

**Hawke's Bay Regional Council's
Long Term Plan 2015-25**

Part 3 | 30 Year Infrastructure Strategy

HBRC's 30 Year Infrastructure Strategy

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Section 1 - Introduction

This is Hawke's Bay Regional Council's first Infrastructure Strategy. It has been prepared from Council's 2015 suite of Asset Management Plans and the Long Term Plan of which it forms part.

The Hawke's Bay region on the central east coast of the North Island has a total land area of 1.42 million hectares. It is bounded in the west by the Kaweka and Ruahine Ranges. The area comprises the local authority districts of Wairoa in the north, Hastings, Napier and Central Hawke's Bay, together with small areas of Rangitikei and Taupo districts. The current Hawkes Bay population of 158,000 is expected to increase by 6,000 people (3.8 %) during the life of this strategy. Population is predicted to increase in Napier City and Hastings District (4.8 and 8.2% respectively) and reduce in Wairoa (25%) and Central Hawke's Bay (9%). These population growth forecasts may change if the Ruataniwha Water Storage Project proceeds. However the major impact of this project will be on the population of Central Hawke's Bay and this is unlikely to significantly influence any changes to levels of service provided by HBRC infrastructure in the area.

Hawke's Bay contains 24 river catchments comprising 7 major rivers (the Wairoa, Mohaka, Esk, Tutaekuri, Ngaruroro, Tukituki and Waipawa) and numerous smaller rivers and streams. Between the mountain ranges and the coast lie flat river plains (Heretaunga, Ruataniwha and Wairoa) containing rich alluvial soils which provide the basis for the important Hawke's Bay horticultural sector.

The largest Scheme is the Heretaunga Plains Flood Control and Drainage Scheme which protects the cities of Napier and Hastings and highly productive lands in their vicinity.

Historically, where frequent flooding or poor drainage have been an issue for local land owners, the Hawke's Bay Regional Council (HBRC) or its predecessor organisation, the Hawke's Bay Catchment Board, have worked with them to establish a flood control and/or drainage scheme to enable them to use their land with reduced risk of flooding and associated improvements to drainage, provided they have been willing to meet a significant portion of both the capital and ongoing maintenance and operating cost. HBRC now administers 25 flood control and drainage schemes throughout the region. It is the assets associated with these Schemes that form the significant infrastructure managed by HBRC.

These schemes have enabled areas benefiting from them to improve the productivity from the land, with resulting benefits to the economy and resilience of the Region. To reflect this wider benefit HBRC sources the majority of funds to meet the ongoing operation, maintenance and improvement cost of the scheme from targeted rates levied on properties benefiting from the Schemes, and a minority portion from general funding sources. General funds are sourced from general rates levied on all properties across the region and from dividends and interest from HBRC investments. HBRC believes that the current level of funding for each of the Schemes is adequate to fund maintenance necessary to maintain Scheme assets such that they continue to deliver the level of service they were designed to provide, however a number of Scheme reviews are planned. A review of any one of the Schemes could result in a proposal to increase the level of maintenance, and or improvement expenditure.

In recent years HBRC has acknowledged the significant potential for the corridors associated with rivers and streams as habitat and refuge for regional biodiversity, as well as being an integral part of the social and cultural fabric of the region. Significant work has been done to quantify those values and a number of projects are now funded through scheme funds to enhance those biodiversity, environmental, cultural and social values. Approximately 95km of pathways have been constructed on land associated with HBRC infrastructure assets. These together with other recreational uses of river berm land cater for public health and wellbeing.

HBRC is also seeking to reduce, or where possible, eliminate any adverse environmental effects of activities associated with the operation or maintenance of the Schemes. To this end a study is currently underway to quantify the ecological aspects of the Schemes, and understand the river bed gravel resource in the region and quantify and manage the impact of current river bed and gravel extraction activities.

The Local Government Act 2002 Amendment Bill Section 101B – *Infrastructure Strategy* states:

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

And

*In this section, **infrastructure assets** includes- 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:*

iv) flood protection and control works:

any other assets that the local authority, in its discretion, wishes to include in the strategy.”

Section 2 – Significant Infrastructure

A significant portion of HBRC infrastructure assets is associated with flood control and drainage schemes that have been established under the Soil Conservation and Rivers Control Act 1941 to provide benefit to defined areas within the region.

All Schemes have the primary purpose of reducing flood risk and/or the time taken to drain stormwater runoff from the land following a major rainstorm event. The Schemes also allow increased productivity from the land by utilising existing small streams along with a network of man-made drains, together with low level pumps which enable the natural near surface water table to be lowered.

The most significant of these Schemes services the Heretaunga Plains. The Heretaunga Plains Flood Control and Drainage Scheme includes significant stopbanking and river control works on the three major rivers (Tutaekuri, Ngaruroro, and Tukituki) crossing the Heretaunga Plains and a network of small streams, drains and pumping stations under 9 internal catchment areas. The Heretaunga Plains Flood Control and Drainage Scheme is divided into 10 separate catchments for management and funding purposes. (Rivers and 9 separate drainage catchment areas).

The Upper Tukituki Flood Control Scheme is the second largest Scheme. This Scheme includes significant stopbanks and river control works on the Waipawa, Tukituki and Tukipo Rivers and a number of their tributaries across the Ruataniwha and Takapau Plains.

The remaining Schemes cover small catchments with minor infrastructure, and are each considered small compared to the above Schemes.

The integrity of the Heretaunga Plains flood Control Scheme assets is critical to the Hawke's Bay economy. Stopbanks and associated river control assets on the three major rivers crossing the Heretaunga Plains are considered critical assets.

Details of the infrastructure assets are tabled below.

	Asset description	Physical dimension / number	Replacement value	Annual operations and maintenance budget (2014-15)	Level of service summary
Heretaunga Plains Flood Control and Drainage Scheme	Stopbanks	156km	\$111,708,000	\$4,514,306	<p>Currently the design Level of Service (LOS) (1%AEP capacity) is provided on the major rivers. Current assessment is that the River control assets provide 100% effectiveness and is at no more than a low risk of failure.</p> <p>A Level of Service (LOS) review for the drainage network is programmed to begin in the 2014/15 financial year.</p>
	River channels and edge protection	96km			
	Drainage channels	473km			
	Pumping stations	18			
	Structures and culverts	2440			
Upper Tukituki Scheme	Stopbanks	76km	\$28,292,000	\$764, 284	<p>Currently the design LOS (1%AEP capacity) is provided over 95% of the stopbanked reaches. The remaining 5% of reaches remain with reduced free board (distance between design flood level and the top of the stopbank).</p>
	River channels and edge protection	130km			
	Drainage channels	12km			
	Structures and culverts	1274			
Small Schemes	Stopbanks	15km	\$13,382,000	\$719,826	<p>Current Levels of Service are being achieved across most the smaller schemes. Levels of Service vary across the schemes, depending on their purpose. Estimated to be operating at 95% or higher after allowing for periodic flood damage.</p>
	River channels and edge protection	8km			
	Drainage channels	85km			
	Pumping stations	4			
	Structures and culverts	288			
Total replacement value			\$153,382,000		

Other Activities

Pathways

HBRC manages approximately 105 km of pathways which have been constructed on land it owns or administers. The majority of the pathways form a portion of the Great rides, and are constructed along stopbanks which are assets of flood protection schemes.

While HB cycle trails are not significant infrastructure assets, the cost of constructing these has been met in part by the regional ratepayers and in part by central government through their NZ Cycle Trails initiative. HBRC therefore has an ongoing obligation to the management and maintenance of these pathways in accordance with the agreement HBRC entered into with the then Ministry of Economic Development (22 Nov 2011) which states that

“Under this agreement HBRC is required to brand the Hawke's Bay Trail as forming part of the Nga Haerenga, New Zealand Cycle Trail, and has agreed to comply with such reasonable conditions as required by the Ministry, including that the Hawke's Bay Trail be managed and maintained in a manner that is consistent with the objectives of Nga Haerenga, New Zealand Cycle Trail.”

Regional Parks

HBRC also manages and administers a Regional Park network including:

- Pakowhai Regional Park
- Pekpeka Regional Park
- Waitangi Regional Park
- Tutira Regional Park;

And contribute toward the management of Te Mata Park.

It is acknowledged that the pathways and these parks are important community assets. HBRC has made financial provision in its long term plan for ongoing management and maintenance of these assets, and for their development and improvement.

2.1 Issues expected over the next 30 years

There are a number of significant infrastructure issues that are expected to be addressed over the life of this Strategy. These have been identified in the Scheme asset management plans. A brief explanation of the most significant of these and options for addressing these are set out following.

Significant Infrastructure Issue	Description	Principal Management Options	Implications of Management Options
Climate change	<p>Prediction is for Hawke's Bay to be dryer but with the potential for increased storminess. Severe storms are predicted to bring greater rainfall which will result in increased flood flows.</p> <p>Sea level rise will also affect assets in the vicinity of the coast.</p>	<p>Provision for the impacts of climate change on flood flows and sea level rise will be considered when the levels of service provided by schemes are reviewed.</p> <p>The impacts of increased drought risk on environmental and river control plantings will be considered as an operational matter.</p>	<p>The potential impacts of climate change will be considered as part of proposed levels of service reviews.</p> <p>Public consultation will be part of these reviews. If preferred option(s) are for retention of existing levels of service, or increased level of service, a capital works programme to increase current capacity of Schemes is expected to be required.</p>
Levels of Service reviews	<p>Land use change and climate change are predicted to result in increased runoff from the land into the waterways</p> <p>The service currently provided by the Schemes to the Hawke's Bay public includes</p> <ul style="list-style-type: none"> • The conveyance of flood water in the major rivers safely to the sea up to a flow with a 1% chance of occurrence in any one year. • The drainage of flood water from the Heretaunga Plains without significant ponding for rain storm events that have a 20% chance of occurrence in any one year. • A reduction in the frequency of flooding in areas serviced by smaller schemes managed by HBRC to levels defined in their asset management plans. <p>HBRC has committed (through its 2012/22 LTP) to increasing the level of protection provided by the Heretaunga Plains Scheme – Rivers infrastructure to convey flood water with a 0.2% chance of occurrence in any one year over the next 15 to 20 years.</p>	<p>There are a number of options for improvement to current levels of service. These will be explored through the level of service review process which will include consultation with benefiting communities and/or land owners.</p> <p>Improvements over time in environmental, cultural, aesthetic values of the environs of waterways under schemes on public land as measured by the Stream Environmental Value (SEV) methodology.</p>	<p>If the current levels of service are to be maintained or improved, improvements are required to the Scheme infrastructure. If no work is undertaken then the level of service will decline over time.</p> <p>Generally enhanced riverine environment, biodiversity and recreational opportunities are expected to be required in addition to an increased level of protection against flood risk.</p>

Significant Infrastructure Issue	Description	Principal Management Options	Implications of Management Options
Land Use Change	<p>There are a number of potential changes to land use that can impact on the amount of water running off the land and into waterways during heavy rainfall events. Climate change is predicted to result in increased storminess and increased severity of rainfall events. A 5% increase in peak rainfall falling in an event with a 1% chance of occurrence in any one year, may result in an increase peak flow in a waterway of up to 25%.</p> <p>Improvements to urban stormwater systems, increased building and/or urban expansion, changes in crops grown on the land – particularly forestry, can all result in changes to the speed and quantity of runoff from the land.</p>	<p>Reviews of all of the Schemes will be undertaken over time. This process will take at least 10 years, however reviews of some of the larger schemes are programmed to be undertaken within the next 5 years.</p>	<p>The potential for increased runoff through land use change associated with urban areas may be managed to some extent through regulation in Regional and District Plans. The impacts on runoff through land use change in rural areas will be considered as part of the Scheme reviews and appropriate provision made in improvement options that flow from the reviews.</p>
Flood channel capacity management	<p>Significant quantities of sediment are carried by the major rivers. While soil conservation initiatives may reduce the amount of sediment finding its way into rivers over time, New Zealand’s geology is young in geological terms and erosion will continue to occur in heavy rain events for many centuries even with the best soil conservation efforts in place. The flood carrying capacity of waterways will be compromised by aggradation of sediment unless appropriate measures are put in place to manage that risk.</p>	<p>A range of river management practices are in place to manage this risk. These include river bed beach raking and commercial silt and gravel extraction.</p> <p>A significant gravel management review programme (7 years) is underway to provide answers to the issues of managing gravel riverbeds.</p>	<p>The gravel management review process will enable the establishment of a managed regime that will ensure a sustainable and resilient gravel (& sediment) management process.</p>

Section 3 – Management Approach

3.1 Maintenance Approach

An annual maintenance programme for all infrastructure assets is prepared prior to the commencement of each financial year. Maintenance work is largely undertaken by HBRC’s own Works Group under an annual maintenance contract.

The annual programme of maintenance is designed to ensure that the infrastructure assets continue to be maintained in accordance with the Scheme asset management plans such that the Scheme continues to deliver its designed level of service.

Inspections of all assets are undertaken as part of the annual programme of works. An annual audit of the Schemes is undertaken by a Registered Engineer with experience in river control works and reported to Council.

Cost effective delivery of services

In terms of section 10 (Purpose of local government) there is a clear requirement to meet the current and future needs of communities for good-quality local infrastructure, local public services, in a way that is most cost-effective for households and businesses.

(2) In this Act, good-quality, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are—

- (a) efficient; and*
- (b) effective; and*
- (c) appropriate to present and anticipated future circumstances*

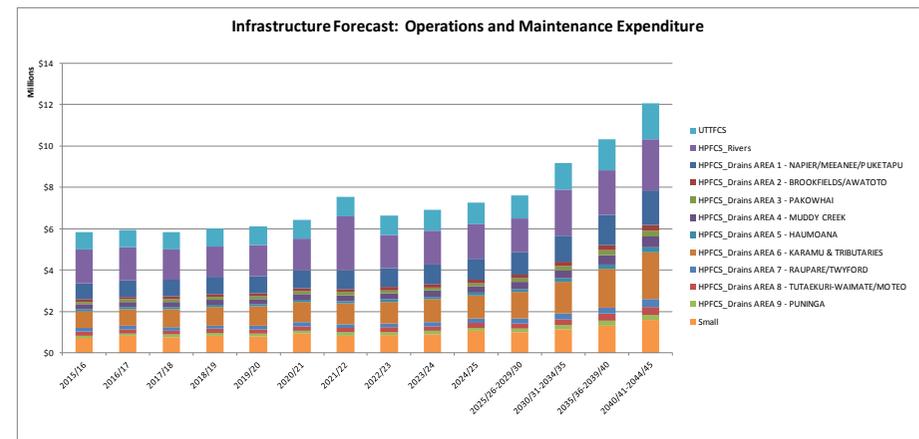
HBRC Works Group operates a fleet of plant and equipment that is specifically designed to deliver the maintenance contracts efficiently and effectively. In addition the Group undertakes less specialist work using local contractors.

The Works Group also tenders for work within its area of expertise from other organisations allowing them to test their competitiveness in the open market.

Any profits made by the Works Group on these maintenance contracts are returned to the respective Scheme at the end of each financial year.

Figure 3.1 below sets out the predicted ongoing maintenance costs. Section 5 of this Strategy sets out the assumptions under which these estimates have been developed.

Figure 3.1: Projected Operational Expenditure –Infrastructure Assets



3.2 Scheme funding

An operating account is held for each scheme. All Scheme funds (targeted rates, general funding allocated to the Scheme, other Scheme income and interest on accumulated funds) are credited to the operating account. Scheme costs (operating, maintenance, and improvement costs, rate collection costs, depreciation, and interest on Scheme deficits) are debited from the account. Any balance remaining in the account (credit or debit) is carried forward from one year to the next.

The major beneficiaries of the Schemes are the owners of land within the scheme areas that are able to use their land more productively. These beneficiaries pay the majority of the cost of operating and improving each scheme through targeted rates. However HBRC recognises that there are wider benefits to the region from land being used productively, and accordingly a portion of the Scheme costs are funded from HBRC's general funding sources, i.e. general rates and interest and dividends from HBRC investments.

The table below sets out the funding sources for each Scheme.

Economic assessments of the wider benefit to the Hawke's Bay Region have assisted HBRC in establishing the proportion of direct benefit vs region wide benefit for the major schemes.

This work showed that the Heretaunga Plains Flood Control and Drainage Scheme – Rivers provided an environment within which significantly increased economic activity was able to occur across the whole region resulting in increased population and facilities to support that population. Accordingly 30% of the cost of the Scheme is met by HBRC general funding.

The Schemes covering the individual catchment areas on the Heretaunga Plains have resulted in improved productivity from the land which is assessed as justifying 10% of the cost of those Schemes being met from general funding sources.

Similarly the Upper Tukituki Scheme provides approximately half the benefit attributable to the Heretaunga Plains Flood Control and Drainage Scheme – Rivers to the whole region, but the cost of maintaining this Scheme is exacerbated by gravel flowing from the Ruahine Ranges. This is deemed to warrant an additional 2.5% of general funding input.

The principles used for the small schemes are as follows.

- Schemes that provide protection to a State Highway receive 12.5% general funding contribution
- Schemes that provide protection to local roading networks receive 10% general funding contribution
- Other Schemes receive 5% general funding contribution.

Scheme	Targeted rate portion	General funding portion
Heretaunga Plains Flood Control and Drainage Scheme <ul style="list-style-type: none"> • Rivers 	70%	30%
Drainage catchment Schemes <ul style="list-style-type: none"> • Napier Meeanee • Awatoto Brookfields • Pakowhai • Muddy Creek • Haumoana • Karamu and tributaries • Raupare Twyford • Tutaekuri Waimate • Puninga 	90%	10%
Upper Tukituki Scheme	82.5%	17.5%

Scheme	Targeted rate portion	General funding portion
Small Schemes		
• Upper Makara	90%	10%
• Paeroa	87.5%	12.5%
• Porangahau	90%	10%
• Poukawa	95%	5%
• Ohuia – Whakaki	95%	5%
• Esk	87.5%	12.5%
• Whirinaki	87.5%	12.5%
• Te Awanga	90%	10%
• Te Ngarue	90%	10%
• Kopuawhara	90%	10%
• Kairakau	90%	10%
• Opoho	90%	10%
• Wairoa Rivers and Streams	87.5%	12.5%
• Central and Southern	87.5%	12.5%

3.3 Renewal approach

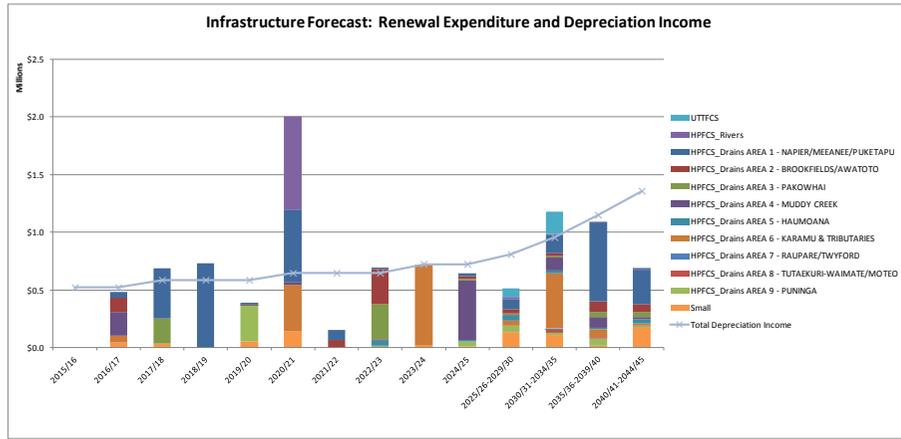
The effective life of each asset (and in some cases components of an asset) is assessed. Some examples are set out in the table below

Asset type	Expected effective life
Stopbanks, live trees for river control and drainage channels	Do not deteriorate over time if they are adequately maintained and therefore have infinite expected life
Concrete structures and culverts	Up to 70 years
Pump station electrics	25 to 30 years
Exposed steelwork e.g. weed screens on pump stations	5 to 30 years depending on environmental conditions.

Depreciation is charged on each Scheme based on the assets deteriorating evenly over time. No depreciation is charged on assets that have an infinite life, e.g. stopbanks. An asset replacement reserve is held for each scheme to which the annual depreciation charge and any interest accruing to the reserve is credited, and the cost of asset replacements is debited. A ceiling is set for funds in each asset replacement reserve at a level sufficient to fund future anticipated replacements. Any depreciation charges and interest in excess of the ceiling are credited to the Scheme operating account.

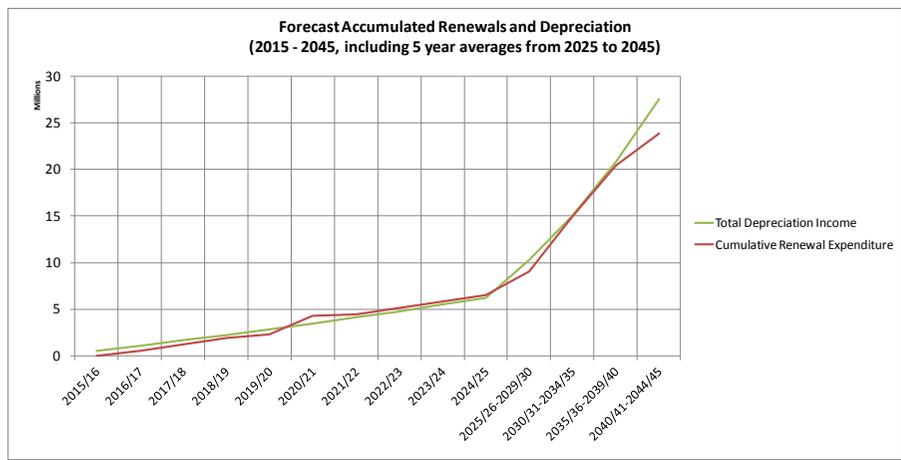
The condition of any asset is assessed before a decision is made to replace it. Where appropriate the replacement date of an asset is extended. Prior to replacing any asset a review is undertaken to determine whether or not there is justification to change the level of service provided by that asset, and particularly for significant assets to consider a range of alternatives to determine the most cost effective approach to its replacement.

Figure 3.3: Projected Renewal Expenditure- Infrastructure Assets



The spike in renewal expenditure schedule at 2020/2021 is the result of a large number of items such as culverts which have been given a nominal life of 50 years, and are programmed for replacement. The condition of these assets will be reassessed over the next 3 to 6 years, and where appropriate, programmed replacement dates will be revised.

Figure 3.4: Projected Cumulative Renewal and Depreciation Income/Expenditure- Infrastructure Assets



3.4 Projected Capital Works covering enhancements and increased level of service

Capital or improvement works are undertaken on some Schemes in accordance with asset management plans. However the majority of capital works will be undertaken to improve the level of service provided. In its 2012-22 Long Term Plan, HBRC consulted on a proposal to increase the level of service provided by the river control and flood mitigation works on the Heretaunga Plains Scheme – Rivers. Additional capital works requirements to improve levels of service of individual Heretaunga Plains catchment areas are expected to be identified through reviews of these Scheme areas.

Capital works may be funded through loans or funded directly from Scheme funds. The identification of an appropriate funding source is determined through a long term plan or annual plan process, or through a special consultative process if one is undertaken.

Key capital projects expected to be undertaken within the life of this Strategy are set out in the table below. HBRC has consulted and received support from the community for increasing the level of service provided by the stopbanks protecting the Heretaunga Plains from floods with a likelihood of occurrence of 1% in any one year (100 year return period) to 0.2% (500 year return period).

HBRC has yet to determine changes in levels of service provided by other schemes. Level of service change options will be determined after the level of service reviews are completed progressively over the next 6 years. The principal options Council expects to consult on are whether to increase the level of service, and by how much, or whether to retain the current service levels.

These decisions will be significant decisions for HBRC prior to commencement of any capital works. Expected timing and costs (for the maximum expected level of service changes) are set out in the table following.

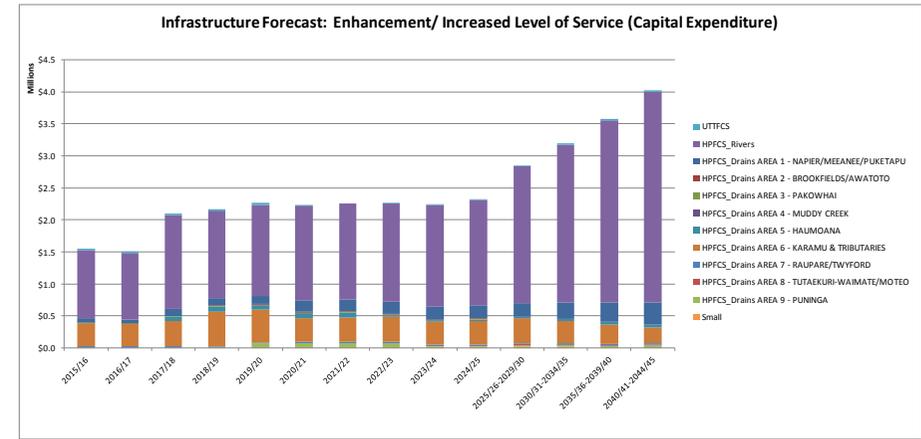
Note the capital works set out in this section are in addition to the renewal works included under Section 3.3 of this Strategy.

Scheme	Capital works description	Indicative project value	Timing
Heretaunga Plains Flood Control and Drainage Scheme - Rivers	Increase level of service from current nominal 100 year protection to 500 year protection	**\$15M	Provision included in LTP for a twenty year project commencing 2016.
Heretaunga Plains Flood Control and Drainage Scheme - Drains	Increase the level of service through; enhancement of urban drains in Napier Meeanee catchment area enhancement of Karamu Stream and tributaries flood channel Capital works identified as a result of level of service reviews	*Unknown, depends on outcome of levels of service reviews. Estimate \$15M- \$25M	2017 est. start time
Upper Tukituki Scheme	Capital works identified as a result of level of service reviews	*ditto *\$10M	2016 est. start time

*Uncertainty: - costs and timing are only very rough order at this stage as the levels of service reviews have only just commenced. Costs/timings will depend on the outcomes of the reviews as well as community consultation and demand.

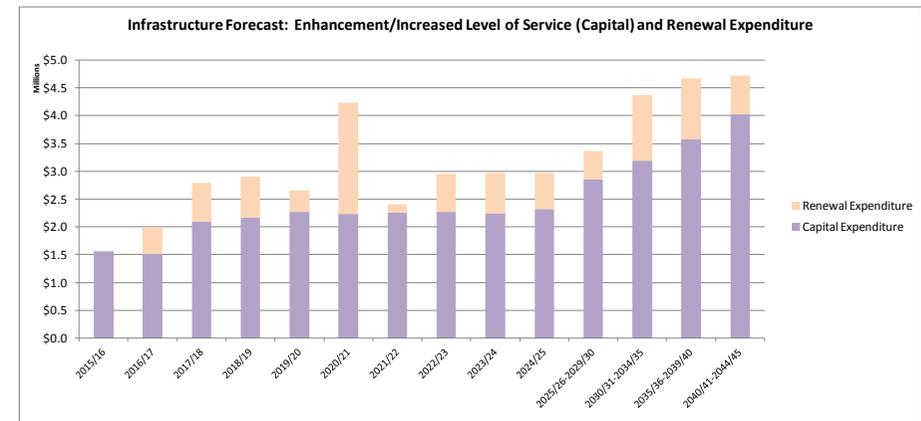
**Funding: - A more reliable estimate of cost will only be available once design philosophy and detailed design have been completed. At this stage it is not proposed to loan fund the project. The project will be undertaken over many years. The length of time for completion will vary depending on the total cost and amount of annual funding allocated through the relevant Scheme.

Figure 3.5: Projected Capital Works Expenditure covering enhancements and increased level of service



The following graph shows the totals for the combined capital works, (which provides enhancements and increase level of service), and the renewals.

Figure 3.6: Projected Capital Works (covering enhancements and increased level of service) and Renewal Expenditure



3.5 Resilience

Scheme beneficiaries have a high expectation of continuing functionality and ongoing protection against flooding. Reviews of the level of service provided by each of the Schemes are progressing. These reviews will include risk assessments of Schemes and where appropriate may recommend changes or improvements that reduce the risk of premature failure, or enable the level of service to be reinstated more rapidly following a natural hazard event that impacts on the scheme.

Risks to Asset Performance

The main risks that would affect the performance of the infrastructural assets are listed below.

Risk	Description
Significant natural hazard event	A significant natural hazard event (e.g. flood, earthquake, tsunami) will impact on the Scheme assets and may affect their integrity or their ability to provide the level of service they were designed for.
Significant biological incursion	An essential part of river control work is live trees – mainly willows. These could be damaged by a significant biological incursion e.g. an insect such as willow sawfly which caused significant damage to willows in the mid 1990's.
Inadequate funding	Ongoing maintenance is essential if the Scheme assets are to provide the design level of service. Maintenance is currently funded through rates levied on land benefiting from the Schemes. The cost of ongoing maintenance must however be affordable to the land owners and be outweighed by the benefits received by them. Should costs outweigh benefits an alternative level of service may need to be considered in conjunction with ratepayers.

HBRC holds disaster reserves and insurance to fund reinstatement of Scheme levels of service should infrastructure assets be damaged in a significant natural hazard event. The highest risk to infrastructure assets is a significant flood event, followed by a major earthquake. HBRC disaster reserves are designed to meet the cost of reinstatement following damage by events with a 4 to 5% chance of occurrence in any one year (i.e. on average events that occur more regularly than once every 20 to 25 years). Insurance secured through an external organisation is held and may be called upon should significant damage occur in a major, but infrequent, event.

Section 4 – Other Emerging Issues

The task of building, operating and maintaining these infrastructure assets in an affordable manner is becoming increasingly challenging. A number of emerging issues have the potential to impact on the ongoing management of the Schemes including their ongoing affordability to the benefiting community:

4.1 Demographic Changes

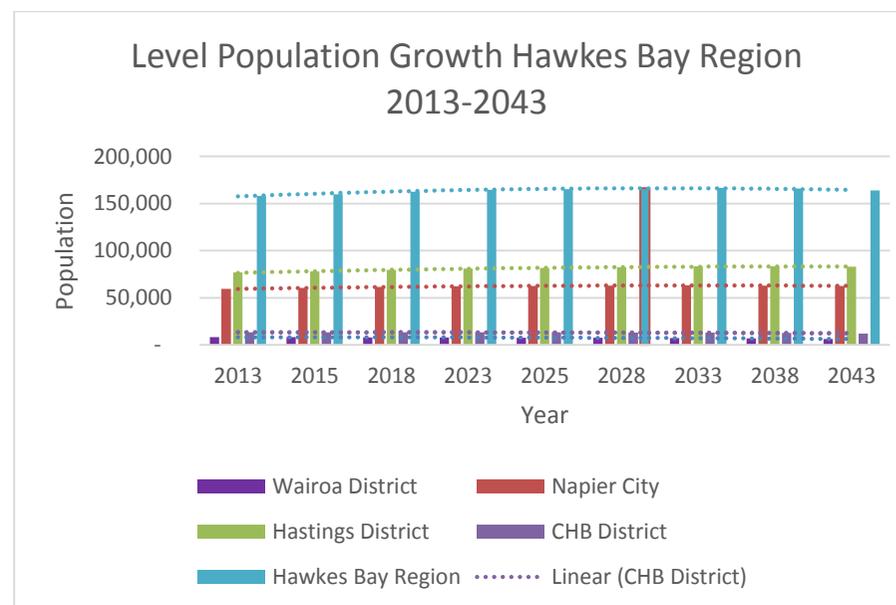
The table and graph below show predicted population changes in the Hawke’s Bay region and each of the districts that make up the region. The analysis set out below is based on a continuation of the historical trend situation, that is, it reflects the Status Quo position and does not necessarily take into account the possible Ruataniwha Water Storage Scheme (RWSS).

Should this project proceed, the construction period for the RWSS and perhaps the first five years or so of its evolving operation will occur within the next 10 years. In the longer term approximately a third of the total regional multiplied GDP impact of the RWSS construction and almost 60% of its total regional GDP impact in relation to increased farm production and processing arising from the RWSS, will occur within just the CHB District alone, as distinct from the remainder of the region.

The Statistics NZ most optimistic or ‘High’ population growth figure for HB in Year 2043 is 188,300 compared to the Medium or Status Quo figure of 164,000. The RWSS would have been operating for a period of some 20 years by 2043. Significantly higher household growth will be associated with the higher population figure. After 2025, annual average regional economic growth of possibly around 2-2.5% could be assumed for HB, over the period. Population growth in Central Hawke’s Bay will have little or no impact on HBRC infrastructure assets, as the Upper Tukituki Scheme provides flood protection for floods with a 1% chance of exceedance in any one year. Initial assessment of the costs versus benefit show no strong justification for increasing this level of service should the RWSS proceed.

The potential for population growth on the Heretaunga Plains will be taken into account in the levels of service reviews for the individual catchment areas programmed to be undertaken over the next several years.

Population Growth predictions					
Year	Wairoa District	Napier City	Hastings District	CHB District	Hawkes Bay Region
2013	8,300	59,600	76,700	13,250	158,000
2015	8,210	60,320	77,820	13,290	159,760
2018	8,070	61,400	79,500	13,350	162,400
2023	7,820	62,300	81,100	13,350	164,600
2025	7,710	62,540	81,620	13,290	165,240
2028	7,540	62,900	82,400	13,200	166,200
2033	7,190	63,200	83,200	12,950	166,600
2038	6,760	63,000	83,400	12,550	165,800
2043	6,260	62,500	83,000	12,050	164,000



HBRC manages a number of Schemes in the Wairoa area. It is essential that the Schemes remain affordable to their benefiting community. As the majority of the Schemes service rural areas, this means that farming operations must be able to remain profitable and the cost of maintaining Schemes continues to be exceeded by the value of the benefit provided.

While little population growth is expected to occur within Hawke's Bay, the average number of people occupying each house is reducing and is expected to continue to reduce. Drainage catchment areas servicing urban and peri-urban areas need to accommodate this trend. This will be considered in the programmed reviews of these areas.

4.2 Changes in Community values

The flood control and drainage schemes administered by Council were designed to modify the natural environment. Today the community values its natural environment and through the Resource Management Act 1991, requires that any adverse effects of future modifications to the natural environment are avoided or mitigated.

Public increasingly seek values in addition to the original single purpose of flood protection at the time many of the Schemes were established. There are significant opportunities within scheme areas, particularly where they include river and stream corridors, for these to be enhanced for aquatic and terrestrial biodiversity, and for public recreation.

The flood control Schemes have substantially reduced the incidence of major flooding in Hawke's Bay. As a result many of the Hawke's Bay public and businesses have little or no knowledge of the potential impact of a major flood on them and are not well prepared for the consequences should a significant flood occur.

The National Policy for Freshwater Management increases the focus on water quality in the region's rivers. HBRC leases for grazing the major flood channels of the Heretaunga Plains Flood Control and Drainage Scheme and has established fencing where necessary to prevent cattle entering water. Grazing is a cost effective way of maintaining a short dense grass sward over the berm areas and stopbanks to reduce the risk of localised scour in a flood event and to minimise fire risk. However there

is now an increasing expectation that stock will be excluded from the vicinity of waterways. The presence of fences is resented by a portion of the community. In the long term there is likely to be an expectation that significant areas of Scheme land currently grazed are managed through other approaches. This will result in increased costs as alternative means of maintaining appropriate vegetative cover on these areas will need to be found.

4.3 Treaty of Waitangi Settlements

Treaty of Waitangi settlements will facilitate increased kaitiakitanga over the rivers and their environs by Maori and therefore increase HBRC's involvement with Maori. Cultural values impacted by activities associated with the ongoing operation, maintenance and improvement of flood control and drainage Schemes and their environment will be of greater importance.

Section 5 – Significant Assumptions

Significant Assumption	Risk & Impact
<p>Budgets have been prepared on the basis that there will be no flood events in the next 10 years that cause major damage to HBRC’s flood protection and drainage assets.</p>	<p>There is always a risk of a flood event occurring that causes damage to flood control or drainage assets. Flood control assets in particular are designed to fail in a limited way during times of significant or prolonged flood flows in the rivers. HBRC holds reserve funds to meet the cost of minor flood damage repairs, and insurance for repairs following a major event. Maintenance programmes and associated budgets will need to be reviewed following a significant event</p>
<p>Current arrangements for gravel extraction will continue</p>	<p>The maintenance of the design flood capacity in river flood control schemes is reliant on the ongoing extraction of gravel by commercial gravel extractors. The economic downturn over the past several years has resulted in the significant reduction in gravel extraction particularly from the Upper Tukituki Scheme rivers. This has resulted in accretion of the river beds within the Scheme area and a reduction of flood carrying capacity.</p> <p>If commercial gravel extraction is inadequate to prevent accretion of river beds, an alternative approach will need to be determined.</p>
<p>HBRC maintains its current policy with regard to responsibility for funding of existing and new flood protection and drainage works</p>	<p>HBRC currently funds flood control and drainage schemes through a mixture of targeted rates and general funding. The current level of funding provides for the maintenance of designed levels of service (on the assumption that commercial gravel extraction is adequate to maintain scheme flood capacity).</p> <p>If funding is reduced the ability to maintain the current level of service provided by Schemes will be compromised.</p>
<p>There will be no changes to legislation that impact on the role of the Regional Council in land drainage and river control</p>	<p>Flood Control and Drainage Schemes have been established in accordance with the Soil Conservation and Rivers Control Act 1941. This Act provides specific powers to HBRC that enable it to protect assets on private land and to undertake works necessary to continue to deliver the Scheme levels of service.</p> <p>This legislation and the powers it provides are essential for HBRC to carry out its functions. Any changes to this legislation or the powers it provides may result in significant work and or expense for scheme beneficiaries and the region.</p>

Significant Assumption	Risk & Impact
<p>The current multi value approach to the management of waterways managed under the major schemes will continue to be accepted by the community, without the need for additional formal governance or co-management arrangements imposed under new Treaty of Waitangi Settlement legislation.</p>	<p>The construction of flood protection and drainage systems has resulted in significant changes to the natural hydrology of their associated catchments. These changes have included a reduction in areas frequently flooded, diversion and straightening of waterway reaches, removal of streamside vegetation, and the use of structures to control flows and erosion.</p> <p>These changes and the ongoing methods used to maintain the schemes have resulted in adverse effects on river and stream ecology and habitats, as well as affecting the social and cultural values of the waterways. HBRC has initiated an enhancement programme, including alternative management of riparian areas, which will promote improvements in water quality and aquatic and terrestrial habitats.</p> <p>HBRC is currently working with Iwi and hapu to enhance waterways. This work is programmed to continue, however there is the potential for a significant increase in demand for this type of work.</p>
<p>Budgets have been prepared on the basis that there will be no new flood control and drainage schemes established within Hawke’s Bay.</p>	<p>HBRC are approached by property owners from time to time requesting that HBRC, using their powers under the Soil Conservation and Rivers Control Act 1941, provide protection to their property. HBRC are willing to consider the establishment of new Schemes where there is a community willingness to meet a significant portion of the cost of any new works and its ongoing maintenance.</p>
<p>Budgets have been prepared on the basis that any changes to levels of service as a result of population growth will be considered as part of levels of service reviews.</p>	<p>The majority of Schemes to be reviewed over the next 6 years. It is possible that these reviews will result in changes to the predicted level of capital expenditure included in this Strategy.</p> <p>There is potential that the RWSS may result in greater than predicted population growth in Hawke’s Bay. A decision on whether or not to this project will proceed is expected to be made prior to levels of service reviews being completed.</p>