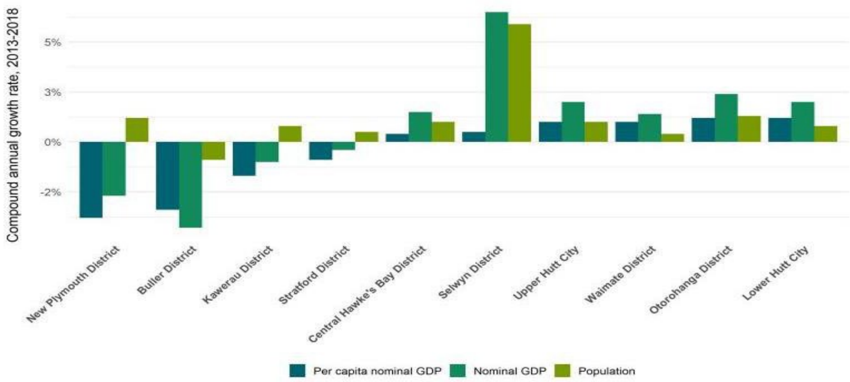


Figure 2.8: Slowest Growing Territorial Authority Areas (2013-2018)

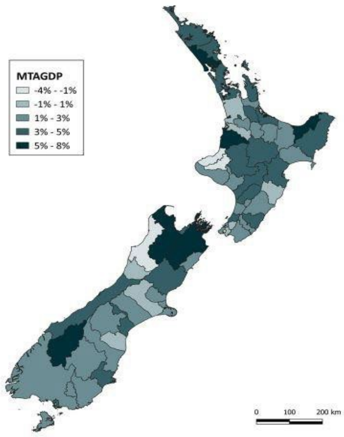


Figure 2.9: Map of Territorial Authority GDP Per Capita Five-Year Growth Rates

2.6 - Three Waters Reform

Preparing our programmes for the wastewater, water supply and stormwater groups of activities have been a challenge for us in this Long Term Plan. We started the process with the expectation that our assets for the three waters would transfer to one of the ten water management entities legislated for by the previous government and that this transfer would occur no later than July 2026. In late 2023 the incoming National, Act, NZ First Coalition Government clearly signalled that the three waters legislation would be repealed and replaced by a new regime – *Local Water Done Well*. Details of the new regime are still being worked on.

To date we have been told that:

- Drinking water, stormwater and wastewater will remain in local control
- There will be stricter rules for water quality and investment in infrastructure
- Councils will need to ringfence money for water infrastructure
- New or replacement water infrastructure will be loan funded and paid back from either rates or user charges.

2.6.1 - What does this mean for us?

It's business as usual until there is more information on the government's intentions with respect to the three waters. We have updated our Water Asset Management Plans and our Infrastructure Strategy for the next 10 and 30 years respectively so we know what work needs to be done and when. We have also made provision in our Long Term Plan programmes for the ongoing management and operation of our water infrastructure by Council staff. This means re-engaging a Manager Waters - we had left this position vacant when it was thought that the three waters would be transferred to one of the new water entities - and ensuring we have the right staff resources in place to operate and maintain the networks.

The accelerated programme of works we started in 2021 has been hugely important for the district. It has enabled us to catch-up on renewing assets that are worn out and increase the capacity of these assets to give us some head room for growth, this work will continue into 2025 and to a lesser extent over the next 10 years.

2.6.2 - Costs

At this stage, we are not anticipating having to build new assets or undertake any major improvement works to existing assets. However, we are budgeting for more loans to help pay for assets when they need replacing as our depreciation reserves are unlikely to be big enough to cover these costs. This will mean that we will have a bigger debt to service in the future for some water schemes.

2.6.3 - Looking into the Future

Until we have more detail about *Local Water Well Done*, it is difficult to determine Council's future role in water management. However, once these details are made public, we will utilise the channels we have available nationally and regionally to participate in the discussions on your behalf to help ensure that the government's proposals are workable at the local level.

Roading is our backbone and three waters are our lifeblood - we know these things don't come cheaply. We expect that as the environmental and health standards for the delivery of quality water services continue to rise so too will the cost to customers. Finding efficient, affordable ways for delivery of water services is an issue we share with our neighbours, and we will be encouraging ongoing regional conversations around making improvements. This may mean joining with others to get better economies of scale in the delivery of services.

2.7 - Ngā Wai o Maniapoto (Waipa River) Act 2012

This is a co-management agreement between the Crown and Ngāti Maniapoto over the Waipā River passed into legislation on 5 April 2012 as the Ngā Wai o Maniapoto (Waipā River) Act. The origins of this agreement lay in the August 2008 deed of settlement between the Crown and Waikato-Tainui regarding the co-management of the Waikato River, which was formalised through the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act on 7 May 2010. This Act also covered the lower portion of the Waipā River from Ngāruawāhia to its junction with the Puniu River. During the third reading of the bill, former MP Nanaia Mahuta commented on the need for an agreement for the Waikato and lower Waipā Rivers to be completed by an agreement with Maniapoto for the upper Waipā:

> *"I will draw attention to a related matter, in closing. The hope of achieving a healthy Waikato cannot be achieved if we have a dirty Waipā. The Waipā River is the largest tributary flowing into the Waikato River. Waikato and Maniapoto have historical and traditional links, which serve only to strengthen each other's interests on this front. To delay a settlement with Maniapoto would stifle progress for the Waikato River. I urge Ministers to expedite negotiations with Maniapoto to align objectives for both of these significant waterways."*

In late 2023, Council signed a Joint Management Agreement with Te Nehenehenui (previously Maniapoto Māori Trust Board) and other local authorities along the Waipā. This agreement encapsulates both the Ngā Wai o Maniapoto (Waipā River) Act 2012 and Maniapoto Claims Settlement Act 2022 respectively. The Joint Committee will convene early 2024, with workplan schedules to be developed between all parties as a priority moving forward.

3.0 - Asset Management Practices

3.0 - Asset Management Criteria

The six most important criteria for asset management planning, as identified in an NZIER study, are listed below along with Ōtorohanga District Councils current self-assessment:

Table 3.1: Criteria for Asset Management Planning

Objective	Information Summary	Self-Evaluation
1. Obtain financial information that accurately indicates the current investment in the drainage assets.	Financial information based on accurate records and independent review of valuations.	Fair degree of confidence. 'Highly Reliable'.
2. Obtain data that indicates the age, condition and performance of the drainage infrastructure services.	Age and performance records are good; information on the condition of the infrastructure is based on historical data and scientific research rather than in situ condition assessments.	Fair degree of confidence. 'Less Reliable'.
3. Obtain information on the setting, delivering and measuring levels of service and compliance for drainage infrastructure services.	Levels of service and compliance are stringently monitored by the Waikato District Health Board and Waikato Regional Council.	High degree of confidence. 'Highly Reliable'.
4. Obtain information on processes that forecast future demand for drainage infrastructure services.	Population forecasts suggest limited population growth in the district hence future water demand is based on current usage figures with any growth offset against savings in water usage and reducing unaccounted for water.	High degree of confidence. 'Highly Reliable'.
5. Identify the governance model adopted to oversee the delivery for drainage infrastructure services (including delegated authority).	Strong governance model is in place via Community Boards and Council.	High degree of confidence. 'Highly Reliable'.
6. Identify the service delivery mechanisms being used in the drainage infrastructure services.	Established drainage systems with delivery methods and infrastructure clearly defined.	High degree of confidence. 'Highly Reliable'.

3.1 - Data Provision Process and Systems

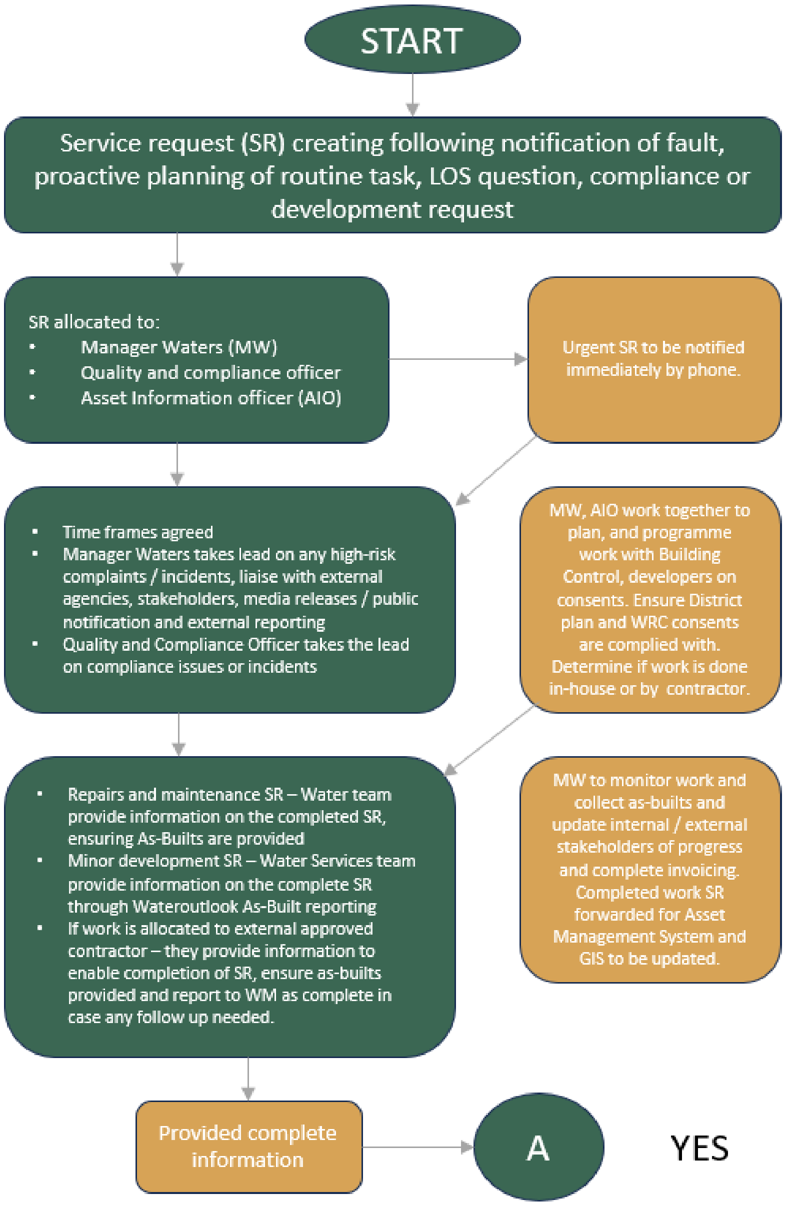
Asset information is captured and stored in the AssetFinda software programme.

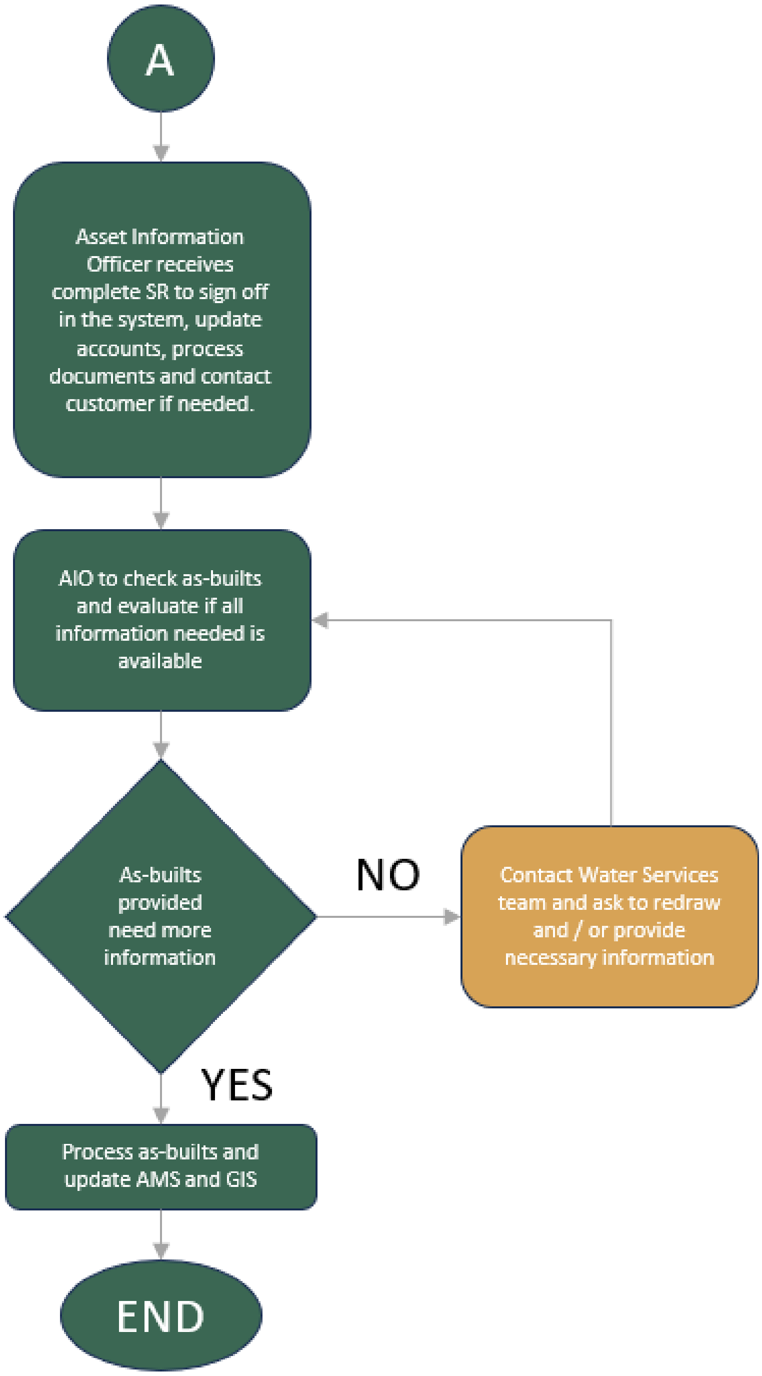
AssetFinda is an advanced Asset Management System that utilises three key interfaces – Web, GIS and mobile devices, e.g. iPads and smart phones, to help improve our asset management practices.

Council invested in AssetFinda as it has been created specifically for asset management of three waters infrastructure, with the purpose of ensuring that the life cycle of assets is maximised and that time spent managing assets is utilised effectively. This, along with a proven track record in local government, makes AssetFinda the ideal choice. AssetFinda allows quick and simple reporting which shows when assets need to be replaced thus allowing both strategic and tactical planning.

AssetFinda is fully compliant with the National Asset Management Standards (NAMS) and national asset accounting standards.

The flow chart below shows the process used to check and capture information related to service requests for non-routine maintenance. This process is also used to check the accuracy of the current data in the GIS programme for location and co-ordinates with any discrepancies being reported back to data entry point.




A
Asset Information Officer receives complete SR to sign off in the system, update accounts, process documents and contact customer if needed.
AIO to check as-builts and evaluate if all information needed is available
As-builts provided need more information
NO
Contact Water Services team and ask to redraw and / or provide necessary information
YES
Process as-builts and update AMS and GIS
END

3.2 - Definition and Management of Critical Risks

3.2.1 - Overview

Environmentally sustainable and financially viable wastewater services are critical to the wellbeing of any community. Where Council provides reticulated wastewater services, the performance of that activity is a primary enabler of public health and growth through smaller section sizes and discharge options for water-intensive industries.

Stormwater services are designed to reduce the risk of flooding of dwellings, and lower lying land from being inundated as upstream land is converted from porous surfaces (greenfields), to developed land (more impervious surfaces such as car-parking and roofs). Increased storm/rainfall intensity and frequency is placing further pressure on stormwater services, which needs to be considered for renewals and new development.

The legislation covering these services, includes the Resource Management Act (for discharge consents), Building Act (for connections to reticulated services), Local Government Act (mandatory measures in providing and funding this activity), and Civil Defence & Emergency Management Act (ensuring lifeline services can continue after any emergency).

3.2.2 - Significance

Delivery of the wastewater and stormwater assets play an essential role in Council meeting its agreed community outcomes. Criticality includes the ability of these assets to perform their civil defence and lifelines purposes but also at an asset level to improve maintenance planning, information accuracy and collection, etc.

Wastewater assets are considered Strategic Assets under section 97 the Local Government Act and form a significant portion of Council's asset valuation, along with operational and capital costs.

3.2.3 - Evaluation

Council has not evaluated each pipe link or pump station in terms of the individual risk failure they would create. Instead, Council uses the criteria below to determine the priorities for replacement or redundancy, (enabling an alternative flow path), where budgets limit which pipes can be replaced in any financial year:

- Pipe diameter and depth of the mains. Trunk mains are a higher priority than laterals, and pipes in trenches over 1.5m deep require significantly more time and controls to replace than those in 1.4m or shallower trenches.
- Health and safety impacts, e.g. loss of service to medical centre, emergency services, schools, playgrounds, parks, community halls, etc.
- Whether the pipe is both a trunk main and located within key transport routes that will require coordination and approval of third parties e.g. under or along State Highway or KiwiRail land, or on land where no formal pipe easements are in place.
- Where the pipe is laid alongside key utility assets that requires additional third party approvals or supervision, such as adjacent to high pressure gas mains, electricity transformers, or under bridges.

If the above evaluation doesn't give a clear priority, Council also considers:

- Legal or insurance compliance – what will be the impact on Council's liability if this pipe is not replaced since being identified as condition rating 5 or 4.
- Criticality – number of customers affected by asset failure.
- Redundancy – ability to replace or circumvent the failed asset.
- Health & Safety – direct or indirect impact of asset failure on the health or safety of individuals or the community.
- Cost of failure – cost of any temporary service provision.

Table 3.2: Controls and Mitigation to Reduce Risks – Pipe and Pump Stations

Risk Event	Causes	Priority	Major Controls	Future Improvements
Network break of blockage	• Failure of trunk main. • Blockage from fatberg, aggregate from pipe bedding or similar.	High	• Three yearly check and rating of trunk mains using in-pipe CCTV to identify condition rating. • Trunk mains with condition rating 5 (failing) or 4 (deficient) prioritized for renewal through LTP programme. • Inventory of suitable pipe spares to replace collapsed pipes in a timely manner. • Call centre staff clear on response times, mitigation to be taken including notifications.	Educational articles and webpage advice on why users should avoid grease or wipes being placed into wastewater reticulation.
Overload of network due to extreme weather	• >1 in 25-year storm/ rainfall event. • Climate change.	High	• Council have agreed process for response to incident (most likely pump station). • New builds (business or private development) use the regional Engineering Standards to ensure pipes adequate for design storm event.	Utilise the waste model to help identify constraints in network in a big event as part of lifelines responsibilities.
Network capacity failure – normal year	• Increased infiltration.	High	• Proactive upsizing of stormwater mains as renewed to increase capacity • Continued CCTV inspections of the wastewater trunk mains to identify infiltration	

Odours from pump stations and networks	• Pump station overloaded from power loss or pump failure. • Sewerage becomes toxic.	High	• Major pump stations have back-up generator capacity and standby / duty pumps. • Proactive cleaning of pump stations by maintenance contractor to reduce risk of premature pump failure.	Installation of odour control Systems.

Table 3.3: Controls and Mitigation to Reduce Risks – Wastewater Treatment Plant

Risk Event	Causes	Priority	Major Controls	Future Improvements
Treatment plant failure – partially treated effluent escape	• Human error through incorrect operation of valves or pumps. • Mechanical failure. • Blockage (pipes.) • Overflows (screens fail).	High	• Ensure approved Operations & Maintenance manual applied, and continuously reviewed by operational staff. • Maintenance contracts/spares and backup power capability installed. • Incident response plan known and applied by operational staff including mitigation and notifications. • Maintain appropriate insurance and ensure risks appropriately communicated.	Monitor maintenance KPIs and use Business Intelligence tools to further optimise plant operation. Improve asset data and information on catchment areas and upstream flows in storm events.
Oxidation pond fails through overload from trade waste business	Excessive chemical or biological loading on wastewater pond where contaminants discharged incorrectly into wastewater stream.	High	• Household effluent disposal companies educated on correct method and location for septic tank cleanings. • Trade waste businesses regularly visited to assess their predicted contaminant loading and pre-treatment systems.	Additional analytical equipment installed on inflow equipment to continuously monitor contaminant loadings.
Oxidation pond sludge levels become excessive	Sludge levels increase over time causing short circuiting of oxidation pond leading to excessive E. coli test results.	High	• Use of biological processes (Park Link) to reduce sludge volumes in-situ before desludging. • Regular drone footage of oxidation pond to identify potential short circuiting of pond baffles.	Desludging into membrane bags suitable for potential re-use.

3.3 - Programme / Project Prioritisation of Renewals

Council's process to programme and prioritise renewals is as set out below:

Figure 3.2 - Process Flow for Programming and Prioritising of Renewals

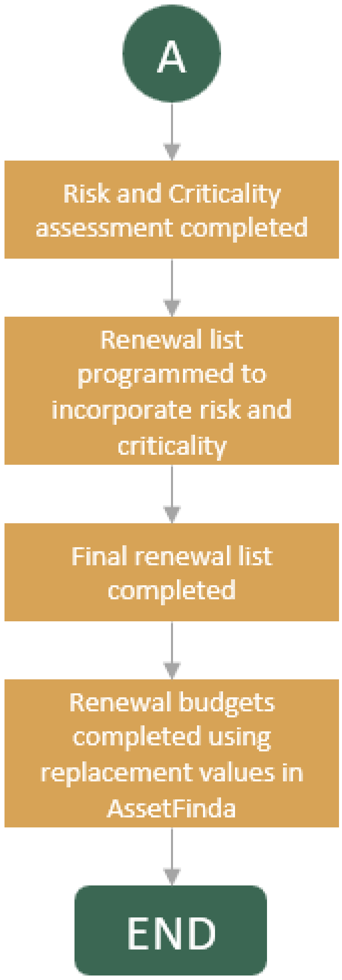


Figure 3.2 - Process Flow for Programming and Prioritising of Renewals (continued)

3.4 - Valuation Practices and Process

Valuations have been completed in accordance with the following standards:

- New Zealand International Accounting Standard No 16 (NZIAS 16).
- New Zealand Infrastructure Valuation and Depreciation Guidelines, issued by the National Asset Management Steering Group (NAMS) of Ingenium.

Process used for the valuations is as follows:

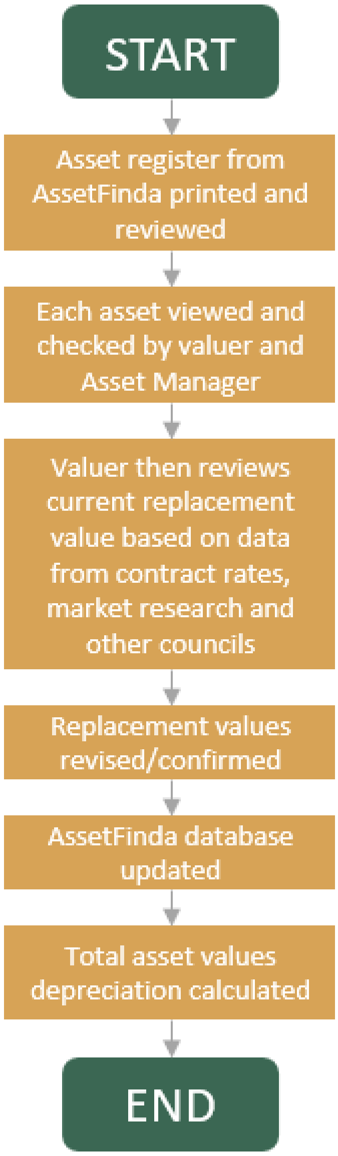


Figure 3.3 - Process Flow for Valuations

All asset records stored in the AssetFinda database are subjected to a site verification to check that the asset exists and its key attributes are correct.

Regular auditing queries are run to check data in key attribute fields to enhance data integrity, this includes size/dimension, installation date and material type and to check for unit rate and base life consistency across each asset or component type. Unit rates are determined by analysing the previous valuation and applying inflation rates, analysing current contract rates, and considering supplier cost increases over the period.

3.5 - Financial Forecasts

Financial forecasts of expenditures and revenues related to drainage activities are developed by Council staff within the NCS MagiQ financial management system.

Inputs to the forecasting process are provided by appropriately skilled Council staff, or where considered necessary, by appropriate external specialists.

The developed forecasts are scrutinised by both senior Council staff, Council's elected members and Council's auditors.

Previous evidence suggests that the forecasting process is robust, and has contributed to Council's drainage services being delivered in a cost-effective manner. See appendix 1 & 2 for OPEX and CAPEX budgets.

3.6 - Performance Measures

Key performance measures can be split into two categories:

- Financial
- Environmental

Financial measures are initially assessed by the effect that expenditure has on rates and charges to ensure budgeted expenditure is acceptable and then by measuring actual costs against budgeted costs. This is closely monitored internally on a monthly basis and by the Council's elected members on a quarterly basis.

Environmental measures are governed by the Waikato Regional Council who audit our annual compliance reports and provided levels of compliance achieved, and any actions that are required.

4.0 - Wastewater and Stormwater Services – General Information

4.1 - Nature of Activity

Council has historically provided wastewater and stormwater services to the urban communities of Ōtorohanga and Kāwhia, (stormwater only), to assist in facilitating economic development and positive public health outcomes, recognising that such public services are preferable to reliance on individual arrangements.

4.2 - Rationale for Delivery of Activity

As a Local Authority, Ōtorohanga District Council has the responsibility of ensuring the community, which it serves, is supplied with the core services that it requires in order to achieve the defined community outcomes. The reticulated wastewater system in Ōtorohanga ensures businesses and households, (especially those on low lying land) can discharge wastewater in compliance with Regional Council policies, enabling sustainable development and effective land use. Council manages the operation, maintenance, renewal, and development of wastewater assets on behalf of the community. Whereas, a large component of work of renewals and capital work is outsourced to private sector contractors and consultants, responsibility for the treatment plant and overall drainage activity is with Council staff.

4.3 - What is the Extent of the Council's Responsibility?

Issuing approvals to connect to the wastewater or stormwater network, and the controls that will apply through Bylaws and Building Consents.

- Collect wastewater on a continuous basis and using a network of laterals then trunk mains, transport this wastewater to the approved treatment facility, via a series of pump stations.
- Treatment of wastewater to standards set by the appropriate discharge consent issued by the Waikato Regional Council.
- Disposal of the treated wastewater in accordance with consents.
- Monitor compliance with consents and Council's Trade Waste Bylaws, or other relevant policies.
- Set and collect fees and rates via the Annual Plan process to ensure these activities are financially sustainable.

Council is also required to administer urban drainage maintenance under the Land Drainage Act 1908, and considers that this activity also makes a positive contribution towards the potential for beneficial development in urban areas. The provision of urban drainage protects private property, (including land and assets), from flooding and subsequent erosion, and enables Council to fulfil its statutory responsibilities under the Building Act 1991. Council owns the wastewater and stormwater systems serving the Ōtorohanga and Kāwhia communities.

Major flooding of the Ōtorohanga Community in 1958, led to construction of an extensive system of stop banks, some 4.5km long and typically 3.6m high, to protect the community from the Waipā River. These flood protection measures continue to be managed by Council, with financial support from Waikato Regional Council.

4.4 - Potentially Associated Negative Effects

Increasingly stringent wastewater resource consent or public health requirements also have potential to cause significant adverse economic impacts. The ability to demonstrate continuous improvement on discharge qualities and volumes will require more monitoring and staffing resources that will increase annual charges to users, and this has the potential for very significant future cost implications.

If not appropriately planned and managed, Council's stormwater and flood protection activities have potential for significant adverse environmental effects, in particular:

- Failure of drainage infrastructure may result in localised flooding.
- Quantities, and/or qualities, of discharged stormwater have potential to adversely affect the receiving waters. (Emphasis on the Waipā River and Kāwhia Harbour catchment areas is required).
- Increasingly stringent stormwater resource consent requirements have potential for economic impact on the community, these effects will most likely be realised at the completion of the stormwater discharge consents renewals.
- Erosion or structural damage to the stop banks could result in their failure and serious flooding.

Wastewater activities may cause negative environmental effects if increasing loading on the system and/or inadequate operation and maintenance practices compromise the effectiveness of treatment processes.

4.5 - Asset Condition

The assets associated with these activities have very little condition data assigned to them, the oldest piped drains date back to 1955. Condition ratings of these piped assets is a priority for the 2024-34 LTP with CCTV and smoke detection projects being planned.

The assets associated with these activities are generally in a sound condition. Whilst the oldest piped drains date back to 1955, random inspections have not indicated that any significant extent of the stormwater reticulation is likely to require renewal in the near future. Major upgrades to Harper Ave, Rangitahi Street and Kakamutu Road are a significant step forward in the renewal programme of the wastewater reticulation that was identified through the accelerated renewals programme from the 2021-31 LTP.

4.6 - Levels of Service

Even more so than for water supply, drainage services tend to be taken for granted and ignored by the community, unless they fail in a significant manner.

For this reason, it is generally difficult to obtain worthwhile feedback from the community in respect of desired levels of service for such assets. It has been Council experience that there is only significant ratepayer, or resident interest, in drainage services if a failure of the wastewater system generates sewerage overflows, or if a severe rainfall event results in damaging flooding of properties, and these are very infrequent events in the Ōtorohanga and Kāwhia communities.

The small number of complaints received is considered to be evidence that the levels of service provided are adequate from the customer's perspective, and Council would not be contemplating any significant changes to these levels of service, were it not for changes in the requirements of external agencies.

4.7 - Demand Trends

Although the district has been growing steadily since 2006, introduction of volumetric water charges prior to 2020 for Ōtorohanga reduced annual water consumption. Dry weather inflow volumes to wastewater volumes are proportional to treated water consumption. So whilst growth is occurring, the impact on volume through the wastewater treatment plant is relatively minor. The capacity of the treatment plant is affected by the accumulation of sludge over time, and work is on-going with a private supplier to see if this volume can be biologically reduced before desludging is required. Mechanical desludging is planned and investigation into grit removal system prior to the plant is to be investigated.

4.7.1 - Wastewater

Over the last three years there has been no real growth in new housing connections in Ōtorohanga.

Table 4.1 – Building Consents for Last Three Years

Year	Building Consents
2020 - 2021	261
2021 - 2022	253
2022 - 2023	191

In 2023 a major subdivision completed the first 2 stages of its development creating 80 new residential lots in Ōtorohanga with the last 2 stages being completed by 2025 creating a further 40 lots.

If it is assumed that each new household generates a fairly typical 1000 litres of wastewater per day, once all lots are occupied, they might create a total of circa 150 cubic metres of wastewater per day, which would represent an increase of approximately 10 -15% on current average annual wastewater volumes.

How quickly these new lots become occupied is however uncertain. Council's previous experience has been that achieving full occupancy of new subdivisions can take 10 years or more.

Also previously discussed, increasing dwelling numbers is unlikely to directly translate into similar proportional increases in demand for water and wastewater services because these are dependent on the numbers of people in those houses, and well-defined, and likely continuing trend of declining average household occupancy.

A further factor to consider is however the effect on wastewater volumes of the recent introduction of metered water charges. This has reduced the total volume of water consumed in the region of 20%, and this reduction is more than 15% forecasted growth for new houses. Assuming a similar proportionality between water and wastewater volumes (as appears reasonable) it appears that even if 120 additional occupied residential lots were to be created in the community, wastewater flows might not be any greater than at present.

For the Ōtorohanga wastewater system perhaps the greatest potential for a substantial increase in demand might come through the establishment of additional significant liquid waste producing businesses. Council would however be very wary of accepting effluent from certain large businesses because of concern regarding potential adverse effects of that additional loading on treatment processes. That being said, if there was pre-treatment at the source, the volume could be accommodated with the potency.

Considering these factors together it is believed that the most appropriate approach is to assume that overall demand for wastewater remains at its current level with a slight increase which is manageable through the existing wastewater plant capacity.

Although capacity of the plant is sustainable in the short-term, Council needs to be mindful of future expansion of the plant long term and should any additional land become available around the plant Council should look to acquire this land to secure any future expansion opportunities. This acquisition may require Council moving quickly to secure their interests.

4.7.2 - Stormwater

In the case of stormwater, the above mentioned subdivision has been designed in such a way to manage all stormwater with onsite attenuation.

With such attenuation in place, the impact on the capacity of downstream reticulation will certainly be less than the 7% increase on the stormwater system.

It should also be noted that because of the geography of Ōtorohanga – a town built on rivers and streams with broad flood plains, and surrounded by hills – there is not an abundance of suitable green-fields development sites, as such significant increases of volumetric demand on the Ōtorohanga stormwater system are not anticipated unless there is extensive intensification of residential development through infill subdivision, which currently appears unlikely. There is also the added difficulty of creating infill housing due to the location of existing services on sections large enough to do so and / or the steep nature of many such sections.

Similar comments can also be made for Kāwhia; the developable catchment area served by the existing stormwater system is relatively small, and as such, only significant intensification of development appears to have the potential to significantly increase demand on the existing stormwater system, and once again, such infill appears unlikely in the medium term. In the event of a reticulated wastewater system being built for Kāwhia, this may well trigger an associated increase in new houses being built.

Council has adopted the policy that there will be no direct connection to the stormwater network without a form of retention or detention. This is easier to manage for roof water but is not so easy for hard stand surfaces and we must remain flexible in our approach with development to enable positive outcomes without putting undue pressure on the network and cost on the individuals. This is particularly relevant in areas of the community where there is no available ground soakage.

4.8 - Drainage Services Delivery

Council has a team of five water operators as opposed to the previous practice of contracting these activities out. This in-house service has been operated in a more cost effective means than previously provided by contractors but more importantly the level of service to ratepayers has improved as a result of this.

In addition, there is greater supervision and management control over the daily tasks, responses to emergencies, flexibility, and a decrease in administration, in the absence of contract preparation and management.

External contractors are still used for large maintenance and renewals of the network as the in-house team does not have capacity to do substantial capital works.

Council has employed wastewater consultants for many years for more technical advice when needed.

4.9 - Asset Information

Information on Council's wastewater and stormwater assets has been historically held in a variety of forms including paper plans and files and a variety of electronic systems. In recent years, efforts have been made to rationalise these information sources, and good progress has been made towards establishing reliance on two main sources. These being a GIS based AssetFinda Asset Management System and an NCS MagiQ electronic document handling system.

The quality of spatial and dimensional information on sewer pipes is now considered to be good, with more than 95% of pipes accurately recorded. Data on stormwater pipes is not as reliable, and despite recent improvement efforts, it is still believed that only around 90% of the available information on stormwater pipes is correct, with some data errors in respect of pipe sizes and detailed connection arrangements.

Whilst the reduced reliability of data on the stormwater system has to date been found to have little adverse effect, it is intended to improve the quality of this information to a level comparable with that available for the water and wastewater systems. Over the next three years, it is intended to review and improve the information held in AssetFinda to confirm accuracy of the water, wastewater and stormwater assets.

Summary details of the assets comprising Council's wastewater and stormwater schemes are attached as Appendix X

4.10 - Maintenance and Renewal Strategies

Council's strategy towards wastewater and stormwater asset maintenance and renewal can be summarised as follows:

- Pump Station and Wastewater Treatment Assets

  These are subject to routine planned maintenance and inspection, and are renewed on an 'as needed' basis, typically based upon evidence of impending failure, or other observed performance deficiencies. The extent to which assets are allowed to approach failure before renewal is dependent on asset type, with failure of smaller, non-critical or easily replaced assets being considered acceptable.

  Since all pump stations have relatively small duplicate pumps, for which replacement units or parts can be easily sourced, it is not considered unacceptable for such units to work to the point of failure. However, this does not mean that maintenance is not carried out to get the most useful life out of our pumps.

  A focus to have consistency in design, make and model of pumps so Council has the ability to move pumps around the network if needed to in an emergency situation to reduce the risk on overflows during pump failures.

  Significant improvements to Te Kawa pump station and the installation of a new pump station on Harper Ave will improve resilience within the network into the future and remove demand on certain stations such as Main North Road as most of the north part of town will now feed into the new Harper Ave pump station.

- Pipe Assets

  Stormwater has not had significant renewal programmes over the last few years but there has been improvements carried out during developments. Over the next 10 years renewals will continue at a modest rate.

  CCTV and smoke inspections of wastewater reticulation will continue as part of the stormwater infiltration investigation, or where regular problems have occurred in some sections of pipeline.

- Development Sundry

  As a result of infill development, we have discovered wastewater and stormwater assets that needed early replacement or were in such poor condition a renewal was required. It was determined that Council assume part of the cost of the renewal as part of asset management and a development sundry was introduced so staff could work with developers on a fair cost sharing approach on asset renewals during the development. This budget is not always used but, in the past, has been utilised to enable positive outcomes for developers.

4.11 - Possible Reticulated Kāwhia Wastewater System

Provision of a reticulated public wastewater system to Kāwhia has been considered by Council on several occasions, initially because of deficient on-site systems that were resulting in unsanitary conditions, and more recently as a means to accommodate potential community development. Protecting the integrity of the Kāwhia Harbour from contamination is a major consideration, and of significant interest to local Iwi.

A major study of potential wastewater system options was conducted in 1995, which indicated that whilst there were no fundamental technical problems in providing an effective system, the capital and operating costs of such a system would probably be unaffordable for the small Kāwhia community.

Because a reticulated wastewater system was not considered viable, Council instead focussed its efforts on addressing the deficiencies of existing on-site wastewater systems, and during the following years most of these issues were successfully resolved, with a significant improvement of general environmental and public health conditions in the community.

In 2002 the Ministry of Health introduced its Sanitary Works Subsidy Scheme (SWSS), which offered up to a 50% subsidy towards the capital costs of constructing or upgrading public wastewater systems serving small communities. This revived interest in the potential for a wastewater system in Kāwhia, though it was still felt that such a system would not be affordable.

In 2005 the Ministry of Health announced that it would increase the maximum subsidy proportion under the SWSS to 90%, and a mandate was obtained from the Kāwhia community to conduct the investigation necessary to make progress towards an application for such funding.

An application was made for Preliminary Approval in respect of a potential Kāwhia sewerage scheme in July 2006, but a decision on the application was at that time deferred by the MoH because it considered that previously approved applications were likely to use all the available funding. Council was however subsequently advised in October 2008 that the Preliminary Approval for a sewerage scheme in Kāwhia had been granted, and that Council should now proceed with submission of an application for Provisional Approval. A significant barrier to further progress was, however, the inability to obtain approval for a site that was potentially both suitable and available for the treatment and disposal of wastewater collected from a community system. As such the preliminary approval for subsidy lapsed.

In 2017 a much more limited proposal was made, to establish a reticulated wastewater system that would just serve those properties on or in the vicinity of Jervois Street that were experiencing significant challenges in operating on-site wastewater systems because of the prevailing high groundwater levels. This proposal was however reliant on the relevant property owners being willing to make financial contributions towards the construction and operation of such a system, and finding a suitable area for the disposal of treated effluent.

Ultimately neither of these requirements could be satisfied, and hence, this proposal also did not proceed any further.

Discussions with the community in respect of the latter proposal did, however, indicate a desire for exploration of a possible in-principal agreement with Tainui Kāwhia Incorporation (TKI) for an area within the TKI forest to be potentially made available for disposal of suitable treated effluent from a whole-of- Kāwhia wastewater system, should such an option be pursued in the future. At this time this has not been further pursued.

Council was fortunate to receive government funding in 2020 to commission a concept design for a wastewater system for Kāwhia. The design was carried out by BPO and informed a proposed project for the 2021-31 LTP.

Consultation during the 2021-31 LTP did not show overwhelming support for a wastewater system and it was decided to defer any plans to install a wastewater system until Council conducted further investigations into the need.

A programme of inspecting a sample of existing septic tanks in Kāwhia was carried out by Ormiston; results of the inspections reveal that the sample sites were of mixed condition and replacement systems are very limited.

The second phase of the investigation was a series of stormwater sampling carried out over a 12-month period by BPO, this was done to see if there was a link between septic tank effluent infiltrating the stormwater and subsequently entering the Kāwhia harbour. The results of the sampling did show elevated E. coli but was consistent with any urban runoff and the large farming catchment upstream of the stormwater network. That being said, there were some private outlets that showed elevated results that required further investigation.

To complete the testing several ground water boreholes were placed around Kāwhia to sample and test ground water, these samples have not shown anything remarkable at this time as there is very little data to show any trends. This sampling is continuing and is part of our stormwater testing programme.

Reticulated wastewater is still considered the most appropriate way forward for Kāwhia but cannot proceed until substantial external funding is available, although we have a concept design on the treatment plant and the reticulation the effluent disposal is still a barrier to a system moving forward. There are no plans to pursue this anymore currently.

4.12 - Trade Waste

Discharges to sewer of fats, solids or other possible blockage-inducing or polluting substances are regulated through Council's Trade Waste Bylaw, which is closely based on the NZS 9201 model for Bylaws of this type. Approximately 50 properties in the community, that have potential to discharge relatively small amounts of such materials, are currently required to hold 'Controlled' Trade Waste Consents, that permit the occupant to discharge to the sewer subject to satisfying stipulated conditions for contaminant interception and other effluent management criteria.

Premises or activities that discharge larger quantities of non-domestic effluent to sewer are required to hold a 'Conditional' Trade Waste Consent, which requires the consent holder to pay Council for the cost of treating this effluent on a pro-rata basis, based upon the quantity and the quality of the effluent. Only three such consents have been issued at this time, all of which relate to commercial waste disposal activities.

There are currently two septage disposal companies disposing into the Ōtorohanga network which services the Ōtorohanga rural district primarily.

4.13 Future Capital Works

4.13.1 Wastewater 10 Year Programme

Project	Primary Driver	Year/s	Cost $M	Financial Data Confidence	Description and objectives of the project	Benefits/ Justification of the project	Project Stage
Renewals	End of service life	2-10	$2.5	Staff cost estimate	Main renewals	Network Resilience	Execution
Replacement of Te Kawa St Rising Main	End of service life	1	$0.5	Staff cost estimate	Pipe renewals	Network Resilience	Execution
Development Sundry Wastewater	Growth	1-10	$0.5	Estimate	Enable growth projects	Improvements that at trigger through development	Execution
Sundry Renewals	End of service life/condition	1-10	$0.3	Estimate	General budget for renewal	Effective Infrastructure and Service Delivery	Execution
Ōtorohanga WWTP Grit Separation/clarification	LOS	1-2	$0.44	Engineer's estimate	Improve influent/effluent quality	Effective Infrastructure and Service Delivery	Initiation & Execution
Pump Renewals	End of service life/condition	2-10	$0.02	Staff cost estimate	Pump renewals for pump stations	Effective Infrastructure and Service Delivery	Execution
Spare Pump for Main North Road pump station	LOS	1	$0.05	Engineer's Estimate	Improve Infrastructure resilience	Network Resilience	Execution
WWTP pond desludging	LOS	1 & 4 & 7	$0.46	Staff cost estimate	Improve influent/effluent quality	Effective Infrastructure and Service Delivery	Execution
Smoke Testing	LOS	1	$0.02	Staff cost estimate	Condition rating of network	Network Resilience	Initiation & Execution
Renewals	End of service life	1-10	$0.07	Staff cost estimate	Renewal of point assets – valves manholes etc	Network Resilience	Execution
Renewals	End of service life	3-10	$0.16	Staff cost estimate	Renewal of plant assets	Network Resilience	Execution
H&S Improvements	LOS	1-10	$0.05	Staff cost estimate	General H&S improvements	Effective Infrastructure Service Delivery	Initiation & Execution
MEICA Renewals	End of service life	1-10	$0.985	Staff cost estimate	Mechanical, Electrical, Instrumentation, Controls & Automation	Effective Infrastructure and Service Delivery	Execution

4.13.2 Stormwater 10 Year Programme

Project	Primary Driver	Year/s	Cost $M	Financial Data Confidence	Description and objectives of the project	Benefits/ Justification of the project	Project Stage
Condition Assessments	LOS	4	$0.1	Staff cost estimate	Complete condition assessment on SW networks	Establish understanding on condition of SW network for targeted renewal programmes and modelling	Initiation
Catchment improvements – Ōtorohanga & Kāwhia	LOS	1-2	$0.04	Staff Cost Estimate	Improvements from Resource Consent improvements for Ōtorohanga and Kāwhia	Conditions that are advised by Regional Council from consent renewals	Initiation & Execution
Kakamutu Rd & Domain Dr Stormwater Investigation	LOS	1-2	$0.13	Staff Cost Estimate	Investigation and build for stormwater improvements on Kakamutu Rd & Domain Dr	Effective Infrastructure and Service Delivery	Initiation & Execution
Development Sundry	Growth	1-10	$0.37	Estimate	Enable growth projects	Improvements that at trigger through development	Execution
Sundry Renewals	End of service life/condition	1-10	$0.65	Staff Cost Estimate	General budget for renewal for Ōtorohanga and Kāwhia SW & Flood Protection	Effective Infrastructure and Service Delivery	Execution
Renewals – Ōtorohanga & Kāwhia	End of service life	1-10	$1	Staff cost estimate	Renewals on SW pipes in Kāwhia and Ōtorohanga	Effective Infrastructure and Service Delivery	Execution
Flood Protection Plant Renewals	End of service life	1	$0.02	Staff cost estimate	Flood protection plant renewals - pumps	Effective Infrastructure and Service Delivery	Execution
Otewa Road Wetland Project	LOS	1-4	$0.025	Staff cost estimate	Wetland project	Effective Infrastructure and Service Delivery	Initiation & Execution
MEICA Renewals	End of service life	1-10	$0.3	Staff cost estimate	Mechanical, Electrical, Instrumentation, Controls & Automation	Effective Infrastructure and Service Delivery	Execution

5.0 - Ōtorohanga Wastewater System

5.1 - Description

The Ōtorohanga wastewater (sewerage) system, in general, serves only the defined Ōtorohanga Community area:

Figure 5.1: Ōtorohanga Wastewater System Map

An outline technical description of the scheme is presented in the table below:

Table 5.1: Ōtorohanga Wastewater System – Technical Description

Date Commissioned	1930's onwards; much of reticulation from 1955 onwards, oxidation pond in 1975 and wetlands 2000.
Collection System	32km of gravity sewers with 14 pump stations. Pumped discharge to treatment facilities north of Ōtorohanga.
Properties Connected	Circa 1270, including approximately 99% of properties within the defined Ōtorohanga Community.
Significant Connected Properties	4 schools, 2 marae, rest-home, Medical Centre, multiple trade waste companies.
Significant Abnormal Discharges Received	3 truck washes, 2 septic tank contractors. Abnormal discharges regulated by Council's Trade Waste Bylaw, which sets discharge quantity and quality limits, and imposes fees for discharge.
Population Served	Assessed 3027 (2018 Census).
Waste Water Quantities	Annual Average – circa 1,100m^3/day. Peak dry weather flow 1,810m^3/day. Peak wet weather flow 2,880m^3/day.
Treatment Process Summary	Coarse solids screening, 3.6Ha aerated oxidation pond, 2Ha coagulation ponds and polishing wetland.
Treatment Plant Design Capacity	Population of 4,500
Treated Effluent Discharge	To Mangaorongo Stream (Waipā River tributary).
Relevant Resource Consents	See below table.

Table 5.2: Ōtorohanga Wastewater Treatment Plant - Resource Consents

Resource Consent	Description	Commenced	Expiry
AUTH143381.02.01	To discharge dewatered biosolids to land.	30/10/21	30/11/2037
AUTH143381.01.01	To discharge contaminants to air associated with the discharge of dewatered biosolids to land	30/10/21	30/11/2037
AUTH123567.01.01	To discharge of contaminants to air, including odour from activities associated with the Ōtorohanga Wastewater Treatment Plant and discharge scheme.	5/12/2012	30/10/2037
AUTH123568.01.01	To discharge treated wastewater (via seepage), to land and groundwater, from activities associated with the Ōtorohanga Wastewater Treatment Plant oxidation pond and wetlands.	5/12/2012	30/10/2037
AUTH123569.01.01	To discharge up to 5,000m3 per day of treated wastewater into the Mangaorongo Stream from the Ōtorohanga Wastewater Treatment Plant.	5/12/2012	30/10/2037

5.2 - System Condition

The condition of the Ōtorohanga wastewater system is considered to be good. The 2021-31 LTP approved an accelerated 3 waters renewal programme and a significant wastewater upgrade for Ōtorohanga. This work is still ongoing but involves a new pump station in Harper Ave, a new pump station and trunk main in Rangitahi Street, and the replacement of the Kakamutu Road to Phillips Ave sewer main.

Closed Circuit Television (CCTV) inspection of sewers has been conducted on an ad hoc basis for some years and mainly because of blockages or issues that have arisen at the time of failure. We have a considerable amount of footage, but it has not been collated or analysed on a network level to see where the gaps are. We will continue to carry out condition assessments but must determine the gaps first so there is a targeted approach to any further investment in CCTV. A programme has been put in place, starting in the 2024/25 financial year.

Condition rating the entire Ōtorohanga sewer system and identify where the most urgent repairs are to take place is a large project and our approach is to have a modest programme of renewals for mains reaching end of life and prioritizing them based on known condition, service requests and staff knowledge.

Projected renewal costs for sewer pipe and equipment assets over the next 30 years based on asset inventory data are shown in the following figure:

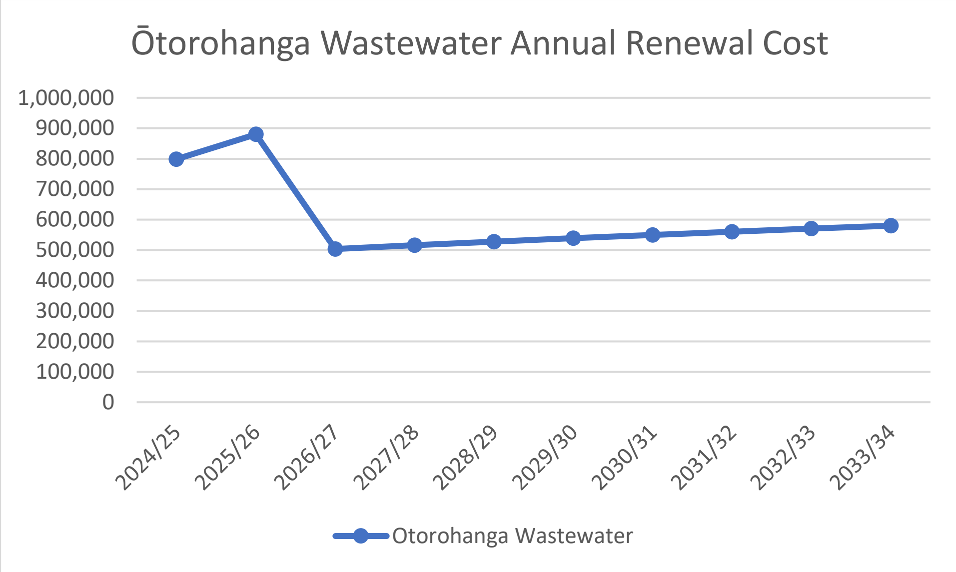


Figure 5.2 – Ōtorohanga Wastewater Annual Renewal Cost Trend

5.3 - System Performance

Target levels of service for the Ōtorohanga wastewater system are presented in section 4.6. The performance of wastewater reticulation in Ōtorohanga is good, with failures or blockages of main sewers being moderate. All significant wastewater pump stations are monitored by telemetry and have back-up pumps, and hence, pump failures normally have little impact on performance. Sewerage overflows are rare, (typically one event per year), and are of limited volume and generally result from very abnormal circumstances such as severe floods, electrical supply failures or damage from careless contractors.

In most cases, the negative environmental effects of overflows (being flood related), are limited because they occur into swollen and highly turbid watercourses, where the effective level of dilution is so high as to make the discharge almost undetectable.

Discharges to sewer of fats, solids or other possible blockage-inducing or polluting substances are regulated through Council's Trade Waste Bylaw, which is closely based on the NZS 9201 model for Bylaws of this type.

Approximately 50 properties in the community that have potential to discharge relatively small amounts of such materials are currently required to hold 'Controlled' Trade Waste Consents, that permit the occupant to discharge to the sewer subject to satisfying stipulated conditions for contaminant interception and other effluent management criteria. Such premises pay a small fixed annual consent fee, to cover the cost of regular inspections by Council.

Premises or activities that discharge larger quantities of non-domestic effluent to sewer are required to hold a 'Conditional' Trade Waste Consent, which requires the consent holder to pay Council for the cost of treating this effluent on a pro-rata basis, based upon the quantity and the quality of the effluent. Only five such consents have been issued at this time, all of which relate to commercial waste disposal activities.

Like many communities, Ōtorohanga does experience significant stormwater infiltration into sewers during heavy rainfall. This is believed to be due to a combination of reticulation leakages, low gully traps and other unauthorised direct discharges of stormwater to sewer.

The extent of this infiltration is within the normal range for urban communities, and since the capacity of the oxidation pond was increased in 2012, there have not been any incidents where pond levels have risen to such an extent that emergency discharges from the pond, (without normal passage through the polishing wetland), have been required.

Wipes disposed of into the sewer network continue to cause nuisance and increases the cost of operating the network with pumps having to be lifted and unblocked more than necessary. The Main North Road pumps have had considerable blockages over the last 18 months, and it has been decided to purchase a spare pump for resilience as the pumps are not readily available in NZ.

Significant upgrading of the wastewater treatment process was required to obtain the relevant resource consents in 2012.

Improvements to the oxidation pond have included installation of flow preventing curtains to prevent effluent short-circuiting, and commissioning of a pumped aeration system.

The wetlands, which were established in 1999/2000, have proved to be more difficult and costly to maintain than was initially envisaged. Sludge accumulates in the surface flow cells, and these have to be periodically cleaned out and replanted, at significant cost.

The existing resource consent for the discharge of treated sewerage to water expired in 2012, the new consent obtained expires on 30 October 2037. To meet the initial increased discharge consent limits work completed at that time included the relocation and upgrade of the ponds inlet, installation of curtains to direct flow through the ponds, increasing the height on the embankment and renew of the wave band, de-sludging the pond and some minor improvements to the wetlands.

As the resource consent conditions became more stringent with effect from 1 December 2017, work to meet these tighter controls was undertaken. The work done to enable compliance is the renewal and resizing of the air blower feeding the bottom fed aeration system in the oxidation pond, repurposing the wet cells (reed beds) into settling / maturing ponds to facilitate the removal of phosphorus along with the introduction of a coagulant and flocculent into the treated effluent leaving the oxidation pond. Advanced Microbial Digestion (AMD) has been added to the oxidation pond, the purpose of which is to digest the organic elements of the sludge and hence control the amount of sludge build up in the pond and reduce the need for more regular mechanical sludge removal.

Some non-compliance with resource consent conditions have occurred whilst these improvements have been underway, and it is clear that the treatment plant needs to be fully functioning, if consistent compliance with resource consent conditions is to be achieved.

The pond is currently awaiting removal of sludge, (proposed to be undertaken in this 2024-34 LTP), and the associated treatment performance of the system appears to have been adversely impacted, with non-compliances in respect of suspended solids, total nitrogen and phosphorus.

The following significant improvements are planned during the next 10 years:

- Reticulation renewals
- Grit Separation system – upstream of the inlet
- Clarifier and dewatering system to replace the coagulation ponds

5.4 - Risk Assessment

A formal risk assessment exercise has not been carried out in respect of the Ōtorohanga wastewater system, but the level of risk associated is considered to be relatively low.

Potential risk events with significant consequences are listed in the table below:

Table 5.3: Ōtorohanga Wastewater System – Potential Risks

Risk Item	**Potential Contingency Measures**	**Potential Risk Reduction Measures**
Main North Road Pump Station – failure of electrical supply.	Back-up generator ready.	Generator stored at Water treatment plant
Te Kawa Street Pump Station – failure of electrical supply.	Back-up generator Septage trucks	Generator stored at Water treatment plant

Failure of Rising Main ex-Te Kawa Street Pump Station.	Rising Main due for replacement Septage trucks Overland pump lines	Overland pump lines
Failure of Rising Main ex-Main North Road Pump Station.	Controlled overflow to stormwater via manholes. Septage trucks	Replacement when due.

The area served by the wastewater system is relatively small, and as such wastewater flows are generally low. Because of this, failures of most pipes or pumps can normally be remedied without significant disruption to service, either by making use of storage capacity in pipes and pump wells, or pumping out to septic tank trucks.

The only elements of the system where wastewater flows are normally too large to be managed in this way, are the main pump station on Main North Road, and (to a lesser extent), the pump station on Te Kawa Street.

The pressure on the Main North Road pump station has been alleviated by the introduction of one new pump station on Harpers Ave and redirecting some wastewater in different directions. This work has substantially reduced the risk of overflows of sewerage.

Council has installed the necessary electrical reticulation to the Main North Road and Te Kawa Street pump stations, to enable a generator to be quickly attached as a back-up supply in the event of a power failure. The use of trucks for sewerage removal is also considered a short term option.

It is, however, also recognised that in the event of such a failure there may be a significant delay before a generator of sufficient capacity can be obtained to power these installations. Council purchased a large capacity generator in the 202/21 financial year to mitigate this risk.

5.5 - Levels of Service and Public Perception

Current level of service targets and associated measurement procedures are set out in the table below:

Table 5.4: Ōtorohanga Wastewater System – Current Level of Service Targets

Level of service	How we measure success	Results for 2022/23	Targets			
			2024/25	2025/26	2026/27	2027-34
Safe, reliable wastewater treatment and disposal system which minimises	Number of dry weather sewerage overflows from the Ōtorohanga sewerage system, per 1000 connections (M)[1].	3 Overflows	0 Overflows	0 Overflows	0 Overflows	0 Overflows

[1] (M) Full wording: The number of dry weather sewerage overflows from the territorial authority's sewerage system expressed per 1000 sewerage connections to that sewerage system.

public health risks and environmental impact.	Compliance with consents for discharge from the Ōtorohanga sewerage system (M)[2]: • Abatement Notices • Infringement Notices • Enforcement Orders • Convictions	0 Non-compliance actions	0 Non-compliance actions	0 Non-compliance actions	0 Non-compliance actions	0 Non-compliance actions
	Median response time for sewerage overflow callouts due to a blockage or other fault in the Ōtorohanga sewerage system (M)[3]. Time from notification until: • Service personnel arrive on site • Confirmation of resolution of the blockage or fault.	54 minutes 1 hour 24 mins	< 50 Mins < 24 Hrs	< 50 Mins < 24 Hrs	< 50 Mins < 24 Hrs	< 50 Mins < 24 Hrs
	Number of complaints[4], per 1000 sewage connections, about (M)[5]: • Odour • System faults • Blockages.	29 complaints	<15 Complaints	<10 Complaints	<10 Complaints	<10 Complaints

2 (M) Full wording: Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of: (a) abatement notices, (b) infringement notices, (c) enforcement orders, (d) convictions received by the territorial authority in relation to those resource consents.

3 (M) Full wording: Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured: (a) Attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site, (b) Resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.

4 As recorded in the request for service system.

5 (M) Full wording: The total number of complaints received by the territorial authority about any of the following (expressed per 1000 connections to the territorial authority's sewerage system): Sewerage odour, sewerage system faults, sewerage system blockages, territorial authority's response to issues with its sewerage system.

In general, the performance of wastewater reticulation in the Ōtorohanga community is considered to be good, and performance against the second indicator above is generally well inside the target. It is believed that public perception of the service is generally positive.

Performance against the first indicator being resource consents to the year ending 30 June 2023 is as follows:

Table 5.5: Ōtorohanga Wastewater System – Resource Consents Reporting

Authorisation	Activity Authorised	Compliance Status
AUTH143381.02.01	To discharge dewatered biosolids to land.	Full compliance
AUTH143381.01.01	To discharge contaminants to air associated with the discharge of dewatered biosolids to land	Full compliance
AUTH123567.01.01	To discharge of contaminants to air, including odour from activities associated with the Ōtorohanga Wastewater Treatment Plant and discharge scheme.	Full compliance
AUTH123568.01.01	To discharge treated wastewater (via seepage) to land and groundwater from activities associated with the Ōtorohanga Wastewater Treatment Plant oxidation pond and settling ponds.	High level of compliance
AUTH123569.01.01	To discharge up to 5,000m3 per day of treated wastewater into the Mangaorongo Stream from the Ōtorohanga Wastewater Treatment Plant.	Partial compliance

The following actions were directed and have been/are being addressed:

Table 5.6: Ōtorohanga Wastewater System – Action Required

Authorisation	Condition Number	Action Required
AUTH123567.01.01	6	Please ensure the odour management plan is reviewed and updated every two years.
AUTH123569.01.01	5	2) Results = SS median 65g/m3 NON-COMPLIANT 6) Result = TP Average summer load 4.6kg/day NON-COMPLIANT 8) Result = E. coli median summer 2419 cfu/100ml NON-COMPLIANT 9) Result = E. coli summer 90%ile 2419 cfu/100ml NON-COMPLIANT Please provide an update on the status of the automated coagulant doing implementation and efficacy by 31 October 2020.
AUTH123569.01.01	17	Please review the Operation & Management Plan following confirmation of coagulant dosing and AMD dosing management; due 30 September 2021.

5.6 - Future Demand

As stated in section 4.7, potential increased volumes of wastewater generated by new residential development are likely to be fully offset by community-wide reductions in residential wastewater associated with declining average household occupancy and the universal metered water charges.

It is, however, important to note that whilst overall wastewater volumes may not increase, (or may even decrease), if the population of the community rises there will be an increase in the biochemical loading on the treatment plant, because there will be a greater mass of organic waste, perhaps assumed to be increasing at a rate of between 0.5% and 1% per annum for the next 10 years.

Other than, in respect of a slightly increased concentration associated with reduced water consumption, the composition of wastewater is expected to remain relatively unchanged, being largely that of a normal residential nature. No new industrial activities with potential to substantially change the composition of the community wastewater, (e.g. meat works), are currently expected.

5.7 - Ability to Accommodate Demand Changes

Council commissioned and has access to a wastewater model of the Ōtorohanga network. The model continues to be developed as assets change and is owned and managed by Jeff Booth Consulting. We can supply information about changes, and they are inputted into the model to give information of any potential issues. The model has been used several times and has been of benefit to some of our renewals but is still lacking some network data to improve accuracy.

The existing wastewater collection system is considered adequate to meet all current needs of the community. The review of the treatment system undertaken as part of the resource consent renewal process in 2012 was based upon an objective that the system should be able to service a population higher than at present. It is, therefore, believed that the existing system in its current form should, if effectively maintained, (including regular de-sludging of the oxidation pond and settling ponds), be fully able to manage the increase of demand outlined in the previous section.

Current estimates with the changes to the treatment processes, the treatment plant will have capacity for a 50% increase in volume, when the continued work on reticulation renewals and the prevention of stormwater infiltration are factored in.

At this stage, however, such a larger increase in demand is not expected, but the potential to do so builds confidence that the envisaged demand can be accommodated, even if at greater levels than currently expected.

Long term considerations have identified that increased land adjacent to the plant is needed to futureproof the plant's increased capacity and to provide area for sludge disposal which will reduce disposal costs and mitigate possible resource consent conditions.

5.8 - Alternate Service Options

The reticulated wastewater service provided to the Ōtorohanga community is generally functioning well and is considered sustainable. There is, therefore, no apparent reason to change the form of this service.

The capacity of existing trunk sewerage reticulation such as rising mains is relatively high, and these would not be expected to constrain growth in the short or medium term. As such it is believed that the existing Ōtorohanga wastewater system should be able to accommodate more than 10 years' growth at current forecast rates.

Local Iwi have previously expressed preferences for land-based disposal of wastewater effluent, however availability of suitable land and the costs associated with establishing such a system is likely to preclude this. This was discussed with Iwi as part of the investigation and consultation process for the resource consent renewal, and it was agreed that the present system with a modified ground contact through the subsurface flow wetlands, would be accepted for the new consent.

6.0 - Ōtorohanga Stormwater System

6.1 - Description

The Ōtorohanga stormwater system, in general, serves only the defined Ōtorohanga Community area and includes the flood protection system. An outlined technical description of the scheme is presented in the table below. Land drainage outside of the urban communities is managed by Waikato Regional Council.

Table 6.1: Ōtorohanga Stormwater System – Technical Description

Commissioning	1950's onwards; Stopbanks, pump stations and majority of reticulation commissioned in 1960's following severe flooding by the Waipa River in 1958.
Collection System	20.1km of pipes, and 3.2km of open drains, draining by gravity to Waipa River unless river high when discharge is pumped through stopbanks at three locations.
Catchments	4 main catchments with total area of 166Ha containing population of approximately 2,000.
Total Stormwater Discharge Flows (estimated)	Typical wet weather – 1m^3/s (<3% of Waipa River Q5 flow). Maximum - 3m^3/s (<10% of Waipa River Q5 flow).
Stormwater Composition	Typical urban stormwater – variable but significant concentrations of coli forms, nitrogen, phosphorus. Minor concentrations of heavy metals. No evidence of severe contamination from specific sources.
Asset Condition	The condition of stormwater pipes and pumping facilities is fair to good. Open drains are functional, but maintenance, (in particular weed control), needs to be ongoing. Flood Protection Assets are in good condition, pumps/pipes
Relevant Resource Consents	AUTH144930.01.01 - Divert and discharge stormwater onto and into land in circumstances where it may enter groundwater, and to surface water (including within, or within a 100m setback from, a natural wetland), from the Otorohanga District Council stormwater network within the Otorohanga urban area. – Expiry July 2023 (under renewal)

An inventory of the assets that comprise the Ōtorohanga stormwater and flood protection system is presented in Appendix X. For accounting and administrative purposes, the system of drains within the stopbanks, (excluding the pump stations), is considered to be the 'stormwater system' and is treated separately from the 'flood protection system' which comprises the pump stations, stopbanks and associated lands.

This distinction is required since Waikato Regional Council has assumed financial responsibility for the 'flood protection system' as part of their role to manage rivers within the region, and reimburses Council for the costs of works required to operate and maintain these assets. The assets are owned by Ōtorohanga District Council.

6.2 - Management

Management of the Ōtorohanga Stormwater system is conducted in accordance with Council's Ōtorohanga Community Stormwater Management Plan 2018, which is attached as Appendix 3. This document provides additional technical information on relevant assets, objectives and policies.

6.3 - System Condition

The condition of assets that comprise the Ōtorohanga stormwater and flood protection systems is generally considered to be sound.

Most of these assets are concrete pipes, which are now believed to have expected lives of 100 years, and as such are still in the middle of those lives, with no evidence of accelerated deterioration.

Investigation into stormwater overload in the Kakamutu Road, Domain Drive will be carried out in 2024-25 to see why the area is overflowing. This could result in some renewals in this area which will occur in 2025-26. A joint funded project with NKC Developments on Main North Road will see the installation of a new stormwater line to service Main North Road properties above stage 3 of the subdivision. As well as these minor projects a basic renewal programme of $1 million has been put in place for the next 10 years.

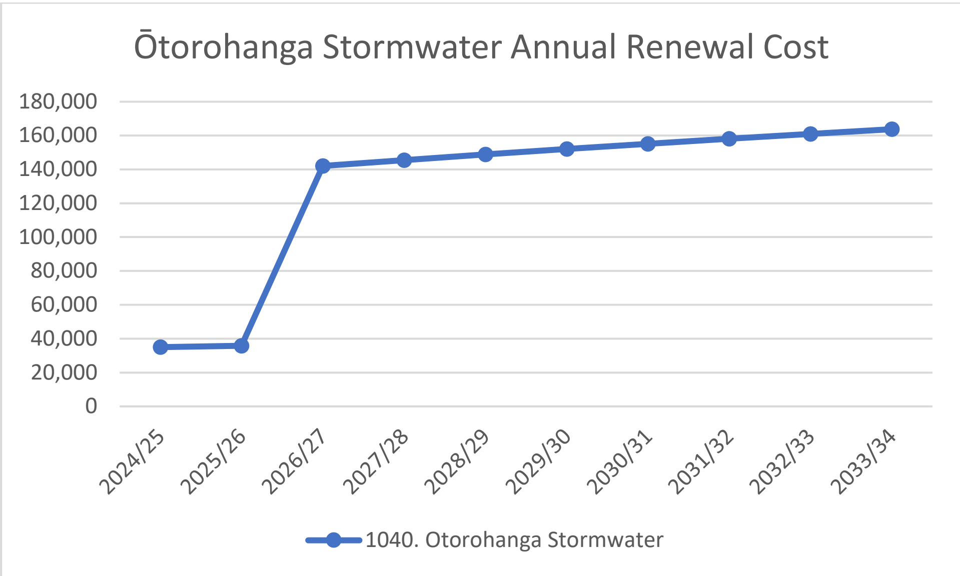


Figure 6.1 – Ōtorohanga Stormwater Annual Renewal Cost

6.4 - System Performance

The performance of the stormwater system serving Ōtorohanga is generally good, with pipe failures or blockages being very rare.

Reticulation is, in general, adequately sized to accommodate flows up to the levels corresponding with flood events of critical duration with return periods up to 10 years, which is the general design parameter currently employed. Localised flooding on roads in the community is typically due to blockages of catchpits, rather than inadequate pipe capacity, although extreme rainfall events do result in surface flooding that generally recedes in a short time.

A significant property-flooding incident occurred in Ōtorohanga during February 2004 when water from the Waipā River inundated several houses and a school, but the area affected was outside of the community stopbanks, and as such, was not served by the defined Ōtorohanga stormwater system. Subsequent consideration of associated issues by Council and Waikato Regional Council has indicated that there is not a simple and affordable means to prevent such flooding in this area, and this, combined with the reluctance of the Ministry of Education to contribute to funding of flood protection works, has left this issue unresolved.

Other than this, stormwater drainage problems have generally been small and localised. Recurring instances of overloading of stormwater drains in the central business area during high intensity rain have been countered by recent development of a new drain, which takes water under the main trunk railway to discharge into the Huiputea drain. This has remedied some of the existing problems, and is expected to have further beneficial effects in future, as more flow from the existing reticulation is directed into this new drain.

In 2010, a new enlarged pipeline was laid under Main North Road from near the main sewer pump station and through the properties off Factory Drive. This gave increased capacity and safety margin for the properties north of the Main Road and for potential future property development in this area. This pipe was subsequently upgraded again in 2019 to accommodate the development of a large factory on Factory Drive.

Discharge of stormwater from Ōtorohanga is subject to conditions contained in a Resource Consent issued by Waikato Regional Council for this activity, and there is no recent history of significant non-compliance with the conditions of the consent, this consent is currently being renewed and is on hold at WRC

6.5 - Levels of Service and Public Perception

As stated in section 4.6, it is difficult to reliably assess the public's perception of stormwater services because their interest in the activity only generally arises when the service fails.

It is difficult to pose readily understandable, yet meaningful questions to the community about preferred levels of service for this activity, and for this reason questions on stormwater were not included in the 2022 and 2023 district wide level of service surveys.

There is, however, very strong public concern at those times when the Waipā River is in severe flood, or stormwater is otherwise retained for extended periods in the ponding areas behind the flood pump stations, presumably because many residents are still mindful of the damage caused to Ōtorohanga by the 1958 flood, although this is now 66 years ago.

It is, therefore, considered important that Council staff are mindful of such concerns, and take appropriate actions to address and allay them.

The aforementioned issues also make it less easy to establish locally relevant level of service measures and targets, and for this reason, the only measures adopted for both Ōtorohanga and Kāwhia, (and which serve as both customer and technical level of service targets), are the mandatory performance measures included in Council's Long Term Plan.

6.6 - Risk Assessment

There are clearly potentially severe consequences if there is a failure of either, the stopbanks or flood pump stations, at critical times. The risks associated with such failures were highlighted in 2003 and 2004, when significant failures of mechanical equipment in flood pump stations were found to have gone undetected. It is believed that the probability of such critical failures can be reduced to a very low level through effective maintenance of these facilities, and Council has subsequently modified operating practices to achieve this and invested heavily in pipe renewals and pump refurbishment over the last 5 years. This programme will continue into the next LTP.

A detailed flood management plan has also been developed to help protect the community from harm in the event of an extremely severe rainfall event that presents a risk of the community being flooded from the Waipā River, or its tributaries.

At a lower level of risk, there are a few small areas in the community where the existing reticulation does not meet the general requirement of being able to accommodate 20 year return period flows, and/or the blockage of particular pipes has potential to create problems that could not be easily addressed in flooding situations. Such issues are being progressively addressed through upgrading or extension of existing networks.

These localised drainage problems generally have potential to create relatively minor nuisance rather than serious flooding.

The level of risk in respect of public health is considered to be very low. The majority of stormwater drains are piped, and the open drains that exist are generally shallow, fast flowing and not considered likely to be a source of disease or a cause of serious accident. There have been no known instances of disease or accident being related to these drains in the last 15 years.

Table 6.2: Joint Customer and Level of Service Measures and Targets for Stormwater (Ōtorohanga and Kāwhia)

Level of service	How we measure success	Results for 2022/23	Targets			
			2024/25	2025/26	2026/27	2027-34
Provision of a safe and reliable stormwater system which minimises flooding and environmental impact.	Number of flooding events in the district and, for each flooding event, the number of habitable floors affected per 1000 properties connected (M)[6].	Achieved	0 Flooding events	0 Flooding events	0 Flooding events	0 Flooding events
	Compliance with consents for discharge from the stormwater system (M)[7]: • Abatement Notices • Infringement Notices • Enforcement Orders • Convictions	Achieved	0 Non-compliance actions	0 Non-compliance actions	0 Non-compliance actions	0 Non-compliance actions
	Median response time[8] to attend to a flooding event (M)[9].	N/a – no flooding events	< 4 hours 30 minutes	< 4 hours 30 minutes	< 4 hours 30 minutes	< 4 hours 30 minutes
	Number of complaints received, per 1000 properties connected, about the performance of the stormwater system (M)[10].	Achieved	≤ 2 Complaints	≤ 2 Complaints	≤ 2 Complaints	≤ 2 Complaints

6 (M) Full wording: (a) The number of flooding events that occur in a territorial authority district. (b) For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.)

7 (M) Full wording: Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of: (a) abatement notices, (b) infringement notices, (c) enforcement orders, (d) convictions received by the territorial authority in relation to those resource consents.

8 Measured from the time of notification until service personnel arrive on site.

9 (M) Full wording: The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.

10 As recorded in the request for service system

The potential for discharge of harmful substances to the stormwater from commercial or industrial premises, is also monitored and controlled through inspections that take place in relation to Council's Trade Waste Bylaw. Whilst this Bylaw focuses on discharges to the sewer system, the associated property inspections also provide an opportunity to identify and address stormwater contamination risks.

In recent times there has been oily substances discharging into Lake Huiputea and although staff carried out a thorough investigation this was never identified. There has not been any further occurrences in the last 12 months and it is believed that this was isolated. A media campaign to remind people of where stormwater goes may have helped.

6.7 - Future Demand

As discussed in section 4.7, it is currently considered unlikely that there will be further significant increases of demand for stormwater services within the existing catchment areas in the near future. However Ōtorohanga is now experiencing growth and will require careful management from Council to make sure that any development is designed to minimise any increases in demand on infrastructure through onsite attenuation and retention systems. With such controls in place, it is believed that stormwater flows through existing trunk reticulation are unlikely to increase by more than 7% over the next 10 years.

6.8 - Ability to Accommodate Demand Change

The existing stormwater reticulation and associated infrastructure is, with some local minor upgrades and extension, considered adequate to accommodate any likely changes in demand for at least 10 years.

6.9 - Alternate Service Options

No alternative service options have been identified.

7.0 - Kawhia Stormwater System

7.1 - Description

The Kāwhia stormwater system in general serves only the defined Kāwhia Community area. An outline technical description of the scheme is presented in the table below:

Table 7.1: Kāwhia Stormwater System – Technical Description

Commissioning	Initial construction in 1970’s, extensive piping of open drains in 1999/2000.
Collection System	3.4km of pipes and 3.4km of open drains, draining by gravity to the Kāwhia Harbour, with one small pump station in low-lying area.
Catchments	5 main catchments with total area of 150Ha containing permanently population of approximately 384.
Total Stormwater Discharge Flows (estimated)	Typical wet weather 0.6m^3/s. Maximum 2.8m^3/s.
Stormwater Composition	Typical urban stormwater – variable but significant concentrations of coliforms, nitrogen, phosphorus. Low concentrations of heavy metals. No evidence of severe contamination from specific sources.
Asset Condition	The condition of stormwater pipes is considered very good. Open drains are sound, though improved maintenance, (including weed control), would be beneficial.
Relevant Resource Consents	AUTH105631 - Divert and discharge urban stormwater runoff and associated contaminants at multiple locations to local streams, the Kāwhia Harbour and land, and use discharge structure, within the vicinity of Kāwhia urban area that is reticulated by the Kāwhia municipal stormwater system. – Expiry July 2023, Currently being renewed.

7.2 - Management

Management of the Kāwhia Stormwater system is conducted in accordance with Council’s Kāwhia Stormwater Management Plan 2023, which is attached as Appendix 4. This document provides additional technical information on relevant assets, objectives and policies.

7.3 - System Condition

The condition of assets that comprise the Kāwhia stormwater system is generally considered to be very good, with most of the significant assets installed in the last 10 years. There are no renewals planned for Kāwhia in the 2024-34 LTP, but a small provision for catchment upgrades has been factored in for what may be set as a condition of the new resource consent.

A projection of long term renewal requirements for these assets, based upon the existing asset inventory, is presented below. All of these indicated renewals and the associated costs can be met from a small capital sundry allowance that is budgeted for each year.

7.4 - System Performance

Since the major upgrading works in 1999/2000, the performance of the Kāwhia stormwater system has been excellent, with no significant flooding issues.

Discharge of stormwater from Kāwhia, is subject to conditions contained in a Resource Consent issued by Waikato Regional Council for this activity.

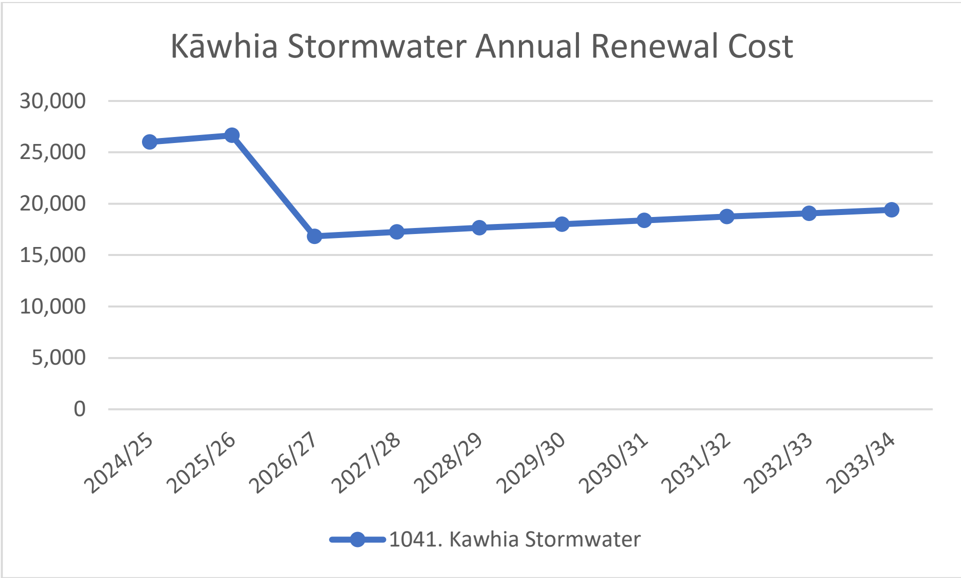


Figure 7.1 – Kāwhia Stormwater Annual Renewal Cost

7.5 - Levels of Service and Public Perception

The level of service targets for the stormwater activity in Kāwhia are the same as those for this activity in Ōtorohanga, and the same associated comments apply.

Public perception of the Kāwhia stormwater system is considered to be good, with the previous upgrading works being viewed positively by residents.

7.6 - Risk Assessment

Risks associated with potential flooding are considered to be low. Public health risks have in the past been viewed as more significant, with suspected discharges of septic tank effluent to stormwater drains in the central areas of the community, however this is likely it has not been shown through the stormwater testing results, but cannot be disregarded.

The central area has a very high water table and ability to install septic tank systems are either extremely expensive or unable to be done within the current regulations. Older systems in this area will continue to present risk to the quality of the stormwater, until such time that a wastewater network in installed.

7.7 - Future Demand

There has been little recent development that would significantly increase demand for storm water services within the existing catchment areas. Whilst there is a significant undeveloped area within the largest of these catchments that could conceivably be developed for residential purposes, it seems increasing unlikely that such development will occur in the near future.

The existing reticulation has substantial capacity, and that retention capacity for any excess flows could easily be developed if required. As such, it is believed that all likely future demands for stormwater disposal can be met, and no significant improvements are likely to be required within the next 10 years.

8.0 - Asset Management Improvement Plan

8.1 - Description

In general, it is considered that this group of assets is currently relatively well managed, and that there is limited scope for cost-effective improvement of management practices at this time. The introduction of in-house services staff and Asset Management team has allowed for better control, management and assessment of the stormwater and wastewater assets.

The following improvements in management practice are, however, targeted:

- Continuing review of the inventory information on all wastewater and stormwater pipes held within the AssetFinda AMS. Use of the AMS systems has identified a number of deficiencies in this data in respect of both inventory completeness and reliability of age, diameter and material data. Addressing these deficiencies has already commenced and will continue over the next three years.
- Condition rating of the entire Ōtorohanga sewer system and identify where the most urgent repairs are to take place.
- While the introduction of a full piped sewerage system in Kāwhia seems financially unfeasible at the present time, it is believed that there are some significant benefits from commissioning such a system. This subject should be kept open through ongoing discussion with Central Government possibly funding such work.
- An ongoing review of performance targets and monitoring of performance against these targets.

Three Waters CAPEX Budgets

	2024/25 Long Term Plan Year 1	2024/25 Long Term Plan Year 2	2024/25 Long Term Plan Year 3
Grand Total	**2,516,000**	**1,982,351**	**1,687,408**
Resiliant Infrastructure: Stormwater	176,000	226,525	211,452
1040. Otorohanga Stormwater	150,000	199,875	194,620
Capital Expenditure	150,000	199,875	194,620
Capital Growth	75,000	51,250	52,600
Capital Level of Service	40,000	112,750	0
Capital Renewals	35,000	35,875	142,020
1041. Kawhia Stormwater	26,000	26,650	16,832
Capital Expenditure	26,000	26,650	16,832
Capital Renewals	26,000	26,650	16,832
Resiliant Infrastructure: Wastewater	798,500	879,963	503,382
1023. Otorohanga Sewerage	798,500	879,963	503,382
Capital Expenditure	798,500	879,963	503,382
Capital Growth	50,000	51,250	52,600
Capital Renewals	748,500	828,713	450,782
Resiliant Infrastructure: Water Supply	1,541,500	875,863	972,574
1010. Tihiroa Water Supply	436,500	54,325	55,756
Capital Expenditure	436,500	54,325	55,756
Capital Renewals	436,500	54,325	55,756
1011. Otorohanga Water Supply	635,000	445,875	405,020
Capital Expenditure	635,000	445,875	405,020
Capital Growth	50,000	51,250	52,600
Capital Renewals	585,000	394,625	352,420
1012. Arohena Water Supply	113,000	100,451	87,316
Capital Expenditure	113,000	100,451	87,316
Capital Renewals	113,000	100,451	87,316
1013. Waipa Water Supply	36,500	18,450	18,936
Capital Expenditure	36,500	18,450	18,936
Capital Renewals	36,500	18,450	18,936
1014. Ranginui Water Supply	38,500	39,462	40,502
Capital Expenditure	38,500	39,462	40,502
Capital Renewals	38,500	39,462	40,502
1016. Kawhia Water Supply	67,000	68,675	70,484
Capital Expenditure	67,000	68,675	70,484
Capital Renewals	67,000	68,675	70,484
1018. Otorohanga Water Treatment Plant	215,000	148,625	294,560
Capital Expenditure	215,000	148,625	294,560
Capital Level of Service	90,000	56,375	42,080
Capital Renewals	125,000	92,250	252,480

*Report Contains Filters

2024/25 Long Term Plan Year 4	2024/25 Long Term Plan Year 5	2024/25 Long Term Plan Year 6	2024/25 Long Term Plan Year 7	2024/25 Long Term Plan Year 8	2024/25 Long Term Plan Year 9
2,047,122	**1,614,791**	**1,754,308**	**1,669,498**	**1,685,653**	**1,672,376**
216,678	221,703	226,326	230,949	235,371	239,592
199,430	204,055	208,310	212,565	216,635	220,520
199,430	204,055	208,310	212,565	216,635	220,520
53,900	55,150	56,300	57,450	58,550	59,600
0	0	0	0	0	0
145,530	148,905	152,010	155,115	158,085	160,920
17,248	17,648	18,016	18,384	18,736	19,072
17,248	17,648	18,016	18,384	18,736	19,072
17,248	17,648	18,016	18,384	18,736	19,072
515,823	527,785	538,791	549,797	560,323	570,372
515,823	527,785	538,791	549,797	560,323	570,372
515,823	527,785	538,791	549,797	560,323	570,372
53,900	55,150	56,300	57,450	58,550	59,600
461,923	472,635	482,491	492,347	501,773	510,772
1,314,621	865,303	989,191	888,752	889,959	862,412
46,354	47,429	48,418	49,407	52,109	51,256
46,354	47,429	48,418	49,407	52,109	51,256
46,354	47,429	48,418	49,407	52,109	51,256
619,850	419,140	427,880	436,620	444,980	452,960
619,850	419,140	427,880	436,620	444,980	452,960
53,900	55,150	56,300	57,450	58,550	59,600
565,950	363,990	371,580	379,170	386,430	393,360
89,474	91,548	93,458	147,073	97,192	98,936
89,474	91,548	93,458	147,073	97,192	98,936
89,474	91,548	93,458	147,073	97,192	98,936
19,404	19,854	20,268	20,682	21,078	21,456
19,404	19,854	20,268	20,682	21,078	21,456
19,404	19,854	20,268	20,682	21,078	21,456
41,503	42,466	43,351	44,236	45,084	45,892
41,503	42,466	43,351	44,236	45,084	45,892
41,503	42,466	43,351	44,236	45,084	45,892
72,226	73,901	74,316	75,834	77,286	78,672
72,226	73,901	74,316	75,834	77,286	78,672
72,226	73,901	74,316	75,834	77,286	78,672
425,810	170,965	281,500	114,900	152,230	113,240
425,810	170,965	281,500	114,900	152,230	113,240
328,790	5,515	45,040	5,745	46,840	5,960
97,020	165,450	236,460	109,155	105,390	107,280

*Report Contains Filters

2024/25 Long Term Plan Year 10
1,926,245
243,813
224,405
224,405
60,650
0
163,755
19,408
19,408
19,408
580,421
580,421
580,421
60,650
519,771
1,102,011
52,159
52,159
52,159
460,940
460,940
60,650
400,290
100,680
100,680
100,680
21,834
21,834
21,834
46,700
46,700
46,700
80,058
80,058
80,058
339,640
339,640
48,520
291,120

*Report Contains Filters

Three Waters OPEX Budgets

	2024/25 Long Term Plan Year 1	2024/25 Long Term Plan Year 2	2024/25 Long Term Plan Year 3	2024/25 Long Term Plan Year 4
Grand Total	**6,259,199**	**6,327,904**	**6,574,681**	**6,765,542**
Resiliant Infrastructure: Stormwater	484,734	511,890	516,656	522,790
1040. Otorohanga Stormwater	310,184	333,793	342,736	352,366
Operating Expenditure	268,273	289,270	297,458	306,393
Finance Costs	10,304	9,303	8,454	7,518
Increase (decrease) in reserves	148,441	161,027	166,288	173,024
Internal charges and overheads applied	56,528	59,490	61,700	63,327
Other operating funding applications	24,500	25,112	25,774	26,411
Payments to staff and suppliers	28,500	34,338	35,242	36,113
1041. Kawhia Stormwater	73,266	77,462	79,154	80,678
Operating Expenditure	73,266	77,462	79,154	80,678
Finance Costs	5,476	4,935	4,661	4,407
Increase (decrease) in reserves	36,435	39,588	40,617	41,566
Internal charges and overheads applied	17,855	19,102	19,674	20,152
Other operating funding applications	6,500	6,663	6,838	7,007
Payments to staff and suppliers	7,000	7,174	7,364	7,546
Resiliant Infrastructure: Wastewater	1,423,530	1,258,933	1,291,152	1,348,882
1020. Otorohanga Sewerage Loan	143,195	145,158	140,044	135,719
Operating Expenditure	143,195	145,158	140,044	135,719
Finance Costs	138,225	139,947	134,704	130,265
Internal charges and overheads applied	4,970	5,211	5,340	5,454
1023. Otorohanga Sewerage	1,280,335	1,113,775	1,151,108	1,213,163
Operating Expenditure	1,280,335	1,113,775	1,151,108	1,213,163
Increase (decrease) in reserves	334,794	372,518	388,712	396,691
Internal charges and overheads applied	255,541	267,707	278,476	286,096
Other operating funding applications	30,500	31,263	32,086	32,879
Payments to staff and suppliers	659,500	442,287	451,834	497,497
Resiliant Infrastructure: Water Supply	4,494,130	4,702,239	4,906,917	5,029,589
1010. Tihiroa Water Supply	457,959	513,467	524,272	506,705
Operating Expenditure	457,959	513,467	524,272	506,705
Finance Costs	30,280	33,319	31,782	30,244
Increase (decrease) in reserves	88,433	103,596	103,513	104,313
Internal charges and overheads applied	162,446	169,708	176,683	181,558
Other operating funding applications	5,300	5,432	5,576	5,713
Payments to staff and suppliers	171,500	201,412	206,718	184,877
1011. Otorohanga Water Supply	807,126	799,368	823,076	851,872
Operating Expenditure	806,967	799,368	823,076	851,872
Increase (decrease) in reserves	329,082	303,530	310,148	325,447
Internal charges and overheads applied	268,885	281,613	293,060	301,123
Other operating funding applications	22,500	23,063	23,670	24,255
Payments to staff and suppliers	186,500	191,162	196,198	201,047
1012. Arohena Water Supply	391,152	413,673	431,050	446,279

Operating Expenditure	391,152	413,673	431,050	446,279
Finance Costs	159	0	0	0
Increase (decrease) in reserves	91,922	104,013	110,736	117,531
Internal charges and overheads applied	158,571	165,648	172,508	177,289
Other operating funding applications	12,500	12,812	13,150	13,475
Payments to staff and suppliers	128,000	131,200	134,656	137,984
1013. Waipa Water Supply	252,729	261,803	267,031	273,791
Operating Expenditure	252,729	261,803	267,031	273,791
Finance Costs	22,888	21,890	20,892	19,893
Increase (decrease) in reserves	57,222	61,863	62,656	63,044
Internal charges and overheads applied	52,919	55,357	57,559	59,122
Other operating funding applications	9,700	9,943	10,204	10,457
Payments to staff and suppliers	110,000	112,750	115,720	121,275
1014. Ranginui Water Supply	100,073	106,460	111,759	116,518
Operating Expenditure	100,073	106,460	111,759	116,518
Increase (decrease) in reserves	29,239	32,952	35,712	38,477
Internal charges and overheads applied	42,234	44,194	45,960	47,210
Other operating funding applications	2,600	2,665	2,735	2,803
Payments to staff and suppliers	26,000	26,649	27,352	28,028
1015. Otorohanga Water Loan	81,241	92,887	88,251	85,038
Operating Expenditure	81,241	92,887	88,251	85,038
Finance Costs	79,619	91,187	86,509	83,258
Internal charges and overheads applied	1,622	1,700	1,742	1,780
1016. Kawhia Water Supply	397,152	417,530	422,917	433,774
Operating Expenditure	397,152	417,530	422,917	433,774
Finance Costs	33,302	36,074	34,755	33,631
Increase (decrease) in reserves	98,556	108,122	105,268	109,781
Internal charges and overheads applied	157,944	165,351	172,066	176,795
Other operating funding applications	8,500	8,712	8,942	9,163
Payments to staff and suppliers	98,850	99,271	101,886	104,404
1018. Otorohanga Water Treatment Plant	652,450	683,547	764,232	799,575
Operating Expenditure	652,450	683,547	764,232	799,575
Finance Costs	29,669	32,763	31,217	29,670
Increase (decrease) in reserves	54,062	63,238	72,312	91,823
Internal charges and overheads applied	326,219	341,032	355,097	364,923
Other operating funding applications	5,500	5,638	5,786	5,929
Payments to staff and suppliers	237,000	240,876	299,820	307,230
Trusted Leadership & Relationships	1,354,407	1,413,504	1,474,329	1,516,037
1017. Water Services Department	1,354,407	1,413,504	1,474,329	1,516,037
Operating Expenditure	1,354,407	1,413,504	1,474,329	1,516,037
Internal charges and overheads applied	630,397	664,961	709,484	735,624
Other operating funding applications	2,200	2,246	2,295	2,341
Payments to staff and suppliers	721,810	746,297	762,550	778,072

2024/25 Long Term Plan Year 5	2024/25 Long Term Plan Year 6	2024/25 Long Term Plan Year 7	2024/25 Long Term Plan Year 8	2024/25 Long Term Plan Year 9	2024/25 Long Term Plan Year 10
6,940,915	**7,083,898**	**7,463,038**	**7,401,179**	**7,486,887**	**7,607,711**
540,825	543,075	545,400	560,399	563,014	566,139
375,981	385,251	394,320	416,035	425,430	435,303
326,482	334,994	343,588	362,091	370,668	379,705
6,466	5,487	4,507	3,616	2,744	2,031
191,368	198,258	205,453	222,758	230,231	237,837
64,674	65,941	66,986	67,799	68,557	69,483
27,024	27,587	28,150	28,690	29,204	29,718
36,950	37,721	38,492	39,228	39,932	40,636
84,918	86,331	87,396	91,206	92,548	93,951
84,918	86,331	87,396	91,206	92,548	93,951
4,171	3,935	3,700	3,464	3,228	2,992
45,328	46,322	47,032	50,480	51,534	52,606
20,528	20,873	21,153	21,453	21,694	21,978
7,169	7,319	7,469	7,611	7,748	7,885
7,722	7,882	8,042	8,198	8,344	8,490
1,366,542	1,389,360	1,646,701	1,463,039	1,480,492	1,508,302
129,425	121,750	114,416	107,102	99,798	92,483
129,425	121,750	114,416	107,102	99,798	92,483
123,865	116,091	108,685	101,279	93,890	86,502
5,560	5,659	5,731	5,823	5,908	5,981
1,237,117	1,267,610	1,532,285	1,355,937	1,380,694	1,415,819
1,237,117	1,267,610	1,532,285	1,355,937	1,380,694	1,415,819
437,306	448,949	470,488	508,057	522,149	540,939
292,431	298,449	303,457	306,878	310,225	314,474
33,641	34,343	35,045	35,715	36,356	36,997
473,739	485,869	723,295	505,287	511,964	523,409
5,162,973	5,273,213	5,385,353	5,484,843	5,543,179	5,625,753
519,866	524,618	531,995	541,868	547,699	554,077
519,866	524,618	531,995	541,868	547,699	554,077
28,707	27,170	25,632	24,095	22,558	21,020
110,502	108,829	110,436	115,827	117,343	118,842
185,646	189,542	192,784	194,913	197,052	199,757
5,846	5,968	6,090	6,206	6,318	6,429
189,165	193,109	197,053	200,827	204,428	208,029
903,549	924,466	951,097	983,770	1,001,028	1,022,556
903,549	924,466	951,097	983,770	1,001,028	1,022,556
365,202	374,948	385,720	410,121	419,388	431,937
307,820	314,184	319,491	323,055	326,552	331,037
24,817	25,335	25,853	26,347	26,820	27,293
205,710	209,999	220,033	224,247	228,268	232,289
466,679	477,271	491,655	508,955	514,397	525,115

466,679	477,271	491,655	508,955	514,397	525,115
0	0	0	0	0	0
130,416	133,961	141,934	154,080	154,495	159,616
181,291	185,107	188,287	190,349	192,426	195,073
13,788	14,075	14,362	14,638	14,900	15,162
141,184	144,128	147,072	149,888	152,576	155,264
281,734	285,499	288,870	298,302	299,442	302,766
281,734	285,499	288,870	298,302	299,442	302,766
18,895	17,896	16,898	15,900	14,901	13,903
67,619	68,327	68,851	72,952	71,763	72,591
60,433	61,679	62,713	63,427	64,136	65,010
10,699	10,922	11,146	11,358	11,562	11,767
124,088	126,675	129,262	134,665	137,080	139,495
123,324	126,348	130,881	136,892	136,425	140,951
123,324	126,348	130,881	136,892	136,425	140,951
43,519	44,890	47,942	52,751	51,124	54,351
48,258	49,254	50,079	50,649	51,210	51,909
2,868	2,928	2,987	3,045	3,099	3,154
28,679	29,276	29,873	30,447	30,992	31,537
83,319	80,206	75,773	71,449	67,163	62,871
83,319	80,206	75,773	71,449	67,163	62,871
81,505	78,360	73,903	69,549	65,235	60,920
1,814	1,846	1,870	1,900	1,928	1,951
449,395	456,350	465,528	460,943	462,918	471,439
449,395	456,350	465,528	460,943	462,918	471,439
32,507	31,382	30,258	29,134	28,009	26,885
119,954	121,870	126,630	118,757	117,581	122,382
180,732	184,474	187,593	189,687	191,751	194,383
9,376	9,571	9,766	9,954	10,132	10,310
106,826	109,053	111,281	113,411	115,445	117,479
784,311	814,468	837,653	853,861	868,018	877,025
784,311	814,468	837,653	853,861	868,018	877,025
28,123	26,577	25,030	23,483	21,937	20,390
117,789	136,143	148,823	157,029	163,422	163,479
373,129	380,945	387,464	391,725	395,983	401,428
6,066	6,193	6,320	6,440	6,556	6,672
259,204	264,610	270,016	275,184	280,120	285,056
1,550,796	1,583,987	1,611,901	1,628,803	1,646,089	1,668,953
1,550,796	1,583,987	1,611,901	1,628,803	1,646,089	1,668,953
1,550,796	1,583,987	1,611,901	1,628,803	1,646,089	1,668,953
755,548	774,671	788,519	791,389	795,375	804,941
2,385	2,427	2,468	2,510	2,550	2,589
792,863	806,889	820,914	834,904	848,164	861,423

OTOROHANGA
DISTRICT COUNCIL
Otorohanga - where kiwis can fly

OTOROHANGA STORMWATER MANAGEMENT PLAN 2018

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APPENDICES

1. Executive Summary

Stormwater from the Otorohanga Township discharges to the Waipa River, which is a valuable natural resource that must be protected from any adverse effects of such discharges.

This document seeks to:

- Describe the stormwater drainage system currently serving the Otorohanga Township, and the environment into which this system discharges;
- Identify and assess potential environmental effects associated with discharges of stormwater from the Otorohanga Township;
- Define management objectives in respect controlling the environmental effects of these stormwater discharges;
- Present options for achieving the defined stormwater management objectives in respect of issues associated with both water quantity and quality;

2. Introduction

2.1 Otorohanga Township

The Township of Otorohanga is the largest community in the Otorohanga District, which was formed in 1979 as a result of amalgamations between Otorohanga Borough and Otorohanga County Councils. Otorohanga lies at the centre of the district, at the junction of State Highways 3 and 31, and on the North Island main trunk railway.

The town is located on the flood plain of the Waipa River, extending into rolling hills to the east of the river. Surface gradients are in general fairly flat, though there is a limited area of relatively steep land towards the north-eastern fringes of the town. The central area of town is built alongside the Waipa River, and is protected from the river by substantial flood banks.

The soils within the Township area generally consist of free draining volcanic ash layers with some clay deposits.

The town (with a population 3000 at the time of the 2013 census) acts as a service centre for the rural district and contains a number of small rural industries. The town is however well located to provide for a variety of industrial and commercial uses, and it is expected that the district's economic base will diversify during the next decade.

The general location of Otorohanga is shown on Appendix 1.

2.2 Land Use

Otorohanga currently has some 1200 individual properties contained within the catchment area, of which approximately 95% have been built upon. A street plan is attached as Appendix 2.

The district plan does not zone individual areas for a particular land use, and each application for subdivision or land use is instead considered as an individual case.

Whilst land use zoning is not practiced, a significant degree of land use segregation has in practice occurred. Residential development has been fairly evenly divided between the flood plain and rolling hills to the east, whilst commercial and industrial development has occurred mainly on the flood plain and where the river has been diverted.

The majority of the commercial properties are located in the area between Turongo Street and the railway line, with the area east of the railway line and Huiputea Drive being largely the locations of industrial activity.

It is expected that the remaining undeveloped sections will be built upon and that the larger developed sections will in time be subdivided. It is also possible that new subdivisions may in future be established, most probably to the east of the existing town boundaries.

2.3 Stormwater Catchments

The Otorohanga Township has a total stormwater catchment area of approximately 310 hectares. The sub-catchments within this area vary in size from three hectares to approximately 70 hectares.

The catchments in the central regions of town are served by a constructed drainage system feeding directly to the Waipa River, and are relatively large and well defined. For the more peripheral areas of the Township drainage is often through small, poorly defined drainage catchments, draining either to small natural watercourses or soakage areas. The major catchments are shown in Appendix 3.

The flood plain areas are protected from flooding by stop banks, which have been constructed from Te Kawa Street in the west round the southern end of town to River Road in the east. These stop banks mean that when the level of the Waipa River is high, pump stations come into action to lift the stormwater from the main catchments into the river

Based on land use and catchment boundaries, Otorohanga can be broadly divided into two main areas in terms of potential for stormwater contamination.

The larger of these two areas, comprising catchments 4, 5, 6 and 7 is primarily residential although it does contain some commercial properties. The second area comprising catchments 1, 2 and 3 contains the majority of the commercial and industrial properties and some residential lots. This area contains the majority of the facilities that are potentially of high risk in respect of contaminated stormwater discharges.

In terms of flow characteristics the town can be divided into a number of different regions:

- Flat flood plain areas, with medium density residential development where relatively low run-off and high runoff concentration times would be expected.

- The CBD area which whilst flat is heavily developed, and for which fairly low runoff concentration times would be expected.

- Residential areas on relatively steep topography to the north east and south of the town, where fairly low runoff concentration times would also be expected, even though the density of development is relatively low.

2.4 Runoff Characteristics

At present the District Plan allows for buildings to cover 30% of the section area but makes no allowance for what proportion of the section may otherwise be impervious, such as driveways, paths and hard standings. It is clear that in many cases much more than 30% of sections are covered by impervious surfaces.

Inspection of plans and aerial photographs has indicated that rooves or other impervious surfaces cover the following proportions of surface area in well-defined major catchments within Otorohanga:

Catchment Location	Catchment Area (Ha)	% Area Impervious
CBD / Mair Street	34.1	52
Kakamutu Road	50.7	14
Otewa Road	11.2	42
Main North Road / Eastern	70 (approx.)	12

As development occurs it is expected that there will be some further increase in the proportion of impervious surface in most catchments. This may result in a higher proportion of runoff and shorter runoff concentration times and the installation of a higher capacity piped reticulation may be required.

For the purposes of analysis the following runoff coefficients have been assumed. These are generally accepted values:

Surface Type	Runoff Coefficient
Roofs	0.95
Asphalt, concrete or paved areas	0.9
Lawns and uncultivated land	0.3
Cultivated land	0.2

For the purposes of modeling (described in Section 7) surfaces have been classified on the simpler basis shown below, assuming averages of the previous runoff coefficient values.

Surface Type	Runoff Coefficient
Impervious	0.93
Pervious	0.25

2.5 Existing Stormwater System

Historically stormwater generated within the Otorohanga Township was conveyed to the Waipa River by modified natural water courses and open drains.

Otorohanga was devastated by floods in 1958 and consequently a number of stop banks, storage basins and pumping facilities were constructed as part of the lower Waikato/ Waipa flood control scheme facilitated by central, regional and local government. This program of works was largely completed in Otorohanga by 1960, and a major program of piping open drains was also undertaken around this time.

Many drains within the Otorohanga community have been piped over the years, either with or without Council's knowledge and assistance. Concern exists regarding the quality of some of the "private' piped drains and Council is reluctant to assume responsibility for these without researching the history of these features.

The original streams within the urban area that have not been piped have generally been straightened and/or regraded, but have not been lined. Open drains are typically less than 1m wide, have beds of sand and silt and contain 10cm or less depth of water during dry weather.

The Otorohanga Stormwater reticulation network managed by Council now includes around 5km of piped mains and 3km of open drains ranging in size from 1050mm to 225mm diameter, in addition to those features specifically associated with roads. The location and size of all pipes and drains is available from plans held by Council. These network assets feed to either one of three operational pump stations, a small natural watercourse that enters the Waipa River 600 metres north of Otorohanga College or various minor out-falls direct into the Waipa River.

The three operational pump stations are located on Otewa Road and Huiputea Drive (both discharging to the Waipa River above SH3) and on Te Kawa Street, which discharges to the Waipa River below the Waipa River Bridge No. 2 on SH31, below the confluence with the Mangapu River.

When the Waipa River is at normal levels, water flows through the intake and outlet chambers of the pump station under gravity discharging into the river through 750mm diameter pipes in robustly constructed outlet structures.

When the level of the Waipa River is high, valves within the chambers of the pump stations prevent gravity flow to the river, and pumps are then required to lift the stormwater over a bulkhead separating the inlet and outlet chambers so that it can then be discharged to the river. Up to three pumps (duty and back up) are used in each pump station to achieve the required discharge rate to the river, with the number of pumps operational being controlled by the level of water in the intake chamber and manual switching.

The condition of the assets comprising the stormwater system is generally considered to be moderate or good. Only a relatively small number of items are expected to require replacement during the next 10 years because of sub-standard condition, though each year there are a small number of unexpected asset failures such as cracked pipes.

The piped drains constructed by council have generally been designed for a 10 year storm event, in line with normal industry standards. The pipes laid without Council's knowledge may however be under-specified or inadequately designed, potentially impacting adversely on the performance of the network as a whole.

On the basis of previous experience the overall performance of the stormwater drainage network is considered to be good, with only a few localized flooding problems that are being progressively remedied.

An analysis of the performance of the overall stormwater drainage network using computer modelling has recently been undertaken. The results of this analysis will be presented in later sections of this document.

2.6 Nature of Receiving Waters

All stormwater from the Otorohanga Township is discharged into the Waipa River either directly or (and to a much lesser extent) via the Mangaorongo Stream, which in turn discharges to the Waipa River approximately 4 km north of Otorohanga. For the purposes of this document the receiving waters will be assumed to be the waters of the Waipa River.

The Waipa River, at Otorohanga flows over a bed of small-medium shingle in a pool and riffle form, with silt and sand dominating the slower reaches. The river is incised 4 – 5m into a wider alluvial terrace.

The river environment is relatively silty, with the turbid flow from the Mangapu tributary a dominant influence on stream characteristics downstream of the Township. The reaches below Waipa River Bridge No. 2 are characterized by long, sedate stretches (>300m in length) of pools 1-3m deep with silty banks and a soft bottom. Between these pools are riffles of faster flowing water where the bed consists of a fine gravel armour (10-50m) overlying fine gravel and sand. Further below the town the river becomes predominantly deep and slow flowing.

2.6.1 <u>River Flows</u>

The Waipa River at Otorohanga is a medium sized stream, with a mean flow of 30.8 m3/s measured at the Waipa River Bridge No. 2 on SH31 below the confluence with the Mangapu River. Of this flow it is estimated that 60% typically originates from the upper Waipa catchment, and 40% from the catchment of the Mangapu.

Mean annual lowest river flow at the measuring site is 5.05 m3/s, with a lowest recorded flow of 2.6 m3/s, whilst the peak flow corresponding with a 2 year return period flooding event is 228 m3/s. It is estimated that in the 100 year return period flooding event of 1998 the peak flow exceeded 500 m3/s.

2.6.2 <u>Water Quality</u>

At Otorohanga the river water quality reflects a range of impacts from agriculture and urban discharges. Turbidity is moderate-high.

The water quality in the Waipa River above SH3 is generally good, with high dissolved oxygen. Nutrient levels are moderate, but progressively increase downstream.

Extensive data on the Waipa River in the vicinity of Otorohanga has been collected by Waikato Regional Council. The results of sampling of the Waipa River at SH3 is presented in the following table:

	Excellent		Satisfactory		Unsatisfactory	
Assessment Parameter	Value	% Samples	Value	% Samples	Value	% Samples
Dissolved Oxygen	>90% Sat.	98	>80% Sat	2	<80% Sat	0
pH	7-8	77	6.5-9.0	23	<6.5, >9.0	0
Turbidity (NTU)	<2	11	<5	35	>5	54
Total NH_3 (g N/m^3)	<0.1	96	<0.88	4	>0.88	0
Total P (g/m^3)	<0.01	0	<0.04	55	>0.04	45
Total N (g/m^3)	<0.1	0	<0.5	67	>0.5	33
Baseflow clarity (m)	>4	0	>1.6	36	<1.6	64
Enterococci (median) (no./100 Ml)	<6	0	<33	0	>33	100

In terms of ecology the river is typical of many Waikato rivers in that it displays raised levels of nitrogen and phosphorus as a result of agricultural activity. Water is seldom very clear, and in times of rain high levels of turbidity may result from the 'bleeding' of recent large slips in the headwaters.

Below the bridge on SH3 the Waipa River is joined by the Mangapu River. This river is poorer that the Waipa River in terms of both ecology and potential effects on human health, as evidenced by data collected by Waikato Regional Council, which is presented below. The quality of water in the Waipa River is significantly degraded by the confluence with the Mangapu River, in particular in respect of turbidity, clarity, phosphorus and nitrogen.

	Excellent		Satisfactory		Unsatisfactory	
Assessment Parameter	Value	% Samples	Value	% Samples	Value	% Samples
Dissolved Oxygen	>90% Sat.	76	>80% Sat	24	<80% Sat	0
pH	7-8	94	6.5-9.0	6	<6.5, >9.0	0
Turbidity (NTU)	<2	0	<5	18	>5	82
Total NH_3 (g N/m^3)	<0.1	82	<0.88	18	>0.88	0
Total P (g/m^3)	<0.01	0	<0.04	2	>0.04	98
Total N (g/m^3)	<0.1	0	<0.5	0	>0.5	100
Baseflow clarity (m)	>4	0	>1.6	0	<1.6	100
Enterococci (median) (no./100 Ml)	<6	0	<33	0	>33	100

Measured Water Quality – Mangapu River, SH3

Continuing downstream to Ngaruawahia the trend of increasing turbidity, nitrate, phosphate and decreasing clarity continues.

2.6.3 River Biota

The riffles of the Waipa River in the vicinity of Otorohanga have a moderate population of invertebrates with cased caddis (*Olinga feredayi, Pynocentrodes* spp), free swimming caddis (*Aoteapsyche* spp) and some mayfly species (*Deleatidium* spp). These species are sensitive to pollution and are indicative of a reasonable water quality. The small black water snail (*Potamopyrugus* spp) is common. Stones are generally clear of extensive periphyton growth. The slow reaches are dominated by silt tolerant fauna such as snails and midge larvae.

The river is home to a range of fish species both indigenous and introduced. The Waipa River supports a healthy trout fishery, and is recognised as a regionally important trout fishery. Both brown and rainbow trout are resident in the reaches adjacent to Otorohanga, the river forming an essential part of the upstream spawning migration of brown trout to the Waipa headwaters from the lower Waipa/Waikato in late summer. Other introduced fish include koi carp and goldfish.

Indigenous species present in the river include grey mullet, eels (short and long finned), several galaxid (whitebait) species, bullies and torrent fish.

The table below lists fish species found within the Waipa River and their ecological significance.

Table 1 : Notable Waterbirds and Fish Recorded or Likely to be Found Along and Within the Waipa River near Otorohanga and their Conservation Status

Species	Usage	Distribution Regionally	Origin	Status
WATERBIRDS				
Mallard duck (Anas platyrhynchos platyrhynchos	R	C	In	G
Grey duck (Anas superciliosa superciliosa)	R	C	I	G
Grey teal (Anas gibberifrons gracilis))	S	C	I	P
NZ shoveler (Anas rhynchotis variegata)	S	C	E	G
Pukeko (Porphyrio porphyrio)	R	C	I	G
Paradise shelduck (Tardona variegata)	S	C	E	G
White faced heron (Ardea novechollendiae)	S	C	I	P
Black shag (Phalarcrocorax carbo)	R	C	E	P
Little shag (Phalacrocorax melanoleucos brevirostris)	R	C	E	P
FISH				
Long-finned eel (Anguilla diffenbachii)	R	C	E	C/R/T
Short-finned eel (Anguilla australis)	R	C	I	C/R/T
Inanga (Galaxias maculatus)	R	C	I	C/R/T
Common smelt (Retropinina retropinnia)	R	C	E	T/R
Grey mullet (Mugil cephalus)	S	C	I	R/T/C
Common bully (Gobiomorhpus cotidianus)	R	C	E	N/S
Brown trout (Salmo trutta)	M/R	C	In	R
Rainbow trout (Oncorhynchus mykiss)	M/R	C	In	R
Lamprey (Geotrid australis)	M	UC	I	T
Torrent fish (Cheimarrichthys foresteri)	M	C	E	N/S
Koaro (Galaxias brevipinnis)	M	T	I	T
Banded kokopu (Galaxias fasciatus)	M	T	E	N/S
Giant kokupu (Galaxias argenteus)	M	R	E	N/S
Short-jawed kokopu (Galaxias postrectis)	N	T	E	N/S

KEY

Usage
S – found seasonally
M – migratory (passing)
R – resident

Distribution Regionally
C – common
UC – uncommon
T – threatened
R – rare

Origin
E – endemic
I – indigenous
In – introduced

Status
N/S – no status
C – commercial
R – recreational
T – traditional
P – protected
G – game bird

2.6.4 Terrestrial Ecology

The river margins and surrounding land are highly modified with little remaining indigenous vegetation. The immediate river berms are dominated by extensive willow growth. More open areas have dense growth of introduced grasses and weeds such as blackberry. Beyond the river margins the land is in pastoral use, mainly for dairy grazing.

The river margins would have substantial value to a number of bird species such as pukeko and water fowl (habitat value to the species). Value of the area in close proximity to the Township would be somewhat reduced by the presence of domesticated and stray cats.

The previous table lists bird species likely to be found in the area and their ecological significance.

2.7 River Users

The Waipa River in the vicinity of Otorohanga is used for a variety of purposes, including recreational activities such as trout fishing (mainly above Otorohanga), duck shooting and (to a much lesser extent) boating or canoeing (mainly below the Township).

The Otorohanga Township draws its municipal water supply from the Waipa River, but this is upstream of any stormwater discharges from the town. Downstream of the town water is drawn from the river for use by the Tihiroa Rural Water Supply Scheme, which supplies mainly farm properties.

The Waipa River downstream of Otorohanga also receives the discharge from the Township's sewerage treatment plant, via the Mangaorongo Stream.

2.8 Statutory Requirements - Stormwater

There is no statutory requirement for Territorial Local Authorities to provide public drainage works, but where such works are provided (as in the case of the Otorohanga Township) all discharges resulting from such activities are subject to the provisions of the Resource Management Act.

It is not however believed that it has been clearly established under the law as to whom is responsible for ensuring that discharges to the stormwater system provided by council meet any requirements of the Regional Authority under the RMA.

3. Objectives

Otorohanga District Council does not currently have well defined objectives in respect of stormwater quality. The target defined in Council's stormwater AMP is that the discharges from the Otorohanga stormwater system is subject to conditions contained in the Resource Consent issued by Waikato Regional Council for the activity.

To that end the following outlines the monitoring program in accordance with conditions 31 and 32 RC105592, as a minimum, the monitoring programme shall include:

a) Monitoring of suspended solids, Biochemical Oxygen Demand, Total Phosphorus, Total Nitrogen, Ammonical Nitrogen and E-coli at the College outlet, Huipitea Drive pump station, and the Mair Street pump station, and additionally, monitoring of Total Petroleum Hydrocarbons, lead, zinc and copper at the Huipitea Drive pump station. Such monitoring shall be undertaken during the months February, June and October, and as far as practicably possible, under the following conditions: during the first flush of a medium intensity rainfall event of at least 10 minute duration, following at least one week of dry weather. After nine series of monitoring results have been recorded (i.e. three years of monitoring), the frequency and locations of monitoring may be reduced to a minimum of one discharge outlet monitored annually, following written acknowledgement from the Waikato Regional Council, having had regard to consistency and significance of monitoring data collected.

b) Monitoring of scour and erosion effects due to stormwater diversions and discharges.
c) Monitoring for visual signs of contaminants in stormwater (conspicuous oil or grease films, scums or foams, floatable suspended materials, conspicuous change in colour or visual clarity);
d) Monitoring to determine if municipal stormwater system catch pits are fitted with stormwater management devices that are capable of capturing and retaining gross pollutants and suspended solids, and if these are maintained in good working order. e) Monitoring to determine appropriate street and catch pit cleaning operations and frequencies;
e) Monitoring to identify informal sewerage system connections to the municipal stormwater system, and to gauge sewage pump station overflow frequencies;
f) Monitoring or modelling of volumes of sewage discharged to the municipal stormwater system;
g) Monitoring to determine municipal stormwater system collection points that are most at risk from non-routine contaminant discharges to the municipal stormwater system.

The consent holder shall review the monitoring programme on an annual basis and shall forward a copy of any updated monitoring programme to the Waikato Regional Council for approval within one month of any updates being made.

4. Risk Assessment – Stormwater Quality

Potential risks in respect the discharge of stormwater from the Otorohanga Township are considered to be associated with the following pollutants or effects:

- Sediments (erosion/wear/weathering/cleaning)
- Nutrients (fertiliser, faeces, detergents and other organic matter)
- Oxygen demanding substances (decaying organic matter)
- pH change (roof and structural erosion)
- Micro-organisms (faeces and organic matter decay)
- Toxic organics (pesticides, herbicides, septic tank leaks etc)
- Heavy metals (vehicle wear, weathering, sewer/septic tanks, hydro carbons)
- Litter and debris (human litter and leaf fall, lawn clippings)
- Oils and surfactants (asphalt pavements, vehicles, other spillages)
- Increased water temperature (run-off, shade removal).

The following sections attempt to evaluate the extent of risks associated with these pollutants or effects posed by different areas and activities within the Otorohanga Township.

4.1 Residential Properties

Chemical pollution risks associated with residential properties in Otorohanga include:

- Pesticides and herbicides used in gardens;
- Oil, paints and associated substances (typically through spillage or illegal discharge);
- Detergents and surfactants (in particular those used in vehicle washing);
- Heavy metals from building weathering.

There is also potential for sedimentation from building weathering and wash-down activities (eg flaked paint and cladding particles) and for pH levels to be modified by erosion of structural and roofing materials.

Under intense rainfall conditions there is also potential for additional sediment loads to result from the development of secondary (surface) flow paths when the primary drainage system is overloaded. This is most likely to occur in the catchments serving the steeper topography to the north-east of the town, where there are known to be some drains of sub-standard capacity.

High levels of micro-organisms may result from sewer overflows or septic tank leaks, though the likelihood of the latter is low in Otorohanga because the majority of the residential areas are serviced with a reticulated sewage system.

Reticulated stormwater and sewerage systems in Otorohanga have been effectively separated for many years, and there are no known instances (within at least the last 10 years) of any observations or other evidence to suggest that any sewerage is discharged to the stormwater system.

Since there is a high proportion of impervious surfaces in some catchments there is also potential for discharges to have elevated temperatures.

There is however as yet no evidence that the stormwater discharged from residential properties in Otorohanga has a significant adverse effect on the receiving waters. Because of this and the difficulty in more accurately assessing the effect of this part of the community on stormwater quality, no further investigation is planned.

4.2 Commercial and Industrial Properties

Of the businesses with the potential to generate contaminated stormwater do in general have adequate systems (ie traps and interceptors, appropriate storage, bunds) or procedures (signage, material handling, housekeeping, spill control measures) in place to prevent or control such contamination.

Only one of these premises (a fertiliser supplier) was considered as potentially representing a significant hazard in respect of stormwater contamination, because there is potential for runoff from this site with high levels of Nitrates, Phosphates and suspended solids from yards with significant quantities of spilled fertiliser and generally poor housekeeping.

This particular facility has subsequently been the target of significant further inspections and monitoring through Councils Environmental Services, and it is believed that most of the issues initially causing concern have now either been dismissed or resolved by improved on-site management processes.

4.3 Agricultural Activities

Only a limited amount of agricultural activity occurs within the Township catchment area, mainly in the area between the railway and State Highway 3 at the east of the town, but also on a number of relatively small areas alongside drains in the central areas of town. This is mainly grazing of cattle, with a little non-intensive arable cultivation.

It is however considered that the agricultural activity that is conducted within the Township would have no greater effect on the quality of the receiving waters than that of a similar area in an entirely rural setting.

The only areas where it is believed that effects of agricultural activity on stormwater quality may be more pronounced are the more central areas of Otorohanga (for example the land inside the stop-banks at Mair Street) where the land in question is also utilised for retention of stormwater.

In these areas it is suspected that the temporary inundation and subsequent drainage of intensively grazed land could potentially result in the discharge of stormwater containing relatively high levels of nitrogen, phosphorus and bacteria.

4.4 Otorohanga Landfill

The old Otorohanga landfill does lie within the defined Township catchment area, but is covered by the provisions of other Resource Consents. The landfill is capped in accordance with Resource Consent No. 960747 and regular monitoring of potential water contamination occurs.

Stormwater from this site flows directly to the Waipa River, and it is considered highly unlikely that this site will contaminate the stormwater being discharged from the principal outlets of the Townships stormwater system.

4.5 Vehicular Emissions

There is a significant length of roading within Otorohanga, including sections of State Highways 3 and 31, with traffic densities up to 11000 vehicles per day. Vehicles emit a range of pollutants including lead, zinc, copper and hydrocarbons, which will be deposited on and around the road.

Roads have high runoff coefficients and low concentration times, allowing any contaminants on the roads to be quickly washed into catch-pits. Catch-pits allow larger solids to settle, but due to turbulence within the pit much of the smaller particulate matter is washed into the piped reticulation. This is more evident during short duration, high intensity storm events.

In Otorohanga the main effects of vehicular emissions would be expected to occur in the catchments discharging to the Te Kawa Street and Huiputea Drive pump stations, which contain the most heavily trafficked roads. The stormwater samples taken from the outfalls of these catchments did not however indicate high levels of lead, zinc or copper, though it is acknowledged that the concentration of these contaminants at these locations is likely to be highly dependent on the time of measurement, and that further sampling is required, as described in section 4.8.

4.6 Street Litter

In general it appears that very little litter enters the stormwater system in Otorohanga. This is presumed to be due to:

- A population of relatively tidy residents
- Numerous street litter bins, which are regularly emptied
- Employment by Council of a dedicated Litter Control Officer
- Relatively few open drains in proximity to busy public spaces.

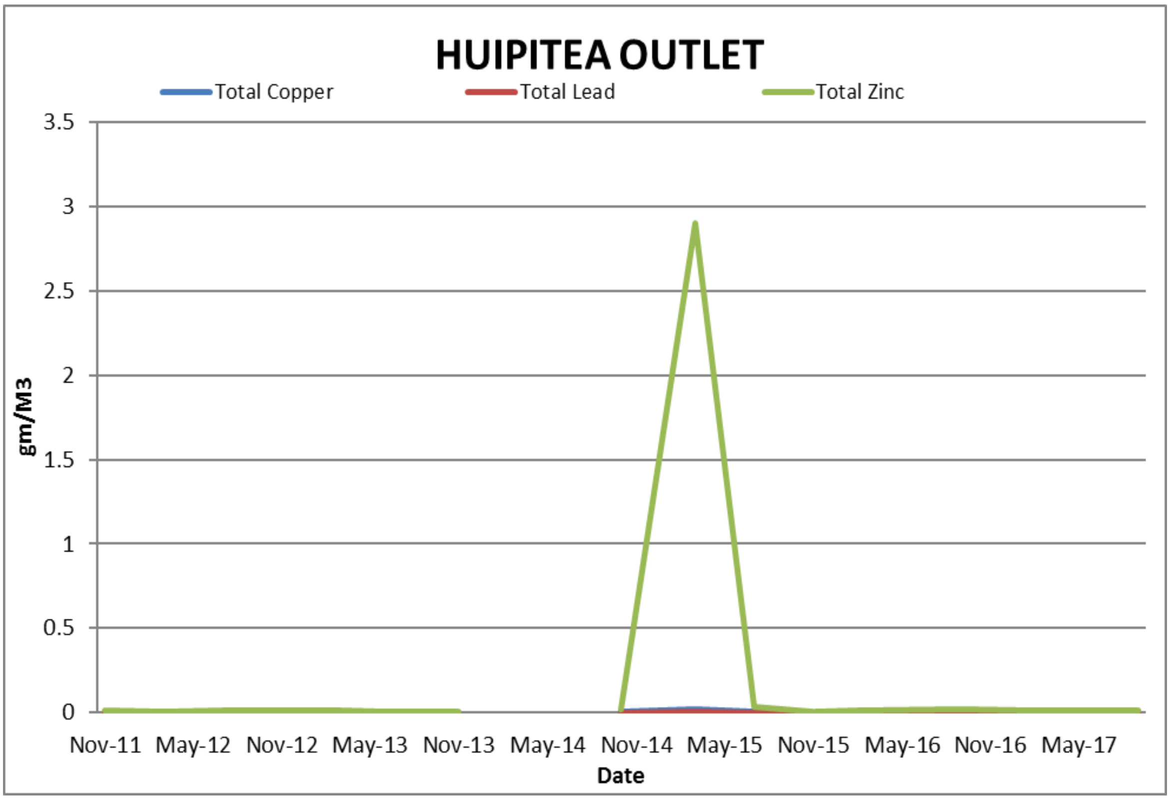
Litter that does enter the stormwater system is frequently captured in catch pits or at the screened intakes to pump stations. There is considered to be very little potential for significant quantities of litter to enter the river from the town's current stormwater system.

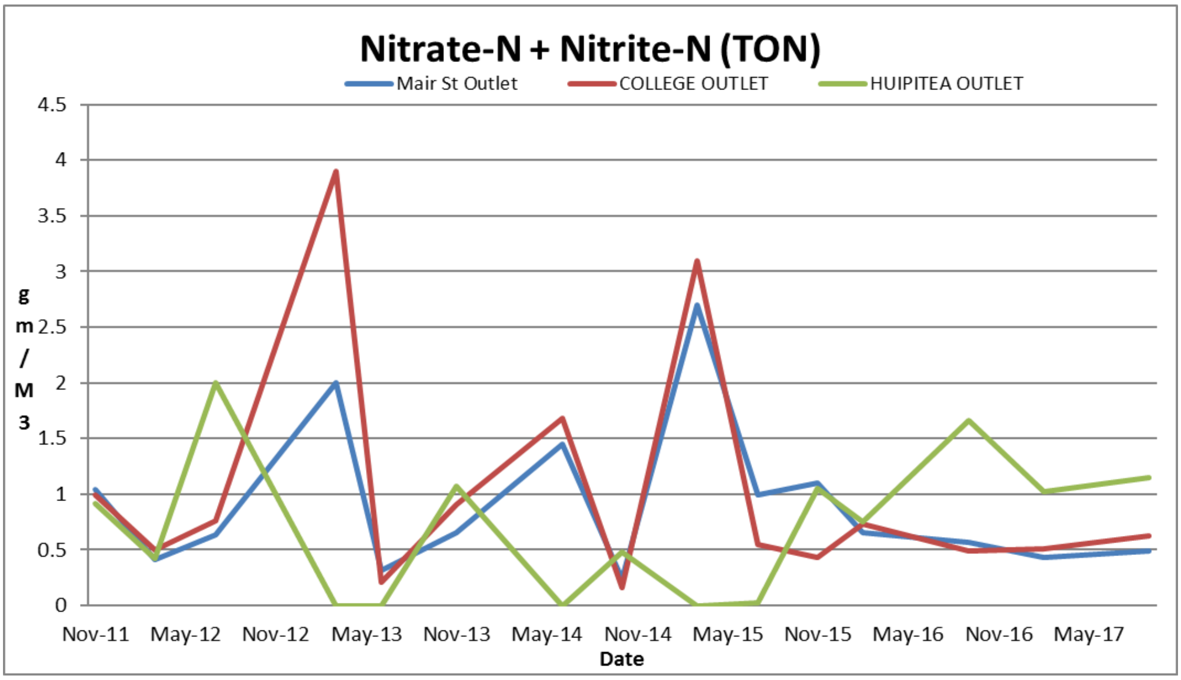
4.7 Historical Stormwater Contamination

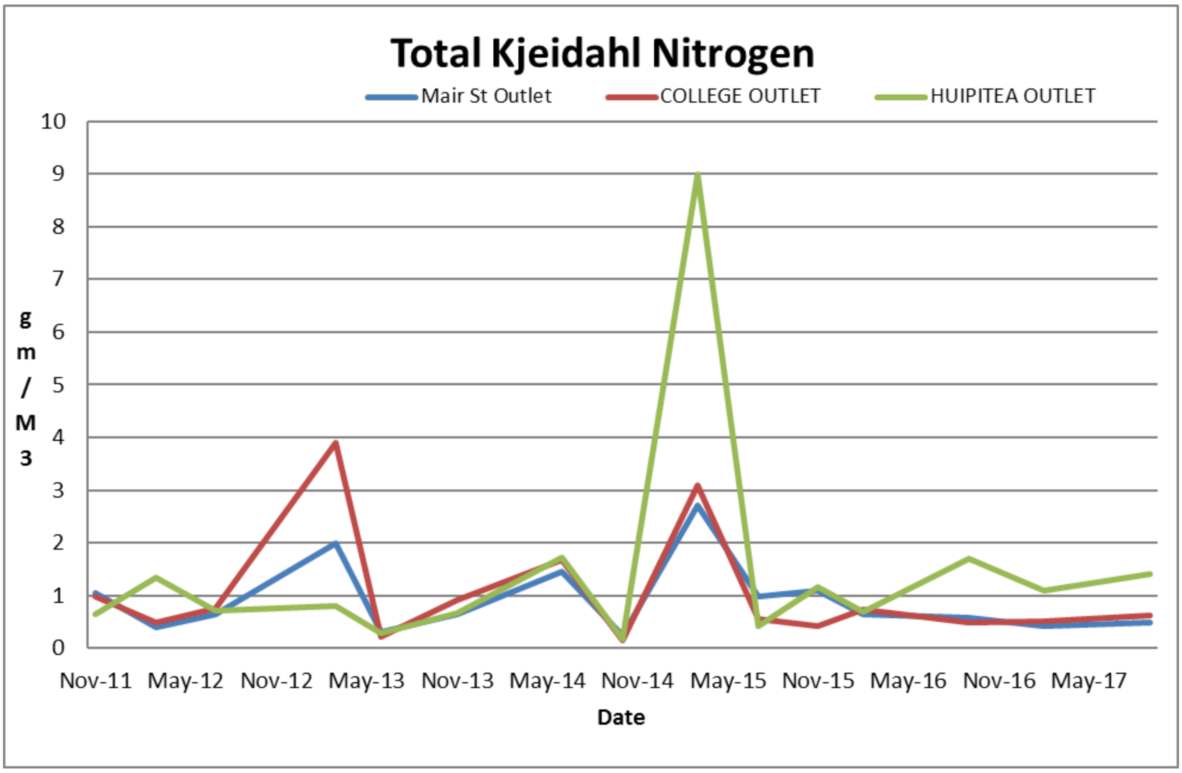
Council is aware of only one contamination, being the sewer pump station failure in October 2004. Outside this there is no evidence that any significantly harmful contamination of stormwater (either accidental or intentional) having occurred within the Otorohanga Township during at least the last 15 years, and Council has apparently not received any public reports or complaints in respect of stormwater quality during this period.

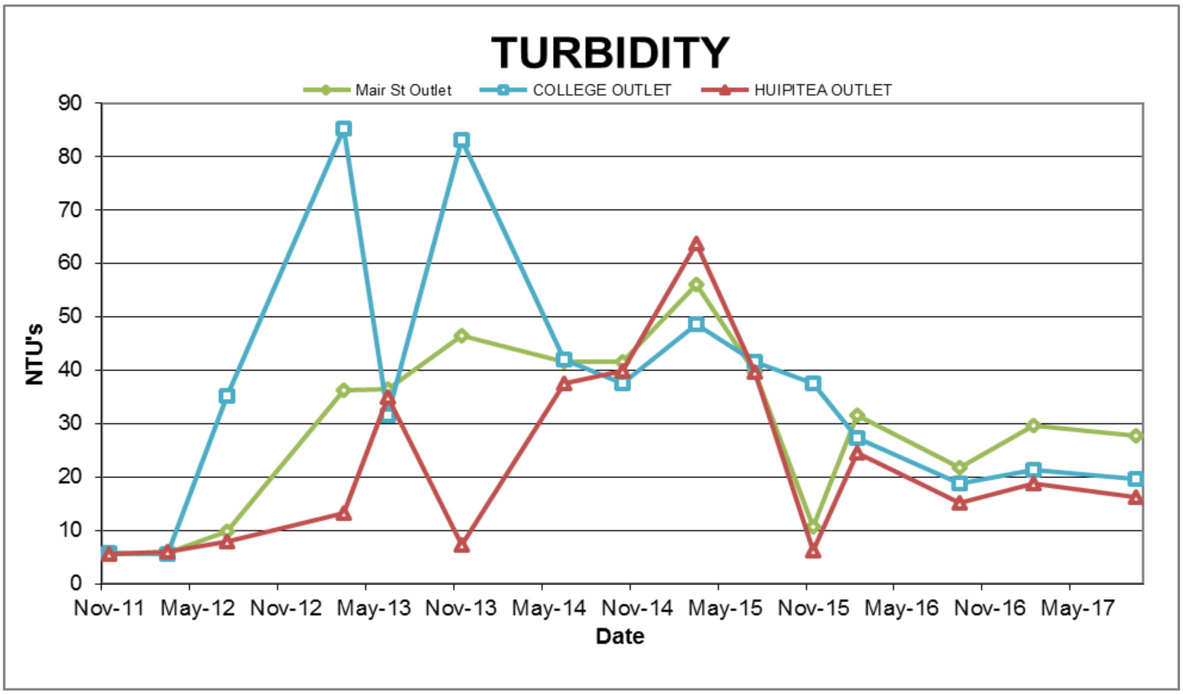
4.8 Measured Stormwater Quality

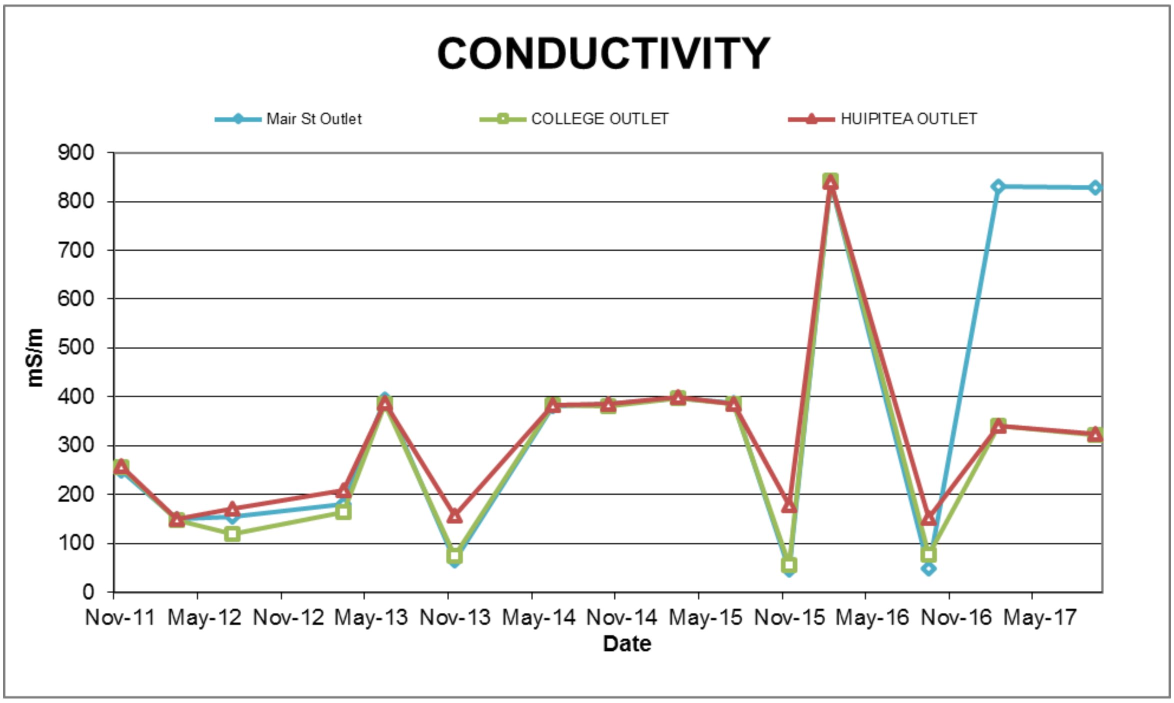
The following graphs provide a brief overview of recent grab sample analysis results.

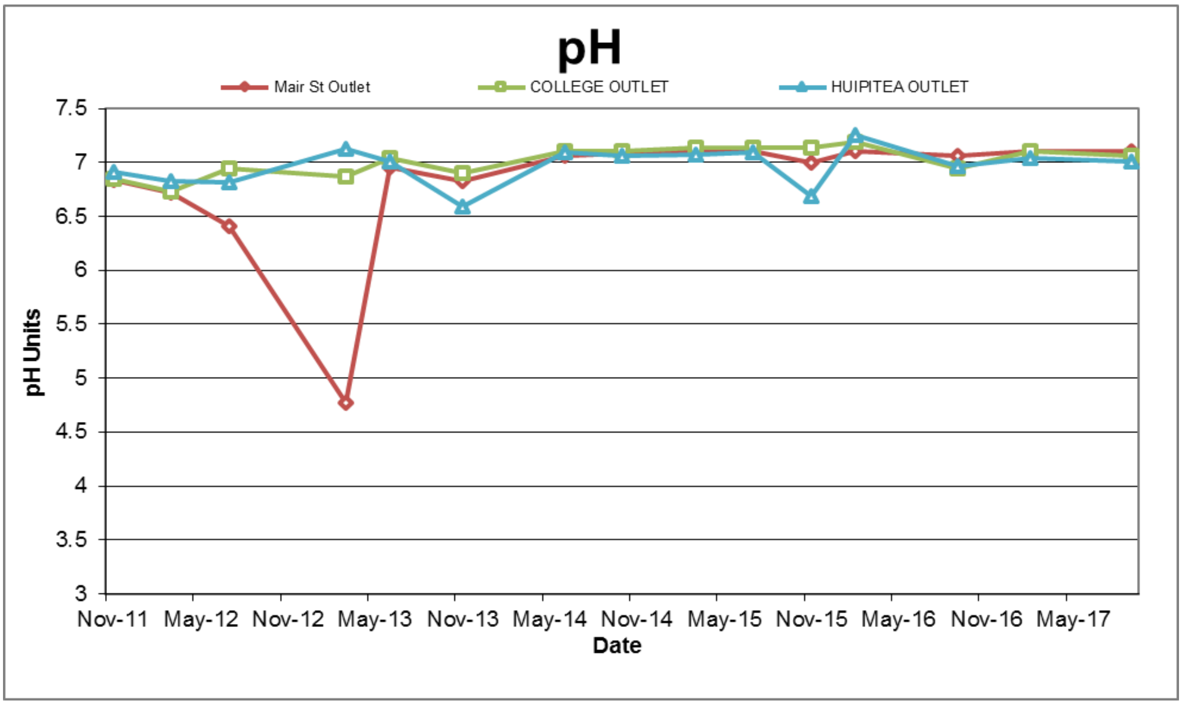


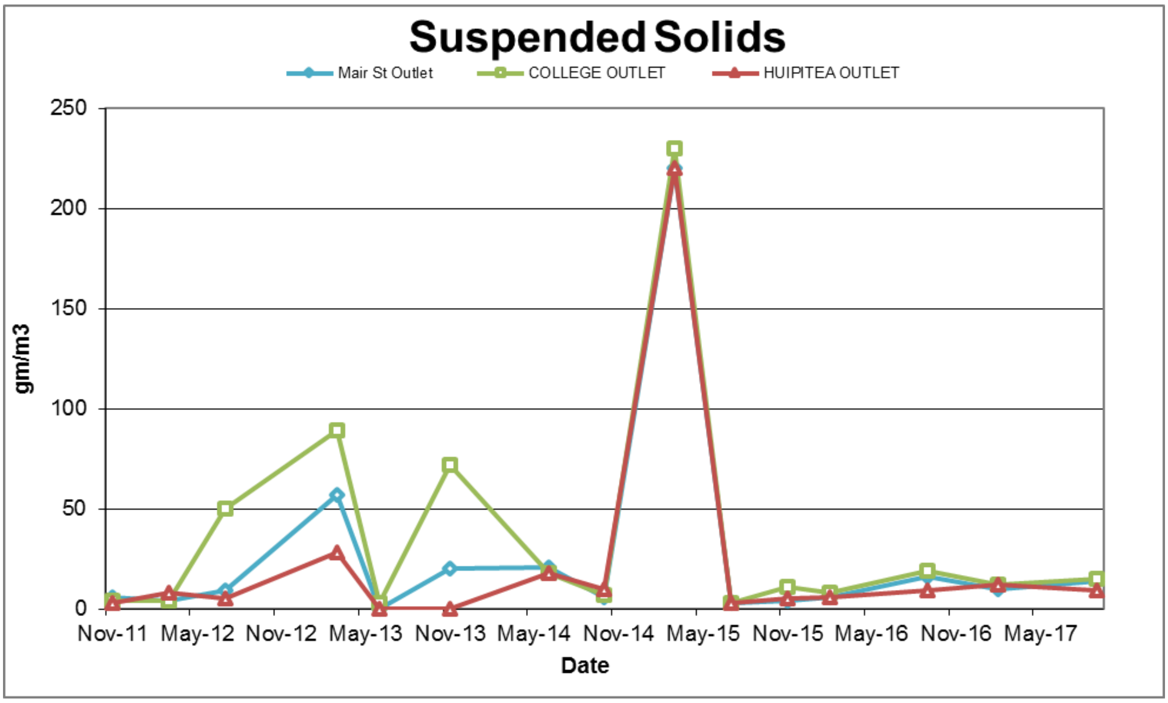

Nitrate-N + Nitrite-N (TON)
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
g m / M 3
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date

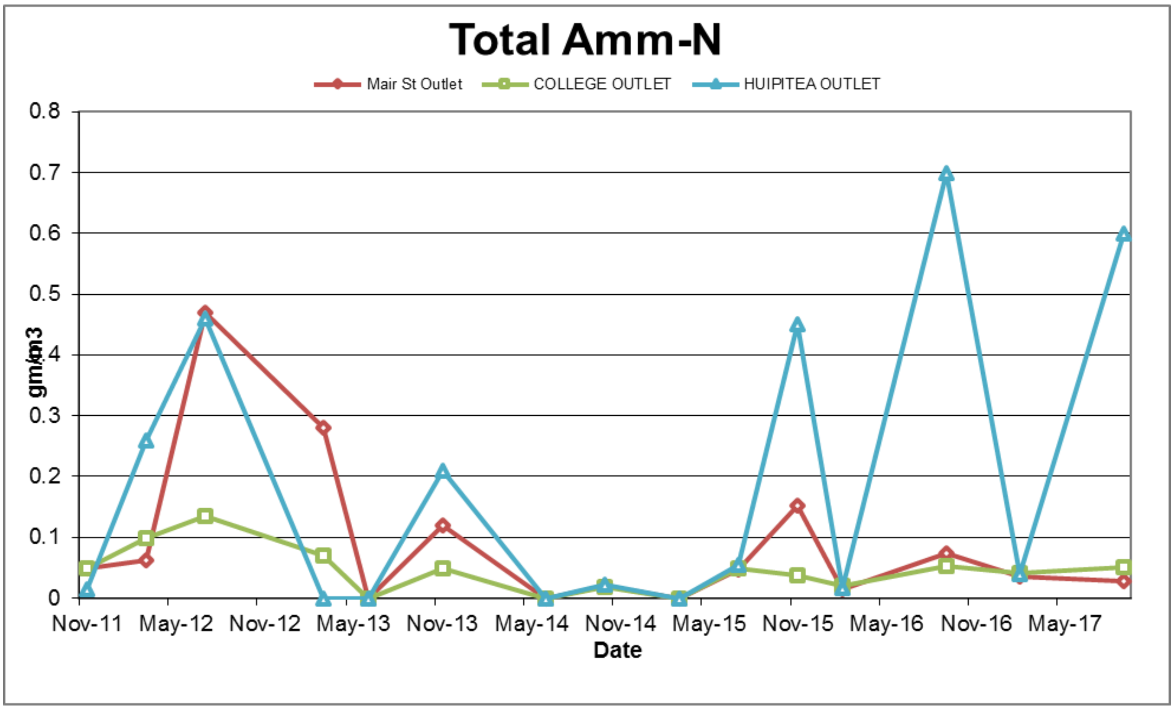

Total Kjeidahl Nitrogen
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
g m / M 3
10
9
8
7
6
5
4
3
2
1
0
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date

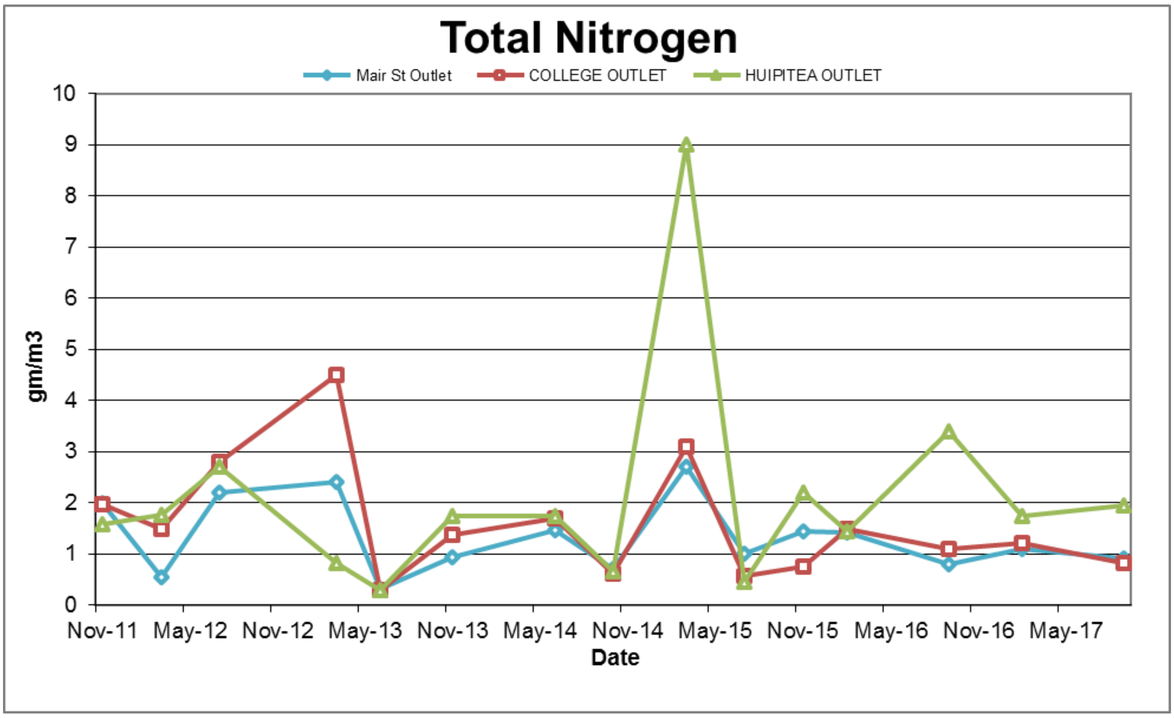

TURBIDITY
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
NTU's
90
80
70
60
50
40
30
20
10
0
Nov-11 May-12 Nov-12 May-13 Nov-13 May-14 Nov-14 May-15 Nov-15 May-16 Nov-16 May-17
Date

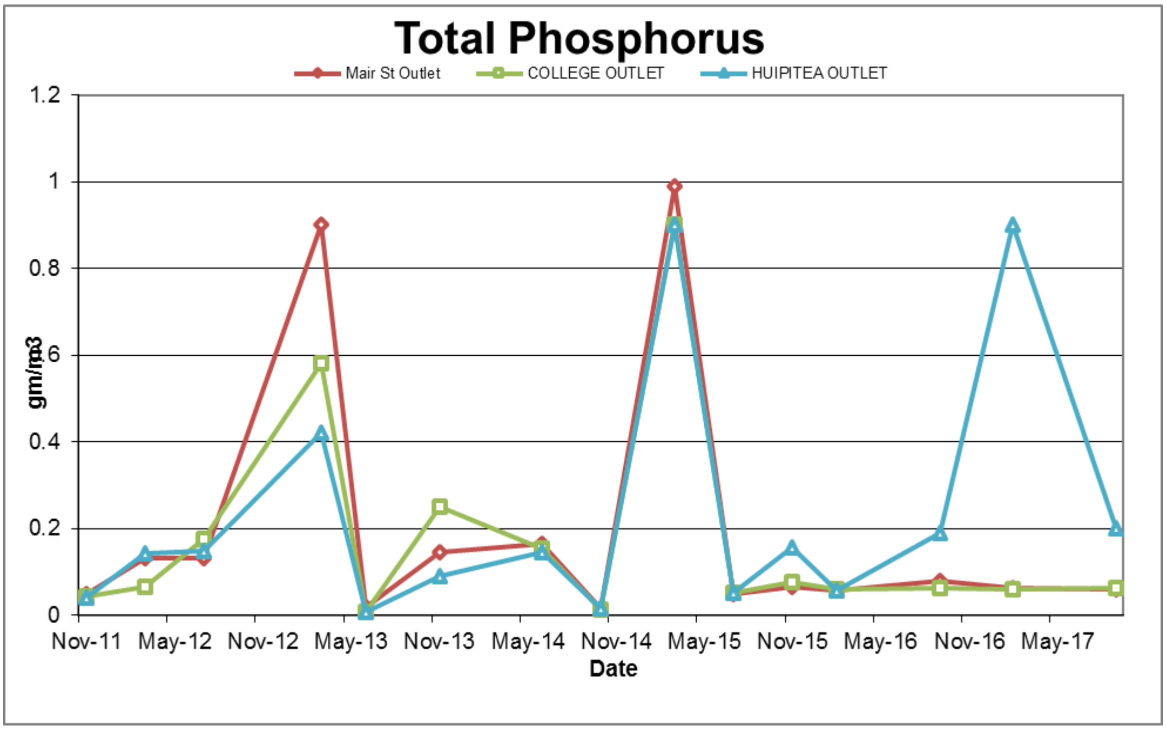

CONDUCTIVITY
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
mS/m
900
800
700
600
500
400
300
200
100
0
Nov-11 May-12 Nov-12 May-13 Nov-13 May-14 Nov-14 May-15 Nov-15 May-16 Nov-16 May-17
Date

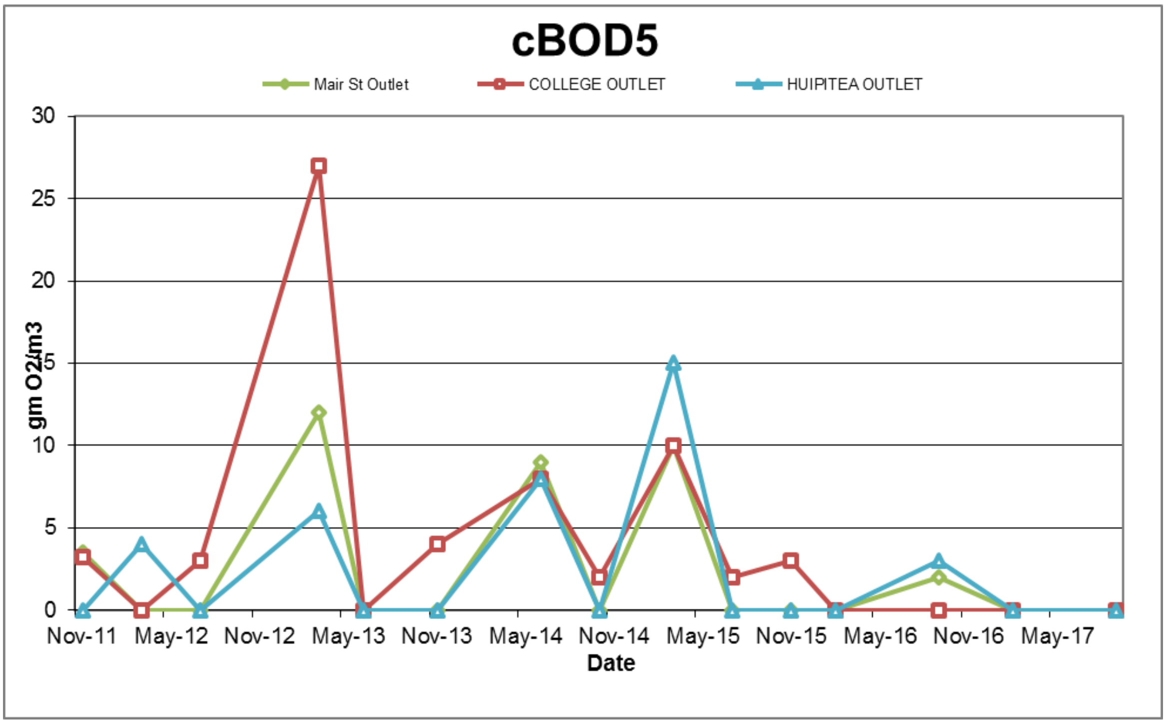

pH
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
pH Units
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date

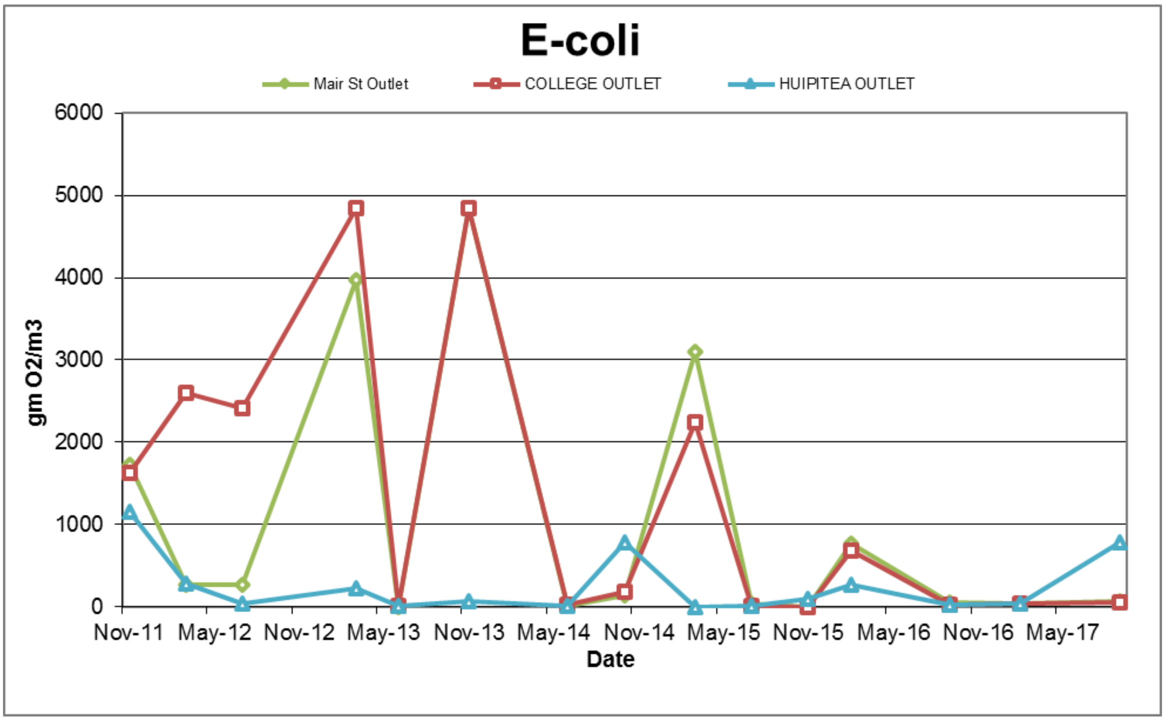

Suspended Solids
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
gm/m3
250
200
150
100
50
0
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date


Total Amm-N
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
gm/m3
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date


Total Nitrogen
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
gm/m3
10
9
8
7
6
5
4
3
2
1
0
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date


Total Phosphorus
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
1.2
1
0.8
0.6
0.4
0.2
0
gm/m3
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date


cBOD5
Mair St Outlet
COLLEGE OUTLET
HUIPITEA OUTLET
30
25
20
15
10
5
0
gm O2/m3
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Date



4.9 Effects on Receiving Waters – Quality

The effects of stormwater discharges on the Waipa River will be a function of both the composition and quantity of these discharges.

Initial sampling indicates that the composition of stormwater discharge from the Otorohanga Township is relatively typical of that found from urban areas. The quality of the sampled stormwater is however significantly poorer than what would be the expected 'average' quality of water in the Waipa River, in particular with respect to Nitrogen, Phosphorus, micro-organisms and turbidity.

It is however clear that the quality of both stormwater and river water will be widely variable, and that in many cases the discharged stormwater will be very effectively diluted in the river, with a resultant reduction of environmental impact on these receiving waters.

Results from computer modeling of the Otorohanga stormwater system suggest that the following peak total stormwater flows would occur into the river and into retention areas in response to storms:

Storm Return Period	Peak Flow, m^3/s
2 year	2.7
5 year	4.1
10 year	7.3

It should be noted that these flows will not in all cases occur directly into the Waipa River, because of potential differences between the times of peak flows in the separate catchments and the modulating effect of retention areas and the associated outlets to the river, which may or may not be pump assisted.

It is believed that in general the total discharge to the river through the pump station chambers will be limited to in the order of $2m^3$ per second, with a further flow of approximately $1m^3$ per second entering the river through outlets not associated with pump stations.

As such it is clear that the retention areas existing within the Township play an essential role in accommodating floods with a return period greater than two years. A conservative estimate of the total capacity of retention areas associated with pump stations is 10000m^3.

This is a very significant volume that would be easily able to contain the expected surcharging that would result from storms with a 10 year return period, which was the most severe rainfall event considered in the modelling exercise.

In practice the stormwater system within the Otorohanga Township has been able to cope with a number of severe rainfall events in recent times, including 50 and 100 year river floods during 1998 and 2004. The stormwater retention areas within the Township were heavily utilized at times during these events, but no damaging flooding result from this.

As stated previously, the stormwater flow to the Waipa River resulting from a 10 year return period storm event in the Otorohanga is estimated to be in the order of 3m^3 per second. If it is assumed that the river is at an average level at the time of such discharge (with corresponding flow in the order of 30 m^3/s) the stormwater from the Township would therefore be diluted at a ratio of 1:10 with river water.

This relatively low level of dilution would however only be of a very temporary duration, and under normal circumstances significantly higher levels of dilution (1:30 or more) would be expected.

5. Management of Stormwater Quality (see also 4.8)

The following measures will together comprise the Management Plan in respect of the quality of stormwater discharged to receiving waters adjacent to the Otorohanga Township:

5.1 Inspection and Monitoring (see also 4.8)

A monitoring programme for stormwater discharging from the Otorohanga catchment area is carried out that has the following components:

5.1.1 Quantitative Stormwater Sampling

Routine sampling of stormwater is carried out three times a year in accordance with conditions 31 and 32 of Resource Consent No.105592.

The test results from the samples are to be compared with the levels given in the “Urban Runoff Data Book” by Williamson and the “Guideline Trigger Levels” from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 1998.

5.1.2 Visual Stormwater Quality Observation

Because of the small size of the Otorohanga community and the permanent presence of Council staff and Contractors in the town there are frequent opportunities to observe storm water discharges in the normal course of works.

Council’s piped services maintenance contractor is contractually required to report on any observed conditions or evidence of non-routine discharges that may be non-compliant with relevant resource consent conditions.

Council staff and the contractor also regularly make specific inspections of storm water flows around the town during periods of unusually heavy rainfall to check for the presence of constrictions in the reticulation systems, which also provides an opportunity to observe storm water quality.

Such inspections typically occur 3 to 4 times per year.

5.1.3 Trade Waste Inspections

Many of the premises within the community that have potential for abnormal discharges to the stormwater system also make (or have potential for) abnormal discharges to the community sewerage system, and as such are required to hold a relevant Trade Waste Discharge Consent under Council’s Trade Waste (2000) Bylaw.

Premises holding Trade Waste Consents are typically inspected at least once every two years by Council staff or appointed agents.

Council is also utilizing these Trade Waste inspections to undertake inspections of connections to the storm water system, and to require modifications to these arrangements where appropriate.

There is close co-ordination between Council’s services staff, environment health officer, building consent officers and inspection/sampling contractors which allows a very comprehensive cover of properties

5.1.4 Response to Adverse Sample/Monitoring Results

Where results from sampling and monitoring are adverse (ie above the trigger levels identified in section 5.1.1, non-compliant with the conditions of the resource consent or otherwise considered to be a cause of concern) the following approach will be adopted:

- Additional sampling and monitoring will be immediately undertaken to further investigate the extent and source of the problem. Previous experience has however suggested that identification of the source may however not always be straightforward, since the discharge may be intermittent.

- If the observed effect is found to be persistent with a traceable source then Council will first attempt to achieve control at source.

- If a point source cannot be identified then further investigation will be conducted to evaluate if the contamination is likely to cause adverse effects to the aquatic environment. If this is the case it will be necessary to mitigate these effects by broader control strategies that may include treatment of the stormwater by separator, filter wetland or other method. If a treatment system is installed monitoring of the outlet will be required to ensure that the installation has achieved the desired goals and that the discharge is within the requirements of the resource consent.

5.2 Control of Development

5.2.1 New Development and Subdivision

The development of land into residential, commercial and industrial properties can have a significant effect on the levels of suspended solids within any stormwater runoff. Typically during such developments the vegetation is stripped and topsoil left exposed. Under such conditions any rainfall will cause excessive volumes of soil to be washed off.

In determining requirements for new works and subdivisions, Council is guided by the Otorohanga District Plan, NZS4404 “Code of Practice for Urban Land Subdivision” and the Hamilton City Development Manual, all of which have a number of requirements aimed at reducing sediment loads in stormwater. These include sediment traps and contour drains, vehicle crossings to be installed before work proceeds on the section and berms to be grassed as soon as possible.

The drainage philosophy for subdivisions is that major watercourse should be retained and located within public reserves and that developers should be encouraged to retain open drains rather than piping where possible. Where development is likely to occur adjacent to streams it would be advantageous to re-contour and institute a programme of riparian planting rather than piping the drain.

New subdivisions are however reviewed on a case by case basis to determine if additional treatment is required. In some cases mitigation of environmental effects may be required in the form of ponds, wetlands, grass swales and filtration or separation devices. These measures will need to be installed prior to the stripping of vegetation and re-contouring of the land. Additional measures may be required such as planting of riparian strips, use of on-site soakage and minimization of impervious areas.

Large earthwork projects require Resource Consents from Environment Waikato and resource consents will also be required for temporary diversion of natural water during construction, permanent diversion of any waterway and for discharge of stormwater.

5.2.2 Existing Partially Developed and Fully Developed Catchments

Although existing developed catchments do not produce the large volumes of suspended solids in the stormwater that are often associated with new subdivisions, they do produce a range of contaminants that can cause adverse effects on the aquatic ecosystems into which they are discharged. Household chemicals such as detergents and bleaches, and garden chemicals can all be washed into the stormwater system. Although the majority of the chemicals used inside the home will be discharged into the sewage system or septic tank there is a risk of these materials entering the stormwater system.

Washing of vehicles, particularly on impervious areas can result in sediment and detergent loaded runoff. Irresponsible disposal of used engine oil and paint thinners into the ground or stormwater system could be a concern. The general litter such as waste packaging can also be washed into the system. The most cost-effective way of tackling these problems is considered to be through public education rather than treating runoff down stream.

Properties within the catchment area that use large quantities of petrol, oil or other similar materials or which are engaged in food preparation should be equipped with suitable traps that must be serviced regularly. The Trade Waste Bylaw provides a mechanism by which such facilities can be checked by the Councils Environmental Health Officer during inspections of similar facilities for control of discharges to the sewer system.

The Otorohanga District Council has instituted an inspection programme of pipe outlets. The structural condition of the pipe and outlet structure will be examined, and attention will be paid to any apparent environmental effects of the discharge. This is to include any erosion caused and if there is any litter, scum, slime or algae that could be attributed to the discharge. This inspection is carried out by Council staff on an annual basis in June of each year.

5.3 Reticulation Maintenance

Council's piped services maintenance contractor is responsible for carrying out routine checking and preventative maintenance of flood pumps and intake facilities. The quality of such activities is assessed through a monthly audit of contractor performance.

Following two incidents in 2003 and 2004 where failures of equipment at pump stations were undetected, increased emphasis has been placed on regular and thorough inspection and maintenance of these and associated facilities, including outfalls.

Open drains are inspected once per year, and clearance of vegetation or other obstructions carried out as required.

Periodic inspections of selected piped stormwater drains are carried out using CCTV equipment, but a program of routine maintenance for these assets has not yet been found to be necessary – pipes are in general relatively new (average age 30 years) and significant blockages or other problems with piped drains have been very rare.

It is however acknowledged that as piped drains age a more pro-active approach may be required. For example, Council has approved the procurement of CCTV equipment 2018/19 fiscal Year for Water Services to utilize without the need for Services to approach Contractors to undertake pipe inspections.

There is a contract in place for cleaning of all catch pits in the community on a four monthly basis. The execution of this work is closely monitored by Council Roading Engineers, with the contractor being required to apply a date-coded mark to each cleaned catch pit to verify cleaning.

It has been found that cleaning at this frequency (which is higher than that adopted by most other local authorities) is sufficient to ensure that all catch pits remain relatively empty and able to effectively capture medium/large sediments at all times, and it is believed that this effective sediment capture is contributing to the low frequency of blockage problems in pipes.

Retention areas generally receive little maintenance other than regular clearance of debris from intake structures.

5.4 Public Education

It is believed that public education is likely to be one of the most effective means of improving the quality of stormwater discharged from the Otorohanga Township.

It is believed that Council's recent activities in inspecting premises in relation to trade waste consents has increased awareness of pollution prevention amongst operators or industrial and commercial premises, and that such informal education has improved the quality of stormwater being discharged.

Consideration is also being given to the development of an educational flyer which would include information on common pollutants and how to prevent them entering the stormwater system. This flyer would to be sent to all properties in the town.

Investigation will also be carried out into distributing information packs to local schools which would similarly highlight stormwater pollution issues.

Council's promotion of its 'zero waste' initiative and associated services is also seen as potentially contributing to improved stormwater discharge quality, by encouraging residents to focus on protecting the environment, and providing enhanced waste management services.

5.5 Modification of Stormwater System

In general it is believed that there is relatively limited practical opportunity for improving the quality of stormwater discharges by modification of reticulation infrastructure.

With the possible exception of the section of old river channel adjacent to Lake Huiputea the existing retention areas do not lend themselves to further development as water treatment facilities due to the fluctuation in water levels that occur, and the need to retain retention capacity.

Recently; the old river channel has undergone a face lift (approved and on application, share funded by the Waikato Regional Council) where it has been partially filled in with soils and planted out with perennial riparian vegetation that allows for the *'Old River Channel'* to transition into a wetland.

This wetland is now a key feature of the Lake Huiputea Park, in addition there is now a newly constructed walk way connecting Lake Huiputea, the new wetland and the Historic Huiputea Tree.

The design of the wetland is such that it acts to assist in the diversion of 1-1:20 year intensity flood event storm water to the Flood Pump Station while in 1:20 year plus flood events the wetland assists in the retention of storm water on route to the Huiputea Flood Pump Station.

The wetland has another role where diversion and retention of flood waters is further complimented, by treatment of storm water via nutrient absorption through the root systems of the newly planted perennial riparian vegetation and microbiological organisms that reside on the wetland vegetation plant stems.

It is hoped that the newly formed wetland will be home to native frogs and wetland dwelling fauna.

5.6 Emergency Responses

In the event of stormwater contamination emergencies Council will adopt some or all of the following measures:

- Prevention of Ingress to Drains

Council maintains a small stock of spill containing or absorbing barriers or pillows that can be used to prevent spills of contaminants entering the stormwater drainage system

- Capture of Spillage

Otorohanga is the base for two contractors engaged in effluent disposal, and it has in the past been found that these contractors respond very quickly to requests by Council to provide pumping and containment services for liquid wastes.

- Prevention of Discharge to River

Both of the stormwater catchments containing the activities with greatest risks of stormwater contamination discharge to the Waipa River via flood pump stations that incorporate valves capable of completely isolating the pump stations from the river.

If a very large stormwater contamination event was to occur that was quickly detected it would therefore be possible to retain the contaminated water within the community stormwater system, allowing either treatment, disposal or a controlled release to the river at a relatively low rate.

- Notification of Regional Council

ODC will immediately notify Waikato Regional Council of any stormwater contamination event which is considered to have potential for significant adverse environmental effects.

- Power Loss

Water Services has recently organized for all three flood pump stations to be generator ready for the rare occasion that power to the sites is lost during a severe weather event, learning from recent flooding events in Dunedin.

5.7 Conclusion

It is expected that with appropriate management the discharges from Otorohanga Township will have a minimal effect on the receiving waters in terms of water quality.

6. Objectives – Levels of Service and Public Perception

The primary objective in respect of flood prevention is to achieve the target levels of service set out in Council's Sanitary Services Asset Management Plan (2018) and LTCCP 2018/19 to 2028/29.

Level of Service Targets for the LTCCP are:

The primary objective in respect of flood prevention is to achieve the target levels of service set out in Councils stormwater Asset Management Plan, which are :-

- An average of less than 1 in 200 properties suffers any significant flooding per year
- Not more than 1 operational failure of a pump station per year (this may not result in any damaging flooding since significant retention capacity associated with these facilities)
- Not more than one stop bank failure per 100 years

It is believed that the levels of service above are achievable with the existing stormwater system.

7. Risk Assessment - Stormwater Quantity (Flooding)

An ongoing program of stormwater system development has greatly reduced the flooding problems experienced in the Township.

Recent experience has indicated that the remaining flooding problems are few in number, relatively localized, and can be (or have been) effectively controlled by modest improvement works that are relatively straightforward to design.

The major flooding experienced in February 2004 is considered an exception to this general picture, since in this case the flood waters came from the Waipa River, rather than arising because of the inability of the community's drainage system to discharge water to the River.

Whilst this event did clearly identify a deficiency in flood protection arrangements it is believed that the associated issues are in general not relevant to the comprehensive stormwater discharge consent.

In an effort to identify and remaining weaknesses in drainage capacity of the Otorohanga stormwater system Council did in 2001 engage a consultant to develop a computer model of the town's stormwater system, so that a more scientific analysis of the performance of the system could be carried out.

The analysis was carried out using the widely accepted MOUSE modeling software, based upon stormwater network data held in Councils survey and GIS systems, and rainfall data for 2 year, 5 year and 10 year return period design storms developed by Hamilton City Council based on actual storm event data collected in Hamilton. It is however believed that this rainfall data is sufficiently representative of Otorohanga to be used for modeling purposes.

The characteristics of these design storms used were as follows:

Return Period (yrs)	Duration (min)	Peak Intensity (mm/min)	Total (mm)
2	46	3.0#	19.8
5	46	4.5#	30.5
10	40	43.5*	156

Sustained peak intensity
* Instantaneous peak intensity only

Other hydraulic parameters generally applied were runoff coefficients of 0.25 for pervious surfaces and 0.93 for impervious surfaces (as discussed in section 2.4) and the following Manning Friction Factor (n) values:

Feature Type	Manning n
Smooth Concrete Pipes	0.0118
Open Drains	0.025
Obstructions	0.020

Development of an effective model did not however prove to be straightforward, for the following reasons:

- The available data on the stormwater network was in some cases either incomplete or of doubtful reliability.

- Significant areas of the Township are served by open stormwater drains that are essentially ‘natural’ in form, and therefore irregular and difficult to characterize in hydraulic terms.

- There are known or suspected to be a number of obstructions in piped drains that are also difficult to reliably represent.

- The micro-catchments served by minor branches of the stormwater network are in some cases difficult to define.

Considerable effort was devoted to attempts to calibrate the model so that its predictions were in line with observed behavior, but this was not entirely successful. Modeling of some catchments indicating greater than expected flooding, whilst other catchments were indicated to be less flood prone than had been previously observed, and the reason for these inconsistencies have not as yet be satisfactorily resolved.

Despite these limitations it is believed that the computer modeling has been able to provide a useful overall picture of the behavior of the stormwater system, and has identified some possible improvements which will be described in the following section.

It is hoped that in the future it may be possible to further refine the existing network model so that the location of secondary flow paths in the event of severe flooding (resulting from 50 or 100 year rainfall events) can be fully identified. This would in turn enable areas in the Township to be defined where any new buildings constructed within those areas will be required to have sufficient free board above the predicted 100-year flood level.

8. Management of Stormwater Quantity (Flooding)

The following measures will together comprise the Management Plan in respect of the quantity and rate of discharge of stormwater from the Otorohanga Township:-

8.1 Modification of Reticulation System

8.1.1 Rectification of Observed Problems

Though the stormwater reticulation system serving the Otorohanga Township has been progressively improved for many years, a few minor problems are still occasionally observed. Two such problems are:

- The capacity of some stormwater pipes draining the central commercial area of the Otorohanga community are under-sized, and a new pipeline has been installed under the railway, discharging into the Huiputea drain to relieve the existing reticulation of some of these flows.
- ‘Bubble Up’ catch pits on Te Kawa Street cause surface flooding and a new line is required to eliminate this.

These are relatively minor improvement works and it is planned that they will be completed over the coming 3-5 fiscal Years, this involves relining of Huiputea and Mair Street flood pump station discharge pipes.

8.1.2 Potential Improvements Indicated by Computer Modeling

The following is a summary of the result of the computer modeling described in section 7, including indicated potential system improvements.

- The modeling of the Otewa Road and Kakamutu Road / Domain Drive and catchments indicated less flooding than has been observed in practice. This could indicate that the computer model is relatively conservative and/or observed flooding has general been as a result of localised flow obstructions rather than inadequate pipe or drain sizes. This may warrant attention, with CCTV inspection as a first step.
- A particular area warranting regular inspection and cleaning is the section of drain and pipe from Alex Telfer Drive along Kakamutu Road to the junction with the line from Mountain View Road.
- The section of open drain along Kakamutu Road could be piped if 900 mm diameter pipes were used and any downstream obstructions were rectified.
- Modeling of the stormwater network draining to the Mair Street pump station (which includes much of the central area of town) has indicated much more extensive flooding than has been observed in practice, with flooding being indicated as widespread for even a two year return rainfall event, which is known not to be the case. A satisfactory explanation has not yet been provided for this inconsistency.
- Potential improvements that have been indicated by the modeling of this section of the network include :-
- Separation of the Te Kanawa Street pipeline from the main piped stormwater drain behind Turongo Street, with a new pipeline being established to the open drain along Te Kanawa Street.
- Separation of the entire CBD branch of the drainage system from the main piped drain, with this branch instead connecting to the new pipeline created along Te Kanawa Street by the works above.

- Observed flooding at the intersection of Turongo St and Hinewai St can be relieved by connecting the current ‘bubble up’ catch pits at the intersection to the main drain via the nearest manhole on Turongo St, if the gradient permits

Because of the previously observed inconsistency between modeled and observed network behavior, it is however believed that caution should be exercised in respect of undertaking the improvement works indicated above until further investigation has been carried out.

It was also indicated that the section of open drain near the intersection of Rangitahi and Te Kanawa Streets could be replaced by a 900 mm pipe, providing the pipes upstream were upgraded to the same diameter. It does however seem unlikely that such work would be justifiable in terms of resultant benefits.

8.2 Retention of Open Drains

During the last 100 years many of the open drains in the Otorohanga Township have been piped, due in part to a council policy offering a financial contribution to ratepayers who wish to carry out work on stormwater drains on their property to relieve flooding problems.

In practice however this policy was been applied fairly loosely, and in some cases council subsidised piping of open drains that merely shifted flooding problems to another location and/or worsened the overall effectiveness of the stormwater system.

It is now believed that the open drains which remain are in general beneficial to the performance of the stormwater system because of their retention capacity, and effort should be made to ensure that these drains are not piped unless there is a clear overall benefit from doing so.

With Council financial intervention in relation to piping of open drains on request, during the Otorohanga Community Board Meeting held on 27 July 2017 the Chair resolved that Council withdraws its policy on contributions to stormwater works and that in future no Council contributions are made to the piping of open storm water drains that is outside of operations.

8.3 Recognition of Development Impacts

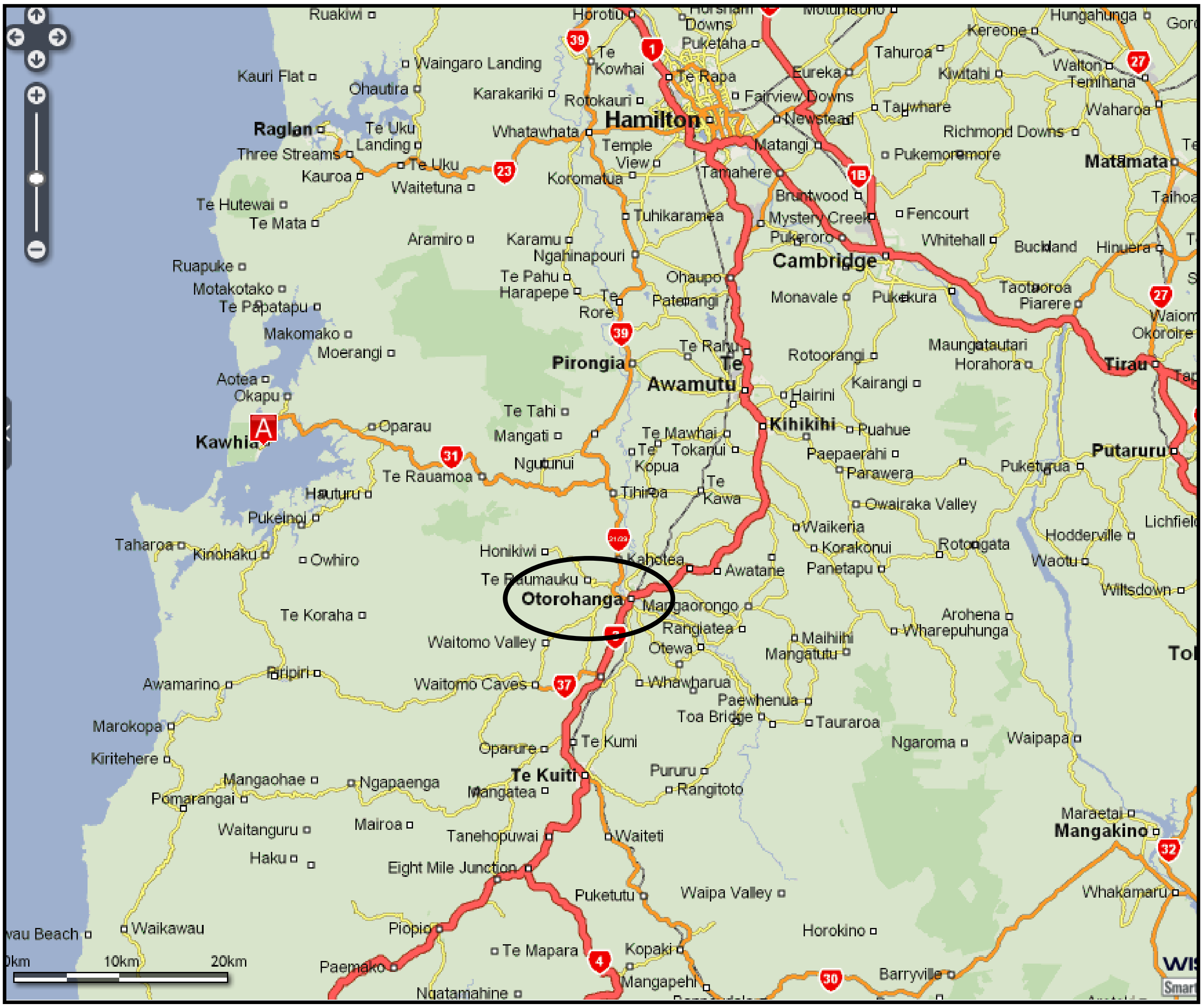
At present Council’s District Plan allows for buildings to cover 30% of the section area but makes no allowance for what proportion of the section may otherwise be impervious, such as driveways, paths and hard standings. It is clear that in many cases the proportion of sections covered by impervious surfaces is substantially more than 30%, with resultant adverse affects on runoff quantities and concentration times.

Given the current interest in property development within the Otorohanga community it is likely that there will be relatively small but continuing increases in the mean runoff coefficients for most catchments.

Whilst it is considered difficult to impose strict limits impervious surface areas within these catchments, Council is aware of the potential impacts of such development on the stormwater system, and will adopt a pro-active approach to ensure that such systems are upgraded as required to accommodate resultant additional loadings.

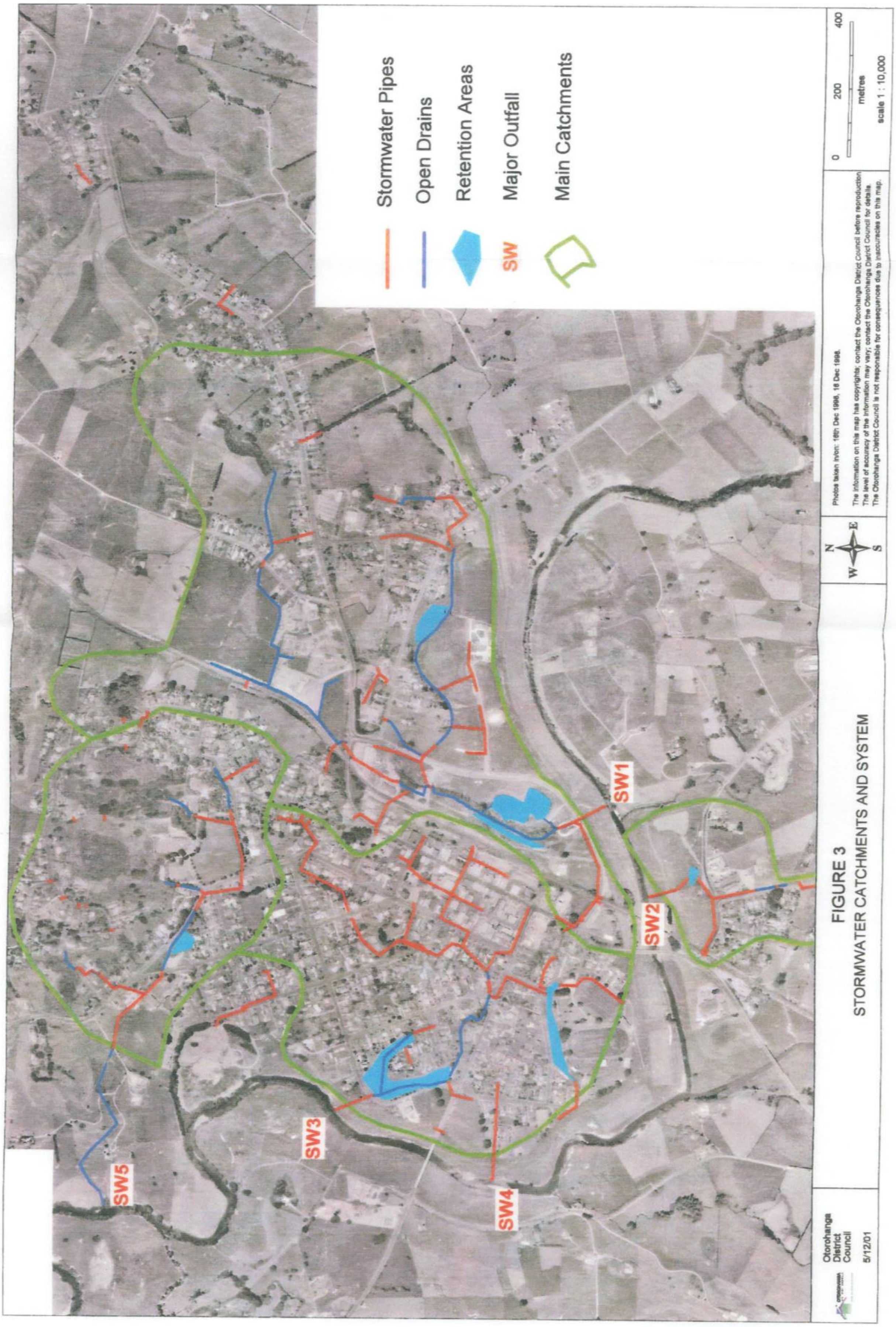
An example of this is the construction of a new drain to link the central commercial area of town to the Huiputea Drain, which has in part been carried out in response to development of extensive car parking areas for new businesses off Maniapoto Street.

Appendix 1 – Otorohanga Location



Appendix 2 – Otorohanga Township

Appendix 3 – Stormwater Catchments and Systems



KĀWHIA

STORMWATER MANAGEMENT PLAN

Updated July 2023

Contents

1. Executive Summary

Stormwater from the Kāwhia Township discharges to the Kāwhia Harbour, which is a valuable natural resource that must be protected from any adverse effects of such discharges.

This document seeks to:

- Describe the stormwater drainage system currently serving the Kāwhia Township, and the environment into which this system discharges;
- Identify and assess potential environmental effects associated with discharges of stormwater from the Kāwhia Township;
- Define management objectives in respect controlling the environmental effects of these stormwater discharges;
- Present options for achieving the defined stormwater management objectives in respect of issues associated with both water quantity and quality;
- Support the Ōtorohanga District Council Comprehensive Stormwater Discharge **Consent No. 105631** issued by Environment Waikato in respect of the Kāwhia Township. This Consent is effective until 1 July 2023.

2. Introduction

2.1. Kāwhia Township

The township of Kāwhia is the second largest community in the Otorohanga District, which was formed in 1979 as a result of amalgamations between Otorohanga Borough and Otorohanga County Councils. Kāwhia lies on the coast and is served by SH31. The general location of Kāwhia is shown on Appendix 1.

The town lies on the northwest shores of the Kāwhia Harbour, and is separated from the Tasman Sea coast by forested hills rising to an elevation of approximately 80 metres. The soils within the township are generally of a sandy, free draining nature.

The Kāwhia Township has a permanent population (2013 census) of 384. The total summer population does however peak at more than 3000 people. The community is largely lifestyle orientated and there is relatively little industrial or commercial activity. Kāwhia has a special significance to Maori as the final resting place of the Tainui canoe, with two important Marae located here.

2.2. Land Use

Kāwhia currently has some 494 individual properties contained within the catchment area, nearly all of which have been built upon. A street plan is attached as Figure 2.

The district plan does not zone individual areas for a particular land use, and each application for subdivision or land use is instead considered as an individual case. The few commercial properties in the township are located near the waterfront on Jervois, Pouewe or Omimiti Streets.

Only minor subdivision and some new building work is presently occurring in Kāwhia, and it is possible that further such development may continue since the township is being increasingly seen as an attractive 'lifestyle' location.

2.3. Stormwater Catchments

The stormwater systems serving the Kāwhia Township has a total stormwater catchment area of approximately 150 Hectares. All stormwater discharges directly to the sea, either via small localized catchments or via collectors connected to the 'main drain' running through the centre of the town.

The main defined sub-catchments within this area vary in size from 8 hectares to approximately 70 hectares. These major catchments are shown in Appendix 3.

These catchments can be briefly described as follows:

i. <u>Catchment 1 - Main Drain Catchment (26 Ha)</u>

This catchment collects run-off from the east-west orientated hillside behind the town, with a few residential properties at the foot of this hillside. This catchment contains much of the steepest topography in the vicinity of the township, but such areas are generally covered with natural bush or other vegetation, reducing runoff. It is estimated that no more than 3% of the catchment area is impervious.

ii. Catchment 2 - Pump Station/ Main Drain Catchment (15 Ha)

This catchment is contained within the smaller of the two basins that occur in the overall township catchment area. This area does not have a gravity outlet and a pump station lifts water from a retention area in the centre of this basin to discharge into the main drain.

The area is residential with some open spaces. It is estimated that in the order of 25% of the area of this catchment is impervious.

iii. Catchment 3 - Waiwera St/Main Drain Catchment (8 Ha)

This catchment lies behind central harbour foreshore, with water being collected in a 375mm pipe along Waiwera Street which discharges to the main drain in Catchment 4.

The area is residential, and it is estimated that in the order of 25% of the area of this catchment is impervious.

iv. Catchment 4 - Main Drain Catchment (10.7 Ha)

This catchment is located in the central valley of Kāwhia, and contains the main drains to which all other substantial catchments feed. The area is relatively flat and contains residential property and a few commercial/services premises. It is estimated that in the order of 35% of the catchment area is covered with impervious surfaces.

v. Catchment 5 - Tunnel Drain/Main Drain Catchment (70 Ha)

This catchment is contained within the larger of two basins in the overall catchment area, to the north of the town. Overland flow is collected in open channels through the farmland and diverted through a 375mm diameter culvert adjacent to the primary school. This culvert acts as a flow control device during significant events, backing up water into the low-lying area between the school and the Bowling Club. The outlet of this culvert combines with the flow from the steep hillsides to the north that form the remainder of the basin area, and this combined flow then discharges through a hand-dug tunnel under Rosamund Terrace to meet the main drains in central Kāwhia. Prior to the creation of this tunnel this northern catchment did not have effective drainage, and a substantial wetland existed north of the area now occupied by Pouewe Street.

The catchment is largely of an agricultural nature, draining a sheep and beef farming property. It is estimated that no more than 4% of the catchment area is impervious. Though this catchment represents approximately 55% of the total catchment area feeding to the main Kāwhia drains it is estimated to typically contribute only 35% of the total stormwater flow, because of the low level of development.

vi. Other Minor Catchments

There are a number of other minor catchments which discharge direct to the harbour. The largest of these serves the area behind Kaora Street between Moke Street and Kāwhia Street, discharging to an outfall near to the boat ramp. This catchment has an area of approximately 3 Ha.

2.4. Runoff Characteristics

At present the District plan allows for buildings to cover 30% of the section area but makes no allowance for what proportion of the section may otherwise be impervious, such as driveways, paths and hard standings. It is clear that in some cases significantly more than 30% of the section is covered by impervious surfaces.

As development occurs it is expected that there will be some further increase in the proportion of impervious surface in most catchments. This may result in a higher proportion of runoff and shorter runoff concentration times and the installation of a higher capacity piped reticulation may be required.

The runoff coefficients used in the investigations described in sections 2.5 and 7.0 are not known, but would be expected to be similar to the general guidelines below:

Surface Type	Runoff Coefficient
Roofs	0.95
Asphalt, concrete or paved areas	0.9
Lawns and uncultivated land	0.3
Cultivated land	0.2

2.5. Existing Stormwater System

Until 2000 the stormwater system serving Kāwhia comprised mostly unlined open drains and road culverts. The Kāwhia Community Board has had a policy of not assisting landowners to pipe drains on their properties, but a small number of drains have been piped without Council's knowledge or input.

Severe rainfall events in 1998 and 1999 did however expose inadequacies in respect of the stormwater system, and as a result an investigation was carried out by Opus International Consultants in 1999. This resulted in a recommendation to upgrade the main drains in Catchment 4. This work has been completed, and the system is now as shown in Appendix 4.
The Kāwhia stormwater reticulation network managed by Council now includes in the order of 1.2 km of piped mains ranging in size from 225mm to 900mm diameter and 1.1 km of open drains. There is also a small pump station, which drains a ponding area on Waiwera Street. All stormwater outfalls discharge to the Kāwhia Harbour, with the three major outfalls discharging to a small bay north of the Community Hall on Jervois Street. These outfalls (900mm pipe from Tainui St., 750mm pipe from Pouewe St. and 300mm pipe from Jervois St.) have been designed to be as unobtrusive as possible, and discharge over rip-rap that reduces the kinetic energy of the outflow to reduce erosion potential.
Little information is available on the historical development of the stormwater system in Kāwhia, and as a result the age of many pipes is not known. The condition of these pipes is however in general believed to be good, with remaining lives predicted to be 40 years or more.

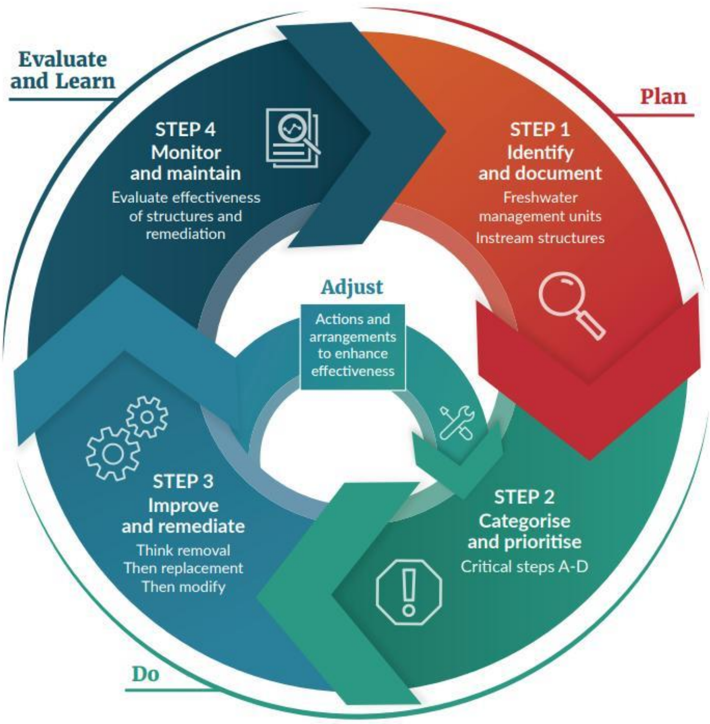
The piped drains constructed by Ōtorohanga District Council have generally been designed for at least a 10 year storm event, in line with normal industry standards. The pipes laid without Council's knowledge may however be under-specified or inadequately designed, potentially impacting adversely on the performance of the network, though the extent of such impacts would be expected to be relatively minor. On the basis of previous experience the overall performance of the stormwater drainage network is considered to be good, with only a few localized flooding problems that are being progressively remedied.

2.6. Nature of Receiving Waters

All stormwater from the Kāwhia Township is discharged into the Kāwhia Harbour. This is an attractive coastal feature containing estuarine wetlands, salt marshes and mudflats which are considered to be of outstanding wildlife significance. The wetland features in particular are listed as being of national significance.
Previous studies carried out in relation to the potential ecological affects of the Kāwhia Landfill on the harbour (Opus 1998) have indicated that harbour very contains low levels of contaminants in comparison with the Manukau Harbour, and that ecosystems in the harbour are relatively unpolluted.

2.7. Fish Passage obstacles

Council is committed to supporting Waikato Regional Council give effect to Te Mana o te Wai through ki uta ki tai (diagram below) and implementing it in mahinga kai areas to assist diadromous indigenous freshwater fish at various stages of their lifecycle.



In-river structures in several territorial authority areas of the Waikato Region were evaluated between 2000 and 2005 for their restriction to fish passage – see *"Assessment of Fish Passage within Selected Districts of the Waikato Region"*, Environment Waikato Technical Series 2007/03. More than half the structures posed some form of restriction to fish passage. In the Otorohanga district, only 6% of the structures posed a barrier and none of the structures are located in the Kāwhia catchment area.

All stormwater discharges directly to the sea via catchments connected to the main drain and there are no open streams or rivers in the township.

3. Objectives

At all times, Ōtorohanga District Council aims to implement Best Practicable Options for minimising actual and potential adverse effects on the receiving environment that result from the municipal stormwater system diversion and discharge activities, and urban development activities.

Council's monitoring programme aims provides information used to identify stormwater management methods to be implemented to avoid, remedy or mitigate actual or potential adverse effects on the receiving environment and ensure compliance with the conditions of Resource Consent 105631.

4. Risk Assessment – Stormwater Quality

Risks associated with potential flooding are considered to be low. Public health risks have in the past been viewed as more significant, with known discharges of septic tank effluent to stormwater drains in the central areas of the community.

Extensive improvements to on-site wastewater systems and the piping of previously open stormwater drains have now largely eliminated such septic discharges. All remaining open drains are shallow and fast flowing, and as such risks of accidents are also very low.

Potential risks in respect of the discharge of stormwater from the Kāwhia Township are considered to be associated with the following pollutants or effects:

- Sediments (erosion/wear/weathering/cleaning);
- Micro-organisms (faeces and organic matter decay);
- Toxic organics (pesticides, herbicides, septic tank leaks etc);
- Heavy metals (vehicle wear, weathering, sewer/septic tanks);
- Litter and debris (human litter and leaf fall, lawn clippings);
- Oils and surfactants (Asphalt pavements, Hydro Carbons, vehicles, other spillages).

The following sections attempt to evaluate the extent of risks associated with these pollutants posed by different areas and activities within the Kāwhia Township.

4.1. Residential Properties

Chemical pollution risks associated with residential properties in Kāwhia include:

- Pesticides and herbicides used in gardens;
- Oil, paints and associated substances (typically through spillage or illegal discharge);
- Detergents and surfactants (in particular those used in vehicle washing);
- Micro-organisms from septic tank leakages;
- Heavy metals from building weathering, septic tank leakages.

There is also potential for sedimentation from building weathering and wash-down activities (eg flaked paint and cladding particles).

Under intense rainfall conditions there is also potential for additional sediment loads to result from the development of secondary (surface) flow paths when the primary drainage system is overloaded.

The Kāwhia township does not have a reticulated sewerage system and septic tanks are used. Council is however investigating the possible installation of a reticulated sewerage system for Kāwhia.

4.2. Commercial and Industrial Properties

There is very little commercial or industrial activity within the Kāwhia Township. During 2000 discussions and preliminary inspections resulted in six premises in the catchment areas being identified as potentially ‘high risk’ in respect of stormwater contamination.

These premises were visited by a consultant to assess potential stormwater contamination hazards and to assess the control measures in place. The findings from these visits are presented in Appendix 1, and these confirmed the belief of Council that the stormwater contamination risks associated with commercial and industrial properties in Kāwhia are very low. While no formal monitoring programme is in place, general inspections of the stormwater system indicate no significant changes to these findings.

4.3. Agricultural Activities

Approximately one quarter of the catchment area drained by the Kāwhia Township stormwater system is agricultural land, owned by a single farmer and used for sheep or cattle grazing. This type of farming is typical of the agricultural activity that is carried out in the areas around the Kāwhia Harbour. It is believed that the agricultural activity that is conducted within the township catchment would have no greater effect on the quality of the receiving waters than would result from similar farming practices in an entirely rural setting.

4.4. Vehicular Emissions

Vehicles emit a range of pollutants including lead, zinc, copper and hydrocarbons, which will be deposited on and around the road.

Roads have high runoff coefficients and low concentration times, allowing any contaminants on the roads to be quickly washed into the stormwater.

The level of potential stormwater contamination associated with vehicular emissions in Kāwhia is however expected to be low, because of low traffic densities. Traffic counts carried out in January 2016 in Pouewe Street where SH31 enters Kāwhia gave an average of 913 vehicles per day. It is estimated that few other roads in the township are carrying more than 200 vehicles per day. The low levels of heavy metals recorded in samples of stormwater (see section 4.8) appear to support this.

4.5. Street Litter

See also 5.4 Stormwater Assets – maintenance and cleaning

There is considered to be very little opportunity for street litter to be discharged to the harbour through the stormwater system, since all inlets to the main stormwater pipes are covered by grilles, as shown below. Small pieces of litter might however enter the system through these grills or catchpits, but the quantity is expected to be insignificant.

- All footpaths, kerb and channel and catchpit grates in the central area of Kawhia (main street, wharf) are hand or mechanically swept to remove all detritus once each week.

4.6. Historical Stormwater Contamination

There is little evidence that any significantly harmful contamination of stormwater (either accidental or intentional) has occurred within the Kāwhia Township during recent times, though as mentioned previously there has been localized sewerage contamination, and septic tanks have on occasion been adversely affected by flooding.

4.7. Measured Stormwater Quality

Refer to tables and graphs following section 4.9.

Stormwater quality is monitored as per resource consent issued by the Waikato Regional Council, condition 30 of RC105631 that requires as a minimum:

a) Monitoring of pH, Electrical Conductivity, Total Suspended Solids, Biochemical Oxygen Demand, Total Phosphorus, Ammoniacal Nitrogen, Total Kjeldahl Nitrogen, Total Nitrogen, and E-coli. at the Main Drain outlet.

b) Such monitoring shall be undertaken sometime during the months of June / July and January / February, and as far as practicably possible during the first flush of a medium intensity rain event of at least 20 minutes duration, and following at least one week of dry weather.

c) The monitoring undertaken during the months of January / February should also include Total Petroleum Hydrocarbons, Total Zinc and Total Copper.

d) Monitoring for visual signs of contaminants in stormwater (conspicuous oil or grease films, scums or foams, floatable suspended materials, conspicuous change in colour or visual clarity).

4.8. Effects on Receiving Waters – Quality

The effects of stormwater discharges on the Kāwhia Harbour will be a function of both the composition and quantity of these discharges.

The quantity of stormwater discharge is relatively small and a peak of 2.4m^3/s could be expected at the outfall of the main drains in response to a 20 minute design storm with a 5 year return period. For a 10 year return period the corresponding peak flow would be expected to be approximately 2.8m^3/s.

Under normal rainfall conditions stormwater flows could be expected to be much less than 1 m^3/s. In dry conditions the base flow is negligible.

Based upon the available discharge quality and quantity data it is not believed that stormwater discharges would adversely affect the receiving waters to a significant extent.

4.9. Rural land discharges

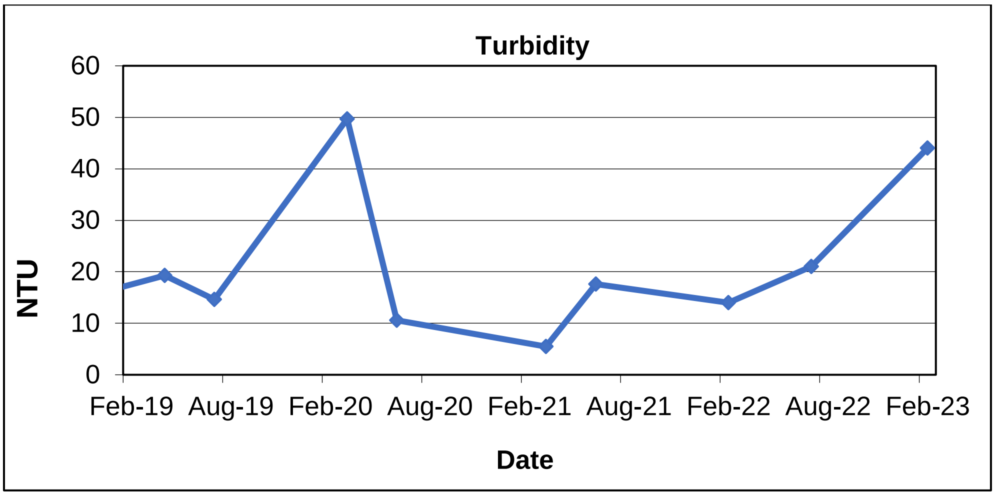
Investigations undertaken into elevated Turbidity, Total suspended solids (TSS), E. Coli, and Total Phosphorus (TP) within certain catchments of the network suggests that discharges from rural land directly above Kāwhia township are entering the stormwater system.

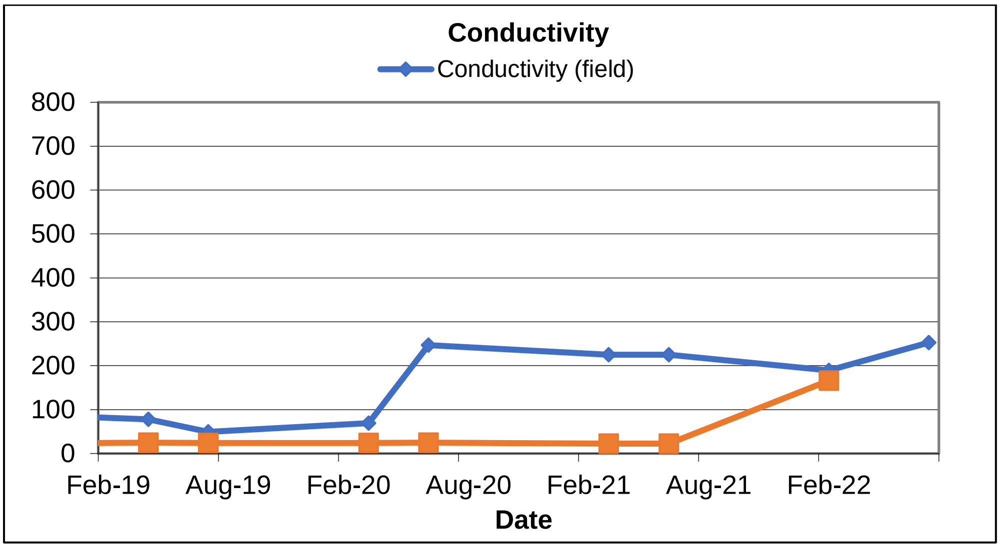
Electric fences have been installed to keep livestock as far from the catchment area as possible. This situation is being monitored by water staff.

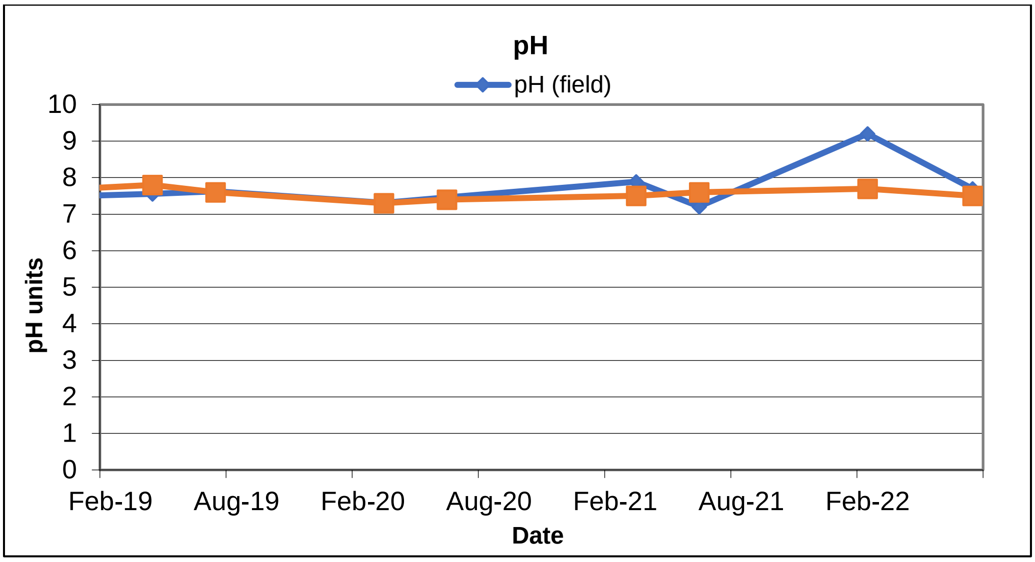
Council will consider communicating with landowners about measures that can reduce water quality.

Stormwater Quality

Date		22/07/2022	24/02/2023
Temp		11.3	15.6
Turbidity	NTU	21	44
Conductivity (field)	µs/cm	253	156
pH (field)		7.7	7.6
Total Coliforms	MPN/100mL	4884	1223000
E-Coli	MPN/100mL	1145	17329
pH (Lab)		7.5	7.7
Conductivity (Lab)		226	121
Total Suspended Solids	g/m3	23	130
Total Ammonical -N	g/m3	0.06	<0.01
Total Nitrogen	g/m3	1.58	0.7
Total Kjeidahl Nitrogen	g/m3	0.42	0.46
Nitrate-N + Nitrite-N	g/m3	1.17	0.24
Total Phosphorous	g/m3	0.194	0.21
cBOD5	gm O2/M3	<2	6
Total Copper	g/m3		0.0041
Total Lead	g/m3		
Total Zinc	g/m3		0.032






pH
pH (field)
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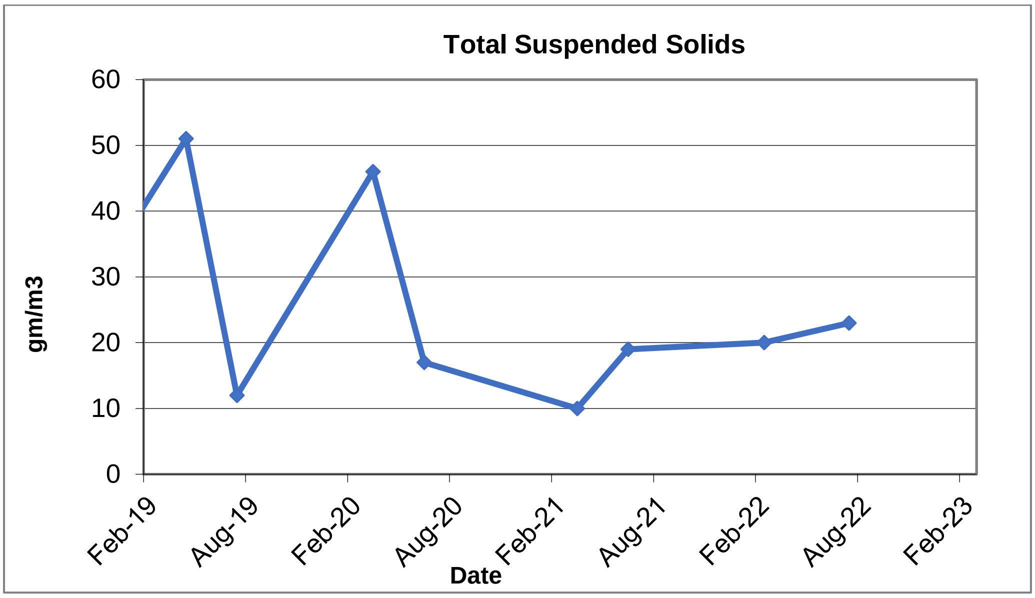
9
8
7
6
5
4
3
2
1
0
pH units
Feb-19
Aug-19
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Date


Total Suspended Solids
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50
40
30
20
10
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gm/m3
Feb-19
Aug-19
Feb-20
Aug-20
Feb-21
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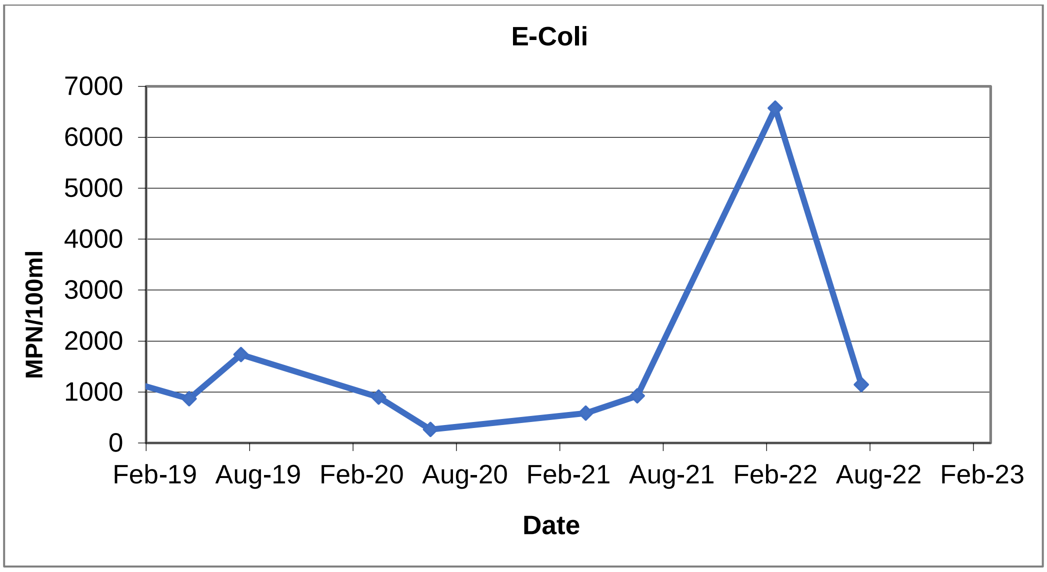
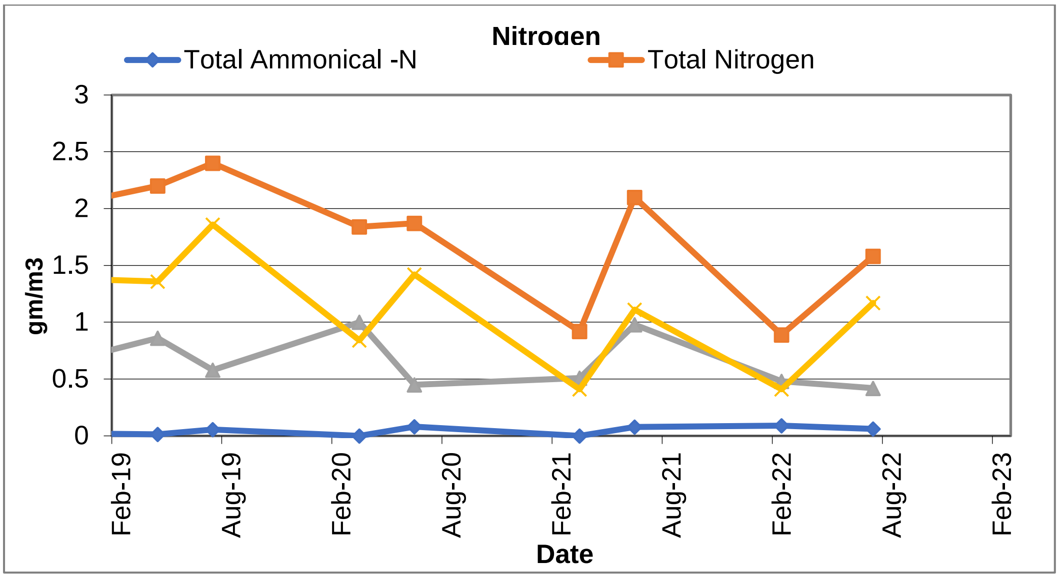
Feb-22
Aug-22
Feb-23
Date


E-Coli
7000
6000
5000
4000
3000
2000
1000
0
MPN/100ml
Feb-19
Aug-19
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Date


Nitrogen
Total Ammonical -N
Total Nitrogen
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2
1.5
1
0.5
0
gm/m3
Feb-19
Aug-19
Feb-20
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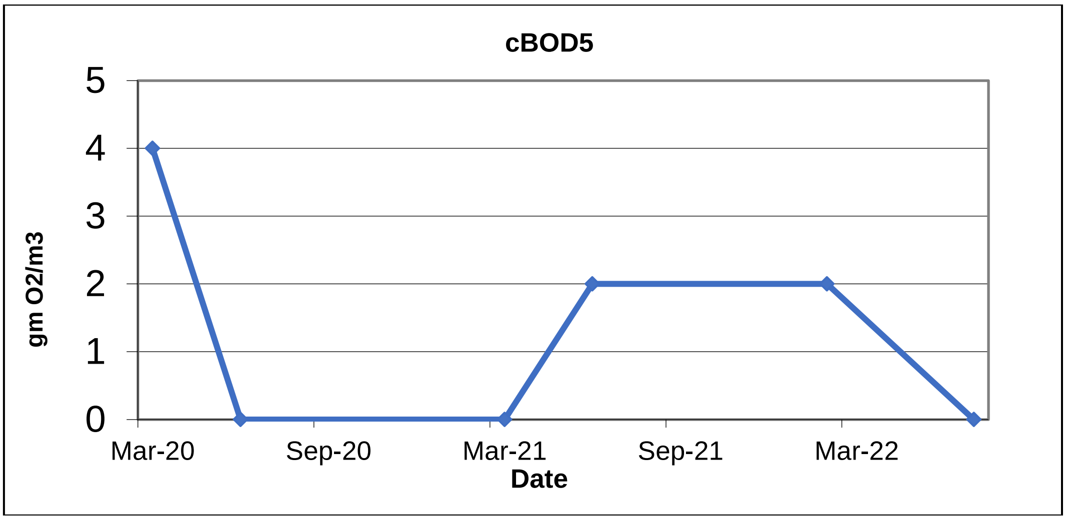
Aug-22
Feb-23
Date


cBOD5
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3
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1
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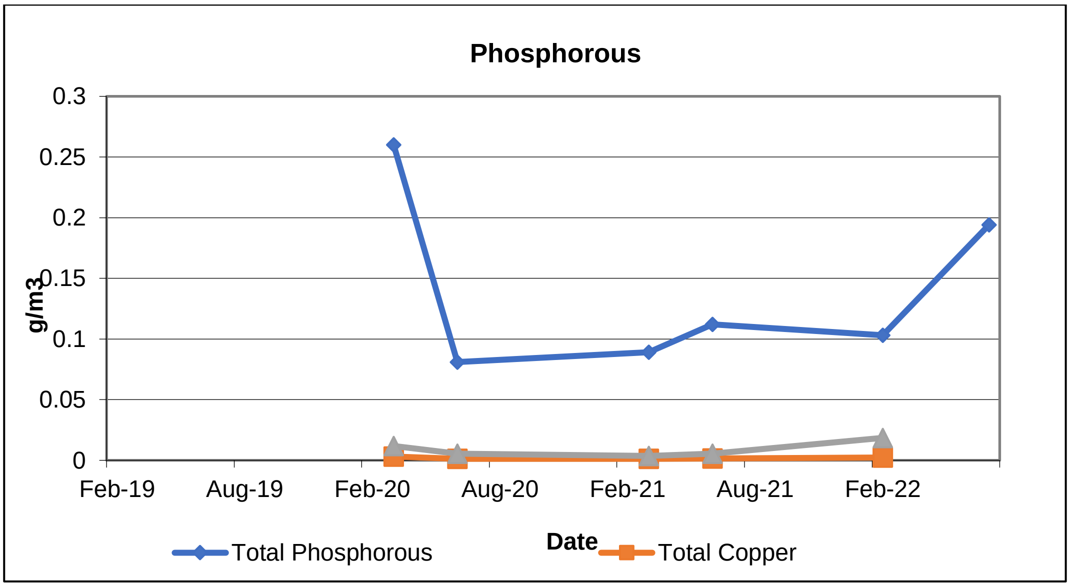
gm O2/m3
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Date


Phosphorous
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0.25
0.2
0.15
0.1
0.05
0
g/m3
Feb-19
Aug-19
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Date
Total Phosphorous
Total Copper

5. Management of Stormwater Overland Flow

The following measures will together comprise the Management Plan in respect of the quality of stormwater discharged to receiving waters adjacent to the Kāwhia Township:

5.1. Inspection and Monitoring

In addition to the sampling undertaken as set out in the Resource Consent Clause 30A and 30C, ongoing monitoring will be undertaken as set out in Clause 30b and 30d-i as follows:

a) Monitoring of scour and erosion effects due to stormwater diversions and discharges.
b) Monitoring to determine if municipal stormwater system catchpits are fitted with stormwater treatment systems that are capable of capturing and retaining the majority of gross pollutants and suspended solids, and if these are maintained in good working order.
c) Monitoring to determine appropriate street and catchpit cleaning operations and frequencies.
d) Monitoring to identify informal sewerage system connections to the municipal stormwater system.
e) Monitoring to determine municipal stormwater system collection points that are most at risk from non-routine contaminant discharges to the municipal stormwater system.
f) Monitoring to identify municipal stormwater system structures that are impeding the upstream and downstream movement of fish and other aquatic fauna.
g) Monitoring to identify secondary overland flow paths.

When sample results are found to exceed the alert levels given in RC105631, further analysis will be carried out. The likely effects of elevated levels will be determined and if these are expected to be significant then measures will be taken to mitigate them.

The contamination will be checked to ascertain if the reported level is correct and is an ongoing problem not a one off event and if this contamination is likely to cause adverse effects to the aquatic environment. If this is the case it will be necessary to mitigate these effects.

Control of point contamination sources will be used where this is possible, but it is suspected that in many cases it may be difficult to identify such sources and broader control strategies may be required.

5.2. Control of Development

New Development and Subdivision

The development of land into residential, commercial and industrial properties can have a significant effect on the levels of suspended solids within any stormwater runoff. Typically during such developments the vegetation is stripped and topsoil left exposed. Under such conditions any rainfall will cause excessive volumes of soil to be washed off.

In determining requirements for new works and subdivisions, Council is guided by the Otorohanga District Plan, NZS4404 “Code of Practice for Urban Land Subdivision” and the Hamilton City Development Manual, all of which have a number of requirements aimed at reducing sediment loads in stormwater. These include sediment traps and contour drains, vehicle crossings to be installed before work proceeds on the section and berms to be grassed as soon as possible.

The drainage philosophy for subdivisions is that major watercourse should be retained and located within public reserves and that developers should be encouraged to retain open drains rather than piping where possible. Where development is likely to occur adjacent to streams it would be advantageous to re-contour and institute a programme of riparian planting rather than piping the drain.

New subdivisions are however reviewed on a case by case basis to determine if additional treatment is required. In some cases mitigation of environmental effects may be required in the form of ponds, wetlands, grass swales and filtration or separation devices. These measures will need to be installed prior to the stripping of vegetation and re-contouring of the land. Additional measures may be required such as planting of riparian strips, use of on-site soakage and minimization of impervious areas.

Large earthwork projects require Resource Consents from Environment Waikato and resource consents will also be required for temporary diversion of natural water during construction, permanent diversion of any waterway and for discharge of stormwater.

5.3. Existing Partially Developed and Fully Developed Catchments

Although existing developed catchments do not produce the large volumes of suspended solids in the stormwater that are often associated with new subdivisions, they do produce a range of contaminants that can cause adverse effects on the aquatic ecosystems into which they are discharged. Household chemicals such as detergents and bleaches, and garden chemicals can all be washed into the stormwater system. Although the majority of the chemicals used inside the home will be discharged into the sewage system or septic tank there is a risk of these materials entering the stormwater system.

Washing of vehicles, particularly on impervious areas can result in sediment and detergent loaded runoff. Irresponsible disposal of used engine oil and paint thinners into the ground or stormwater system could be a concern. The general litter such as waste packaging can also be washed into the system. The most cost-effective way of tackling these problems is considered to be through public education rather than treating runoff down stream.

Properties within the catchment area that use large quantities of petrol, oil or other similar materials or which are engaged in food preparation should be equipped with suitable traps that must be serviced regularly. The Trade Waste Bylaw provides a mechanism by which such facilities can be checked by the Councils Environmental Health Officer during inspections of similar facilities for control of discharges to the sewer system.

The Otorohanga District Council has instituted an inspection programme of pipe outlets. The structural condition of the pipe and outlet structure will be examined, and attention will be paid to any apparent environmental effects of the discharge. This is to include any erosion caused and if there is any litter, scum, slime or algae that could be attributed to the discharge. This inspection is carried out by Council staff on an annual basis in June of each year.

5.4. Stormwater Assets – maintenance and cleaning

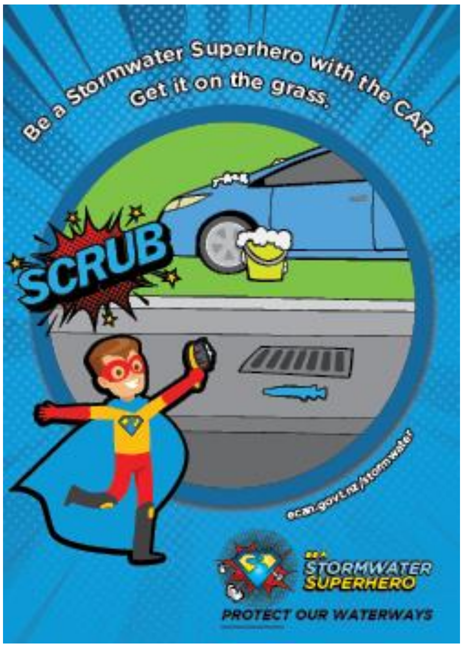
Council's contractor is responsible for maintenance and cleaning of stormwater assets in Kawhia which is set out in the 'District Roads Maintenance' document. The documents outlines cleaning and maintenance schedules of stormwater assets including culverts, catchpits, kerbs and channels.

- All footpaths, kerb and channel and catchpit grates in Jervois Street (Pouewe Street to the Wharf) and Pouewe Street (Jervois Street to Charleton Street) are hand or mechanically swept to remove all detritus once each week.
- The contractor undertakes a detailed inspection and maintenance works of all stormwater assets annually.
- In addition, Council conducts an annual inspection.
- A separate Annual Joint Inspection takes place involving council staff and the contractor.
- More frequent checks may be made by the public in service requests.

5.5. Public Education

Public education is likely to be one of the most effective means of improving the quality of stormwater discharged from the Kāwhia Township. In previous years, a flyer containing information about common pollutants and how to prevent them from entering the stormwater system was created and distributed around the town. The following could occur:

- Distributing information packs to Kāwhia School which highlight stormwater issues;
- Communicate with owners of farmland above Kāwhia regarding ways that they could reduce bacteria and sediment from entering the stormwater system;
- Look for ways to better manage waste including hazardous substances;
- Social media campaigns promoting keeping contaminants out of stormwater – posters overleaf (Environment Canterbury):



5.6. Modification of Stormwater System

There is limited practical opportunity for improving the quality of stormwater discharges by modification of reticulation infrastructure. Kāwhia Township occupies a relatively narrow strip of land between the shores of the harbour and the hills to the west. Because this strip of land is extensively developed there is little opportunity to construct effective treatment facilities such as detention ponds or wetlands and such modifications may be unnecessary as shown by sampling and testing carried out.

5.7. Conclusion

It is expected that with appropriate management the discharges from Kāwhia Township will have a minimal effect on the receiving waters in terms of water quality.

6. Emergency Response Procedures

6.1. Significant non-routine contaminant discharges – overview

- Be safe (wear correct PPE)
- Stop the source
- Protect stormwater
- Notify
- Clean up
- Dispose
- Restock and review

6.2. Procedure

- Discharge discovered by council staff or member of the public
- Emergency services called – 111
- Council called (24 hours) - 0800 734 000 or 07 873 4000
- Assessment made by emergency services or ODC water operators wearing PPE - determine:
  - surface area
  - depth
  - concentration
  - origin
  - drainage pathway
- Diversion, containment, treatment
  - Council has a spill kit stored in Kawhia
  - Block off access to stormwater drains or unpaved ground with drain covers, bunding, sandbags, booms or materials appropriate to the spill
  - If possible, mop up contaminant
- Dispose of contaminant using suitable materials
- Submit re-order used spill kit contents
- Water operators and Compliance officer to complete a spill report immediately to find out how and why the spill happened.

6.3. Public Education

Council will consider its communication strategy regarding spills.
It may be beneficial to post information on the council website and social media pages about what to do to avoid a spill and/or in the event of a small or a significant spill. The cost is minimal and potential benefit, huge and lead times minimal.

7. Objectives

7.1. Levels of Service and Public Perception

- **Level of Service**: Council stormwater systems are well operated and maintained
- **How it contributes to community outcomes**: Sound planning of appropriate stormwater systems will ensure that communities are safe and healthy and ensure that efficient and effective water services are provided, to meet both current and future demands.

How performance is measured:

- Percentage of customers requesting substantial improvements of level of service from a three yearly customer satisfaction survey
- Perception of customers actively engaging with the service taken from an annual survey of 50 randomly selected customers recorded on Council's service requestor as making requests for services to Council in the last 12 months. Received responses identify performance as adequate or better. Where less than 50 recorded, all recorded customers surveyed.

During the LTP 2021 – 2031 early engagement, residents did not request any improvements to the stormwater system.

7.2. Performance Targets (for the financial year)

You can expect	Measuring our performance	Baseline Performance 2019/20	Target 2021/22	Target 2022/23	Target 2023/24	Target 2024/31
Stormwater operations are optimised	The number of flooding events in the District; and, For each flooding event, the number of habitable rooms affected – expressed per 1000 properties connected to the stormwater system*	0 flooding events	0 flooding events	0 flooding events	0 flooding events	0 flooding events
Stormwater operations are managed in accordance with resource consents	Compliance with the resource consents for discharge from the stormwater system, measured by the number of: • Abatement Notices; • Infringement Notices; • Enforcement Orders; and • Convictions – received by the Council*	0 non-compliance actions	0 non-compliance actions	0 non-compliance actions	0 non-compliance actions	0 non-compliance actions

You can expect	Measuring our performance	Baseline Performance 2019/20	Target 2021/22	Target 2022/23	Target 2023/24	Target 2024/31
Service response times are reasonable	• The median response time to attend to a flooding event*, measured from the time of notification until service personnel arrive on site	0 flooding events	< 4 hours 30 minutes	< 4 hours 30 minutes	< 4 hours 30 minutes	< 4 hours 30 minutes
Stormwater operations are managed to minimise complaints	• The number of complaints received by the Council about the performance of the stormwater system, expressed per 1000 properties connected to the stormwater system*, as recorded in the request for service system	Not measured	≤ 2 complaints	≤ 2 complaints	≤ 2 complaints	≤ 2 complaints

8. Risk Assessment - Stormwater Quantity (Flooding)

The Kāwhia stormwater system has apparently been developed in a largely piecemeal fashion. An investigation in 1991 identified system deficiencies in the vicinity of Waiwera Street and associated connections to the main drain; in 1992 this lead to the development of the pump station on Tahuri Street.

In 1998 and 1999 there was however flooding under houses in the main drain catchment, and as a result Opus International Consultants were engaged by Council in 1999 to analyse the Kāwhia stormwater system and propose measures to reduce the risk of flooding. The solution proposed by Opus was a major upgrade of the drains in the main drain catchment, in particular on Tainui, Cowell and Fairchild Streets. This work was completed in 1999/2000.

There are currently some minor problems associated with the drainage of parts of the northern catchment that were reclaimed from the original wetland; these problems only affect peripheral areas of town, and there is little potential for significant damage to result.

Similarly there are minor drainage issues in the vicinity of Amopo, Kāwhia, Pouewe Streets and Rosamund Terrace; these problems pose little risk of property damage, and do not require urgent resolution.

As a result of the major improvement works it is believed that the Kāwhia stormwater system is able to accommodate a critical rainfall event with a 5-year return period without any surcharging, and that providing that existing secondary overland flow paths are maintained, the system could safely accommodate significantly greater ARI rainfall events without any significant damage resulting. This is considered an acceptable standard of performance, and as such the risks associated with flooding are acceptable.

At a lower level of risk there are a few small areas in the community where the existing reticulation does not meet the general requirement of being able to accommodate 20 year return period flows and/or the blockage of particular pipes has potential to create problems that could not be easily addressed in flooding situation. Such issues are being progressively addressed through upgrading or extension of existing networks. These localised drainage problems generally have potential to create relatively minor nuisance rather than serious flooding.

The level of risk in respect of public health is considered to be very low. The majority of stormwater drains are piped, and the open drains that exist are generally shallow, fast flowing and not considered likely to be a source of disease or a cause of serious accident. There have been no known instances of disease or accident being related to these drains in the last 15 years.

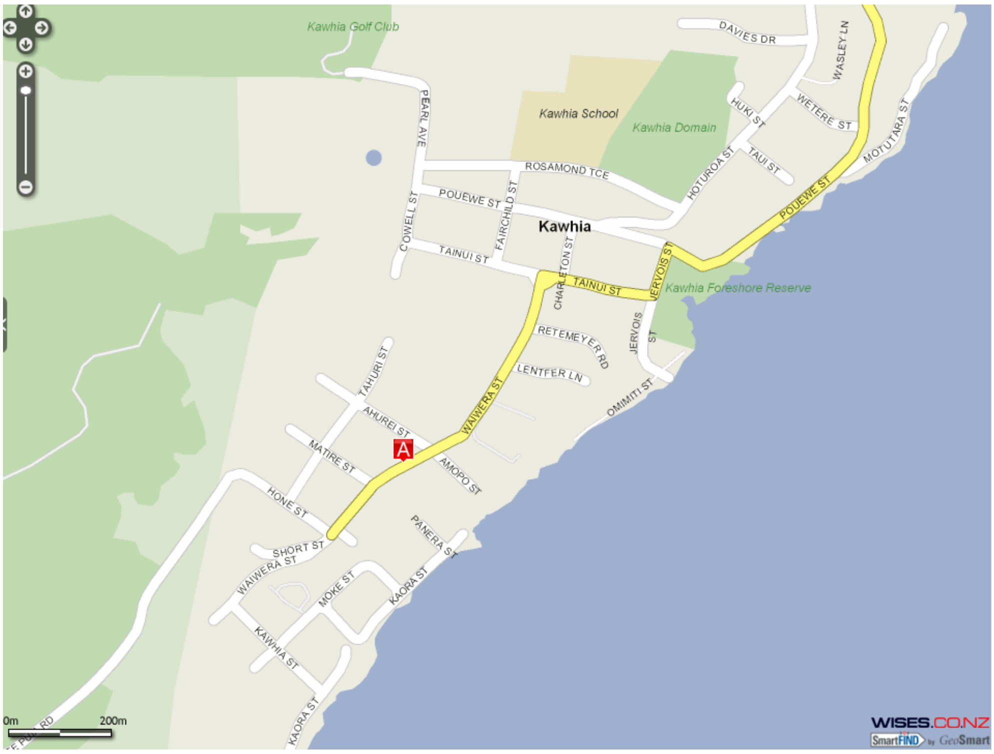
The potential for discharge of harmful substances to the stormwater from commercial or industrial premises is also monitored and controlled through inspections that take place in relation to Council’s Trade Waste Bylaw. Whilst this Bylaw focuses on discharges to the sewer system, the associated property inspections also provide an opportunity to identify and address stormwater contamination risks.

9. Management of Stormwater Quantity (Flooding)

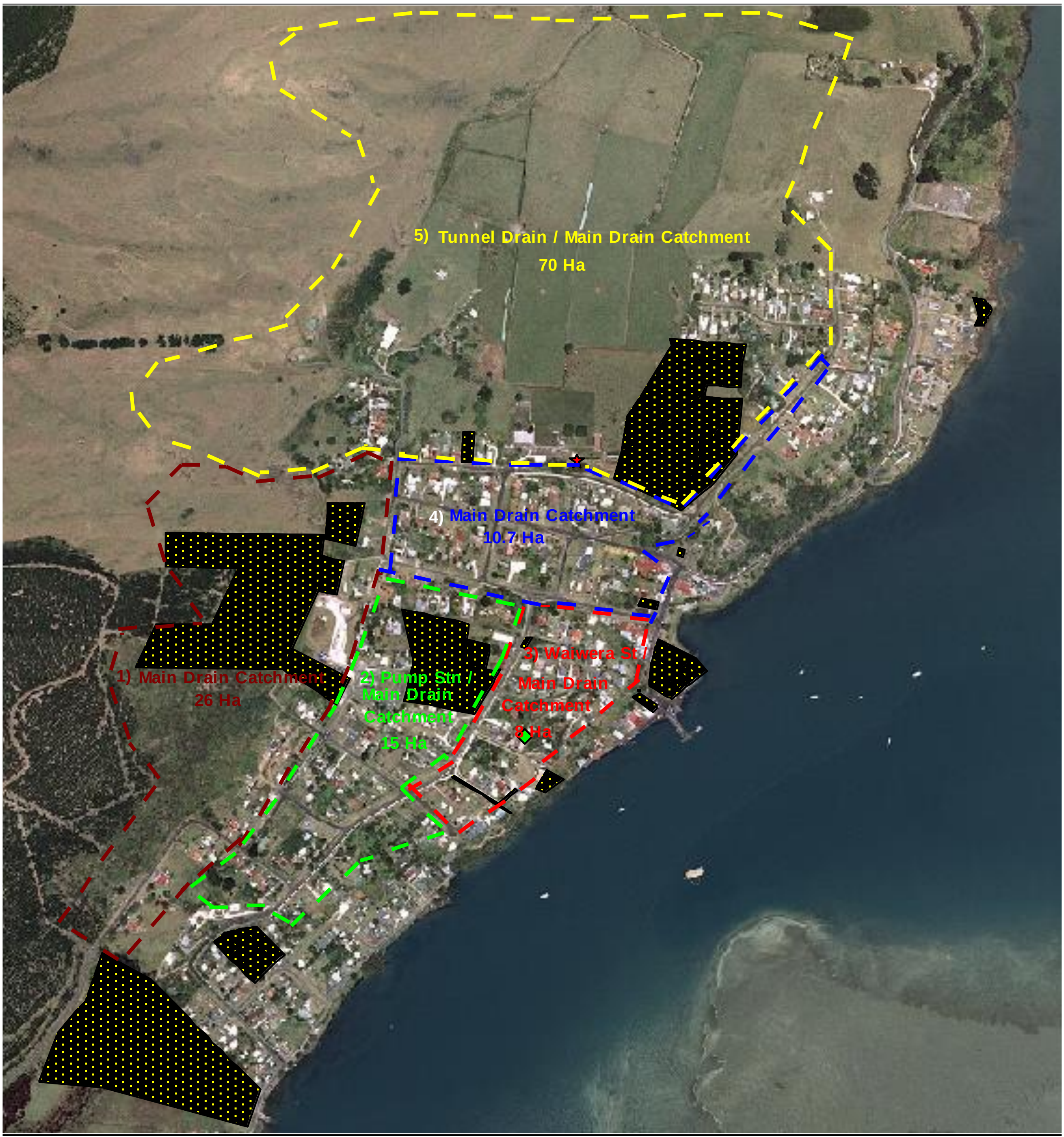
With the recent improvements to the Kāwhia stormwater system it is believed that stormwater quantity (flooding) issues will be adequately managed provided that basic maintenance of the stormwater system (ie pump servicing, cleaning of catchpits and drain inlets) is carried out.

Appendix 1 - Kāwhia Location

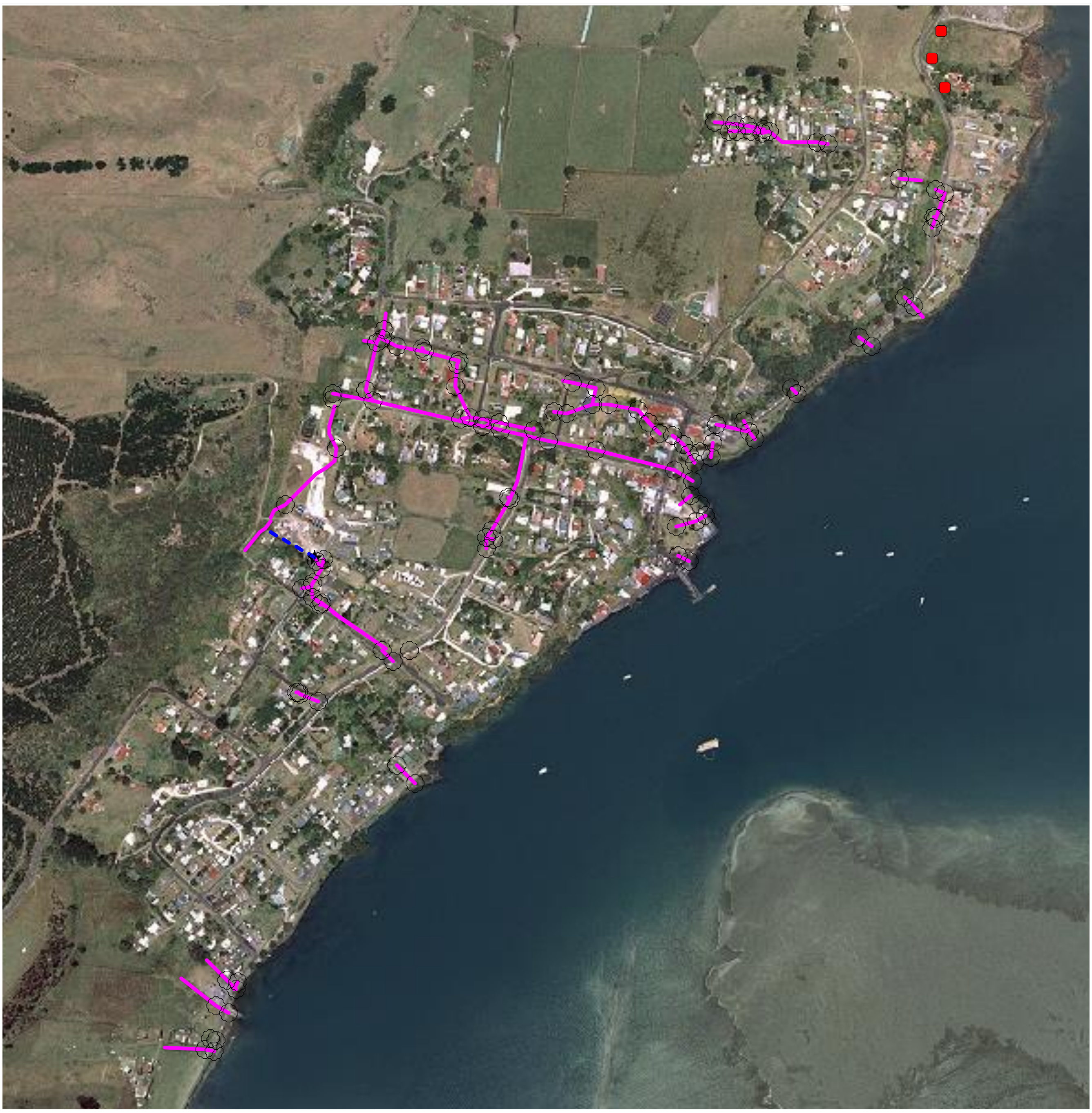
Appendix 2 - Kāwhia Street Map



Appendix 3 - Kāwhia Catchment Areas



Appendix 4 - Kāwhia Reticulated Stormwater Network



WASTEWATER 10 YEAR PROGRAMME

Project	Primary Driver	Year/s	Cost $M	Financial Data Confidence	Description and objectives of the project	Benefits/ Justification of the project	Project Stage
Renewals	End of service life	2-10	$2.5	Staff cost estimate	Main renewals	Network Resilience	Execution
Replacement of Te Kawa St Rising Main	End of service life	1	$0.5	Staff cost estimate	Pipe renewals	Network Resilience	Execution
Development Sundry Wastewater	Growth	1-10	$0.5	Estimate	Enable growth projects	Improvements that at trigger through development	Execution
Sundry Renewals	End of service life/condition	1-10	$0.3	Estimate	General budget for renewal	Effective Infrastructure and Service Delivery	Execution
Ōtorohanga WWTP Grit Separation/clarification	LOS	1-2	$0.44	Engineer's estimate	Improve influent/effluent quality	Effective Infrastructure and Service Delivery	Initiation & Execution
Pump Renewals	End of service life/condition	2-10	$0.02	Staff cost estimate	Pump renewals for pump stations	Effective Infrastructure and Service Delivery	Execution
Spare Pump for Main North Road pump station	LOS	1	$0.05	Engineer's Estimate	Improve Infrastructure resilience	Network Resilience	Execution
WWTP pond desludging	LOS	1 & 4 & 7	$0.46	Staff cost estimate	Improve influent/effluent quality	Effective Infrastructure and Service Delivery	Execution
Smoke Testing	LOS	1	$0.02	Staff cost estimate	Condition rating of network	Network Resilience	Initiation & Execution
Renewals	End of service life	1-10	$0.07	Staff cost estimate	Renewal of point assets – valves manholes etc	Network Resilience	Execution
Renewals	End of service life	3-10	$0.16	Staff cost estimate	Renewal of plant assets	Network Resilience	Execution
H&S Improvements	LOS	1-10	$0.05	Staff cost estimate	General H&S improvements	Effective Infrastructure Service Delivery	Initiation & Execution
MEICA Renewals	End of service life	1-10	$0.985	Staff cost estimate	Mechanical, Electrical, Instrumentation, Controls & Automation	Effective Infrastructure and Service Delivery	Execution

STORMWATER 10 YEAR PROGRAMME

Project	Primary Driver	Year/s	Cost $M	Financial Data Confidence	Description and objectives of the project	Benefits/ Justification of the project	Project Stage
Condition Assessments	LOS	4	$0.1	Staff cost estimate	Complete condition assessment on SW networks	Establish understanding on condition of SW network for targeted renewal programmes and modelling	Initiation
Catchment improvements – Ōtorohanga & Kāwhia	LOS	1-2	$0.04	Staff Cost Estimate	Improvements from Resource Consent improvements for Ōtorohanga and Kāwhia	Conditions that are advised by Regional Council from consent renewals	Initiation & Execution
Kakamutu Rd & Domain Dr Stormwater Investigation	LOS	1-2	$0.13	Staff Cost Estimate	Investigation and build for stormwater improvements on Kakamutu Rd & Domain Dr	Effective Infrastructure and Service Delivery	Initiation & Execution
Development Sundry	Growth	1-10	$0.37	Estimate	Enable growth projects	Improvements that at trigger through development	Execution
Sundry Renewals	End of service life/condition	1-10	$0.65	Staff Cost Estimate	General budget for renewal for Ōtorohanga and Kāwhia SW & Flood Protection	Effective Infrastructure and Service Delivery	Execution
Renewals – Ōtorohanga & Kāwhia	End of service life	1-10	$1	Staff cost estimate	Renewals on SW pipes in Kāwhia and Ōtorohanga	Effective Infrastructure and Service Delivery	Execution
Flood Protection Plant Renewals	End of service life	1	$0.02	Staff cost estimate	Flood protection plant renewals - pumps	Effective Infrastructure and Service Delivery	Execution
Otewa Road Wetland Project	LOS	1-4	$0.025	Staff cost estimate	Wetland project	Effective Infrastructure and Service Delivery	Initiation & Execution
MEICA Renewals	End of service life	1-10	$0.3	Staff cost estimate	Mechanical, Electrical, Instrumentation, Controls & Automation	Effective Infrastructure and Service Delivery	Execution

2023 Activity	Replacement Cost	ODRC	Annual Depreciation
Water	40,630,477	23,848,218	751,879
Wastewater	21,130,274	10,036,277	328,136
Stormwater	18,649,542	11,560,051	213,880
Total Three Waters	80,410,293	45,444,546	1,293,895

V4 Detailed Pivot	**80,410,294**	**45,444,545**	**1,293,894**

2022 Activity	Replacement Cost	ODRC	Annual Depreciation
Water	36,057,534	20,545,575	671,244
Wastewater	19,687,229	9,549,410	304,816
Stormwater	17,179,246	10,733,379	202,235
Total Three Waters	72,924,008	40,828,364	1,178,294

Source: Copy of 2021-22 ODC 3 Water Valuation V12 Beca Review (3)

Difference	Replacement Cost	ODRC	Annual Depreciation
Water	4,572,943	3,302,643	80,635
Wastewater	1,443,045	486,867	23,320
Stormwater	1,470,296	826,672	11,645
Total Three Waters	7,486,285	4,616,182	115,601

Percentages	Replacement Cost	ODRC	Annual Depreciation
Water	12.7%	16.1%	12.0%
Wastewater	7.3%	5.1%	7.7%
Stormwater	8.6%	7.7%	5.8%
Total Three Waters	10.3%	11.3%	9.8%

Sensitivity: General

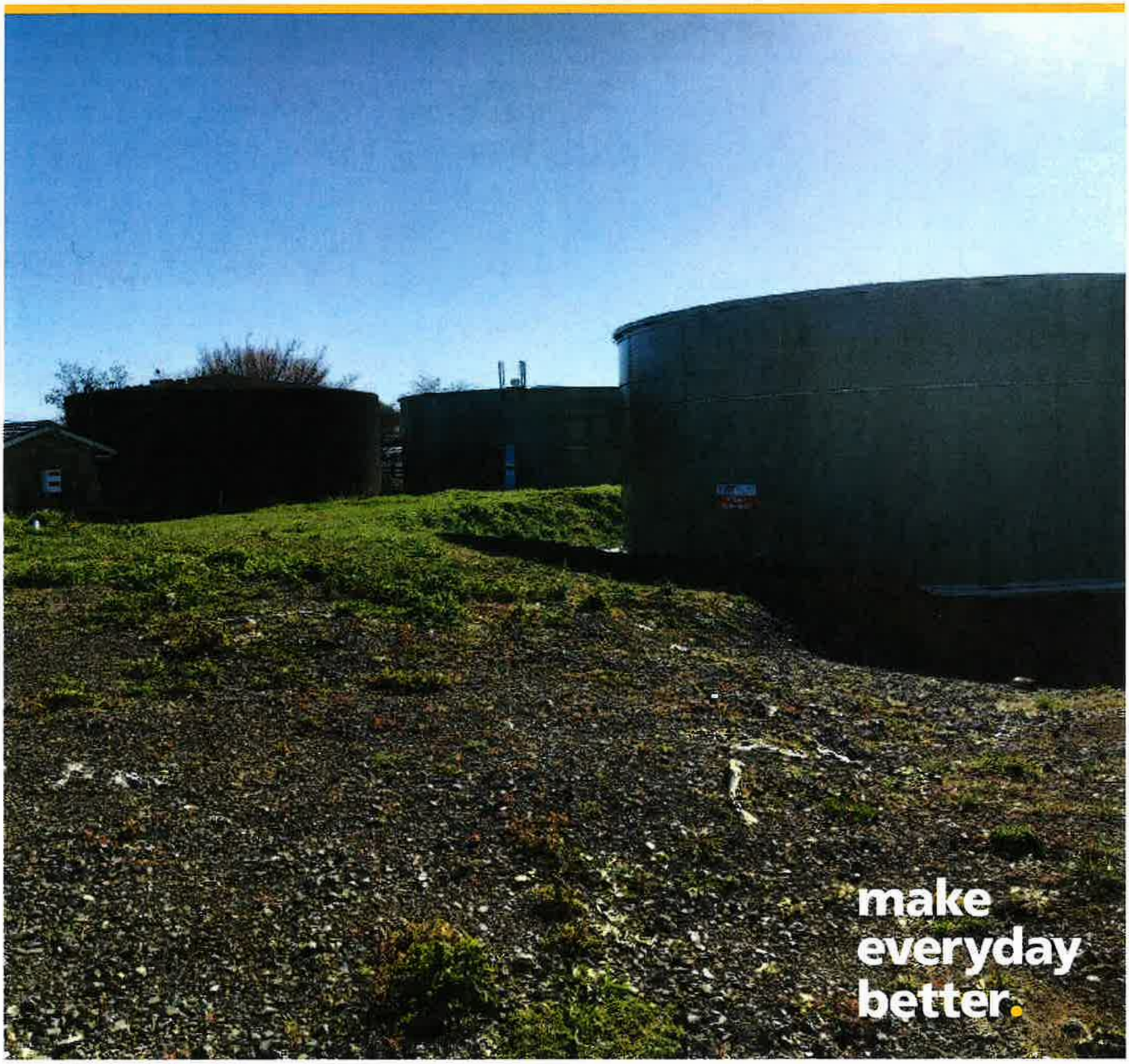
Beca

Peer Review of Otorohanga District Council Three Waters Infrastructure Valuation

Report

Prepared for Otorohanga District Council
Prepared by Beca Projects NZ Limited

5 October 2023



Revision History

Revision Nº	Prepared By	Description	Date
1	Ryan Wong	Peer Review Report	05/10/2023

Document Acceptance

Action	Name	Signed	Date
Prepared by	Ryan Wong		05/10/2023
Reviewed by	Robert Berghuis		05/10/2023
Approved by	Marvin Clough		05/10/2023
on behalf of	Beca Projects NZ Ltd		

Contents

Appendices

1 Introduction

Beca Projects NZ Limited (Beca) was commissioned by Otorohanga District Council (ODC) to complete a Peer Review of their 2023 Three Waters Infrastructure Valuation for financial reporting purposes.

Three water asset information is recorded in the Univerus Asset Management System (Univerus) that holds asset information, records condition assessments, and produces detailed and summary valuations in spreadsheet formats. This information and ODC's financial reports were provided for this peer review.

Recognising that escalating construction costs since the 2022 valuation will influence fair value, ODC decided to complete a 2023 revaluation using the Univerus system. An escalation movement of 6.56% from 30 June 2022 to 30 June 2023 was determined using Stats NZ CGPI CEPQ indices code for systems for water and sewerage, and this movement was applied across all existing assets for assessment as at 30 June 2022.

Three waters valuation summaries reported are effective as at 30 June 2023.

2 Scope

The scope of work was to complete the peer review as three distinct activities:

1. Review ODC's unit rates CGPI escalation 2022-2023 for assets for the following asset groups and classes:

- Water Supply (WS) infrastructure line (ws_line), plant ws_plant), and point (ws_point) assets.
- Wastewater (WW) infrastructure line (ww_line), plant (ww_line), and point (ww_point) assets.
- Stormwater (SW) infrastructure line (sw_line), plant (sw_plant), and point sw_point) assets.

2. Complete peer reviews of ODC 2023 valuation to provide an assessment of the infrastructure revaluation processes and the degree of compliance against current valuations standards and industry guidelines.

3. Provide support for ODC's inputs and outputs including validations of the base data, formulae, valuation processes, and valuation draft and final reports

ODC supplied a valuation report detailing purpose, scope, movements, basis of valuation, valuation process, methodologies, data confidence, optimisation and residual values including assumptions for this peer review.

The valuation excludes roading, amenities, and property assets owned by Council. Some of these assets exist in the Univerus database as connections to the three waters systems are identified but are not valued.

3 Values Reported

The asset group values reported by ODC for financial reporting purposes as at 30 June 2023 are:

Asset Group	Replacement Cost	Fair Value (DRC)	Annual Depreciation
Water Supply	40,630,477	23,848,218	751,879
Wastewater	21,130,274	10,036,277	328,136
Stormwater	18,649,542	11,560,051	213,880
TOTALS	**80,410,293**	**45,444,546**	**1,293,895**

The values are in New Zealand dollars and exclude GST.

4 Basis of Peer Review

This peer review was completed in accordance with the PBE IPSAS17, an accounting standard published by External Reporting Board (XRB), and with references to the current industry guidelines as described below.

PBE IPSAS 17

PBE IPSAS17 Public Benefit Entity International Public Sector Accounting Standard 17 - Property Plant and Equipment, applies to public sector entities other than Government Business Enterprises that prepares and financial statements under the accrual basis of accounting in accounting for property, plant, and equipment. These assets include infrastructure. Infrastructure assets are described in PBE IPSAS 17 Section 21 as:

"Infrastructure Assets:

Some assets are commonly described as "infrastructure assets." While there is no universally accepted definition of infrastructure assets, these assets usually display some or all of the following characteristics:

a) They are part of a system or network;

b) They are specialized in nature and do not have alternative uses;

c) They are immovable; and

d) They may be subjected to constraints on disposal.

Although ownership of infrastructure assets is not confined to entities in the public sector, significant infrastructure assets are frequently found in the public sector Infrastructure assets meet the definition of property, plant and equipment and should be accounted for in accordance with this standard.

A different approach is used to value specialised and non-specialised assets for their existing use. Non-specialised assets are valued on a market basis, usually by way of sales comparison or income approaches. Specialised assets are seldom traded on an open market, so they are valued on a depreciated replacement cost (DRC) basis to account for age and deterioration and optimised depreciation replacement cost (ODRC) was calculated from the DRC valuation by allowing for asset obsolescence, over-capacity, or redundancy.

Industry Guidelines

The New Zealand Infrastructure Asset Valuation and Depreciation Guidelines 2006 (NZIAVD) published by the National Asset Management Support (NAMS) Group sets out the general principles of valuation of public entity infrastructure and provides guidance on acceptable methods and legislative requirements surrounding valuations and guidance on the assessment of useful lives and depreciation methods used to value assets.

The International Infrastructure Management Manual 2020 (IIMM) published by the Institute of Public Works Engineering Australasia (IPWEA) describes asset life cycle management principles including the monitoring of performance and condition and predictive modelling on such parameters for determining remaining useful lives and identifying optimised obsolescent assets.

The Inland Revenue IRD265 2020 (IRD265) General depreciation rates guidance document provides advice on calculating asset depreciation rates using diminishing value (DV) and straight line (SL) methods based on estimated useful life. The document includes different industry sector asset types estimated useful life tables.

5 Valuation Processes

The valuation reports were peer reviewed for content, and completeness with both the spreadsheet and report peer reviews completed independently and interactively with ODC to facilitate amendments.

NZIAVD defines valuation processes for performing depreciated replacement cost (DRC) methodologies used to determine infrastructure fair values at a set point in time. The following processes were peer reviewed with any inconsistencies found reported to ODC to review.

Define the Component Level

Componentisations of assets are typically at a level that an entity replaces them at differing times. Asset items may be treated individually or combined into a global process. Appropriate componentisations of assets having differing useful lives were checked.

Establish the Valuation Database

The valuation database should contain asset register data with dimensional and descriptive attributes and the various valuation factors including optimisation, condition, modern equivalent asset (MEA) and impairment for completing the DRC calculations. Asset database register attributes and valuation factors were checked.

Optimise Replacement Costs

Assets are generally normalised to a global unit to assess a representative unit rate for valuation purposes. Costing factors are then applied to the unit rate to be assets to assess and assets optimised replacement cost. Project overheads, MEA considerations, optimisation, availability of supply and demand factors that may affect an asset's replacement cost were checked.

Assess Useful and Remaining Useful Lives

Useful life represents the period an entity expects the asset to be available for use. It is generally taken as the lesser of physical life where an asset deteriorates to a point where it cannot be used or its economic life where an asset has been installed and used for a particular purpose with a definite timeframe.

Infrastructure assets are generally those with useful lives usually ranging between ten and one hundred years with varying asset types having their own useful life ranges, which may be extended outside the usual range. Useful lives were checked for consistency against applicable ranges in NZIAVD, IIMM and IRD265 guidelines.

Remaining useful life is generally assessed from useful life less asset age unless there are conditional or other remaining life limiting factors such as deterioration modelling, process changes or obsolescence to consider. Remaining useful lives were checked for consistency considering the varying remaining life limiting factors.

Calculate DRC and Annual Depreciation

Depreciated Replacement Cost assess the consumption of an asset at a set point in time using diminishing value (DV) or straight line (SL) depreciation methods considering current replacement cost, residual value, useful life, and remaining useful life. Residual value for infrastructure assets is usually set to zero as they are generally part of a network, specialised for their purpose and are generally not traded.

The DV method assumes initial rapid consumption that slows down to a plateau at end of life while SL assumes constant rate of consumption. As infrastructure assets have long useful lives compared to consumable assets, they are generally depreciated using the SL method. Aside from non-depreciating assets, annual depreciation is the rate applied using the SL method considering the current DRC and remaining useful life.

Both DRC and annual depreciation calculations were checked for consistency.

6 Council Documents

ODC documents provided for the purpose of this peer review included:

- business-price-indexes-march-2023-quarter-capital-goods-price-index
- 2023 ODC 3 Waters Valuation V1 Draft Spreadsheet
- 2023 ODC 3 Waters Valuation V2 Draft Spreadsheet
- 2023 ODC 3 Waters Valuation V3 Draft Spreadsheet
- 2023 ODC 3 Waters Valuation V4 Final Spreadsheet
- Otorohanga District Council 2023 Three Waters Revaluation Report Draft
- Otorohanga District Council 2023 Three Waters Revaluation Report Final

The Univerus data includes selected purchase costs from contracts across all asset classes since 2016.

7 Univerus Base Data

Univerus hierarchies are owner, status, community, category, class, map group, system, type, and sub-type.

Attributes and inputs used for this revaluation include material, diameter, quantity/length, width, area, install date, year (of valuation), purchase cost, base life, unit cost, residual value, depth, unit rate factor, minimum remaining life percentage, dep asset (Y/N), make, model, and size.

Univerus calculations and outputs include age, non-depreciated value, depreciated value, annual depreciation, remaining life adjusted, and age remaining life. Condition remaining life was not used.

The detailed Univerus report included 15,636-line items map grouped by Water, Wastewater, and Stormwater. Each group was subdivided into lines, points, and plant, with meters being included into the water map group. This included 664-line items that were zero-rated due to owner, status, or type (primarily nodes or map points).

The summary Univerus report included 68-line items that are selectable by community, asset class and status.

The following filters were applied to the following separable assets in this revaluation:

Owner - Local Authority assets separated from Crown, Private, Roading, and Waipa District Council.

Status - Existing assets separated from abandoned, private, removed, replaced, and Roading Asset.

It was noted that most filterable assets had zero values due to a zero-unit rate factor being correctly applied, however, the reviewer used spreadsheet-based owner and status filters to exclude all separable assets.

8 Financial Groups

The following financial groups were incorporated manually into the Univerus valuation using spreadsheets:

- Community Water – Otorohanga water assets.
- Rural Water Supplies - Huirimu, Kahorekau, Kawhia, Ranginui, Taupaki, Tihiroa, Waipa water assets.
- Sewerage - Otorohanga wastewater assets
- Drainage Network – Kawhia and Otorohanga stormwater assets.

Refer to Appendix A for the Univerus Outputs by Financial Group.

9 Observations

9.1 General

This review was completed independently, although interactively with ODC, as ODC wished to use the peer review process to provide timely feedback in order to complete the valuations.

9.2 Compliance

Compliance aspects relating to the basis of valuation, processes, and methodologies in terms of evidence, as determined by review, were considered in terms of PBE IPSAS 17 and industry guidelines as shown below.

High compliance scores have been attributed to criteria that have statements support with evidence, medium scores where evidence has not been provided to support statements and low scores to aspects expected to be included in the valuation but were not included.

Criteria / Compliance	Evidence
Valuation shall be conducted by an independent valuer, or the Entity employs a person sufficiently experienced to conduct a valuation, subject to review by an independent valuer. **Compliance:** High	The three waters infrastructure valuations were led by ODC Brendan O'Callaghan, Finance Manager, and his team are sufficiently experienced to conduct a valuation subject to review by an independent valuer. A desktop peer review of the valuation was carried by Beca as the independent valuer using the approaches described above.
DRC basis to be used for assets where reliable market evidence is not available. **Compliance:** High	As infrastructure assets are specialised and rarely sell, there is no reliable market evidence on which to base fair value. DRC was carried out within Univerus from asset data and the system to produce detailed valuation outputs. The report details the cost and lives inputs used for DRC calculations.
Asset Register should provide general data on assets. **Compliance:** High	Asset registers were compiled for this peer review from the Univerus Detailed Valuation output spreadsheets that holds general data for Infrastructure assets in the various tables. Assets in the Univerus inventory are entered at levels that allows for differing types and lives e.g., pump, valve, and tank. General data included asset type and general attributes e.g., install date, dimensions, and materials.
Valuation Database should provide specific data on assets. **Compliance**: Medium	Although ODC have populated condition grades for assets, condition indices were not used for adjusting remaining lives. This is accepted as condition remaining life adjustments are lesser defined compared with age based remaining lives.
Documented data quality processes **Compliance:** High	The valuation refers to data quality assurance processes to eliminate blank values and correct totalling inconsistencies. As the Univerus attribute data aligns with GIS, ODC can run mapping quality checks on captured assets to check for any inconsistencies. Data quality is an ongoing data activity.
Establishing Useful Lives **Compliance:** High	Useful lives are featured in Univerus as base lives as given to an asset to represent the period of time Council expects the asset to perform at defined levels of service. These base lives generally compare with this ranges in the NZIAVD guidelines.

Establishing Standard Replacement Costs **Compliance**: High	Standard Replacement Costs are represented in Univerus as Unit Costs. The costs are typically sourced from the market, local contracts, cost estimations, and inflationary sources. For the 2023 fair value assessment, the unit costs that were established for the 2022 valuation were escalated from June 2022 to June 2023 as described in Section 9 at 6.56%. A Unit Rate Factor of 0.5 has been consistently applied for rural pipes as compared to urban pipes for this assessment instead of the complicated unit rate factors approach applied to various Communities for the 2022 valuation having noted that resulting differences to fair value was not material.
Estimate of residual values **Compliance:** High	The valuation states that, assets are depreciated to a residual value of 2.5% of the replacement cost. This residual value is not comparable to a saleable or recoverable residual value as offered by the market. Accordingly, the residual value used by Univerus for recoverable purposes has been set at zero.
Assessing asset age **Compliance**: High	Installation dates were provided for all asset records for the purpose of assessing asset ages.
Estimating remaining lives **Compliance**: Medium	Univerus calculates age RUL from the useful life less age and condition RUL from condition index applied to base life. For the reasons explained above condition RUL is not used. Where age RUL calculates to zero or a negative amount due the asset exceeding its base life, an adjusted remaining life of 2.5% of base life is applied, however, for assets with base lives less than 40 years, this results in decimal RULs that could inflate annual depreciation higher than its fair value.
Optimisation Compliance: High	There has been no optimisation applied for over design or redundancy. However, lowest replacement cost optimisation has been applied by considering an assets replacement with a modern equivalent asset (MEA) that may be procured and installed at a lower cost.
Annual Financial Depreciation (AFD) Compliance: Medium	Using the above inputs Univerus calculates AFD using the financial formula AFD = DRC / RUL to calculate depreciation on any asset in service to its base life. As described above, the application of RULs less than one year generates AFDs exceeding the DRC. For assets exceeding its base life, AFD = 0 . Beca has observed an immaterial variance when comparing Beca's depreciation calculation against the Univerus AFD.
Optimised Depreciated Replacement Cost (ODRC) Compliance: Medium	Refer sub-section 10.3 Optimised Depreciated Replacement Cost (ODRC) below.

9.3 Optimised Depreciated Replacement Cost (ODRC)

As stated above, fair value for infrastructure assets is equivalent to its depreciated replacement cost (DRC). Using the above inputs Univerus calculates DRC using the financial formula as:

DRC = (RC-RV) * RUL / (RUL + Age) + RV, and, for assets exceeding their base life, DRC = 2.5% x RC.

In line with Audit recommendations, ODC has adopted a "residual" depreciated value of 2.5% of replacement cost to recognise asset in service after the asset has exceeded its useful life. The DRC residual of 2.5% ORC and zero depreciation is applied when assets surpass useful life was checked and were consistently applied. Beca has observed an immaterial variance when comparing Beca's depreciation calculation with Univerus.

The reviewer noted that there were limited instances applied where assets that were not owned by Council or had a status other existing were had values applied. However, by using pivot queries, these assets were excluded from the valuation. The final fair value assessment result for the total three waters is $45,444,546.

The valuation summary as shown in Section 3 Valuation Summary and comparisons with the 2022 valuation movement summaries by group and asset type are shown in ODC's 2023 Three Waters Revaluation Report.

Final 2022-2023 ODRC (Fair Value) Summaries by Asset Group are:

Group	2022	2023	Difference	% Change
Water	20,525,575	23,848,218	3,302,643	16.1%
Wastewater	9,549,410	10,036,277	486,867	5.1%
Stormwater	10,733,379	11,560,051	826,672	7.7%
Three Waters	40,828,364	45,444,569	4,635,183	11.3%

10 Validated Values

Beca consulted with site staff to review the asset register, age, condition, utilisation and remaining useful economic life of the assets. Beca considers the asset register to be reliable and suitable for the valuation.

11 Conclusions

The infrastructure datasets used for the valuation are considered to be substantially complete and accurate.

The total fair value of the three waters assets calculated using Univerus as at 30 June 2023 is $45,445,589. This is an increase of 11.4% on the previous valuation undertaken in 2022.

The ODRC movements explained for the assets in the report are considered reliable considering changes to the network, vested asset additions, asset deletions, data improvements, and found assets.

As replacement cost, ODRC and annual depreciation calculations were based on derived asset replacement costs and the useful lives are consistent with the industry guidelines or were appropriately modified to meet certain conditions, Beca considers these values to be reliable and suitable for financial reporting purposes.

The reviewer observed a 7% variance when comparing peer review depreciation calculation with the ODRC produced by Univerus. This has primarily occurred on assets that have exceeded their base lives and, given that these assets will likely be replaced in the foreseeable future, the variance may be considered immaterial. Supporting spreadsheet *ODC 3 Waters Valuation 2023 RW Review Updated RB with ODC Input* has details.

12 Recommendations

The following recommendations are provided for ODC to consider. These include asset data validations and process improvements and are listed are in no particular order.

It is recommended that ODC:

Data Attributes

- Continue to develop and improve the data capture and verification processes to minimise unknowns.
- Continue to populate the size and notes fields to capture specific asset attributes and relevant information.
- Continue to develop record for retired assets and demolished assets.

Valuation Inputs

- Request Univerus check algorithms used to calculate age, and adjusted remaining lives are consistent.
- Investigate asset type condition grade index development for calculating condition remaining useful lives.

Valuation Outputs

- Run only Local Authority owned assets in Univerus to ensure Local Authority quantities are recorded.
- Request Univerus to check that their calculations for replacement cost, depreciated replacement cost, and annual depreciation are consistent with ODC's financial policies and valuation methodology.

13 Limitations

The following limitations apply to this valuation peer review:

- Reliance has been placed on the accuracy and completeness of information supplied by ODC.
- It has been assumed that assets are in proper working order and functioning for the purposes for which they were designed, and conform to current building, fire, health & safety regulations & codes.
- The report is on the basis that ODC owns the assets reviewed.
- This report has been prepared for the specific purpose stated herein. Any party that relies upon it for another purpose without reference to the writer does so at their own risk.
- Beca's responsibility in connection with this report is limited to the ODC to whom it is addressed. Beca disclaim all responsibility and accept no liability to any other party.
- Not the entire report nor any part of it may be referred to or included in any published document, circular or statement without our written approval of the form and context in which it may appear.
- Beca reserve the right but not the obligation to revise this report in the light of any information existing or additional information that comes to our attention after this report has been issued.

14 Declaration

Beca is aware that the auditors will be relying on Beca's knowledge of infrastructure valuations of this type.

Beca is not aware of any reason why ODC's auditors should not place reliance on the information provided by ODC and values in the valuation report, as provided by ODC, based on the above data.

This review was completed by Robert Berghuis and approved by Marvin Clough. Both Robert and Marvin are registered plant and machinery valuers experienced in the completion of public benefit entity valuations and peer reviews.

Please contact the undersigned if you have any questions regarding this peer review.

Robert Berghuis

Registered Plant and Machinery Valuer

Senior Valuer

Marvin Clough

Technical Director - Valuations

on behalf of

Beca Project NZ Ltd

Email: Robert.Berghuis@beca.com

A

Appendix A – Univerus Outputs by Financial Group

Community	Count	ORC	DRC	AFD
Community Water	**9090**	**18,816,050**	**10,263,527**	**391,842**
Otorohanga	9090	18,816,050	10,263,527	391,842
Drainage Network	**1184**	**18,649,542**	**11,560,051**	**213,880**
Kawhia	197	3,097,986	2,305,537	35,984
Otorohanga	987	15,551,556	9,254,514	177,896
Rural water Supplies	**2411**	**21,814,427**	**13,584,691**	**360,037**
Huirimu	191	2,363,139	1,405,962	39,822
Kahorekau	171	2,540,167	1,677,544	37,339
Kawhia	1200	4,958,695	2,201,045	108,771
Ranginui	73	1,945,350	1,093,031	27,897
Taupaki	95	771,800	434,409	11,473
Tihiroa	269	5,352,170	4,199,779	78,452
Waipa	412	3,883,106	2,572,921	56,284
Sewerage	**2303**	**21,130,274**	**10,036,277**	**328,136**
Otorohanga	2303	21,130,274	10,036,277	328,136
Grand Total	**14988**	**80,410,294**	**45,444,545**	**1,293,894**

Table Source: V4 Detailed Pivot excluding EXCLUSIONS.

WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

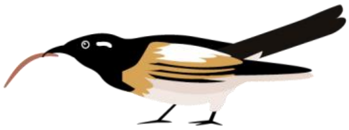
FEES AND CHARGES 2024/25

ŌTOROHANGA DISTRICT COUNCIL

DATE: JULY 2024

Te Kaunihera ā-Rohe o Ōtorohanga District Council

Where kiwi can fly



CONTENTS

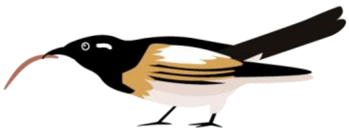
LAND TRANSPORT (ROADING)

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
TEMPORARY ROAD CLOSURE			
Approved Community Events			
• The Event is being organised by a non-commercial, not-for-profit organization; or			
• The Event is appropriate for all members of the Community to enjoy; or			
• The organiser has had event at least annually for 3 years e.g. Fishing Contest, Christmas Parade, Kāwhia Regatta, Kai Festival			
Application – Local Roads			
Application Fee		No Charge	No Charge
External Advertising		Actual costs	Actual costs
Other Events – Sealed Roads (Rallies, Hill Climbs, Car Testing, Cycle Races etc.)			
Each application will be considered on its merits			
Application fee for administering the Road closure and damage assessment		$905.00	$905.00
External Advertising		Actual costs	Actual costs
Plus, Bond (can be waived at the discretion of the Group Manager Engineering or designate)		$5,000.00	$5,000.00
Repairs (any repair work will be quoted and first deducted from the bond)		Actual costs	Actual costs
Other Events – Unsealed Roads (Rallies, Hill Climbs, Car Testing, Cycle Races etc.)			
Each application will be considered on its merits			
Application fee for administering the Road closure and damage assessment		$905.00	$905.00
External Advertising		Actual costs	Actual costs
Plus, Bond (can be waived at the discretion of the Group Manager Engineering or designate)		$5,000.00	$5,000.00
Repairs (any repair work will be quoted and first deducted from the bond)		Actual costs	Actual costs
KERB AND FOOTPATH CROSSINGS			
A bond for the reinstatement of road, berm kerb or crossing resulting from damage caused during building or other consented works	Deposit, with any balance payable on completion of reinstatement works	$2,000.00	$2,000.00
Construction of a new kerb or footpath crossing/vehicle entrance by the Council on behalf of the owner	Deposit, with any balance payable on completion of work	$2,000.00	$2,000.00
A bond where a new or upgraded kerb or footpath crossing/vehicle entrance will be installed by the owner using a contractor pre-approved by Council		$2,000.00	$2,000.00

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
STOCK MOVEMENT			
Refundable Bond (Costs or expenses covered by droving)		$625.00	$625.00
Construction of a cattle race on a road reserve			
Application Fee		$145.00	$145.00
Installation of a road crossing for dairy cattle			
Application Fee		$145.00	$145.00
TRAFFIC MANAGEMENT			
Traffic Management Plan –- Simple	Flat fee	$120.00	$150.00
Traffic Management Plan – Complex	Per hour	New charge	$150.00
Traffic Management Plan Approval – Maintenance/Emergency Works/Approved Community Events		No charge	No charge
OVERWEIGHT PERMIT			
Overweight Permit – New 12 month permit		New charge	$200.00
Overweight Permit – Renewal of 12 month permit		New charge	$150.00

WATER SUPPLY

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
RURAL WATER SUPPLY CHARGES			
Arohena, Ranginui, Tihiroa and Waipā Schemes			
Capital Contribution	Set on Application		
Connection Costs		Actual	Actual
Administration Fee		$800.00	$800.00
Special meter reading fee		$80.00	$80.00
ŌTOROHANGA/KĀWHIA WATER CHARGES			
Within Ōtorohanga and Kāwhia Urban Areas			
Application Fee		$360.00	$360.00
Standard Domestic Connection (for 20 / 25mm service within 4.0m of the watermain) by ODC contractor		$1,500.00	$1,500.00
Special meter reading fee		$80.00	$80.00
All other connections (e.g. commercial/ industrial)	Fixed price quote to be provided by Council approved Contractor		
Outside Ōtorohanga and Kāwhia Urban Areas			
Application Fee		$360.00	$360.00
Capital Contribution		$1,595.00	$1,595.00
Standard Domestic Connection	Approved Contractor	Quote	Quote

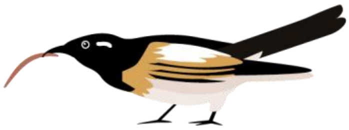


SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Extraordinary Use			
Permit to take water from Fire Hydrant – plus volumetric charge	Conditions Apply		
Per Day		$100.00	$100.00
Per Month		$250.00	$250.00
Per Annum		$2,500.00	$2,500.00
Permit to take water from Fire Hydrant – volumetric charge		Up to $5.00/m^3	Up to $5.00/m^3
Other Services			
Water Disconnection/Reconnection		$500.00	$500.00
Water Meter testing - Domestic		$400.00	$400.00
Water Meter testing – Commercial/Industrial	Fee payable in advance – refunded if meter faulty	POA	POA
On-site pipe or toby locate	Further costs may apply if excavation required	$150.00	$150.00

WASTEWATER TREATMENT AND DISPOSAL

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
SEWER CONNECTION (ŌTOROHANGA)			
Application Fee		$360.00	$360.00
Connection – Domestic, Commercial/Industrial	Fixed price quote to be provided by Council approved Contractor		
Outside Ōtorohanga Urban Areas			
Application Fee		$195.00	$195.00
Capital Contribution		$1,590.00	$1,590.00
Connection	Fixed price quote to be provided by Council approved Contractor		
[1]Note: Connections to Council reticulation can be made by other approved contractors subject to Council's terms and conditions. In these cases the applicant is liable for the application fee and capital contribution (if applicable) only.			
Disconnection/Reconnection		New charge	POA
TRADE WASTE (TRADE WASTE BYLAW)			
Application Fee	All classes	$110.00	$110.00

[1] Conditions apply



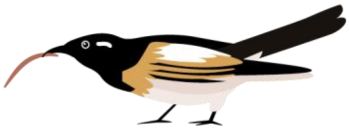
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Controlled Consents	Annual fee	$148.00	$148.00
Controlled Consents	3 yearly fee[1]	$294.00	$294.00
Inspection Fee	Per inspection	$100.00	$100.00
Conditional Consents	Set on Application - Refer to Bylaw		
DISCHARGE OF SEPTIC TANK WASTE	Must be a Council-approved operator		
Domestic Septic Waste (Within District)	Per m3[1]	$40.00	$40.00
Domestic Septic Waste (Outside District)	Per m3[1]	$108.00	$108.00

STORMWATER

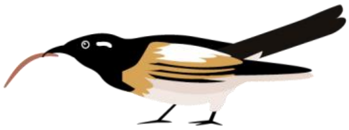
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
STORMWATER NETWORK CONNECTION			
Application Fee		$360.00	$360.00
Connection – Domestic, Commercial/Industrial	Fixed price quote to be provided by Council approved Contractor		
Disconnection/Reconnection		POA	POA

WASTE MANAGEMENT

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
ŌTOROHANGA/KĀWHIA RECYCLING CENTRES - FEES			
Recycling (sorted)			
Plastic Milk bottles; Soft drink (1 and 2); Steel/Aluminum cans	Washed/ Squashed	Free	Free
Glass (bottles/jars only)	Washed	Free	Free
Paper	No food	Free	Free
Cardboard	No food / flattened	Free	Free
Scrap Metal		Free	Free
Lead-Acid battery	Each	$5.00	$5.00
LPG bottles (must be degassed)	Each	$10.00	$10.00
Computer	Each	$15.00	$15.00
Electric motor	Each	$10.00	$10.00
Clean reusable timber		Free	Free
Firewood timber	Trailer	$10.00	$10.00
Car Tyres	Each	$6.00	$6.00

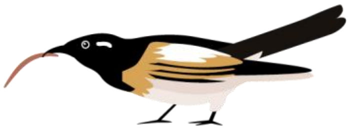


SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
4x4 Tyres	Each	$9.00	$9.00
Truck Tyres	Each	$20.00	$20.00
Replacement Recycling Crate	Each	$20.00	$20.00
CLEANFILL/GREENWASTE			
Cleanfill/Greenwaste - No weeds or flax	Per m^3	$30.00	$30.00
Standard bag	Each	$3.00	$3.00
Large bag	Each	$5.00	$5.00
Car boot	Per load	$10.00	$10.00
6 x 4 trailer / ute	Per load	$30.00	$30.00
Other	Per m^3	$30.00	$30.00
REFUSE			
Refuse	Per m^3	$45.00	$45.00
Official bag	Each	Free	Free
Standard bag	Each	$4.00	$4.00
Large bag	Each	$7.00	$7.00
Whiteware (must be degassed)	Each	$10.00	$10.00
Television	Each	$25.00	$25.00
Video recorder	Each	$5.00	$5.00
Toaster/kettle	Each	$5.00	$5.00
Timber	Per m^3 load	$55.00	$55.00



LIBRARIES

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
GOLD CARD (ADULT)			
Free New Fiction, Magazines, General Fiction, Non-Fiction, Children's Books, Large Print	Per card	$45.00	$45.00
Renewal - New fiction and selected popular non fiction	Per renewal	$2.00	$2.00
Renewal - New Magazines	Per renewal	$1.00	$1.00
Overdue Charges	Per day after 3 weeks	$0.20	$0.00
Extra/Replacement Card		$5.00	$0.00
Interloan		$4.00	$5.00
STANDARD CARD			
Free Fiction, Non Fiction, Large Print, Children's Books			
New Books (Fiction and selected popular non-fiction) (All Issues)	Per book	$2.00	$2.00
Non Fiction and Large Print	Per book	Nil	Nil
Renewal - New fiction and selected popular non fiction	Per book	$2.00	$2.00
New Magazines (6 months only)	Per magazine	$1.00	$1.00
Renewal - New Magazines	Per magazine	$1.00	$1.00
Renewal - Magazines	Per magazine	$0.50	$1.00
Overdue Charges – Adult	Per day after 3 weeks	$0.20	$0.00
OTHER FEES AND CHARGES			
Sale of Books	Per book	$0.50 - $2.00	$0.50 - $2.00
Lost Books	Cost	Replacement cost	Replacement cost
Lost Book Handling		$2.00	$2.00
Photocopying	Black and white - per page – A3	$0.20	$0.30
	Black and white - per page – A4	$0.30	$0.20
	Colour - per page – A3	$1.00	$1.00
	Colour - per page – A4	$0.50	$0.50
DVDs	Per DVD (per week)	$2.50	$2.50
Laminating	Per page – A4	$2.00	$2.00
Book Bags	Each	$3.00	$3.00
Rural Book Delivery	Per delivery	$7.00	$10.00
Out Of District Membership Fee	Per annum	$40.00	$40.00
APNK Computers		Free	Free
Document Scanning		Free	Free
PROGRAMMES ROOM			
Use by Community Groups	New service	N/a	Free



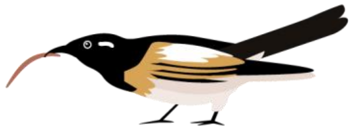
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
MAKERSPACE			
3D Printing	Service Fee	New charge	$2.00
Filament	ABS, PLA, PLA+ Per gram	New charge	$0.20
Vinyl cutting (10 cm length)	Gloss	New charge	$2.00
	Clear	New charge	$2.00
	Paper	New charge	$2.00
	Phototex	New charge	$3.00
	Heat Transfer Vinyl	New charge	$6.00
Sewing Machine		New charge	Free
Overlocker		New charge	Free
Kits (ie tech/ dementia/ home maintenance/ STEM)		New charge	Free

ŌTOROHANGA/KĀWHIA CEMETERIES

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
PLOTS			
Adults		$1,650.00	$1,650.00
Children		$500.00	$500.00
Ash Wall and Ash Berm		$385.00	$385.00
INTERMENT			
Adults		$1,650.00	$1,650.00
Extra Depth		$2,000.00	$2,000.00
Child 11yrs and under		$500.00	$500.00
Ash Wall (incl. Council installation of plaque and interment)		$360.00	$360.00
Ash Wall (incl. Own installation of plaque and interment)		$180.00	$180.00
ADDITIONAL FEES			
Extracts from cemetery plans and records		nil	nil

OTHER COMMUNITY FACILITIES AND SERVICES

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
ŌTOROHANGA SWIMMING POOLS			
Admission			
Adults (over 16 years)		$4.50	$4.50
Children (Up to 16 years)		$3.00	$3.00
Children (Under 4 years)		Free	Free
Students (With I.D)		$3.00	$3.00
P.W.D		$2.00	$2.00
Seniors		$3.00	$3.00
Spectators		$1.00	$1.00
Aquacise Public		$5.00	$5.00
Aquacise Senior		$4.50	$4.50



SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Concession			
Family Day Pass (2 adults, 3 children)		$12.00	$12.00
Adult (10 swim)		$40.50	$40.50
Child (10 swim)		$24.00	$24.00
Senior (10 swim)		$24.00	$24.00
Aquacise Pass (Public) (10 swim)		$45.00	$45.00
Aquacise Pass (Senior) (10 swim)		$40.00	$40.00
Pool Hire (non-exclusive, conditions apply)			
Within Ōtorohanga – per hour		$36.00	$36.00
Outside Ōtorohanga – per hour		$48.00	$48.00
Lifeguard supervision – per hour		$30.00	$30.00
ŌTOROHANGA SECURITY PATROL SERVICE			
Charges for properties outside defined area	Capital Value	Current Rate	Current Rate
Former Differential Rating Area No 1	Uniform Charge	Current Rate	Current Rate
KĀWHIA WHARF			
Berthage			
Casual	per day	$52.00	$52.00
KAWHIA COMMUNITY CENTRE			
Hire Fee (excluding Kitchen)	Minimum charge	New charge	$40.00
	Up to 4 hours	New charge	$40.00
	Up to 8 hours	New charge	$80.00
Hire Fee (excluding Kitchen) – Not for profit Community Groups	Up to 4 hours	New charge	$20.00
	Up to 8 hours	New charge	$40.00
Hire Fee (night time whole hall hire)	Includes day for setup, kitchen and supper room use	New charge	$160.00
Hire Fee (Board/Supper room only)		New charge	$20.00
Hire Fee (Kitchen)		New charge	$50.00
Hire fee (shoulder day)		New charge	As above
Callout fee	Staff member attendance during event for issue with hall caused by user	New charge To be taken from bond	$50.00
Refundable Hire bond			$200.00
OTOROHANGA GIRL GUIDE HALL			
Hire fee	Per Day	New charge	$150.00
Refundable Hire bond		New charge	$200.00

REGULATORY SERVICES

RESOURCE MANAGEMENT

All references are to the Resource Management Act 1991 unless specified otherwise

NOTES TO PAYMENT OF CHARGES

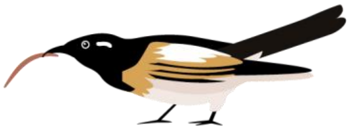
All the deposits and specified amounts are payable in advance.

In accordance with Section 36(AAB(1)) Council retains absolute discretion whether to remit the whole or any part of any charge, under the relevant staff members' financial delegated authority. Considerations for any requests for remission will be conservatively applied based on: the assessed public benefit vs private benefit; and the legal status of the requestor (i.e. Charitable Trust, community organisation or for-profit entity).

Pursuant to Section 36 (AAB(2)) of the Resource Management Act 1991 Council need not perform the action to which the charge relates until the charge has been paid to it in full.
An additional charge may be required under Section 36 where the set charge is inadequate to enable Council to recover its actual and reasonable costs relating to any particular application.
Deposits made will be non-refundable and do not include GST.

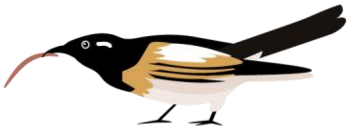
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
EXTERNAL CONSULTANT FEES			
Actual consultant costs will be recovered for consultant services, including but not limited to: a. Due diligence meetings and resource consent advice after the first half hour which will not be charged b. Pre application meetings and resource consent advice after the first half hour, which will not be charged c. Reviewing applications d. Processing, recommending and reporting on applications e. Attending hearings and advising on consent decisions and consent conditions		Actual cost	Actual cost
DUE DILIGENCE AND PRE-APPLICATION ADVICE			
First half hour of either due diligence or pre-application meeting is no cost			
After the first half hour, staff time will be calculated at an hourly rate[2]		Actual time	Actual time
After the first half hour, consultant and expert actual costs will be charged		Actual time	Actual cost
APPLICATION FOR CHANGE TO DISTRICT PLAN			
Deposit payable on receipt of the application with the balance of Council's costs recoverable on an actual and reasonable basis.	Deposit	$12,000.00	$50,000.00
Staff time will be calculated at an hourly rate[2]		Actual time	Actual time
Consultant and expert actual costs will be charged		Actual time	Actual cost

[2] Refer to page 26 for Staff Charge Out Rates



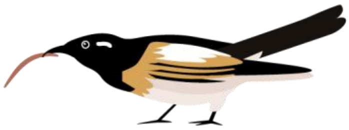
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Notified Application			
Land use and Subdivision	Deposit	$10,000.00	$10,000.00
Limited Notified Application			
Land use and Subdivision	Deposit	$5,000.00	$5,000.00
Categories include: • Controlled activities • Restricted Discretionary and Discretionary activities • Non-complying activities • Extension of consent periods (Section 125) • Change or cancellation or consent condition (Section 127)			
Deposit payable on receipt of the application with the balance of Council's costs recoverable on an actual and reasonable basis.			
Staff time will be calculated at an hourly rate[3]		Actual time	Actual time
Consultant and expert actual costs will be charged		Actual time	Actual cost
RESOURCE MANAGEMENT HEARINGS			
Hearings Panel;			
In addition to staff time, a charge shall be payable by the applicant for the cost of convening a Hearings Panel and for any site visit by the Hearings Panel.			
Independent hearing commissioners		Actual costs	Actual costs
Non-Notified Applications for Resource Consent (Land use)	Deposit	$1,200.00	$1,200.00
This category includes the following: • Controlled activities • Restricted Discretionary and Discretionary activities • Change or cancellation or consent condition (Section 127) • Relocatable dwellings			
Non-Complying Activities	Deposit	$1,500.00	$1,500.00
Staff time will be calculated at an hourly rate[3]		Actual time	Actual time
Consultant and expert actual costs will be charged		Actual time	Actual cost
Application for Permitted Boundary Activity (Section 87AAB Resource Management Act)		$450.00	$450.00
Monitoring		$400.00	$400.00
In the case of Land Use consents an additional fee to apply at the time of issuing the consent to cover the cost of ongoing monitoring.			

3 Refer to page 26 for Staff Charge Out Rates



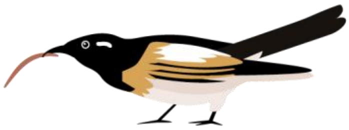
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Non-Notified Applications for Resource Consent (Subdivision) This category includes the following: • Controlled activities • Restricted Discretionary and Discretionary activities • Change or cancellation or consent condition (Section 127 Resource Management Act)			
Subdivision to Create One Additional Lot			
Boundary Relocation or Adjustment involving up to Three Existing Titles	Deposit	$1,500.00	$1,500.00
Non complying activities	Deposit	$1,800.00	$1,800.00
Subdivision to Create Two or More Additional Lots			
Boundary Relocation or Adjustment involving Four or more Existing Titles	Deposit	$2,200.00	$2,200.00
Non complying activities	Deposit	$2,500.00	$2,500.00
Staff time will be calculated at an hourly rate[4]		Actual time	Actual time
Consultant and expert actual costs will be charged		Actual time	Actual cost
Change or Cancellation of Consent Notice including Preparation of Document (Section 221 Resource Management Act)		$1,200.00	$1,200.00
DESIGNATIONS AND NOTICES OF REQUIREMENTS			
Receipt of a designation or notice of requirement with the balance of Council's costs recoverable on an actual and reasonable basis.	Deposit	$2,500.00	$2,500.00
Outline Plan Application (Section 176A Resource Management Act)	Deposit	$500.00	$500.00
Application to Waive the Requirement for an Outline Plan (Minor Works only) (Section 176A Resource Management Act)	Fee	$200.00	$200.00
Application to do anything to land that is subject to a Designation (Section 176(1)b Resource Management Act)	Deposit	$330.00	$330.00
Application to do anything to land that is subject to a Designation (Section 176(1)b Resource Management Act)	Deposit	$330.00	$330.00
Request to the Requiring Authority responsible for an earlier designation (Section 177 Resource Management Act)	Deposit	$330.00	$330.00

[4] Refer to page 26 for Staff Charge Out Rates



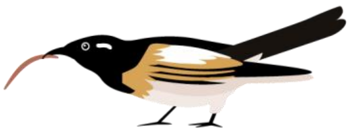
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Application to do anything that would prevent or hinder the public work or project (Section 178 Resource Management Act)	Deposit	$330.00	$330.00
Transfer of rights and responsibilities for a Designation (Section 180 Resource Management Act)	Deposit	$330.00	$330.00
Requirement for alteration of a designation (Section 181 Resource Management Act)	Deposit	$1,200.00	$1,200.00
Removal of a designation (Section 182(2) Resource Management Act)	Deposit	$700.00	$700.00
Application to extend the life of a designation (Section 184 and 184A Resource Management Act)	Deposit	$700.00	$700.00
The balance of Council's costs recoverable on an actual and reasonable basis[5]		Actual time	Actual time
HERITAGE ORDERS			
Receipt of a heritage order or notice of requirement with the balance of Council's cost recoverable on an actual and reasonable basis (Section 189 Resource Management Act).	Deposit	$1,200.00	$1,200.00
Application to do anything which would wholly or partly nullify the effect of a heritage order (Section 193 Resource Management Act)	Deposit	$500.00	$500.00
Removal of a heritage order (Section 196 Resource Management Act)	Deposit	$1,200.00	$1,200.00
Staff time will be calculated at an hourly rate[5]		Actual time	Actual time
Consultant and expert actual costs will be charged		Actual time	Actual cost
OTHER RESOURCE MANAGEMENT ACT APPROVALS			
Preparation and signing of any Bond (except relocatable Bond), covenant, legal document or variation thereto required as a condition of consent (s.108,109) or application to vary or extend time in respect of any bond, covenant or consent notice under s.108 and/or 109 including preparation of documents.	Deposit	$550.00	$550.00
Bond discharges (except cash relocatable bonds)	Standard fee	$320.00	$320.00
Relocatable Buildings			
• Bond Preparation Fee		$210.00	$210.00
• Partial Bond Refunds		$210.00	$210.00

[5] Refer to page 26 for Staff Charge Out Rates



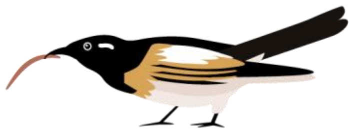
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Application for an Extension of Time to Complete Works (Section 109(4) Resource Management Act)	Deposit	$200.00	$200.00
Renewal of Resource Consent (Section 124(b) Resource Management Act)	Deposit	$500.00	$500.00
Application for Extension of Consent Periods for Non-Notified Resource Consents (Section 125 & 126 Resource Management Act)	Deposit	$700.00	$700.00
Application for Certificate of Compliance and Application for Existing Use Certificate (Section 139 and 139A Resource Management Act)	Deposit	$1,200.00	$1,200.00
Application to Extend the Period Specified to Carry Out and Complete Work Subject to a Bond (Section 222(2) Resource Management Act)	Deposit	$500.00	$500.00
Application for a Section 224 Certificate (Completion of subdivision conditions)	Deposit	$700.00	$700.00
Application for a Section 226(1)(e) Certificate (Allotment in accordance with requirements of District Plan)	Deposit	$1,200.00	$1,200.00
Cancellation of Amalgamation Condition (Section 241 Resource Management Act)	Deposit	$550.00	$550.00
Staff time will be calculated at an hourly rate[6] Consultant and expert actual costs will be charged		Actual time Actual time	Actual time Actual cost
Removal of Building Line Restriction (Section 327A Local Government Act 1974)	Deposit	$550.00	$550.00
Easement Approvals and Revocation (Section 348 Local Government Act 1974)	Deposit	$700.00	$700.00
INFRINGEMENT FEES			NO GST
Contravention of Section 9 (Restrictions to use of land) (Section 338 (1) (a))	Standard fee	$550.00	$550.00
Contravention of Abatement Notice (but not under Section 322 (1) (c), Section 338 (1) (a))	Standard fee	$800.00	$800.00
Contravention of an Excessive Noise Direction (Section 338 (2) (c))	Standard fee	$700.00	$700.00
Contravention of an Abatement Notice about Unreasonable Noise (Section 338 (2) (d))	Standard fee	$700.00	$700.00

[6] Refer to page 26 for Staff Charge Out Rates



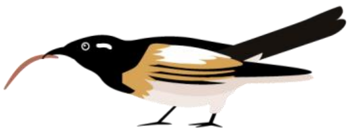
BUILDING CONTROL

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Certificate of Title Search			
Required for all Building Consent applications		$30.00	$25.00
Code Compliance Certificate			
Receive and process application. Issue Code Compliance Certificate			
• Commercial		$550.00	$550.00
• Residential		$350.00	$350.00
• Other		$150.00	$150.00
Any additional inspection necessary to approve Certificate	Plus Travel costs	$110.00	$110.00
PIM – Project Information Memorandum			
• Less than $20,000		$100.00	$100.00
• $20,000 to $300,000		$200.00	$200.00
• Over $300,000		$400.00	$400.00
BUILDING CONSENTS BY PROJECT CATEGORY	Cost includes PIM		
Minor Works			
• Solid Fuel Heaters	Rural area add travel for 1 inspection	$500.00	$500.00
• Garden Sheds		$450.00	$450.00
• Installation of Basic Warning System		$450.00	$450.00
• Marquees		$450.00	$450.00
• Plumbing and Drainage		$450.00	$450.00
Minor Building Work	Rural area add travel for 2 inspections		
• Carports		$600.00	$600.00
• Demolition		$600.00	$600.00
• Para Pools and Equivalent Type Pools		$600.00	$600.00
• Decks and Pergolas		$600.00	$600.00
Exemption from Building Consent		$160.00	$220.00
Other Buildings/Structures	Rural area add travel for 2 inspections		
• Garages		$750.00	$750.00
• Hay Barns		$750.00	$750.00
• Implement Sheds		$750.00	$750.00
• Concrete Swimming Pools		$750.00	$750.00
Bridges	Rural area add travel for 3 inspections	$900.00	$900.00
Detached Habitable Buildings (No plumbing and drainage) Sleepouts, Office, Studio, small additions up to $30m^2$	Rural area add travel for 3 inspections	$1,000.00	$1,000.00

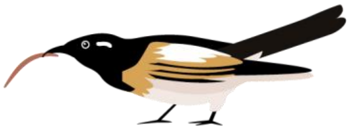


SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Small Additions or Alterations up to 30m^2 (No plumbing and drainage)	Rural area add travel for 3 inspections	$1,200.00	$1,200.00
Additions or Alterations over 30m^2 (No plumbing and drainage))			
• Residential	Rural area add travel for 3 inspections	$1,400.00	$1,400.00
• Commercial		$2,500.00	$2,500.00
Detached habitable buildings (With plumbing and drainage) Sleepouts with Toilet/Shower	Rural area add travel for 4 inspections	$1,350.00	$1,350.00
Small Additions or Alterations up to 30m^2 (With plumbing and drainage)	Rural area add travel for 4 inspections	$1,350.00	$1,350.00
Additions[7] between 30 and 60m^2	Rural area add travel for 4 inspections	$1,800.00	$1,800.00
Implement Shed (over 110m^2)	Rural area add travel for 5 inspections	$1,450.00	$1,450.00
Dairy Sheds	Rural area add travel for 5 inspections	$3,000.00	$3,000.00
Re-sited Dwellings	Rural area add travel for 5 inspections	$2,400.00	$2,400.00
Single Storey Dwellings Up to 100m^2	Rural area add travel for 8 inspections	$2,800.00	$2,800.00
Single Storey Dwellings Up to 200m^2	Rural area add travel for 8 inspections	$3,000.00	$3,000.00
Single Storey Dwellings in Excess of 200m^2	Rural area add travel for 9 inspections	$3,400.00	$3,400.00
Dwellings Two Storey or More Up to 200m^2	Rural area add travel for 9 inspections	$3,600.00	$3,600.00

[7] Note: for work over 60m^2, dwelling, commercial and industrial fees apply



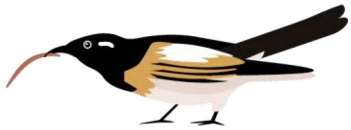
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Dwellings Two Storey or More Over 200m²	Rural area add travel for 10 inspections	$4,000.00	$4,000.00
Small Commercial/Industrial Buildings Up to 300m²	Rural area add travel for 9 inspections	$3,500.00	$3,500.00
Commercial/Industrial Buildings in Excess of 300m²	Rural area add travel for 10 inspections	$5,000.00	$5,000.00
Large Industrial and Commercial Projects in excess of 500m²	Quoted cost	Actual Cost	Actual Cost
Travel Costs (Inclusive of Staff Time) • Applies to building consents in excess of 5 km from Ōtorohanga	Per km each way	$3.50	$3.50
• A set rate will be charged with any building work in Kāwhia	Per trip	$155.00	$155.00
• A flat rate will be charged with any building work in Ōtorohanga		$50.00	$50.00
Extra Inspections Where an inspection is requested but the project is not ready and fails inspection		$160.00	$160.00
Report on Buildings to be Relocated Inspection and report		$400.00	$400.00
Inspections of Existing Swimming Pool Fences Per inspection	Plus travel costs	$200.00	$200.00
Inspections of buildings for Compliance with Section 224(f) Resource Management Act 1991 Per inspection		$250.00	$250.00
Code Compliance Certificate Per inspection and for each additional inspection necessary to obtain compliance	Plus travel costs	$160.00	$160.00
Extension of Time for which Building Consent is Valid Application must be lodged before the date consent lapses.		$100.00	$100.00
Amendments/Variations • Minor Variation		$100.00	$100.00
• Major Variation Fees will be assessed as a percentage of consent fee at the discretion of the Building Control Manager.		$200.00	$200.00



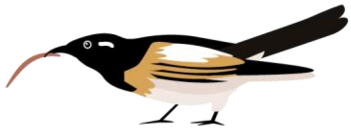
SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
LEVIES			
• Department of Building and Housing Levy (MBIE)	Per $1,000	$1.75	$1.75
• B.R.A.N.Z Levy	Per $1,000	$1.00	$1.00
• BCA Accreditation Levy	Per consent	$50.00	$50.00
OTHER			
Application for Certificate of Acceptance		$500.00	$500.00
Per inspection, plus full applicable consent fee		$160.00	$160.00
Application for Certificate of Public Use		$500.00	$500.00
Per inspection		$160.00	$160.00
Planning Check			
Application reviewed for compliance with District Plan		$150.00	$150.00
Notice to Fix		$500.00	$500.00
Per inspection		$160.00	$160.00
Section 71 and Section 77 Building Act 2004			
Preparation, signing and registration of Notices and Certificates charged at actual cost	Deposit	$500.00	$500.00
Electronic submission and processing			
Fees and charges associated with on-line / electronic lodgment and processing of building consents via a third-party building consent platform		New charge	Actual fees levied by any third-party provider
Cancellation of Building Consent			
Upon lapse of building consent and request from building owner for a building consent that has been approved, Council will refund all fees less the Building Consent Application Fee.	Per consent		
Building Consent Information – Others	Per year	$307.00	$307.00
External Consultant Fees			
When external consultants are engaged to peer review consent applications, the applicant will be charged the actual cost for those services and any additional costs incurred by Building Control.		Actual Cost	Actual Cost
Audit Compliance Schedule		$200.00	$200.00
Issue new Compliance Schedule and Compliance Schedule Statement		$300.00	$300.00
Amend Compliance Schedule		$300.00	$300.00

PUBLIC HEALTH FEES

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
FOOD PREMISES Amended Fee Structure applies to all Food Premises			
Fees Applicable to All Registration Types			
All administration and verification activities including pre-registration assistance, annual audit, reporting, non-conformance visits and any activity not specified in the schedule below for operators based in the Ōtorohanga District.	Per hour plus $1.20/km	$165.00	$165.00
All administration and verification activities including pre-registration assistance, annual audit, reporting, non-conformance visits and any activity not specified in the schedule below for operators based outside the Ōtorohanga District.	Per hour plus $1.20/km	$220.00	$220.00
Cancellation of scheduled verification within 24 hours or key personnel not available for the verification		$165.00	$165.00
Copies of Food Control Plan folder and documents		$25.00	$25.00
Fees Applicable to Food Control Plans			
Application for registration of template Food Control Plan	Plus hourly rate after first hour	$410.00	$410.00
Application for renewal of registration of template Food Control Plan	Plus hourly rate after first hour	$320.00	$320.00
Application for a significant amendment [section 45(3)] of registration of template Food Control Plan, or move from Food Control Plan to National Programme during registration year	Plus hourly rate after first hour	$150.00	$150.00
Application for a minor amendment [section 45(2)] of registration of template Food Control Plan.	Plus hourly rate after first hour	$75.00	$75.00
Voluntary suspension of food control plan	Plus hourly rate after first hour	$85.00	$85.00
Fees Applicable to National Programmes			
Application for registration of National Programme	Plus hourly rate after first hour	$410.00	$410.00
Application for renewal of registration of National Program	Plus hourly rate after first hour	$320.00	$320.00
Application for significant amendment [Section 81] of registration of National Programme or move from National Programme to Food Control Plan during the registration year.	Plus hourly rate after first hour	$150.00	$150.00
Voluntary suspension of National Programme	Plus hourly rate after first hour	$85.00	$85.00
Issue of improvement notice, or review of an improvement notice	Plus hourly rate after first hour	$150.00	$150.00

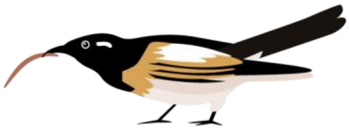


SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Application for statement of compliance Additional staff time not covered elsewhere	Plus hourly rate after first hour	$150.00 EHO hourly rate	$150.00 EHO hourly rate
FUNERAL DIRECTOR • Initial registration • Initial inspection and interview plus apportioned annual fee or $100.00, whichever is greater • Renewal annual fee		$300.00 $210.00	$300.00 $210.00
HAIRDRESSERS • Initial registration of premises • Initial inspection and interview plus apportioned annual fee or $100.00, whichever is greater • Renewal annual fee	Plus apportioned annual fee	$300.00 $340.00	$300.00 $340.00
OFFENSIVE TRADES • Initial registration • Initial inspection and interview plus apportioned annual fee or $100.00, whichever is greater • Renewal annual fee	Plus apportioned annual fee	$300.00 $340.00	$300.00 $340.00
SALEYARDS • Initial registration • Initial inspection and interview plus apportioned annual fee or $100.00, whichever is greater • Renewal annual fee		$300.00 $210.00	$300.00 $210.00
CAMPING GROUNDS Initial registration Initial inspection and interview to check compliance with Camping Ground Regulations plus apportioned annual fee or $100.00, whichever is greater Renewal annual fee	Plus apportioned annual fee	$300.00 $340.00	$300.00 $340.00
MOBILE OR TEMPORARY TRADING Mobile trading, food trucks, hawkers: • Annual license per site • Temporary license for 3 months per site		 $150.00 $50.00	 $350.00 $150.00

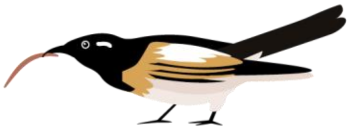


DOG CONTROL

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
DOG CONTROL			
Registration Fees			
(Section 37 of the Dog Control Act 1996)			
• Urban Dogs		$162.00	$162.00
• Urban plus Neutered Dogs		$127.00	$127.00
• Urban plus Special Owner Dogs		$127.00	$127.00
• Special Owner plus Neutered Dogs		$70.00	$70.00
• Rural plus Special Owner Dogs		$70.00	$70.00
That an additional registration fee of 50% of the fee that would have been payable on dogs not registered by 31 July shall apply.			
• Registration tags		Free of charge	Free of charge
• Replacement tags		Free of charge	Free of charge
• Dog collars – Size - Small		$13.00	$13.00
• Dog Collars – Size - Big		$20.00	$20.00
POUND FEES			
Dogs (Section 68 of the Dog Control Act 1996)			
The following fees by payable for impounding of dogs:			
• Seizure fee	Per dog	$60.00	$60.00
• A poundage fee first impoundment	Per dog	$60.00	$60.00
• An additional poundage fee for second and subsequent impounding.	Per dog	$70.00	$70.00
Fee for dogs uplifted for barking complaints, threatening public safety, non-registration or any other purpose authorised under the Dog Control Act 1996		Actual and reasonable costs incurred.	
Sustenance fee while impounded	Per dog per day or part thereof	$18.00	$18.00
Surrender disposal fee (in addition to applicable impounding charges and sustenance)		$80.00	$80.00
Infringement fees will be imposed as set under the Dog Control Act 1996			
Notification Fee		$50.00	$50.00
Impounded dogs only be released from the pound between the hours of 8.30am to 5.00pm Monday to Friday on full payment of all fees. No releases to be made on Saturdays, Sundays or public holidays.			
OTHER ANIMALS			
(Section 14 of the Impounding Act 1955)			
Poundage			
• For every horse, mare, gelding, colt, filly or foal		$50.00	$50.00
• For every mule or ass		$50.00	$50.00
• For every bull above the age of 9 months	Per head up to 6 head	$50.00	$50.00

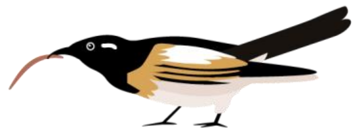


SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
• For every bull above the age of 9 months	For every head over 6 head	$22.00	$22.00
• For every ox, cow, steer, heifer or calf	Per head up to 6 head	$40.00	$40.00
• For every ox, cow, steer, heifer or calf	For every head over 6 head	$22.00	$22.00
• For every stag above the age of 9 months		$50.00	$50.00
• For all other deer		$40.00	$40.00
• For every ram above the age of four months		$16.00	$16.00
• For every ewe, wether, or lamb		$11.00	$11.00
• For every goat		$11.00	$11.00
• For every boar		$45.00	$45.00
• For all other pigs		$45.00	$45.00
Notification Advertisement			
In addition to the above fees and to be considered part of the poundage fee, where applicable, a notification fee of a newspaper circulating in the local authority district.		$60.00	$60.00
Repeated Impounding			
Where stock, not necessarily the same animal, but owned by the same person is impounded on a second or subsequent occasion, the Poundage fee shall be twice that charged on the initial impounding.		Double initial impounding fee	Double initial impounding fee
Sustenance			
Sustenance fees shall be payable by the owner of impounded stock sufficient to reimburse the Council for all actual and reasonable costs incurred in the sustenance of the stock provided that no such fee shall be less than.	Per head of stock per day	$8.00	$8.00
DRIVING CHARGES			
In the case of any stock found trespassing, straying or wandering on any road, the owner shall pay to the Council all actual and reasonable costs incurred in loading, driving or conveying the stock from the place where it is found to the nearest pound.			
Impounded stock will only be released from the pound between the hours of 8.30am to 5.00pm Monday to Friday on full payment of all fees. No releases to be made on Saturdays, Sundays or public holidays.			
TRESPASSING (WANDERING STOCK)			
Trespass on any paddock of grass or stubble			
• For every horse, cattle, beast, deer, ass or mule	Per day	$3.00	$3.00
• For every sheep	Per day	$1.00	$1.00
• For every pig or goat	Per day	$6.00	$6.00
Trespass on any land bearing any growing crop or from which the crop has not been removed, or in any reserve, cemetery or burial ground			
• For every horse, cattle, beast, deer, ass or mule	Per day	$6.00	$6.00
• For every sheep	Per day	$2.00	$2.00
• For every pig or goat	Per day	$12.00	$12.00



OTHER REGULATORY SERVICES

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
AMUSEMENT DEVICES			
• Permit Fees - First Device (first 7 days)		$11.25	$11.25
• Permit Fees - Each additional device (first 7 days)		$2.30	$2.30
• For each device for each further period of 7 days		$1.15	$1.15
LIQUOR LICENSING FEES			
On, Off and Club Licenses			
Application Fee			
• Very low		$368.00	$368.00
• Low		$609.50	$609.50
• Medium		$816.50	$816.50
• High		$1,023.50	$1,023.50
• Very High		$1,207.50	$1,207.50
Annual Fee			
• Very low		$161.00	$161.00
• Low		$391.00	$391.00
• Medium		$632.50	$632.50
• High		$1,035.00	$1,035.00
• Very High		$1,437.50	$1,437.50
Special Licence Class			
• Class 1		$575.00	$575.00
• Class 2		$207.00	$207.00
• Class 3		$63.25	$63.25
Managers Certificates	New and renewal certificates	$316.25	$316.25
Application for Temporary Authority		$296.70	$296.70

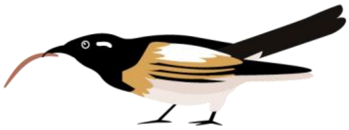


SUPPORT SERVICES

SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
GIS PLANS			
Custom maps – based on GIS Officer's time[8]	Per hour	$55.00	Actual costs
Raster Data[9]	A4 (210 x 297)	$10.50	$10.50
	A3 (420 x 297)	$12.50	$12.50
	A2 (420 x 594)	$15.50	$15.50
	A1 (840 x 594)	$31.00	$31.00
Vector Data	A4 (210 x 297)	$7.00	$7.00
	A3 (420 x 297)	$8.00	$8.00
	A2 (420 x 594)	$15.50	$15.50
	A1 (840 x 594)	$20.50	$20.50
PHOTOCOPYING			
Single <5			
A4 White		$0.40	$0.40
A3 White		$0.60	$0.60
A4 Coloured		$1.00	$1.00
Single >5			
A4 White		$0.35	$0.35
A3 White		$0.50	$0.50
A4 Coloured		$0.80	$0.80
Double sided <5			
A4 White		$0.60	$0.60
A3 White		$0.80	$0.80
A4 Coloured		$1.50	$1.50
LAND INFORMATION MEMORANDUM			
Application Fee		$230.00	$330.00
Urgent Fee (within 5 working days)	Additional	$130.00	$130.00
Any follow up work as a result of a LIM		Actual costs	Actual costs
Application for a property that include more than one valuation Reference	Charge for each additional reference	$50.00	$0.00
LEGAL DOCUMENTS			
Preparation of Leases and Licences of Council land (plus actual disbursement costs e.g. any advertising fees)	Standard Fee	$205.00	$205.00
Preparation of Leases and Licences of Council land – renewal	Standard Fee	$155.00	$155.00
Sealing Fee per set of documents		$35.00	$35.00
Title Search - Standard (plus disbursements)	Per document	$25.00	$25.00

8 Refer to page 26 for Staff Charge Out Rates

9 Raster plots are dearer as they are solid graphics like topographical maps or aerial photography, whereas vector data is only line work and text, so uses less ink.



SERVICE/ITEM	NOTES	CURRENT	PROPOSED FROM 1 JULY 2024
Title Search - Complex (plus disbursements) Search fee for complex title search staff time[10]	Per document per hour	$25.00 $50.00	$25.00 Actual costs
RATING INFORMATION Road / Street Index Written confirmation of individual property information and requisitions Verbal information on properties to the owner, occupier or their representatives.	 On disc/drive On paper	 $510.00 $50.00 Actual costs Nil	 $510.00 $50.00 Actual costs Nil

STAFF CHARGE OUT RATES

POSITION	PER HOUR $
Group Manager	$200
Manager/ Principal (all roles)	$185
Senior level staff (all roles) / Team Leader	$175
Intermediate level staff (all roles) and Environmental Health Officer	$165
Graduate level staff (all roles)	$150
Administration staff and any other staff not specified	$100

[10] Refer to table for Staff Charge Out Rates.

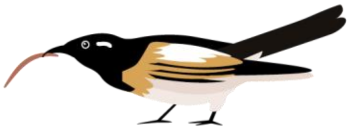
WEAVING THE FUTURE, TOGETHER
KOTAHITANGA
ŌTOROHANGA DISTRICT COUNCIL

RATES REMISSION POLICY

ŌTOROHANGA DISTRICT COUNCIL

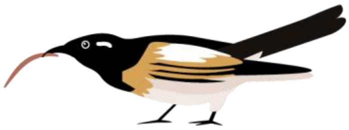
JULY 2024

Te Kaunihera ā-Rohe o Ōtorohanga District Council
Where kiwi can fly



CONTENTS

APPROVAL AND REVIEW	DETAILS
Approval authority:	Council, CEO
Administrator:	
Effective date:	1 July 2024
Next review date:	30 June 2030 or earlier as required



GENERAL

Section 85 of the Local Government (Rating) Act 2002 states a council can remit all or part of the rates of a rating unit if a remission policy has been adopted under the Local Government Act. This policy has been prepared in accordance with Section 109 of the Local Government Act 2002[1], and may be amended or revoked using a consultation process that gives effect to the requirements of Section 82 of that Act.

Types of remissions covered by this policy are:

- Instalment penalties
- Arrear penalties
- Community, sporting and other organisations
- Wastewater charges to schools
- Covenanted land including Queen Elizabeth National Trust
- Rating unit affected by calamity
- New subdivisions
- Uniform charges on contiguous properties
- Rating units with a capital value of $3,000 or less
- Excess water consumption
- Two separately habitable units
- Extreme financial hardship
- Care for the elderly and disadvantaged persons.

The following information is provided for each remission type:

- Objective(s) sought to be achieved by remission of rates
- Conditions and criteria to be met in order for rates to be remitted including penalties payable on unpaid rates.

INSTALMENT PENALTIES

A remission of 100 percent instalment penalties will be granted in the following circumstances, where:

- The ratepayer elects to pay the annual rates by way of a regular payment arrangement to have rates cleared by 31st May of each year.
- The ratepayer has omitted to pay a rates instalment in time due to extraordinary circumstances as approved by the General Manager Business Enablement.
- The ratepayer has missed a penalty date but has otherwise a record of paying rates on time.

OBJECTIVES

- To facilitate the payment of rates allowing ratepayers to pay their rates by way of an agreed regular payment arrangement over a specified time period.
- To recognise the occurrence of late rates instalment payments in certain circumstances

CONDITIONS AND CRITERIA

- Ratepayers paying their rates by way of payment arrangements must make regular payments of specified amounts, as agreed by the Council.

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[1] www.legislation.govt.nz/act/public/2002/0084/latest/DLM172372.html

- The ratepayer has made a late payment, but has made all rates payments on time during the previous three years; or if the ratepayer has owned the property for less than 12 months, from the time they purchased the property.
- The ratepayer can demonstrate that late payment has been made because of extraordinary circumstances.
- The Group Manager Business Enablement has delegated authority to determine whether a request for remission should be granted or refused.

ARREARS PENALTIES WHERE A PAYMENT ARRANGEMENT IS IN PLACE

A remission of 100 percent of arrears penalties may be applied to rates accounts in respect of which a payment arrangement is in place and is being honoured (i.e. regular payments of specified amounts are made as agreed between the ratepayer and Council which will allow outstanding rates to be repaid in full).

OBJECTIVE

To facilitate the payment of rates by allowing ratepayers to pay their rates by way of an agreed payment arrangement.

CONDITIONS AND CRITERIA

- The payment arrangement is being honoured, i.e. ratepayers must pay certain amounts at regular intervals as agreed between the ratepayer and Council.
- If current rates and rate arrears are paid through a payment arrangement, the payments must have the effect of reducing rate arrears, before a remission of arrears penalties is considered.
- In considering whether a remission is granted in respect of rates accounts with outstanding balances, the Council may take into account the reasons for the arrears.
- The Group Manager Business Enablement has delegated authority to grant or refuse remission in respect of accounts with outstanding balances.

COMMUNITY, SPORTING AND OTHER ORGANISATIONS

OBJECTIVES

- To facilitate the on-going provision of non-commercial (non-business) community services and/or sporting and recreation opportunities that meets the needs of Ōtorohanga district's residents;
- To provide rating relief to Council community properties, sporting, recreation and other community organisations; and
- To make membership of the sporting, recreation and other community organisations more accessible to the general public, particularly disadvantaged groups. These include children, youth, young families, older persons and economically disadvantaged people.

CONDITIONS AND CRITERIA

The policy may apply to land owned by the Council which is used exclusively or principally for community purposes, sporting, recreation, or to land which is owned and occupied by a charitable organisation and used exclusively or principally for sporting, recreation or other community purposes.

The policy does not apply to:

- Organisations operated for private pecuniary profit, or those which charge commercial tuition fees; and
- Groups or organisations whose primary purpose is to address the needs of adult members (over 18 years) for entertainment or social interaction, or who engage in recreational, sporting, or community services as a secondary purpose only.

Under this policy the following rate remission may apply to the Council and those sporting, recreation and other community organisations which qualify, with the exception of targeted rates for water supply, sewage disposal or refuse collection.

- A remission of the 50 percent residual rates will be given to those societies and associations who qualify for the 50 percent non-rateable category under Schedule 1, Part 2 of the Local Government (Rating) Act 2002.

WASTEWATER CHARGES TO SCHOOLS

OBJECTIVE

To provide relief and assistance to educational establishments in paying wastewater charges.

CONDITIONS AND CRITERIA

This policy will apply to educational establishments as defined in Schedule 1 Part 1 clause 6 (a-b) of the Local Government (Rating) Act 2002. It does not apply to school houses or any part of a school used for residential purposes.

Wastewater charges for schools will be calculated based upon a notional number of pans as follows:
Staff plus pupils[2]*/ 20 = number of pans*

The wastewater charge for the educational establishment will be charged at:

- 100 percent for the first four pans
- The fifth to tenth pan charges will be discounted to 75 percent
- All pan charges exceeding ten will be discounted to 50 percent.

The policy applies to all wastewater charges including Uniform Targeted Rates and Targeted Rates for debt servicing.

COVENANTED LAND[3]

OBJECTIVES

- To provide for relief for land where an open-space covenant under Section 22 of the Queen Elizabeth the Second (QE2) National Trust Act 1977 has been registered against the title of a property.
- To provide relief for land where a covenant or consent notice is registered on the title to the land to secure an appropriate interest in perpetuity for conservation, heritage and cultural purposes under the Resource Management Act 1991 or Reserves Act 1977.

CONDITIONS AND CRITERIA

The Local Government (Rating) Act 2002 provides for land owned or used by the QE2 National Trust to be non-rateable.

- Where the land to which the covenant relates remains in the ownership of the ratepayer, the covenanted land will be eligible for a remission of rates.
- Where a covenant or consent notice under the Resource Management Act 1991 as described in the objective above is registered, the covenanted land will be eligible for a remission of rates.

The remission applied will be 100 percent of all rates other than targeted rates for water supply, sewerage disposal and refuse collection.

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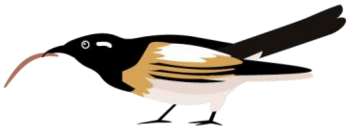
2 Pupil numbers are the number of pupils on the roll at March 1 in the year immediately before the year in which the charge relates. The number of staff is the number of full time equivalent and administration staff employed on 1 March immediately before the year in which the charge relates.

3 It should be noted that there are a number of other types of land, not specified in this policy that are categorized as non-rateable under the Local Government (Rating) Act 2002. Some examples include:

- National Park under the Nationals Park Act 1980
- Reserve under the Reserves Act 1977
- Conservation area under the conservation Act 1987.

https://www.legislation.govt.nz/act/public/2002/0006/latest/DLM133512.html#DLM133513



RATING UNIT AFFECTED BY CALAMITY

OBJECTIVE

To permit the Council to remit part or whole of the rates charged in any financial year on any land that has been detrimentally affected by erosion, subsidence, submersion, or other calamity.

CONDITIONS AND CRITERIA

The Council may remit the rates charged on a rating unit if:

- The property is detrimentally affected by erosion, subsidence, submersion, declared drought or other natural calamity; or
- The property is unable to support the activity which it was used prior to the calamity. For example a residence or commercial building that is unable to be occupied as a result of a calamity.

Rates remissions will only be considered and made following the receipt of an application by a qualifying property in respect of the financial year in which the application was received. There will be no backdating of rates remissions.

Rates remissions (for part or all) may be applied to all rates charged on qualifying properties.

NEW SUBDIVISIONS

All Uniform Charges - with the exception of targeted rates for Refuse, Water and Sewerage - may be remitted for the second and subsequent lots of a new subdivision as long as the lots remain unsold and unoccupied.

OBJECTIVE

To facilitate subdivision development in the Ōtorohanga District.

CONDITIONS AND CRITERIA

- The subdivided new lots must be unsold and unoccupied
- Rates remission will apply to the second and subsequent lots of the subdivision.

UNIFORM CHARGES ON CONTIGUOUS[4] PROPERTIES

All ratepayers will pay at least one set of Uniform Targeted Rates[5].

OBJECTIVE

To provide for the remission of rates where two or more sets of Uniform Targeted Rates are set on rating units that are:

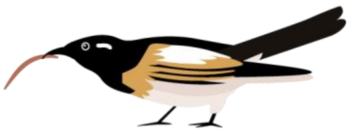
- Contiguous; and
- Owned and/or occupied by the same person or persons; and
- Used jointly for a single residential or farming use.

CONDITIONS AND CRITERIA

- The rating unit must be contiguous
- The policy applies to ratepayers who are recorded as ratepayers of two or more separate rating units. Each rating unit will attract a set of uniform targeted rates.
- The rating unit must:
  - In the case of an urban property, be owned by the same ratepayer/s who use the rating units jointly as a single residential property, or
  - In the case of a rural property, be separately occupied by the same ratepayer/s who uses the rating units jointly as a single purpose.

[4] Definition of Contiguous: Sharing an edge or boundary; touching; or separated only by a road, railway, drain, water race, river or stream.

[5] A set of uniform targeted rates refers to the Uniform Annual General Charge and all Uniform Targeted rates with the exception of targeted rates for Refuse, Water and Sewerage.



RATING UNITS WITH A CAPITAL VALUE OF $3,000 OR LESS

OBJECTIVE

To allow Council to act fairly, reasonably and efficiently where rating units have capital valuations of $3,000 or less.

CONDITIONS AND CRITERIA

Rating units that have a registered capital value of $3,000 or less held in the District Valuation Roll as at 30 June for the current rating year are eligible for remission of rates.
The remission applied will be 100 percent of all Ōtorohanga District Council rates that have been assessed for the rating unit. The Group Manager Business Enablement, under delegated authority, may apply this remission on the ratepayers behalf.

EXCESS WATER CONSUMPTION

OBJECTIVE

To enable the Council to provide relief to ratepayers who have metered properties and have suffered excessive water consumption due to a leak or other similar circumstances.

CONDITIONS AND CRITERIA

On written application of the ratepayer, Council may remit 100 percent of excess water use for the first affected billing period, and 50 percent for the second affected billing period, provided that:

- Excess water consumption has occurred through a broken or leaking pipe that realistically was not observable or otherwise noticeable or some other exceptional circumstances; and
- Evidence is provided that the fault has been remedied; and
- No other application for remission for excess water use on the particular meter had been granted in the previous two years or at the discretion of the Group Manager Business Enablement.

After two consecutive periods, no remission will apply.

The amount of the remission will be the difference between the average consumption of the property prior to the leak, as deemed reasonable by Council, and the consumption over and above the average.

Decisions for remission of water-by-volume rates for rating units will be delegated to the Group Manager Business Enablement.

RATING UNITS CONTAINING TWO SEPARATELY HABITABLE UNITS

OBJECTIVE

To enable the Council to provide relief for ratepayers who own a rating unit containing two habitable units but who use the second unit only to accommodate non-paying guests and family.

CONDITIONS AND CRITERIA

On written application of a ratepayer annually, Council may remit second targeted rates for Water, Wastewater and Refuse Collection, provided that:

- Their rating unit contains two habitable units; and
- The second unit is used only for family or friends of the occupants of the first unit on a non-paying basis; and
- The application is accompanied by a Statutory Declaration made by the ratepayer that declares that the previous bullet point has been complied with for the current rating year and will continue to be complied with in the ensuing year.

If a rating unit contains more than two habitable units used by non-paying guests and family, only one is entitled to remission.

The application for remission must be made to the Council prior to commencement of the rating year (1 July). Applications received during a rating year will be applicable from the commencement of the following rating year. Applications will not be backdated.

EXTREME FINANCIAL HARDSHIP

OBJECTIVE

To provide relief for residential ratepayers experiencing extreme financial hardship.

APPLICATIONS

- Where an application for rates relief due to extreme financial hardship is received, Council may remit all or part of rates relating to a rating unit.
- Applications on the grounds of extreme financial hardship are considered only when exceptional financial circumstances exist. Approved remissions are therefore a result of an extraordinary situation and should be recognised as an exception from the ratepayer's legal obligation to pay rates.
- An application can be lodged in any year that such hardship exists.
- Applications received that meet the criteria of this policy will be considered by Council on a case-by-case basis.
- The Group Manager Business Enablement has delegated authority to decline an application or remit rates, including arrears, of up to $2,000 in any one case.

CONDITIONS AND CRITERIA

- Preference will be given to rating units used solely for residential purposes (as defined by Council)
- A ratepayer making an application must be the registered owner and occupier.
- A ratepayer making an application must not own any other rating units or investment properties (whether in the district or in another district).
- The ratepayer must supply sufficient evidence, including financial statements, to satisfy the Council that extreme financial hardship exists.
- When considering an application, the ratepayer's personal circumstances will be relevant such as age, physical or mental ability, injury, illness and family circumstances.
- Before approving an application, Council must be satisfied that the ratepayer is unlikely to have sufficient funds left over, after making the payment of rates, for normal health care, proper provision for maintenance of their home and chattels at an adequate standard as well as making provision for normal day to day living expenses.
- The applicant must provide sufficient evidence on how they plan to meet their rating commitment going forward.
- It is expected that the ratepayer will pay a minimum of the value of the Uniform Annual General Charge per annum towards his/her rates account. However, each case will be considered on its merits.
- If the applicant is eligible for a Rates Rebate then such application must be made at the time of applying for rates relief due to extreme financial hardship.

INSTITUTIONS PROVIDING CARE FOR THE ELDERLY AND DISADVANTAGED PERSONS

A 100 percent remission of all rates - excluding targeted rates for Water, Wastewater and Refuse Collection - may be applied to land owned or used by charitable institutions and groups which provide care of the aged and disadvantaged persons.

OBJECTIVES

- To facilitate the operation of charitable groups and institutions.
- To support the services provided by such groups and institutions.

CONDITIONS AND CRITERIA

- Charitable organisations must provide care on a non-profit basis.

- An application for rates[6] remission must be made to the Council prior to the commencement of the rating year; rates remissions will not be applied during the rating year or retrospectively.
- The application must include the following information in support of the application:
  - Objectives of the organisation.
  - Funding and financial information
  - Information on activities and programmes
- No rates remission will be granted in respect of Targeted rates for Water, Wastewater or Refuse Collection.

The Group Manager Business Enablement has delegated authority to determine whether the organisation qualifies for rates remission.

[6] Rates includes penalties payable on unpaid rates.

WEAVING THE FUTURE, TOGETHER
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RATES REMISSION ON MĀORI FREEHOLD LAND POLICY

ŌTOROHANGA DISTRICT COUNCIL

JULY 2024

Te Kaunihera ā-Rohe o Ōtorohanga District Council
Where kiwi can fly

APPROVAL AND REVIEW	DETAILS
Approval authority:	Council, CEO
Administrator:	
Effective date:	1 July 2024
Next review date:	30 June 2030 or earlier as required

PURPOSE

This policy aims to ensure the fair and equitable collection of rates from all sectors of the community while recognising that certain Māori owned lands have particular conditions, features, ownership structures or other circumstances that make it appropriate to provide relief from rates.

OBJECTIVES

The remission of rates on Māori freehold land is to:

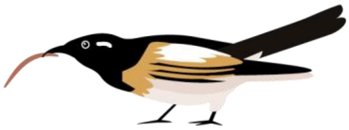
- Recognise situations where a person has effectively inherited rates arrears from a deceased owner.
- Recognise where multiple rating units of Māori freehold land should be treated as one for the purpose of calculating rates if they are used as one economic unit.
- Recognise where multiple homes on a rating unit of Māori freehold land should have separate rate accounts if the owner requests, which will enable owners to access rates rebates.
- Recognise situations where there is no occupier or person gaining an economic or financial benefit from the land.
- Encourage the setting aside of land that is better set aside for non-use because of its natural features (whenua rāhui).
- Recognise matters related to the physical accessibility of the land.
- Recognise and take account of the presence of wāhi tapu that may affect the use of the land for other purposes.
- Grant remission for the portion of land not occupied where part only of a block is occupied.
- Facilitate the development or use of the land where the Council considers rates based on land value make the use of the land uneconomic.
- Recognise and take account of the importance of land in providing economic and infrastructure support for marae and associated papakāinga housing.
  - Recognise and take into account the importance of the land for community goals relating to: The preservation of the natural character of the coastal environment.
  - The protection of outstanding natural features.
  - The protection of significant indigenous vegetation and significant habitat of indigenous fauna.

It should be noted that there are a number of different types of Māori freehold land that are categorized as non-rateable under the Local Government (Rating) Act 2002. Some examples include:

- Land that is set apart under section 338 of the Te Ture Whenua Māori Act 1993
- Māori freehold land on which a Meeting House is erected.

LEGISLATION

- Section 102(1) and (2) of the Local Government Act 2002 (the LGA) provides that Te Kaunihera o Ōtorohanga (the Council) must adopt a policy on the remission and postponement of rates on Māori freehold land (the policy).
- Section 102(3A) of the LGA provides that the Council must support the principles set out in the preamble to Te Ture Whenua Māori Act 1993.
- Section 108 of the LGA provides what the policy must contain.
- Section 114 of the Local Government (Rating) Act 2002 provides that the council may remit all or part of the rates (including penalties for unpaid rates) on Māori freehold land if its policy includes provision for the remission of rates and is satisfied that the conditions and criteria in the policy have been met.
- Section 108(4A) of the LGA provides that this policy must be reviewed every six years.



PREAMBLE TO TE TURE WHENUA MĀORI ACT 1993

Whereas the Treaty of Waitangi established the special relationship between the Māori people and the Crown: And whereas it is desirable that the spirit of the exchange of kawanatanga for the protection of rangatiratanga embodied in Te Tiriti o Waitangi be reaffirmed: And whereas it is desirable to recognise that land is a taonga tuku iho of special significance to Māori people and, for that reason, to promote the retention of the land in the hands of its owners, their whanau, and their hapu, and to protect wāhi tapu: and to facilitate the occupation, development, and utilisation of that land for the benefit of its owners, their whanau, and their hapū: And whereas it is desirable to maintain a court and to establish mechanisms to assist the Māori people to achieve the implementation of these principles.

CONDITIONS AND CRITERIA

The Council will maintain a register titled the Māori Land Rates Relief Register for the purpose of recording properties on which it has agreed to remit rates under this policy. The Register will comprise two category lists:

- The Māori Land General Remissions List; and
- The Māori Land Economic Adjustment Remissions List

Owners or trustees making application should include the following information in their applications:

- Details of the property
- The objectives that will be achieved by providing a remission; and
- Documentation that proves the land, which is the subject of the application, is Māori freehold land.

The Council may, at its discretion, add properties to the lists. Relief, and the extent thereof, is at the sole discretion of the Council and may be cancelled or reduced at any time.

MĀORI LAND GENERAL REMISSIONS LIST

The Council will consider remission of rates on land that comes within the following criteria:

- The land is:
  - Unoccupied and no income is derived from the use or occupation of that land; or
  - Better set aside for non-use (whenua rāhui) because of its natural features; or
  - Inaccessible and unoccupied; or
  - Occupied only in part.
- Whether the land qualifies for the statutory remission of rates for Māori freehold land under section 114 of the Local Government (Rating) Act 2002.
- Whether rates should be remitted because a person has effectively inherited rates from a deceased owner.

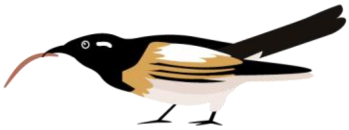
MĀORI LAND ECONOMIC ADJUSTMENT REMISSIONS LIST

OBJECTIVE

Council recognises that there is a need to incentivise economic development on Māori freehold land. Enabling and incentivising Māori Freehold economic development through the remission of rates may see direct economic and social benefits to landowners generating a return on the land, as well as to Council from future rates contributions, as the venture grows and becomes sustainable.

The objective for remission under this category is:

- To provide an incentive to assist the conversion of otherwise unoccupied or unproductive Māori freehold land, to an economic use through a progressive stepped application of a full liability for the payment of rates, over a five-year period.



CONDITIONS AND CRITERIA

Where there is an intention to make economic use of the land, or a clear intent to progressively develop the economic use of the land over time, Council will enter into a remission of rates arrangement with the Trustee/ Owner(s) or Occupier(s) where the Council is satisfied such an arrangement will encourage economic use through development over time.

Applicants must provide:

a. A written plan setting out the planned economic use of the land or the planned economic development against a five-year timeline prepared by a suitable person holding authority over the land and responsible for the planned use.
b. Any other documentation that the Council may require to make an assessment.

EXTENT OF REMISSIONS

At Council's discretion during the annual review and/or with negotiations with the land owner/s or trustees, a staged rates requirement will be implemented according to the following schedule:

- Year 1 Not less than 20% payable for that year
- Year 2 Not less than 40% payable for that year
- Year 3 Not less than 60% payable for that year
- Year 4 Not less than 80% payable for that year
- Year 5 100% payable for that year.

No remission will be granted on Targeted Rates for water supply, sewage disposal, and solid waste collection services.

POSTPONEMENT OF RATES

Council's policy does not provide for the postponement of rates on Māori freehold land, as security cannot be taken against Māori freehold land for postponed rates. Council will remit rates where it considers rates relief is appropriate, as set out in this policy.