DRAFT

TE RAUTAKI HANGARAU A TE KAUNIHERA

INFRASTRUCTURE STRATEGY 2024-2054

SECTION 1 | PURPOSE

The purpose of this Infrastructure Strategy (IS) is:

(a) To identify significant infrastructure issues for Waitomo District Council (WDC) over the period covered by the strategy, and
(b) To identify the principal options for managing those issues and the implications of those options.

The IS addresses the above purpose by outlining how WDC intends to manage its infrastructural assets for the 30 year period 2024 - 2054, within the following four groups of activities:

i. Water Supply
ii. Wastewater (Sewerage)
iii. Stormwater
iv. Roads and Footpaths

The key issues impacting on future management of WDC's infrastructure assets have been highlighted taking account of asset renewal or replacement needs, impacts of changes in demand for services reliant on those assets, changes to levels of service (e.g. as a result of new resource consents), consideration of public health and environmental outcomes, and managing risks impacting on the resilience of the assets to natural hazards.

This strategy represents an accumulation of the corresponding asset management planning underpinning WDC's Long Term Plan 2024 -2034 (LTP).

SECTION 2 | BACKGROUND

Clause 101B of the Local Government Act 2002 (LGA) requires Council to prepare and adopt an infrastructure strategy as part of its Long Term Plan.

WDC's first Infrastructure Strategy was prepared and adopted in 2015.

This updated IS will form part of the LTP 2024-2034 in accordance with Section 101B(1) and Schedule 10 of the LGA.

The strategy is required to provide an outline of "the most likely scenario" of how WDC intends to manage its infrastructure assets, taking account of the need to:

- renew and replace existing assets
- respond to growth or decline in demand for services reliant on those assets
- allow for planned increases or decreases in levels of service provided through those assets
- maintain or improve public health and environmental outcomes or mitigate adverse effects on them
- provide for resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks.

SECTION 3 | STRATEGIC CONTEXT

CENTRAL GOVERNMENT POLICY

The following updated strategic environment has been taken into account in the 2024-2054 Infrastructure Strategy.

Three Waters -Local Water Done Well

There have been recent changes to the legislation for three waters with the repeal of the Water Services Bill which puts the water, wastewater and stormwater assets back under control of local authorities.

The new government's approach to ensure water, wastewater and stormwater is delivered effectively gives control to local councils while using regulators to enforce rules around investment and compliance. This is outlined in the policy 'Local Water Done Well'.

The expectation is that three waters service delivery will be self-sustaining and paid for by users through revenue, rates or a combination of both. This will need to cover cost of maintenance required to meet compliance and expected levels of service. An Infrastructure Regulator will also ensure that sufficient investment is made to meet minimum standards and to allow for growth.

The option to form Regional Council Controlled Organisations comprised of the water, wastewater, stormwater, service delivery and assets will be available which is likely to offer economies of scale and long-term borrowing separated from council's balance sheet.

This IS does not assume that WDC join a Regional CCO, the investment in 3 waters has been based on the available information at the time. The level of investment is prioritised to the most critical issues that could impact public health and safety and resilience for the future. WDC has a stable population base and projections indicated a small amount of growth in the first 10 years followed by a decline to return to current population numbers in 30 years. Infrastructure investment is not a limiting factor to the expected growth at the projected rate.

RMA - Management

The new government have repealed the Natural and Built Environments and Spatial planning Acts which means that the RMA 1991 is the current legislation. The Climate Change Adaptation Act was the third part of reforming the RMA. This bill is currently being developed by the Ministry. It will address how communities adapt to climate change and the process around managed retreat. Planning and infrastructure investment decisions will be governed by this legislation to ensure infrastructure is climate resilient and decisions have considered the relevant risks relating to climate change.

Infrastructure investment and planning decisions will be made in accordance with current legislation and in line with our current Operative District Plan.

National Policy Statement for Freshwater Management

In addition to the changes for the RMA legislation the National Policy for Freshwater Management 2020 will be replaced. The requirement for councils to implement a freshwater management plan by the end of 2024 has been removed by Cabinet. The new NPS-FM will take about 2 years to complete. Council's freshwater plan changes to align with this are due to be notified by the end of 2027.

Any future investment or upgrades in the management of freshwater and environmental discharges will need to consider these changes.

Government Policy Statement (GPS) for Land Transport

The Draft Government Policy Statement on Land Transport 2024-33 (GPS 2024) is due to come into effect in July 2024. GPS 2024 defines six new priorities which are:

1. Maintaining and operating the system
2. Increasing Resilience
3. Reducing Emissions
4. Safety
5. Sustainable urban and regional development
6. Integrated freight systems

Figure 1 – Strategic Priorities

The previous, GPS 2021 was based on four strategic priorities:

1. Safety,
2. Better Travel Options,
3. Improving Freight Connections and,
4. Climate Change.

The priorities of GPS 2024 have changed, but the five pillars of the Transport Outcomes Framework (2021) have remained:

1. Healthy and safe people
2. Environmental Sustainability
3. Resilience and security
4. Economic Prosperity
5. Inclusive Access

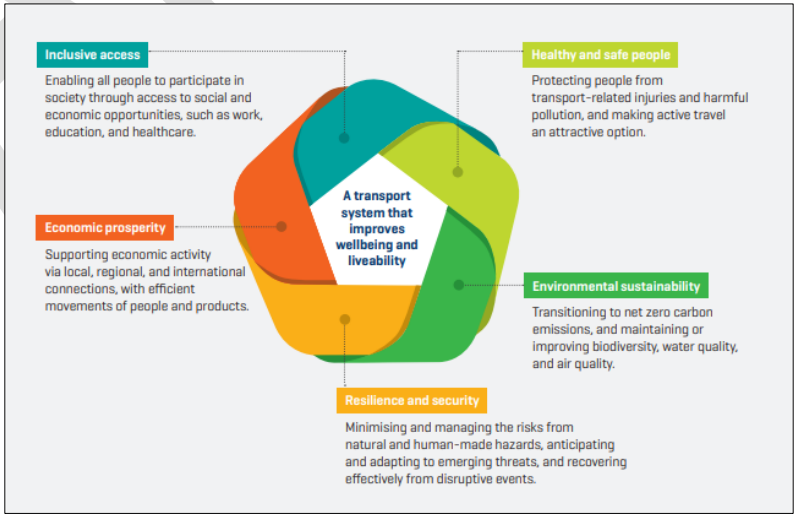


Figure 2 - Framework

Table 1: Summary of changes between GPS 2021 and GPS 2024 for Land Transport

GPS 2021 Priorities	GPS 2024 Priorities	Notes
Safety Develop a transport system where no-one is killed or seriously injured.	**Maintaining and operating the system** The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users.	*Safety remains a priority, however, GPS 2024 indicates that the core principals of maintaining current assets plays a pivotal role in safety.*
Better Travel Options Provide people with better travel options to access places for earning, learning, and participating in society.	**Increasing resilience** The transport system is better able to cope with natural and anthropogenic hazards	*Improving better travel options remains a priority, however, in GPS 2024 and after significant emergency events, the resilience of our transport networks needs drastic improvement to provide and promote better travel options.*
Improving freight connections Improve freight connections to support economic development.	**Reducing Emissions** Reducing to a lower carbon transport system	*Freight and logistics is still a priority in GPS 2024, slight reduction in priority.*
Climate Change Transform to low carbon transport system that supports emissions reductions, aligned with national commitments, while improving safety and inclusive access.	**Safety** The primary focus of this priority is to make transport substantially safer for all	*Climate change has an increased priority in GPS 2024 – "Reducing Emissions"*
	Sustainable urban and regional development People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Sustainable urban and regional development is focussed on developing resilient and productive towns and cities that have a range of low-emission transport options and low congestion	*Newly created priority highlighting that the "movement" and "place" functions of ONF will play a pivotal role with development and modes of transport*
	Integrated freight systems Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal and low-carbon connections to support productive economic activity.	*Similar priority to GPS 2024, reduced priority as some significant work has been previously undertaken.*

POPULATION PROJECTIONS

Infometrics was engaged by WDC to review and develop growth projections for the Waitomo District in September 2022. The purpose of the review was to provide population projections for long-term planning activities. The projections start with a base of the estimated residential population and then consider elements such as employment, migration, fertility, mortality, and household formation. Demographics and labour market are incorporated to the districtwide trend while sub-district considers household growth capacity and historical trends.

In 2013 Waitomo hit its lowest point having been in decline since the mid-1980s. Waitomo's population grew steadily from 2013, to reach 9,663 in 2021. Waitomo is projected to continue growing to reach a peak of 10,035 in 2039, thereafter easing back to 9,640 in 2054. This means that although growth is forecast over the next 20 years, by the end of the 30-year horizon, Waitomo is expected to have a similar population level to what it has today.

This correlates to a high to medium growth projection scenario which will be used for planning assessment purposes in this Infrastructure Strategy.

High to Medium Growth Scenario

Population - Waitomo's population growth has been relatively weak over the past 25 years, although stronger net migration gain in recent years has increased growth. Waitomo's population average growth rate over the past 25 years was -0.1%pa, improving to 0.1% for the past 10 years. Looking out to 2054, most of Waitomo's growth is expected over the next ten years, as stronger net migration is expected to replace retiring workers. Waitomo's population is projected to grow by 0.3%p.a. between 2021 and 2031, reducing to 0.1%p.a. between 2031 and 2041, and -0.3%p.a. between 2041 and 2054.

Households - The number of households and average household size are estimated based on projected changes in the sex and age structure of the population (such as a growing older-age population) and trends in household formation (such as women deferring childbirth). This provides a theoretical estimate of the number of households; however, the actual number of households will depend on a sufficient number of dwellings being available. If fewer dwellings are made available, for example due to lower levels of new dwelling construction, then fewer households will be able to form, and the average household size may be higher.

Waitomo's average household size is projected to continue falling over the next decade, from 2.61 in 2021 to 2.55 in 2031. This is driven by smaller families and an increasing proportion of older persons forming couple-without-children or one-person households. By the 2030s, average household size is projected to stabilise at around 2.55, remaining around that level for the remainder of the projection period.

The decline in household size means that the household number is projected to grow faster than the population due to more households forming within the existing population, and additional households from population growth.

Households are projected to grow around 0.5% per annum over the next decade, with growth steadily falling thereafter. Household growth is projected to turn negative from 2039 onwards, following the district's trend for population decline.

Rating Units - Population and dwelling growth flows through to rating units. The district's rating units are predominantly Residential and Residential Lifestyle, with nearly two thirds of the total rating units falling under these two categories. Therefore, any rating unit growth will be heavily dependent on dwelling growth.

The number of households in the Waitomo District is estimated to have risen from 3,608 in 2018 to 3,656 in 2021. Households are projected to grow steadily to 3,907 in 2039, before easing back to 3,757 in 2054.

The number of rating units is currently 5,950 as at 31 January 2024. Rating units are trending at 0.5% per year with the dwelling growth and new households on the same trajectory. The average trend of 0.5% per year will be applied over the first 10 years, after this point population growth is expected to slow and then go backwards. The rating units are also expected to follow this stagnating trend however it is unlikely rating units will reduce and there may still be land development changes that create some increases therefore years 11-30 a small increase of 0.1% per year has been applied.

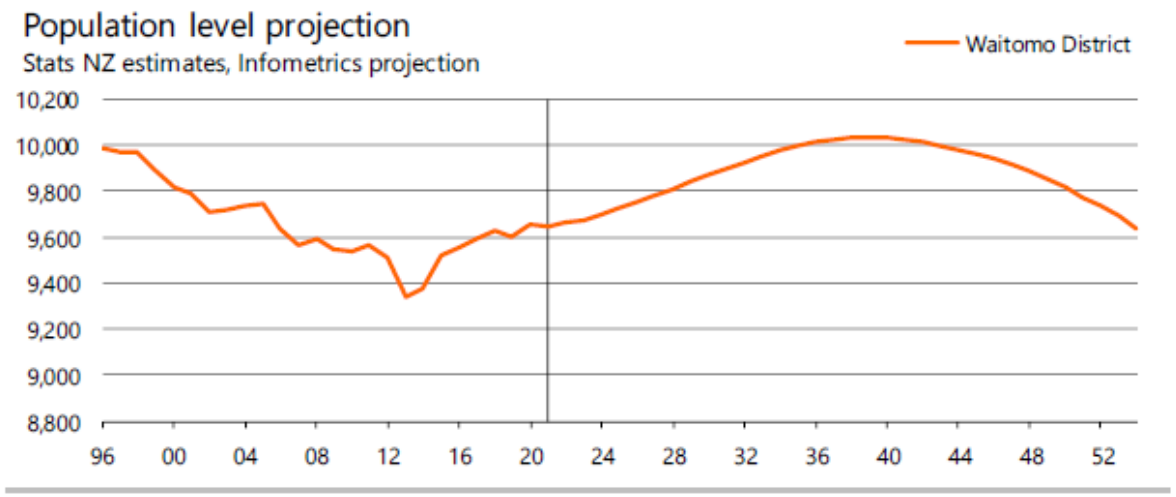
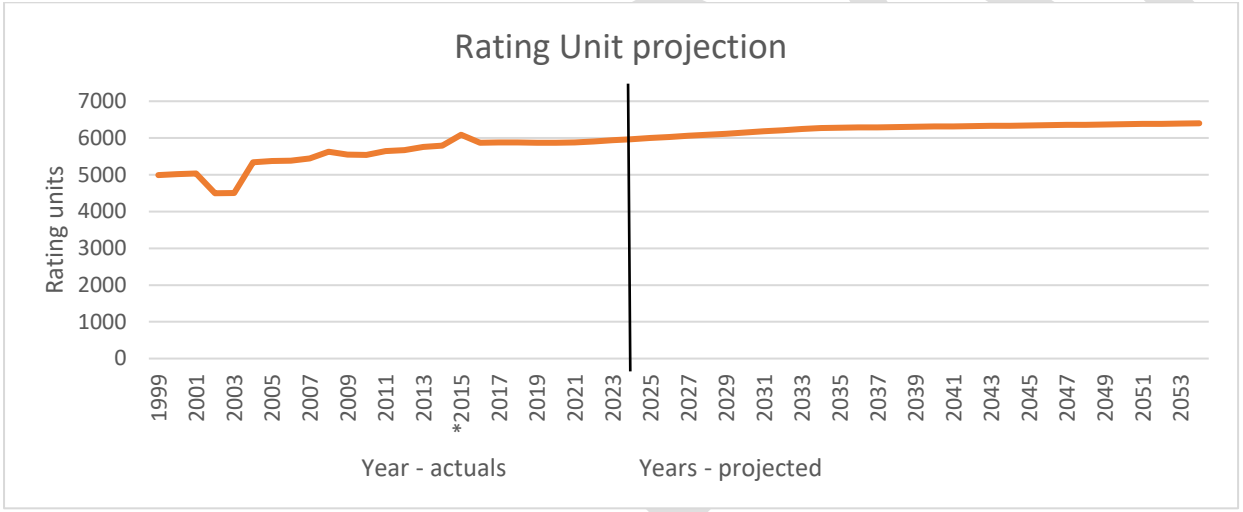


Figure 3: Waitomo District Population Forecasts 2022-2054



*Change from rateable properties to rating units

Figure 4: Rating unit projection

Table 1: Waitomo District Population and Dwelling Forecasts 2022-2054

Output	2022	2023	2024	2034	Change 2024 to 2034	2054	Change 2034 to 2054
Resident Population	9,340	9,673	9,708	9,985	+277	9,640	-345
Total Households	3,673	3,691	3,712	3,878	+166	3,758	-120
Total Rating Units	5,906	5,938	5,950*	6,273	+323	6400	+127

*Total rating units as at 31 January 2024

Population Structure

The 65-years-and-older age group has been Waitomo's fastest growing in the past two decades, growing 42% between 2003 and 2018. It will continue to be the fastest growing age group, projected to grow 53% between 2018 and 2033 as the last of the baby boomer generation transitions into the age group.

The 65-years-and-older age group accounted for 1,480 or 15% of Waitomo's population in 2018, and this is projected to rise to 2,435 (25%) by 2053 (Graph 2). The 30–64-year-old population is projected to hold steady over the next 30 years at around 4,300 (44%). The 15-29-year-old population is projected to ease from 1,840 (19%) in 2018 to 1,323 (14%) in 2053. The 0-14-year-old population is also projected to ease, from 2,110 (22%) in 2018 to 1,634 (17%) in 2053.

As a result of out-sized growth in the 65-years-and-over age group, the average age of Waitomo's population is projected to rise strongly over the next 30 years. Waitomo has historically had a relatively young population, with an average age below the national average. However, decades of net migration outflows have aged the population in Waitomo, as younger cohorts leave the district and older cohorts stay put. This has brought Waitomo's average age to the same as New Zealand's, 39 years in 2021.

Over the next 30 years, Waitomo is projected to experience weak net migration losses, at the same time as New Zealand overall experiences steady net migration gains. Net migration typically brings in relatively young population, which is important as the population ages and births are decreasing. Altogether, Waitomo is projected to age more rapidly than New Zealand overall. Waitomo's average age is projected to be 45 years in 2054, compared to 44 years for New Zealand.

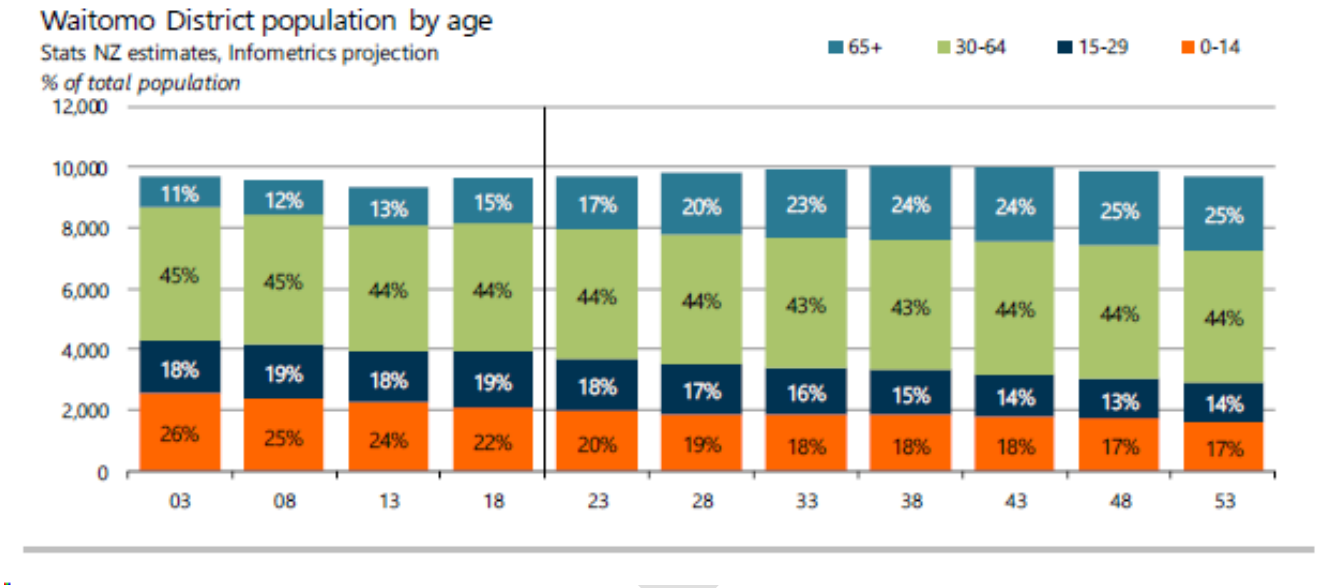


Figure 5 – Population by age

Projections by sub-district

Population growth is projected to be strongest in Te Kuiti (East and West) over the medium and long term (Table 1). This reflects historic growth patterns and the greater availability of serviced and zoned land within Te Kuiti compared to Waitomo's smaller communities. Employment growth is also likely to be stronger in Te Kuiti. National environmental regulations around greenhouse gas emissions and freshwater will drive deintensification of livestock farming and afforestation, which will adversely affect employment in the district's rural communities more so than in Te Kuiti.

Te Kuiti West had a population of 2,668 in 2021, is projected to grow 0.5%pa over 2021-2034, and 0.1%pa over 2034-2054. Te Kuiti East had a population of 2,066 in 2021, is projected to grow 0.5%pa over 2021-2034, and 0% over 2034-2054.

Table 3

Waitomo District population by SA2

Stats NZ estimate, Infometrics projection

		Annual average growth	
	2021	2021-2034	2034-2054
Herangi	1,019	0.0%	-0.5%
Hangatiki	1,324	0.2%	-0.2%
Aria	1,283	0.1%	-0.4%
Te Kuiti West	2,668	0.4%	0.1%
Te Kuiti East	2,066	0.5%	0.0%
Waipa Valley-Tiroa	1,287	0.1%	-0.5%
Waitomo District	**9,647**	**0.3%**	**-0.2%**

Current Pattern of Building and Subdivisional Development

Population growth for the district is projected to increase on average by 0.3%pa over the next ten years, while the number of dwelling and rating units are projected to grow slightly and then level off as the population declines from 2034-2054.

There has been a recent increase in recent years 2020-2024 of residential and residential infill subdivisions occurring in Te Kuiti along with modest lifestyle development around Te Kuiti, Waitomo Village, Mokau, and Awakino. However, residential building activity has slowed in the 2nd half of 2023 and into 2024, but this is consistent with national trends.

Recent work on WDC's Proposed District Plan has confirmed the availability of land for future residential development, contiguous with existing urban and rural residential settlement areas. In other words, land availability for future growth is not a limiting factor over the term of this Infrastructure Strategy.

Future Development Activity

From an infrastructure planning perspective, particularly in respect of the three water services provided to the larger residential communities in the district, demographic and development trends will not impact on the demand for these services at the present time or in the foreseeable future.

For roads and footpaths, there is a relationship between population and traffic volumes, but not linear due to the impact of age profile, incidence of car ownership and fuel prices. More relevant to roading infrastructure planning will be land use activities, and the numbers of heavy commercial vehicles attaching to that.

From a recent, informal, desktop planning exercise, drawing from development proposals which are known to officers and/or are in the early stages of consent processing, it has been identified that further growth is unlikely to place pressure on the provision of Council services as there is capacity in the reticulated water and wastewater network for additional dwellings, and new dwellings will need to treat stormwater on-site before it can be discharged into the reticulated stormwater network.

Indications are the recent trends of reasonably high growth (2021 and 2022) are likely to drop off in the near future (which is consistent with what is occurring nationally at present). An indication of the recent growth can be seen from the number of building consents issued for new dwellings in the district over the past three years (i.e., since 2020) – a total of 133 (compared to 74 over the 3-year period 2017 – 2020). While the majority of these (approx. 40) were located in and around Te Kuiti, the distribution is otherwise diffuse. Figure 2 below illustrates this.

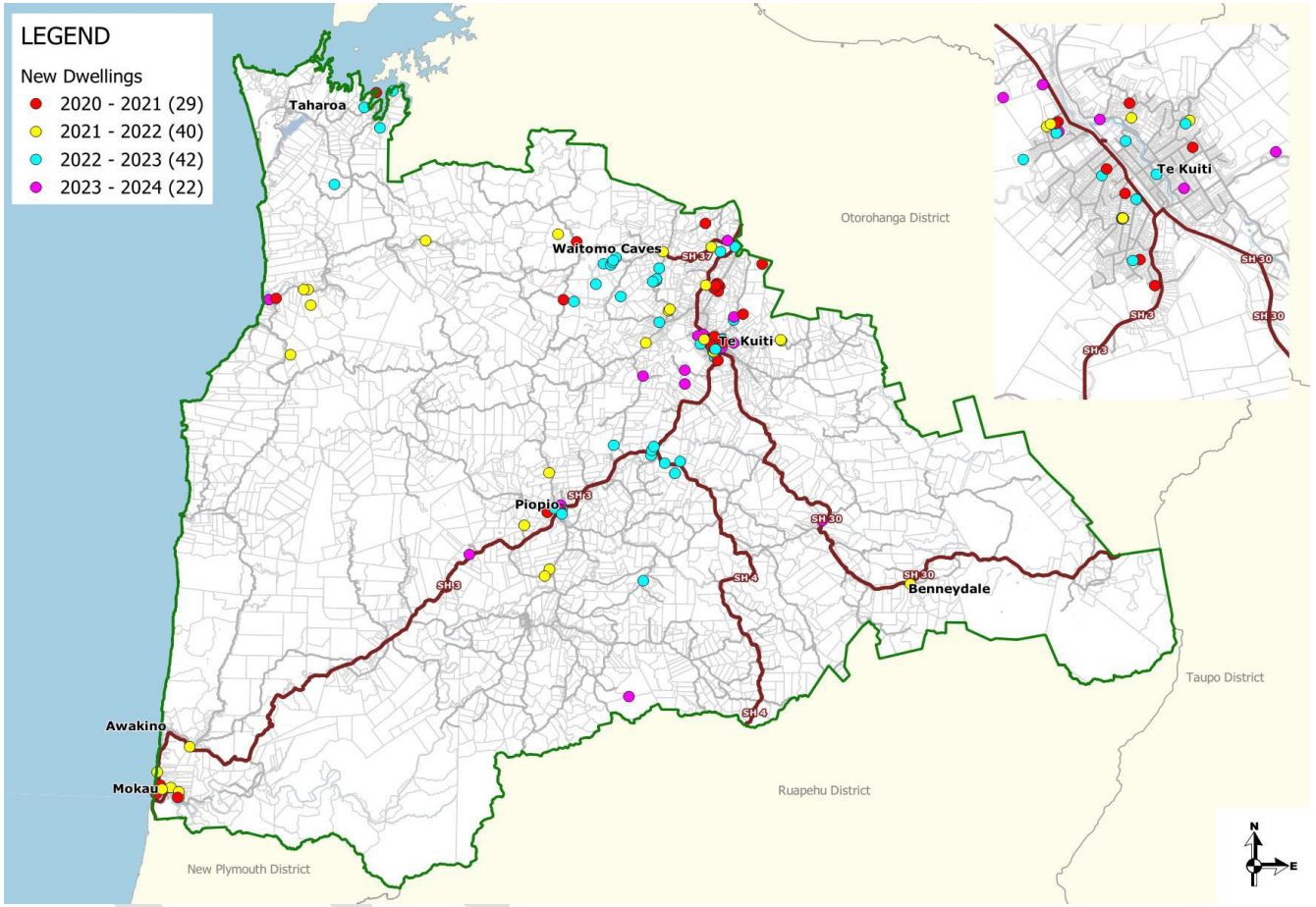


Figure 6: Waitomo District Distribution of Building Consents –2020-2023

GEOGRAPHY

Waitomo District encompasses 354,649 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 the Ōtorohanga District to the north, Taupo District to the east and Ruapehu and New Plymouth Districts to the south.

Te Kuiti is the administrative and main trading centre in the Waitomo district, with approximately 45% of the District population residing in this town. There are several other smaller settlements located throughout the district, including the popular beach settlements of Mokau, Awakino, Marokopa, Te Waitere and Taharoa. The main rural communities are Maniaiti/Benneydale, Piopio and Waitomo Village.

While the district is predominantly contained within the Waikato Region, the south-eastern corner of the District is within the Manawatu-Wanganui (Horizons) Regional Council's jurisdiction.

INFRASTRUCTURE CONTEXT

Council's asset management strategy over the past 10 years, particularly in respect of WDC's water supply and wastewater infrastructure, has been to focus on improving asset condition and performance in support of the community's public health and environmental outcomes, whilst at the same time taking a prudent approach to financial management. The increasing demographic trend projected for the next 20 years will help to improve pressure on the financial affordability however inflation will keep costs increasing to make it difficult to provide levels of service beyond the minimum required to meet its resource consent and other legislative requirements.

In the 10-year period between 2013/14 and 2023/24, WDC invested approximately $80 million on various capital projects within the four groups of activities covered by this IS in meeting the infrastructure needs consistent with the above approach. Some of the key projects completed over this period included:

- Construction of raw water storage dam at Mokau
- Mokau Water Treatment plant upgrade.
- Mokau network pipe renewals
- Upgraded the treatment processes and systems to comply with Protozoa requirement at Mokau and Maniaiti/Benneydale water supplies
- Te Kuiti water treatment plant upgrade
- Backflow preventors districtwide installation.
- Maniaiti/Benneydale wastewater treatment plants upgrade
- Te Kuiti wastewater treatment plant re-build
- Rora Street Stormwater and Watermain upgrades
- Structural improvements across both sealed and unsealed roads
- Road safety improvements
- Te Ara Tika – pedestrian bridge
- Footpath replacements districtwide

Whilst a projected increase in population improves investment in terms of affordability, there is little or perhaps no scope to scale up Council's involvement in the provision of core infrastructure. The growth in infrastructure terms is relatively short lived and can be accommodated in improvements being made to the existing networks, such as repairing leaks and widening existing footpaths. The exception to this is the investment in the stormwater network that has been driven by recent flooding events and predicted climate change that this will occur more regularly. Some investment is required for anticipated minimum infrastructure, environmental and public health standards as government reforms progress.

For the three waters, the strategic direction will include minimum investment standards as a result of Central Government's Local Water Done Well Programme, the Taumata Arowai - Water Services Regulator Act 2020, and National Policy Statement for Freshwater Management. For roading, the Government Policy Statement for Land Transport 2024 prioritises operating and maintaining the network and building resilience which are important for our network as we rebuild from recent severe weather events.

In summary, the projected increase in population, and minimal new development, is forecast to have minimal impact on Council's delivery of

core infrastructure, over the next 30 years. Within that, however, is the need to focus on managing core infrastructure in a manner that ensures compliance with minimum standards and improvements are delivered that provide some additional capacity.

SECTION 4 | STRATEGIC RESPONSE TO MANAGING INFRASTRUCTURE ASSETS

Council has taken a strategic approach to sustainable management of its infrastructural assets to ensure, as a minimum, existing service levels are maintained for the foreseeable future. This approach means that decisions around operation and maintenance, renewal and upgrade, demand and growth, etc. are taken in the context of optimising overall asset lifecycle costs and the provision of services over the lifetime of that asset.

In respect of its three-waters infrastructure, it is important that Council continues to plan and deliver water services to agreed customer and technical levels of service irrespective of the Central Government led review of water service delivery. Any future changes to the current delivery model will be expected to maintain Council's aspirations for those services. This Infrastructure Strategy will be an important mechanism for documenting those current and future expectations and planning needs.

Investment of our Roads, Footpaths and other transport infrastructure has been clearly articulated in the 2024-2027 Activity Management Plan (AMP). The AMP and strategy are in line with GPS 2024 with a combined effort of investment across both Operational and Capital workstreams building in emphasis on the priority of *"Maintaining and operating the system"*

ASSET VALUES

Revaluation of WDC's infrastructure assets included in this IS is completed on a 3-yearly cycle, with roading and solid waste assets revalued a year ahead of the 3-waters to help spread the cost and workload.

The value of roads and footpath assets far outweighs the value of any other asset group, being some 3.9 times the combined value of the 3-waters assets. Wastewater assets have the second highest value. Table below summarises the respective and total asset values of the four asset groups comprising this IS.

Table 4: Asset values

Activity	Valuation Date	ORC*	ODRC**	Accumulated Depreciation	Annual Depreciation
Water Supply	30 June 2022	$44.5M	$28.6M	$15.8M	$851.0
Wastewater	30 June 2022	$52.0M	$33.4M	$18.7M	$993.2k
Stormwater	30 June 2022	$22.6M	$12.2M	$10.4M	$250.7k
Roads and Footpaths	30 June 2023	$671.7M	$528.9	$142.8M	$4.78M
TOTAL		**$790.8M**	**$603.1M**	**$187.7M**	**$6.87M**

* = Optimised Replacement Cost

** = Optimised Depreciated Replacement Cost

Of interest is the comparative value between water supply assets and wastewater assets. While there are four wastewater and four water supply schemes across the district, with similar lengths of pipework, but daily wastewater discharge volumes nominally 70% of water consumption volumes, the wastewater asset value reflects the high level of investment required for treatment and storage of effluent before it is to an acceptable environmental standard before discharge to freshwater streams. Pipe sizes required for gravity wastewater reticulation pipes are also typically larger than for pressurised water supply reticulation.

In all cases, the annual and accumulated depreciation is an indicator of decline in asset condition particularly stormwater, this is offset by annual renewals programmes.

ASSET RENEWAL STRATEGY

Asset renewal is a key driver in respect of the infrastructural assets within this IS, as the majority of Council's significant infrastructure has been upgraded to minimum service levels required by regulation or resource consents in recent years. Council's approach is largely based on the need for timely and effective asset renewal over time, especially for reticulation assets, to ensure levels of service are maintained.

Asset renewal profiles, particularly for the three water assets, are based on theoretical useful lives, material type, length, age etc. A strictly

theoretical approach to developing asset renewal programmes would result in projections for renewal funding fluctuating year to year as assets reach the end of their nominal useful lives and become due for replacement.

This IS takes into account a long-term asset management approach to renewals programming including sound engineering judgment, actual asset condition where available, the optimisation of lifecycle costs, and community affordability to ensure that renewal programs are prioritised according to onsite asset condition, asset criticality and failure history, over theoretical asset lives. This approach results in financial provision for asset renewals that is not only considered appropriate and affordable but can be refined according to more robust asset condition data as it improves over time.

Asset renewals programmes also take into account asset performance. Where additional capacity is required, asset upgrading work is combined with asset renewals.

MANAGING GROWTH AND DEMAND

The main drivers of growth and demand for infrastructure assets are:

- Land use activities
- Changes in population and demographics
- Community needs economic and social

Changes in demand over the life of the IS are expected to be no more than minor. Possible exceptions include peak summer demand for services where capacity for certain services is already marginal and where large seasonal variations in population occur. With the exception of addressing specific resilience issues in Te Kuiti, it is expected that any additional demand concerns over the life of this strategy will be addressed through a reduction in usage (either voluntarily or through demand management) in the first instance.

Planning assumptions for growth and demand will be monitored on a regular basis so to ensure that any changes are reflected in the IS as and when they occur.

LEVELS OF SERVICE

Levels of service for both the current and future are largely dominated by regulatory and technical considerations. Generally, service levels have been improved in recent times, but only to maintain alignment with those considerations and are expected to be continued over the strategy period.

Recent upgrades of WDC's infrastructural assets have been designed to address issues regarding public health and environmental protection. Council's long term approach is to maintain and improve its infrastructural assets as required to ensure compliance with the appropriate standards wherever possible. The minimum standard requirements of a potential new Infrastructure Regulator are currently unknown, budgets for improvements and compliance have been included however these may need to be adjusted through annual plan process once more information is known.

RISK AND RESILIENCE

The natural hazards potentially impacting on WDC's infrastructure assets include earthquake, land slippage, inundation, and the effects of climate change. The district is characterised by significant variations in climatic condition, from sub-alpine to coastal. The terrain is dominated by soft volcanic sediments prone to instability in wet conditions. River and coastal environments are sensitive to erosion and rising sea level.

The approach taken to mitigating the risk of asset damage and interruption to the delivery of essential services due to the potential impact of natural hazards, involves identifying and managing risks relating to those hazards and making appropriate financial provision for managing those risks. Council has identified hazard prone assets and this information will be used to inform this strategy. The proposed district plan requires an adaptive management approach to both private property and Council infrastructure in areas prone to coastal erosion and coastal inundation.

Climate Change

Current predictions of the effects of climate change in Waitomo District are:

- **Extreme rainfall events.** Very extreme events higher than 2 year average occurrence are likely to happen more often.

- **Changes in average annual rainfall.** In the Waitomo District average annual rainfall is expected to increase, this could be up to 5% in the winter months by 2070.
- **Sea-level rise**. The coastline in our district is likely to be impacted by sea level rise which on under a best case and worst-case emissions scenarios is 0.2m to 0.6m by 2070[3].
- **Storm surges** a high emissions scenario resulting in a 0.5m sea level rise by 2070[4] would cause a high tide storm surge of 3.6m to 3.7m along our coastline.

Relevant examples include the vulnerability of Te Kuiti's single water source to soil instability within the wider catchment, the Mokau storage dam's susceptibility to stratification and algae blooms, and exposure of the roading network to damage and closures due to undersized culvert capacity, bank instability and stream and coastal erosion.

Recent modelling work done on the impacts of natural hazards for the Proposed District Plan has identified that in the Te Kuiti central business district area and in the coastal communities along the West Coast, there is infrastructure that is vulnerable to the effects of climate change. In Te Kuiti, the water treatment plant is located in a high risk flood zone and parts of the wastewater pumping stations and treatment plant are subject to inundation in major flood events. Along the west coast, the district roading network is at risk from storm surge inundation. In Awakino and Te Kuiti there is some risk to the stormwater systems.

In some cases, the risk to Council's infrastructure from natural hazards is known to be at risk of high intensity or duration weather events. For instance, the Te Kuiti piped stormwater network has a nominal design capacity equating to a 1 in 2-year storm event. During an intense rainfall event in October 2023 of only short duration the stormwater network was unable to cope with the sudden high volume. The Te Kuiti water treatment plant and wastewater treatment plant are vulnerable to inundation during storm events such as experienced with a nearly 1 in 250-year event with pumps and intake assets being impacted. The impacts of climate change are likely to exacerbate the intensity and frequency of these types of situations.

Moving forward, Council plans to gain better information regarding the location, age, and condition of its infrastructure in order to address the potential effects of climate change. This may affect capital expenditure forecasts but ultimately be a balance of the level of service Council is prepared to accept and able to fund.

In recent years, the affects from climate change and the resulting adverse weather events have had a significant impact on transport infrastructure. The impacts have presented council with substantial and on-going financial pressures, not only restoring the levels of service but also adopting the philosophy of "Building back better". Table below illustrates the spend to date and forecast expenditure resulting from emergency events and the repairs to our transport infrastructure.

Table 5: Expenditure to date and forecast to complete.

Weather event	Date of event	Cost to restore and improve LOS
Cyclone Dovi	February 2022	$10.5M
Winter 2022	June, July and August 2022	$5.5M
Pukerimu 5.8	November 2022	$250K
Auckland Anniversary/Cyclone Gabrielle	January 2023	$600K
Mangarino Road	September 2023	$1.5M
Total	2022 – 2024	$18.4M

Alignment of GPS 2024 and this IS will ensure we are investing in the right places, at the right time to protect our communities and the key routes they rely on. The following GPS 2024 priorities are relevant to climate change and how we prioritise funding to reduce the impacts to our community.

- Maintaining and operating the system,
- Increasing resilience, and
- Reducing emissions.

Critical Assets

Critical assets are those having the highest consequence of failure. The strategy identifies mitigation actions including risk assessments, establishing the required level of resilience, and programme implementation of identified risk mitigation to increase the resilience of critical assets to natural hazards.

In general, a pragmatic approach has been taken to risk management in individual asset management plans, with identified risk events grouped into:

- Natural events, where there is no real control over the timing or extent of the event, although probabilities may be understood, e.g. floods, lightning strikes, earthquakes.
- External impacts, where other service providers are providing services which impact on WDC, e.g. power supply failures, material supply failures.
- Physical failure risks, where the condition of the asset or third party damage could lead to failure.
- Operational risks, where maintenance and/or management of the asset or asset management activities may impact adversely on the service.

Part of WDC's asset management practices includes risk management decision making tools used to prioritise long term renewal, upgrade and development expenditure for infrastructure.

SECTION 5 | SIGNIFICANT INFRASTRUCTURE ISSUES FOR WAITOMO DISTRICT

The tables on the following pages summarise the significant wastewater, water supply, stormwater drainage and roads and footpaths infrastructure issues facing WDC, the proposed response to those issues, and the implications of taking or not taking the action proposed by the response. In many instances, the same principal response option can address several infrastructure issues.

WDC WASTEWATER SCHEMES

WDC owns and manages four separate wastewater schemes in the district: at Te Kuiti, Piopio, Maniaiti/Benneydale, and Te Waitere. The largest of these is at Te Kuiti. All schemes have been upgraded over the past nine years and reconsented. The Piopio wastewater scheme is the most recently constructed, commissioned in 2012. Waitomo Village wastewater scheme is not owned by WDC so does not form part of this IS.

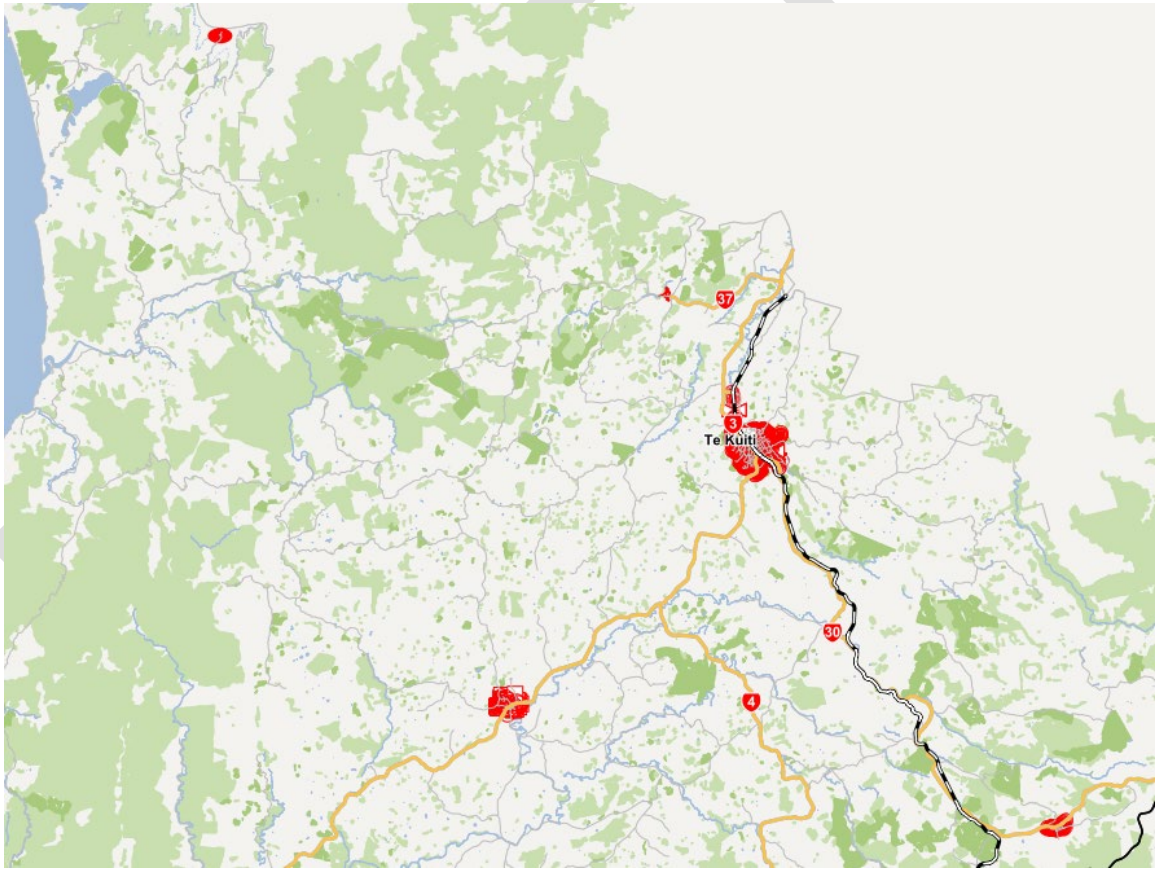


Figure 7: Waitomo distribution of wastewater schemes

A snapshot of the key design parameters for each scheme is shown in the table below:

Table 6: WDC Wastewater Schemes - Key Features

Scheme	Pipe length (km)	Consented discharge volume (m^3/d)	Avg. DWF (m^3/d)	Max. WWF (m^3/d)	Discharge consent expiry date
Te Kuiti	55.67	7,000.0	2,395.0	6,951	18-Dec-2039
Piopio	10.9	135.4	92.2	127	30-Jun-2028
Maniaiti/Benneydale	3.73	85.0	48.0	122	26-Oct-2026
Te Waitere	0.89	10.3	3.0	-	31-Jul-2042
Total	**71.19**	**7,230.7**	**2,538.2**		

Te Kuiti Wastewater Scheme

The Te Kuiti wastewater scheme comprises approximately 56km of reticulation of varying pipe diameters and materials, four secondary pump stations, a main pump station and a tertiary treatment plant. The treatment plant was subject to a major upgrade, completed in 2014. Features of the treatment plant include a stormwater bypass, activated sludge reactor, clarifier, oxidation pond, sludge processing, sand filtration and UV disinfection. The final treated effluent is discharged to Mangaokewa Stream upstream of Te Kuiti airfield.

The upgraded treatment plant capacity is limited by the design flow of the activated sludge (A/S) reactor and clarifier of 4,000 and 4,500 m3 per day respectively. The A/S reactor can cope with flow volume of up to 5,000m^3/day. Flows exceeding 5,000m^3/day is bypass directly to the oxidation pond and return to plant inlet when inlet flow volume is down to 4,000m^3. The plant discharge consent allows for 7,000 m^3 per day.

Work to remove the sludge build up inside the sludge pond (#3) that has been accumulating for the last 20 years commenced in 2023/24 and will continue for the next 10 years.

The Te Kuiti wastewater scheme is somewhat unique in that there are two major wet industries (in this case, abattoirs) discharging to the system. The total load on the WWTP is significantly impacted by the discharge from these two industries, even after the on-site pre-treatment that is in place at both premises (approx. 20% of total inflow, 45% BOD, 50% phosphorous, and 40 % total nitrogen).

Infrastructure management issues include:

Table 7: Te Kuiti Wastewater infrastructure issues

Description	Principal options for response	Implications
ISSUE: Asset renewal or replacements		
A significant portion of the pipe network is now old, even though the rates of infiltration into the system are comparatively low. Direct inflow poses a more substantial problem, affecting the peak inflow at the Wastewater Treatment Plant (WWTP) SCADA and electrical assets due for renewal at least once every 15 years. Certain treatment plant mechanical and material components will require renewal/replacement within the 30 year period. Several pump stations are due for renewal over the period, including the terminal pump station. The latter is a critical asset. The existing sand filter at the Te Kuiti WWTP is generating additional wear and tear on the downstream UV plant.	Condition assessment of pipe network followed by prioritised repair and renewal programme. Replacement expenditure "smoothed" to avoid significant variations in expenditure from one year to the next. Pump station renewal work includes pump, valve and guide rail replacements, and upgrading of switchboards. Options for either replacing or operating it more effectively and efficiently for the current sand filter at the WWTP are to be explored. Alternatively, the UV plant renewal will need to be brought forward to Year 10.	The financial impacts of deferred maintenance and renewals have been balanced against levels of service, consent compliance and ratepayer affordability. High inflow during storm events can result in surcharge of raw sewage onto residential property, with potential for serious public health impacts. Reticulation renewals programme of $236k on average per year identified for Years 1-3 of LTP, reducing to $208k on average per year from Year 4. From Year 4 of LTP, a mechanical and electrical replacement budget of $43k on average per year has been allowed. Electrical assets scheduled for replacement 2035-39 ($3.1M). Treatment plant reactor liner scheduled for replacement in 2034/35 ($331k) Routine pump station renewals totalling $354k over the first 10 years have been scheduled, with $64k per year thereafter. The two UV units at the WWTP will require replacement by Year 7 of the LTP at an estimated cost of $162k.
Addressing the issue concerning an aging mechanical step screen within a facility, which has undergone repairs twice over the past decade. This equipment is crucial for wastewater treatment processes, ensuring that solids are effectively removed to prevent damage and clogging in subsequent stages of treatment. Improve/extend main building, with a specific focus on creating separate areas for the laboratory, office, and electrical/SCADA control systems. This restructuring aims to enhance operational efficiency and safety by segregating functions that have different	Replace the old step screen with a newer, more efficient model. Implement the project in phases, focusing first on the most critical areas. This could involve prioritizing the separation of the laboratory due to safety or operational needs, followed by the office and electrical/SCADA control spaces in subsequent phases. Implement modular storage solutions within the existing shed that can be customized to safely separate chemicals based on their properties and risks. Avoid Algae bloom (Cyano-bacteria) and provide oxygen for bacteriological activities	Invest in a new Mechanical Step Screen. $304k* set aside for 2042-2043. Financial commitment for this work is estimated at $94k*, with the budget spread over two years: $27k* allocated for the Year 13 and an additional $67k* for the Year 14. $38k* for the fiscal year 2034-2035. This investment is directed towards creating a safer work environment by adhering to stringent safety standards and preventing potential accidents, which could have far-reaching consequences both financially and in terms of staff safety. Two-year financial plan, with an allocation of $126k* for fiscal year 2034-2035 and an additional $129k* for fiscal year 2035-2036. This investment underscores the commitment to enhancing the wastewater treatment infrastructure and addressing environmental concerns proactively. *Inflated figures

Description	Principal options for response	Implications
requirements and risks associated with them. Improve chemical storage shed to separate chemicals, aiming to meet Health, Safety, and Environmental (HSNO) compliance and WorkSafe regulations. The primary goal is to mitigate the risk of accidents that could result from improper storage, thereby safeguarding both personnel and facilities. Supply and Install surface aerators in oxidation ponds to combat algae blooms, specifically targeting Cyano-bacteria, and to enhance oxygen levels for bacteriological processes. This strategic upgrade is essential for maintaining the ecological balance within the ponds and ensuring efficient wastewater treatment.		
ISSUE: Response to demand		
Recent treatment (2014) upgrade provides for up to 4,500m^3/day average, peak 7,000m3/day. Current average flow is 2,910m^3/day, with average DWF of 2,395m^3/d and WWF of 3,740 m^3/d. Peak inflow was 6,951m^3/day in July 2019. Includes inflow from two major wet industries. The population projection for Te Kuiti is for a decline over the term of this IS.	On-going I & I investigation and prevention programmes targeted to worst areas of reticulation will affect reduction to peak inflow and average wet weather flows. Future, modest, capacity increase could be achieved through a dedicated, on-site monitoring and control regime. Larger scale capacity increases would require significant additional capital investment at the WWTP. Control of industrial discharges is critical to managing capacity and performance of WWTP. Regular monitoring and enforcement of trade waste discharges is key to that. Larger scale treatment plant capacity can be achieved by increasing power supply and duplication of the clarifier/reactor process stream. It will also increase the resilience and operational contingency for this critical asset.	Deferring further investment aimed at increasing plant capacity can be realised by reducing unnecessary inflow sourced from groundwater infiltration and direct inflow. Duplication of clarifier/reactor is scheduled over two years from 2035-36 and 2036-37 at an estimated cost of $2.6M.

Description	Principal options for response	Implications
ISSUE: Levels of service (LoS)		
LoS is dominated by resource consent compliance for all discharges from treatment plant – air, water, groundwater etc. Customer LoS principally relate to sewer blockages, overflows, odour, and responsiveness to service requests. 2023 resident satisfaction survey identifies that 89% of respondents were satisfied with current LoS.	Continuation of current LoS achieves an effective balance between regulatory compliance, resident satisfaction, and cost. Modest increases in technical LoS are necessary to improve effectiveness of sludge handling and chemical dosing at the treatment plant.	Increasing current technical LoS will improve consent compliance and operational performance of treatment plant.
ISSUE: Public Health and Environment		
The upgraded treatment plant (circa 2014) has improved the effects of the activity on the receiving environment. Mitigating adverse effects on the environment is achieved through effective operation of the WWTP.	Routine monitoring and analysis of plant operation and performance, followed by timely interventions, will ensure public health and environmental outcomes are maintained. The effects of the activity on the environment are controlled through the resource consent. Consent renewal is due in 2040 Effective WWTP performance relies on timely, routine maintenance and operation of mechanical and electrical equipment	Managing the complete wastewater system from reticulation to disposal is fundamental to mitigation of adverse effects on public health and environmental outcomes. The resource consent provides the legal right to operate the Te Kuiti WW treatment plant. The estimated cost of the 2039 renewal process is $2.0M.
ISSUE: Risk and Resilience[1]		
Wastewater service continuity and public health is threatened by the poor condition of sections of the wastewater network. Older pipes are brittle and prone to breakages and infiltration with natural ground movement, or in the event of ground movement caused by a seismic event. Most of the Te Kuiti CBD and parts of the residential area adjoining and to the west of Mangaokewa Stream are located within the 100–year flood plain. Climate change impacts will exacerbate the extent of flooding. Direct inflow to the wastewater	Rolling replacement of wastewater pipes in poor condition and at the end of their effective life with new, flexible, pipe materials. Routine property inspections to identify and remove illegal stormwater connections/stormwater runoff to the wastewater system.	Failure to complete this work will increase the risk of overloading the treatment plant during flood events, and the risk of pipe failure due to end of lifecycle or following an earthquake event. Such failures have the potential to breach the discharge consent and contaminate surrounding groundwater with untreated waste. The probability of this risk occurring is considered to be low to moderate within the term of this strategy, but the consequences are high. Wastewater overflow during a severe, 1 in 100 year, rainfall event is unavoidable due to the inundation of property gully traps and parts of the WWTP.

[1] Note: The risk management processes used by the Waitomo District Council are consistent with Australian/New Zealand Standard AS/NZ 4360 which defines risk assessment and management. A fuller description of the risks identified in the tables can be found in Waitomo District Council asset management plans for each activity area.

Description	Principal options for response	Implications
network and inundation of parts of the WWTP will overload the hydraulic capacity of the reticulation and treatment plant, leading to widespread wastewater overflows. The five pump stations servicing the reticulation rely on continuity of energy supply to avoid wastewater overflow.	Raised pond embankments, effluent storage and elevated manhole risers at the WWTP, bypass pipework and high stormwater dilution during flood conditions are mitigating factors.	Funding for enhancements to the Pump Station has been allocated in the Long-Term Plan (LTP) from Year 1 to Year 10, with a total budget of $499k over this decade.

Piopio Wastewater Scheme

The Piopio wastewater scheme was installed in 2012 and comprises approximately 10.9km of reticulation of varying pipe diameters, 182 domestic pumps, one community pump station, and a packed-bed reactor treatment plant. A feature of the scheme is the use of small diameter, MDPE pipes to collect effluent from individual septic tanks from where it is pumped to the treatment plant. The final treated effluent is discharged to Mokau Stream via a rock filter.

Infrastructure management issues include:

Table 8: Piopio Wastewater Infrastructure Issues

Description	Principal options for response	Implications
ISSUE: Asset Renewal or Replacements		
The infiltration rates entering the pipe network are low, corresponding to the recent construction of the scheme (in 2012). Inflow during heavy rain occurs due to surface flooding entering through tank access covers. SCADA and electrical assets due for renewal at least once every 15 years. Septic tank and pump maintenance costs escalating	Condition monitoring of pipe network followed by prioritised repair and renewal programme. Replacement expenditure "smoothed" to avoid significant variations in expenditure from one year to the next. Increased routine maintenance of the scheme and monitoring of plant operation and performance will ensure public health and environmental outcomes are maintained. Higher routine maintenance required.	Scheme capacity and consent compliance relies on condition of network. The current scheme has been operating for only 9 years so remaining life of assets is high. Routine condition assessments are an effective method of monitoring the rate of condition decay, and to inform planning processes.

Description	Principal options for response	Implications
Supply and install Plant building to ensure safety of worker and proper storage.	To house Telemetry/SCADA, Monitoring Instruments, Chemical Storage and Equipment.	A budget of $76k* is allocated for the 2034-2035 fiscal year. *uninflated figures
Supply and Install new UV and improve Operations and Maintenance	Change to Technology and health and safety during Operations and Maintenance	A budget of $151k is allocated for the 2028-2029 fiscal year.
ISSUE: Response to demand		
Scheme is designed for 250 residential units equivalent. Residual capacity is approximately 20 residential units. Consent discharge limit is 135.4 m^3 /d. Current average discharge measured over 2021-2022 period was 73 m^3/d. Peak discharge was 111.3 m^3/d. Residential population projection for Piopio is for a decline in the medium to long term.	Increased capacity could be achieved by adding the maximum number of treatment modules to the existing plant to accommodate an additional 50 residential units or construct an additional treatment plant on a separate site to give capacity for a further 180 residential units. Monitoring of plant load and performance over time will provide earliest indication of the need for additional capacity. Monitoring and enforcement of trade waste discharges is critical to managing capacity and performance of WWTP.	The cost of increasing capacity by 50 residential units would be in the order of $2.7M. The cost of increasing capacity by 180 residential units would be in the order of $5M, including land purchase. There is no projected need for either option at the present time but will form part of the consent renewal considerations in 2028. Control of industrial discharges.
ISSUE: Levels of service		
LoS is dominated by resource consent compliance for all discharges from treatment plant – air, water, groundwater etc. Customer LoS principally relate to sewer blockages, overflows, odour, and responsiveness to service requests. Customer service requests indicate dissatisfaction with the frequency of system blockages.	The need for increased routine maintenance of individual tanks and the treatment plant has been identified. Also, regular education of scheme users to encourage avoidance of disposal of fats and other wastes that have been a contributing factor to pipe blockages.	Increased levels of service in the form of increased routine maintenance of the scheme has been necessary to achieve improved customer satisfaction and consent compliance.
ISSUE: Public Health and Environment		
The Piopio WW scheme has addressed previous public health and environmental issues associated with high groundwater during winter months adversely impacting on ground soakage of effluent from the original private septic tanks. Prolonged heavy rain events can result in non-compliance as there is no additional storage capacity available to manage the discharge rate within consent conditions.	The effects of the activity on the environment are controlled through the resource consent. Consent renewal is due in 2028. Increased maintenance of septic tank units may help reduce peak discharge flow rates. In addition, buffer storage is required to accommodate peak discharge during heavy rain events.	Failure to achieve improved scheme performance could compromise the 2028 consent renewal. The resource consent provides the legal right to operate the Piopio WW treatment plant. Funding for renewal of discharge consent has been allowed in years 2,3 and 4 at a total cost of $137k. Provision for additional buffer storage has been made in Year 4 at an estimated cost of $151k.
ISSUE: Risk and Resilience		

Description	Principal options for response	Implications
Wastewater service continuity and community health is protected from seismic damage modern and type of construction of the network. The treatment plant is located within the outer limits of a high risk, 1 in 100 year, flood zone under a climate change scenario (RCP 8.5). Majority of reticulated residential area unaffected but would not be able to be serviced while WWTP inundated and discharge flow-path contaminating southern end of township. WWTP would not be accessible by road.	The network is already designed to provide high resilience to natural hazards through the use of small diameter, flexible pipes. Site contours and flood depth at WWTP to be confirmed. Stop banking may be practicable, or relocation of the WWTP to higher ground. The latter timed to coincide with renewal of existing WWTP in approx. 40 years' time. Affected properties would require evacuation during flood event. Mokau River will burst its banks during storm event. High dilution factor will help mitigate health risk.	The probability of system failure occurring due to natural hazards is considered to be low within the term of this strategy. Timing of WWTP replacement will fall outside this IS planning period, in 2060. The preliminary cost estimate to relocate the WWTP is $2.5M.

Maniaiti/Benneydale Wastewater Scheme

The Maniaiti/Benneydale scheme comprises approximately 3.73km of reticulation, predominantly AC pipe, and one pump station. The treatment plant consists of an old Imhoff tank and trickling filter, followed by a small, constructed wetlands from where the final effluent discharges to a soakage field during November – April, and the Mangapehi Stream during the wetter months of the year.

Infrastructure management issues include:

Table 9: Maniaiti/Benneydale Wastewater infrastructure issues

Description	Principal options for response	Implications
ISSUE: Asset Renewal or Replacements		
Approximately 50% of the reticulation has reached its theoretical design life. Condition assessment of the pipes comprising this portion of the network indicates that there is approximately 15 years of effective life remaining. The treatment plant was last upgraded in 2009. A small wetland system was added for winter discharge.	Condition assessment of pipe network followed by prioritised repair and renewal programme. Replacement expenditure "smoothed" to avoid significant variations in expenditure from one year to the next.	The financial impacts of renewals have been balanced against condition assessment, levels of service, consent compliance and ratepayer affordability. Current LoS will be maintained. $150k has been allowed for every three years commencing in Year 3 for pipe replacements.

Description	Principal options for response	Implications
Some components now require replacement, namely the trickling filter and Imhoff tank SCADA and electrical assets due for renewal at least once every 15 years.	Align treatment plant replacement programme with outcome of consent renewal in May 2025. Replacement components to be consistent with new discharge quality standards.	Tank and filter replacements have been allowed for in Year 4 at an estimated cost of $486k.
Replace out of date & dying old Plantings inside the wetland	Replace old and dying plants. To ensure biological activity is active and ensure compliance with discharge consents requirements	An allocation of $71k* has been made for the fiscal year 2035/2036. *Inflated figures
Supply and install new disinfection system. (Maybe UV and chlorination system)	Ensure compliance with Resource Consent requirements	An allocation of $203k* has been made for the fiscal year 2037/2038.
ISSUE: Response to demand		
Average plant inflow is 51 m^3 per day. Average DWF is currently 48 m^3 per day. The consented discharge volume is up to 85 m^3/day. Treatment plant capacity is nominally 165 m^3/day. The scheme has spare capacity for an additional 27 residential connections, or the equivalent thereof. The population projection for Maniaiti/Benneydale is for a decline in the medium to long term.	Monitoring of actual demand on the Maniaiti/Benneydale scheme over time will provide the basis for future capacity upgrade decisions. In the meantime, current capacity is expected to be sufficient over term of this IS. Monitoring and enforcement of trade waste discharges.	While there are no apparent demand related implications for the Maniaiti/Benneydale wastewater scheme in the foreseeable future, routine monitoring of actual demand will provide early indication of the need to respond to any change to that assumption. Control of industrial discharges is critical to managing capacity and performance of WWTP.
ISSUE: Levels of service		
Level of Service (LoS) is primarily influenced by adherence to resource consent for all emissions from the treatment plant, which includes air, water, groundwater, etc. Customer LoS mainly pertains to issues like sewer blockages, overflows, odour, and the promptness in addressing service requests. According to the 2020 resident satisfaction survey, 93% of participants expressed satisfaction with the current LoS. However, this satisfaction level has slightly dropped to 89% in 2023.	Maintaining the current Level of Service (LoS) continues to provide a viable equilibrium between meeting regulatory requirements, ensuring resident satisfaction, and managing costs. However, it's crucial to regularly evaluate and adapt our strategies to accommodate evolving regulations, community expectations, and financial constraints.	Maintaining current levels of service will achieve high customer satisfaction and consent compliance. The scheme is sensitive to increased expenditure
ISSUE: Public Health and Environment		
The upgraded treatment plant (circa 2009) has improved the effects of the activity on the receiving environment. The next consent is likely to require additional environmental protection standards in light of the Governments NPS for Freshwater Management and the new Water Services Regulator – Taumata Arowai.	Continuation of routine maintenance of the scheme and monitoring of plant operation and performance will ensure public health and environmental outcomes are maintained. The effects of the activity on the environment are controlled through the resource consent. Consent renewal is due in May 2025.	Failure to continue current routine maintenance levels could result in consent non-compliance. The resource consent provides the legal right to operate the Maniaiti/Benneydale WW treatment plant. A budget of $112k has been provided over Years 1 and 2 (2024/25 and 2025/26) to prepare and submit the next consent application, followed by $486k in

Description	Principal options for response	Implications
		Year 4 (2027/28) for treatment plant upgrade works (see renewals section above).
ISSUE: Risk and Resilience		
Wastewater service continuity and community health is threatened by the poor condition of sections of the wastewater network. Older pipes are brittle and prone to breakages and leaks with natural ground movement or in the event of ground movement caused by a seismic event.	Rolling replacement of wastewater pipes in poor condition and at the end of their effective life with new plastic pipes and flexible joints. Replacement of the trickling filter and Imhoff Tank will improve resilience of the WWTP.	Failure to complete this work will increase the risk of overloading the treatment plant during flood events, and the risk of pipe failure due to end of lifecycle or following an earthquake event. Such failures have the potential to breach the discharge consent and contaminate surrounding groundwater with untreated waste. The probability of this risk occurring is considered to be low to moderate within the term of this strategy, but the consequences are high.

Te Waitere Wastewater Scheme

The scheme involves collection of septic tank effluent from approximately 11 properties through a reticulated system comprising approximately 800m of small diameter pipe, from where it is pumped to a community soakage field located on private land. The rising main from terminal pumping station was recently renewed. The Te Waitere Village sewage system was designed in the late 1970s/early 1980s by a developer and approved by the Council, with each section in the development required to have a septic tank that feeds grey water to a holding station, which is then pumped to a discharge field on private farming property. After completion of the required work, maintenance of the system was accepted by the Council in 1988, and the system became vested in Council. Since then, additional residential properties, the Te Waitere Boat Club, and public toilets have been added to the system, while nine Te Waitere properties are not yet connected.

Infrastructure management issues include:

Table 10: Te Waitere Wastewater Infrastructure Issue

Description	Principal options for response	Implications
ISSUE: Asset Renewal or Replacements		
The community soakage field theoretically overloaded. Most of the reticulation has been replaced over the past 4-years, including the rising main. The pump station was refurbished in 2018. SCADA and electrical assets due for renewal at least once every 15 years.	Replacement or refurbishment of the soakage field with an expanded facility is required.	All existing fields have been renewed to meet current requirements. However, to accommodate future growth and ensure sustainability, a budget provision of $216k has been made in Year 4 (2027-2028) of the LTP 2024-2034 for land acquisition and soakage field development.
ISSUE: Response to Demand		

Description	Principal options for response	Implications
Current capacity of the disposal field is designed for 13 properties. While the population projection for Te Waitere is for static growth, the wastewater discharge from the current population already takes up most of the capacity of the existing soakage field	Replacement or refurbishment of the soakage field to include an upgraded and extended facility with capacity for modest additional demand.	See above.
ISSUE: Levels of Service		
Levels of service focus on reliability of service, capacity, public health and environmental protection.	Environmental and public health protection consistent with the operative resource consent.	Current levels of service relating to system capacity and environmental protection will potentially need to be enhanced early in the strategy period.
ISSUE: Public Health and Environment		
The extended reticulation has addressed previous public health and environmental concerns associated with the scheme.	Replacement or refurbishment of the soakage field with an upgraded facility is required. Renewal of the resource consent for the Te Waitere discharge was completed in 2017. Consent renewal is due in 2042.	The resource consent is fundamental to the legal right to operate the Te Waitere WW treatment plant
ISSUE: Risk and Resilience		
Wastewater service continuity and protection of the environment is threatened by the condition and capacity of the current soakage field.	Replacement or refurbishment of the soakage field with an upgraded facility is required.	Failure to complete this work will increase the risk of overloading the soakage field during normal operating conditions. Such system failure has the potential to breach the discharge consent and contaminate the surrounding environment with treated waste. The probability of this risk occurring is medium to high in the long term.
Land Acquisition for Expansion	This involves procuring additional land to extend the soakage field. While this could significantly enhance the system's capacity, it might involve substantial costs and potential environmental impact assessments. Moreover, there could be challenges related to zoning regulations and community acceptance.	See Asset Renewals above

Waitomo Village Wastewater Scheme

The wastewater infrastructure at Waitomo Village is privately owned and operated. WDC has extensively investigated options for future WDC ownership/management of the Village wastewater (and water supply) services. Discussions with representatives of the two ownership trusts and private owners of this infrastructure have been inconclusive. The potential for a possible pathway forward is unknown at the present time, due to land tenure, asset ownership and funding issues remaining unresolved.

Given the level of uncertainty around the timing of resolution of these issues, this IS does not include any financial provision for WDC assuming responsibility for ownership or management of these assets.

WDC WATER SUPPLY SCHEMES

WDC owns and manages four water supply schemes, at Te Kuiti, Piopio, Maniaiti/Benneydale and Mokau. The largest supply is at Te Kuiti and the smallest at Maniaiti/Benneydale.

Over the last five to ten years, enhancing service levels and ensuring the security of water supply have been central priorities across all water schemes. This focus has been significantly influenced by the Public Health (Drinking Water) Amendment Act and the introduction of the Drinking Water Quality Assurance Rules 2022. The legal foundation for securing the necessary water volumes for both domestic and commercial/industrial purposes is provided through resource consents.

The immediate and upcoming emphasis is on maintaining drinking water quality and meeting the systems' compliance requirements. The Drinking Water Quality Assurance Rules 2022, along with the compliance and service delivery strategies under development as part of the three waters reform program, are expected to present challenges and changes in the next two to three years.

Nonetheless, these developments do not alleviate the responsibilities of WDC to continue overseeing, planning, and ensuring the provision of safe drinking water within its four service areas.

Table 11 below summarises current consent expiry dates and key asset data:

Table 11: WDC Water Supply Schemes

WATER SUPPLY SCHEME	Pipe Length (km)	Storage (m^3)	Pumping Stations	Consented Take (m^3/d)	Average Demand (m^3/d)	Take Consent Expiry Date
Te Kuiti	61.1	3,296	3	4,800 (4,200 when stream flow <0.7 cumecs)	3,336 (Peak 4,320)	30-Sep-40
Piopio	9.0	450	1	450	309	01-Aug-23
Maniaiti/ Benneydale	5.7	100	2	180	100	07-Apr-31
Mokau	14.0	20,000	1	1,000	120	15-Sep-26
Total	**89.9**	**23,846**	**7**	**6,610**	**3,885**	

Te Kuiti Water Supply Scheme

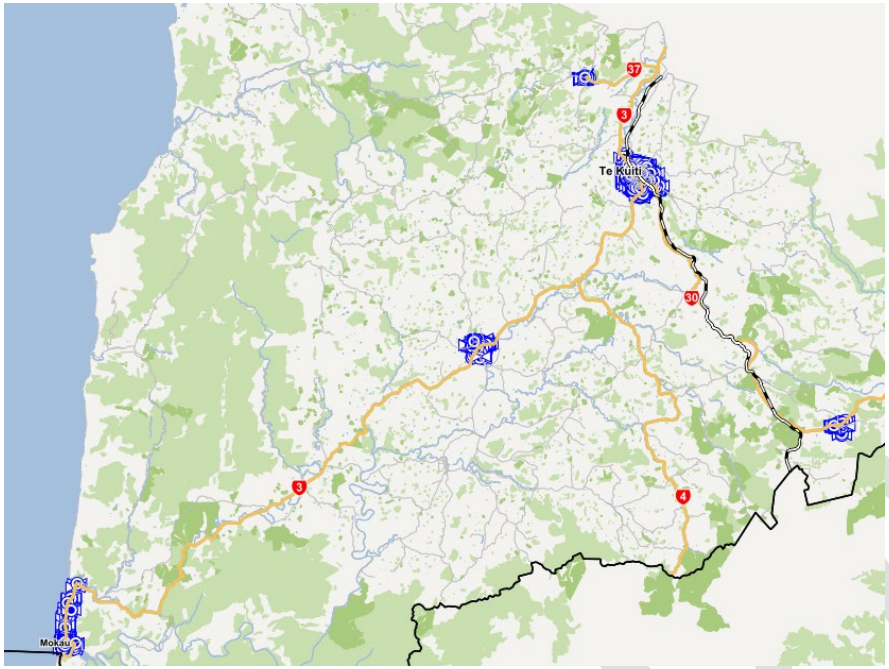


Figure 8

The Te Kuiti water supply scheme comprises a surface take from the Mangaokewa Stream from where raw water is treated and disinfected following a process of coagulation/flocculation, carbon dosing, sand filtration, pH correction and chlorine disinfection. Treated water is simultaneously pumped to five storage reservoirs and the reticulation network, i.e. there is no separate rising main to the reservoir, resulting in pressure surges within the network. The network totals some 58.4km of pipework of varying diameters and is predominantly older asbestos cement and PVC material type. There are three pumping stations – at Tonga Street, Rata Street and Awakino Road.

Over the past three years, the focus has been on completing the water intake and treatment plant to mitigate the risks of contamination from pathogenic organisms commonly found in stream water sourced from an open catchment where the predominant land use is agricultural.

With the current supply relying on a single stream source, its vulnerability to declining minimum stream flows due to climate change, the consequential increasingly adverse effects of the take on stream habitat, and an unstable upstream catchment, are high. Additionally, the intake is located downstream of an industrial zone and wastewater pumping station. The next phase will therefore address the resilience of the supply, with a significant resilience project for Te Kuiti including a dedicated rising main and refurbishment of the existing storage reservoirs and increased treated water capacity, all form part of this strategy.

Recent work completed on flood hazard modelling in parts of the district, including Te Kuiti, has identified an additional consideration adding to the importance of locating and securing alternative water source. It has shown that the Te Kuiti water treatment plant maybe be subject to inundation, at least 0.5m deep, under a 1 in 250-year rainfall event. However, during the recent 1 in 250-year rainfall event, the water treatment intake structure was underwater and river water level came up almost the treatment plant area. That hazard will be further exacerbated by the effects of climate change, in terms of scale, frequency and intensity. Further, while the water treatment plant will become inoperable during inundation conditions, the majority of the Te Kuiti residential area will remain elevated above flood level and reliant on limited treated water storage for supply.

$50k for Y1 and Y2 has been allocated for monitoring of non-revenue water within the reticulation network. This will involve installing zone valves, flow meters and sensor to assist in determining water loss throughout the network.

All properties with old gate valves and tobies will have them replaced with a backflow prevention device and water meter in year 4 costing $1.295m and Y5 with cost of $1.295m. This will provide a more reliable data to manage non-revenue water and prevent water loss with the reticulation.

Specific infrastructure management issues for Te Kuiti water supply are summarised in the table below.

Table 12: Te Kuiti water supply infrastructure issues

Description	Principal options for response	Implications
ISSUE: Asset Renewal or Replacements		
Large parts of reticulation are near the end of their useful lives. Increasing incidence of mains failure, leaks, etc.	Accelerated mains replacement programme based on actual pipe condition.	Replacement programme of $307k per year average. Delaying the pipe replacement programme would leave the network vulnerable to failure or complete severance in the event of earthquakes or other ground movement. The probability of this risk occurring is considered to be low to moderate within the term of this strategy but the severity of the consequences are expected to be high
SCADA and electrical assets are due for renewal at least once every 15 years.	Programmed renewal of electrical and control equipment on 15-year cycle.	An initial investment in the first two years of $101k , followed by consistent annual allocations of $8k aimed at supporting ongoing renewals and upgrades to the Telemetry/Scada systems.
Four storage reservoirs each approximately 70 years old will become due for replacement within the next 30 years.	Undertake condition assessment of oldest reservoir to ascertain best practicable option – refurbish or replace. If replace, increase reservoir storage capacity to improve supply resilience during flood hazards.	The TK Water Resilience project will oversee the refurbishment of all tanks.
ISSUE: Response to demand		
Treatment plant design capacity has been increased to 6,600m^3/day. Average demand is 3,336 m^3/day. Peak demand is 4,320 m^3/day. New (2015) consent limit is 4,800 m^3/day. The long term population projection for Te Kuiti is for decline.	Monitoring of actual demand on the Te Kuiti scheme over time will provide the basis for future capacity upgrade decisions. In the meantime, current capacity is expected to be sufficient over the term of this IS. Demand management techniques can be applied to curb peak summer demand. On-going leak detection and mains replacement programmes will help reduce water losses.	While there are no apparent demand related implications for the Te Kuiti water supply in the foreseeable future, routine monitoring of actual demand will provide early indication of the need to respond to any change to that assumption. Failure to monitor and plan could lead to consent non-compliance and/or imposition of water restrictions. All properties with old gate valves and tobies will have them replaced with a backflow prevention device and water meter in Year 4 costing $1.295m and Year 5 with cost of $1.295m. This will provide a more reliable data to manage non-revenue water and prevent water loss with the reticulation.
Improve the workspace within the main control building by separating laboratory from toilet and Instrumentation area. Building another chemical storage shed	Health and Safety and HSNO requirements	Budget provision of $252k* in (Y11) 2034-2035. *inflated figures
ISSUE: Levels of Service		
Colour, taste and odour are due to presence of residual iron and manganese in reticulation and algal growth on rocks during low flow stream conditions. Iron and manganese concentrations are in part due to corrosion inside old steel pipes in the reticulation. Protection of public health remains a higher priority over taste and odour issues.	Regular flushing of dead end mains. Upgrade of treatment plant to include a flow proportional, carbon dosing system to remove "taste" from source water (completed)	The additional costs of water treatment to improve the taste and odour characteristics of the supply are included in LTP budget forecasts.

Description	Principal options for response	Implications
Direct pumping to the reticulation results in pressure fluctuations, leading to premature mains failure and damage to water fittings, particularly in the low lying commercial area of Te Kuiti.	Construction of a dedicated rising main from the treatment plant to reservoirs would eliminate pressure fluctuations.	The budget provision has been made for construction of a dedicated rising main and is included in the Te Kuiti Water Resilience Project (Year 1 and Year 2 with an overall budget of $8.55M)
ISSUE: Public Health & Environment		
The Te Kuiti supply is fully compliant with NZ Drinking Water Standards for protection against potentially pathogenic giardia and protozoa.	Implementation of a 3-stage upgrade of the water treatment plant including sterilisation, relocation and reconfiguration of the raw water intake, and a new clarifier, was completed in 2018/19, with additional treated water storage to come later. This has addressed previous deficiencies in public health risk management for the supply. The current backflow prevention programme will be extended through to 2051 to remove the risk of cross-contamination of the potable supply from household appliances.	The potential risks to public health from pathogenic organisms in the raw water supply has been mitigated following completion of the current improvements to the Te Kuiti water treatment plant. Completion of the backflow prevention programme will provide a further level of public health risk prevention.
The current take represents nearly 25 % of stream flow during low flow conditions, with potential impacts on in-stream habitats. This is significant. The effects of the take on Mangaokewa Stream are allowed for in the resource consent.	Renewal of the resource consent is due in 2040.	Renewal of the resource consent is fundamental to the legal right to take water for the Te Kuiti community supply.
Supply and Monitoring instruments (pH, Chlorine and Turbidity) on Reticulation and reservoir	Compliance with Drinking Water requirements	Budget provision of $323k* is made for 2035-2036 (Y12) *inflated figures
Implement improvement actions from Water Safety Plans	Compliance with Drinking Water requirements	Budget Provision of $105k* is made over 5 years in the period 2034 – 2039 *inflated figures
ISSUE: Risk and Resilience Issues		
The supply relies on a single source that is currently under pressure during low flow conditions, when demand is typically greatest. Climate change predictions suggest a worsening of these conditions. Also, parts of catchment have been shown to be unstable, with risk of supply being cut-off due to slips, and the water supply intake is located downstream of an industrial zone and wastewater pumping station.	Raw water storage, involving harvesting of winter stream flows, has been identified as a potential means of mitigating these risks, but at an estimated cost of $30-40M is likely to be cost prohibitive. Construction of a new treated water reservoir to improve storage capacity across the network.	Construction of a large storage reservoir has been provisionally programmed for Year 1 and Year 2 (2024/25 and 25/26) at an estimated budget of $8.55M.
The four water storage reservoirs are critical assets, each approximately 70-years old. Resilience of these reservoirs to a major seismic event is key to the security of the treated water supply.	Refer to Asset Renewal or Replacements section above.	Refer to Asset Renewal section above.

Piopio Water Supply Scheme

The Piopio water supply is sourced from the Kurutahi Stream, to the west of SH3. During 2012/13, the treatment plant was rebuilt. It now consists of the floating intake that pumps into a horizontal flow concrete clarifier from where it is gravitationally piped through two 400 micron roughing filters. The settled water is then forced through a membrane ultra-filtration filter to five 25,000 litre plastic tanks. The treated water is chlorinated and pumped to the existing reservoir.

$10k for Y1 and Y2 has been allocated for monitoring of non-revenue water within the reticulation network. This will involve installing zone valves, flow meters and sensor to assist in determining water loss throughout the network.

All properties with old gate valves and tobies will have them replaced with a backflow prevention device and water meter in year 4 costing $270k. This will provide a more reliable data to manage non-revenue water and prevent water loss with the reticulation.

The reticulation comprises some 9km of various diameters and is predominantly asbestos cement. Water is pumped to a new 450m3 reservoir located above the treatment plant via the reticulation i.e. there is no separate rising main to the reservoir, resulting in pressure surges within the network.

Infrastructure management issues include:

Table 13: Piopio Water Supply Infrastructure Issues

Description	Principal options for response	Implications
ISSUE: Asset Renewal or Replacements		
Large sections of the reticulation is nearing the end of its useful life. The age-based renewal profile is misleading, suggesting a longer residual life than has been evidenced by actual operational experience, the latter indicative of poor pipe condition.	Accelerated mains replacement programme based on actual pipe condition, using modern pipe materials with flexible joints, with expenditure "smoothed" to avoid significant variations in expenditure from one year to the next. Average renewal forecast aggregated into 3-yearly instalments.	Regular annual mains replacement programme continued over the next 30 years comprising total of $658k In addition, provision has been made for minor treatment plant renewals and mechanical and electrical renewals totalling $35k* per year. A reduced renewal programme would result in reduced levels of service due to increased mains failure, loss of water pressure and potential loss of supply, with associated higher maintenance costs.
SCADA and electrical assets are due for renewal at least once every 15 years.	Programmed renewal of electrical and control equipment on 15-year cycle.	SCADA and electrical assets replacement programmed for renewal on 15-year cycle of the IS (included in renewals budgets). *inflated figures
Supply and Install Sludge treatment to manage sludge generated from process	Comply with Resource Consent Conditions	A budget provision of $397K* has been allocated for the fiscal year 2036-2037. *inflated figures
Supply & Install another Membrane Skid	For redundancy and to ensure compliance	A budget provision of $669k* has been allocated for the fiscal year 2041-2042. *inflated figures

Description	Principal options for response	Implications
ISSUE: Response to Demand		
The treatment plant has a design capacity of 600m^3/d. Current demand is approx. 309m^3/d. Peak demand is 527m^3/d. Consented take is 450m^3/d. The long term population projection for Piopio is for decline.	Monitoring of actual demand on the Piopio scheme over time will provide the basis for future capacity upgrade decisions. In the meantime, current capacity is expected to be sufficient over the term of this IS. Demand management techniques can be applied to curb peak summer demand. On-going leak detection and mains replacement programmes will help reduce water losses.	Close match between current demand and consent limit reinforces need for efficient use of water. All properties with old gate valves and tobies will have them replaced with a backflow prevention device and water meter in year 4 costing $270k. This will provide a more reliable data to manage non-revenue water and prevent water loss with the reticulation.
ISSUE: Levels of Service		
Rising main to reservoir also feeds town reticulation causing pressure fluctuations in lower lying areas and is a cause of pipe failure. Levels of service for colour, taste and odour are acceptable to most residents.	Construction of a dedicated rising main from treatment plant to town reservoir is scheduled for 2032-2033 and 2033-2034	A dedicated rising main will address water pressure spikes and help protect ageing pipes from premature failure. Budget provision of $960k included in Year 9 (2032/33) and year 10 (2033/34).
ISSUE: Public Health & Environment		
The absence of back-flow preventers is a potential health risk for Piopio water supply consumers. It exposes water consumers to the risk of cross contamination between the water supply and "greywater" from automatic household appliances. Effects of take on Kurutahi Stream are allowed for in resource consent.	Provision of back-flow prevention devices scheduled as an annual programme. Underground water take resource consent expired in August 2023. Application to renew the resource Consent for underground water take was submitted in July 2023 to Waikato Regional Council. Still waiting for approval from WRC.	Provision of a back-flow prevention programme, at an average of $9k* per year for the next 12 years. Renewal of the water take consent will provide legal rights to take water from underground water source. *inflated figures
Reduce exposure to harmful contaminants and pathogens in the drinking water, thereby mitigating some of the health risks associated with environmental pollutants.	Supply and Install 2 x UV units, as security to membrane failing and compliance with Protozoa	Reduce exposure to harmful contaminants and pathogens in the drinking water, thereby mitigating some of the health risks associated with environmental pollutants.
Meet or exceed regulatory standards for drinking water quality	Implement Improvement Actions from water Safety Plans Gain Compliance with Drinking Water Requirements	Meet or exceed regulatory standards for drinking water quality
ISSUE: Risk and Resilience Issues		
In Piopio, asbestos cement reticulation are at risk of damage from a major seismic event	Use of flexible pipes and joints for mains replacements will reduce the risk of pipe failure in the event of earthquakes or other ground movement. The probability of this risk occurring is considered to be	Provision for increased resilience of the Piopio water supply reticulation has been built into LTP replacement programmes.

Description	Principal options for response	Implications
	low to moderate within the term of this strategy, but the severity of the consequences would be high.	

Maniaiti/Benneydale Water Supply Scheme

The Maniaiti/Benneydale water supply treatment plant is located to the east of Maniaiti/Benneydale township. The whole system was replaced in 2008, including an upgrade of the intake and treatment plant and the addition of automation. Maniaiti/Benneydale now has a modern water supply system which meets the requirements of the Drinking Water Standards for New Zealand 2005 (Revised 2018).

The supply is sourced from a surface take and a groundwater bore. The latter can be used as a back-up during dry stream conditions.

The head works for the surface take comprise a weir across an unnamed tributary of Mangapehi Stream and a new overflow. Water feeds through a uPVC gravity main 100m long to the water treatment plant. The water then gravitates through coarse settling tanks to an adsorption clarifier and on into a concrete sump from where it is pumped by a submersible pump through a diatomaceous earth (DE) filter to a contact tank. From the contact tank it is pumped to a 100m3 reservoir at the top of a nearby hill, from where it is gravity fed to the reticulation. Disinfection is by hypochlorite solution which is injected into the pump line between the DE filter and the contact tank.

The reticulation was totally replaced in 2008 apart from about 800m of MDPE installed in 2003. It consists of 5.7km of uPVC, PE and MDPE materials with an expected remaining life of 100 plus years. All connections have backflow preventers and are metered.

A SCADA and telemetry system allows remote monitoring and limited control to further improve the service at this comparatively remote location.

Infrastructure management issues include:

Table 14: Maniaiti/Benneydale Water Supply Infrastructure Issues

Description	Principal options for response	Implications
ISSUE: Asset renewal and replacement		
The treatment plant and reticulation has been renewed and upgraded since 2008. SCADA and electrical assets due for renewal at least once every 15 years.	Future replacement expenditure "smoothed" to avoid significant variations in expenditure from one year to the next. Programmed renewal of electrical and control equipment on 15 year cycle.	Apart from normal operation and maintenance and renewal of mechanical and electrical components, this scheme should not require further capital investment over the next 10-15 years. Beyond that, an increased requirement for pipe renewals can be expected. SCADA and electrical assets replacements included in renewals budgets.
Sand filters, essential for removing particulates from water, need renewal or replacement over time due to wear, damage, or outdated technology.	Proceed with the planned replacement in Year 12, ensuring that the facility remains compliant with drinking water standards. This option prioritizes public health and regulatory compliance but requires significant upfront capital investment.	The immediate replacement requires a substantial capital outlay of $388k* in 2035-2036, impacting the facility's budget. Alternative options like phased upgrades or exploring new technologies might offer cost savings or spread the financial load over time. *inflated figures
Scheduled replacement of sand media within a water treatment facility's sand filter system, is critical to maintaining filtrate turbidity within regulatory compliance standards. Sand media plays a pivotal role in the filtration process, capturing particulate matter as water passes through the sand filter. Over time, the effectiveness of sand media diminishes due to the accumulation of particles and potential degradation of the media itself, necessitating periodic replacement to ensure the quality of the treated water remains within acceptable standards.	Replacement of Sand media to ensure Filtrate Turbidity is compliant with Standards.	The financial planning for this asset renewal and replacement has been forecasted at $49k* in Year 22 and an identical expenditure of $59k* in Year 30. *inflated figures
ISSUE: Response to Demand		
The water treatment plant has a design capacity of 140m^3/day. The recent average demand was 120 m^3/day. Peak demand was 245 m^3/day. Recent investigations have located and repaired a number of leaks, reducing the short term average demand to 50 m^3/day.	Monitoring of actual demand on the Maniaiti/Benneydale scheme over time will provide the basis for future capacity upgrade decisions. In the meantime, current capacity is expected to be sufficient over the term of this IS. Demand management techniques can be applied to curb peak summer demand.	The close match between current peak demand and the surface water consent limit reinforces need for efficient use of water.

Description	Principal options for response	Implications
Consent limit is 360m^3 per day split equally between the bore and surface takes. The long term population projection for Maniaiti/Benneydale is for decline.	On-going leak detection and mains replacement programmes will help reduce water losses.	
ISSUE: Levels of Service		
Levels of service for colour, taste and odour are acceptable to most residents. Automated control allows remote monitoring of treatment plant 24x7. Current supply copes with demand. Water supply safety protection measures are in place and maintained.	Continuation of routine monitoring and maintenance plan.	Regular monitoring and routine preventative maintenance is key to the on-going success of the Maniaiti/Benneydale scheme.
ISSUE: Public Health & Environment		
Effects of take on the stream and groundwater are allowed for in resource consents.	Back-flow prevention devices are in place. Groundwater bore consent application has been logged and currently being assessed by WRC. Surface take consent expires in 7 April 2031.	The existence of back-flow prevention units safe-guards water consumers from the risk of cross contamination between the water supply and "greywater" from automatic household appliances. Renewal of resource consents is fundamental to the legal right to take water for Maniaiti/Benneydale community supply. Budget provision has been made for $58k in Year 7 (2030/2031).
Meet or exceed regulatory standards for drinking water quality	Implement Improvement Actions from water Safety Plans Gain Compliance with Drinking Water Requirements	The provision of $65k* per year from Year 11 to Year 14 to fund improvement actions stemming from the Water Safety Plan (WSP) is a strategic financial commitment towards ensuring the long-term safety and quality of drinking water. This allocation demonstrates a proactive approach to water management, recognizing that maintaining and enhancing water safety is an ongoing process that requires regular investment. *inflated figures
ISSUE: Risk and Resilience Issues		
The Maniaiti/Benneydale water supply scheme has been upgraded since 2008. The issues regarding security of supply, health protection, reticulation condition i.e. loss of water and cross-contamination, have been addressed.	Maintain monitoring and routine maintenance and inspections of assets. Strengthening of the old concrete reservoir.	Seismic strengthening of the old concrete reservoir has been scheduled for 2037/2038 at an estimated cost of $533k*. *inflated figures

Description	Principal options for response	Implications
The existing treatment plant includes a single UV disinfection unit. Operational failure of that unit would pose a reasonable significant public health risk to the Maniaiti/Benneydale community, requiring boil water protection before the supply was safe for drinking purposes.	Installation of a second UV unit would provide operational protection to ensure continuity of safe water supply delivery.	Provision of $108k has been made in Year 4 (2027/28) for alteration of the existing pipework at the Maniaiti/Benneydale water treatment plant to accommodate installation of a second UV unit.

Mokau Water Supply Scheme

The Mokau urban water supply collects water from two earth dams located on an escarpment above the township fed by two small springs. One is within the front dam basin itself and one at the top end of the catchment. This is supplemented by local runoff off from private farmland property. Storage was doubled to 20,000m^3 when an 11,000m^3 raw water storage reservoir was completed in early 2014. The water is treated by an absorption clarifier, sand filter and UV disinfection, built in 2003/04. In 1996/97 a timber reservoir was added to the system and installed in town with a booster pump station to maintain pressure at about 650kPa, but has since been removed and substituted by three elevated storage tanks located above the treatment plant.

The reticulation comprises approximately 14km's of pipe work of various sizes and materials. The predominant pipe material in the urban area was originally asbestos cement pipe, most of which was laid in circa 1972. Most of this has been replaced over the last three – six years. There is also a MDPE (Alkathene) pipe to Awakino supplying water to some of the properties along the way, including the Marae and a few properties in Awakino.

Infrastructure management issues for the Mokau water supply scheme include:

Table 15: Mokau water supply infrastructure issues

Description	Principal options for response	Implications
ISSUE: Asset renewal or Replacements		
Most (90%) of the Mokau water supply reticulation has been replaced since 2015 due to a high incidence of mains failures in recent times, in part due to the increased hydraulic pressure now available following construction of elevated treated water reservoirs, and the then predominance of brittle AC pipes. The existing treatment plant building will require targeted maintenance treatments within the next 10 years due to its deteriorating structural condition. New SCADA and electrical assets due for renewal at least once every 15 years.	Replacement of rider mains has been scheduled. Programmed renewal of electrical and control equipment on 15-year cycle.	Mokau Watermain Renewals $107K has been included in Year 1 and 2 (2024/26). The financial strategy for water treatment plant renewals includes allocating an average of $20k annually for minor renewals during the initial two years (Year 1 to Year 2). Following this period, there will be a gradual reduction in the budget by $15k each year over the subsequent six years. This approach aims to address immediate maintenance needs while gradually decreasing expenditure as the facility potentially stabilizes or optimizes its operations An average of $6k per year has been allowed over the 30-year term for Telemetry/Scada Renewals
ISSUE: Response to demand		
Treatment plant design capacity is 400m^3/day. Current average demand is 121 m^3/day. Peak demand is 350m^3/day. The consented take is up to 1,000m^3/day. The long term population projection for Mokau is for decline.	Current supply capacity meets and exceeds average and peak demand, with future population projected to decline in the long term. The 11,000m^3 lower raw water storage pond allows variations between average and peak demand to be buffered. Principal option is to routinely monitor the supply/demand balance to ensure early detection and intervention if that ratio changes. Demand management measures would be the first response over additional capital investment in supply capacity.	No immediate implications. Previous investment in water storage in 2014 will endure over the term of this strategy.
ISSUE: Levels of service		
Levels of service for colour, taste and odour are acceptable to most residents. Distance factor negatively impacts on response times and servicing costs.	Continuation of routine monitoring and maintenance plan. Service level agreements in place with contractors.	Regular monitoring and routine preventative maintenance are key to the on-going success of the Mokau scheme.

Description	Principal options for response	Implications
ISSUE: Public Health and Environment		
Effects of take on the natural resource are allowed for in resource consents. The absence of back-flow preventers is a potential health risk for Mokau water supply consumers.	Resource consent to take water expires in 2026. Allowable take will be addressed then. Annual programme for installation of back-flow prevention devices has been scheduled to continue.	Back-flow preventers will remove the risk of cross contamination between the water supply and "greywater" from automatic household appliances. An annual installation programme at an average of $13k per year over the 2024-54 planning period has been included. Renewal of the resource consent is fundamental to legal right to take water for Mokau community supply. Consent renewal is scheduled for 2025/26 at an estimated cost of $61k with $32k allowance in 2026/2027 for any Resource Consent improvement actions.
Green sand is utilised within the sand filter systems to capture particulate matter, ensuring that the filtrate turbidity remains within regulatory compliance standards. This is now due for replacement.	Replacement of Green sand, to ensure the filter is performing well and filtrate Turbidity is in compliance with requirement.	The budget allocations are set at $38k* in Year 11, $62k* in Year 20, and $98k* in Year 30. This phased investment strategy demonstrates a commitment to maintaining water quality over time while also addressing the anticipated wear and operational demands on the filtration system. *inflated figures
Meet or exceed regulatory standards for drinking water quality	Implement Improvement Actions from water Safety Plans Gain Compliance with Drinking Water Requirements	The provision of $65k* per year from Year 11 to Year 14 to fund improvement actions stemming from the Water Safety Plan (WSP) is a strategic financial commitment towards ensuring the long-term safety and quality of drinking water. This allocation demonstrates a proactive approach to water management, recognizing that maintaining and enhancing water safety is an ongoing process that requires regular investment. *inflated figures
ISSUE: Risk and Resilience Issues		
Asbestos water mains are vulnerable to breakage or complete severance in the event of earthquakes or other ground movement.	Continue to replace remaining water mains with flexible pipe materials and pipe joints.	The probability of this risk occurring is considered to be low to moderate within the term of this strategy but the severity of the consequences are expected to be high.
The past issues of water shortage and quality during summer drought conditions, have largely been addressed. The construction of additional raw water storage in 2014 and treatment plant improvements, have improved security of the supply and water quality since 2015. Seismic strengthening required.	Increased raw water storage was completed during 2015/16. Seismic strengthening of the reservoir.	The risk of water shortage during drought conditions has been addressed. Seismic strengthening of the reservoir has been scheduled for 2037/38 at a cost of $533k*. *inflated figures

Waitomo Village Water Supply

Refer to section on Waitomo Village Wastewater Scheme (page 172)

WDC STORMWATER DRAINAGE

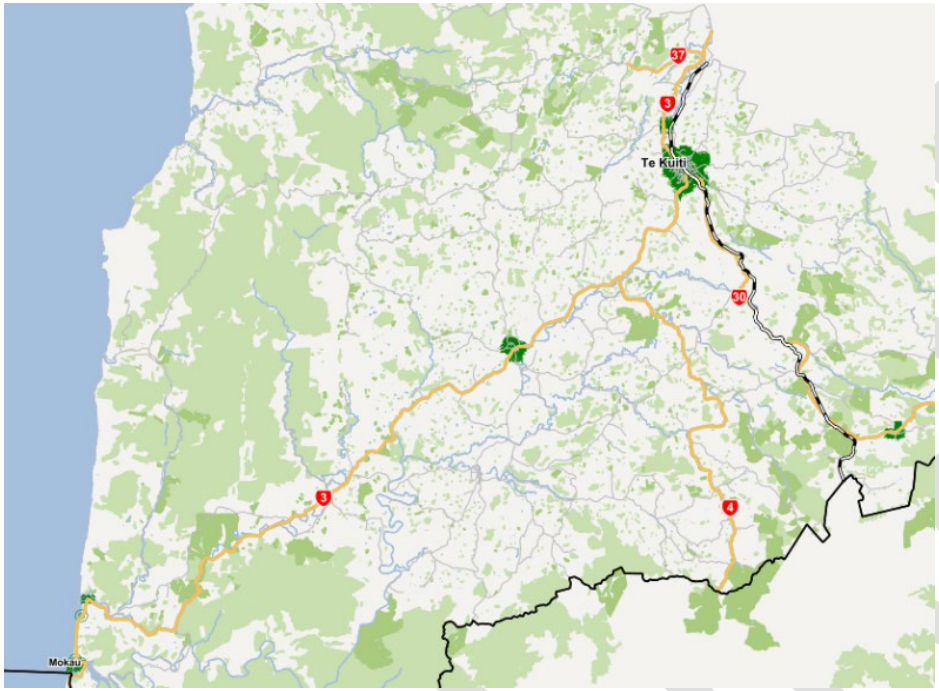


Figure 9

WDC's stormwater (SW) infrastructure is divided into two distinct parts. The primary component, mainly located in urban areas like Te Kuiti, includes SW pipes, open drains, and discharge structures. Conversely, the secondary component primarily involves overland flow paths, a significant part of which integrates the roading network.

Unfortunately, the information on the assets that make up this stormwater network is sparse. The primary components reach extends to the SW networks, which include approximately 36.34km of pipes, open drains, manholes, and discharge structures, culminating in a comprehensive drainage network of 45.87km. On the other hand, overland flow paths, a substantial part of which incorporates the roading network, form the secondary component

The multiple (19) Te Kuiti SW discharges are consented through a district wide comprehensive consent. The consent expires 1 July 2024.

Table 14 includes all stormwater assets in the district and Table 15 summarises the stormwater issues.

Table 16: Urban Stormwater Assets Districtwide

Asset Type	Quantity
Manholes	532
Pump stations	Nil
Catchpits	601
Stormwater piped reticulation	36,340 m
Open channels	9,530 m
Outlet structures	22

Table 17: WDC stormwater infrastructure issues

Description	Principal options for response	Implications
ISSUE: Asset renewal or Replacements		
Ageing pipe assets some of which are in poor condition. Information on pipe condition is mostly anecdotal. Approx. 4km of pipe has been inspected. A large section of pipe network in Te Kuiti is partially silted up.	Implement stormwater pipe condition assessment programme. Undertake renewals on a prioritised basis, "smoothed" across the 30 year planning period to avoid peaks and troughs in expenditure. Use findings from criticality assessment and network inspection programme to prioritise repairs/replacement programmes and optimise pipe replacement sizes taking account of catchment management plans.	Continued stormwater renewal and rehabilitation programme at an average of $240k per year. Inspection programme at an average of $16k per year over Years 1 – 10.
ISSUE: Response to demand		
The current network provides a modest response to SW drainage requirements, and principally in the Te Kuiti urban area. The nominal design capacity of the piped SW network is sized for a 1 in 2 year rainfall event. Parts of the piped network do not even achieve that. Roofwater drainage in the Te Kuiti residential area is required to discharge to on-site ground soakage or tank storage. If that was to change because of localised flooding, or if more intensive, residential land development was allowed to occur in future, greater pressure would be imposed on the existing limited SW drainage capacity, particularly the downstream sections of the network.	The current level of service for the SW activity is designed for a modest rainfall event occurring on average, once every two years. Future planning of SW services is required to understand and prioritise future demand, available capacity, and impact on required service levels. Preparation of catchment management plans, initially for Te Kuiti, are required to develop a better understanding of catchment flow rates and primary and secondary flow paths. Apply investigative techniques such as, visual inspection, CCTV inspection, and peak flow calculations to gather information regarding the stormwater reticulation.	Any future increase in demand will be met by maintaining current LoS. While population growth is projected to decline in the medium term, climate change might increase the frequency and intensity of a 1 in 2 year rainstorm event.

Description	Principal options for response	Implications
The long term population and land subdivision projection for the district is for decline.		
ISSUE: Levels of Service		
The SW reticulation has been designed to cope with a very modest, 1 in 2 year storm event. Beyond that, the SW system relies on secondary, overland flow paths to drain excess surface water. Current LoS include reducing the threat of stormwater flooding of property, responsiveness to customer services during flood events and managing the adverse effects of SW on the quality of the receiving water.	Council's preferred option is to maintain current levels of service, except for potential requirement for higher environmental standards post the new resource consent. It will achieve that by ensuring that secondary flow paths are identified and protected (through catchment management plans), and that the existing SW infrastructure performs to capacity, by continuation of CCTV inspection and repair programmes to identify the condition of the existing network and to prioritise work programmes to restore capacity of damaged or blocked sections. Alternative options involving increased drainage capacity would entail significant investment due to extensive lengths of pipe replacements at increased pipe diameters.	Budget provision ($1.3M per year over the next 5 years to implement short, medium, and long-term stormwater improvement plans and actions. This involves in installations of wingwalls and grates on open channels, increase size of catch pits on the roadside kerbs, installing scruffy domes on low lying areas, identifying open areas to purchase land, design and construct retention dams. Council will also carry out detail stormwater 1D and 2D modelling. Budget provision of $286k in overs Years 1 and 2 for preparation of catchment management plans (see Public Health and Environment, below) followed by an additional $135k for Year 3.
ISSUE: Public Health and Environment		
Public health issues can arise in residential areas of Te Kuiti where there is no reticulated SW network. The impact of that can result in overloading of the sewerage network due to surface run-off. WDC holds a comprehensive SW Discharge Consent to capture the numerous SW point discharges. There is no SW treatment provided.	Extension of drainage network to unserviced urban areas to mitigate the risk of SW inflow to sewerage network. Effects of SW discharge on the natural environment are controlled via resource consents. The application to renew the current SW discharge consent will be made 2048/2049 Conduct environmental assessment of each stormwater drain and receiving water to identify and assess any ecological sensitivity and determine the appropriate form of environmental amenity of such streams and/or drains	The current SW discharge consent expired on 1 July 2024 A budget of $45k has been allowed in Year 1 (2024/25) with $5k for each of the two years Year 3 & Year 4 in anticipation of additional consent monitoring and reporting requirements. Renewal of the resource consent is fundamental to the legal right to discharge urban SW to the environment.
Resource Consent Renewal in Y25 for Te Kuiti (Comply with Legislative Requirement)	The application to renew the current SW discharge consent will be made 2048/2049	Provision of $140k in Y25 for Te Kuiti Resource Consent renewal.
Stormwater Legislative compliance and environmental stewardship for Rural Towns	The application to renew the current SW discharge consent will be made 2048/2049	The allocation of $70k for the resource consent renewal for six rural sites in Year 25 underscores a strategic approach to ensuring these sites comply with legislative requirements.
ISSUE: Risk and Resilience Issues		

Description	Principal options for response	Implications
Current risks include pipe failure, flooding of property due to impaired stormwater capacity and blocked secondary flow paths. A major flood event could overtop the banks of Mangaokewa Stream with consequential flooding of property. The increased frequency of high rainfall events, over time, exacerbated by the very limited capacity of the existing network, will potentially increase resident expectations for an effective stormwater drainage system. There is an overlap between SW and wastewater services. It is not unusual for roofwater downpipes to be connected to sewer laterals, or gully traps to be used as sumps on residential properties, especially where ponding is a problem. Rising sea level could impact negatively on the district's beach communities, mainly through impeded stormwater drainage due to rising sea levels and surcharging of stormwater outlets.	Identification and protection of secondary flow paths through catchment management plans. A prioritised programme of works to address any identified capacity/protection shortfall, including protection of secondary flow paths and environmental protection works to mitigate adverse effects at the points of discharge, would be derived from this work Repair and replacement of damaged stormwater pipes using seismic resistant pipe materials and flexible joints, sized for future demand projections. Extension of drainage network to unserviced urban areas to mitigate the risk of SW inflow to sewerage network.	Failure to complete catchment management plans will increase the risk of flooding and damage to property. See above Level of Service.

TOWNSHIPS CURRENTLY NOT SERVICED WITH WATER SERVICES

A high level review of demand for additional water services across the district has been planned for Year 25 (2046/47). This review will be coordinated with the then Water and Sanitary Services Assessment, as required from time to time under section 125 of the Local Government Act 2002. The budget estimate is $160,000.

For example, there is currently no wastewater scheme at Mokau, with individual properties fitted with privately owned and maintained septic tanks. The risk of cross-contamination between septic tanks and groundwater used for drinking water is alleviated through the existence of WDC's reticulated water supply. The impact of increased hydraulic loading consequential to the impact of the reticulated water supply on the performance of individual septic tanks may, however, need to be addressed in the future through the provision of a reticulated wastewater scheme for Mokau/Awakino. Protection of public health and the environment are the main drivers for this proposal.

The preliminary estimated total cost of the project is in the order of $20 – 25M. No provision has been made in the Infrastructure Strategy for this specific project proposal, pending completion of the district wide review of demand for additional water services, scheduled for 2046/47.

The findings from the assessment will be used to inform the Infrastructure Strategy review in 2047.

ROADS AND FOOTPATHS

Roading Assets

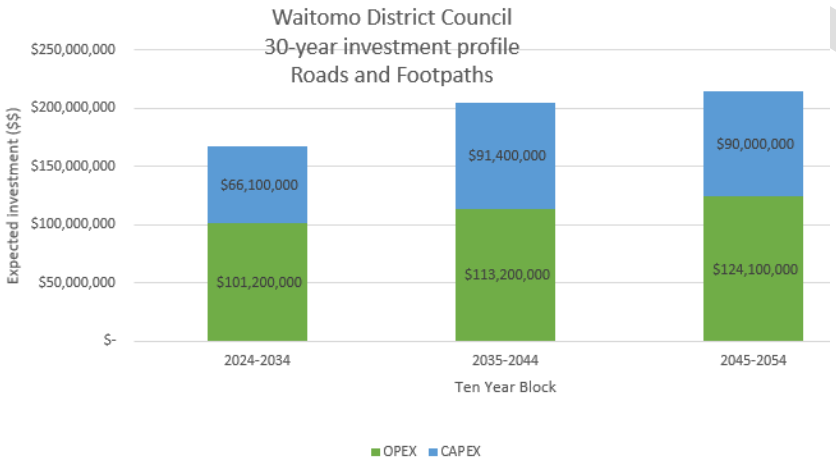
Our transport network integrates different modes of transport including heavy vehicles, cars, biking, and walking. We maintain, operate, renew, and invest in new to ensure the appropriate levels of service are met. We currently maintain 459.6km of sealed roads and 546.2km of unsealed roads. We maintain and renew associated assets such as bridges, culverts, kerb and channel, carparking, road signage, retaining structures, and street lighting.

It is expected that due to the stable regional growth, GPS 2024 objective of Maintain and Operate will be more relevant than ever. Maintaining the current levels of service will require upwards of $586M over the next 30-years – illustrated in table 18 and figure 10 below.

Table 18: 30-year investment profile across OPEX and CAPEX

Investment Portfolio	Ten year block			Totals - 30 year
	2024-2034	2035-2044	2045-2054	
OPEX	$ 101,200,000	$ 113,200,000	$ 124,100,000	$ 338,500,000
CAPEX	$ 66,100,000	$ 91,400,000	$ 90,000,000	$ 247,500,000
Totals	$ 167,300,000	$ 204,600,000	$ 214,100,000	$ 586,000,000

Figure 10: 30-year investment profile across OPEX and CAPEX



The next 10-years will focus on investing in four key areas, in line with the 2024-2027 Activity Management Plan (AMP).

Focus Area one: Investing in the ageing bridge stock, maintaining, and investing in these assets to ensure our network remains prosperous and connected.

Focus Area two: Investing in resilience to cope with the increased frequency and scale of weather events.

Focus Areas three and four: Promoting smarter and more efficient investment decisions to cope with unprecedented inflation and cost increases. Higher costs will ultimately result in the same value of money being invested but with a reduced ability to maintain levels of service.

The management, monitoring, and delivery of the Roading and Footpath programmes requires specialist knowledge and expertise. WDC is currently working towards in-house delivery of some roading aspects resulting less reliance on external contractors.

Figure 11: Road Length by Type -Km (Total length 1,006km)

Classification of transport network

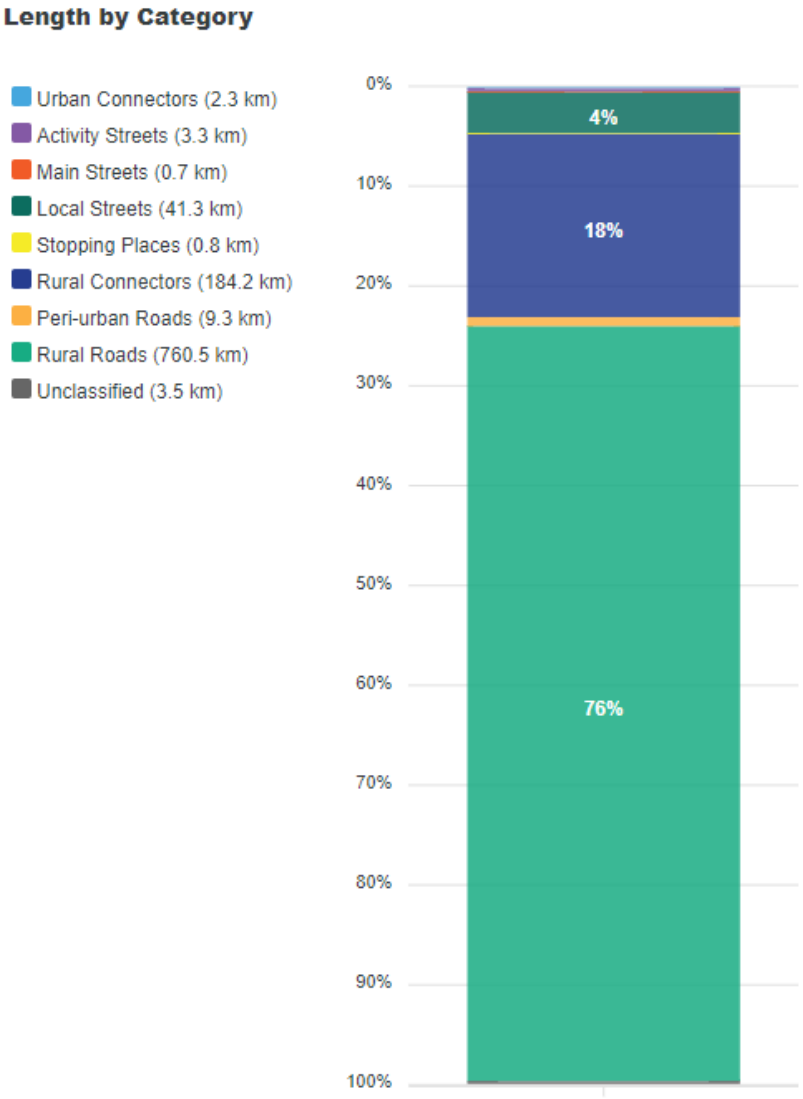
The One Network Framework (ONF) is the new national classification system for roads and streets. It replaces the One Network Road Classification (ONRC) which has been in use since 2012.

The ONF uses the movement and place framework to determine the function of all roads and streets, acknowledging that roads and streets perform two functions – they help move people and goods and are places where people spend time.

When fully implemented, the ONF can be used to benchmark performance and align performance measures and outcomes. In 2021, Council completed the desktop review of all roads and reclassified them in conjunction with the ONF guidelines.

Lengths for the ONF within the district and each classification as a percentage of the total network length are included in the figures below.

Figure 12: One Network Framework (ONF)



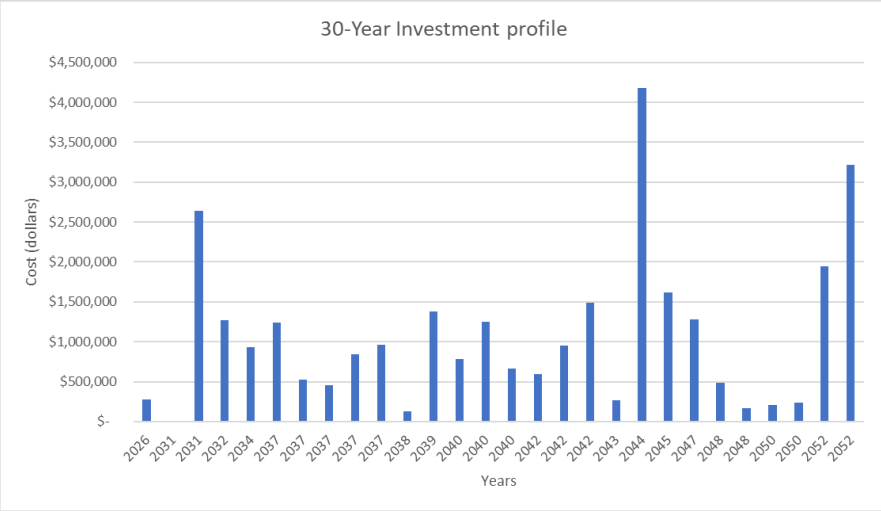
Bridge Assets

There are 162 bridges and large culverts (cross sectional area greater than 3.4m²) throughout the district. 96 of these are one lane structures – mainly on low volume roads. Some bridges are small structures providing access to one or more rural properties; others are large, catering for up to 1,000 vehicle movements per day.

There are 14 stock underpasses providing farm access under the road and improving safety for road users and the landowner. These underpasses belong to the property but are included in Council's data base to ensure they are inspected and maintained regularly. There are good records of the age and construction details for bridges and most large culverts held in the RAMM database.

Bridges are the second highest value asset in roading, with a replacement value of $35M. Due to the large network and the nature of the terrain serviced by the roading network, all bridges are considered critical, as the loss of any bridge would result in unacceptably lengthy detours, where available. In many cases, there is no alternative route available.

Figure 13: 30-Year Bridge Replacement Programme (2024-2054)



Forecasted investment needs over the next 30-years is illustrated below in table 19. High level analysis indicates that the initial 10-year requirements are within the realms of $6M, which is less than the forecasted need of $11M through the second 10-year period of 2035-2044. This bow wave of investment will require on-going and proactive financial management to ensure the structural assets throughout the district are maintained and renewed when they are required.

Table 19: 30-year investment blocks (uninflated figures)

10-Year Block	Investment need
2024 - 2034	$ 6,000,000.00
2035 - 2044	$ 18,000,000.00
2045 - 2054	$ 11,000,000.00

Paraheka bridge #254 – illustrated below is third priority and due for renewal in 2031. It is the only suspension cable bridge within the district and will likely be replaced with a modern equivalent, expecting to cost in the realms of $2-4M.

Figure 14: Paraheka Bridge #254

Maintaining and Improving Resilience

The Waitomo District has a history of significant weathers events which have become much more frequent over the last two-three years which has had adverse effects on transport infrastructure. The impacts have presented council with substantial and on-going financial pressures, not only restoring the levels of service but also adopting the philosophy of "Building back better". Table 19 below illustrates the spend to date over the past two years and forecast expenditure resulting from emergency events and the repairs to our transport infrastructure.

Table 20: Expenditure to date and forecast to complete.

Weather event	Date of event	Cost to restore and improve LOS
Cyclone Dovi	February 2022	$10.5M
Winter 2022	June, July and August 2022	$5.5M
Pukerimu 5.8	November 2022	$250K
Auckland Anniversary/Cyclone Gabrielle	January 2023	$600K
Mangarino Road	September 2023	$1.5M
Total	2022 – 2024	$18.4M

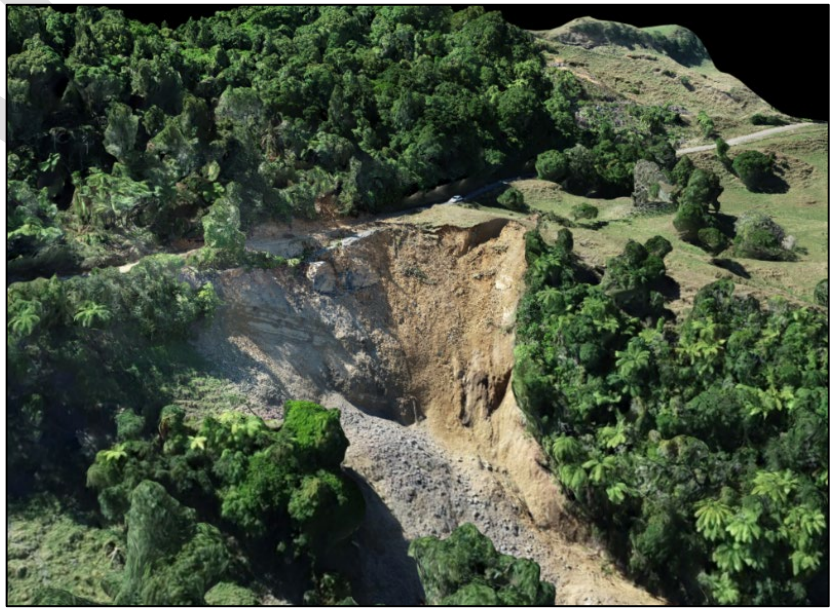
Alignment of GPS 2024 and this Strategy will ensure we are investing in the right places, at the right time to protect our communities and the key routes they rely on. The following GPS 2024 priorities are relevant to climate change and how we prioritise funding to reduce the impacts to our community.

- Maintaining and operating the system,
- Increasing resilience, and
- Reducing emissions.

Maintaining and improving resilience will be undertaken by:

- Key route dependency analysis to help council identify which routes are vital to ensuring communities remain connected.
- Substantial investment in drainage, improvements
- Increased inspection frequency of drainage assets to better inform vulnerable assets which require maintenance and renewal.
- Increased funding into corridor improvements in and around high risk areas consisting of unstable geology, around streams and rivers, single route dependency and alternative routes.
- Maintained funding into alternative methods of transport such as investment into walking and cycling, reducing the dependency of motor vehicles in our urban centres.

Figure 15: Taumatatotara West Road, one of the worst effected roads resulting from Cyclone Dovi (2022)

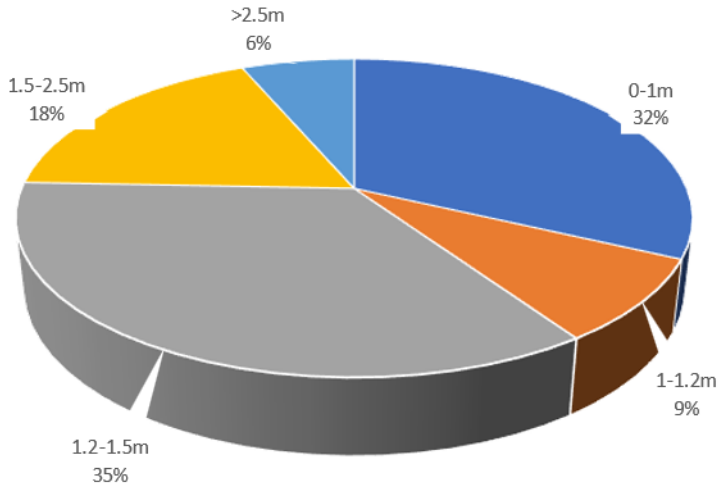


Footpath Assets

The Waitomo District has roughly 51 kilometres of footpath ranging in width from less than 1 metre to over 2.5 metres wide.

The standard minimum footpath width for urban areas is 1.5 metres, wider footpaths are required in high pedestrian areas i.e. CBD areas and outside schools. The majority (76%) of footpaths in the district have a width of less than 1.5 metres which may reflect the age of existing footpaths (i.e. constructed when standard footpath widths were narrower).

Figure 16: Footpath Lengths by Widths



Council is in the process of adopting the "W*alking and Cycling Strategy 2023 – 2053)* which places emphasis on four overarching objectives which in turn, provide six-focus areas within these objectives. The four objectives are:

Improve the existing footpath network

Improving the existing footpath network by widening existing narrow footpaths and providing strategically placed safe road crossing points for existing footpaths.

Healthy Communities

Providing accessible, safe and improved connectivity of the walking and cycling network in the District, to make walking and cycling a more desirable transport mode for all users.

Promotion of walking and cycling

Enhance promotion of walking and cycling options in the District targeting residents and tourism.

Enhance access and connectivity

Improve access to existing attractions, focal points, reserves, CBD's by providing more footpaths and cycleways to maximise the benefit for existing and current footpath and cycleway users.

It is expected that we will invest upwards of $17.5M into walking and cycling over the next 30-year period, enabling members of our community to move around freely, utilising the multi-modal transport methods as opposed to traditional motor-vehicles.

Work Activity - Forecast Summary

The following tables represent the forecasted investment by activity across both Operational and Capital portfolios.

Table 21: Operational forecast split across the three, ten-year blocks and associated risks (the figures represented have been rounded up to the nearest $100k and uninflated)

Work Category	Name	2024 - 2034	2035 - 2044	2045 - 2054	2024 – 2054 30-Years	Risk Assessment
111	Sealed Pavement Maintenance	$23.5M	$25.7M	$28.2M	$77.3M	Medium Risk – Cost inflation will result in reduced LOS
112	Unsealed Pavement Maintenance.	$11M	$12.4M	$13.6M	$37M	Medium Risk – Cost inflation will result in reduced LOS
113	Drainage Maintenance	$6.1M	$6.9M	$7.5M	$20.5M	High Risk – LOS difficult to manage
114	Structures Maintenance	$3.3M	$3.6M	$4M	$10.9M	High Risk – LOS difficult to manage – ongoing structural improvements and maintenance required
121	Environmental Maintenance	$9.2M	$10.3M	$11.3M	$30.8M	High Risk – LOS difficult to manage, hazardous trees coming to end of life requiring removal
122	Network Maintenance	$3.9M	$4.4M	$4.8M	$13.1M	Medium Risk – Cost inflation will result in reduced LOS
125	Footpath Maintenance	$700K	$800K	$800K	$2.3M	Low Risk – focus on multimodal transport
131	Level crossing maintenance	$600K	$600K	$700K	$1.9M	High Risk – Kiwirail costs largely unknown and lack of FWP visibility
140	Minor improvements	$8.6M	$9.6M	$10.6M	$28.8M	High Risk – largely unknown, this budget is used for emergency response
155	Professional Services and Asset Management	$34.4M	$38.9M	$42.6M	$115.9M	Low Risk – Stable demand, impacted by inflation
OPEX Total		$101.2M	$113.2M	$124.1M	$338.5M	High risk – will struggle to maintain LOS with inflation and stable population growth

Table 22: Capital forecast split across the three, ten-year blocks and associated risks (the figures represented have been rounded up to the nearest $100k and uninflated)

Work Category	Name	2024 - 2034	2035 - 2044	2045 - 2054	2024 – 2054 30-Years	Risk Assessment
211	Unsealed road renewals	$8.6M	$9.6M	$10.6M	$28.8M	Medium Risk – Will struggle to maintain LOS with reduced funding and inflation
212	Sealed road resurfacing	$25.5M	$29.3M	$32M	$86.8M	High Risk – Will struggle to maintain LOS with reduced funding and inflation
213	Drainage renewals	$4.3M	$4.8M	$5.3M	$14.4M	Medium Risk – Will struggle to maintain LOS with reduced funding and inflation
214	Sealed pavement rehabilitation	$17.6M	$17.6M	$19.3M	$54.5M	High Risk – Will struggle to maintain LOS with reduced funding and inflation
215	Structural component replacement	$3.1M	$3.3M	$3.7M	$10.1M	High Risk – Will struggle to maintain LOS with reduced funding and inflation, bridge replacement demand will increase in this 30-year period
216	Structural Renewal	$5.4M	$25M	$17.1M	$47.5M	High Risk – Will struggle to maintain LOS with reduced funding and inflation, bridge replacement demand will increase in this 30-year period
222	Traffic services renewals	$1M	$1.1M	$1.2M	$3.3M	Low risk
225	Footpath Renewals	$600K	$700K	$800K	$2.1M	Low risk
CAPEX Total		$66.1M	$91.4M	$90M	$247.5M	

Summary of Strategy Considerations

The table below identifies and summarises road and footpath infrastructure considerations resulting from this Infrastructure Strategy.

Table 232: WDC Roads and Footpath Infrastructure Issues

Description	Principal options for response	Implications
ISSUE: Asset Renewal or Replacements		
Bridge stock is in generally good condition. There are 28 bridges identified for renewal in next 30-year period with a replacement value of $35M. Four of those bridges fall in the 2024 – 2034 period (value $6M).	Monitoring of bridge condition and programme renewal of structural components.	Bridges are a critical roading asset. Regular inspections, maintenance and structural repair/renewal is vital to protecting public safety.
Seven bridges have weight restrictions prohibiting their use by 45/46 tonne vehicles that are now permitted "as of right" use over the network. A further seven bridges are unsuitable for HPMV vehicles resulting in parts of the District being inaccessible to these vehicles.	Determining what is required to upgrade bridge structures to HPMV standards. A priority list will be developed and one structure per year analysed.	Budget allowance of an additional full-service analysis over Years 1 to 10 from the Network and Asset Management category. Resulting capital works will be programmed from year 4 onwards.
Additional rehabilitation and resurfacing required to achieve sustainable asset condition. Pavement condition, surface condition and smooth travel are stable and compare well with national values.	On low traffic roads a combination of heavy maintenance and reseals might be more economic than a full rehabilitation treatment. The sealed roads carrying the lowest traffic volume will be trialled for this option.	Reduced affordability for sealed pavement resurfacing and rehabilitations resulting from stable budgets but increased costs. DIA KPI's won't be achievable, and LOS will reduce.
Average annual resurfacing length of approximately 32 km required to maintain a current seal life of 12 years and avoid backlog occurring.	Maintain length of road resurfaced with seal and asphaltic concrete to an average of 32 km each year, consistent with a seal life of 12 years.	Road surfacing maintain water proofing and skid resistance. Reseals budget to increase to maintain LOS.

Description	Principal options for response	Implications
ISSUE: Response to Demand		
A recent survey of forestry owners in the district has identified an intense period of forest harvest operations scheduled to take place over the 2024-29. That together with the increasing incidence of 50MAX vehicles now accessing the network, suggests a consequential increased demand for expenditure on road maintenance and strengthening/rehabilitation programmes.	Planning and prioritising of road rehabilitation projects to ensure construction works are aligned with demand. In parallel, sealed and unsealed road maintenance activities will be increased to offset increased wear and tear from logging trucks. Unsealed road maintenance will include increased frequency of metalling for roads with increased logging traffic.	Additional demand in the form of increased numbers of HCVs on specific forestry and mineral extraction haulage routes will shorten pavement lives and advance the need for rehabilitation of some routes. Road widening and geometry will be addressed at the same time. See asset renewals response above. Damages resulting from forestry traffic have not been allowed for in this strategy, this will be an on-going issue which will be managed accordingly.
The maximum legal heavy vehicle gross weight increased from 44 tonnes to 45/46 tonnes from 1 February 2017, and this can be expected to place further stress on already under-strength pavements. The scale of this has yet to be determined.	Establishment of agreements with high impact road users for reimbursement of additional road maintenance and rehabilitation costs associated with road use activity.	Sealed maintenance budgets slightly increased. More heavy maintenance need to counteract reduced rehabilitation spend.
Description	**Principal options for response**	**Implications**
ISSUE: Levels of Service		
Levels of service include road safety, bridge/pavement capacity, reliability and accessibility, responsiveness and smoothness of ride.	GPS 2024 Strategy No.1 promotes maintaining and operating current assets as a priority over building new. This will have a positive impact for WDC and allow investment back into current assets to maintain the levels of service but equally have a consequential impact on assets that don't meet LOS and require capital investment.	
The rugged terrain of large parts of Waitomo district has resulted in a roading network that has significant numbers of tight bends where the road geometry does not meet the dimensional requirements for large truck and trailer configurations (e.g., 50MAX HPMV). There are 226km of the sealed network and 270km of the unsealed network that do not meet these minimum technical levels of service (TLOS).	Improvements to be completed to selected parts of the sealed and unsealed network that do not meet the existing TLOS over time. The first priority, after ensuring network resilience is upheld, will involve curve widening to reduce tight corners in the network. to a level suitable for modern truck configurations while maintaining a reasonable level of safety for other road users.	Improved access for movement of primary sector goods to a level suitable for modern truck configurations and ensuring a reasonable level of safety for other road users. Current levels of service for responsiveness, smoothness, amenity and reliability/resilience will be maintained through the strategy period.

Description	Principal options for response	Implications
ISSUE: Public Health and Environment		
Road maintenance and construction activities can potentially involve discharge of contaminated material to the natural environment.	Controlling roading operations to avoid and mitigate adverse effects including dust and sediment discharge to water ways.	Resource consents will be required for activities that may have an adverse effect(s) on the receiving environment(s).
Traffic accidents involving excessive speed, loss of control and tail end collisions.	Coordinate investigations, response and promotion of road safety through formation of a multi-agency, action group.	A programme of signage and guardrail improvements on selected routes is proposed. Investment of an additional capex over the next three years.
Many of the local roads have a variety of road users such as tourists, heavy vehicles, school buses, young driver, cyclists, farm vehicles and residents, all with conflicting road use purposes and behaviours. Each of these users has different safety needs. The proportion of "Bend/Lost control" crashes occurring on secondary collector roads is high compared to other crash types.	A targeted programme of safety improvements at conflict points will be developed and funded as a part of the Low Cost, Low Risk work category.	
Five of the Waitomo District's urban areas are built along state-highways coincident with principal pedestrian routes: ○ Te Kuiti (SH3, SH30) ○ Piopio (SH3) ○ Mokau (SH3) ○ Waitomo Caves (SH37) ○ Maniaiti/Benneydale (SH30) Pedestrian danger zones are present due to the high traffic volumes, heavy vehicles and speeding traffic that travel through these areas	WDC's recently developed town centre concept plans involve improvements to pedestrian facilities to improve pedestrian access to destinations alongside the highway. It is proposed to progressively implement these improvements as part of the footpath renewal and upgrade programme. The current footpath capital works programme is in effect improving network condition.	The footpath renewal and upgrade programme includes provision of new footpaths where justified and improving the width of existing paths. Footpaths are currently in good condition; however it is expected that additional maintenance funding increases will be required in future years.

Description	Principal options for response	Implications
ISSUE: Risk and Resilience		
The district roading network is exposed to severe operating conditions with high incidence of flood damage and localised extremes in climatic conditions. Increasing weather extremes due to climate change are expected to increase maintenance costs and disruptions to the road network. Climate change is predicted to lead to a rise in sea levels that will affect several coastal roads in the District. By 2050 parts of the roads listed below will be below sea level. It will be necessary to either raise the level of these roads or re-route onto higher ground in order to preserve road access to the affected communities. ○ Kawhia Harbour Rd ○ Marokopa Rd ○ Soundy Rd ○ Te Mahoe Rd ○ Taharoa Rd Critical assets include bridges and large culverts Failure of bluff areas causing slips and dropouts could isolate rural communities.	Bridge inspections are completed every two years. Key route dependency assessments are undertaken to determine which routes are critical for community connections – i.e. lifelines. Years 1 – 3: WDC will continue its programme of culvert improvements to reduce the risk of road closures during extreme rainfall and complete structural maintenance on retaining walls to reduce risk of premature failure. It will develop a fully costed programme of works to raise the level of roads at risk of inundation due to sea level rise for implementation in future LTP. Reduction in emergency reinstatement funding from NZTA will increase the risk of prolonging reinstatement of roads and footpaths post an emergency event.	Current risk mitigation will be maintained through the strategy period. Greater community ownership of appropriate road safety behaviours. budget allowed capital investment on increased resilience of coastal roads to rising sea level under climate change modelling.

SECTION 6 | INFRASTRUCTURE INVESTMENT PROGRAMME – THE MOST LIKELY SCENARIO

TOTAL EXPENDITURE

In addressing the issues identified in the previous sections of this strategy, the Waitomo District Council expects to spend $400.3 million on new or replacement infrastructure between 2024 and 2054 Over the same period, $802.6 million is expected to be spent on operating costs, labour, depreciation, materials and maintenance. These figures are anticipated to be spread across the four infrastructures asset activity areas as shown below.

Table 24 below shows that expenditure across the four infrastructure activity areas will continue to be dominated by operational and maintenance requirements (operating costs, labour, depreciation, materials, and maintenance) between 2024 and 2054.

Infrastructure Activity	Capital Expenditure (new and replacements) Inflated figures	Operational Expenditure Inflated figures	Total Inflated figures
	$000's	**$000's**	**$000's**
Waste Water	25,319	191,063	**216,382**
Water Supply	47,235	186,762	**233,997**
Stormwater Drainage	22,663	44,532	**67,195**
Roads and Footpaths	332,424	609,994	**942,418**
TOTAL	**427,641**	**1,032,351**	**1,459,992**

Table 24: Total Infrastructure Expenditure 2024-2054

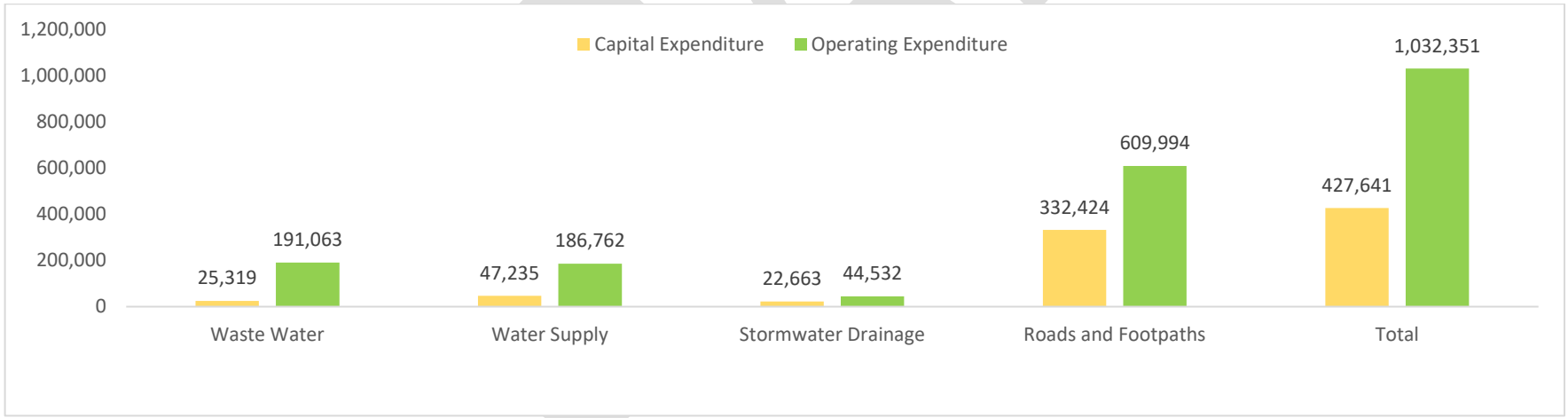


Figure 17: Total Capex and Opex 2024-2054 by Infrastructure Category

Table 25 and Figure 18 below show the indicative estimates of total operational and capital expenditure up to 2054, by infrastructure asset type. The estimates are shown on an annual basis for the first 10 years, followed by annual average expenditure for the next 20 years in 5 year blocks.

Operating and Capital Expenditure Forecasts	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Wastewater	5,010	5,282	5,619	6,372	5,545	5,875	6,078	5,856	6,083	6,009	8,159	7,105	7,814	8,653
Water Supply	9,596	10,151	5,237	7,500	8,289	6,345	6,196	6,136	6,486	7,177	7,607	7,588	8,081	8,901
Stormwater	2,738	2,820	3,147	2,892	3,015	1,931	1,989	2,000	2,065	2,008	1,819	1,998	2,274	2,428
Roads & Footpaths	23,158	22,882	23,673	23,241	23,872	24,495	24,722	27,476	26,869	26,025	29,387	33,189	36,578	40,046
Total	**40,502**	**41,135**	**37,676**	**40,005**	**40,721**	**38,646**	**38,985**	**41,468**	**41,503**	**41,219**	**46,972**	**49,880**	**54,747**	**60,028**

Table 253: Total Operating and Capital Expenditure 2024-2054

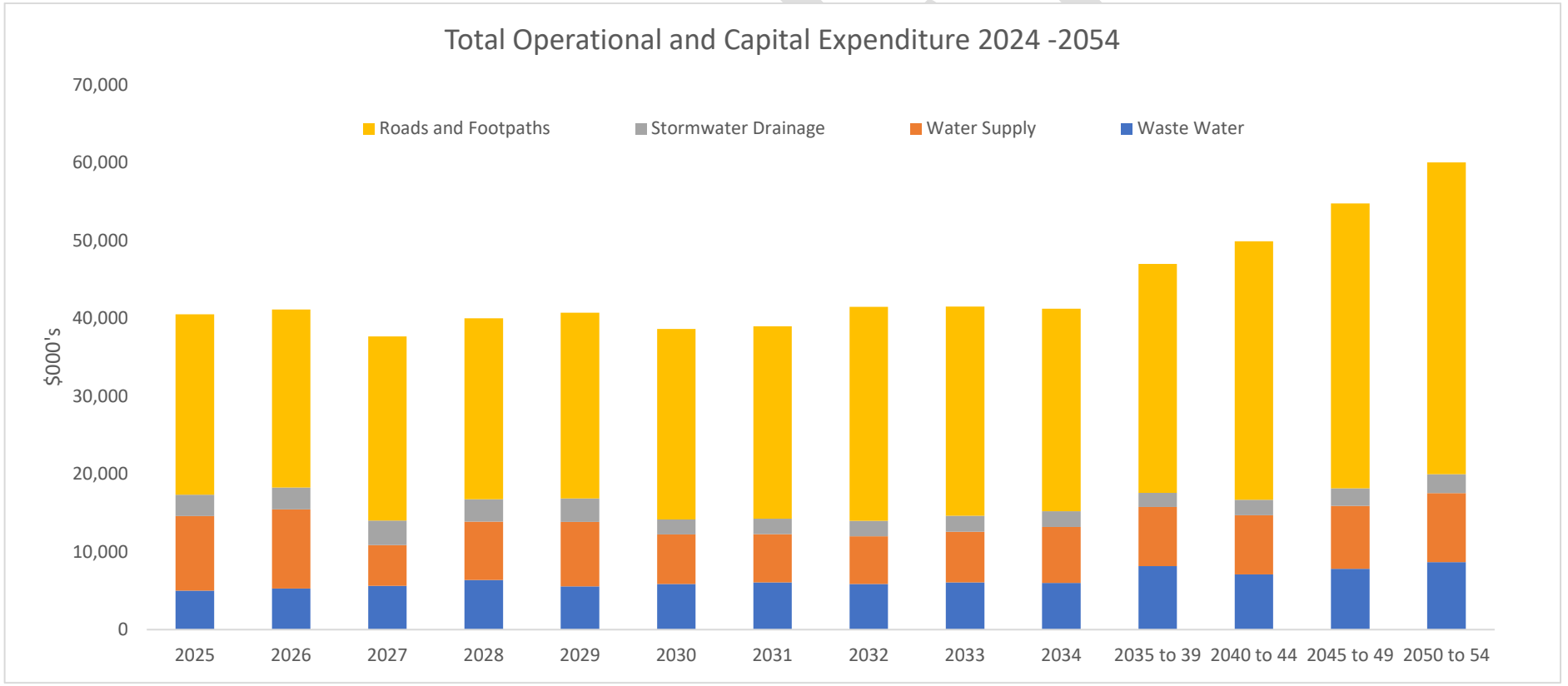


Figure 18: Total Operating and Capital Expenditure 2024 – 2054

OPERATIONAL EXPENDITURE FORECASTS

Operating Expenditure Forecasts	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Wastewater	4,518	4,687	4,942	5,119	5,130	5,329	5,444	5,448	5,593	5,597	5,952	6,568	7,279	8,052
Water Supply	4,197	4,623	4,618	4,979	5,330	5,424	5,482	5,464	5,541	5,563	5,897	6,434	7,052	7,725
Stormwater	950	1,035	1,204	1,193	1,270	1,303	1,334	1,322	1,383	1,323	1,402	1,529	1,677	1,836
Roads & Footpaths	14,740	15,056	15,353	15,692	16,209	16,438	16,700	17,208	17,529	17,813	19,075	21,102	23,354	25,920
Total	**24,405**	**25,401**	**26,117**	**26,983**	**27,939**	**28,494**	**28,960**	**29,442**	**30,046**	**30,296**	**32,326**	**35,633**	**39,362**	**43,533**

Table 26 – Infrastructure Capital Expenditure Forecasts 2024 –2054

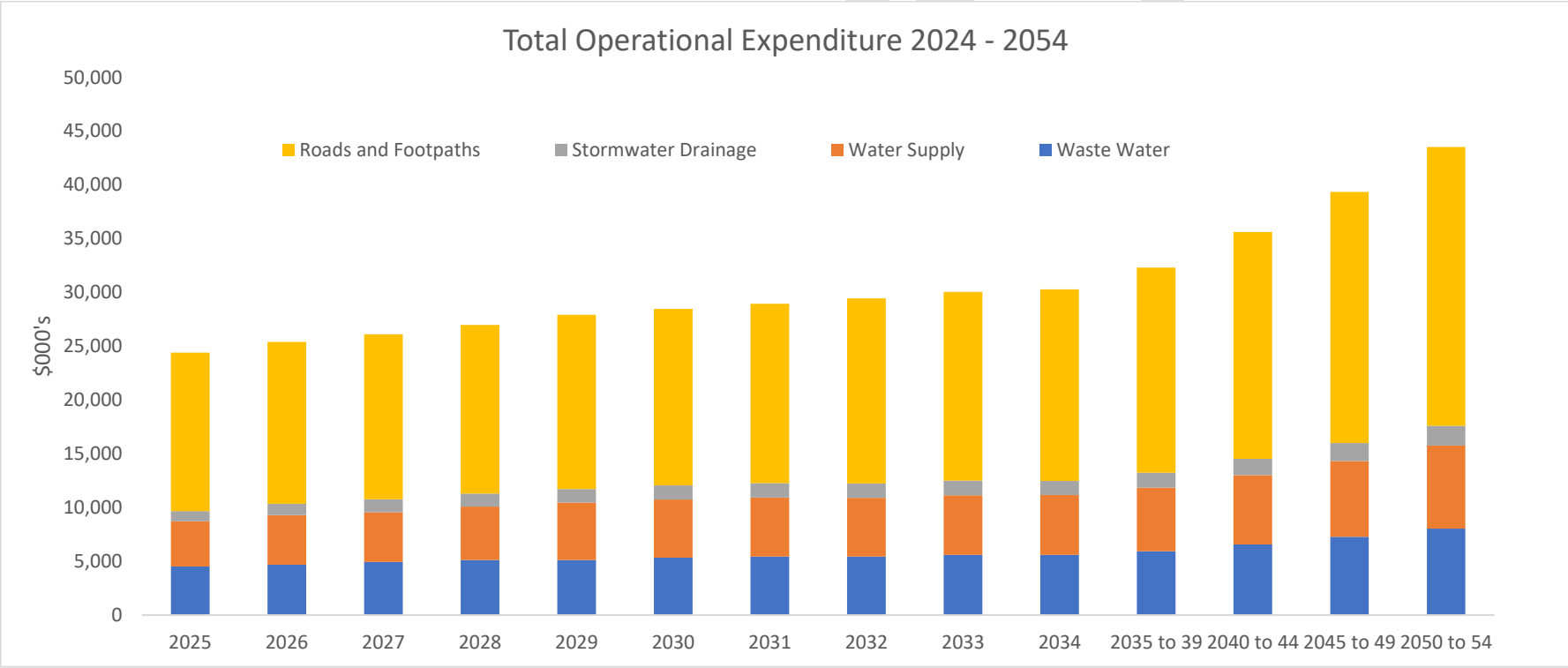


Figure 19: Operating Expenditure 2024 - 2054

CAPITAL EXPENDITURE FORECASTS

Capital Expenditure Forecasts	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Wastewater	493	595	677	1,252	415	546	635	408	490	413	2,207	537	535	601
Water Supply	5,399	5,528	619	2,521	2,959	920	713	672	945	1,614	1,710	1,154	1,028	1,176
Stormwater	1,788	1,785	1,942	1,699	1,745	628	655	677	682	684	417	469	597	592
Roads & Footpaths	8,418	7,826	8,320	7,549	7,663	8,058	8,022	10,269	9,340	8,212	10,313	12,086	13,224	14,126
Total	**16,098**	**15,734**	**11,558**	**13,021**	**12,782**	**10,152**	**10,025**	**12,026**	**11,457**	**10,923**	**14,647**	**14,246**	**15,384**	**16,495**

Table 27 – Infrastructure Capital Expenditure (Renewals and Improvements) Forecasts 2024- 2054

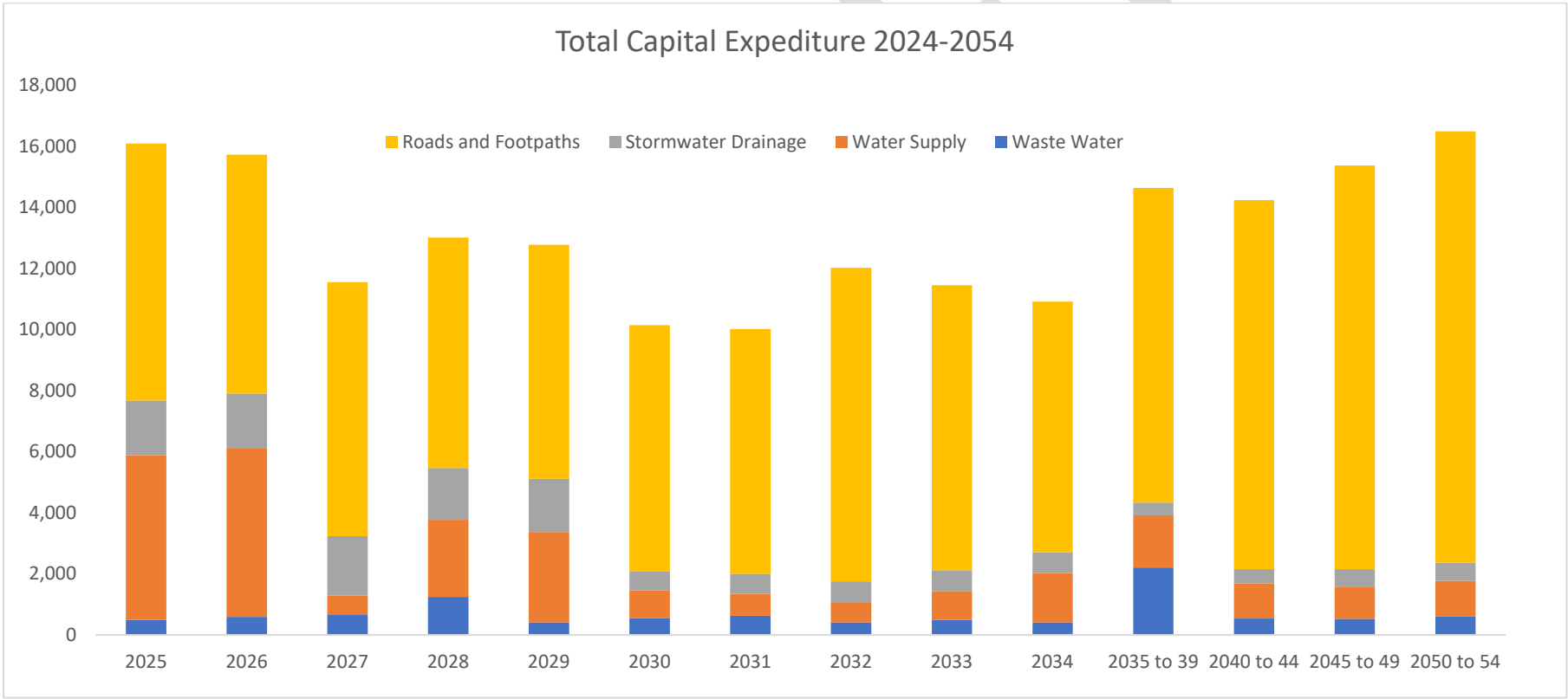


Figure 20: Capital Expenditure Forecasts 2024-2054

The forecast capital expenditure profile, as indicated by Table 27 above, is relatively static over the life of the Infrastructure Strategy with an emphasis on asset renewal. This is further demonstrated in the series of graphs below that show that spread of renewal and minor improvement capital works (by activity type) over the life of the strategy. The graphs use estimates shown on an annual basis for the first 10 years, followed by annual average expenditure for the next 20 years in 5 year blocks.

Wastewater Capex

Capital expenditure on WDC's wastewater schemes trends upwards over the next four years, with significant spend in capital works at the Te Kuiti wastewater treatment plant during the 30 year planning period. That involves relining of the reactor and augmentation of the existing clarifier.

Additional resilience of the Piopio wastewater treatment plant has also been allowed in 2060 at a preliminary estimated cost of $2M. The project involves relocating the WWTP to a more elevated site to protect against inundation during a 100-year rainstorm event.

Wastewater	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Improvements LOS	0	0	0	0	0	0	162	0	0	0	124	0	0	0
Renewals	493	595	677	1,252	415	546	472	408	490	413	2,083	537	535	601
Total	**493**	**595**	**677**	**1,252**	**415**	**546**	**634**	**408**	**490**	**413**	**2,207**	**537**	**535**	**601**

Table 48: Wastewater Capital Expenditure 2024– 2054

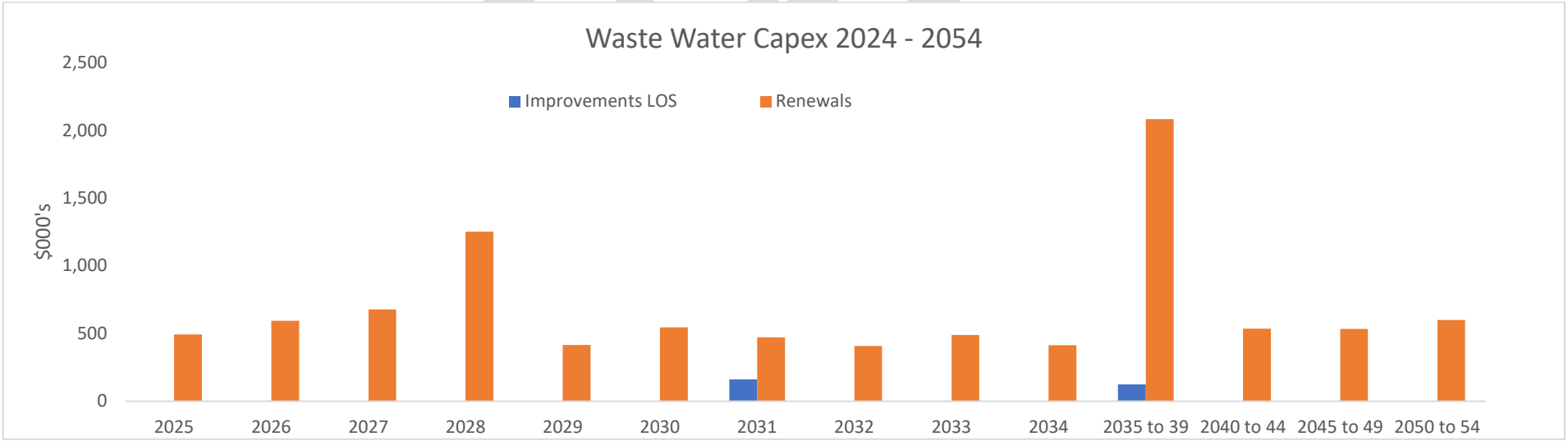


Figure 11: Wastewater Capital Expenditure 2024 -2054

Water Supply Capex

The water supply improvements are dominated by the resilience project for Te Kuiti. scheme, at a preliminary cost estimate of $9M, over the period 2024-2026. This project will provide a dedicated rising main and includes the refurbishment of the reservoir tanks.

Water Supply	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Improvements LOS	4,773	4,842	148	1,884	1,442	165	168	174	286	1,082	799	309	298	334
Renewals	626	686	472	636	1,517	755	545	498	660	531	911	845	731	842
Total	**5,399**	**5,528**	**620**	**2,520**	**2,959**	**920**	**713**	**672**	**946**	**1,613**	**1,710**	**1,154**	**1,029**	**1,176**

Table 59: WDC Water Supply Capital Expenditure 2024 – 2054

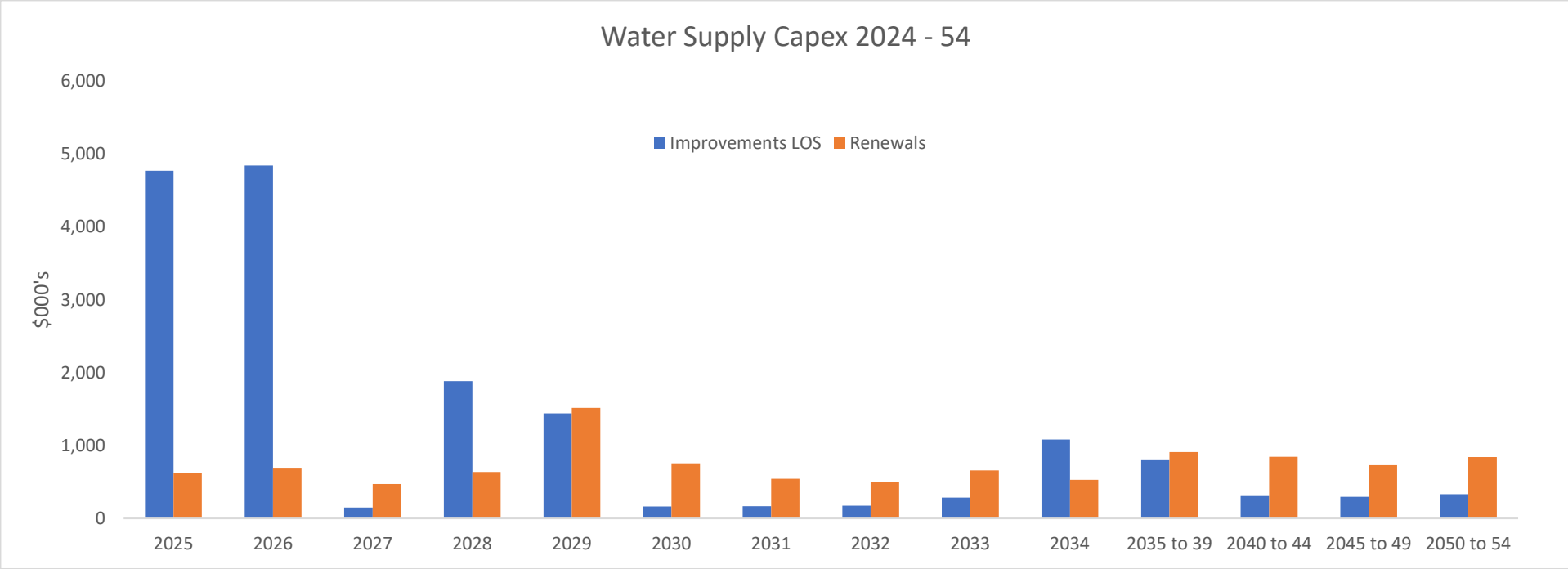


Figure 22: Water Supply Capital Expenditure

Stormwater Capex

The stormwater capital expenditure profile is dominated by the investment in years 1 to 5 . This requires 1.24M per year over the next 5 years to implement short, medium, and long-term stormwater improvement plans and actions. Investment will then return to a baseline renewal programme.

Stormwater	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Improvements LOS	1,240	1,271	1,306	1,339	1,373	272	278	284	290	296	0	0	0	0
Renewals	548	514	637	360	372	356	378	393	392	389	417	469	597	592
Total	**1,788**	**1,785**	**1,943**	**1,699**	**1,745**	**628**	**656**	**677**	**682**	**685**	**417**	**469**	**597**	**592**

Table 30: WDC Stormwater Capital Expenditure 2021 – 51

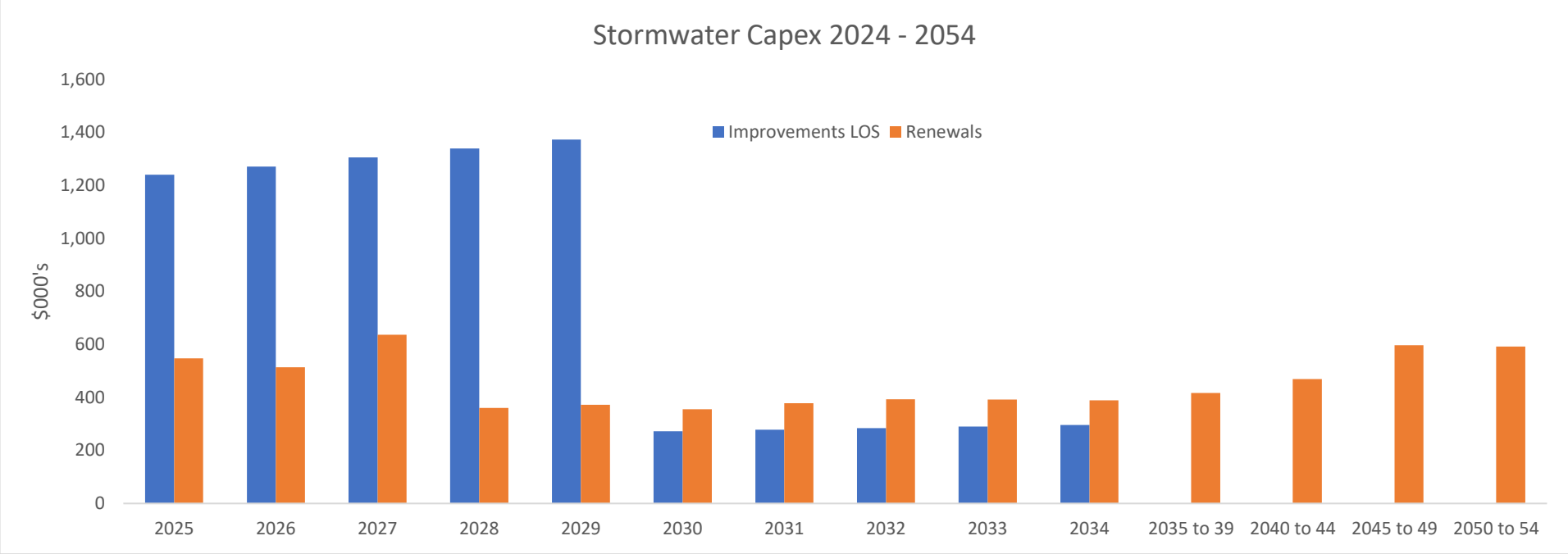


Figure 23: Stormwater Capital Expenditure 2024 - 2054

Roads and Footpaths Capex

The roads and footpaths capital programme is dominated by renewals over new works and reflects a modest reduction to reseals and rehabilitation works to a sustainable level.

Roads and Footpaths	Year 1 $000's	Year 2 $000's	Year 3 $000's	Year 4 $000's	Year 5 $000's	Year 6 $000's	Year 7 $000's	Year 8 $000's	Year 9 $000's	Year 10 $000's	Years 11 to 15 Average $000's	Years 16 to 20 Average $000's	Years 21 to 25 Average $000's	Years 26 to 30 Average $000's
Improvements LOS	416	471	525	551	563	575	586	598	610	621	661	733	813	901
Renewals	8,001	7,356	7,794	6,998	7,100	7,483	7,436	9,671	8,730	7,591	9,652	11,353	12,411	13,225
Total	**8,417**	**7,827**	**8,319**	**7,549**	**7,663**	**8,058**	**8,022**	**10,269**	**9,340**	**8,212**	**10,313**	**12,086**	**13,224**	**14,126**

Table 316: Roads and Footpaths Capital Expenditure 2024 – 2054

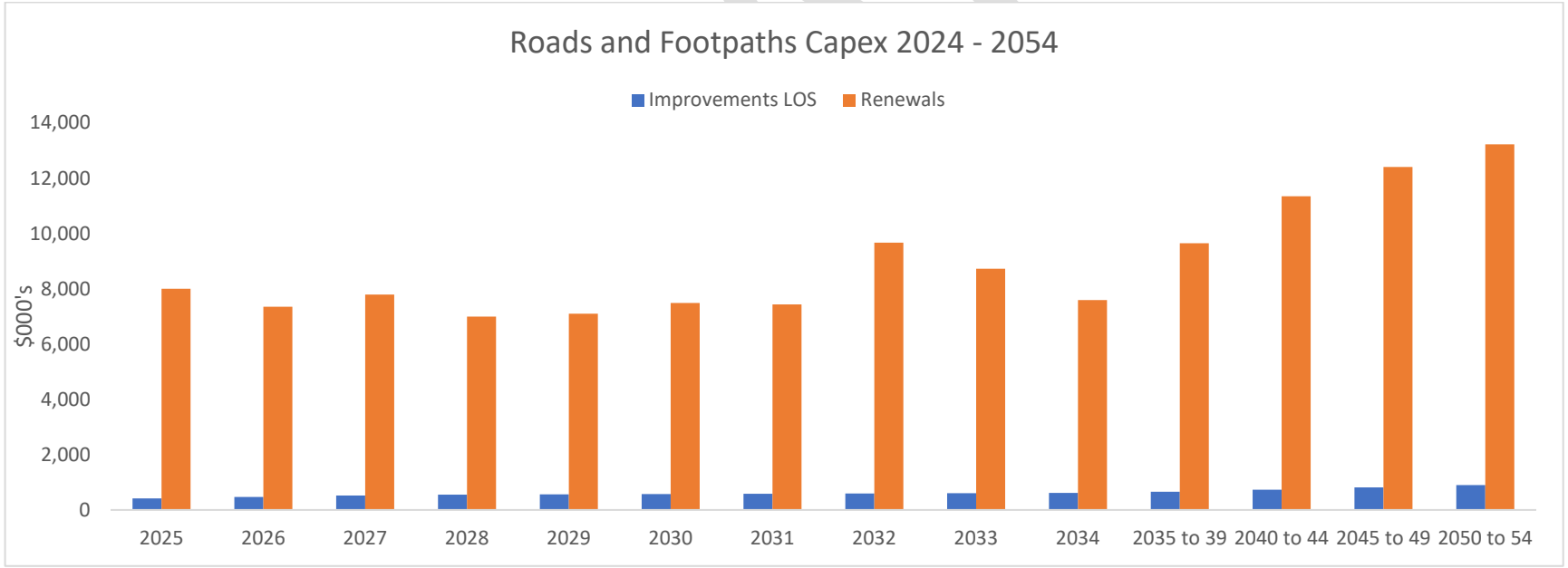


Figure 24: Roads and Footpaths capital expenditure 2024 - 2054

RELIABILITY OF ASSET CONDITION DATA

Asset condition data is one of several factors impacting on the accuracy of WDC's financial forecasts for its network infrastructure. Other factors relevant to forecasting maintenance and replacement programmes for asset components include data regarding the type of asset, the material it is made from, its size (e.g., larger pipe diameters tend to have longer effective lives than smaller pipe diameters, for the same type of material), its age, and categorisation/location (e.g., road pavements exposed to heavy traffic will have shorter lives than low traffic volume roads).

Taken together, the above factors are used to assess the remaining useful lives for each asset component, and from that, the forecast financial programmes for each activity. As part of that, an assessment is made of the accuracy of the data, expressed as a confidence grade, summarised below:

Confidence Grade	Label	Description
A	Accurate	Data based on reliable documentation
B	Minor inaccuracies	Data based on some supporting documentation
C	Significant data estimated	Data based on local knowledge
D	All data estimated	Data based on a best estimate of an experienced person

Table 32 – Data Confidence Grades

The results of the above assessment process are summarised in the table below:

Activity	Confidence Grade				
	Asset Type	Physical properties	Categorisation	Age	Condition
Wastewater	B	B-	B	B	C+
Water Supply	B	B-	B	B	C+
Urban Stormwater Drainage	B	C+	B	B	B
Roads and Footpaths	A	A	A	B	A-

Table 33 – Data Confidence Assessment

The above confidence gradings are factored in the respective financial forecasts, overlaid with local knowledge of operational performance.

Looking ahead, future asset management improvement programmes reflect the areas where more effort is required to improve knowledge of asset condition. Where more recent asset data suggests different condition ratings from that earlier assumed, adjustments are made to financial forecasts through the three-yearly review of the long term plan.

SPECIFIC ASSUMPTIONS

Whilst the LTP 2024-2034 provides for global planning assumptions, there are a number of detailed assumptions specifically relevant to the Infrastructure Strategy which are detailed below.

Table 34 – Infrastructure Strategy Assumptions

Assumption	Level of Uncertainty	Potential Effects of Uncertainty
Construction Costs No major changes relative to current cost structure.	Low - medium	Budgets are reassessed each year for the Annual Plan process to mitigate this risk. BERL inflation factors applied to the LTP also incorporate an element of price changes in different activity sectors.
Maintenance and Operational Costs These are largely based on historical rates and assume similar contract rates throughout the planning period for 3 waters. Roading includes increases relating to indicated cost increases from recent tendered contracts.	Medium	BERL inflation factors have been applied to the programmes and budgets in the LTP. Budgets for successive years of the Annual Plan will be based on the corresponding year of the LTP.
NZ Transport Agency Subsidies Subsidy rates will continue at current level of 75%. New government is making significant changes to budgets.	Low - medium	Reduced subsidy would impact on local affordability of WDC's contribution to road asset maintenance and renewals required to maintain current levels of service.
Depreciation Average asset lives at a project level for new works have been used to calculate depreciation.	Medium	Actual rate of asset depreciation is condition based and more accurately described as decline in service potential. Depreciation funding may be over or understated.
Vested Assets On average the same level of assets are gifted to the council as a result of subdivision as has occurred over the last 5 years	Low	Rate of sub divisional activity is low. Financial provision for increased lifecycle costs has been allowed for.
The vesting/transfer of Waitomo Village water and wastewater assets to WDC ownership will not occur during the 2024-2054 planning period	Low	The potential for a possible pathway forward for transfer of the Village water supply and wastewater infrastructure to WDC's future ownership and management is unlikely, this may be considered through the Regional CCO pathway.
Service Potential Service potential of the asset is maintained by the renewal programme.	Pipe networks – Medium.	

Assumption	Level of Uncertainty	Potential Effects of Uncertainty
	Roading & Footpaths – Low	There is medium risk that the service potential of the pipe network assets will not be maintained by implementation of the renewal programme since the latter is not based on reliable asset condition information.
Asset Lives Assumed lives for Council's assets will have minimum impact on financial estimates.	Pipe networks – Medium. Roads & Footpaths - Low	The risk that pipe network asset lives are inaccurate is medium. Lives are based on generally accepted industry values, modified by local knowledge and condition assessment. The condition of large sections of pipe networks has yet to be confirmed. The potential effect is that, for the unconfirmed pipe sections, the effective lives of pipe assets might be overstated, with a consequential impact on depreciation funding and the respective renewals programme.
Natural Disasters That there are no major natural disasters requiring additional funding for reinstatement of assets.	Medium - high	There is medium to high risk of a natural disaster occurring during the 30-year period requiring additional funds to repair or reinstate assets. Some provision for increasing the resilience of the assets has been built into this strategy but there is still further work to be undertaken to determine the desired level of resilience and the further asset improvements required to achieve this.
Climate Change The impacts of climate change will be minimal over the planning period.	Medium	The likely effects of climate change on the region have been documented. The extent to which these will impact on WDC's network infrastructure will be better understood over time and the strategy adapted accordingly.
Council Policy No significant change to Council policy that impacts on assets and services.	Low	Any significant change will require a full review of the Infrastructure Strategy and implications identified at the time.
Growth or Decline in Demand No significant change in demand.	Low	Potential changes in demand are not expected to be significant over the period due to the population growth demand being meet by asset improvements and demand management.
Changes to Levels of Service Except where specifically identified, changes to levels of service are minor.	Wastewater, water and stormwater assets – Medium to high.	Levels of service increases due to increased regulatory requirements introduced by a potential new Infrastructure Regulator for 3 waters have been accommodated in the strategy on a minimal basis however this will need to be reviewed as further information come though. Uncertainty regarding new levels of service in future resource consents is low for WDC's wastewater schemes because of the recent consent renewal processes.
	Roading assets – medium.	NZTA's current nation-wide move towards a common roading classification (One Network Framework – ONF), and review of the associated customer levels of service, could result in a

Assumption	Level of Uncertainty	Potential Effects of Uncertainty
		change to the level of funding received from NZTA over time. Prescribed levels of service and in turn the required level of investment will be monitored over time.