Waikato Regional Council

Infrastructure Strategy
2018 -2067

Flood protection and land drainage assets
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Executive summary

Waikato Regional Council ("Council") manages flood protection and land drainage assets across the region that are essential in managing risks to communities associated with natural hazards, enabling and protecting economic productivity and contributing to community well-being.

The assets and the schemes they make up have been developed over the last 80 years and primarily consist of stopbanks, pumpstations and floodgates, across eight management zones and have a replacement value of $580 million. The assets are supplemented by a range of land drainage assets.

This Infrastructure Strategy outlines Council’s approach to managing and maintaining these assets over the next 50 years, which is crucial to support the Council Mission of “working together to build a Waikato region that has a healthy environment, a strong economy and vibrant communities”.

Council’s approach to infrastructure management is guided by the following overarching principles:

- Decisions are aligned with Council’s strategic direction and priorities
- Maintaining established infrastructure and levels of service
- Collecting and maintaining best possible data and information
- Appropriate replacement of existing infrastructure (renewals)
- Taking account of climate and morphological change
- Responding to the demands for new capital
- Service sustainability

In regard to the management of Council’s flood protection and land drainage assets, the following issues have been identified:

- Ageing of assets and impact on levels of service
- Increasing environmental and regulatory performance expectations
- Climate change
- Risk of natural disasters
- Economic conditions and affordability
- Growth and development
- Business continuity

Council’s preferred approach for addressing these issues is presented as well as discussion relating to alternative strategies and actions that were considered. The preferred approach is generally based around continuance of present asset management practice and policy, while looking for opportunities for targeted improvements.

Council’s forecast expenditure in relation to the management of flood protection and land drainage assets over the next 50 years is forecast to be $1,121 million, split as follows:

- Capital expenditure: $268 million
  - $260 million on renewals
  - $7.9 million on new capital
- Operational expenditure: $853 million
  - Includes ongoing operating, maintenance and labour costs and depreciation.
For the first ten years, confirmed works programmes and project estimates are the dominant influence on the forecast expenditure associated with asset renewals. Beyond the ten year horizon, the combination of current asset values (determined through asset revaluation\(^1\)) and remaining asset lives are used to estimate longer term renewal forecasts out to 50 years in the future. There will be an ongoing requirement to make decisions on renewals expenditure on a cyclical basis as part of the processes associated with Council’s LTP.

This 50 Year Infrastructure Strategy needs also to be considered in the context of other council documents and processes including Financial Strategy, 2018 Long Term Plan, council’s Asset Management Policy and zone/asset plans.

This 50 Year Infrastructure Strategy is to be adopted as part of Council’s 2018 Long-Term Plan.

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\(^1\) Current asset values updated in December 2016
1 Purpose of the Infrastructure Strategy

Waikato Regional Council ("Council") manages flood protection and land drainage assets across the region with a replacement value of $580 million. The assets provide services to the region that are essential in managing risks associated with natural hazards, enabling economic productivity and providing for community well being. It is important that these assets are managed in a way that ensures that the required outcomes and level of service are delivered in the most cost effective manner to present and future generations.

The purpose of the Infrastructure Strategy is to:

- Identify significant infrastructure issues for Council over the next 50 years
- Consider and assess potential management options
- Identify a preferred way to manage these issues
- Outline the associated service and financial implications of managing these issues
- Provide the regional community with visibility and understanding of the issues and the long term investment needs associated with the provision of the flood protection and control assets over that timeframe.

1.1 Scope

This strategy has been prepared for the flood protection and control works infrastructure as required under Local Government Act 101B 6 (a) (iv). It covers the following infrastructural assets:

- Flood protection schemes
- River management where there is a relationship to flood protection assets
- Land drainage schemes
- Catchment management assets owned by council

In preparing this strategy non-asset solutions to address significant infrastructure issues have also been identified and discussed where appropriate.

1.2 Statutory requirements

In August 2014 the Local Government Act (LGA) 2002 Amendment Act 2014 introduced a new requirement for infrastructure strategies and asset management planning. The Act includes provisions that require councils to prepare an Infrastructure Strategy for at least a 30 year period, and to incorporate this into Long-Term Plans from 2015.

In complying with the Act, Council has outlined how it intends to manage its infrastructure assets, taking into account the need to:

- renew or replace existing assets
- respond to growth or decline in the 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 the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks.

The legislative requirements for Infrastructure Strategies are set out in Appendix A.
1.3 Updates from the 2014 Strategy

This strategy is Council’s second Infrastructure Strategy and it builds on the earlier iteration. The updates have been made to incorporate elements of best practice in the Local Government sector identified through various reviews and reflect the fact that infrastructure management and the evolution of this strategy is ongoing.

The main updates from the first strategy include:

- Incorporating appropriate recommendations and learnings from Audit NZ’s report “Asset management and long-term planning: Learnings from audit findings 2015 to 2017”
- Incorporating appropriate recommendations and learnings from the Office of the Auditor General’s report “Matters arising from the 2015-25 local authority long term plans”
- Extending the time period from 30 years to 50 years to reflect the very long lives of the infrastructure assets that Council is responsible for
- Expansion of the significant infrastructure issues, particularly with regard to discussion of different potential options
- Further provision of forecast financial information
- Updates to asset and demographic data to reflect the most recent information available
- Minor structural changes to the overall strategy document.
2 Regional context

2.1 Geographic and historical context

The Waikato region is the fourth largest region in New Zealand. It stretches from the Bombay Hills and Port Waikato in the north to the Kaimai Ranges and Mt Ruapehu in the south, and from Mokau on the west coast across to the Coromandel Peninsula in the east.

The region has 11 territorial authorities, three of which lie across the regional boundary. The territorial authorities within the region are:

- Hamilton City Council
- Hauraki District Council
- Matamata-Piako District Council
- Otorohanga District Council
- Rotorua District Council
- South Waikato District Council
- Taupo District Council
- Thames/Coromandel District Council
- Waipa District Council
- Waitomo District Council
- Waikato District Council.

The Waikato region comprises of four primary catchments covering over 2.4 million hectares, with the Waikato River catchment divided into five separate subcatchments (or zones) for management purposes. The eight catchment zones in the region are listed below and shown in Figure 1:

- Lake Taupo (part of Waikato River catchment)
- Upper Waikato (part of Waikato River catchment)
- Waipa (part of Waikato River catchment)
- Central Waikato (part of Waikato River catchment)
- Lower Waikato (part of Waikato River catchment)
- Waihou Piako
- Coromandel
- West Coast.
Figure 1  Waikato region and subcatchments

<table>
<thead>
<tr>
<th>Catchment / Zone</th>
<th>Area (000ha)</th>
<th>%age of region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Taupo</td>
<td>350</td>
<td>14%</td>
</tr>
<tr>
<td>Upper Waikato</td>
<td>433</td>
<td>18%</td>
</tr>
<tr>
<td>Waipa</td>
<td>307</td>
<td>12%</td>
</tr>
<tr>
<td>Central Waikato</td>
<td>64</td>
<td>3%</td>
</tr>
<tr>
<td>Lower Waikato</td>
<td>291</td>
<td>12%</td>
</tr>
<tr>
<td>Waihou/Plako</td>
<td>395</td>
<td>16%</td>
</tr>
<tr>
<td>Coromandel</td>
<td>196</td>
<td>8%</td>
</tr>
<tr>
<td>West Coast</td>
<td>425</td>
<td>17%</td>
</tr>
</tbody>
</table>

River classification derived by NIWA/MFE.
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Council has developed infrastructure related schemes over the last 50 to 60 years for flood control and river management that:

- Reduce risks to communities from natural events
- Protect the economic productivity of the region
- Contribute to community well being

The infrastructure assets predominantly consist of stopbanks, pumpstations and floodgates and have a replacement value of $580 million. They have been built and managed over time to provide the required outcomes and levels of service for past, present and future generations. Council also has responsibility for dams and low voltage power lines across the region. Many of the low voltage power lines were transferred to Council from other territorial authorities, and Council is working to improve the understanding and management of these assets. Compared with the flood control and river management assets, the overall asset values of dams and low voltage power lines are relatively low.

Of the eight catchment zones, the assets in the Waihou Piako catchment are the oldest, being established in the 1960s and 1970s. The assets in the Coromandel catchment are the newest, with those assets being developed in the early 2000s. The early schemes (those developed between 1960 and 1992) were largely funded by central government, which is different to current practice where the region is responsible for funding these protection scheme assets. Prior to the late 1990s, depreciation was not funded which has placed a higher burden on current (and future) ratepayers as many of the assets are now reaching the point where significant renewals are required.

While the schemes were implemented successively over time on a catchment by catchment basis, they now collectively provide extensive benefits to the region as a whole. These benefits include those to transportation and lifeline networks and well as contributing to the regional economy. It is for these reasons that the current funding model includes a regional rate component in addition to targeted rating (which reflects the direct beneficiaries). Council has undertaken to explore further whether the current funding policy fully reflects the range of benefits received from the protection schemes.

Table 1 provides an overview of the flood protection and river management assets that Council is responsible for.
### Table 1  Catchment asset summary

<table>
<thead>
<tr>
<th>Zone</th>
<th>Area (000 ha)</th>
<th>Average age (years)</th>
<th>Assets</th>
<th>Replacement value ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Taupo</td>
<td>350</td>
<td>15</td>
<td>7.4</td>
<td>$7.8</td>
</tr>
<tr>
<td>Upper Waikato</td>
<td>433</td>
<td>13</td>
<td>-</td>
<td>$0.3</td>
</tr>
<tr>
<td>Waipa</td>
<td>307</td>
<td>0 – 13</td>
<td>-</td>
<td>$1.1</td>
</tr>
<tr>
<td>Central Waikato</td>
<td>64</td>
<td>13</td>
<td>-</td>
<td>$0.04</td>
</tr>
<tr>
<td>Lower Waikato</td>
<td>291</td>
<td>45 – 65</td>
<td>250</td>
<td>$169.3</td>
</tr>
<tr>
<td>Waikou/Piako</td>
<td>395</td>
<td>25 - 60</td>
<td>351</td>
<td>$372.6</td>
</tr>
<tr>
<td>Coromandel</td>
<td>196</td>
<td>1 - 15</td>
<td>2.6</td>
<td>$2.9</td>
</tr>
<tr>
<td>West Coast</td>
<td>425</td>
<td>n/a</td>
<td>-</td>
<td>$-</td>
</tr>
<tr>
<td>All drainage assets</td>
<td>n/a</td>
<td>varies</td>
<td>12</td>
<td>$30.9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,462</strong></td>
<td>-</td>
<td>523</td>
<td><strong>$585</strong></td>
</tr>
</tbody>
</table>

**Key:**
- **S** Stopbanks (km)
- **P** Pumpstations (no.)
- **F** Floodgates (no.)
- **O** Other*

* Other refers to assets such as retaining, control and miscellaneous structures, fencing, drains, culverts, bridges, floodwalls and river training works.

### 2.2 Demographic context

The population of the Waikato Region is expected to continue to grow over the next 50 years as shown in Figure 2. Current forecasts suggest that the region will be home to nearly 600,000 people by 2060 which is a 40% increase on today’s population.
The majority of the regional population growth is forecast in Hamilton City (in the Central Waikato zone). The Lower Waikato Zone is also forecast to have considerable growth, with population expected to nearly double over the next 50 years. Modest growth or small declines are expected in the remaining zones, which are the more provincial areas of the region. The forecast population changes over the next 50 years, by catchment zone, are shown below in Figure 3.

In developing this strategy it is important to consider population projections as they can give insight into future challenges such as:

1) Where development pressures may be expected to accommodate population growth. This results in a need to liaise and collaborate with the relevant territorial authorities to ensure

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2 Based on University of Waikato medium growth projections
that growth is appropriately located and that infrastructure needs and pressures are understood in advance.

2) Declining populations have the potential to signal long term affordability issues. Understanding affordability and sustainability issues will support key decisions about infrastructure renewals.

Whilst population is an important consideration, the demand for and management of flood protection and river management assets is also driven by:

- Location of growth and land use – for example, growth outside flood prone areas is unlikely to drive additional infrastructure requirements. However, increasing urbanisation may have an impact on infrastructure requirements as increasing the amount of impervious surface within mature flood protection schemes may trigger the need for upgrades or improvements.
- Tourism and recreational use - ensuring that both visitors and the region’s communities continue to be able enjoy the mixture of environments that Waikato has to offer.
- Connections with other key infrastructure, such as transportation networks which are crucial to both the region and country as a whole.

All of these drivers have a relationship to flood protection and river management assets services.

2.3 Economic context

The Waikato region comprises the fourth largest regional economy in New Zealand, with the latest official estimates showing a gross regional product of approximately $20 billion in 20153. Agriculture, one of the main sectors that benefits from the services provided by the flood protection and land drainage assets, making up 14% of that total ($2.6 billion)3.

The services provided by the flood protection and land drainage schemes have a variety of quantifiable benefits which enables contribution to the region’s economy, including:

- Protection of land and property, which reduces associated potential damage and increases the value of the land
- Improving the productivity of land, which adds value to the regional economy
- Protection of regionally and nationally important infrastructure associated with activities such as transport (e.g. roads including state highways and rail) and electricity transmission
- Avoided costs from flood damage that would otherwise result if the schemes were not in place (or maintained to the necessary standard)

Schemes within the two major catchment zones of Lower Waikato and Waihou-Piako provide protection to land and property (which has a combine value of approximately $19 billion).

The value-added to the regional economy by land protected by the schemes in these two zones is estimated to be approximately $960 million ($190 million from the Lower Waikato scheme and $770 million from the Waihou-Piako scheme), based on current prices and value-added multipliers. This value added4 can be interpreted as the contribution of this land to regional GDP (gross domestic product) that is enabled through the provision of the infrastructure.

Since it is the flood protection and land drainage assets that enable that land to be utilised, the importance of these two schemes alone is clearly of significant benefit to the regional economy. To

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3 Statistics NZ. GDP by region (provisional).
4 The different methodologies used to determine regional GDP by Statistics NZ and the value-add by Council may mean the two figures are not directly comparable, and the value-add may be wider than agriculture only.
put it into context, the replacement value of these two schemes is $542 million – approximately half the contribution to the regional GDP that they enable from land productivity improvements alone.

The value of other infrastructure protection or avoided damages are not estimated at this time.

Previous studies have also identified a variety of benefits of flood protection and drainage in addition to the above, which could, in principle, be valued\(^5\). These include

- A more secure investment environment for land adjacent to the flood control area leading to increased intensification of that land
- The regional economic impact of changes in the sub-catchment
- Social benefits associated with peace of mind, recreation, reduced risk and security of access to schools and hospitals.

There are also a number of negative economic impacts that the assets and schemes cause that are not included in the overall economic context at this time. This includes issues such as the environmental impacts of the schemes. For example, main channel plantings and stability control represent benefits of management, but there are also environmental costs, such as the drainage of wetlands (which typically has high ecosystem service values)\(^6\) and the subsidence of peat soils (requiring increasing costs to pump) which offset the benefits provided.

It is intended that, over time, additional information will be incorporated to enable the inclusion of the wider benefits (and costs) of the services that flood protection and land drainage assets provide.

2.4 Environmental context

The increasing awareness of the interrelationships between land use and water quality is leading to changes in regulatory requirements and community expectations. Decisions relating to river management must now factor in societal elements over and above the basic purpose of providing safety and security to people and property from flooding.

Current trends are placing greater importance on the social, cultural, and environmental values of water resources. Evidenced by a number of new initiatives, notably co-management arrangements with Tangata Whenua and the National Policy Statement for Freshwater Management 2014. Despite this trend, the industry has not yet been able to agree and develop an environmental methodology for estimating the economic value associated with these changes. As a result, the costs and benefits have not been able to be captured in a consistent way, often leading to an effective funding shortfall and additional stress on existing assets.

The rising standard of environmental outcomes that society and the community expects is something that needs to be considered, especially with regard to the impact on the funding, depreciation and renewals of the river scheme assets. These changing requirements can mean increased expenditure is required, or asset lives are not fully utilised if upgrades are implemented before the assets would otherwise require investment.

As an example, one of the key components of the flood protection and control scheme are the pump stations. Many of these structures are many years old and consist of pumps that need replacing from time to time as part of the renewals programme. In recent times, there has been a move to replace these old pumps with newer technology that includes fish-friendly pumps to reduce the occurrence of fish loss as a result of pumping. These pumps are considerably more expensive than those that they are replacing, yet as the overall level of service related to flood protection (i.e.

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\(^5\) Mesiter and Quazi, 2001

\(^6\) For example, in 1999, the value of ecosystem services provided by wetlands was estimated to be approximately $40,000 per hectare (Patterson, M. and Cole, A., 1999, \textit{Estimation of Ecosystem Services in the Waikato Region}, Environment Waikato Internal Series 1999/02).
to people and property) being provided is unchanged, the works are classed as renewals. The fish-friendly pumps are providing enhanced regional biodiversity outcomes to meet community expectations and Council needs to consider the most appropriate way to fund this type of expenditure.

2.5 Regional infrastructure challenges

The assets involved in flood protection and land drainage have long lives and are important to both the region and the national economy. Associated with those assets are significant costs, particularly in terms of maintenance and renewals and there is a need to ensure that the future expenditure is affordable. This will ensure the future performance of the scheme is preserved and flood protection can continue to be provided. This presents a challenge for the region – ensuring that the required costs to maintain the infrastructure can be met.

The assets are primarily funded by targeted rates from those who directly benefit from or contribute to the need for them. This makes up approximately 75% - 80% of the funding with the remainder coming from overall general rates from across the region. The balance of direct beneficiary versus regional contribution is intended to reflect both the direct benefits that land owners are provided but also the wider community benefits and environmental improvements that are delivered. From time to time there will be a need to revisit this funding split in determining appropriate funding policy.

For most catchment zones, the value of the assets are relatively small and the issue is not considered to be significant, however as shown in Figure 4, the Lower Waikato and Waihou-Piako schemes have a considerable replacement value, for which the costs are largely borne by modest populations.

Figure 4 Catchment zone population and asset values

As discussed above, these two schemes enable a significant contribution to the regional economy, so while the population may be small, the value-added (on average) should mean that their rates contributions are affordable. Within the catchment zone, this is likely to be variable, for example properties on drained peat which will have considerably higher costs.
This issue of affordability is one that Council is aware of and is seeking to better understand over the long term, particularly in light of some of the significant issues that have been identified (refer Section 3). This includes issues such as rising sea levels associated with climate change, or further peat subsidence.

Balancing the need to fund the increasing costs of these assets alongside other calls on Council spending, with the need to bear overall rates affordability in mind, is a key challenge currently faced by the council. Ensuring that the funding of asset-related costs matches the period of benefit derived from the assets will continue to be important in managing the affordability of these services.

Another consideration is the national benefit that Council’s assets provide and enable. For example, the protection that is provided to state highways (particularly SH1) and the North Island Main Trunk enables both the regional and national movement of people and freight. As noted earlier, the initial investment in most of the schemes was made by central government, but ongoing costs are now borne by the region, and in particular the direct beneficiaries identified earlier (who are effectively subsidising those national beneficiaries). The wider range of beneficiaries are not necessarily accounted for or contributing at this time. This approach to funding is fairly simplistic and not consistent across all the infrastructure schemes. It is an area that Council is working on to improve equity and transparency.
3 Significant infrastructure issues over the next 50 years

This section summarises the significant infrastructure issues facing the Waikato Regional Council over the next 50 years, the potential consequence of these issues and the Council’s proposed approach to managing the issue.

The significant issues that have been identified are as follows:

- Ageing of assets and impact on levels of service
- Increasing environmental and regulatory performance expectations
- Climate change
- Risk of natural disasters
- Economic conditions and affordability
- Growth and development
- Business Continuity

The issues are discussed along with Council’s preferred management approach in the following tables. To determine the proposed approach, Council has considered a number of options and their potential implications along with the drivers for changes identified in Council strategic direction (shown in Appendix B).
Table 2  Ageing of assets and impact on levels of service

<table>
<thead>
<tr>
<th>Why is it an issue?</th>
<th>Council’s preferred approach to manage this issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many of Council’s assets were constructed over the period 1960’s to 1990’s and will reach the end of their predicted life in the next 50 years. These assets are critical in ensuring people and property are safe from hazards associated with flooding. They also contribute to regional economic productivity and social wellbeing.</td>
<td>The options of allowing the level of service to decline, maintaining the same level of service or replacing to a higher standard will be considered in the light of demand, cost and risks. Generally, Council expects to continue to undertake renewal programmes that ensure assets provide the level of service agreed with communities. This may in some cases, lead to increased financial requirements. This is due to expected impacts of climate change, higher environmental performance requirements and regulatory compliance. The practice of replacing ‘like with like’ is to be continually evaluated and technological improvements incorporated where this may extend asset life or reduce lifecycle costs. These matters will be incorporated into decision making processes conducted with communities and based on the best information available. It is forecast that approximately $ million (TBC) of renewal works undertaken in the next 10-years and approximately $ million (TBC) over the next 50-years. <strong>The preferred approach is to continue to maintain to current standards, while noting that in some instances, this will require intervention and increased costs if the same level of service is to be provided. This approach must also be considered in the context of the other issues identified to follow.</strong></td>
</tr>
</tbody>
</table>

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications relating to outcomes and costs.

<table>
<thead>
<tr>
<th>Reduced maintenance</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Assets could be allowed to decline. | • Reduced levels of service.  
• Reduced costs.  
• Increased risks.  
• Environmental benefits (return of land to natural state, for example).  
• Adverse economic impacts. |

<table>
<thead>
<tr>
<th>Continue to maintain to current standard</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Assets maintained as at present. | • Similar levels of expenditure.  
• Reducing level of service over time (climate change not provided for). Intervention needed to maintain levels of service. |

<table>
<thead>
<tr>
<th>Renew assets to a higher standard</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Forecast future growth and demand may drive a higher level of service (refer Table 6). | • Reduced risks.  
• Higher capital and operating costs.  
• Improved asset lives. |
Table 3  Increasing environmental and regulatory performance expectations

<table>
<thead>
<tr>
<th>Why is it an issue?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community and central government expectations in relation to environmental outcomes continue to increase over time. Flood protection infrastructure is often located in areas of high environmental, recreational or conservation value and these values may be impacted by that infrastructure. Council’s strategy is to achieve multiple outcomes wherever possible. This will be progressed by actively managing scheme effects, full regulatory compliance and achievement of a range of outcomes including those associated with Treaty settlements, biodiversity and recreational opportunities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Council’s preferred approach to manage this issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is intended that improvements in environmental performance continue to be achieved. We will seek to:</td>
</tr>
<tr>
<td>• Achieve the most appropriate balance between environmental and economic outcomes by applying best practice.</td>
</tr>
<tr>
<td>• Continue to improve the level of understanding as to the impacts of flood and river schemes.</td>
</tr>
<tr>
<td>• Apply innovative approaches to mitigation options. This may include provision for fish passage, modified pumping facilities and reversion of land to its former natural state. Retreat from flood protected lands may be favoured as a result of climate change and increased environmental objectives and requirements.</td>
</tr>
<tr>
<td>• Obtain comprehensive consents that authorise activities over a significant period. This provides increased certainty around mitigation requirements and costs.</td>
</tr>
<tr>
<td>• Build and maintain collaborative relationships with key stakeholders to assist in meeting regulatory requirements.</td>
</tr>
<tr>
<td>• Consider opportunities for greater promotion of catchment wide initiatives through use of green infrastructure including promotion of afforestation in upper catchments as a means of mitigating flood risk.</td>
</tr>
<tr>
<td>The preferred approach is to enhance current practice with a planned and targeted programme of environmental performance improvement.</td>
</tr>
</tbody>
</table>

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications relating to outcomes and costs.

<table>
<thead>
<tr>
<th>Current practice</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance within resource consent and other regulatory requirements.</td>
<td>• Maintenance of current cost structure.</td>
</tr>
<tr>
<td>Achievement of currently agreed standards.</td>
<td>• Failure to meet increasing expectations as to performance.</td>
</tr>
<tr>
<td></td>
<td>• Declining environmental outcomes, some issues not addressed.</td>
</tr>
<tr>
<td></td>
<td>• Decline in long term sustainability of protection schemes.</td>
</tr>
<tr>
<td>Enhanced environmental performance</td>
<td>Implications</td>
</tr>
<tr>
<td>More targeted enhancements and innovations to provide improved environmental outcomes.</td>
<td>• More sustainable long term outcomes. Better information on which to make decisions.</td>
</tr>
<tr>
<td></td>
<td>• Increased costs to meet higher standards.</td>
</tr>
<tr>
<td></td>
<td>• Increased collaboration with stakeholders and partners to achieve multiple objectives.</td>
</tr>
<tr>
<td></td>
<td>• Potential decommissioning, retreat and reversion to natural state.</td>
</tr>
</tbody>
</table>
Table 4  Climate change

Why is it an issue?

Council’s strategic direction signals that it wishes to be more responsive to managing climate change impacts. Climate change is likely to increase flood hazard and risk due to sea level rise, lead to more frequent and more intensive storm events, increased adverse river behaviour and higher water tables. This will place pressure on council’s assets and their services. Council seeks to reduce carbon emissions, this having relevance to council’s 119 pump stations, for instance.

As indicated, council must respond to projected climate change if current levels of service are to continue to be delivered.

Council’s preferred approach to manage this issue

Council intends to have a plan to address climate change impacts on its infrastructure. A guidance document will set out considerations in relation to the management of river and flood protection infrastructure. This will:

- Provide consistency on values, time frames and scenarios in relation to climate change projections for the Waikato region.
- Provide guidance to project managers to assist in preparing forward work programmes and financial forecasts.
- Identify what likely effects climate change will have on our existing (and future) flood protection structures and associated levels of service.

The preferred approach is to take a more planned and strategic approach to climate change based on a regionally developed standard.

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications.

<table>
<thead>
<tr>
<th>Current practice</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliance on current design standards to accommodate short to medium term effects of climate change.</td>
<td>• Deferral of a time when more substantial provision is needed.</td>
</tr>
<tr>
<td></td>
<td>• Accumulation of infrastructural debt</td>
</tr>
<tr>
<td></td>
<td>• Risk that insufficient provision is in place.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>More planned approach to climate change</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional standards in place and applied to all asset management and works programme functions over a longer planning period.</td>
<td>• More planned and substantial provision made thus reducing risks to communities and to council.</td>
</tr>
<tr>
<td></td>
<td>• Consistent regional standards and guidelines in place.</td>
</tr>
<tr>
<td></td>
<td>• Options in place to reduce council’s carbon footprint.</td>
</tr>
</tbody>
</table>
Table 5  Risk of natural disasters

Why is it an issue?
The Waikato region is one of the most hazardous regions in New Zealand due to its geographical location which makes it prone to severe storms and tsunamis, seismicity and volcanic risks. Extreme events such as tsunamis, coastal storm surge, land instability, earthquakes and volcanic eruptions pose significant threat to infrastructural assets and the services they provide.

There will always be risks associated with flood management infrastructure. Residual risks are those that exist despite protection being in place. Such risks may be associated with power supply outages, poor maintenance and vandalism. Infrastructure assets may be inundated during an ‘over design’ event leading to damage, failure or overtopping. A significant portion of councils assets are sited on “liquefiable” soils making them prone to damage in a major earthquake.

Council’s preferred approach to manage this issue
To minimise damage to flood protection assets and to respond effectively, Council will develop plans and processes that will:

- Take a risk management approach.
- Identify critical assets.
- Incorporate climate change impacts into asset management processes
- Seek to reduce the damage potential of natural hazards on our assets
- Develop strategies to enable timely response following a natural disaster
- Ensure funding policies are robust and appropriate.

Council will regularly review its disaster funding provisions to ensure that it can respond following adverse natural events (refer Councils Financial Strategy). Residual risk areas are to be identified and incorporated into the regional asset management plan and communicated to Council, District Councils and the wider community.

The preferred approach is to continue with current practice but to more actively raise community awareness of natural hazards and risks. This is consistent with council’s strategy to increase community understanding of risks and resilience.

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications relating to outcomes and costs.

<table>
<thead>
<tr>
<th>Current practice</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of infrastructure based on risk and asset criticality.</td>
<td>• Scheme reviews provide primary basis to respond to changes and maintain levels of service.</td>
</tr>
<tr>
<td></td>
<td>• Response to disaster events within funding policy, including use of financial reserves and self-insurance.</td>
</tr>
<tr>
<td></td>
<td>• Engagement with other agencies.</td>
</tr>
<tr>
<td>Raising of community awareness</td>
<td>• Increased telemetry sites to enhance flood warning and monitoring outcomes</td>
</tr>
<tr>
<td></td>
<td>• Higher level of information collection to fully understand the impacts of river morphological change and residual risk.</td>
</tr>
<tr>
<td></td>
<td>• More community engagement on risks.</td>
</tr>
</tbody>
</table>
**Table 6   Economic conditions and affordability**

### Why is it an issue?

The region’s economic conditions have an impact on the ability of communities to pay for the services provided. There are increasing pressures on the current level of funding to deliver more. In the future, there may be less funding available to fund flood protection. The affordability of the levels of service may be impacted by changes to the levels of natural risk, increased input costs, reduced returns from land use and changes to the cost of compliance. There is a strong link between social and economic trends. Trends such as an ageing population, urban drift and social inequality all have an impact upon the ability to fund infrastructure.

The construction sector within the Waikato region is currently at full capacity. This is expected to continue for at least the short to medium term, and possibly beyond. This has an impact upon the availability of suitable contractors and consultants, costs and ability to deliver within expected timeframes.

### Council’s preferred approach to manage this issue

Council recognises the need to balance both the demand for current and additional services with the community’s ability to pay. The balance is achieved through the prioritisation of work requirements, sustainable revenue and financing policies and an awareness of community needs.

Given increasing pressures upon affordability, it is appropriate to keep under review the full range of scheme beneficiaries to assess if current funding policies continue to be appropriate.

Council will continue to improve it’s monitoring of economic indicators and trends in order to anticipate the responses needed. The development of improved criteria and methodology around this will better inform decision making.

Opportunities will be identified for cost efficiencies in the way work delivery programmes are procured. Earlier recommendations adopted by council (2016) regarding market trends and cost escalations will be implemented.

*The preferred approach is to continue with current practice but to increasingly apply improved methods of market analysis and forecasting.*

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications relating to outcomes and costs.

<table>
<thead>
<tr>
<th>Current practice</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Prioritised work programmes implemented in consultation with communities as their affordability. | • Continuance of current funding policies.  
• Market movements and construction cost increases are incorporated into programme estimates and contingencies. |

<table>
<thead>
<tr>
<th>Enhanced market evaluation and forecasting</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Improved evaluation and forecasting of market trends, costs and resource availability. | • Review of funding strategies to assess appropriateness.  
• Targeted consultation with communities as to affordability.  
• Development of advanced decision making tools.  
• Enhanced procurement practices including letting of longer term large scale contracts to provide greater certainty. |
Table 7 Growth and development

Why is it an issue?

Population growth, land development and intensification of use all generate demand for additional levels of service. As growth continues, the demand for further new schemes and higher levels of protection can be expected.

In April 2017, changes were made to the RMA (section 6) highlighting the increasing level of natural hazard risk and the need to ensure growth and development does not increase these risks (and associated costs). Some growth is proposed in areas of high or increasing natural risk and there is a need for information to be available to assist in decision making and managing community expectations.

Council’s preferred approach to manage this issue

Council’s strategic direction supports sustainable growth and development.

Council will continue to monitor regional growth and development with the view to planning for and incorporating growth requirements into ongoing maintenance and renewal programmes.

Collaboration with territorial authorities in relation to expected growth and demand will continue with respect to river and flood management. This will include identifying areas of risk. It may also include opportunities for innovative approaches to managing the impacts of development. For example, management of storm water from urban areas which could impact services provided by Council. There is a need to ensure sufficient information is available to assist in informing where there may be risks associated with development.

*The preferred approach is to continue with current practice but to seek to identify opportunity for improved growth forecasting and, the development of relationships with other agencies.*

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications relating to outcomes and costs.

<table>
<thead>
<tr>
<th>Current practice</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth and development trends are monitored and forecasts incorporated into forward programmes.</td>
<td>• Technical and financial viability, environmental impacts and community and cultural acceptability are assessed for proposals associated with demand for new services.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enhanced demand forecasting</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Improvements in information gathering, analysis and forecasting to assist in decision making in regard to infrastructure decisions. | • More robust planning and assessment procedures to manage risks and ensure mitigation measures are in place and funded in a sustainable manner.  
• More definitive information available as to areas of risk and trends.  
• More formal agreement and closer working relationship with territorial authorities.  
• Improved forecasting of future changes. |
Table 8 Business Continuity

Why is it an issue?

Experienced and skilled personnel are required if a high standard of service is to be provided to the regional community into the future. In relation to infrastructure management, council staff must not only possess the necessary skills to carry out routine or core business activities but have the ability to function effectively in emergency situations. This experience is ideally gained through involvement with natural hazard related events over a period of time.

A number of key council infrastructure management and operations staff have been employed by the council for some years and a range of existing positions will need to be recruited over coming few years. In recent times, recruitment of experienced engineering and construction related staff has become increasingly challenging due to a shortage of suitably qualified candidates. This is a product of a limited number of individuals being trained in these disciplines and an employment market that is near capacity due to extensive infrastructure development nationally. This is having an impact on both the ability to recruit suitable staff and access sufficient resources through external providers.

Council’s preferred approach to manage this issue

Flood protection services cannot be provided to a high standard unless council has skilled and experienced staff in place and the council has access to suitable external resources through contract engagement. New or more innovative approaches to recruitment, training, upskilling, retention and contract engagement will be needed if uninterrupted services are to be provided.

The preferred approach is to identify and implement improved opportunities for the effective retention of key staff, training programmes and recruitment. Alternative service delivery models must also be considered.

A number of alternative options for managing this issue were also considered and these are summarised below along with the associated implications relating to outcomes and costs.

<table>
<thead>
<tr>
<th>Current practice</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement of staff as required</td>
<td>• Limited forward planning is undertaken due to pressures on resources</td>
</tr>
<tr>
<td>Succession planning</td>
<td>• Limited ability to be agile to respond to demands</td>
</tr>
<tr>
<td></td>
<td>• Protracted recruitment processes often with little success.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enhanced approach</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>More strategic approach to staff replacement and</td>
<td>• Scholarship, graduate programmes and training opportunities developed</td>
</tr>
<tr>
<td>review of alternative outsourcing options</td>
<td>within council</td>
</tr>
<tr>
<td></td>
<td>• Alternative options developed for staff eligible for retirement including</td>
</tr>
<tr>
<td></td>
<td>part time employment, contract engagement and contribution to</td>
</tr>
<tr>
<td></td>
<td>coaching and mentoring programmes.</td>
</tr>
<tr>
<td></td>
<td>• More structured succession planning</td>
</tr>
<tr>
<td></td>
<td>• Remuneration parity maintained with the private sector, as appropriate</td>
</tr>
<tr>
<td></td>
<td>• Review of contractor engagement options including scope for longer term</td>
</tr>
<tr>
<td></td>
<td>contracts to provide greater certainty and continuity of services (in contrast to short term, annual or seasonal engagements).</td>
</tr>
</tbody>
</table>
4 Approach to infrastructure management

Waikato Regional Council has management responsibility for the delivery of flood protection and land drainage services within the Waikato region. Infrastructure assets associated with these services are valued at $580 million and include stopbanks, flood gates and pump stations. Management of these infrastructure assets is crucial to support the Council Mission of “working together to build a Waikato region that has a healthy environment, a strong economy and vibrant communities” as these assets serve to:

- Protect the economic productivity of the region
- Reduce risks to communities from natural events
- Contribute to community well being

The approach taken by Council in managing its infrastructure assets is based on the key principles outlined below. These underpin Council’s overall objectives for infrastructure planning and practice, which are to ensure that:

- Council services and infrastructure assets provide appropriate levels of service in a sustainable manner over the long term.
- Council infrastructure assets are managed in accordance with statutory and regulatory requirements.
- A whole of life approach is taken for all decisions on infrastructure assets incorporating asset lifecycles and condition ratings.
- An integrated catchment management approach is taken to the planning, delivery, operation, renewal and disposal of infrastructure assets.
- Council has regard to iwi, community and relevant stakeholders associated with the delivery of services and the management of infrastructure assets.

4.1 Infrastructure management principles

Decisions are aligned with Council’s strategic direction and priorities

Council seeks to meet the needs of the community and support the delivery of those services set out in the Council’s Long Term Plan (LTP). The Council has reviewed its strategic direction and priorities for the period 2016 – 2019. We will ensure that infrastructural services are managed in alignment with Council’s strategic direction.

A key Strategic Priority is to increase the communities’ understanding of risks and resilience to change. In this regard, Council will continue to maximise opportunities to inform the community as to areas of natural risk and the measures in place to manage these risks.

Maintaining established infrastructure and levels of service

Our existing flood protection and land drainage infrastructure has developed over the last 60 years and has contributed to and enabled regional population and economic growth. This infrastructure underpins the regional economy by providing safety, certainty and protection from natural events. The levels of services have been tested and agreed with the affected communities and they tell us that they seek for these levels of service to be maintained. We will periodically consult with the community in regard to levels of service provision and provide appropriate emergency responses to ensure services are uninterrupted where possible.
Collecting and maintaining best possible data and information

Sound decisions are dependent upon the ongoing collection and management of appropriate information. Council places high importance on regular river surveys, condition and performance surveys and structural auditing to inform work programmes and associated activities. This also enables us to identify and ensure appropriate management of our most critical assets.

Improving the quality and accuracy of our data that informs these decisions is an ongoing activity that Council is committed to.

Appropriate replacement of existing infrastructure (renewals)

Different infrastructure assets will deteriorate at different rates over time. This may lead to underperformance of the asset, increased risk of failure and increased maintenance requirements. Undertaking asset renewals is an appropriate way to extend an asset’s working life and these are planned (in conjunction with asset lifecycle assessments) to deliver the most efficient use of expenditure. To help with renewals programming, assets are revalued on a three yearly cycle to inform future financial projections.

Taking account of climate and morphological change

We expect that the effects of climate change will impact on our infrastructure and the way we manage it. Our work programme will include a level of response needed based on national climate change forecasts. These changes will be agreed with communities.

Rivers and catchments are natural systems that are subject to continual change. These changes and their consequences in terms of the continuity of service delivery, need to be understood and actively managed. For instance, some the beds of river systems are aggrading due to higher silt loads and changes in the characteristics of the river channel. These changes have the potential to compromise levels of service. We will therefore actively monitor and survey rivers as part of the regular review of scheme performance.

Responding to the demands for new capital

Council will consult with communities in relation to requests for new capital work initiatives. Funding will be agreed based on Council funding policy – a requirement of the Local Government Act. In general terms, this means that costs will be met by those that benefit or contribute to the need for the capital work.

Service sustainability

We intend to carry out regular reviews of the long term sustainability of our river and flood protection assets and the service they provide. This is recognised as being necessary in light of potential challenges associated with climate change, environmental expectations and affordability.
5 Infrastructure investment programme

5.1.1 Planning asset renewals

Council undertakes physical inspection of above ground assets on an annual basis. This allows performance to be determined which confirms or influences the assigned remaining life of the asset (asset lives are contained in zone management plans and in Council’s information system, Conquest). In addition to visual inspections, Council has undertaken a programme of structural audits which commenced in 2012. To date, structural audits of 59 out of 119 pumpstations (50%) and 128 out of 479 floodgates (27%) have been undertaken. This programme is ongoing.

For the first ten years, confirmed works programmes and project estimates are the dominant influence on the forecast expenditure associated with asset renewals. Beyond the ten year horizon, the combination of current asset values (determined through asset revaluation\(^7\)) and remaining asset lives are used to estimate longer term renewal forecasts out to 50 years in the future.

Council’s infrastructure assets generally deteriorate gradually over time. Therefore, it is not critical that a particular pump, floodgate or stopbank is renewed or replaced in a particular year. Where practical, Council will smooth planned replacement programmes to ensure effective use or resources and management of risk.

5.2 Infrastructure expenditure assumptions

The Infrastructure Strategy investment programme is based on the following assumptions:

- Council’s Zone Management Plans have been used to determine issues and understand the asset management requirements. These plans have a 50-year horizon.
- Council’s renewals forecasting and modelling tool has been used as the basis for determining capital renewals costs. Assumptions made by this tool have been adopted by the Infrastructure Strategy.
- Asset lifecycle costs are based on useful remaining lives, condition assessments and replacement values as at the 31 December 2016 revaluation.
- All capital renewal expenditure is based on the continued provision of current levels of service.
- Policy and planning frameworks will limit growth and development in flood prone areas. Thus there will be only limited associated impact on additional growth related investment.
- Responding to major natural disasters is assumed to be funded through insurance and damage reserves.
- Inflation adjustments have been made using BERL inflation indices.

Further detail on the underlying assumptions, associated uncertainty and the potential implications is provided in Appendix C.

5.3 Total expenditure

In addressing the issues identified in Section 3 of this strategy, Council expects to spend a total of $2688 million on capital expenditure between 2018 and 2067. Over the same period, $853 million is expected to be spent on non-capital related cost including ongoing operating and maintenance,

\(^7\) Current asset values updated in December 2016
labour and depreciation. These figures are anticipated to be spread across the eight zones and land drainage schemes as shown in Table 9.

Table 9  Expected infrastructure expenditure, 2018-2067

<table>
<thead>
<tr>
<th>Catchment zone</th>
<th>Capital expenditure</th>
<th>Operational expenditure</th>
<th>Total expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Taupo</td>
<td>$4.1m</td>
<td>$43.5m</td>
<td>$47.6m</td>
</tr>
<tr>
<td>Upper Waikato</td>
<td>$0.3m</td>
<td>$6.6m</td>
<td>$6.9m</td>
</tr>
<tr>
<td>Waipa</td>
<td>$0.1m</td>
<td>$57.0m</td>
<td>$57.1m</td>
</tr>
<tr>
<td>Central Waikato</td>
<td>$0.0m(^1)</td>
<td>$43.0m</td>
<td>$43.0m</td>
</tr>
<tr>
<td>Lower Waikato</td>
<td>$70.9m</td>
<td>$226.3m</td>
<td>$292.5m</td>
</tr>
<tr>
<td>Waihou-Piako</td>
<td>$189.3m</td>
<td>$294.2m</td>
<td>$480.3m</td>
</tr>
<tr>
<td>Coromandel</td>
<td>$1.4m</td>
<td>$39.5m</td>
<td>$40.9m</td>
</tr>
<tr>
<td>West Coast</td>
<td>-</td>
<td>$15.0m</td>
<td>$15.0m</td>
</tr>
<tr>
<td>Land drainage</td>
<td>$1.5m</td>
<td>$127.6m</td>
<td>$129.1m</td>
</tr>
<tr>
<td>TOTAL(^2)</td>
<td><strong>$268m</strong></td>
<td><strong>$853m</strong></td>
<td><strong>$1,120m</strong></td>
</tr>
</tbody>
</table>

\(^1\) Central Waikato renewals are $25,000
\(^2\) Slight differences are due to rounding

The capital expenditure consists primarily of expenditure associated with asset renewals ($260 million), with new capital expenditure totalling only $7.9 million. The capital forecasts are discussed in more detail below.

The operational expenditure is split between river management, flood control, land drainage with depreciation shown separately.

The total expenditure profile over time across the capital and operating expenditure categories is shown in Figure 5. The total annual expenditure is shown from 2018/19 to 2027/28 and then an average spend over five-year periods is shown between 2028 and 2067.
### Total expenditure summary

As shown in both Table 9 and Figure 5 above, the vast majority of the forecast expenditure in relation to Council's flood control and river management assets is associated with operational requirements and depreciation.

#### 5.4 Capital expenditure

The most significant driver of capital expenditure is infrastructure renewals. Of the $268 million of proposed capital expenditure over the next 50 years, $260 million is renewals. The remaining expenditure ($7.9m on new capital) relates to increases in the level of service that is provided. There will be an ongoing requirement to make decisions on renewals expenditure on a cyclical basis as part of the processes associated with Council’s LTP.
Figure 6 shows the expected renewal expenditure profile for the different infrastructure assets associated with flood protection and land drainage. This expenditure forecast is developed in line with the assumptions outlined in Section 5.2.
Points to note in regard to climate change:

- Depreciation is closely matched to the long term average capital expenditure.
- There is a greater level of capital expenditure in the first three years and this is related to the required asset renewal programme, driven by the asset age profile and deferred works from previous years. This includes works needed in response to the 2017 flood events.
- Only the major schemes are included at this stage (others to be included when completed)
- Assumes climate change provision as from Year 4 (2021/22)
5.4.1 Significant capital expenditure

There are a number of significant individual expenditure programmes and projects which make up this forecast. Significant capital expenditure is defined as where the project or programme of works exceeds $100,000.

In terms of renewal expenditure, the schemes within the Lower Waikato and Waikou-Piako zones have the most significant planned expenditure across the region. Table 10 summarises the total zone expenditure by category over the next 50 years.

Table 10 Significant renewal expenditure, 2018-2067

<table>
<thead>
<tr>
<th>Renewal category</th>
<th>Catchment zone</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Waikato</td>
<td>Waihou-Piako</td>
</tr>
<tr>
<td>Pumpstations</td>
<td>$31.9m</td>
<td>$35.4m</td>
</tr>
<tr>
<td>Stopbanks</td>
<td>$18.7m</td>
<td>$84.1m</td>
</tr>
<tr>
<td>Floodgates</td>
<td>$8.5m</td>
<td>$44.6m</td>
</tr>
<tr>
<td>De-silting channels</td>
<td>$2.1m</td>
<td>$5.4m</td>
</tr>
<tr>
<td>Other structures</td>
<td>$2.1m</td>
<td>$8.5m</td>
</tr>
<tr>
<td>Other</td>
<td>$3.0m</td>
<td>$8.2m</td>
</tr>
<tr>
<td>Total</td>
<td>$66.2m</td>
<td>$186.1m</td>
</tr>
</tbody>
</table>
Only three significant projects are currently planned that are categorised as new capital expenditure. These projects are planned to deliver increases in the level of service provided. Additional new capital projects will no doubt be identified over the next 50 years and these will be developed and included during regular revisions to this strategy and other relevant planning documents.

Table 11 Significant new capital expenditure, 2018-2067

<table>
<thead>
<tr>
<th>Project</th>
<th>Expenditure</th>
<th>Timing</th>
<th>Project assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waihou Piako</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muggeridges pumpstation</td>
<td>$3.2m</td>
<td>2017-2019</td>
<td>This expenditure assumes community support and adoption of a funding policy to enable this project to proceed.</td>
</tr>
<tr>
<td>Lower Waikato</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Waikare Control Gate</td>
<td>$5m - $15m</td>
<td>2018-2019</td>
<td>This matter is currently under appeal and awaiting an Environment Court decision. The $128 appeal is expected to be resolved in the 2017/18 year. In the meantime, the consent holder and submitters are working through a process to determine the best mitigation outcomes to address sediment reduction at the outlet of the northern control gate. Three possible mitigation options have been agreed to by all parties at a cost ranging from $5 - $15 million. A future council decision will be needed as to affordability and a funding policy. Currently council has an approved expenditure of $5 million of which $1.9 million has been spent to date.</td>
</tr>
<tr>
<td>Tauhei stream</td>
<td>$1.6m</td>
<td>2018-2020</td>
<td>Council approval for this project is $3.2 million to complete the whole project. There are ongoing discussions with the community as to what the final fit for purpose design will be.</td>
</tr>
</tbody>
</table>

5.5 Updating expenditure forecasts

It is expected that with each review, Zone/Asset Management, Long Term and Infrastructure Strategy, the cost estimates will be updated, particularly in the early parts of the plan. This will enable the forecasts to be updated to reflect more detailed design and understanding of costs associated with those projects progressing in the early years.
Appendix A Local Government Act 2002 Amendment Bill (No 3) 101B Infrastructure strategy

101B Infrastructure strategy

(1) A local authority must, as part of its long-term plan, prepare and adopt an infrastructure strategy for a period of at least 30 consecutive financial years.

(2) The purpose of the infrastructure strategy is to—
   (a) identify significant infrastructure issues for the local authority over the period covered by the strategy; and
   (b) identify the principal options for managing those issues and the implications of those options.

(3) The infrastructure strategy must outline how the local authority intends to manage its infrastructure assets, taking into account the need to—
   (a) renew or replace existing assets; and
   (b) respond to growth or decline in the demand for services reliant on those assets; and
   (c) allow for planned increases or decreases in levels of service provided through those assets; and
   (d) maintain or improve public health and environmental outcomes or mitigate adverse effects on them; and
   (e) provide for the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks.

(4) The infrastructure strategy must outline the most likely scenario for the management of the local authority’s infrastructure assets over the period of the strategy and, in that context, must—
   (a) show indicative estimates of the projected capital and operating expenditure associated with the management of those assets—
      (i) in each of the first 10 years covered by the strategy; and
      (ii) in each subsequent period of 5 years covered by the strategy; and
   (ab) identify—
      (i) the significant decisions about capital expenditure the local authority expects it will be required to make; and
      (ii) when the local authority expects those decisions will be required; and
      (iii) for each decision, the principal options the local authority expects to have to consider; and
      (iv) the approximate scale or extent of the costs associated with each decision; and
   (b) include the following assumptions on which the scenario is based:
      (i) the assumptions of the local authority about the life cycle of significant infrastructure assets:
      (ii) the assumptions of the local authority about growth or decline in the demand for relevant services:
      (iii) the assumptions of the local authority about increases or decreases in relevant levels of service; and
   (c) if assumptions referred to in paragraph (b) involve a high level of uncertainty,—
      (i) identify the nature of that uncertainty; and
      (ii) include an outline of the potential effects of that uncertainty.
(5) A local authority may meet the requirements of section 101A and this section by adopting a single financial and infrastructure strategy document as part of its long-term plan.

(6) In this section, infrastructure assets includes—

(a) existing or proposed assets to be used to provide services by or on behalf of the local authority in relation to the following groups of activities:

   (i) water supply:
   (ii) sewerage and the treatment and disposal of sewage:
   (iii) stormwater drainage:
   (iv) flood protection and control works:
   (v) the provision of roads and footpaths; and

(b) any other assets that the local authority, in its discretion, wishes to include in the strategy.”
Appendix B Drivers for change

In WRC’s strategic direction the following key external future change drivers have been identified:

Table 12  Key external future change drivers

<table>
<thead>
<tr>
<th>Driver</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural resource constraints</td>
<td>There will be continued pressure on the region’s natural resources from activities such as land use intensification and urban growth (including Auckland). The resources most impacted will be water (quality and quantity), soils (e.g. peat shrinkage), coastal and marine (e.g. use conflicts) and biodiversity. Increasingly central government policy recognises the need to address resource constraints.</td>
</tr>
<tr>
<td>Economic trends</td>
<td>The Waikato economy is not meeting its potential, and is highly dependent on the performance of the national and global economies.</td>
</tr>
<tr>
<td>Changing community values and expectations</td>
<td>What is important to the community and their expectations of Council continue to evolve with each generation. The trend from successive independent Waikato surveys over the past 10 years indicates Waikato people are most concerned about job and business opportunities, financial and economic matters, and the environment. Eighty five per cent of Waikato residents are positive about their quality of life. A focus on water quality appears to overshadow many other environmental issues. People see competing uses for water, allocation of water, water quality and associated environmental concerns as having a major impact on the economic and social wellbeing of the region.</td>
</tr>
<tr>
<td>Demographic changes</td>
<td>The Waikato is facing the national trends of an aging population, rural depopulation, and increasing young Maori population. Over the next 20 years the population of over 65 year olds will increase by 84 per cent. While 95 per cent of the region’s growth will be in the Future Proof area (Waipa, Hamilton and Waikato districts), the annual growth of this area is estimated to be less than 1 per cent per annum over the next 20 years. Increasingly, Auckland’s population growth is impacting on the Waikato.</td>
</tr>
<tr>
<td>Iwi Maori influence</td>
<td>The political and economic influence of Iwi will continue to increase, particularly following Treaty settlements.</td>
</tr>
<tr>
<td>Regional risks</td>
<td>The major Waikato risks relate to civil defence (e.g. volcanic, flooding, tsunami), biosecurity (e.g. fanworm), and the impacts of climate change (e.g. coastal erosion, droughts and intensive storm events).</td>
</tr>
<tr>
<td>Local government change</td>
<td>In response to community pressure and the challenging economic climate, the government commenced an eight point reform programme for local government in March 2012. This is part of the government’s broader programme for building a more productive, competitive economy and better public services. Changes have also been made to the Land Transport Management Act and are being made to the Resource Management Act. Council needs to respond to the government’s agenda by ensuring it is undertaking functions that are efficient, effective and appropriate. The Local Government Commission has received applications for reform in some other regions. While reform conversations have commenced in the Waikato, the current focus has been on collaboration, in particular increased shared services and combined planning.</td>
</tr>
</tbody>
</table>

(The drivers for change strongly influence the significant issues outlined in this document. These drivers are considered when determining options for response and the potential implications of decisions.)
### Appendix C Infrastructure assumptions and uncertainty

<table>
<thead>
<tr>
<th>Forecasting assumption</th>
<th>Risk</th>
<th>Likelihood of occurrence</th>
<th>Financial materiality</th>
<th>Reasons and financial effect of uncertainty</th>
</tr>
</thead>
</table>
| **Projected price change factors**  
Forecast financial information contained in this plan includes a provision for inflation. Council has used the price level change factors supplied by Business and Economic Research Ltd (BERL) in order to calculate the amount of inflation to include.  
Where expenditure is subject to inflation, the following cumulative rates have been applied. | That actual price changes vary significantly from the levels assumed | Medium | Low  
(2015/16 – 2016/17)  
Medium  
(2017/18 – 2024/25) | Inflation is affected by external economic factors that are outside the control of council. Given the current economic climate, the actual inflation rates for both the short and long term are uncertain. While council believes it has taken a conservative approach by applying the rates supplied to the local government sector by BERL, it acknowledges that actual inflation rates may vary from these in any year of the plan. |
| **Useful lives of significant assets**  
The useful lives of council’s significant assets are as disclosed in the notes to the accounts | That the actual life of an asset is shorter than assumed. This may impact on the level of depreciation expense recognised, the asset maintenance work required, and the timing of any asset replacement | Low | Low | Council’s most significant assets are its infrastructural assets which are comprised of flood protection works. The useful lives of these assets have been assessed by engineers and valuers as part of the asset revaluation process undertaken in 2014. Following any significant capital expenditure, the useful life of an asset is also reassessed. |
| Sources of funds for future replacement of significant assets | That Council has insufficient funds to replace significant assets at the end of their useful lives | Low | Low | Depreciation on assets is fully funded and transferred to reserve accounts to be available to pay for replacement assets.

A combination of catchment operating and disaster recovery reserve funds and insurance arrangements are in place to fund repair costs up to prudential limits should damage from climatic events or natural disasters occur.

Council’s financial strategy sets out how provision is made for damage costs.
The revenue and financing policy sets out the funding sources that may be used in relation to capital expenditure. |

| Revaluation of non-current assets | That actual revaluation changes vary significantly from those forecast | Low | Low | Council undertook revaluations of those property, plant and equipment assets that are subject to revaluation in 2014. Council’s accounting policies state that these assets should be revalued at least every 5 years, with an assessment of values carried out annually. Any change in value will impact the forecast financial statements through the funding of depreciation. Budgeted depreciation expense takes account of the estimated impact of the revaluation of assets over the term of this plan. If the results of revaluations vary significantly from the estimates |
Depreciation rates on planned acquisitions
New capital expenditure will be depreciated in line with the depreciation rates set out in council’s accounting policies.

<table>
<thead>
<tr>
<th>Description</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>That further review of the nature of capital expenditure may alter the depreciation expense incurred</td>
<td>Low</td>
<td>Low</td>
<td>Significant capital works are based on detailed asset management plans which specify the nature and timing of capital works. Due to the long-term nature of these capital works, any impact on depreciation is minimal.</td>
</tr>
</tbody>
</table>

Regional growth
Council has estimated that there will be 2,900 new properties in the region each year. This is based on an annual growth rate of 1.5 per cent. From year two onwards, the growth project is reduced to 1 per cent per annum to reflect less buoyant economic forecasts for this period.

<table>
<thead>
<tr>
<th>Description</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>That growth will not be sustained at the level anticipated.</td>
<td>Low</td>
<td>Low</td>
<td>Given the current economic climate, council has taken a conservative view of future growth across the region over the period of this plan. This growth estimate has only been used to project likely revenue for those rates set on a per property charge, and in the calculation of rating impacts to existing ratepayers.</td>
</tr>
</tbody>
</table>

Unforeseen or new environmental issues or resource management needs
There will be new environmental or resource management issues requiring work that cannot be funded out of normal budgetary provisions.

<table>
<thead>
<tr>
<th>Description</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>There will be new environmental or resource management issues requiring work that cannot be funded out of normal budgetary provisions</td>
<td>Low</td>
<td>Low</td>
<td>The potential effect of any new environmental or resource management issues is dependent upon the scale, type, location and impact on the environment. Each issue will be addressed on its merits and any funding requirement addressed in terms of the principles outlined in the Revenue and Financing Policy and Financial Strategy. It is considered that any new issue(s) resulting from climate change will be managed within existing resources.</td>
</tr>
</tbody>
</table>

Significant natural or other hazard emergencies
There will be new natural or other hazard emergencies.

<table>
<thead>
<tr>
<th>Description</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>There will be new natural or other hazard emergencies</td>
<td>Low</td>
<td>Low</td>
<td>The potential effect of a natural disaster on the Council’s financial position is dependent upon the</td>
</tr>
</tbody>
</table>
requiring work that cannot be funded out of normal budgetary provisions

scale, duration and location of the event. However, Council’s financial position is strong enough to fully replace all infrastructural assets in the case of an event causing total destruction. Disaster recovery reserves are being built up over time and insurance cover is in place to fund up to 40% of qualifying expenditure in the event of a natural disaster.

Refer to council’s financial strategy for further information on its approach to mitigating the financial risk associated with natural disasters.

| Climate change          | Costs will change in response to climate change impacts | Low | Low | Potential climate change impacts are routinely factored into the Council’s planning and design activities as prediction and adaptation information becomes available. In particular, the council’s infrastructure strategy considers the impact of climate change on the management of flood protection scheme assets. |