



# **Infrastructure Strategy**

**Long Term Plan 2015-2025**

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## **1.0 Purpose**

1.1 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.

This IS addresses the above purpose by outlining how WDC intends to manage its assets for the 30 year period 2015-2045, in the following four groups of activities:

Water Supply

Sewerage and Treatment and Disposal of Sewage (Wastewater)

Stormwater and

Roads and Footpaths

The key issues impacting on future management of WDC's infrastructure assets have been highlighted in this IS 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.

For the first 10 years of the planning period (2015-25), this strategy represents a culmination of the planning underpinning WDC's corresponding activity management plans (AMPs).

## **2.0 Strategic Context**

### **2.1 Formation of Waitomo District Council**

The Borough of Te Kuiti was constituted in 1910. In 1922 the Awakino County was amalgamated with a newly created Waitomo County Council (in an area of the then Otorohanga County) to form a new separate local authority. Part of the Kawhia County was included with Waitomo County in 1956 while the balance of the former Kawhia County was incorporated with the neighbouring Otorohanga County. The Te Kuiti Borough and Waitomo County Councils were amalgamated to form the Waitomo District Council on 1 April 1976, and although minor changes to boundaries occurred with the 1989 re-organisation, the District remains largely unchanged today. The present Waitomo District Council (WDC) was reconstituted on 1st November 1989.

### **2.2 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 Otorohanga 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 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.

## **2.3 Population Projections**

The population in Waitomo District has declined over the past three decades from around 10,500 in 1986 to 8,907 in 2013, an annual decrease of -0.5%, although there have been some period of growth in between the 30 year period. A comparison between the 2006 and 2013 census show that the annual usually resident population decline has been more significant over 2006-2013 at -0.8%.

Not all of the census areas within the Waitomo district, however, showed a decline in previous years. Between the 2001 and 2006 census 5 out of 8 census units showed an increase or no change. However, this dropped off between 2006 and 2013, when only 2 areas, Taharoa and Waipa Valley, showed an increase in population.

For estimated future population in the Waitomo District the IS uses population projections that have been carried out at territorial authority level for the Waikato region by the National Institute of Demographic and Economic Analysis, University of Waikato (NIDEA). These projections have been used for planning across all aspects of the 2015-25 Long Term Plan (LTP).

The NIDEA projections show a continuing trend of declining population for Waitomo District with a projected population of 8,743 in 2025 (medium projection and median stochastic). These projections follow the recent trend in the District's population reasonably closely, with annualised population decline over the period 2013-2025 of 0.5% per year (base year projection is different to actual). Further decline is projected by NIDEA with the district's population reducing to 7,239 by 2048.

The population trends show that there is no demand for growth related infrastructure at the present time or in the near future. There is currently enough capacity in the infrastructure network to allow for nominal growth should it occur in an area.

## **2.4 Infrastructure Context**

Council's strategy in the last 7-8 years, for core infrastructure assets, particularly in the Water Supply and Wastewater activity areas, has been to focus on improving their condition, where this has been essential, in order to support public health outcomes and to achieve good environmental outcomes (as required by its Resource Consent and other legislative requirements); whilst at the same time taking a prudent approach to financial management.

The demographic trend supports the Council's decision to adopt an approach which continues to involve upgrades and maintenance of its existing infrastructure network as opposed to the development of new capacity driven infrastructure.

In the period since 2007-08, WDC has invested approximately \$57 million on various capital projects in the four groups of activities covered by this IS.

Some of the key projects (within the four infrastructure activities) completed in this period are:

- Construction of raw water storage dam at Mokau
- Disinfection upgrades completed for Mokau and Benneydale water supplies
- Te Kuiti Wastewater Treatment Plant re-build
- Piopio sewerage system
- Critical renewal work to Stormwater system (Ngati Street, George Street and Duke Street)
- 4000 linear metres of Stormwater reticulation system cleaned and surveyed
- Construction of the Transfer Station located at Waitomo District Landfill
- Commencement of development of an additional cell at landfill site
- Three Rora Street Upgrades
- Structural metal placed on 42 kms of unsealed roads

Whilst a projected decline in population is of concern in terms of affordability, there is little or perhaps no scope to scale back Council's involvement in the provision of core infrastructure as historic and future investment is aligned to complying with minimum environmental and public health standards.

In short, the projected reduction in population and static development is forecast to have minimal or no impact on Council's service delivery over time in terms of core infrastructure. The trend does however highlight the need for a focus on managing core infrastructure in a manner that ensures compliance with minimum standards and early identification of future investment needs so that all options can be carefully considered.

### **3.0 Strategic Approach to Managing Infrastructure Assets**

Council takes a strategic approach to managing its infrastructural assets and has planned that such assets must, at a minimum, be able to deliver existing service levels for the foreseeable future. This approach means that decisions around operation and maintenance, renewal and upgrade, demand and growth, service levels etc are taken in the context of optimising overall asset lifecycle costs and the provision of service in perpetuity.

#### **3.1 Asset Renewal**

Asset renewal is a key driver in respect of all Council's Infrastructural Assets within this IS, as the majority of Council's significant infrastructure has been upgraded in recent years. Council's approach in the IS is largely based on the need for informed and consistent asset renewal over time, especially for reticulation assets.

Asset renewal profiles (particularly for the three water assets) are based on theoretical useful lives, material type, length, age etc. A strictly clinical approach to developing asset renewal programmes results in projections for renewal funding fluctuating year to year as assets reach the end of their useful lives and need replacing. This long term IS takes into account sound engineering judgment, actual asset condition, the optimization of lifecycle costs and community affordability to ensure that renewal programs are prioritized according to in-situ asset condition and failure history over theoretical asset lives. This approach results in a financial provision for asset renewal that is not only considered consistent, appropriate and affordable but that can be applied according to sound asset information as it improves over time.

#### **3.2 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

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 marginal and where large seasonal variations in population occur. With the exception of addressing specific capacity (storage) issues it is expected that any additional demand concerns over the life of this strategy will be addressed through the reduction in usage (either voluntarily or through regulation) in the first instance. Options for demand management are however considered to have limited practical relevance for the Waitomo District.

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.

### **3.3 Levels of Service**

Levels of service in both a current and a future sense are largely dominated by regulatory and technical considerations. Generally service levels have been improved in recent times in alignment with those considerations and are expected to be maintained over the strategy period. Customer service levels are more discretionary and are considered in the context of the current planning assumptions which project a static or declining population.

### **3.4 Public Health and Environmental Outcomes**

As with service levels Public Health and Environmental Outcomes are largely dominated by National and Regional regulatory considerations. Recent upgrades of Infrastructural Assets have been 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 National and Regional Standards wherever possible. This also means ensuring that all infrastructural assets operate with current resource consents at all times.

### **3.5 Risk and Resilience**

The main natural hazards potentially impacting on WDC's infrastructure assets include earthquake, flooding and the effects of climate change. Critical assets are those having the highest consequence of failure. The strategy identifies mitigation actions including risk assessments, establishing the required level of resilience, programme implementation of identified risks to increase the resilience of critical assets to the required level.

In general a pragmatic approach is taken to risk management in individual Asset Management Plans, identified risk events are 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 not providing services which impact on the organisation or individuals, e.g. power supply failures, material supply failures.
- Physical failure risks, where condition, performance of the asset or third part damage could lead to failure.
- Operational risks, where maintenance and or management of the asset or asset management activities may impact adversely on the asset.

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.

Of the overall risk management framework, critical assets are defined as those that must continue to operate to an acceptable level to avoid damage to community well-being that would occur if any one of the key components listed below was to fail.

## 4.0 Significant Infrastructure Issues for Waitomo District

This strategy relates to WDC's Wastewater, Water supply, Stormwater drainage and Roads and Footpaths infrastructure assets. The tables on the following pages summarise the significant 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 is capable of addressing several infrastructure issues.

Flood protection and control works in Waitomo District are the responsibility of Waikato Regional Council and therefore do not form part of WDC's IS.

### 4.1 WDC Wastewater Schemes

WDC owns and manages four separate wastewater schemes in the district, at Te Kuiti, Piopio, Benneydale, and Te Waitere. The largest of these is at Te Kuiti. With the exception of Te Waitere, all schemes have been upgraded over the past six years and re-consented. The Piopio Scheme is new, commissioned in 2012. The consent for Te Waitere expires in September 2017.

Scheme	Consent expiry date
Te Kuiti	2040
Piopio	30 June 2028
Benneydale	1 May 2025
Te Waitere	30 September 2017

#### 4.1.1 Te Kuiti Wastewater Scheme

Issue	Description	Principal options for response	Implications
Asset Renewal or Replacements	High infiltration rates entering pipe network indicate poor asset condition.	Condition assessment of pipe network followed by prioritised repair and renewal programme	The financial impacts of deferred maintenance and renewals have been balanced against levels of service, consent compliance and ratepayer affordability.
Risk and Resilience	Wastewater service continuity and community health is threatened by 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 flexible pipe materials.	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

Issue	Description	Principal options for response	Implications
			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.

#### 4.1.2 Benneydale Wastewater Scheme

Issue	Description	Principal options for response	Implications
Risk and Resilience	Wastewater service continuity and community health is threatened by 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.	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.

#### 4.1.3 Te Waitere Wastewater Scheme

Issue	Description	Principal options for response	Implications
Asset Renewal or Replacements	The scheme involves collection of septic tank effluent through a piped system which is then pumped to a community soakage field. The rising main from terminal pumping station was recently renewed. The community soakage field is showing signs of failure.	Replacement or refurbishment of the soakage field with an expanded facility is required when resource consent is renewed.	An amount of \$16,000 has been allowed in the LTP for rehabilitating or upgrading the soakage field.
Response to Demand	While the population projection for Te Waitere is for static growth, the wastewater discharge from the current population already take up the full capacity of the existing soakage field	Replacement or refurbishment of the soakage field with an upgraded and extended facility with capacity for modest additional demand	While there are no growth related implications for the Te Waitere wastewater scheme, current demand already take up full existing capacity.
Levels of Service	Levels of service focus on reliability of service, capacity, public health and	Environmental and public health protection will probably need to be	Current levels of service relating to system capacity and environmental

Issue	Description	Principal options for response	Implications
	environmental protection.	enhanced consequent to the imminent resource consent renewal process in 2017.	protection will probably need to be enhanced early in the strategy period.
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.	Environmental and public health protection will probably need to be enhanced consequent to the imminent resource consent renewal process in 2017.
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 high and the consequences are significant in the context of the imminent consent renewal process.

#### 4.1.4 Waitomo Village Wastewater Scheme

The wastewater infrastructure at Waitomo Village is privately owned and operated. WDC is currently in discussion with representatives of the Village Trust and private owners of this infrastructure with the potential for WDC to acquire an interest. The potential and a possible pathway forward for transfer of the Village wastewater infrastructure to WDC's future ownership and management is unknown at the present time, due to land tenure issues.

Given the level of uncertainty around the timing of resolution of these issues, this IS does not provide for any financial forecasts for these assets. However, Appendix 1 of this IS contains information with regard to the possible upgrade costs associated with this scheme, based on some investigation work that has been carried in the past.

#### 4.1.5 Mokau

No wastewater scheme currently exists in Mokau, however the development of this IS has identified that sometime in the future, it may be necessary to consider the treatment and reticulation of wastewater in Mokau/Awakino due to increasing public health and environmental pressures. Council intends to keep a watching brief on this aspect over the next few years to ascertain if it will require intervention over time.

## 4.2 WDC Water Supply Schemes

WDC owns and manages four water supply schemes, at Te Kuiti, Piopio, Benneydale and Mokau. The largest supply is at Te Kuiti. Higher levels of service driven by the Public Health (Drinking Water) Amendment Act and security of supply are two key issues impacting on all schemes. Consents to take water are critical to maintaining adequate, all year, supply quantities for domestic and commercial/industrial use. The following table summarises current consent expiry dates:

Scheme	Key Consent Expiry Dates
Te Kuiti	31 January 2015 (renewal process to be complete by June 2015)
Piopio	1 August 2023
Benneydale	7 April 2031
Mokau	September 2026

### 4.2.1 Te Kuiti Water Supply Scheme

Issue	Description	Principal options for response	Implications
Asset Renewal or Replacements	Large parts of reticulation near the end of its useful life. Increasing incidence of mains failure, leaks, etc	Accelerated mains replacement programme based on actual pipe condition.	Replacement programme of \$90,000 per year over the next 10 years.
		A reduced replacement programme extending over a longer period would result in reduced levels of service and increase in maintenance cost due to increased mains failure, loss of water and supply interruptions	Not replacing the pipes leaves them vulnerable to breakage 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
Levels of Service	Levels of service for colour, taste and odour are not met 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 is a higher priority over taste and odour issues.	Upgrade of treatment plant to include a flow proportional, carbon dosing system to remove "taste" from source water.	The costs of additional treatment to improve the taste and odour characteristics of the supply are included in the proposed, 4-stage, upgrade programme.
Public Health & Environment	The Te Kuiti supply does not fully meet NZ Drinking Water Standards for protection against potentially pathogenic giardia and protozoa.	Implement 4-stage upgrade of treatment plant sterilisation, raw water intake, clarification, and additional storage.	Stage 1 and 2 – 2015/16: \$5.41m. Stage 3 – 2016/17: \$1.2 m. Stage 4 – 2026-2030: \$1.23 m.

Issue	Description	Principal options for response	Implications
	The current take represents near 25 % of stream flow during low flow conditions, with associated impacts on in-stream habitats.		Total: \$7.83 M (un-inflated estimates).
Risk and Resilience Issues	<p>Raw water storage is identified as a potential risk should the effects of climate change become more prominent.</p> <p>The four water storage reservoirs are critical assets, each approximately 40-years old. Resilience of these reservoirs to a major seismic event is key to the integrity of the supply.</p>	<p>Investigate options for raw water storage.</p> <p>Assess seismic strength of reservoirs</p>	<ul style="list-style-type: none"> <li>Estimated cost of investigations has been included in forecasts.</li> <li>Outcome of investigations need to be awaited to show how critical the matter is and what options are available to Council.</li> <li>Strengthening the treated water reservoirs is critical to the resilience of the water supply.</li> </ul>

#### 4.2.2 Piopio Water Supply Scheme

Issue	Description	Principal options for response	Implications
Asset Renewal or Replacements	Large parts of the reticulation is nearing the end of its useful life. The renewal profile suggests a longer residual life than is 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.	Regular continued annual replacement programme over the next 30 years.
		A reduced replacement programme extending over a longer period would result in reduced levels of service due to increased mains failure, loss of water and supply interruptions with associated higher maintenance cost	An extended renewal programme would result in reduced levels of service due to increased mains failure, loss of water pressure and potential loss of supply.
Public Health & Environment	The absence of back-flow preventers is a potential health risk for Piopio water supply consumers.	Provision for back-flow prevention.	The estimated cost of a back-flow prevention programme is \$5,130 per year for the next 10 years.
Risk and Resilience Issues	In Piopio the water treatment plant, reservoir and reticulation are at risk of damage from a major seismic event	<p>Assess seismic strength of reservoirs.</p> <p>Using 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</p>	Provision for increased resilience of the Piopio water supply reticulation has been built into LTP replacement programmes. Further measures will be dependent on investigations into the resilience of current infrastructure.

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

#### 4.2.3 Benneydale Water Supply Scheme

Issue	Description	Principal options for response	Implications
Risk and Resilience Issues	The Benneydale water treatment plant, reservoir and reticulation are at risk of damage from a major seismic event	Assess seismic strength of reservoir and treatment plant.	Further measures will be dependent on investigations into resilience of the current infrastructure.

#### 4.2.4 Mokau Water Supply Scheme

Issue	Description	Principal options for response	Implications
Asset renewal or Replacements	Most of the Mokau water supply reticulation is nearing the end of its useful life. The majority of the network comprises asbestos pipes. The renewal profile suggests a longer residual life, based on a nominal pipe life of 70 years, than is evident from actual operational experience. This is indicative of poor pipe condition.	Accelerated mains replacement programme based on actual pipe condition, using modern pipe materials with flexible joints.	Replacement programme of \$47,000 per year (on average) over the next 30 years.
		A reduced replacement programme extending over a longer period.	An extended 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 increase in maintenance cost.
Risk and Resilience Issues	Asbestos water mains are vulnerable to breakage or complete severance in the event of earthquakes or other ground movement.	Replace 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.
	Sufficient water storage is required to secure the water supply during drought conditions.	Increased raw water storage will be completed during 2015/16.	The risk of water shortage during drought conditions will be reduced.

#### 4.2.5 Waitomo Village Water Supply

The Water Supply infrastructure at Waitomo Village is privately owned and operated. WDC is currently in discussion with representatives of the Village Trust and private owners of this infrastructure with the potential for WDC to acquire an interest. The potential and a possible pathway forward for transfer of the Village Water Supply

infrastructure to WDC’s future ownership and management is unknown at the present time, due to land tenure issues.

Given the level of uncertainty around the timing of resolution of these issues, this IS does not provide for any financial forecasts for these assets. However, Appendix 1 of this IS contains information with regard to the possible upgrade costs associated with this Supply, based on some investigation work that has been carried in the past.

### 4.3 Stormwater Drainage

WDC’s stormwater infrastructure comprises two components. The primary component consists of 31km of stormwater pipes, open drains and discharge structures in urban areas, predominantly Te Kuiti. The secondary component consists of overland flow paths, including the roading network. The multiple Te Kuiti Stormwater discharges are consented through a district wide comprehensive consent. The consent expires in July 2024.

Issue	Description	Principal options for response	Implications
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. Large section of pipe network in Te Kuiti is partially silted up.	Implement stormwater pipe condition assessment programme. Undertake renewals on a prioritised basis	Continued stormwater renewal programme of \$100k per year
Risk and Resilience Issues	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.	Identification and protection of secondary flow paths through catchment management plans. Repair and replacements of damaged stormwater pipes.	Failure to complete this work will increase the risk of flooding and damage to property.

## 4.4 Roads and Footpaths

WDC's road and footpath infrastructure assets comprise 1,014km of roads of which approximately 459km are sealed and 555 are unsealed. In addition, there are 159 bridges including large culvert structures, and 50 km of footpaths.

Associated assets include pavements, small culverts, kerb and channel, carparking, road signage, retaining structures, and street lighting.

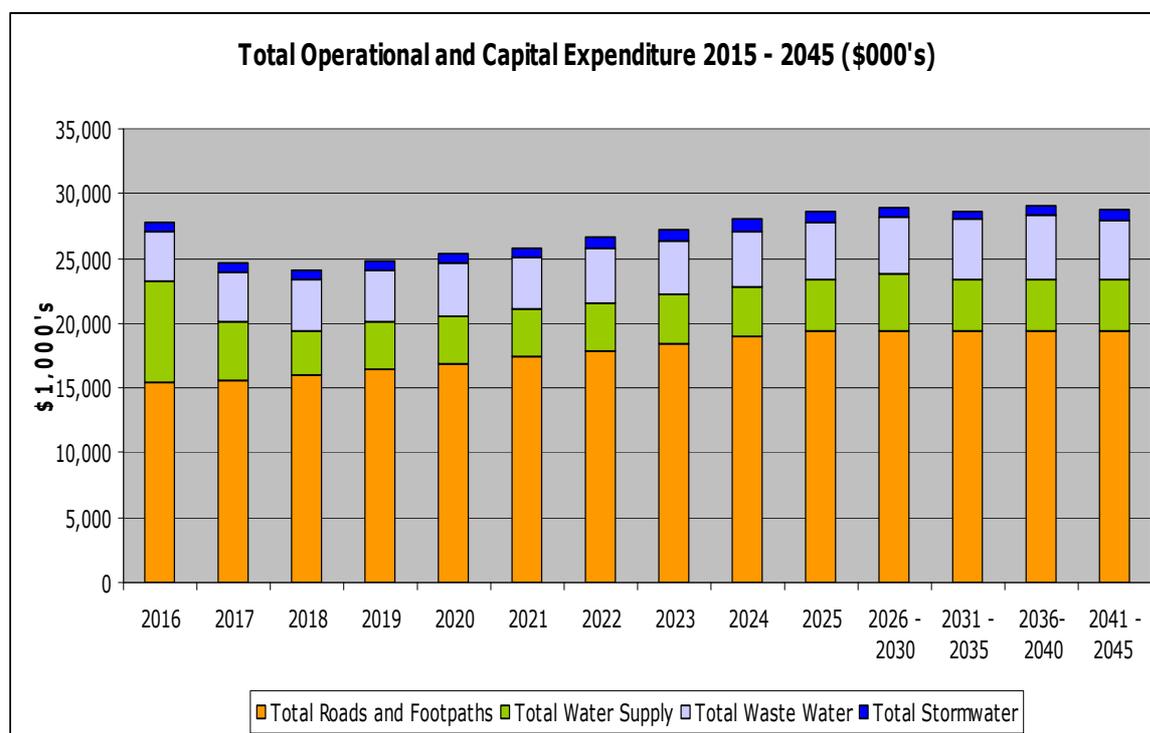
Issue	Description	Principal options for response	Implications
Asset Renewal or Replacements	Bridge stock is in generally good condition. There are 31 bridges identified for renewal in next 30 year period with present value of \$9 million. 30 of those bridges falls in the 2016 - 2045 period	Monitor bridge condition and programme renewal of structural components.	With the present maintenance regime the probability of this risk occurring is considered to be low, with the severity of the consequences being moderate
Levels of Service	Levels of service include road safety, reliability and accessibility, responsiveness and smoothness of ride.	Widening of narrow, unsealed rural roads to a minimum carriageway width of 5.0m has been identified as an aspirational goal. No other changes to current levels of service are proposed.	Any widening of narrow unsealed roads will be managed within the existing funding. Current levels of service will be maintained through the strategy period.
Risk and Resilience	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 and structural assessments completed every 5 years. Alternative routes are maintained for Collector roads	Current risk mitigation will be maintained through the strategy period.

*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.*

## 5.0 Infrastructure Investment Programme - The Most Likely Scenario

### 5.1 Total Expenditure

In addressing the issues identified in the previous sections of this strategy, the Waitomo District Council expects to spend \$258 million on new or replacement infrastructure between 2015 and 2045. Over the same period, \$582 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.



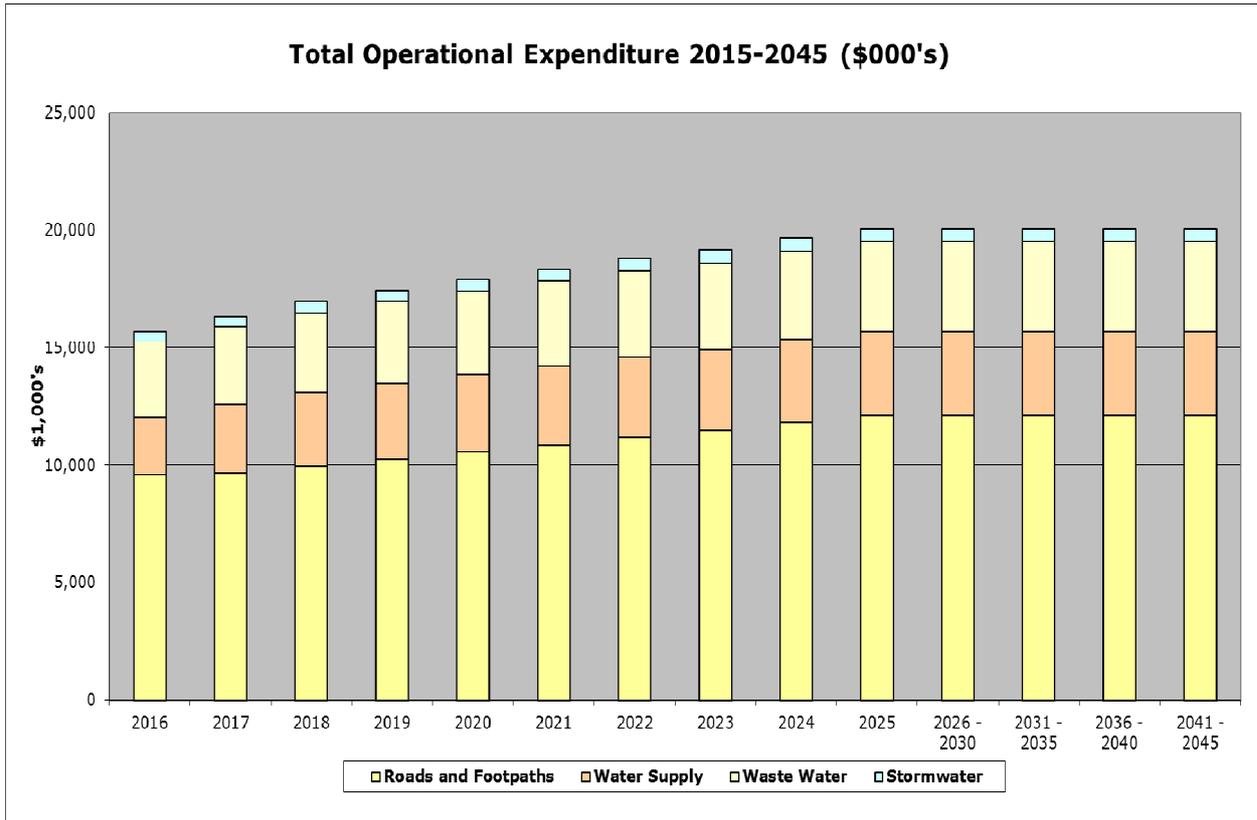
Infrastructure Activity	Capital Expenditure (new and replacements)	Operational Expenditure
Wastewater	20,458,000	112,680,000
Water	19,296,000	103,745,000
Stormwater Drainage	6,684,000	16,095,000
Roading and Footpaths	211,840,000	349,571,000
<b>Total</b>	<b>\$258,278,000</b>	<b>\$582,091,000</b>

The table above shows that expenditure across the four infrastructure activity areas will continue to be dominated by operational requirements (operating costs, labour, depreciation, materials and maintenance) between 2015 and 2045.

The tables below show the indicative estimates of operational and capital expenditure up to 2045, 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:

## 5.2 Operating Expenditure Forecasts

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-30	2031-35	2036-40	2041-45
Wastewater	3,243	3,287	3,401	3,499	3,576	3,617	3,677	3,694	3,752	3,854	19,270	19,270	19,270	19,270
Water Supply	2,424	2,931	3,160	3,216	3,279	3,351	3,400	3,465	3,528	3,571	17,855	17,855	17,855	17,855
Stormwater	421	440	472	471	490	504	554	556	574	553	2765	2765	2765	2765
Roading & Footpaths	9,602	9,675	9,930	10,260	10,572	10,867	11,190	11,464	11,827	12,104	60,520	60,520	60,520	60,520
<b>Total</b>	<b>15,690</b>	<b>16,333</b>	<b>16,963</b>	<b>17,446</b>	<b>17,917</b>	<b>18,339</b>	<b>18,821</b>	<b>19,179</b>	<b>19,681</b>	<b>20,082</b>	<b>100,410</b>	<b>100,410</b>	<b>100,410</b>	<b>100,410</b>



As can be seen from the graph Operating and Maintenance<sup>1</sup> costs are forecast to be relatively static over the life of the Infrastructure Strategy given the existing planning assumptions. The only significant exception to this trend is forecast expenditure for water supply as a result of the upgrade to the Te kuiti Water Treatment Plant in the first three years of the Strategy. Capital expenditure on the Te Kuiti Water Treatment plant has a resulting impact on Forecast Operating and Maintenance costs due to increased interest and depreciation.

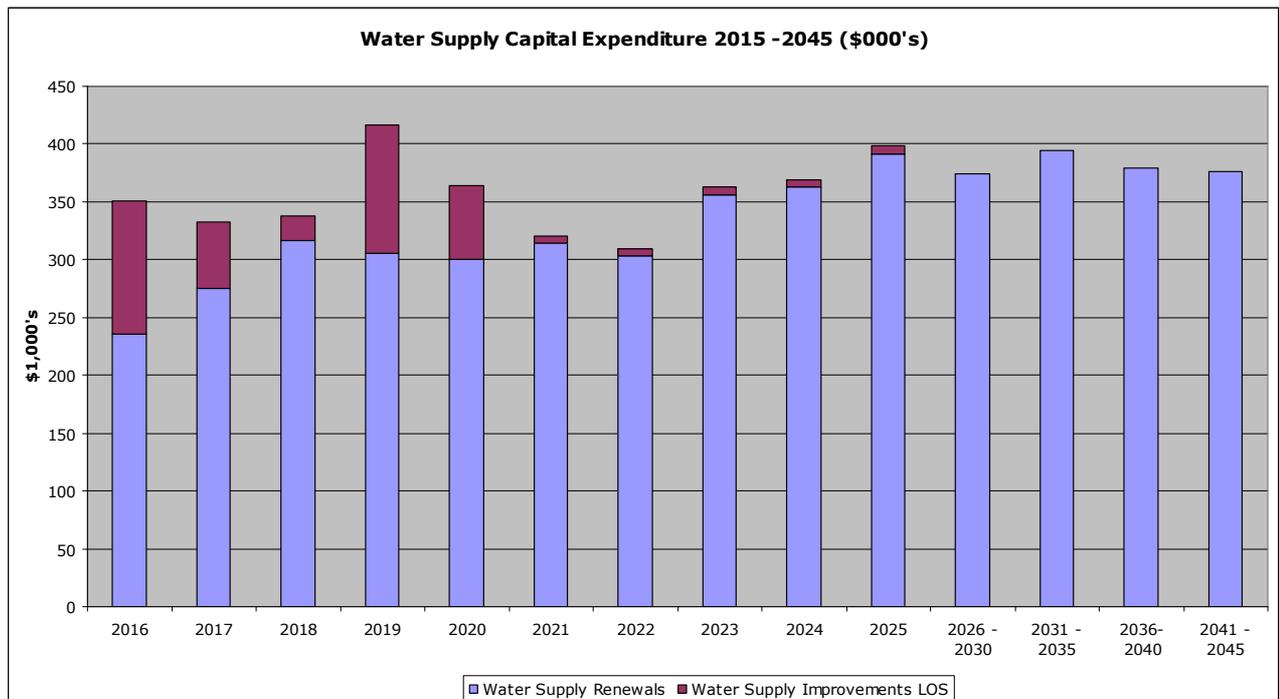
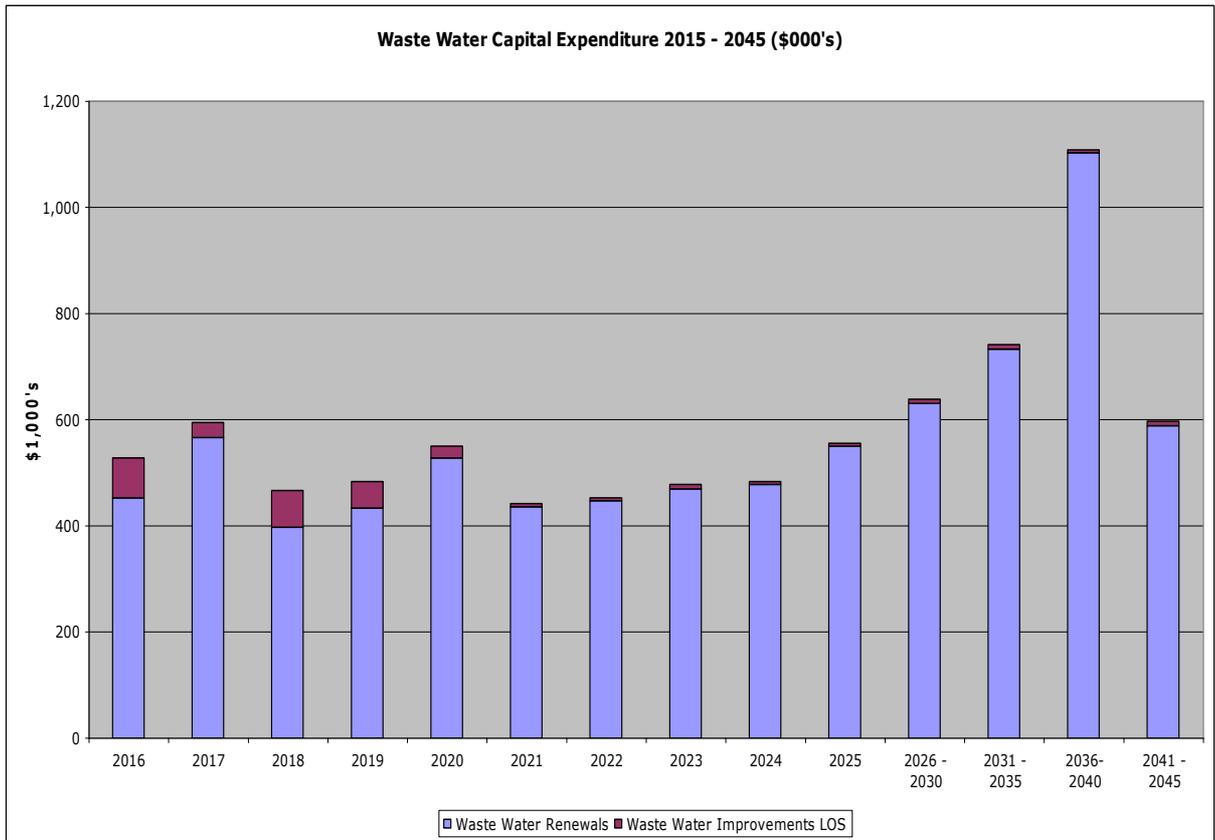
<sup>1</sup> This graph uses estimates shown on an annual basis for the first 10 years, followed by annual average expenditure for the next 20 years in 5 year blocks.

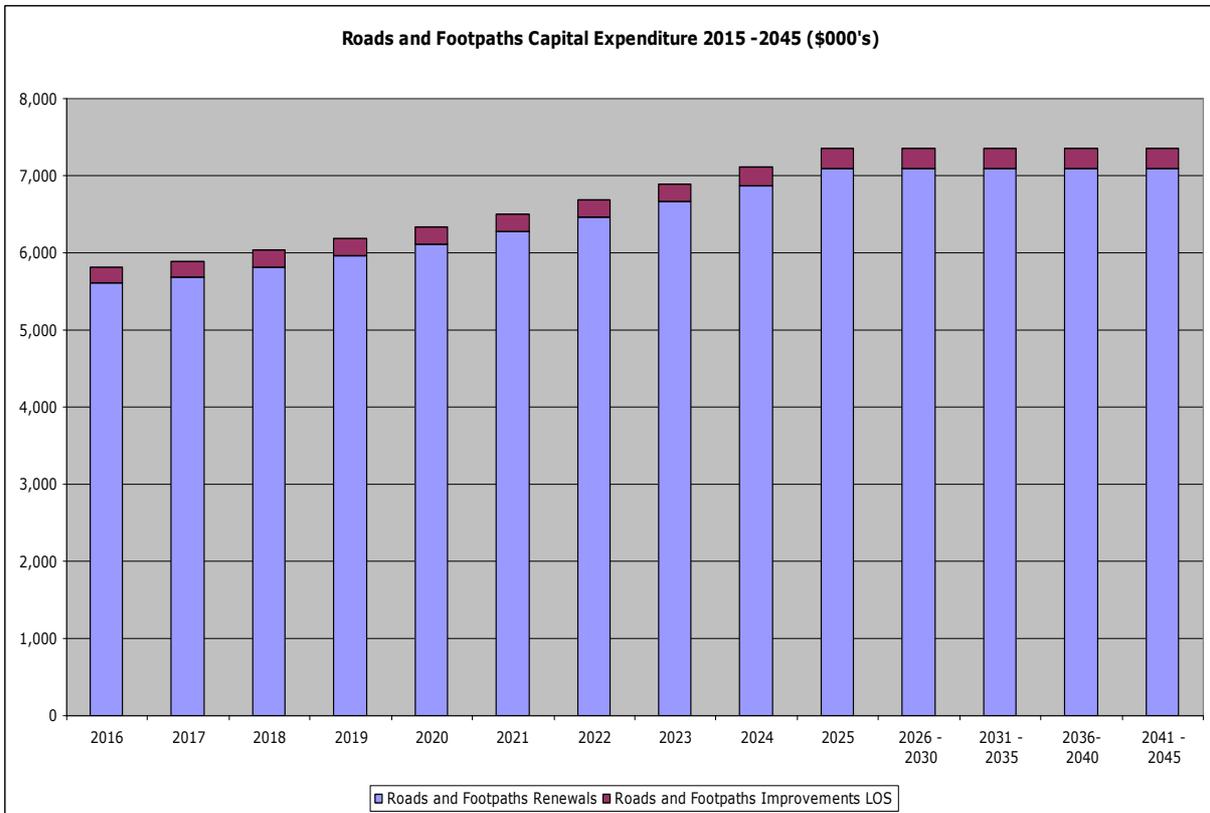
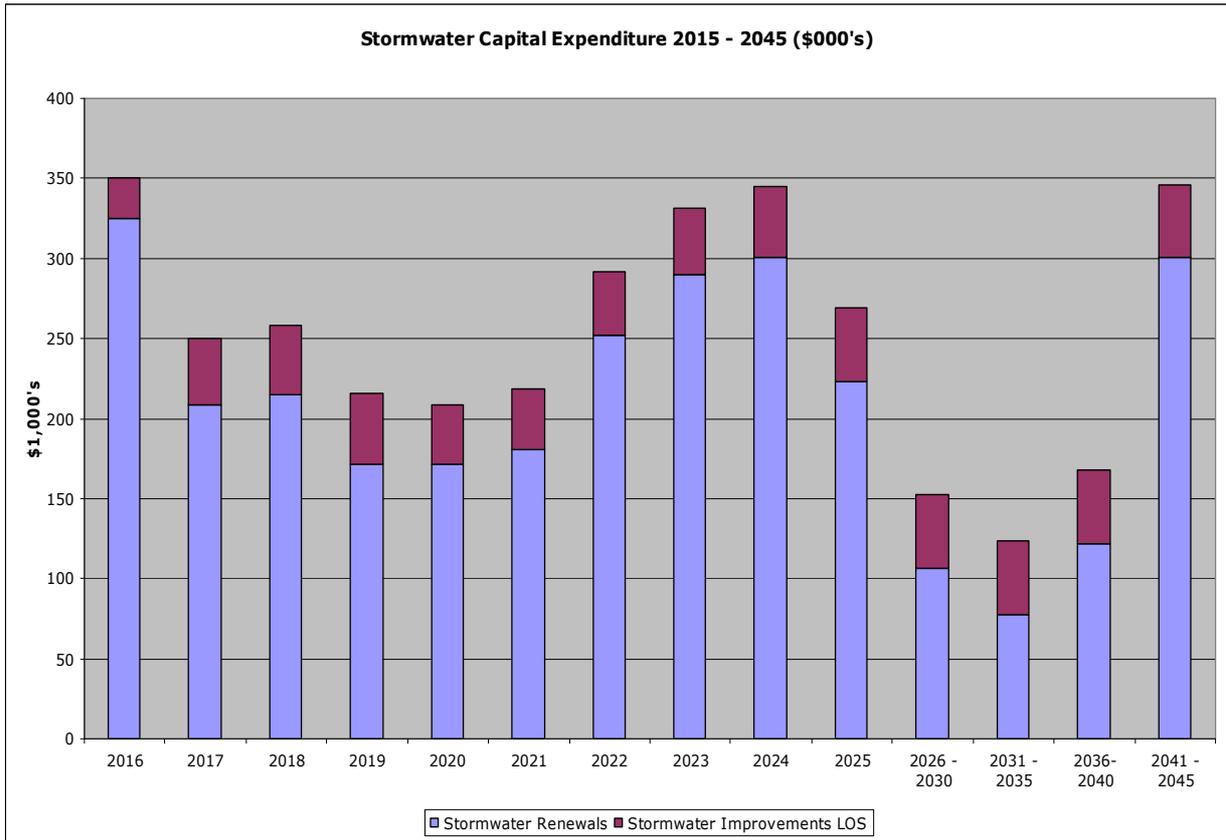
## 5.2 Capital Expenditure Forecasts

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-30	2031-35	2036-40	2041-2045
Wastewater	529	593	466	483	550	442	453	476	484	556	3,144	3,716	5,566	3,000
Water Supply	5,431	1,626	338	417	364	321	310	363	369	399	3,610	1,970	1,898	1,880
Stormwater	350	250	258	216	209	219	292	332	345	269	761	615	838	1,730
Roading and Footpaths	5,815	5,897	6,031	6,176	6,333	6,508	6,694	6,897	7,118	7,351	36,755	36,755	36,755	36,755
<b>Total Forecast Capital Expenditure</b>	<b>12,125</b>	<b>8,366</b>	<b>7,093</b>	<b>7,292</b>	<b>7,456</b>	<b>7,490</b>	<b>7,749</b>	<b>8,068</b>	<b>8,316</b>	<b>8,575</b>	<b>44,270</b>	<b>43,056</b>	<b>45,057</b>	<b>43,365</b>

The forecast capital expenditure profile, as indicated by the above table, is relatively static over the life of the Infrastructure Strategy with a focus on asset renewal, particularly after the planned upgrade of the Te Kuiti Water Treatment Plant over 2015 – 2017 period.

Future investment considerations include the moving of the raw water intake for Te Kuiti and the construction of a raw water storage dam for the same supply area. Financial provision has been made for further investigation in to the need for a raw water storage dam in this most likely scenario in years 2018 and 2019. This is further demonstrated by 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.





## 6.0 Infrastructure Strategy – Specific Assumptions

Whilst the preliminary Long Term Plan provides for global planning assumptions there a number of detailed assumptions specifically relevant to the Infrastructure Strategy which are detailed below.

Assumption	Level of Uncertainty	Potential Effects of Uncertainty
<b>Construction costs</b> No major changes relative to current cost structure.	Low	It is possible that the price of some components will change relative to others. 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.
<b>Maintenance and operational costs</b> These are largely based on historical rates and assume similar contract rates throughout the planning period.	Low	No inflation factors have been applied. BERL inflation factors will be applied to the programmes and budgets in the LTP. Budgets for successive years of the Annual Plan are based on the corresponding year of the LTP.
<b>NZ Transport Agency subsidies</b> Subsidies will remain at amended levels	Medium	Reduced subsidy will impact on local affordability of WDC's contribution to road asset maintenance and renewals required to maintain current levels of service.
<b>Depreciation</b> 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.
<b>Vested Assets</b> 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 and static. Financial provision for increased lifecycle costs has been allowed for.
The potential vesting/transfer of Waitomo Village water and wastewater assets to WDC ownership will not have a substantial associated costs	High	The additional costs of upgrading the Waitomo Village water and wastewater infrastructure assets to mandatory and sustainable levels of service have been investigated. However, the potential costs associated with any transfer could have a material effect. Council will have to weigh up the cost/benefits once the details become clearer through the process being undertaken currently.
<b>Service Potential</b> Service potential of the asset is maintained by the renewal programme.	Pipe networks – Medium 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.
<b>Asset Lives</b> Asset lives are accurately stated.	Pipe networks – Low to 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.

<b>Assumption</b>	<b>Level of Uncertainty</b>	<b>Potential Effects of Uncertainty</b>
<b>Natural Disasters</b> That there are no major natural disasters requiring additional funding for reinstatement of assets.	Medium	There is medium risk of a natural disaster occurring during the 30-year period requiring additional funds to repair or reinstate assets. Some further provision for increasing the resilience of the assets has been built into this plan but there is still further work to be undertaken to determine the desired level of resilience and the further asset improvements to achieve this.
<b>Council Policy</b> 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.
<b>Growth or Decline in Demand</b> No significant change in demand.	Low	Potential changes in demand are not expected to change significantly over the period due to the static population growth projection.
<b>Changes to levels of service</b> Except where specifically identified, changes to levels of service are minor.	Wastewater, water and stormwater assets – Low.	Levels of service due to increased regulatory requirements for drinking water and waste water discharges have been accommodated in the strategy. Uncertainty regarding new levels of service in future resource consents is low for WDC's wastewater schemes (excluding Te Waitere) because of the recent consent renewal processes. Uncertainty regarding technical levels of service for Te Waitere wastewater is medium due to current capacity issues and imminent consent renewal process in September 2017. Changes to technical levels of service for the Te Kuiti water supply take are expected due to the consent renewal process in January 2015.
	Roading assets – medium.	NZTA's current nation-wide move towards a common roading classification, and review of the associated customer levels of service, could result in a 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.

## Appendix 1: Waitomo Village Water and Wastewater

While an outcome from these discussions is some way off, and no financial provision has been made for managing these assets within the IS or the 2015-25 LTP financial forecasts, an indication of the likely issues has been made in anticipation that a decision will be reached within the term of this strategy.

### Wastewater Scheme

Issue	Description	Principal options for response	Implications
Asset Renewal or Replacements	Reticulation system is substandard and at end of its economic life. Reticulation and treatment ponds are located on multiple, private properties.	Complete replacement of the reticulation and major upgrade of the treatment ponds, is required. Land use agreements will be necessary.	<ul style="list-style-type: none"> <li>Estimated cost of plant upgrade/renewal is \$578,000. Reticulation renewal is \$450,000</li> <li>Estimated cost of future development of reticulation is \$210,000</li> </ul>
Response to Demand	The current wastewater infrastructure is a constraint to future development of the village. There is no spare capacity for growth.	As above, sized for realistic growth in tourism activities, noting that most of the demand is from high numbers of visitors to the tourism attractions	Implications of future demand are included in asset renewal and public health/environment considerations.
Levels of Service	Levels of service focus on reliability of service, capacity, public health and environmental protection.	Minimum levels of service required include environmental and public health protection consequent to the imminent resource consent renewal process in 2015.	Current levels of service relating to system capacity and environmental protection will need to be enhanced.
Public Health and Environment	The discharge from the treatment ponds often does not comply with current consent conditions. Sludge from the ponds is stored in bags on nearby private land. There is no apparent plan for its safe disposal. The current discharge consent expires in 15 April 2015.	Replace existing treatment ponds with an upgraded treatment plant to meet future environmental standards and sized for future growth.	<ul style="list-style-type: none"> <li>Estimated cost of consent renewal is \$100,000</li> <li>Estimated cost of replacing and upgrading the treatment ponds with a modern wastewater treatment plant is \$578,000.</li> </ul>
Risk and Resilience	Resilience to natural hazards is unknown but unlikely to be adequate. Lateral displacement failure of treatment pond embankments and adjacent stream banks in a major seismic event is a potential issue.	Assess treatment plant for resilience to a major earthquake.	Additional investment would be required to achieve an adequate level of resilience to natural disasters appropriate to the iconic status of the Village tourism attractions.

## Water Supply

Issue	Description	Principal options for response	Implications
Asset renewal or Replacements	The water reticulation is in relatively poor condition with high levels of deferred maintenance and renewals.	Replacement of water mains	<ul style="list-style-type: none"> <li>Indicative cost of \$540,000 in years</li> <li>Future development of mains \$227,000</li> </ul>
Response to Demand	The current water supply infrastructure is a constraint to future development of the village. There is no spare capacity for growth.	Sizing the capacity of the water supply appropriate to current and realistic growth in tourism activities, noting that most of the demand is from high numbers of visitors to the tourism attractions	Implications of future demand are included in asset renewal and public health/environment considerations.
Levels of Service	Current levels of service are unknown or very low/ad hoc.	Levels of service would increase to a minimum of secure supply, continuous supply, responsive service and compliance with NZ Drinking water Standards.	Current levels of service relating to security of supply and public health protection would be enhanced.
Public Health & Environment	The water supply does not comply with NZ Drinking Water Standards	Major renewal or replacement of the water treatment plant is required.	Estimated cost of \$1.0M
Risk and Resilience Issues	Resilience to natural hazards unknown but unlikely to be adequate. Resilience to a water borne health outbreak is low.	Assess reservoirs and treatment plant for resilience to a major earthquake.	Additional investment would be required to achieve an adequate level of resilience to natural disasters appropriate to the iconic status of the Village tourism attractions.