

# Infrastructure Strategy



# Infrastructure Strategy

## INTRODUCTION

The Infrastructure Strategy (IS) identifies the significant infrastructure issues the New Plymouth District is likely to face over the next 30 years.

The IS is not a 30-year budget. Rather, it takes a long-term view of the infrastructure and services our communities will need over time, and how we might provide them. As well as identifying the key issues, the IS details the options we have for managing these issues and the implications of each of these options. It also outlines the Council's preferred response and how much it is likely to cost. Sitting alongside the Financial Strategy, the IS helps us avoid any major surprises in the future. In developing this strategy, we have considered:

- the infrastructure required to implement our strategic vision;
- how much the district will grow and where and when that growth will occur;
- the current state of our assets and the issues likely to arise over the next 30 years;
- the possible solutions to these issues and how much they will cost; and
- the impact of any decisions on levels of service, rates and debt.



## NEW PLYMOUTH DISTRICT

With an area of 2,324 square kilometres, the New Plymouth District is the tenth largest district in New Zealand. It's made up of New Plymouth City, our largest centre, and a number of surrounding settlements that support smaller communities and lifestyle living.

New Plymouth City is the focus for the region's economy, which is dominated by dairy farming, oil, natural gas and petrochemical exploration. The city is also the region's financial centre and home to Port Taranaki – the only deep-water port on the west coast of New Zealand. Lying 11km north of the city centre, New Plymouth's Airport is an important regional airport in New Zealand. New Plymouth is recognised as the tourist hub of the Taranaki region, which was named '2nd Best Region in the World to Visit' by Lonely Planet in 2017.

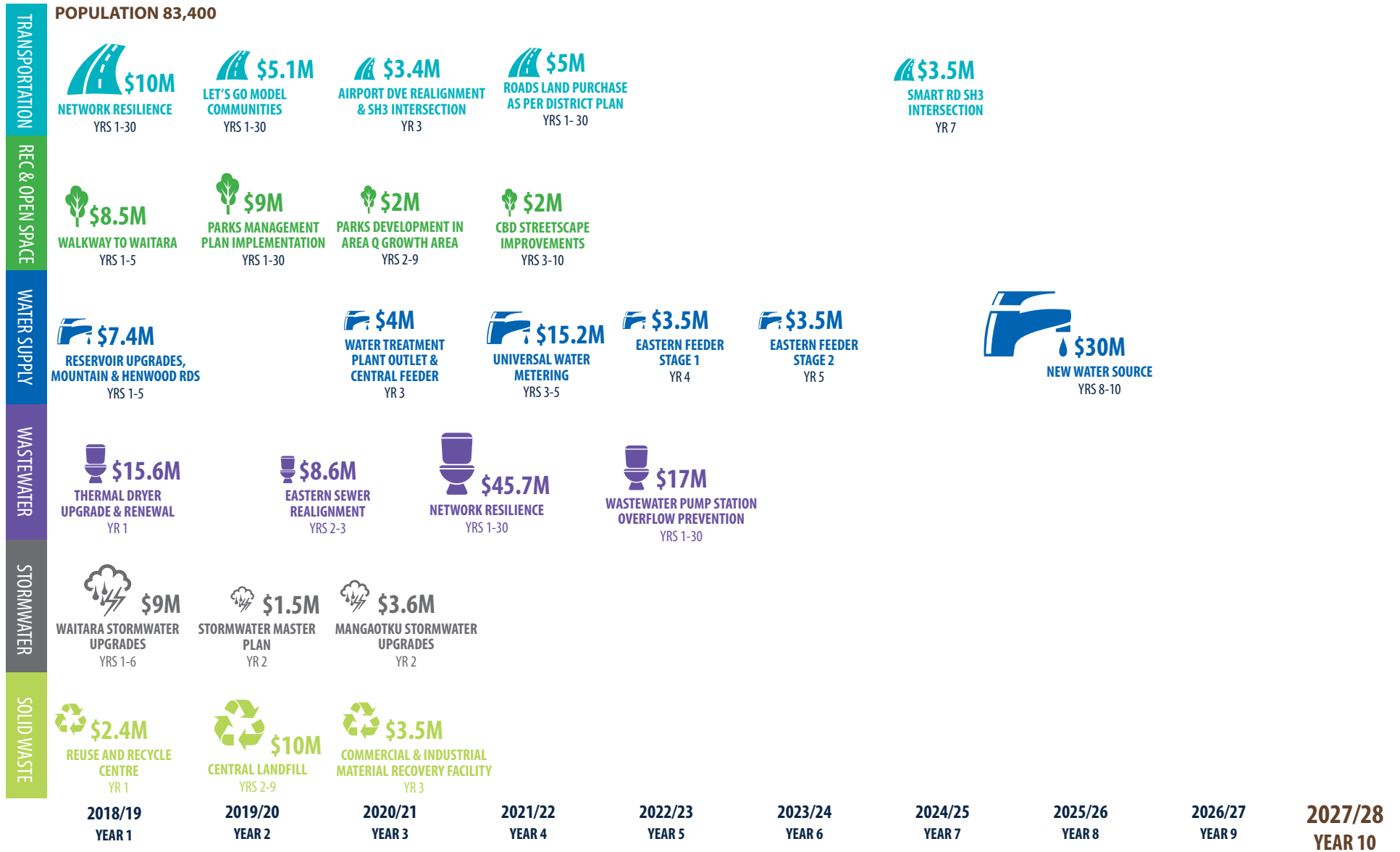
The district is currently experiencing high population growth and is expected to grow by 27 per cent by 2048. A significant proportion of those residents will be aged 65 years and over.

To support a vibrant and resilient district well into the future, it is important we manage our infrastructure assets both prudently and sustainably through future periods of growth and other pressures.

## STRATEGIC FRAMEWORK

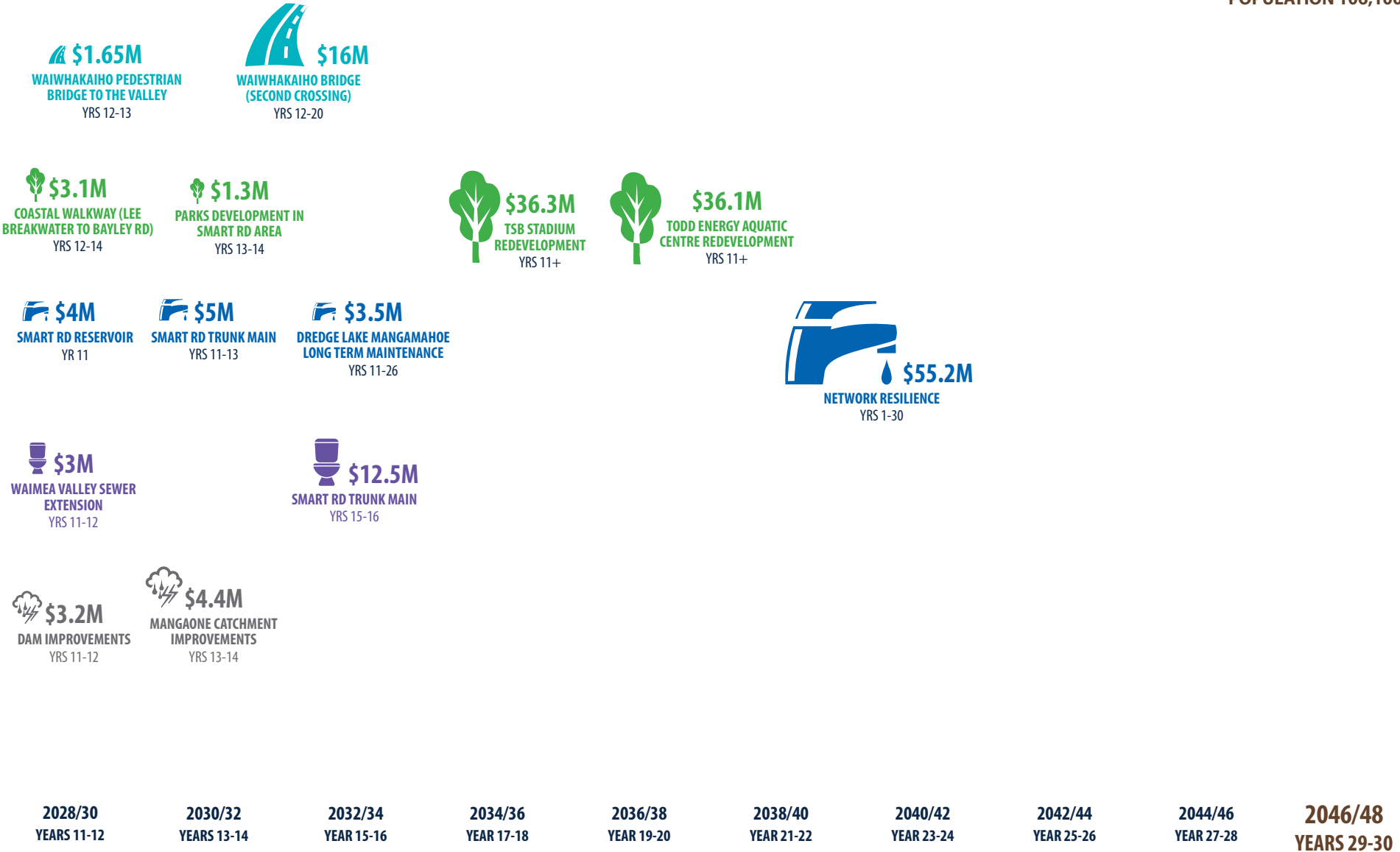
The Council's vision is for the Council, together with the community, to be *Building a Lifestyle Capital/He Whakatūtū Haupū Rawa Hei Āhua Noho*. This vision and its associated community outcomes *People/He Tangata, Place/Tiakina and Prosperity/Āwhina*, support our 30-year vision encapsulated in the District Blueprint. A copy of the Council's strategic framework can be found in the Strategic Direction section of the Long-Term Plan (LTP) 2018-2028.





# Our 30-Year Investment in Infrastructure

POPULATION 106,100



# THE VALUE OF OUR INFRASTRUCTURE



## GUIDING THEMES

### What we need to renew

Our greatest priority in managing infrastructure is to look after the infrastructure assets we've already got. Much like maintaining a car, it is important we maintain the condition of our infrastructure assets to make sure they perform, that they are safe and that they have as long and useful life as possible. We do this through renewals, by either replacing or fixing an infrastructure asset that provides essential services for our communities.

Renewals are funded from reserves, set aside annually from rates. Before any investment, we assess whether an asset is still required to meet the current levels of service. We use forecasting models to plan long-range renewal requirements and to ensure that the proper funding (funded depreciation) is in place. Rather than age, we have adopted a risk based approach using criticality and condition assessments to help prioritise the assets that need to be renewed first. An asset, or a component of an asset, will only be renewed if:

- The asset is failing to deliver the current level of service.
- The annual maintenance cost exceeds the annualised rate of consumption (annual depreciation).
- Continuing to operate the asset in its current condition is deemed to carry too high a risk.

Significant Renewal Projects	Year	Value
<b>Water reticulation network renewal</b> These are for network renewals identified through routine maintenance and asset management planning.	2018-2048	\$108.0m
<b>Transportation reseal and rehabilitation</b> Thirty-year programme to retain current level of resealing and rehabilitate sealed roads.	2018-2048	\$150.0m
<b>Wastewater reticulation network renewals</b> For network renewals identified through routine maintenance and asset management planning.	2018-2048	\$48.5m

<b>Replacement of the thermal dryer of Wastewater Treatment Plant</b> To replace the thermal dryer with significantly more energy efficient technology that has capacity to meet future sludge processing requirements.	2019-2021	\$15.0m
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### Condition and Performance of Assets

It is critical that New Plymouth District has clear knowledge of the condition of its assets and how they are performing. Condition data has been captured over a number of years for a range of assets. Our strategy is to improve our knowledge of asset condition and data management over time. Having reliable condition assessment data will help us to understand future expenditure requirements and make management decisions regarding maintenance, replacement and renewals.

The performance of an asset is its ability to provide the required levels of service to customers.

Activity	Condition Data	Certainty	Current Performance
Water	Seventy-three per cent of water pipes are rated moderate or better condition.	Certain	Aside from some unsatisfactory pressure management and Inglewood discolouration we are meeting required levels of service.
Wastewater	Fifty-two per cent of wastewater pipes are rated moderate or better condition.	Certain	Currently meeting required levels of service.

## Guiding Themes

Activity	Condition Data	Certainty	Current Performance
Stormwater	The asset base is in very good condition and on average has 65 per cent of its original life remaining.	Certain	Generally meeting levels of service with the exception of Waitara.
Flood Protection	The network is in very good condition.	Certain	Currently meeting required levels of service.
Transportation	The asset base is in good condition and has on average 57 per cent of its original life remaining.	Certain	Currently meeting required levels of service.

### *What if we don't maintain our assets?*

If we do not maintain and renew our assets appropriately they will deteriorate, and fail to deliver their intended services. They could also become unsafe for users or adversely affect the environment. Therefore, we plan for our long range renewal requirements and the associated costs to ensure our community enjoys consistent benefits from our infrastructure, both today and into the future.

## Response to growth

Our district is growing. In 2018, our population was 83,400, about two thirds of the Taranaki region. The population is projected to grow to 92,400 over the next 10 years and to 106,100 by 2048 (an increase of 27 per cent).

To meet our strategic vision and support a sustainable and connected community, we must plan for future growth. Planning ahead and making the appropriate infrastructure investment means we can service a growing number of residents, and ensure the district remains an affordable and desirable place to live.

Our District Plan identifies areas in the district that can best provide for future growth. The Infrastructure Strategy discusses how we plan to service these areas.

### *Growth strategy*

In accordance with the District Plan, our growth strategy can be summarised as follows.

*Identifying and providing land to meet the short, medium and long-term future growth needs of the district, while utilising existing infrastructure and ensuring a compact urban environment that enables growth in the following areas:*

- Existing undeveloped residential zoned areas in the short and medium term.
- Infill within existing residential areas in the short, medium and long term, e.g. large back yards.
- Southern growth areas of New Plymouth City in the medium term e.g. Hurdon, Ferndale, Vogeltown.
- Hillsborough in the long term.
- Rural townships where there is adequate infrastructure and growth is desired by those communities.

A Council priority is to encourage growth in those areas where there is existing infrastructure, or where it is relatively easy and inexpensive to extend that infrastructure and provide services.



**Central government policy**

The National Policy Statement on Urban Development Capacity (NPS-UDC) requires us to look at the district’s projected population growth and pre-empt market demand by unlocking and servicing land feasible for development. Figure 1 shows NPS-UDC projections of our annual housing requirements, calculated on an average household occupancy of 2.6 people.

We anticipate that new houses in undeveloped residentially zoned land and the new growth areas identified will enable us to meet these future housing requirements.

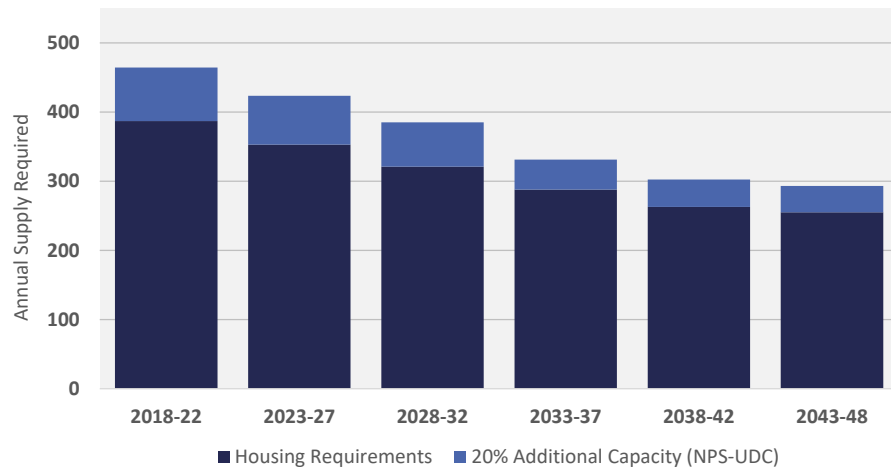


Figure 1: New Plymouth housing supply required under NPS-UDC



## Guiding Themes

### *Future growth areas*

The following table and map shows the areas in the district that have been identified for future growth and the year that they are likely to be zoned for residential development.

Growth Area	Year 1 2018/19 (lots)	Year 2 2019/20 (lots)	Year 3 2020/21 (lots)	Year 4 2021/22 (lots)	Year 5 2022/23 (lots)	Year 6 2023/24 (lots)	Year 7 2024/25 (lots)	Year 8 2025/26 (lots)	Year 9 2026/27 (lots)	Year 10 2027/28 (lots)	Yrs 11-15 2028-32 (lots)	Yrs 16-20 2033-37 (lots)	Yrs 21-25 2038-42 (lots)	Yrs 26-30 2043-47 (lots)
Urban infill (2nd dwelling)	179	179	179	179	179	179	179	179	179	179				
Undeveloped residential land	508	508	508	282	282	282	282	282	282	282				
Area Q	594							155						
Junction area	8					183					90	99		
Carrington area			264											
Ōākura south area		158												
Ōākura west area											390			
Okato area											57			
Frankley/Cowling area											680			
Waitara east area											76			
Smart Road area												600	2,990	

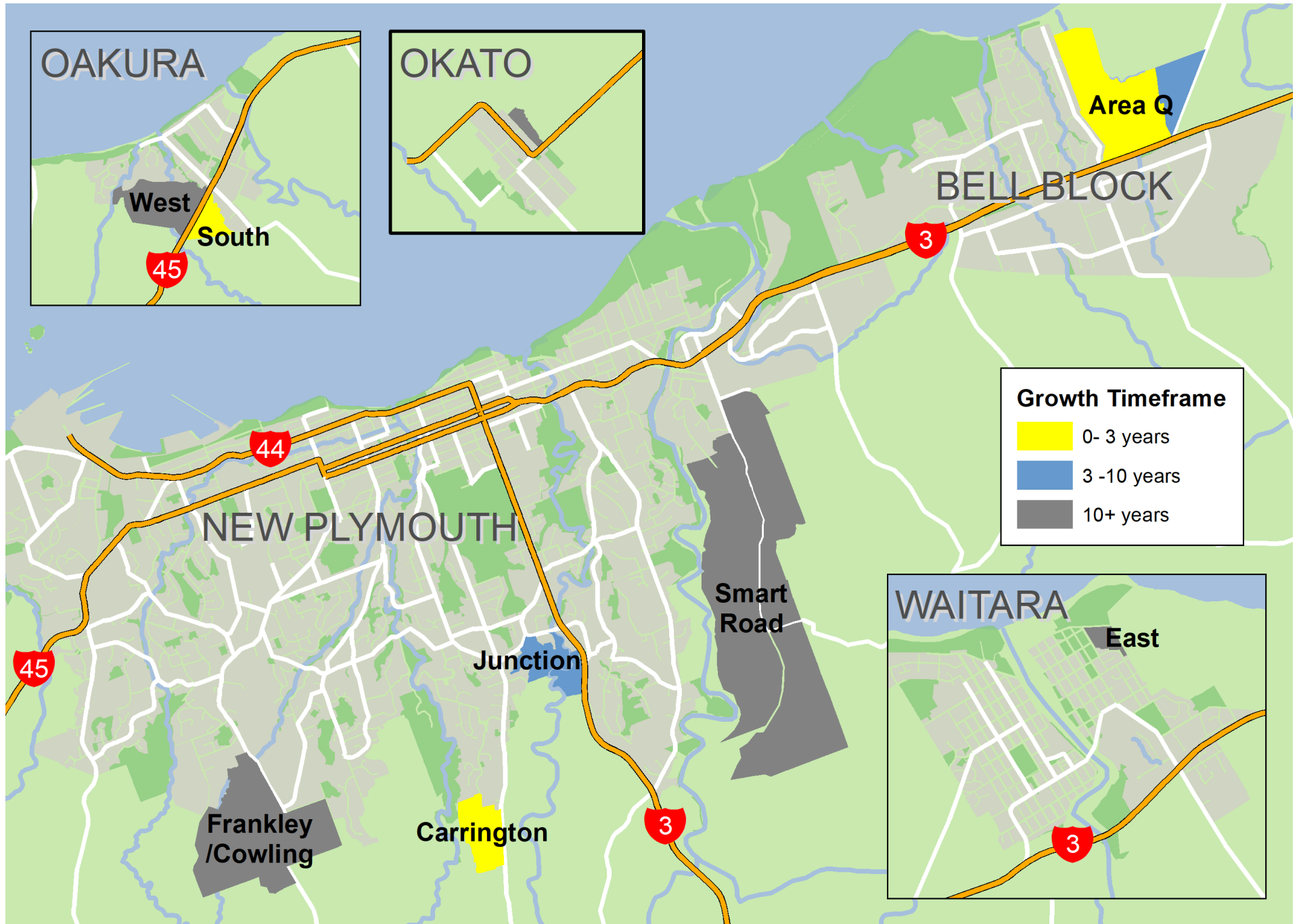


Figure 2: Planned residential growth map

## Guiding Themes

### Growth related infrastructure

We are planning to meet the needs of growth through efficient and cost effective infrastructure networks. We want to use network modelling tools to better understand and utilise the infrastructure we already have, and explore the implications of any infrastructure decisions we might make.

Future growth will require investment in both network wide infrastructure such as central processing plants and in upgrading or slightly extending existing infrastructure on the boundary of our urban areas.

Significant Growth Projects	Year	Value
<b>Water supply, wastewater and stormwater network modelling</b> Without network modelling, it is difficult to identify the capacity of our reticulation networks to accommodate future growth and where upgrades to the system are required. Network modelling provides the information we need to make the most beneficial and cost efficient decisions for reticulation infrastructure.	2018-2021	\$3.0m
<b>Transportation network modelling</b> Network modelling of our transportation network allows us to identify network capacity for future growth and make informed decisions about upgrade and extension requirements.	2021-2022	\$400,000
<b>Second bridge crossing over Waiwhakaiho River</b> Planning for a second Waiwhakaiho River crossing is critical to facilitate and cater for growth in the district. Adding an alternative crossing also contributes to the district's resiliency.	2030-2038	\$16.0m+

Significant Growth Projects	Year	Value
<b>Smart Road water, sewer and stormwater upgrades</b> The Smart Road area is earmarked for significant growth over the next 30 years and will require a significant investment in infrastructure.	2029+	\$25.9m
<b>Eastern wastewater network realignment</b> The eastern wastewater network realignment will streamline sewage flow entering the treatment plant from the east and provide for growth in this area.	2021-2022	\$8.6m
<b>Residential universal water metering</b> Installing water meters is a demand management response to help reduce our high water consumption. Both existing and new customers will pay for what they use, therefore a proportion of this is service level related.	2022-2025	\$15.2m
<b>Mountain and Henwood roads water reservoirs</b> There is limited capacity at both of these reservoirs. To cater for growth, a second reservoir is required at each location.	2018-2020	\$7.4m

### Who does what?

The Council intends to lead any large scale infrastructure projects in the district. We will recover a portion of expenditure required to service new growth areas from developers of those areas, in accordance with our Development Contributions Policy. Property developers are responsible for smaller scale and less complex infrastructure upgrades at the time they undertake their developments. The table on the next page shows how the responsibility for growth related infrastructure is split.

Council-provided Infrastructure	Developer-provided Infrastructure
<ul style="list-style-type: none"> <li>Water and wastewater treatment plant upgrades.</li> <li>Water reservoirs and connecting bulk mains.</li> <li>Wastewater interceptor pipes.</li> <li>Major arterial roads.</li> <li>Major pump stations.</li> <li>Sports parks and large destination parks.</li> <li>Community and events infrastructure – libraries, pools, stadiums etc.</li> </ul>	<ul style="list-style-type: none"> <li>Local water and wastewater pipes (sometimes upsized by the Council).</li> <li>Stormwater infrastructure for the development (sometimes up-sized by the Council).</li> <li>Collector roads, local roads, footpaths and street lighting (sometimes up-sized by the Council).</li> <li>Local reserves.</li> </ul>

### ***What if we don't plan for growth?***

Failure to plan sufficiently for projected growth may make housing less affordable as demand outweighs supply, and the district will become a less desirable place to live. In addition, unless appropriate investment takes place, our existing infrastructure will become unable to support the growing number of residents it is required to service.

### **Meeting community expectations**

Community expectations are the levels of service our community expects from the Council-provided services. A summary of our community expectations by activity is as follows.

	Community Expectations
Roading	A safe, reliable roading network with minimal interruptions and adequate parking with an appropriate quality is provided at an affordable cost that minimises harm to the environment.
Water	A continuous, adequate and reliable water service with minimal interruptions that is safe, clear and tastes good at an affordable price that minimises harm to the environment and maintains public health.
Wastewater	A continuous, adequate and reliable wastewater service with minimal interruptions at an affordable price that minimises harm to the environment and maintains public health.
Stormwater and Flood Protection	An adequate service that safeguards life, property and public health that is able to cope with extreme rainfall events at an affordable price that minimises harm to the environment.
Solid Waste	An adequate, regular refuse collection with well-maintained facilities in appropriate locations at an affordable cost that minimises harm to the environment and maintains public health.
Recreation and Open Space	Safe, secure, convenient parks facilities, sportsgrounds, and playgrounds that have adequate, clean toilets along with a quality zoo (with well cared for animals) that minimises harm to the environment, maintains the natural ecosystem and maintains public health outcomes.

## Guiding Themes

Significant Level of Service Projects	Year	Value
<b>TSB Stadium redevelopment</b> The redevelopment will cater for simultaneous sport and commercial events and meet the increasing needs of community sports and recreation.	2029+	\$36.3m+
<b>Todd Energy Aquatic Centre redevelopment</b> The redevelopment of the Todd Energy Aquatic Centre into a destination health and recreation facility would provide more capacity and service variety.	2029+	\$36.1m+
<b>New water source and treatment plant</b> With current projections, demand on the district's current water source is expected to exceed supply capabilities at some point. A new water source will be required.	2026-2028	\$30.0m
<b>Wastewater pump station overflow prevention</b> This includes installation of emergency storage (where practical) or investigation into alternate options where it is not practical (e.g. generators).	2019-2048	\$17.0m
<b>Commercial and industrial material recovery facility at Colson Road</b> We plan to develop a commercial and industrial material recovery facility at Colson Road.	2020-2021	\$3.5m
<b>Resource recovery facility at Colson Road</b> This facility will promote reuse and recycling and reduce the amount of recoverable residential, commercial and industrial waste going to landfill. Development of this area will involve community groups and activities, with an emphasis on education.	2018-2019	\$2.4m

Significant Level of Service Projects	Year	Value
<b>Taranaki Traverse (Waiwhakaiho River section)</b> Proposed for development of the Taranaki Traverse walkway linking the Waiwhakaiho River Mouth to Mt Taranaki.	2018-2023	\$1.0m
<b>Walkway to Waitara</b> Extending the walkway from Tiromoana Crescent through to Waitara.	2018-2023	\$8.5m
<b>Let's Go active transport infrastructure and services</b> This project relates to the ongoing commitment by the Council and the New Zealand Transport Agency to encourage active travel in the district.	2018-2048	\$5.1m

Over the life of this strategy there will be increases in levels of service. These are driven by factors such as community-led financial constraints, changing expectations and needs, and the development of new technology.

### *What if we don't meet community expectations?*

The Council's primary focus is meeting the needs of our community. We need to be very clear with the community about our agreed levels of service and we need to respond accordingly if the levels of service delivered do not meet those targets agreed.

### Building resilience

In order for our community to be resilient our infrastructure needs to be able to withstand a major event, or be restored to service as soon as possible after an event.

The ex-cyclone Gita event that damaged a main water pipe on 20 February 2018 resulted in significant water shortages across the district. Together with the Havelock North Water Inquiry, it has highlighted the importance of our water network and providing safe drinking water to our community. In response to this the LTP and Infrastructure Strategy include a number of projects that will improve the district's resilience across a variety of infrastructure types.

Significant Resilience Projects	Year	Value
<b>Replace water and wastewater pipes with PVC</b> Installation of more durable and long lasting PVC wastewater pipes.	2018-2038	\$120.0m
<b>Water network resilience (multiple projects)</b>	2018-2048	\$55.2m
<b>Wastewater network resilience (multiple projects)</b> Invest more to look after our current water supply and wastewater networks and invest in upgrades to make our water supply and wastewater networks more resilient.	2018-2048	\$45.7m
<b>Transportation network resilience</b> Roading upgrades to reduce the likelihood of slips closing roads.	2019-2048	\$10.0m
<b>Periodic maintenance dredging Lake Mangamahoe</b> Maintain storage so we can continue to supply water for longer in the event of drought or failure of the tunnel between Waiwhakaiho River and Lake Mangamahoe.	2029-2038	\$2.0m

Significant Resilience Projects	Year	Value
<b>Increase water reservoir storage capacity (Mountain and Henwood roads)</b> Increases reserves of stored treated water. Increases length of time we can continue to supply water in the event of failure of the trunk mains supplying the reservoirs.	2018-2020	\$7.4m
<b>Duplicate New Plymouth Water Treatment Plant outlet pipe and central feeder</b> Duplication means a main can be out of service for maintenance or through pipe failure and supply can continue through the duplicate pipeline.	2020-2021	\$4.0m

### Failure of assets

The failure of assets spectrum ranges from a water main break to the impacts of a large scale natural disaster. The Council has identified critical and significant infrastructure assets and services signaled for priority restoration following a large scale event—particularly for reticulation systems and the roading network. Each Council business area also has incident response and business continuity plans that plan a coordinated and strategic response to any event.

### Natural hazards

The district is susceptible to a range of natural hazards that pose risks to infrastructure and the services provided to the community. The most significant is a volcanic event. Although Mount Taranaki is dormant, Massey University research states that significant seismic activity is likely in the next 50 years, creating risk of lahars for almost all areas. Significant ash fall could cause major disruption.

The district is also susceptible to flooding and high winds, particularly tornadoes and cyclones. Being situated on a coast with exposure to the north and west makes storm surge and tsunamis a risk, particularly to above-ground assets close to the coast. Coastal erosion and inundation is also a significant natural hazard. While we have invested in protection works, the potential impact of rising

## Guiding Themes

sea levels on coastal erosion rates does require consideration and planning for alternatives such as planned and coordinated retreat strategy is required.

There are a number of active fault lines in the district, both on and off-shore, which could cause a significant earthquake event. Studies show that liquefaction is not a significant risk for the Taranaki region.

### Climate change

The Ministry for the Environment projections of climate variance for Taranaki could adversely affect the district's infrastructure. Increased frequency and length of dry periods in summer water could affect water supply over summer months. It could also increase the likelihood of blockages and related dry-weather overflows of the wastewater system.

Increased frequency and more intense rainfall in winter months could lead to:

- Increase in overflow events caused by inflow/infiltration into the wastewater network.
- Increased flooding and erosion caused by stormwater system overload.
- Road failure as a result of weakened pavements and slip events.
- Compromised user safety on roads and bridges as a result of weather related damage/slippage/flooding.
- Increased stormwater in parks and reserves, possibly increasing erosion.

### Ageing population

Currently 18 per cent of the district's population is aged 65 or older. This number is expected to increase to 26 per cent by 2028. At the same time, the working age population (15-65) is expected to decrease from 60 per cent in 2018 to 55 per cent in 2028. The potential impacts of these changes demographic shifts include:

- An increase in the percentage of fixed income ratepayers resulting in downward pressure on rates.
- An increased demand for accessibility of footpaths and other Council assets.
- An increase in demand on the Council's housing for the elderly service.

We need to cater for an ageing population so that our community remains connected, is less reliant on cars, and the elderly and less physically able remain actively engaged in the lifestyle our district offers.

### What if we don't build resilience?

It is prudent for the Council to factor resilience into infrastructure decisions. Building resilience minimises the risk of harm to our community and our environment and better ensures uninterrupted services during natural disasters or other significant events.

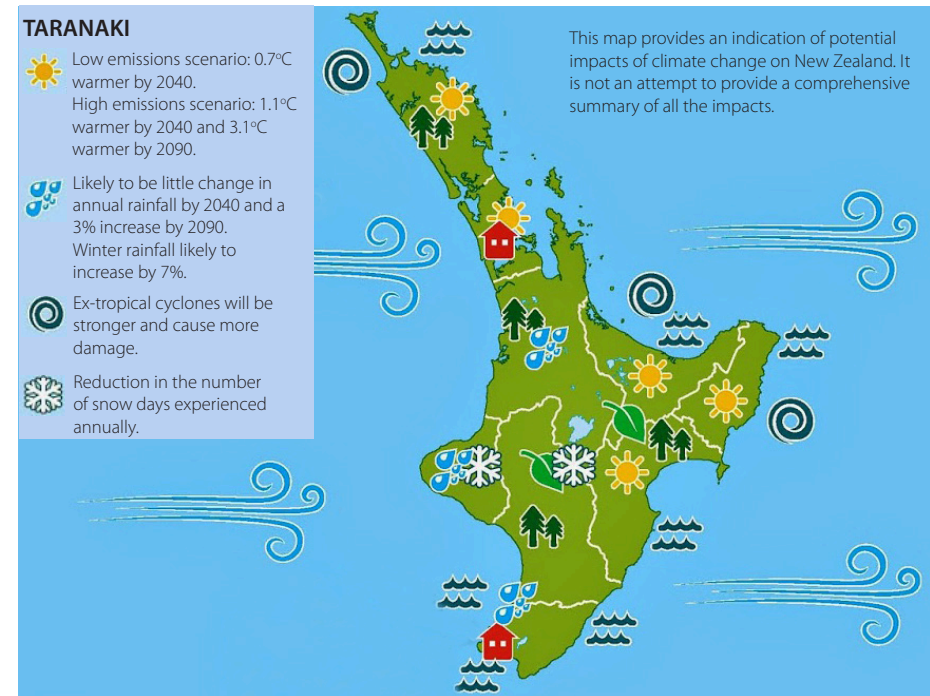


Figure 3: Potential climate change impacts (Ministry for the Environment, [www.mfe.govt.nz](http://www.mfe.govt.nz))



## INFRASTRUCTURE BY ACTIVITY

In this section we highlight the significant infrastructure issues we are likely to face over the life of this strategy within the following infrastructure asset groupings: water supply, wastewater, stormwater, flood protection, transportation, recreation and open space, and solid waste.

Within each grouping, we discuss the infrastructure issues related that asset group and present the possible options for managing those issues in relation to our guiding themes:

- What we need to renew.
- Responding to growth.
- Meeting community expectations.
- Building resilience.

We also outline the significant expenditure highlights anticipated over the next 30 years.

Asset values presented are from the 2016 certified valuation conducted by Council staff and registered valuers. All assumptions have been peer reviewed against industry benchmarks and audited by Audit New Zealand. All condition scores given to assets are based on National Asset Management Support Group (NAMS) guidelines.

## Water Supply

The Council operates four separate water supplies in the district, providing approximately 32m litres of water per day to just under 28,000 households and businesses. We develop, operate and maintain water treatment plants to meet water quality standards. We also manage pump stations, pipe networks and storage facilities such as reservoirs to ensure our community has a reliable and sustainable supply of fresh water.

### Key Water Supply Issues

- High water consumption means the district is already at risk of demand exceeding supply.
- An increasing population will put added pressure on supply. It may be difficult to meet community expectations of a consistent water supply and maintain a contingency supply for emergencies.
- Ageing infrastructure such as asbestos piping requires replacement.
- Inglewood's water supply is experiencing discolouration.
- Meaningful iwi engagement.
- Adapting to new water safety regulations.
- Changing regulations due to freshwater reforms.

### *Demand for water*

One of the most significant water supply issues the district faces is demand exceeding supply.

On average, New Plymouth residents consume 30 per cent more water than the national average. Low river levels over the dry months of summer have become more frequent and longer in duration in the past 10 years. Combined with increases in tourist numbers during summer months, we are already at risk of our peak demand coinciding with low flow periods.

## Infrastructure by Activity

### Water Supply

Under current usage, our primary source of water has storage capacity for about 10 days of supply at any given time. In line with the district's growth projections, demand for water is expected to grow by 20 per cent over the next 30 years.

We are now at the point where our communities need to significantly reduce water consumption, and make decisions about investing in new infrastructure to maintain a constant and reliable water supply into the future.

#### *Water Master Plan*

We have developed a preliminary Water Master Plan, which takes a long term view of the water needs across the district. In developing this plan, we've used a computer model of our water system to help identify network weaknesses and opportunities for investment. The investment programme proposed in the Water Master Plan includes:

- Implementing a demand management programme including education, leak detection, pressure reduction and universal water metering.
- Increasing storage capacity in some of our reservoirs.
- Increasing the capacity of some of our trunk mains.
- Finding a new and additional water source.

#### *Demand management*

Whatever decisions we make about our future water supply, in the short term we need to reduce the amount of water we consume. Finding and securing more water will be necessary in the medium to long term but our water resources will last longer if we avoid wasting water today. Reducing our consumption will also delay the requirement for new sources of water, delaying the costly investment required for new infrastructure.

Our primary demand management options are:

- Applying water restrictions.
- Detecting and repairing leaks in the network.
- Implementing universal water metering.

- Reducing water pressure within the distribution network (less coming out of the tap and less pipe leakage).
- Encouraging the use of private water tanks.
- Educating our communities about water conservation.

In the short term, we will be implementing a combination of these demand management solutions. Implementing universal water metering is a big step for our community and as a result we will continue this conversation with the community in the future.

#### *Water safety*

The Havelock North Drinking Water Inquiry has raised significant issues about the way water supplies are managed and delivered in New Zealand. Safe potable water supplies are essential services for the health and well-being of our communities. We are in the process of investigating the provision of water across the district and making changes as required.

### What we need to renew

Repairing and replacing the infrastructure we already have is one of our key priorities. The map shows the extent of the water supply network in the district. Areas requiring renewal over the life of this strategy are highlighted in red.

#### Ageing infrastructure

We use forecasting models to plan long-range renewal requirements. According to best practice we have adopted a risk based approach using criticality and condition assessments and failure mode analysis rather than age to prioritise what assets are to be renewed first. Prioritising replacement of critical assets reduces consequences of failure for the community, reserving money to pay for emergency renewals as they occur in less critical pipes. We then see less critical assets run to failure, achieving maximum life and value for money. Service disruption is limited to the repair of less critical assets at the time of failure. We have also grouped renewals geographically to maximise opportunities for procurement efficiencies and to minimise disruption to the community.

Asbestos Cement (AC) pipes, which were widely used in the 1960s, are now approaching the end of their life. Not only are they susceptible to leakage, they also reach a point when they are irreparable. Replacing AC pipes with modern materials with a longer life expectancy will also reduce the long term cost of funding depreciation.

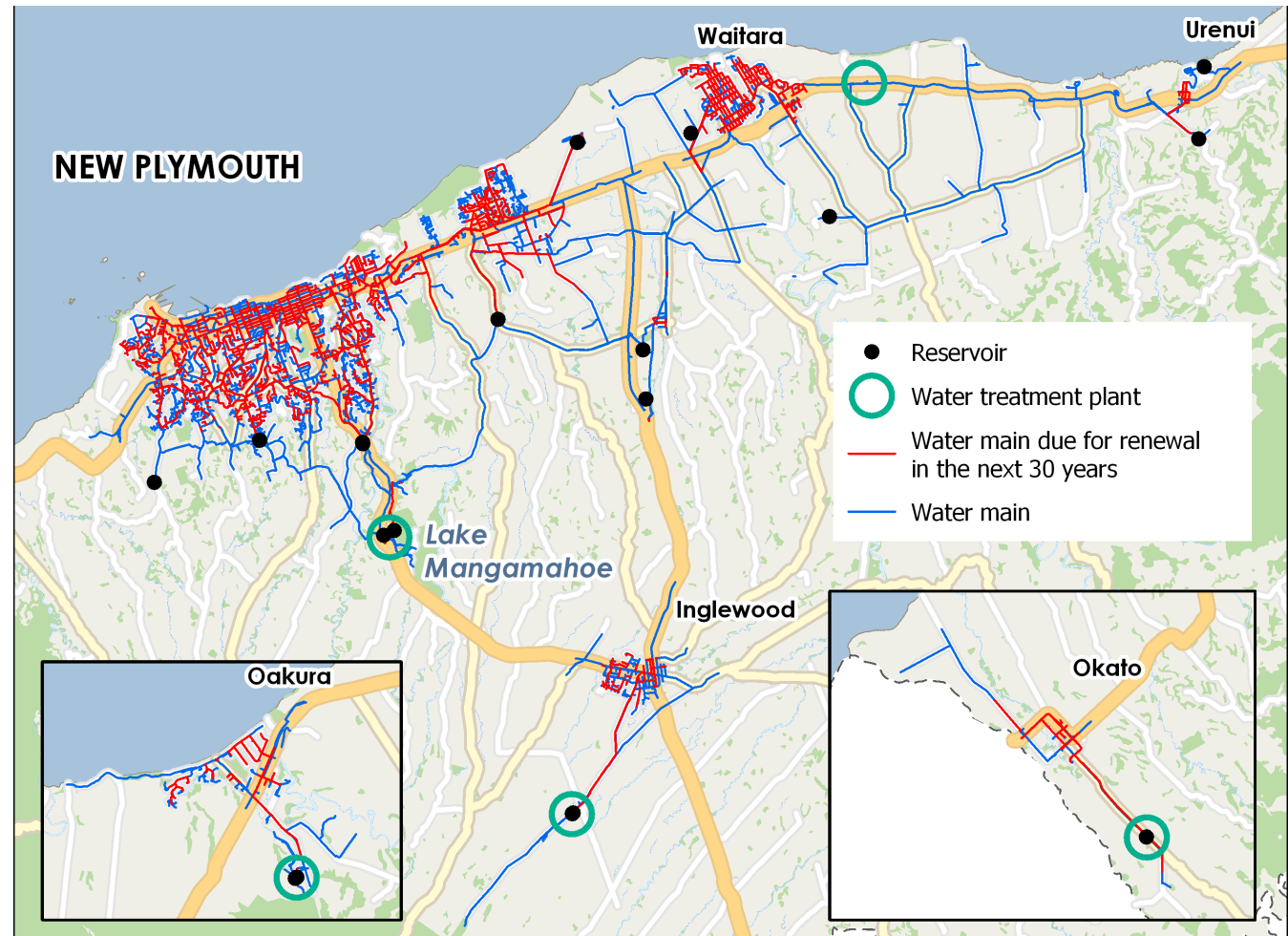


Figure 4: Water supply network renewal

## Infrastructure by Activity

### Water Supply

#### Response to growth

The district's population projections and the resulting demand for water poses significant issues for our water supply. As a community, we use more water over summer when water levels are at their lowest. With demand already at its peak, the district's growing tourist numbers during summer months put additional pressure on supply. As a community, we need to give serious consideration to how we want to manage our water resources and provide for growth in the district.

Options	Implications
1. Amend the Council's water abstraction consent so that we can take more water.	<ul style="list-style-type: none"> <li>Estimated cost circa \$1m.</li> <li>Three years required to implement.</li> <li>Effective lifespan of circa 10 years.</li> <li>Demand management still likely required depending on how much of an increase is granted.</li> <li>Taranaki Regional Council may not grant a lower allocation to the resource consent.</li> </ul>
2. Secure a new water source and build a new water treatment plant.	<ul style="list-style-type: none"> <li>Estimated cost circa \$30m.</li> <li>Ten to 15 years to implement.</li> <li>Effective lifespan of circa 30+ years.</li> <li>Demand management required in the short term.</li> <li>Risks around Taranaki Regional Council not granting consent and the availability of required water volume.</li> </ul>

Options	Implications
3. Secure a new water source, build a new water treatment plant and build lake storage, e.g. new dam.	<ul style="list-style-type: none"> <li>Estimated cost of \$70-100m.</li> <li>Twenty years to implement.</li> <li>Effective lifespan circa 50+ years.</li> <li>Demand management required in the short term.</li> <li>Risks around availability and acquisition of suitable land and availability of required water volume</li> <li>Potential recreational opportunities on a newly created lake.</li> </ul>

#### Preferred Response: Options 2 or 3

We are starting to plan for a new water source being required around 2026-2028. This requires a significant financial investment from the community of approximately \$30m. The details of this project are yet to be determined and will involve a high degree of community consultation, including meaningful iwi participation.

#### Servicing growth areas

A number of new growth areas have been identified in or around existing urban areas to meet our growing housing requirements. These areas sometimes require alterations or extensions of the existing water network. These will be paid for by property developers when they undertake development in accordance with our Development Contributions Policy. There are also some larger more centralised upgrades required to cater for projected growth. These are listed in the significant expenditure highlights further on in this section.

Large new subdivisions at higher levels (over 90 metres above sea level) will likely require an additional pump stations to deliver adequate water pressure to new housing areas. The cost of these pump stations will be recovered from property developers at the time of development.

### *Smart Road growth area*

The District Blueprint identifies the Smart Road area as potentially providing for a significant portion of the district's growth needs over the next 30 years. Water related infrastructure required to cater for this growth includes a new water trunk main estimated at \$5m and water reservoir estimated at \$4m. A significant portion of this cost would be recovered by developers of property in this growth area. Development of the lower Smart Road area is currently programmed for around 2035. However, planning for the water trunk main will begin within the next 10 years.

### *Reticulating rural townships - Okato water supply*

The Mangatete Stream is the main water supply to the 561 residents of the Okato township. This supply will sufficiently meet the predicted short to medium growth in the Okato area. The Council will continue to engage with the Okato community on water supply solutions as the township grows.

### *Reticulating rural townships - Egmont Village water supply*

The 483 residents of Egmont Village township currently source water from privately owned water tanks. Previous investigations show that a reticulated water supply in the village would cost in the order of \$9m. The Council's current priority is to invest in areas of high growth within the district. Egmont Village has not been identified as an area of high growth. Therefore, we do not foresee water reticulation in this area within the lifetime of this Infrastructure Strategy.

## Meeting community expectations

Our community expects clean, clear water at an appropriate pressure. Currently, Inglewood's water supply is discoloured, which is a priority issue for the Council. Two factors cause this discolouration:

1. The cast iron and steel pipes in and around the CBD are corroding, causing discolouration as water passes through them.
2. There are low flow levels in the trunk mains from the Inglewood Treatment Plant to the township. This results in sediment depositing on the bottom of the pipes, which is stirred up during periods of high use and increased flow.

Options	Implications
1. Invest in a long term solution to Inglewood's water discolouration issue.	Requires significant Council investment and will result in a cost to the wider community.
2. Do not invest in a long-term solution to Inglewood's water discolouration issue.	The Council investment is restricted to short-term cleaning and therefore the cost to the community is reduced.

### Preferred Response: Option 1

The existing treatment process means water is supplied to New Zealand drinking water standards. However, the discolouration is an issue affecting levels of service and community expectations.

A two phase project is currently underway. Phase one involves using a specialised truck to clean nearly all of the town's water pipes, including the two trunk mains. This will remove as much of deposited mineral material as possible. Phase two involves replacing about 6.8km of older water pipes in the Inglewood township.

## Building resilience

The key resilience issues facing the district in relation to water supply over the next 30 plus years include:

1. The network requires significant investment in a variety of ways if it is to become more resilient.
2. Ageing asbestos cement (AC) pipes expose the network to increasing risk of catastrophic failure during a significant earthquake.
3. Contamination of water sources (Lake Mangamahoe, three rivers and Ōākura bore).
4. Longer dry periods in summer with population and tourism growth adding additional demand.

## Infrastructure by Activity

### Water Supply

The ex-cyclone Gita event of February 2018 that resulted in water shortages across the district highlighted weaknesses in our water supply network. As a result the community now has the option of addressing these weaknesses, and to what extent, or maintaining the network in its current state.

Our options for meeting increased demand have been discussed in the response to growth section above. Details of our approach to renewing ageing infrastructure using a risk-based programme can be found in the 'what we need to renew' section above. The options for building resilience into our water supply network are as follows.

Options	Implications
1. Invest more to look after our current water supply and wastewater networks.	<p>Cost of \$86.7m over the life of this strategy (majority going to water supply) and includes:</p> <ul style="list-style-type: none"> <li>• More inspections and preventative maintenance.</li> <li>• More back-up spare parts for critical equipment.</li> <li>• Increase the number of backflow protection units on high risk properties.</li> <li>• Enhanced scenario based planning and mitigation for weather events.</li> <li>• Investigate options for improving the resilience of water sources.</li> </ul>
2. Invest in upgrades to make our water supply and wastewater networks more resilient.	<p>Cost of \$89.9m (majority going to water supply) and includes:</p> <ul style="list-style-type: none"> <li>• Upgrade our critical pipe bridges.</li> <li>• Upgrade our three water supply and 30 wastewater pump stations to be more reliable.</li> </ul>

Options	Implications
	<ul style="list-style-type: none"> <li>• Design back up options for parts of our water supply network that only have one pipe.</li> <li>• More back-up spare parts for critical equipment.</li> </ul>
3. Invest more to look after our current water supply and wastewater networks AND invest in upgrades to make our water supply and wastewater networks more resilient. Includes options 1 and 2.	<p>Cost of \$117.4m (majority going to water supply).</p> <p>A combination of both options 1 and 2.</p>
4. A significant investment to ensure our water supply, wastewater and stormwater networks are robust.	<p>Cost of \$216m (majority going to water supply).</p> <p>As well as everything in Option 3, this investment would include:</p> <ul style="list-style-type: none"> <li>• Build a second water pipe bridge across the Waitara River.</li> <li>• Increased investment in pipe renewals by \$30m so we can replace our aging network.</li> <li>• Bring forward the second road bridge across the Waiwhakaiho River.</li> <li>• Upgrade our flood protection dams.</li> <li>• Increased investment in Waitara's stormwater systems by an additional \$8m.</li> </ul>
5. Do not invest in projects that increase the resilience of our infrastructure.	No additional cost.

**Preferred Response: Option 3**

The Council is intending on investing \$117.4m over the life of this strategy to increase the resiliency of our water supply network and to a lesser extent our wastewater and stormwater networks. Refer to the building resilience section above for a high level list of resilience projects proposed across all infrastructure types.

As previously discussed, implementing demand management measures to reduce consumption is a short-term response that will buy some time while we as a district decide how we will meet our growing water demands.

Replacing old pipes with PVC or polyethylene when they are due for upgrade will also increase the resilience of our network given the long life and durability of these materials.

The Ōākura bore is the only bore currently used as a community water source. We are currently compliant with the drinking water standards, however a \$1.5m upgrade is planned to ensure this water source remains safe.



## Infrastructure by Activity

### Water Supply

#### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
Water resilience (multiple water projects)	2018-2048	\$55,200,000	Service Level
Water reticulation network renewal	2018-2048	\$3,585,000 p.a.	Renewal
New water source	2026-2028	\$30,140,000	Service level
Residential universal water metering	2022-2025	\$15,200,000	Service level
Water supply P&E and I&E renewals	2018-2048	\$1,050,000 p.a.	Renewal
Mountain Road and Henwood Road reservoirs	2018-2020	\$7,400,000	Growth
Smart Road water reservoir	2029	\$4,000,000	Growth
Smart Road water trunk main	2029-2033	\$5,000,000	Growth

#### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	12.74	13.70	14.32	14.94	16.02	16.47	16.89	17.23	18.05	18.91
Renewals	3.26	3.45	4.37	5.01	5.45	4.95	5.03	5.32	5.86	7.46
Service level	3.68	4.65	4.18	7.23	5.07	4.34	4.26	0.33	13.65	14.08
Growth	4.00	3.86	4.25	3.54	1.28	3.08	3.17	0.07	0.07	0.08

#### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	71.72	87.55	107.83	124.57	142.46	161.51
Renewals	21.54	28.62	22.03	19.10	16.12	17.59
Service level	24.81	36.65	4.06	4.52	4.97	5.43
Growth	16.93	6.47	12.04	0.41	3.08	0.50



## Wastewater (sewage)

The wastewater reticulation network and pump station collects, domestic and industrial wastewater from more than 25,850 properties in urban New Plymouth, Bell Block, Waitara, Inglewood and Ōākura. We treat wastewater at the central New Plymouth Wastewater Treatment Plant (WWTP) before discharging the clean water via outfall to the sea. We also process the clean sludge at the Thermal Drying Facility (TDF) into Bioboost fertiliser which we sell throughout the country.

### Key Wastewater Issues

- Ageing infrastructure compromising performance and resilience.
- Increased demand on existing infrastructure as a result of growth.
- Demand for new infrastructure as a result of growth.
- Meaningful iwi engagement.
- Community expectations of environmental management.

### What we need to renew

Maintaining the infrastructure we already have is a key priority. Figure 5 shows the extent of the wastewater network in the district.

### Upgrading the WWTP

In 2012, we began a \$23m upgrade of the centralised wastewater treatment plant. The plant is designed to meet the district's wastewater needs until 2040. The yet to be developed Three Waters

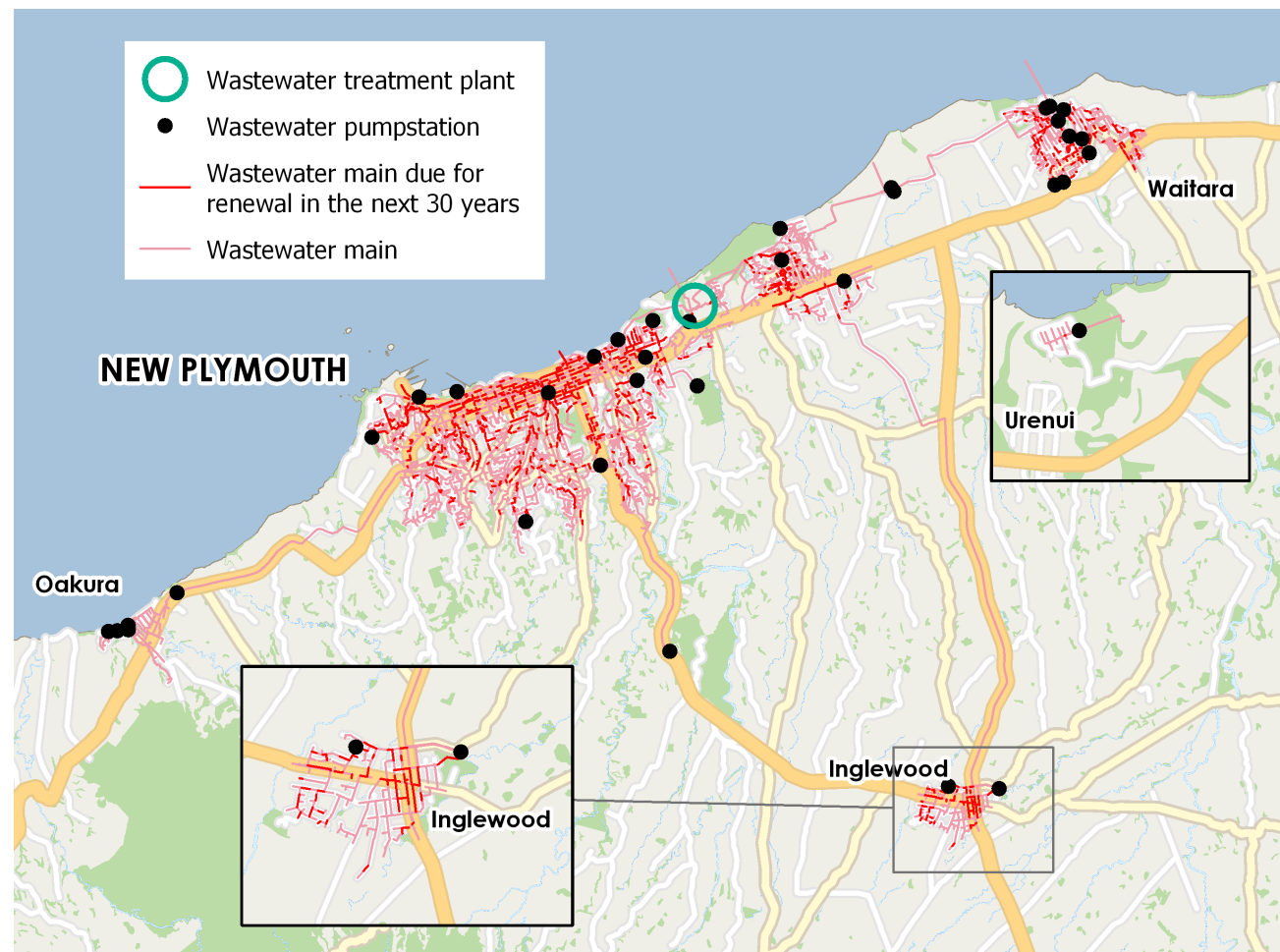


Figure 5: Wastewater network renewal

## Infrastructure by Activity

### Wastewater (Sewage)

Strategy, and the wastewater network modelling that will inform it, will provide more information in terms of the expected life of the WWTP and what a renewal of the facility might involve. Once the Three Waters Strategy and wastewater network modelling is complete we will be better informed to make the decision about the type of facility we would replace the existing facility with and when that replacement is likely to be needed. See our Wastewater Asset Management Plan for more details.

#### ***Replacing the thermal drier at the WWTP***

The thermal drier used in processing treated sludge is nearing the end of its life. An upgrade costing approximately \$15m is due to begin in 2019.

#### ***Ageing infrastructure***

As network infrastructure ages, it allows more inflow and infiltration of stormwater into the system, adding volume and costs to wastewater treatment. This is a significant issue that predicted increases in the frequency and intensity of rainfall will only exacerbate.

We use forecasting models to plan long-range renewal requirements. According to best practice we have adopted a risk based approach using criticality and condition assessments and failure mode analysis rather than age to prioritise what assets are to be renewed first. Prioritising replacement of critical assets reduces consequences of failure for the community, reserving money to pay for emergency renewals as they occur in less critical pipes. We then see less critical assets run to failure, achieving maximum life and value for money. Service disruption is limited to the repair of less critical assets at the time of failure. We have also grouped renewals geographically to maximise opportunities for procurement efficiencies and to minimise disruption to the community.

#### **Response to growth**

As the district's population grows demand on the wastewater system will increase in a number of ways:

- Increased demand on the existing network as a result of anticipated intensification of housing.

- Demand for new infrastructure in new growth areas.
- Increased demand on the central wastewater treatment plant resulting in upgrade requirements.

For the location of identified growth areas in the district, see Figure 2.

#### ***Bell Block and Area Q (eastern wastewater realignment project)***

The Area Q residential growth in eastern Bell Block will provide up to 1000 new homes over the next five to 10 years. Currently, all wastewater from Bell Block and Inglewood is combined at Bell Block's Mangati pump station, before being piped for treatment at the central waste water treatment plant.

Population growth in Bell Block means that the Mangati pump station is already struggling to cope with this combined flow. In order to address this, we are planning the Eastern Sewer Realignment project, which will divert some of Inglewood's sewage to the new pump station installed at Area Q. This will take the pressure off the Mangati pump station and give the new Area Q pump station enough volume to operate effectively. As Area Q is developed, Inglewood's sewage will need to go elsewhere. At that point Inglewood's sewage will be piped to the yet to be constructed Area N (new industrial zoned land) pump station, and the temporary connection between Inglewood and Area Q will be disconnected. This project is the most cost effective way to service both Area Q and Area N, and manage Inglewood's sewage. This project will cost approximately \$8.6m, a large portion of which will be recovered from developers of land in these areas, in accordance with our Development Contributions Policy.

#### ***Junction, Upper Carrington and Ōākura growth areas***

Full development of these growth areas requires small upgrades to the wastewater which will be paid for by the relevant property developer(s).

#### ***Frankley/Cowling growth area***

The fact that the wastewater network currently terminates near Arundel Crescent is restricting development in Area E (already zoned for residential development), and a new growth area planned between Frankley and Cowling roads. An extension of the wastewater in this area has been mooted for some time at an

estimated cost of \$3m. Some of these costs would be recovered by contributions from property developers in these areas. The extension of this wastewater is planned for approximately 2029 in order to allow the growth area to be developed in accordance with our growth strategy.

### **Smart Road growth area**

The wastewater infrastructure required in order for this area to be developed includes a new wastewater trunk main and an upgrade to the Glen Avon Pump Station estimated at \$12.5m. A significant portion of this cost would be recovered by developers of property in this growth area. Development of the lower Smart Road area is currently programmed for around 2035. However, planning for this infrastructure will begin within the next 10 years.

### **Reticulating rural townships**

Rural communities such as Egmont Village, Urenui, Onaero, and Okato have expressed a desire extension of the wastewater network into the townships to allow for growth and address perceived environmental and public health issues.

Options	Implications
1. Prioritise the extension of the wastewater network into urban growth areas that will accommodate a larger amount of new houses to provide for increasing housing demand.	Increased demand for housing as a result of growth is likely to be met because the urban growth areas are able to provide a large amount of new houses. Costs are generally recovered from property developers at the time of land development.
2. Prioritise the extension of the wastewater network into our townships.	<p>Increased demand for housing as a result of growth is unlikely to be met by the limited number of new lots that can be provided in and around our rural townships.</p> <p>Requires expenditure, too large to recover from property developers alone and would likely impact the wider community.</p>

### **Preferred Response - Short-term: Option 1**

The Council's investigations have found that the cost to extend wastewater reticulation to rural areas varies between \$5m for Okato and \$17m for Urenui. Any known environmental or public health issues as a result of malfunctioning septic tank systems would drive further investigation into extending reticulation into rural townships. However, neither the Taranaki Regional Council nor the Taranaki District Health Board believes this to be the case.

In the short-term, the Council intends prioritising the extension of the existing wastewater into growth areas that can be developed into smaller residential lots on the outskirts of existing urban areas. This is a more efficient use of resources compared with extending the wastewater great distances into townships that can meet only a small portion of the district's growing housing demand. The Council does not foresee the extension of the wastewater into rural townships during the life of this Infrastructure Strategy.

### **Meeting community expectations**

The limited emergency wastewater storage capacity of our wastewater pump stations can result in overflows into the environment during emergencies such as power cuts or other system failure. In meeting community expectations we need to plan for such events and minimise the impact of wastewater on the environment.

Options	Implications
1. Invest in projects to reduce the likelihood of sewage overflow in to the environment.	Projects such as the installation of emergency storage at pump stations across the network and the work required to avoid the use of the Waitara marine outfall come at a cost the community.
2. Make no significant changes to the way wastewater is dealt with during emergencies.	Avoids costs. Pump stations across the network remain at risk of localised sewage overflows and the Waitara marine outfall is used during emergencies.

## Infrastructure by Activity

### Wastewater (Sewage)

#### Preferred Response: Option 1

To decrease the likelihood over wastewater overflow into the environment we intend investing \$17m over the life of the strategy. We are currently investigating a project that will eliminate the need to use the Waitara marine outfall during emergencies. This project will also remove the need to renew the outfall pipe, saving significant costs.

#### Building resilience

Predicted changes in future weather patterns and other environmental hazards could have implications for the wastewater network:

- Increased rainfall could cause more inflow resulting in an increase in frequency and volume of overflow events.
- Longer dry spells could increase the likelihood of blockages and related dry-weather overflows.
- Our susceptibility to earthquakes means the wastewater network needs to be able to withstand small events and recover quickly from major events.

The ex-cyclone Gita event of February 2018 that resulted in water shortages across the district highlighted weaknesses in our wastewater network (in addition to our water network). As a result the community now has the option of addressing these weaknesses or maintaining the network in its current state. There are a number of projects planned to increase the resilience of wastewater network (see guiding themes section).

Options	Implications
1. Invest in projects that increase the resilience of our wastewater network.	Investing in projects that increase our network's resiliency will result in increased costs upfront. However, this investment reduces the risk of catastrophic damage to the network during an earthquake. It is prudent we ensure our network can withstand a major event, or be restored to service as soon as possible after an event.

Options	Implications
2. Do not invest in projects that increase the resilience of our wastewater network.	Not investing in projects that increase the resilience of our network avoids short term cost. However, our community would remain at risk of interruptions to wastewater services after a major event.

#### Preferred Response: Option 1

The Council is intending on investing \$45.7m over the life of this strategy to improve the resiliency of our wastewater network. Refer to the Building Resilience section above for a list of proposed projects

The Council has opted to use more resilient pipes in all upgrades and new growth areas. PVC (M grade) pipes are now commonly installed as a more durable and long lasting solution. Polyethylene was used in the Waitara to New Plymouth rising wastewater main, and is currently being installed in the Area Q trunk wastewater construction. Polyethylene was selected for these two projects because it is more flexible than PVC and has fewer joints, so it is less likely to break during an earthquake. However, polyethylene is more difficult to both repair and connect to, so is best suited for use in trunk mains with few direct connections.

As we develop our integrated Three Waters Strategy, we will examine ways to enhance asset resilience, by looking at opportunities such as installing alternative trunk mains to provide additional capacity rather than replacing an existing trunk main with a larger sized pipe. Wastewater modelling technology still under development will help us investigate and understand these opportunities.

## Infrastructure by Activity Wastewater (Sewage)

### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
Wastewater resilience (multiple wastewater projects)	2018-2048	45,700,000	Service Level
Wastewater reticulation network renewals	2018-2048	\$1,600,000 p.a.	Renewal
Thermal dryer upgrade	2019-2021	\$15,600,000	Renewal/Service Level/Growth
Eastern sewer network realignment	2021-2022	\$8,600,000	Growth
General P&E and I&E renewals	2018-2048	\$580,000 p.a.	Renewal
Wastewater pump station overflow prevention	2018-2048	\$17m	Service Level
Urenui Domain resewering	2021-2022	\$1,600,000	Renewal/Service Level
Smart Road sewer	2033-2035	\$12,500,000	Growth

### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	16.83	17.73	18.08	18.67	19.35	19.49	19.62	20.14	20.28	20.51
Renewals	3.40	5.75	9.88	4.38	2.39	2.44	2.50	2.56	2.63	2.69
Service level	1.80	1.35	1.23	1.66	1.23	1.09	1.12	1.15	1.17	1.20
Growth	1.47	2.60	3.25	8.71	0.37	0.11	0.12	0.12	0.12	0.12

### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	90.67	100.04	117.49	133.56	150.51	168.36
Renewals	25.81	12.82	22.44	26.57	28.61	31.23
Service level	7.27	5.73	4.02	4.47	4.92	5.37
Growth	16.40	0.59	10.18	7.68	0.57	0.62

## Infrastructure by Activity

### Stormwater

#### Stormwater

Over 300 rivers and streams cross Mt Taranaki's ring plain and run to the lowlands in a distinctive radial pattern. Following high-intensity rainfall water culminates in the various river catchments, draining quickly to the sea. Heavy rain has the potential to overwhelm stormwater systems and can cause localised flooding. These effects are usually short-term and related to a particular storm event. However, there are areas in the district that are more prone to these effects than others.

#### Key Stormwater Issues

- Predictions of more frequent and intense rainfall mean we need to work toward solutions for flood prone areas.
- Infill development within existing urban areas is increasing the ratio of impermeable surface to uncovered land, which can exacerbate flooding in low lying areas.
- We want to provide property developers the right guidance on designing developments with minimal flood risk but maximum benefits for water ecology.
- Meaningful iwi engagement.

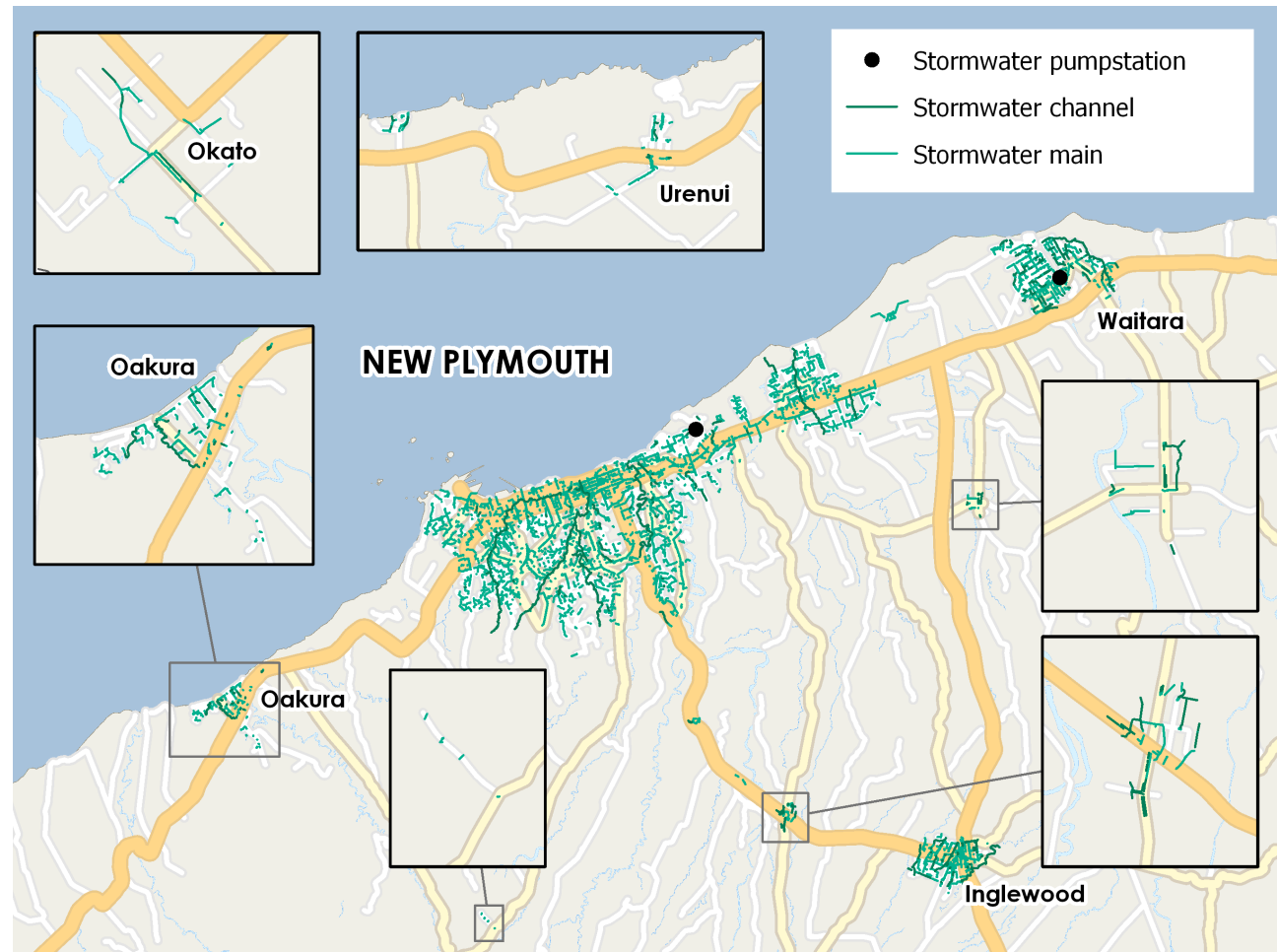


Figure 6: Existing stormwater infrastructure

#### Stormwater Catchment Management Plans

The Council has programmed development of a series of Stormwater Catchment Management Plans to assist with sustainable solutions to issues such as flood prone areas, population growth and climate change. Using network modelling technology, information gathered in developing these plans will provide a number of benefits including:

- Increased understanding of the extent of flooding in the district and priorities for investment that will deliver intended levels of service e.g. flooding contained to a defined acceptable limit.
- Management of urban growth and land development to minimise any adverse impacts on properties downstream and the wider receiving environment.
- Informing the technical standards for public and private storm water system performance.
- Informing the Council and the community about what 'water sensitive design' might look within each catchment.

#### What we need to renew

Managing stormwater within urban areas can be complicated. Pooling of stormwater in certain areas is caused by a wide range of factors. However, it is exacerbated by increased density of housing– a trend currently occurring within New Plymouth.

We use forecasting models to plan long-range renewal requirements. According to best practice we have adopted a risk based approach using criticality and condition assessments and failure mode analysis rather than age to prioritise what assets are to be renewed first. Prioritising replacement of critical assets reduces consequences of failure for the community, reserving money to pay for emergency renewals as they occur in less critical assets. We then see less critical assets run to failure, achieving maximum life and value for money. Service disruption is limited to the repair of less critical assets at the time of failure. We have also grouped renewals geographically to maximise opportunities for procurement efficiencies and to minimise disruption to the community.



Figure 7: Mangaone River catchment

## Infrastructure by Activity

### Stormwater

Identifying flood prone areas and prioritising them for renewal protects people and property, saving money over time. Stormwater Catchment Management Plans for each of our major river systems will help inform Council’s investment decisions at the time of renewal as well as guide new development.

#### Response to growth

As our population grows, there is more intensive living occurring in our urban areas. There are also new subdivisions being developed on the outskirts of existing urban areas. With an increased ratio of buildings and paved areas to grass, gardens and forest, we expect to see more intense ‘peak’ stormwater runoff events leading to a greater risk of flooding.

Options	Implications
1. Use stormwater catchment management information to create site specific guidance for property development to ensure developments are reduce the risk of flooding and provide ecological benefit.	Property developers would be required to consider subdivision layout and housing density in water sensitive areas so that land development reduces flood risks and protects ecology.
2. Retain the status quo in terms land development procedures and deal with flooding and/or ecological issues as they arise.	A piecemeal approach to stormwater management would prevail as property developer’s focus only on their sites. This may result in detrimental downstream and ecological effects requiring the Council to invest in infrastructure that could have otherwise been minimised or avoided.

#### Preferred Response: Option 1

It is likely that within each catchment there will be a combination of existing flood prone urban areas and new developments. The stormwater Catchment Management Plans in progress will help us understand where development is risky or likely to have detrimental downstream effects and what techniques will be the most likely to minimise flooding in that river catchment.

Taking a holistic, catchment based approach to development, as opposed to dealing with a specific site, means new development will have minimal impact on the rest of the catchment. We will also have a better understanding of the impending effects of any developments occurring upstream when investing in lower catchment assets.

The Catchment Management Plans will inform future District Plan revisions, including local engineering/surveying standards and subdivision design guidance for property developers in relation to the ration of buildings and paved areas to uncovered land.

A large portion of the Smart Road growth area is within the Mangaone River catchment. There are known choke points in the Mangaone River as it nears the industrial area near State Highway 3. It is highly likely that stormwater upgrades will be required at these chokes points as development occurs in this catchment at approximately \$4m in around 2032. The catchment management plan for this area will improve our understanding of what investment will be required.



**Meeting community expectations**

Heavy rain has the potential to overwhelm stormwater systems, causing harm to both the environment and community well-being. Some of our urban areas are prone to localised flooding during storm events. These include Makere Street in Waitara and the lower reaches of the Mangaotuku Stream in New Plymouth. We need to address these issues, particularly in light of predicted increases in annual rainfall and storm intensity. However, stormwater solutions often require significant civil works and come at a significant cost to the community.



Figure 8: Flooding in Joll Street Reserve (Waitara)

Options	Implications
1. Invest in long-term solutions in known flood prone areas.	Delivering long term solutions in flood prone areas is likely to come at a significant cost to the community and therefore require community consultation and support.
2. Attempt to fix flooding issues as they arise with smaller scale solutions.	Small scale solutions may reduce the impact of flooding on some residents and significant cost to the community is avoided or delayed. However this option may cost the community more over the long term and not resolve flooding issues that impact large areas. This may also result in simply moving the problem from area to area.

**Preferred Response: Option 1**

The Council is taking steps to reduce the frequency and severity of flooding resulting from rainfall. As mentioned previously, a fundamental step is the development of Catchment Management Plans for each of our major river systems. These plans will better enable us to understand local issues and possible solutions. The first Catchment Management Plan being developed is for Waitara. We have completed preliminary investigations and are currently developing some high level options for solutions. These will be presented to the community for consultation, including meaningful consultation with iwi.

## Infrastructure by Activity

### Stormwater

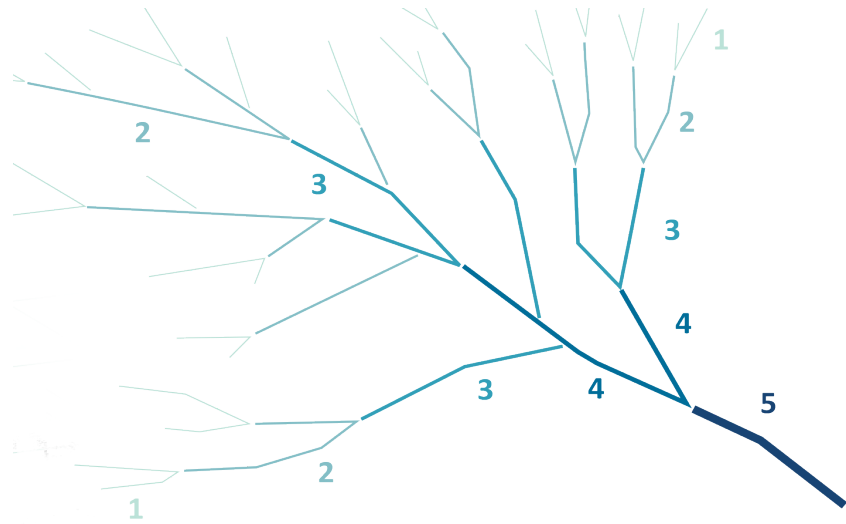


Figure 9: Stormwater catchment feeding into one river (water sensitive design for stormwater - Auckland Council)

### Building resilience

Increased and more intense rainfall over time is likely to increase the frequency of stormwater system overloads, resulting in flooding.

When replacing existing infrastructure or adding new infrastructure we need to consider both the size and type of piping we install to cater for the future. If pipes are undersized they may not cope with increased stormwater flows and will require premature replacement, at a cost to the community.

The design and layout of new subdivisions also needs to consider existing natural stormwater flow paths. Using fewer pipes and designing systems that retain natural flow paths can reduce the risk of flooding and result in ecological benefits.

Options	Implications
1. Retain existing stormwater management practices and do not increase pipe sizes to account for increasing rainfall frequency and/or intensity.	Piped systems are 'tried and tested'. However, premature replacement may be required if they are not adequately sized to cater for increasing rainfall frequency and intensity, creating more costs. Potential 'water sensitive design' benefits are not realised e.g. flood resilience, ecological, amenity.
2. Retain existing practices but increase pipe sizes to account for increasing rainfall frequency and intensity.	Oversizing pipes to cater for future rainfall predictions will result in additional upfront cost to developers and rate payers but may avoid early replacement. Potential 'water sensitive design' benefits not realised e.g. flood resilience, ecological, amenity.
3. Ensure new Council owned stormwater assets and/or private subdivisions are designed using principles of 'water sensitive design'. This will result in a combination of pipes (sized for climate change) and assets that mimic natural processes.	Education and localised testing of 'water sensitive design' techniques will be required. There may be some resistance from property developers who do not see the value in 'water sensitive design', especially if it has greater upfront costs. 'Water sensitive design' benefits will be realised in the appropriate context, e.g. flood resilience, ecological, amenity.

### Preferred Response: Option 2 with a transition to Option 3

We are moving towards requiring new pipes/assets to account for climate change predictions in all new developments. In alignment with best practice within New Zealand, we assume a temperature increase of 2.1 degrees celsius by 2090 when determining stormwater pipe size using the National Institute of Water and Atmosphere's High Intensity Rainfall Design System. This stormwater pipe size guidance will apply to both the Council and private stormwater works.

Information from our stormwater Catchment Management Plans will help us determine the combination of stormwater management techniques that will best deliver the outcome desired outcome for each area e.g. remove rain water quickly or store it on site during storm events. Using water sensitive design can also achieve enhanced outcomes for both ecosystems and our communities. These principles seek to protect and enhance natural freshwater systems and mimic natural processes. We are shifting our focus toward allowing water to follow its natural course (protecting secondary overland flow paths).



Figure 10: Water sensitive design example (Anselmi Ridge, Auckland Design Manual)



Figure 11: Water sensitive design example (Long Bay Auckland, Boffa Miskell)

## Infrastructure by Activity

### Stormwater

#### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
Waitara stormwater upgrades	2019-2025	\$9,000,000	Service Level
Mangaotuku stormwater upgrades	2020-2021	\$3,600,000	Growth
Minor stormwater renewals and augmentations projects	2018-2048	\$220,000 p.a.	Renewal
Stormwater Master Plan	2020-2021	\$1,500,000	Growth
Mangaone catchment improvements (Smart Road growth area)	2031-2033	\$4,000,000	Growth

#### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	3.42	3.68	4.19	4.19	4.59	4.70	4.77	5.02	5.06	5.08
Renewals	0.21	0.22	0.33	0.33	0.23	0.24	0.24	0.25	0.25	0.26
Service level	0.05	0.55	4.66	2.44	2.17	2.22	0.95	0.06	0.07	0.07
Growth	0.05	0.07	1.55	0.16	0.16	0.16	0.11	0.08	0.08	0.08

#### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	20.07	24.63	38.43	54.44	72.54	92.75
Renewals	1.32	1.24	5.45	4.51	2.44	2.66
Service level	9.86	3.36	0.77	0.40	0.44	0.48
Growth	1.99	0.52	5.36	0.49	0.54	0.59

### Flood Protection

Our Flood Protection and Control Works protect urban areas in New Plymouth District when the stormwater system becomes overloaded with rain. The service includes monitoring and maintaining existing flood protection schemes and planning of future flood protection measures.

#### Key Flood Protection Issue

Managing the likelihood and impact of flooding with increases in rainfall predicted.

#### What we need to renew

The Council has three diversion tunnels, three dams and a weir to protect New Plymouth from flood events. The replacement value for flood protection assets is \$18m or about one per cent of the Council's fixed asset base.

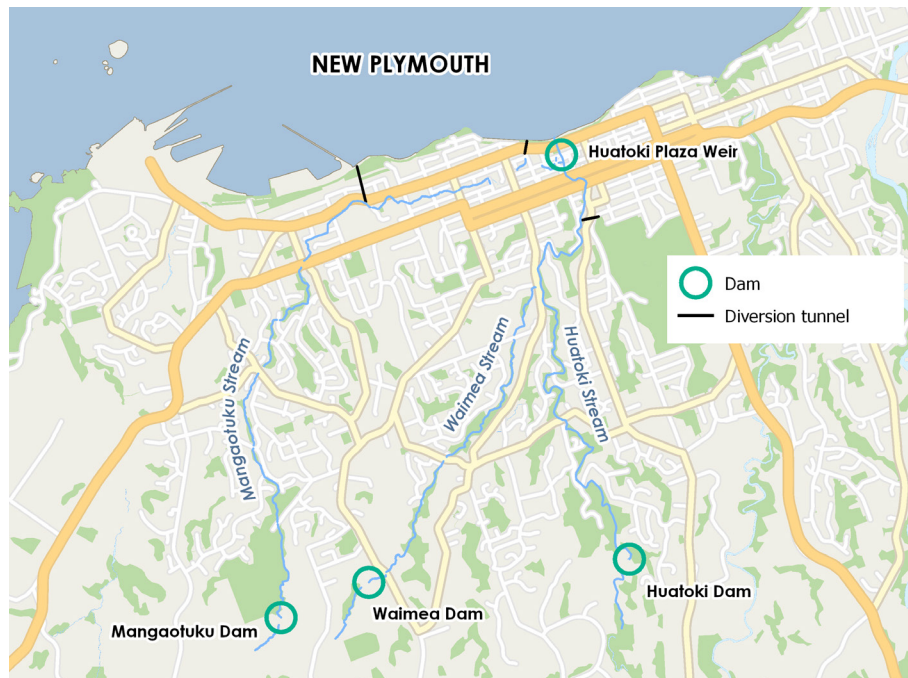


Figure 12: Location of flood protection assets

### Building resilience

Despite some significant rainfall events over the past few years, the district's flood protection network has coped well and our flood protection measures have not been significantly tested.

Built in the 1980s, most of the dams and tunnels used for flood protection have a very long life expectancy. However, changing climatic conditions may mean we will need to revise and adjust the level of protection required over time.

A recent investigation has indicated that our three dams may overtop in a one in 100 year storm. The Council has already begun acquiring land adjacent to the Huatoki dam in order to protect our ability to raise the dam if that is deemed the best option moving forward. Further investigation is required to understand the options available in order to maintain the level of protection we have agreed with our community. However \$3.2m has been earmarked for years 2029–2033 of this IS.

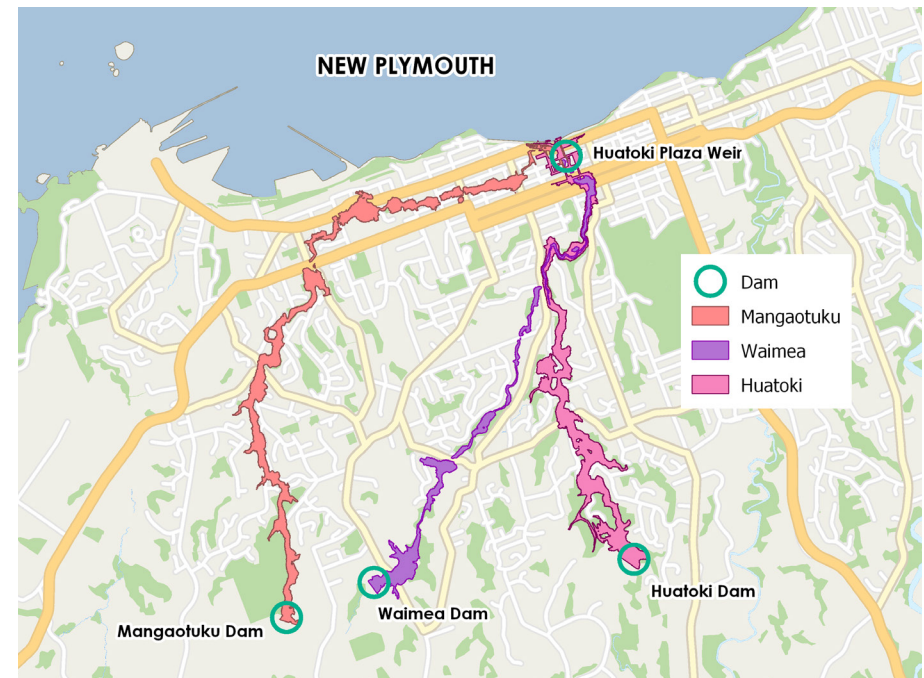


Figure 13: Extent of flood hazard in unlikely event of one of the detention dams falling while full

## Infrastructure by Activity

### Flood Protection

#### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
Dam improvements	2029-2033	\$3,200,000	Service Level

#### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	0.218	0.237	0.205	0.210	0.219	0.295	0.302	0.338	0.385	0.395
Renewals	0.024	0.025	0.025	0.026	0.026	0.027	0.028	0.028	0.029	0.030
Service level	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005
Growth	-	-	-	-	-	-	-	-	-	-

#### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	1.089	1.715	2.466	2.692	2.919	3.145
Renewals	0.126	0.142	0.050	0.044	-	-
Service level	0.021	0.024	3.216	-	-	-
Growth	-	-	-	-	-	-

## Transportation

In general, the district's roads are in good condition. Compared with other parts of New Zealand, our roads have relatively low traffic volumes so roading failure as a result of wear generally only occurs in high stress areas. This is typically where heavy vehicles turn at key intersections and along some key arterial and primary collector roads. Most road surface failure is the result of age related degradation.

### Key Transportation Issues

- Growth of population and climate change leading to increased maintenance and renewal requirements.
- Increased expectations of quality, and footpath and cycleway infrastructure.
- Growth of population and resiliency limited by a single Waiwhakaiho Bridge crossing.

### What we need to renew

Growth in our population and economy leading to increased movement of people and goods requires an agile renewal programme that can adapt to the changing needs of the district. Renewals undertaken in our road rehabilitation programme include upgrading roads to take modern traffic loads. With the introduction of the New Zealand Transport Agency's 'One Network Road Classification' system, the Council is focusing on renewing the 'right assets' at the 'right time' with a 'fit for purpose' investment approach.

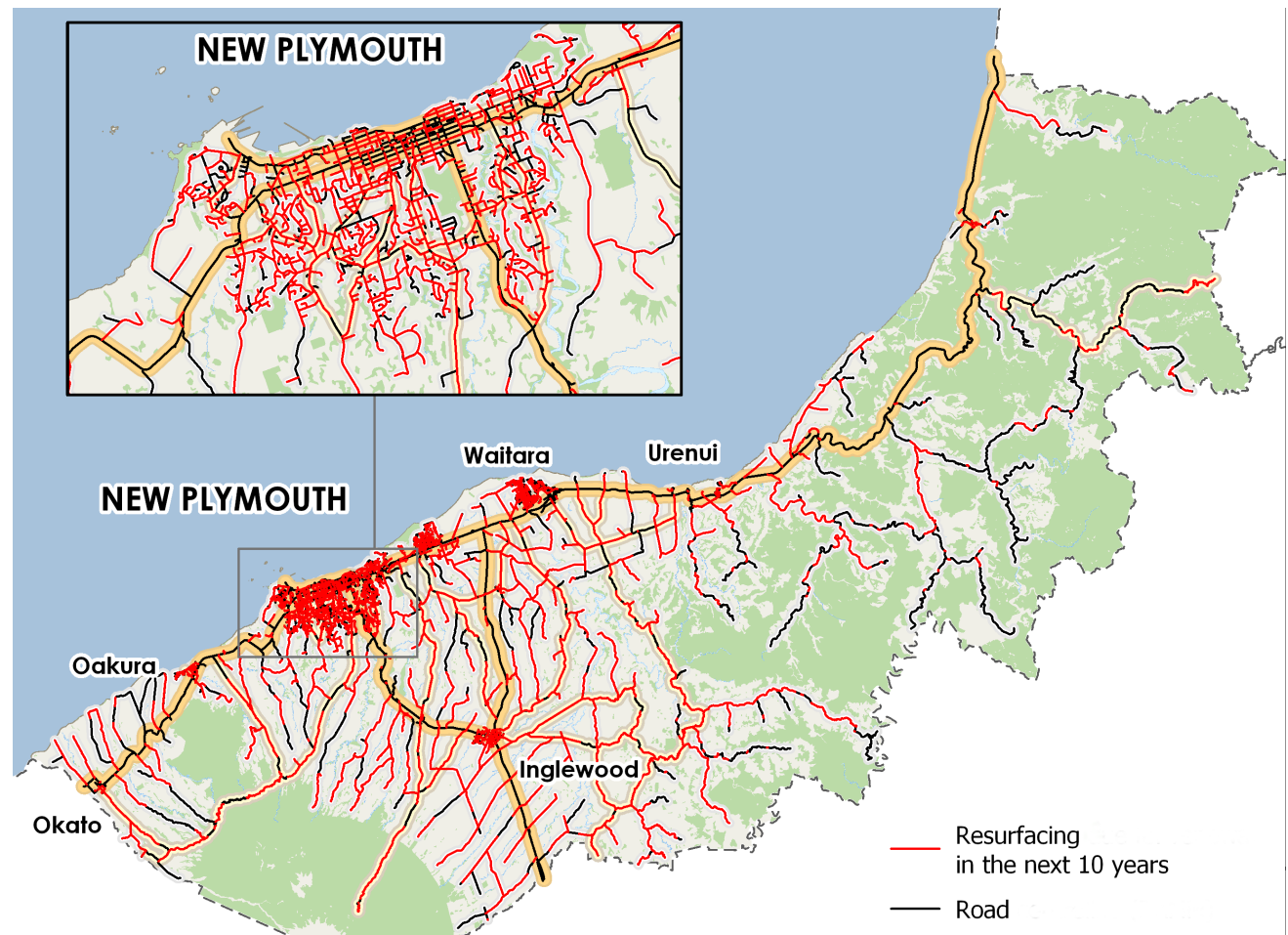


Figure 14: Roading renewals over the next 10 years

## Infrastructure by Activity

### Transportation

We use forecasting models to plan long-range renewal requirements. According to best practice we have adopted a risk based approach using criticality and condition assessments and failure mode analysis rather than age to prioritise what assets are to be renewed first. Prioritising replacement of critical assets reduces consequences of failure for the community, reserving money to pay for emergency renewals as they occur in less critical roads. We then see less critical assets run to failure, achieving maximum life and value for money. Service disruption is limited to the repair of less critical assets at the time of failure. We have also grouped renewals geographically to maximise opportunities for procurement efficiencies and to minimise disruption to the community.

Currently, resealing CBD surfaces, selected locations on arterial roads, primary collector roads with cycle lanes, and high wear areas such as heavy vehicle turning areas are high priorities for renewals. An implication of this focus is that we will need to monitor failure of roads in areas that service fewer people, and assess renewal requirement of those roads, if any.

#### Response to growth

As the population of the district continues to grow, demand on the transportation network will also continue to grow. We are already aware of limitations to the existing network. These limitations are likely to be exacerbated over time.

Options	Implications
1. Respond to growth related transportation infrastructure requirement as the need arises.	The Council's investment is not made until the need presents itself. This delays any additional cost to the community, but results in traffic issues building to a critical point, adversely affecting road users. Certain quick fixes may be required at either greater cost or providing only short term solutions. The implication of this is that additional investment would still be required.

Options	Implications
2. Conduct traffic network modelling to better understand the impacts of predicted growth and plan accordingly in advance.	The Council would develop a long term plan to cater for growth, investing at the most appropriate time. Allows for greater analysis of options, resulting in significant projects being cheaper. Allowing time for proper engagement with stakeholders may also create longer lasting solutions.

#### Preferred Response: Option 2

To understand the overall impact of projected growth on the district's transportation network computer modelling is required. We have programmed traffic modelling to occur over the next few years. This modelling will provide the information we need to make an informed decisions about the need, location and timing of a potential second bridge crossing over the Waiwhakaiho River to the Smart Road growth area. This modelling will also help identify and test the need for alternative roads around the perimeter of the existing urban New Plymouth area, such as a link road from Omata to State Highway 3 and linking Smart Road with industrial and rural land to the east.

In the interim, to meet our obligations under the NPS-UDC we have identified a requirement for investment in the growth areas listed below.

Growth Area	Road Infrastructure	Year Built	Cost
Upper Carrington growth area	Carrington Road widening	2020	\$1.1m
Bell Block, Area Q growth area	Airport Drive realignment (likely to be contributed to by external funders)	2021	\$3.4m
Ōākura growth area	Wairau Road intersection roundabout	2021	\$1.2m
Junction Road growth area	Junction Road bridge renewal into two lanes	2022	\$3.0m



Growth Area	Road Infrastructure	Year Built	Cost
Frankley/Cowling growth area	Frankley and Cowling roads widening	2029+	\$1.8m
Smart Road growth area	Second bridge crossing over Waiwhakaiho River and build new collector road	2030+	\$16.0m+

### Meeting community expectations

There is a range of competing community needs in relation to the transportation network.

- Population growth and increased traffic means more wear and tear of CBD surfaces, selected arterial and primary collector roads.
- There are increasing expectations of our footpath and cycleway infrastructure.
- Rural customers expect high quality rural infrastructure, which in some areas is also experiencing higher use as a result of logging.

This requires a flexible management approach.

Options	Implications
1. Focus investment on high use areas of the transportation network.	High use areas are well developed and maintained. Low use areas degrade over time leaving localised groups of customers potentially dissatisfied.
2. Spread investment evenly across the transportation network.	High use areas may be underdeveloped and/or degrade quickly leaving a high proportion of customers potentially dissatisfied.

### Preferred Response: Options 1 and 2

The Council intends to strike a balance between ensuring that high use areas are adequately developed and appropriately maintained, and providing a level of service in low use areas that is appropriate for the road type and extent of usage, i.e. 'right assets' at the 'right time' that are 'fit for purpose'.

The implication of adjusting the levels of service to meet the evolving needs of the community is that some people/groups may experience reduces service in order to improve levels of service in another area.

### Building resilience

A resilient transportation network is critical to the social and economic wellbeing of the district. Predicted growth in both private and commercial road users will add pressure on the transportation system performance.

There is also a lack of viable alternative routes, which during a major event could result in significant delays, risking transport and utility severance. Movement east to west is currently restricted to a single crossing point over the Waiwhakaiho River via State Highway 3.

Within the New Plymouth District we have a significant portion of road network susceptible to slips during heavy rain.

Climate change could adversely affect the transportation network in two ways:

1. Faster deterioration of transportation infrastructure over time requiring more regular maintenance, impacting roading budgets and travel times.
2. Disruptions and safety issues resulting from extreme weather events or natural disasters.

# Infrastructure by Activity

## Transportation

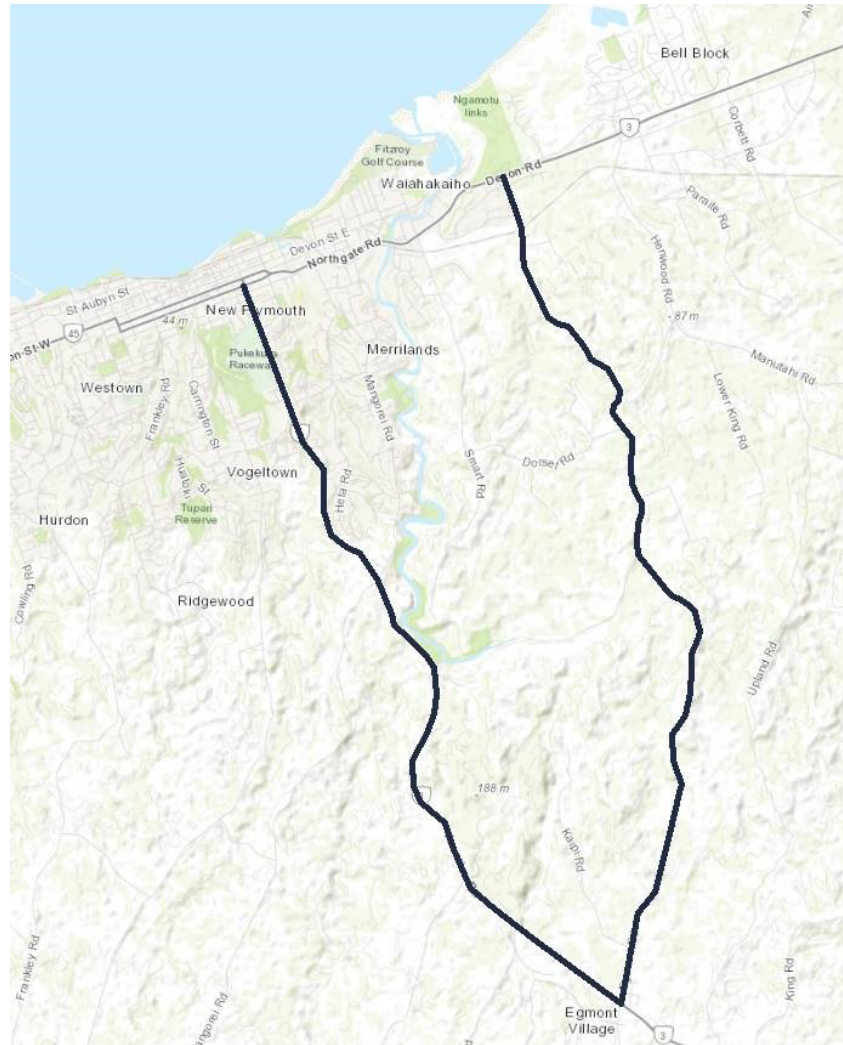


Figure 15: Alternative east to west route if existing Waiwhakaiho River crossing was closed

Options	Implications
1. Develop and maintain the roading network to meet today's needs only. Replace 'like with like' when renewing assets at the end of their useful life.	Today's needs are met at an acceptable cost. Risk that less resilient assets fail to cope with increasing rainfall potentially resulting in expensive network fix ups. Risk of significant disruption during a major event if an alternative east to west crossing point over.
2. Take a 'whole of life' approach that considers long term network resilience for renewals and when planning significant projects.	Today's needs are balanced with preparing to meet the needs of tomorrow's customers. A 'whole of life' approach ensures that assets are built to last. This may result in additional costs up front, but savings over the long-term.

### Preferred Response: Option 2

Likely increases in rainfall and the impact on roadside drainage capacity need to be considered in the short to medium term. Potential mitigation measures include increasing the capacity of drainage channels and enlarging through flow. We do not anticipate moving roading carriageways above potential areas of inundation in the short to medium term.

The Council is intending on investing \$10m over the life of this strategy to improve the resiliency of our road network, with a focus on slip prevention.

Planning a second Waiwhakaiho River crossing is critical for long term growth and has benefits for resiliency. If the existing crossing is damaged or closed, the city will be divided, with the only other crossing at Egmont Village. Estimates for a new crossing are approximately \$16m, including land acquisition and development costs.

## Infrastructure by Activity Transportation

### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
Transportation reseal and rehabilitation	2018-2048	\$4,870,000 p.a	Renewal
Transportation resilience	2018-2048	\$10,000,000	Service Level
Extension of the Coastal Walkway to Waitara (this cost likely to be shared with external funder)	2018-2023	\$8,500,000	Service Level
Let's Go Model Communities - activities and infrastructure	2018-2048	\$500,000 p.a	Growth
Roads land purchase as per District Plan and rural widening	2018-2048	\$500,000 p.a	Growth
Smart Road/SH3 intersection upgrade	2025-2026	\$3,500,000	Growth
Airport Drive realignment and intersections	2021-2022	\$3,400,000	Growth
Second bridge crossing over Waiwhakaiho River	2030-2038	\$16,000,000	Growth

### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	24.28	25.34	26.62	26.41	27.70	27.76	28.17	29.82	30.20	30.70
Renewals	9.58	10.17	15.50	9.53	9.19	11.11	9.44	9.68	9.91	10.17
Service level	3.61	3.12	2.90	4.56	3.08	3.64	3.17	3.96	3.33	3.42
Growth	0.46	0.42	0.47	2.23	0.49	0.62	0.50	3.34	0.53	0.54

### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	130.35	146.65	204.70	254.87	310.31	371.04
Renewals	53.98	50.32	44.70	54.36	55.97	61.09
Service level	17.26	17.52	7.39	5.04	5.55	6.06
Growth	4.08	5.53	12.91	32.05	13.65	14.90

## Infrastructure by Activity

### Recreation and Open Space

#### Recreation and Open Space

Recreation and open spaces contribute positively to social, physical and mental well-being. Maintaining these assets contributes to our strategic priority of 'caring for our place', preserving and enhancing the natural environment. It also supports economic prosperity. The places, spaces and assets we manage and maintain include:

- 1,600 hectares of park and reserve land.
- 82 km of walkways, including 12.7km of coastal walkway.
- 48 playgrounds.
- Nine skate park sites.
- 24 sports parks for use by residents and visitors.
- Brooklands Zoo.
- 46 public toilets.
- TSB Stadium.
- Todd Energy Aquatic Centre.
- Four local community pools.

#### ***Key Recreation and Open Space Issues***

- Our growing population will place additional pressure on existing parks and recreational spaces. It will likely drive development and maintenance of new parks and open spaces in new growth areas.
- Increases in the number of residents and in tourists will mean more use of facilities such as the Coastal Walkway, Pukekura Park, Brooklands Zoo, TSB Stadium and Todd Energy Aquatic Centre.
- Predicted increases in the frequency and intensity of storms and rising sea-levels are likely to result in increased risk to vulnerable beaches and coastal open spaces.

Our strategic vision is to build New Plymouth as the lifestyle capital of New Zealand. As we transition toward this vision, there will likely be improvements to key facilities and the introduction of some new facilities.

The Council currently meets the community's expectations in terms of the availability of parks and open spaces. As a result, new parks and open spaces are only likely to occur in new growth areas.

It is prudent that we look after the highly valued assets that we already have, such as Pukekura Park. There are a number of projects planned to ensure that this key facility remains fit for purpose and safe being: the maintenance of Festival of Lights infrastructure, renewing the exterior of the Tea House, playground shade structures, rebuilding the cricket ground terraces, maintaining walking paths and the dredging of the lake.

It is also important that biodiversity is maintained in our open spaces not only from an environmental perspective but to also encourage prosperity. Access to our thriving beaches, bush and mountain is an important part of being a lifestyle capital. Our biodiversity objectives are to collaborate with key partners, protect and enhance biodiversity through land management such as pest control, and to raise community awareness and appreciation of important values within our open spaces.

Visitor numbers will continue to grow as the district matures as a tourist destination. We need to ensure facilities such as public toilets and car parks are appropriately located and maintained in tourist hotspots.

Some of the areas of discussion around future infrastructure planning are:

- Should we simply maintain what we've got or build more parks and open spaces?
- Should we replace our recreational assets 'like with like' or upgrade over time?
- Should we prepare for higher usage now or respond to growth as it occurs?
- Should we prepare our parks and open spaces for climate change?

### Meeting community expectations

There are developments proposed within the lifetime of this strategy that will increase levels of service in relation to recreation and open space assets. The Council has identified a number of flagship infrastructure projects that seek to meet the growing needs of our community and will ultimately contribute to our district's lifestyle, attractiveness and vitality.

### Extension of the Coastal Walkway to Waitara

A walking and cycling connection between Bell Block and Waitara is proposed. The connection will benefit the residents of Waitara and New Plymouth by providing an off-road commuter route and extend the recreational and potential economic benefits of the existing Coastal Walkway for the wider community.

Options	Implications
1. Develop the Walkway to Waitara.	Cost to the community. A new off-road commuter and recreation route connects Waitara to the existing Coastal Walkway. Has potential active transport, economic and general well-being benefits.
2. Do not develop the Walkway to Waitara.	No cost to the community. Waitara remains unconnected to the existing Coastal Walkway resulting in a lost opportunity for an off-road commuter and recreation route towards New Plymouth. Potential active transport, economic and general wellbeing benefits are missed.

### Preferred Response: Option 1

The route is currently being explored. Relevant issues include important cultural heritage sites, coastal erosion and airport security. Feasibility work and discussions with interested parties, including iwi and hapū, will be undertaken to determine the most appropriate route.

The connection is estimated to cost \$8.6m. Funding assistance will be sought from the New Zealand Transport Agency. The Council has allocated \$1.6m in 2019 for the project which will take a number of years to deliver.

### TSB Stadium

The stadium is already at capacity with events often conflicting with community sports.

Sports such as basketball, netball and volleyball require more indoor space than is currently available. New Plymouth is also unable to host larger tournaments due to the lack of facilities. Demand for other indoor community sports such as futsal, one of the world's fastest-growing indoor sports, is also anticipated. Population growth will create further pressure on the facility.

The stadium already attracts a high number of events that provide commercial benefit to the local economy. However these events limit the community's ability to access the facility for sport and recreation. Due to these limitations we are not currently reaching our potential in terms of providing for community recreation or commercial opportunity.

Options	Implications
1. Redevelop the TSB Stadium into a multi-sport facility.	Significant cost to the community. Community access to indoor court space is increased. The need for an improved netball facility is achieved. The district gains the ability to host major tournaments and events and receives the associated economic benefits.

## Infrastructure by Activity Recreation and Open Space

Options	Implications
2. Do not redevelop the TSB Stadium into a multi-sport facility	No significant cost to the community. Community involvement in indoor sports remains restricted by the existing capacity shortage. The Waiwhakaiho netball facility will require investment in order to meet the needs of the community in the absence of a new facility at the TSB Stadium. The district misses out on the opportunity to host major tournaments and events and the associated economic benefits.

### Preferred Response: Option 1

As part of our commitment to provide facilities that support an active community the Council will continue to work with the relevant stakeholders and wider community to ensure that the future redevelopment of the stadium will meet the requirements of the relevant sports codes, while maximising opportunities to host major events. It is foreseen that the redevelopment of the stadium will occur around 2029 at an approximate cost of \$36.3m.

### Todd Energy Aquatic Centre

The Todd Energy Aquatic Centre is not currently meeting community demand for lane swimming, casual swimming or learn to swim facilities, which all compete for space during peak times. The facility also sits on the iconic Coastal Walkway and has the potential to leverage off our growing tourism market and become a premier destination for visitors to New Plymouth.

Options	Implications
1. Redevelop the Todd Energy Aquatic Centre.	Significant cost to the community. Community access to lane swimming, casual swimming and learn to swim facilities is increased. The new facility is well connected with the Coastal Walkway and creates another premier destination within the district.
2. Do not redevelop the Todd Energy Aquatic Centre.	No significant cost to the community. Community access to lane swimming, casual swimming and learn to swim facilities remains restricted by the existing capacity shortage. The opportunity to connect the facility with the Coastal Walkway and create another premier destination within the district is missed.

### Preferred Response: Option 1

There is interest within the community to retain the existing 50m outdoor pool as a part of any future redevelopment. Investigations into the condition of this pool are underway and will inform future redevelopment options.

The redevelopment of the Todd Energy Aquatic Centre is envisaged to occur sometime after 2029 at approximately \$36.1m. The extent of the redevelopment will be determined after meaningful stakeholder and community consultation.

### Taranaki Traverse (Waiwhakaiho River section)

The Council has the long-term aspiration of creating a link between Mount Taranaki and the Waiwhakaiho River Mouth as a part of the Taranaki Traverse project. This project aims to enable accessibility to key natural and cultural assets, linking to and leveraging existing attractions, open spaces and walking and cycling networks.



Figure 16: Taranaki Traverse

We are currently investigating the development of a walkway along the Waiwhakaiho River, connecting the city with the mountain. One million dollars has been budgeted for land acquisition and to conduct a business case analysis for this section of the walkway.

Another section of the Taranaki Traverse is the Pouakai Crossing (marked with blue dots in Figure 16). There is a need for an improved car park and toilet facility at the Mangorei Road end for users of the Pouakai Crossing. This project costs \$930,000 which will be shared between the Council and external funders.



Figure 17: Pouakai Crossing car park

## Infrastructure by Activity

### Recreation and Open Space

#### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
TSB Stadium redevelopment	2029+	\$36.3m	Service Level
Todd Energy Aquatic Centre facility redevelopment	2029+	\$36.1m	Renewal/Service Level
Parks Management Plan implementation	2018-2048	\$300,000 p.a	Service Level
Rail safety on Coastal Walkway	2020-2021	\$2,100,000	Service Level
Park development - Area Q growth area	2019-2027	\$2,000,000	Growth
Park development - Smart Road growth area	2031-2033	\$1,300,000	Growth

#### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	28.88	33.11	31.65	31.84	33.58	35.19	35.24	37.79	39.42	40.13
Renewals	4.62	3.05	3.44	3.91	4.86	3.88	3.21	3.06	3.14	2.91
Service level	3.42	4.03	5.53	4.25	3.55	2.77	2.78	3.20	2.83	2.85
Growth	1.72	2.56	2.14	2.59	1.95	2.42	2.16	2.15	1.92	1.86

#### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	159.07	187.77	213.38	233.26	253.20	273.19
Renewals	19.88	16.21	8.33	8.86	9.82	10.72
Service level	20.78	14.43	81.85	2.82	3.11	3.39
Growth	10.96	10.50	2.27	0.89	0.98	1.07



**Solid Waste and Refuse Collection**

This service includes waste and recycling collection from more than 27,900 residential and school premises each year. It also includes transfer stations, the Colson Road Landfill, the Resource Recovery Facility and education programmes to encourage waste minimisation in the district.

**Key Solid Waste Issues**

- The existing landfill at Colson Road is expected to reach capacity in 2019.
- A new regional landfill is being developed in Eltham, South Taranaki.
- Our strategic vision includes reducing the amount of waste going to landfill in the district, with a goal for zero waste.

When the regional landfill at Colson Road, New Plymouth reaches capacity in 2019 it will be closed down. A new regional landfill is being developed in Eltham, South Taranaki, which will increase waste transportation cost for the New Plymouth District.

We are currently constructing a Resource Recovery Facility adjacent to the existing Colson Road Transfer Station. This facility includes a Material Recovery Facility which is now complete. The facility also includes a community operated Reuse and Recycle Centre and Refuse Transfer Station. This facility will increase the district’s capacity to reuse and recycle materials and reduce the amount of waste transported to the new regional landfill in Eltham.

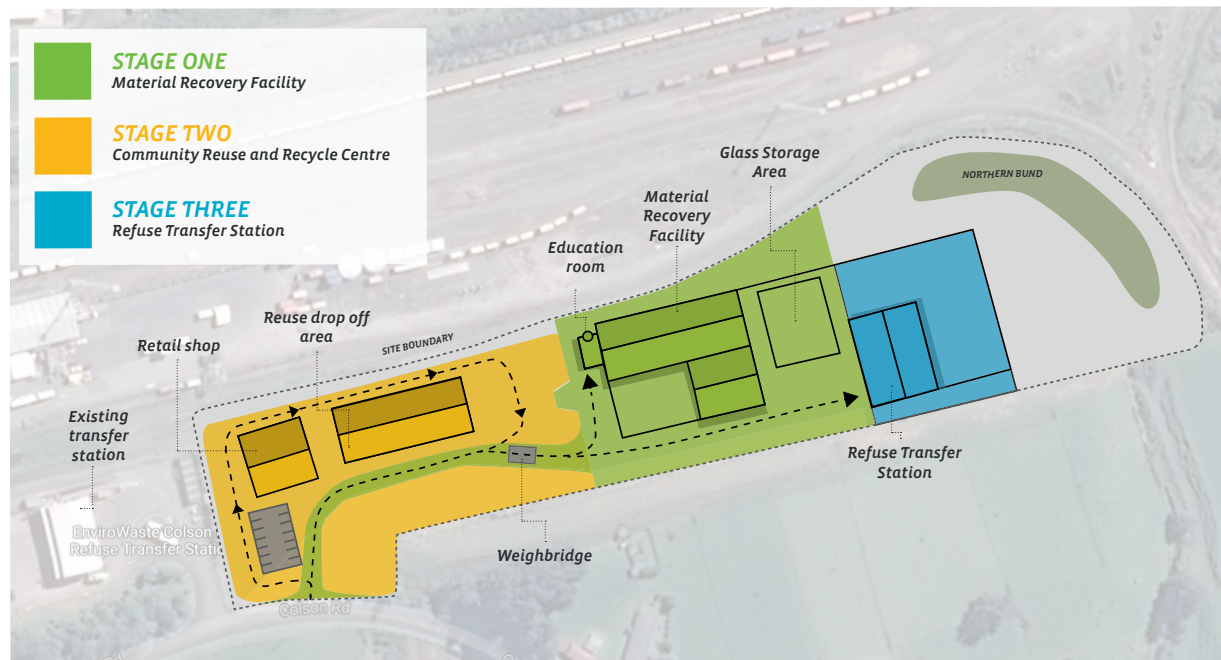


Figure 18: Proposed staged development of a Material Recovery Facility, Community Reuse and Recycle Centre and new Transfer Station at Colson Road

## Infrastructure by Activity

### Solid Waste and Refuse Collection

#### Our response

In accordance with the Waste Minimisation Act 2008, the Council consulted on its draft Waste Management and Minimisation Plan (WMMP) in mid-2017. The plan was adopted in November 2017 and is available on the Council's website.

The WMMP details a number of options for working towards the vision of zero waste. Feedback shows community support for the vision, goals and objectives in the Plan. The key goals for the next six years are to:

- Maximise opportunities to reduce levels of waste sent to the landfill.
- Reduce the harmful and costly effects of waste.
- Improve efficiency of resource use.

#### Meeting community expectations

Reducing waste volumes going to landfill means the Council will be better positioned to respond to tighter legislative requirements relating to landfills as they are introduced over time.

Reducing waste volumes over time also progresses us towards meeting the community's expectations of zero waste in the district. In addition to encouraging waste minimisation, we will need effective education on the long term benefits of targeting zero waste now, to demonstrate to ratepayers that investing in zero waste now is cost effective in the medium to long term.

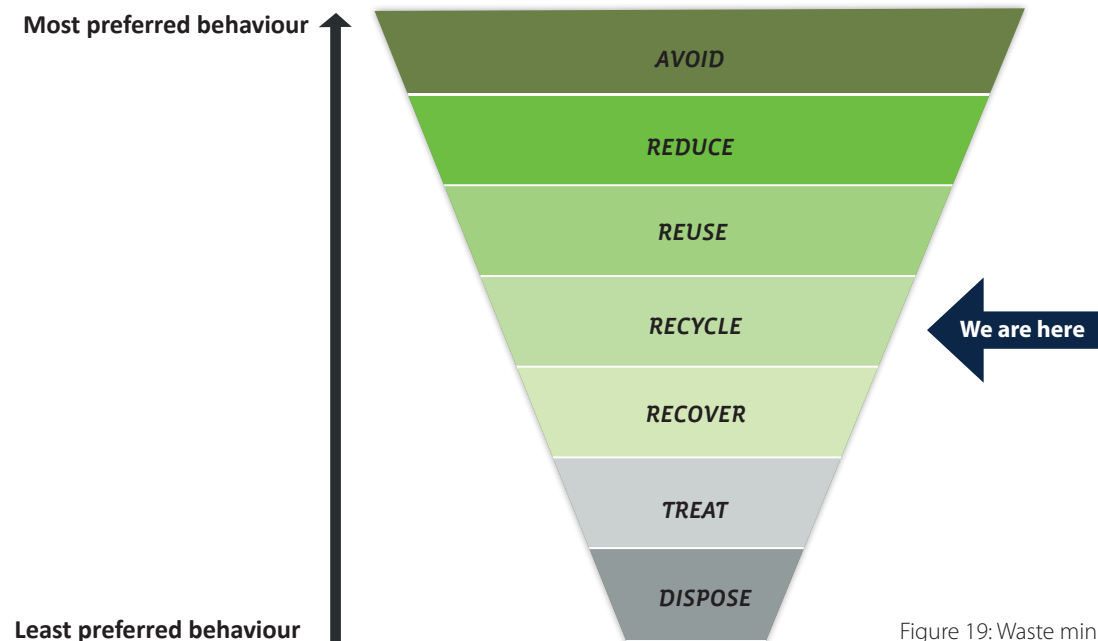


Figure 19: Waste minimisation hierarchy

## Infrastructure by Activity

### Solid Waste and Refuse Collection

#### Expenditure

Significant Expenditure Highlights	Year	Cost	Primary Driver
Central Landfill (Council contribution only)	2018-2019	\$10,000,000	Renewal
Commercial and Industrial Materials Recovery Facility	2020-2021	\$3,500,000	Service Level
Resource Recovery Facility	2018-2019	\$2,400,000	Renewal

#### 10 Year Expenditure (includes inflation)

	Year 1 2018/19 \$m	Year 2 2019/20 \$m	Year 3 2020/21 \$m	Year 4 2021/22 \$m	Year 5 2022/23 \$m	Year 6 2023/24 \$m	Year 7 2024/25 \$m	Year 8 2025/26 \$m	Year 9 2026/27 \$m	Year 10 2027/28 \$m
Opex	12.70	15.33	14.65	14.86	15.13	15.51	16.20	16.85	17.20	17.63
Renewals	12.56	1.06	0.13	0.09	0.09	0.09	0.09	0.09	0.10	0.10
Service level	-	-	3.60	0.05	0.05	0.66	0.06	0.12	0.06	0.06
Growth	-	-	-	-	-	-	-	-	-	-

#### 30 Year Expenditure (includes inflation)

	Years 1-5 2018-2022 \$m	Years 6-10 2023-2027 \$m	Years 11-15 2028-2032 \$m	Years 16-20 2033-2037 \$m	Years 21-25 2038-2042 \$m	Years 26-30 2043-2047 \$m
Opex	72.66	83.40	100.46	109.67	118.88	128.09
Renewals	13.93	0.47	0.03	0.42	1.44	1.57
Service level	3.71	0.96	-	-	-	-
Growth	-	-	-	-	-	-

## Assumptions

The assumptions in this Infrastructure Strategy align with the Council's LTP, reflecting the issues that could impact on Council activities. A full list of the Council's significant forecasting assumptions can be found in the Additional Information section of the LTP. These assumptions underpin the Council's preferred options for infrastructure management and the capital expenditure decisions required over the life of this strategy.

Assumption	Risk	Level of Uncertainty	Impact
<p><b>Population growth</b></p> <p>There will be high population growth in the New Plymouth District over the next 10 years. Projections estimate the district's population will grow from 83,400 in 2018 to 92,400 over the life of the 10-Year Plan and to 106,100 by 2048.</p>	Population growth occurs at a faster or slower rate than projected.	Medium	Slower or faster population growth may impact on service levels, infrastructure expansion, renewal programmes and costs, resulting in increased or decreased rates requirements.
<p><b>Climate Change</b></p> <p>Climate change is predicted to increasingly affect the district, particularly over the life of this 30-year Infrastructure Strategy, with high temperatures, increased rainfall, and sea-level rise.</p>	Climate change becomes a more prevalent issue for the district.	Medium	If climate change becomes more prevalent, the district will experience higher levels of rainfall, resulting in more flooding, landslides, and coastal inundation and erosion. Conversely, we could experience longer drier periods at certain times of year putting additional pressure on our water supply.
<p><b>Tourism</b></p> <p>In accordance with the Ministry of Business, Innovation and Employment national growth rate forecasts, tourist guest nights will increase by 4.9 per cent per annum.</p>	Tourism grows at a faster or slower rate than predicted	High	Slower growth could have a negative impact on investment opportunities, while faster growth could lead to increased utilisation of assets.
<p><b>Levels of Service</b></p> <p>Projects such as the TSB Stadium redevelopment, Walkway to Waitara and water/wastewater resilience projects will increase the Council's levels of service provided over the life of this strategy.</p>	The Council may need to adjust service levels in response to new issues identified by the community, changes to legislation or external factors.	Low	Changes to levels of service may result in new operational and/or capital expenditure costs, which could require increased rates funding.
<p><b>Life cycle</b></p> <p>It is assumed that asset information is reliable and reflects the condition and performance of the assets. It is assumed that no significant assets will fail before the end of their useful lives.</p>	Asset life and/or condition assessments prove to be invalid and assets require replacement earlier or later in their life cycle.	Low	Asset management is a priority for the Council. Unexpected failure of an asset would be managed by re-prioritising capital expenditure programmes. If the renewals programme is not able to be re-prioritised, additional borrowing or rates funding could be required.