

2018-2028 PARKS ASSET MANAGEMENT PLAN  
*He Rautaki Whakahaere Rawa mō Ngā Papa Whānui*

# STRUCTURES NGĀ HANGATANGA

VOLUME ONE | PUKAPUKA TUATAHI



Mountain to Sea  
Te Kaunihera-ā-Rohe o Ngāmotu  
**NEW PLYMOUTH DISTRICT COUNCIL**  
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# DOCUMENT CONTROL

Document Name	2018-2028 Parks Asset Management Plan Volume 1 - Structures
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# 1. INTRODUCTION

This volume provides details of the asset lifecycle management for the **Structures** asset category of the Parks AMP. The framework and key elements of the overall asset management plan are outlined in Table 1.

**Table 1 Asset management document summary**

No.	Document Name	Key Document Contents
1	Long Term Plan (LTP)	Infrastructure Strategy <ul style="list-style-type: none"> <li>• Strategic Framework</li> <li>• Guiding Themes</li> <li>• High Level Information for Each Asset Class</li> </ul> Council Services <ul style="list-style-type: none"> <li>• High Level Information</li> <li>• Levels of Service</li> <li>• Financial Plan</li> </ul>
2	Asset Management Strategy	General Asset Management Principles and Overview
3	Asset Class General Volumes	General Information and Glossary about each asset class <ul style="list-style-type: none"> <li>• Executive Summary</li> <li>• Introduction</li> <li>• Levels of Service</li> <li>• Future Demand</li> <li>• Risk Management Plan</li> <li>• Financial Summary</li> <li>• Plan Improvement and Monitoring</li> </ul>

4	Asset Category Lifecycle Management Volumes	Asset Life Cycle Management for each asset category within each asset class <ul style="list-style-type: none"> <li>• Description</li> <li>• Condition</li> <li>• Remaining Lives</li> <li>• Valuation</li> <li>• Operations &amp; Maintenance</li> <li>• Renewals</li> <li>• Acquisition and Augmentation</li> <li>• Disposals</li> <li>• Annual Work Plan</li> <li>• Risk Management</li> <li>• Financial Summary</li> <li>• Improvement Plan</li> </ul>
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## Purpose and Key Issues

In providing parks and open spaces we create opportunities for community recreation, areas of scenic interest, off road linkages, and urban 'lungs' in the natural environment in predominantly built-up landscapes. This volume includes general structures, bridges and foreshore protection assets.

For general structures, our purpose is to provide high quality facilities or structures for use by the public within parks and reserves. Structures include archways, grandstands, shelters jetties, boat ramps, decks, pedestrian ramps, fences, gates, walls, steps, barriers and weirs.

Bridges include pedestrian bridges, vehicular bridges, suspension bridges and tunnels. They provide connectivity for the walkways and roads that belong to the Parks portfolio. Foreshore protection covers the structures involved with rock/boulder sea walls, combo rock/concrete seawalls, large rock/boulder rivers groynes, and concrete river groynes. Foreshore protection structures protect the foreshore from erosion and provide the supporting structure for walkways and cycle ways.

# 1. INTRODUCTION

The key issues facing Parks structure assets are:

- Level and timing of renewal programmes
- Managing increased demand for more and improved facilities while at the same time protecting the natural character and values in parks.
- Providing quality standard assets wherever possible, while allowing for diversity in design for special areas.
- Monitoring and managing the impact of wave action and storm events on coastal protection works and other major infrastructure.
- Legal obligations for fencing with neighbours under the Fencing Act 1978.

## Levels of Service

The levels of service for the operations, maintenance, renewals and minor improvement of structures in the Parks service are included in Section 3 of the Parks General AMP volume.

Related policies include:

- General Policies for Council Administered Reserves (P06-003) 2006
- Coastal Strategy 2006
- Coastal Erosion Strategy 1995

## Related management plans include:

- New Plymouth District Neighborhood Reserves Management Plan 2009
- Waitara Neighborhood Parks Management Plan 2009
- Coastal Reserves Management Plan 2006 Pukekura Park Management Plan 2004
- Historic Reserves Management Plan 2010
- New Plymouth District Cemeteries Management Plan 2012
- Lake Mangamahoe Management Plan 2011
- Sports Parks Management Plan 2012
- Barrett Domain Management Plan 2013
- Tongaporutu Reserve Management Plan 2015

## Future Growth

Future demand on the Parks service is driven by domestic growth across the district generally and at specific land development areas e.g. Area Q. Regulations require that developers of new subdivisions create green areas and provide access to recreational facilities, which creates additional assets for us to maintain.

General projects responding to planned growth areas in the district are included in the Parks General volume.

**Note:** All financial forecasts are shown in inflation adjusted dollar values.

# 2. LIFECYCLE MANAGEMENT PLANS

## 2.1 Asset Description

Structures assets are classified into the three categories: general structures, bridges, and foreshore protection. The number of assets in each category is shown in Table 2.

**Table 2 Asset summary**

Asset Category	Number
General Structures	9,905
Bridges	113
Foreshore Protection	55

### 2.1.1 General Structures

General structures include a variety of assets as summarised in Table 3. These assets are constructed from a range of materials including ponga, timber, concrete etc.

**Table 3 General structures asset summary**

Asset Type	Number
Archway - Decorative	2
Band Rotunda	2
Barrier - 3 Wire Fence And Galvanised Poles On Lookout	1
Concrete Deck	1
Concrete Stage	1
Deck	24
Deck (Boardwalk)	6
Earth Dam	1
Fernery Tunnel #1	1
Fernery Tunnel #2	1
Fernery Tunnel #3	1
Fernery Tunnel #4	1
Fernery Tunnel #5	1
Flag Pole	1
Grandstand	1
Handrail - Chain Link And Pole Along Track (Paritutu Rock)	1

Handrail - Wooden Adjoining Steps (Paritutu Rock)	1
Information Cabinet	2
Jetty	2
Lake Edge - Geocloth Retaining Wall	12
Lake Edge - Timber Retaining Wall	7
Model Boat Launch Jetty	1
Retaining Walls - Concrete Retaining Wall	5
Retaining Walls - Geocloth Wall	2
Retaining Walls - Geogrid Reinforced Soil Wall	3
Retaining Walls - Rock Retaining Wall	2
Retaining Walls - Timber Retaining Wall	10
Shed	2
Shelter	9
Staircase - Wooden (Paritutu Rock)	1
Steps - Boxing Type [150+] (Paritutu Rock)	1
Steps (Swimming Pool To Road)	1
Steps And Platforms	1
Vehicular Ramp - Concrete	1
Water Wheel	1
Weir Structures	2
Weir Structures - Concrete With Timber Gate	1
Weir Structures - Timber	1
Welcome Sign	2
Fences (47,815M)	304
Gates	350
Walls	158
Steps	5,981
Barriers	2,996
<b>Total</b>	<b>9,905</b>

# 2. LIFECYCLE MANAGEMENT PLANS

## 2.1.2 Bridges

Our 113 bridge assets include pedestrian bridges, vehicular bridges, suspension bridges and tunnels. Bridges are constructed from a variety of materials including concrete, timber, concrete/steel, earth covered with concrete beam, steel and timber/steel.

## 2.1.3 Foreshore Protection

The 55 foreshore protection assets in this category include rock and/or boulder sea walls, large rock/boulder river groynes, concrete river groynes and coastal walkway decks.

Our well maintained and updated EAM asset inventory means the data presented on the quantity and type of the assets in this AMP is classed as grade **B – Reliable**.

## 2.2 Asset Condition

Asset condition grades are given in accordance with Section 5 of the Asset Management Strategy.

### General Structures

For the purpose of assessing condition, general structures are split into two categories:

i) Miscellaneous low risk assets include steps, fences, gates, walls and barriers. Most of these assets were last inspected in 2013 with a selection of higher profile assets inspected in 2017. The majority of these assets are less than 30% through their useful lives. Based on this, 75% of these assets were graded very good or good condition. We also assess the condition of miscellaneous assets during maintenance and inspections and may plan repairs and renewals based on these inspections.

ii) There are 121 significant structures. These are higher risk structures and include all the other asset types listed in the table above e.g. grandstands. We contract external engineering consultants to conduct condition and valuation assessments of these assets every three years. Many of these assets are high use, with high visibility and high individual replacement cost. The significant general structure condition grades are shown in Figure 1.

Figure 1 Significant structures condition grades



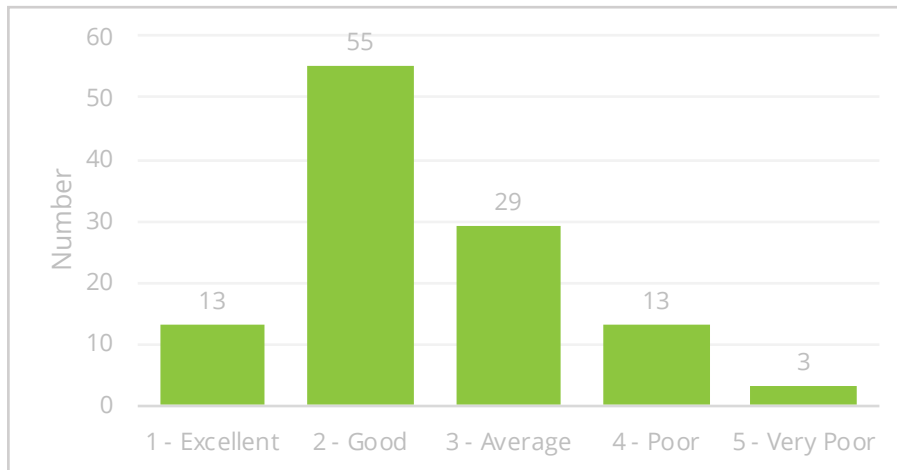


# 2. LIFECYCLE MANAGEMENT PLANS

## Bridges

An external engineering consultant conducts condition assessments and valuations for bridge assets every three years. Many of these assets are high use, with high visibility and high individual replacement cost. The overall condition grades for bridge assets are shown in Figure 2.

Figure 2 Bridges condition grades



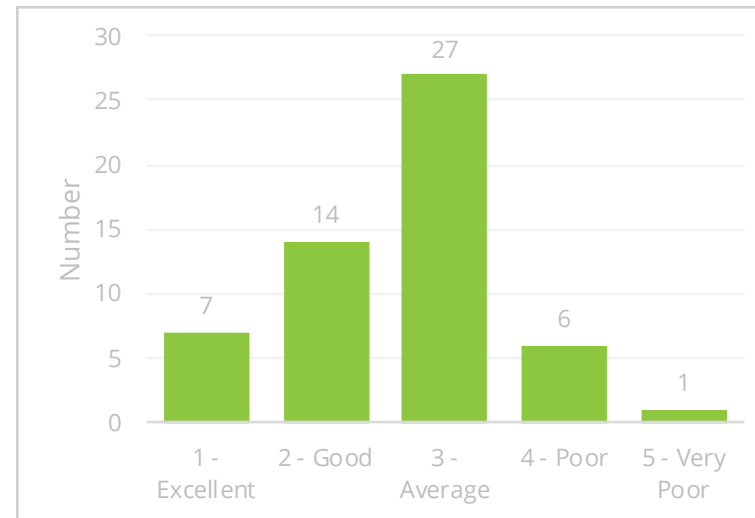
We have proposed a risk assessment and prioritisation of Parks bridges using the methodology applied to transportation bridges (refer Transportation AMP: Volume 2 – Bridges and Structures). This includes assessing factors such as flooding, seismic exposure, year of construction, corrosiveness, material, scour condition, etc.

We are also proposing to inspect bridges the same way as our Transportation bridges to ensure a consistent and rigorous approach is taken to these significant high criticality assets. **This is an improvement action and is recorded in Section 5 – Improvement and Monitoring Plan.**

## Foreshore Protection

An external engineering consultant conducts condition assessments and valuations of our foreshore protection assets every three years. Many of these assets are high use, with high visibility and high individual replacement cost. The condition grades for foreshore protection assets are shown in Figure 3.

Figure 3 Foreshore protection condition grades



The data presented on the condition of the assets in this AMP is classed as grade **B – Reliable** due to the data being based on sound records, procedures and regular condition inspections.

# 2. LIFECYCLE MANAGEMENT PLANS

## 2.3 Asset Remaining Lives

The remaining life of an asset generally depends on its construction materials, with variation based on usage and environment.

### General Structures

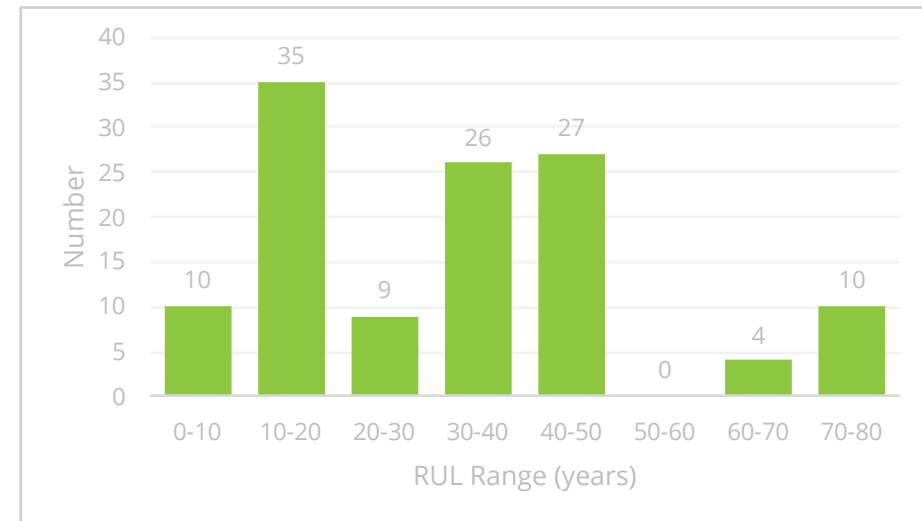
The average expected remaining lives for general structures assets are shown in Table 4.

**Table 4 General structures average expected lives**

Asset Category	Average Expected Life
Archways	50
Band Rotundas	80
Grandstands	80
Shelters	48
Jetties	46
Boat Ramps - concrete	30
Boat Ramps - precast	30
Decks	36
Pedestrian ramps (concrete)	72
Vehicular Ramps	80
Vehicular ramps	50
Fences (47,815m)	25
Gates	25
Walls - restricted access	75
Walls - retaining ponga	25
Walls - retaining wood	67
Walls - retaining concrete/stone	75
Walls - geo-cloth/geogrid	50
Steps - concrete	75
Steps - wood	20
Barriers - wood, steel	23
Barriers - Steel, concrete	25
Weirs	50

The remaining useful life of significant general structure assets was assessed during the 2016 condition assessment and valuation. The results of the assessments are shown in Figure 4.

**Figure 4 General structures remaining useful lives**



# 2. LIFECYCLE MANAGEMENT PLANS

## Bridges

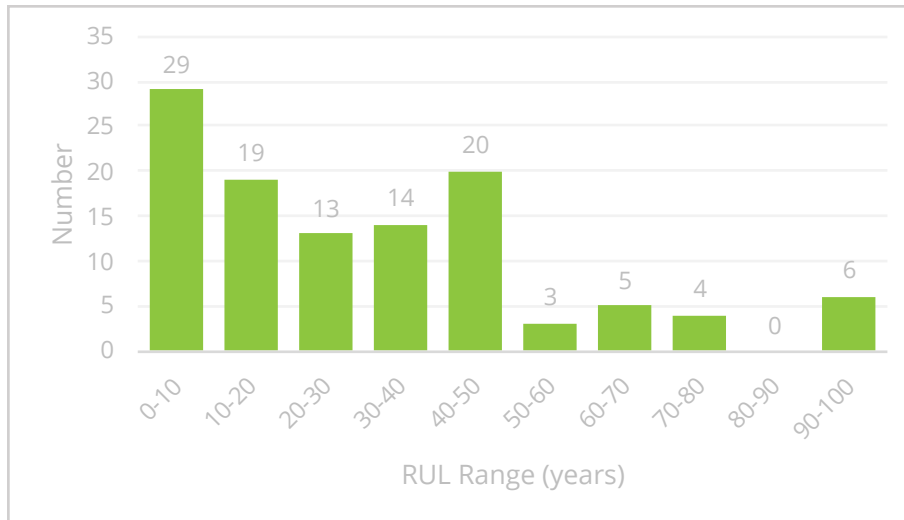
The average expected remaining lives for bridges assets are shown in Table 5.

**Table 5 Bridges average expected lives**

Asset Category	Average Expected Life
Pedestrian bridges wood, concrete	50-80
Vehicular bridges wood, concrete	50-80
Suspension bridges	50
Tunnels	80

The remaining useful life of bridges assets was assessed during the 2016 condition assessment and valuation. The results of the assessments are shown in Figure 5.

**Figure 5 Bridge remaining useful lives**



# 2. LIFECYCLE MANAGEMENT PLANS

## Foreshore Protection

The average expected remaining lives for foreshore protection assets are shown in Table 6.

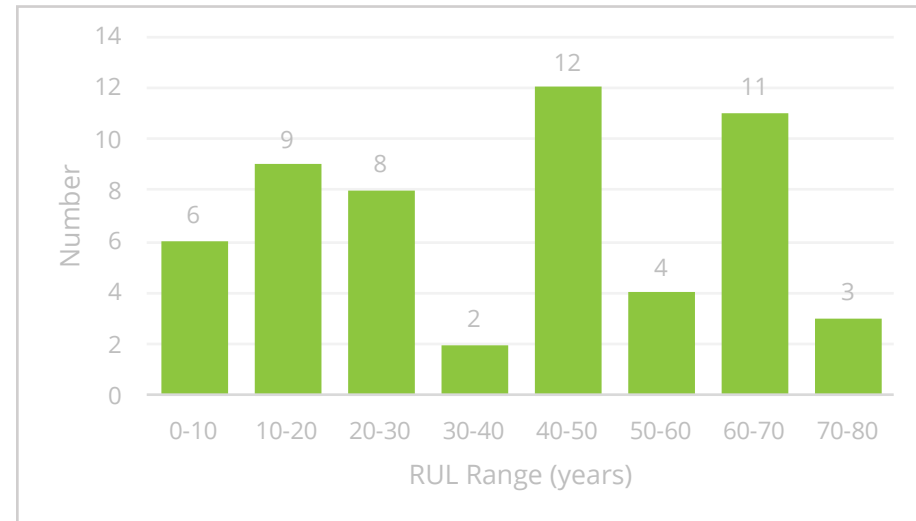
**Table 6 Foreshore protection average expected lives**

Asset Category	Average Expected Life
Rock/boulder sea walls	80
Combo rock/concrete sea walls	60
Large rock/boulder river groynes	60
Concrete river groynes - concrete, boulders	77-80

The remaining useful life of the foreshore protection assets was assessed during the 2016 condition assessment and valuation. The results of the assessments are shown in Figure 6.

Over recent years there has been a number of events that have significantly affected the condition of the sea wall structures that have required significant repair and renewal works. The increased frequency of adverse weather conditions e.g. cyclone Gita and rising sea levels associated with climate change may affect the average expected life of the sea wall structures. A more detailed risk and criticality assessment of the foreshore protection assets will also be conducted. **This is an improvement action and is recorded in Section 5 – Improvement and Monitoring Plan.**

**Figure 6 Foreshore protection remaining useful lives**



The data presented on the remaining life of assets in this AMP is classed as grade **B – Reliable** due to the data being based on sound knowledge, standards, guidelines and regular estimates of remaining useful lives by engineering consultants.

## 2.4 Asset Valuation

As at 30 June 2016, the value of Parks structures assets is shown in Table 7.

**Table 7 Asset valuation**

Description	Gross Current Replacement Value (GCRC) (\$)	Annual Depreciation (\$)	Optimised Depreciated Replacement Cost (ODRC) (\$)
General Structures	16,074,095	394,336	10,289,979
Bridges	10,836,500	119,644	8,098,070
Foreshore Protection	16,982,196	285,521	10,690,575
<b>Total</b>	<b>43,892,791</b>	<b>799,501</b>	<b>29,078,624</b>

The data accuracy and confidence level is rated as **B - Reliable**. Values are from the 2016 statutory valuation.

Valuation of the low risk assets was conducted in detail by internal staff and the significant high risk assets by and external engineering consultant. The internal valuation was subject to peer review and endorsed by Beca consultants.

## 2.5 Operations and Maintenance

We identify scheduled maintenance requirements for structures during inspections. As already stated, condition assessments of all structures are conducted every three years in conjunction with the certified valuation process. These consultant reports indicate items of maintenance for bridges, built structures (such as decks, grandstands, shelters) and foreshore protection works. Our programmes teams then schedule the work. In-house Parks staff assess other assets (such as fences, barriers) and identify maintenance items to the programmes team. Annual inspections of structures assets are now programmed into Routine Operations and Management. Note: other foreshore protection assets such as dune plantings are included in Volume 6 – Soft Assets.

Reactive maintenance is generally in response to customer enquiries, referrals, or complaints and is recorded through the Service Request (formerly INFRA) system. This system documents and tracks our response times to the issue. Much of our reactive maintenance is in response to vandalism and graffiti removal.

Routine maintenance now includes regular inspections of minor structures by Parks staff, and scheduled maintenance carried out by both staff and contractors. Several key staff have trained in inspection processes to make information gathering more robust and consistent.

The requirement for major repairs is infrequent and is most likely to be as a result of extreme weather or storm events. However, over recent years the frequency of more significant weather events due to climate change mean that we expect more frequent major impairment of foreshore protection assets.

The general 10-year Opex forecast for Parks assets is included in the Parks General Volume.

# 2. LIFECYCLE MANAGEMENT PLANS

## 2.6 Renewals Plan

As structural assets continue to age, more investment in renewal is required to maintain current reliability levels. Renewals are selected based on the information collected during condition assessments and inspections.

We have included a general annual provision for any minor renewals that may be required during the period of the plan. All other items are specific to particular assets and are based on our knowledge of their condition and the predicted year renewal will be required.

As noted previously, our future proposal is to select bridge component renewals using the methodology that is used for transport bridges. This includes a risk analysis matrix to account for seismic exposure, flooding, condition rating and age etc.

The financial forecast for structures renewals is shown in Table 8. The full renewal cost has been included for the Onaero Domain Bridge in 22/23 but this will be subject to a full strategic review of the use of the domain. This review will determine the future requirements for the bridge and the most economical renewal options.

**Table 8 Renewals expenditure forecast**

Structures, Bridges, Foreshore Protection Renewal Forecast (\$000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
PK1016 - Structures renewals - parks and reserves	26	27	27	28	29	29	30	31	31	32	290
PK1017 - Bridges renewals - parks and reserves	30	31	32	32	33	34	35	35	36	37	335
PK2003 - Pukekura Park Terrace Refurbishment	570	-	-	-	-	-	-	-	-	-	570
PK2022 - Foreshore Protection Renewal - Kawaroa Park Large Concrete B	-	-	-	-	-	180	-	-	-	-	180
PK2030 - Tongaporutu Boat Ramp Renewal	-	-	74	-	-	-	-	-	-	-	74
PK2031 - Onaero Boat Ramp Renewal	-	-	-	-	-	-	-	71	-	-	71
PK2038 - Bell Block Boat Ramp Renewal	-	-	-	-	-	-	34	-	-	-	34
PK2039 - Back Beach Vehicle Ramp Renewal	-	-	-	-	-	-	-	-	-	31	31
PK2040 - Fitzroy Surf Club Access Ramp Renewal	-	-	-	-	-	-	-	-	30	-	30
PK2041 - Foreshore Protection Renewal - Kawaroa Concrete Nib Wall	-	-	26	-	-	-	-	-	-	-	26
PK2044 - Onaero Domain Bridge Renewal	-	-	-	111	821	-	-	-	-	-	932
<b>Total</b>	<b>626</b>	<b>58</b>	<b>159</b>	<b>171</b>	<b>883</b>	<b>243</b>	<b>99</b>	<b>137</b>	<b>97</b>	<b>100</b>	<b>2,573</b>

## 2.7 Acquisition and Augmentation Plan

### Acquisition

Any new assets installed by developers to serve new domestic and non-domestic developments are usually vested in us. Assets are built to our NZS4404: 2010 – Land Development and Subdivision Standard and to the specific requirements as defined in New Plymouth District Council (NPDC) and South Taranaki District Council (STDC) adopted standard for Land Development and Subdivision Infrastructure, which is based on NZS 4404:2010 with local amendments. When an asset is vested with us, we have full responsibility for the asset and it is included in our operations, maintenance and future renewal plans.

### Growth

We have no new structures projects related to growth planned during the period of the plan.

### Level of Service

The section of the foreshore between Kawaroa and Belt Road is subject to coastal erosion. To maintain levels of service we plan to renew (20%) and improve (80%) the foreshore protection assets in this area in 20/21. Expenditure required is show in Table 9.

**Table 9 Level of service expenditure forecast**

Structures, Bridges, Foreshore Protection Level of Service Forecast (\$000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
PK2010 - Kawaroa to Belt Road Cliff Erosion & Seawall	-	109	835	-	-	-	-	-	-	-	944
<b>Total</b>	-	109	835	-	-	-	-	-	-	-	944

## 2.8 Disposal Plan

Disposal is the retirement or sale of assets when they become surplus or superseded by new or improved systems. Assets may become surplus to requirements for any of the following reasons:

- Under-utilisation
- Obsolescence
- Provision exceeds required level of service
- Replacement before end of predicted economic life
- Uneconomic to upgrade or operate
- Policy changes
- Service provided by other means (e.g. private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social)

No asset disposals are planned over the 10 year AMP period.

# 3. RISK MANAGEMENT PLAN

## 3.1 Critical Assets

We have not yet assessed the criticality of Parks structures. As mentioned previously, we plan to apply the bridge risk and criticality assessment system that was recently developed for transportation bridges to our Parks bridge assets. This will give us a better understanding of where any significant risks exist and assist in our renewal planning. A similar criticality assessing of foreshore protection assets will also be conducted. **This is recorded as an action in Section 5 – Improvement and Monitoring Plan.**

## 3.2 Risk Assessment

Details of our Risk Management Framework are included in section 6.2 of the Parks General AMP volume and section 7 of the Asset Management Strategy.

## 3.3 Infrastructure Resilience Approach

Some Parks structures are at risk of catastrophic failure as a result of natural hazard events such as earthquakes, tsunami and floods. For example, it is only in the last forty years that bridge design has incorporated modern earthquake standards (incorporating ductility). Further to this, insufficient hydraulic capacity or blockage of a bridge can mean failure of the bridge to pass surface runoff during high rainfall events. This can cause backup of floodwater, flooding problems and washouts, forcing road closures and damage to adjacent property. Over recent years the frequency of more significant weather events due to climate change mean that we expect more frequent major impairment of foreshore protection assets. We will consider opportunities to build additional resilience into bridges and other structures as we complete the risk and criticality assessments covered in 3.1 above.





# 4. FINANCIAL SUMMARY

A summary of the Capex forecasts included in this volume is shown in Table 10.

**Table 10 Capex forecast summary**

Structures, Bridges, Foreshore Protection Forecast Expenditure (\$000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Renewals	626	58	159	171	883	243	99	137	97	100	2,573
Service Level	-	109	835	-	-	-	-	-	-	-	944
Growth	-	-	-	-	-	-	-	-	-	-	-
Total	626	167	994	171	883	243	99	137	97	100	3,517

The Opex forecast for operations and maintenance is included in the overall Opex forecast for Parks as detailed in the LTP and included in the Parks General Volume.

# 5. IMPROVEMENT AND MONITORING PLAN

Our general Asset Management Maturity Improvement Plan is included in the Asset Management Strategy.

General improvements to Parks assets are included in the Parks General Volume. The specific areas of improvement identified for treatment plant assets are listed in Table 11.

**Table 11 Improvements summary**

No	Improvement Area	Owner	Start Date	End Date
1	Carry out bridge inspections in the same way that Transportation bridge inspections are conducted.	Asset Operations Planning Lead	Jul 2018	Jun 2019
2	Apply the risk and criticality system developed for Transportation bridges to the Parks bridges assets and review output and renewals plans if required.	Asset Operations Planning Lead	Jul 2018	Jun 2019
3	Review the average life expectancy of the sea wall structures due to increased frequency of adverse weather events associated with climate change and conduct risk/criticality assessment.	Asset Operations Planning Lead	Jul 2018	Jun 2019



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