Far North District Council
Te Kaunihera o Tai Tokerau ki te Raki

LONG TERM PLAN 2021 - 31

Infrastructure Strategy 2021-2051

Document history and status

Revision	Date	Description
1	12.01.2021	Final Draft
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Contents

1. Introduction

The Far North District Council (Council) is the steward of stormwater, wastewater, water and transport assets that are vital for households, businesses and communities. These assets represent a major investment by today's communities and future generations.

Roads that make up the Far North transport network are vital lifelines for communities and provide important networks for road freight. The three waters infrastructure (water, wastewater and stormwater) is critical for providing for the wellbeing of communities and supporting urban growth. The management of these assets is long term, with the lifespan of much of the infrastructure spanning generations.

This Infrastructure Strategy has been prepared in accordance with the requirements of Section 101B of the Local Government Act 2002 (LGA) and:

- Identifies our significant infrastructure issues for transport, water, wastewater and stormwater over the next 30 years (2021-2051)
- Summarises the main options we have for managing those issues, our strategic response and likely course of action
- Sets out the likely cost implications of managing infrastructure over the next 30 years.

Council prepares an Infrastructure Strategy every three years as part of the Long Term Plan (LTP) process. This is Council's third Infrastructure Strategy and serves as an update to the version prepared in 2018 during the LTP 2018-2028 process. This strategy covers water, wastewater, stormwater, and transport assets owned by Council.

2. Strategic framework

Infrastructure plays a vital role in promoting the wellbeing of our communities. How we invest in and manage our assets now will have implications for future generations. This document sets out our infrastructure management approach for the next 30 years, considering any likely significant challenges ahead of us.

This document serves as a connection between the 10-year financial planning horizon of the LTP and Council's longer-term strategic asset delivery approach. This strategy is part of a suite of long, medium and short-term strategies, plans and policies that contribute to the long-term sustainable management of Council's infrastructure. The Strategy sits above the asset management system and asset management plans and is a key supporting document for the LTP 2021-31, reflecting the contribution to our vision and the outcomes we aspire to achieve for our communities. Key strategic links are discussed below.

2.1. Our vision

Council has adopted the district wide vision: He Whenua Rangatira - a district of sustainable prosperity and wellbeing. He Whenua Rangatira was developed collaboratively with the Far North community.

Infrastructure is a key platform on which community wellbeing is provided for. The goal of this strategy is to support our district wide vision through the provision of infrastructure.

2.2. Our community outcomes

Council's community outcomes are set out below. Council acknowledges these as aspirational long-term goals that Council aims to help its communities to achieve. The provision of core infrastructure is an essential part of achieving these goals. The 30-year Infrastructure Strategy is therefore a key document to map out the long-term issues and opportunities that may affect these aspirations.

The community outcomes we believe our District needs to grow and succeed are:

Communities that are healthy, safe, connected and sustainable
Our aspiration is that communities have access to everything that they need to have a good quality of life. We have the freedom of opportunity and choice in the way that we live. We know our communities and can participate in all that they have to offer.

Connected and engaged communities prepared for the unexpected
Our communities are aware, informed and well-equipped to be able to respond to an unexpected event. We are resilient and know that we can look to each other to get through whatever comes our way. This is our strength.

Proud, vibrant communities
Our communities celebrate who they are and where they live. We embrace and respect the diversity within our communities and take pride in our unique places and spaces. We are working together to achieve our aspirations.

Prosperous communities supported by a sustainable economy
Our communities are unlocking the potential of our district and are empowered to pursue opportunities. We are leveraging our valuable resources and producing quality products that will directly support our communities. Our communities are known for quality, for manaakitanga and for prosperity

A wisely managed and treasured environment that recognises the special role of tangata whenua as kaitiaki
Our natural resources are valued and are thriving. We are safeguarding them for the future and ensuring that they are being used sustainably. We are actively seeking balance in the environment to maintain its life-sustaining properties for everybody to enjoy.

We embrace and celebrate our unique culture and heritage and value it as a source of enduring pride
Our unique culture and heritage define our journey as a district. We embrace and respect all cultures without our communities, and we are proud of our unique history.

2.3. Long Term Plan Strategic Priorities

The Long Term Plan 2021-31 is focused on addressing seven strategic priorities intended to provide for the wellbeing of our communities and achieve the community outcomes we have identified. These strategic priorities are:

Protecting our water supplies
This priority is about improving the resilience of our water supplies during periods of extended dry weather. The importance of this priority was made all too clear during the severe drought event that affected Northland during the 2020/21 summer.

Enable sustainable economic development
This priority is about acknowledging the role Council can play in supporting economic wellbeing, which is particularly important as a result of the impacts of the COVID-19 pandemic on the tourism sector – one of the biggest contributors to our local economy.

Better asset management
Our district is large, and our communities are dispersed. Providing water and roading infrastructure to many, small communities places a heavy burden on our limited resources. Our decision making around how we renew and upgrade our assets is limited by the way we gather and store our asset information. This strategic priority is about continuing to invest in our asset management approach in order to optimise our infrastructure investment, improving both the reliability of our services and their overall cost.

Deepen our sense of place and connection
Our communities are diverse and spread across our District. It is important that each of our communities feel that sense of belonging and connection that will build future resilience and ensure our communities can and are able to connect across our District and region.

Adapt to climate change
Council recognises that climate change is one of the biggest risks we face in the Far North. The Council has adopted a Climate Change Roadmap and will soon engage with the community on its goals and principles. The first stages of the roadmap will be implemented during the period covered by the Long Term Plan 2021-31.

Address affordability
A significant challenge we face is paying for the public services our communities require to maintain a quality standard of living. Most of the money that pays for these services comes from individual households through rates. Balancing the cost of services against a relatively low number of ratepayers is a significant challenge. In the Long Term Plan 2021-31, Council is looking at options that could lessen the burden on those who can least afford it.

2.4. The Far North

2.4.1. The place we live in

The Far North District is the northernmost territorial local authority in New Zealand. Compared to other districts, the Far North ranks as the14th largest district by land area.

Figure 1 depicts the Far North District land area.

Figure 1. The Far North District

Around half of the population reside in small urban settlements located throughout the District, the largest of which are Kerikeri and Paihia on the east coast, Kaitaia to the north and Kaikohe, located between the east and west coast. The populations within these larger urban areas range from approximately 4,000 to 6,500 people. The rest of the population lives in rural or semi-rural settlements. Our population density is around nine people per km^2, which is average for provincial New Zealand.

The coastline of the Far North is one of the District's defining geographic features - it is unique, diverse and extensive. The coast, along with the District's unique biodiversity[1], and rich heritage, make the Far North an attractive place to live and visit.

With a lengthy history of Māori and Pakeha settlement, the Far North District has a rich and nationally significant heritage. Key examples include the Hokianga Harbour (Hokianga-nui-a-Kupe) on the west coast which according to tradition was the landing place of Kupe, who is regarded as the first to set foot on Aotearoa; and on the east coast, the Bay of Islands is home to the Waitangi Treaty House and Okiato, which was the nation's first capital.

We generally have high rainfall during autumn and winter with prolonged dry spells during summer. This seasonal rainfall can lead to low flows in our smaller river catchments and although it doesn't typically affect our groundwater, long periods without rain affect the amount of water that is available to supply communities and commercial and industrial activities. Water quality can be affected by rainfall and low flows, as well as temperature, surrounding land use, and discharges (including those from our infrastructure, such as roads, stormwater and wastewater). High (and

[1] The Far North is considered a biodiversity hotspot, hosting unique habitats such as coastal dune lakes and harbouring extensive tracts of public conservation land and native forests.

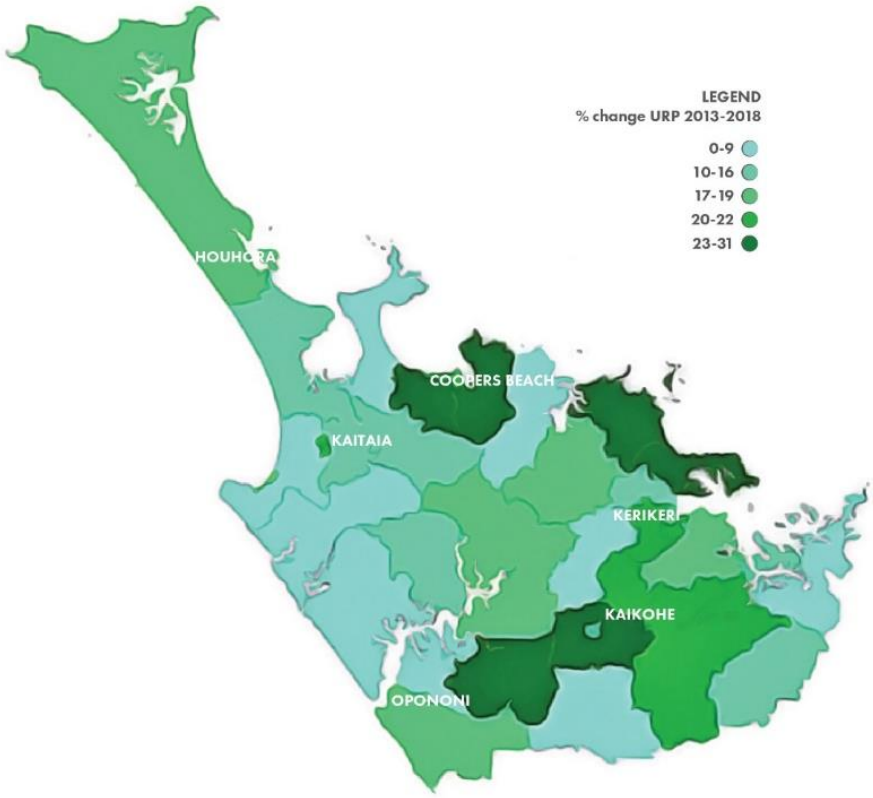
intense) rainfall can also cause flooding. Our air quality is generally good but dust from heavy vehicles travelling on unsealed roads is a problem in rural communities during dry summer periods. We have a diverse range of soils and rock strata, including highly productive soils, and much of our land is prone to erosion which affects our infrastructure.

2.4.2. Our population

Estimated resident population of the Far North is 71,000[2]. Population growth since the 2013 Census has been above the national average, with an average annual increase of approximately 2% between 2013 to 2020.

Percentage change in usual resident population is shown in Figure 2.

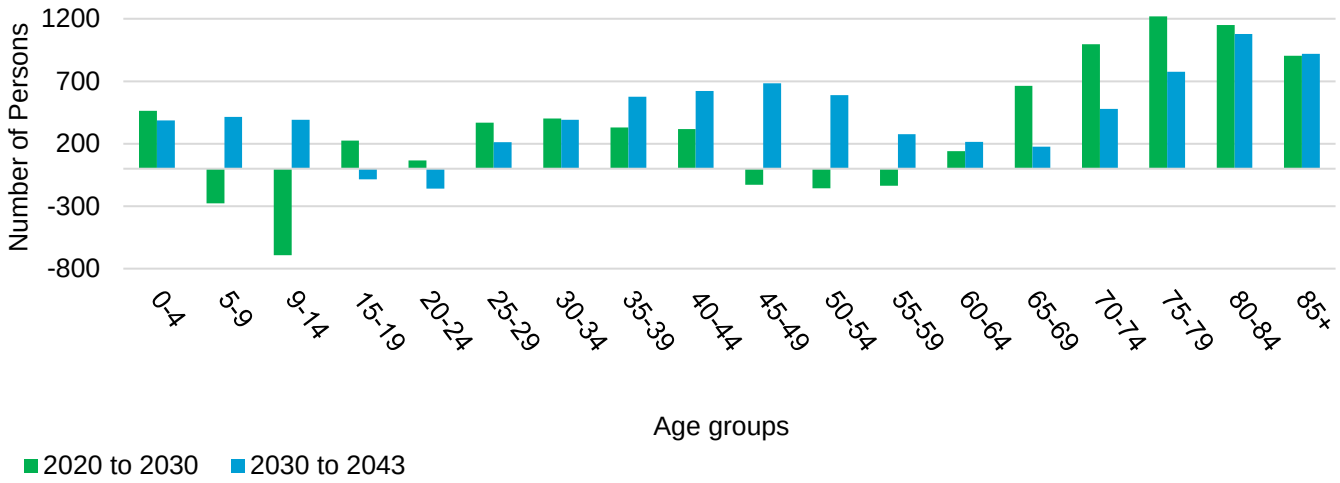
Figure 2. Percentage change in Usual Resident Population (URP) between 2013-2018 based on Census URP population counts.



The population is forecast to increase at a rate of approximately 0.5% per annum between now and 2043, resulting in a total population of approximately 78,000 people[3] by 2043. Most of this growth is projected to occur in the Far North's main urban centres (Kaitaia, Kaikohe, Kerikeri and Paihia) and the Doubtless Bay area. Importantly, the age structure of the Far North District is forecast to change substantially. The 65+ demographic is predicted to represent a big component of population change over the next 20 years () with the demographic representing 32-37% of the population along several east coast communities between the Bay of Islands to Doubtless Bay. We have one of the highest deprivation rates[4] in the country. The most deprived areas are located on the west coast and the northern tip of the district, north of Pukenui. The least deprived areas located on the east coast, including Kerikeri, Paihia and Kapiro.

[2] StatsNZ Subnational Population Estimates: At June 2020 (provisional)
[3]Population and household forecasts, 2013 to 2043, prepared by .id, February 2020.
[4] Broadly speaking, deprivation can be described as lack of access to benefits considered to be basic necessities in society. The University of Otago in collaboration with the New Zealand Department of Public Health, has undertaken a study to assess and map deprivation throughout New Zealand. www.otago.ac.nz/wellington/research/hirp/otago020194.html

Figure 3. Population and household forecasts for the Far North District 2020 to 2043.



Source: Forecast source data obtained from .id

2.4.3. Our economy

Economic growth in the Far North District averaged 2% per annum over the 10-year period 2009-2019 compared with an average of 2.5% per annum in the national economy. The District accounts for 0.8% of the national economy and 31% of the Northland regional economy. Tourism and Primary Production (agriculture, forestry and fishing) are by far the greatest contributors to the local economy, with these sectors combined contributing 25% to the Gross Domestic Product in 2019. By comparison the contribution of these sectors to the national GDP is around 11%[5].

Māori are making an increasing contribution to the economy of the Far North District. Over the past ten years (2009-2019), the number of filled jobs (both employed and self-employed) held by Māori grew at an average rate of 1.5% per year, more than twice the average annual growth in filled jobs held by non-Māori in the district (0.7%). Māori account for 38% of total filled jobs in the Far North District in 2019 compared to 36% in 2009. The main industries in which Māori hold filled jobs are education and training; agriculture, forestry and fishing; health care and social assistance; accommodation and food services; and construction. These five industries account for 56% of all Māori employed in the Far North and 78% of the increase in filled jobs held by Māori between 2009 and 2019. The average income of Māori receiving wages and salary in the Far North was $32,174 in 2009 representing 86% of the average income received by a wage and salary earner in the Far North. By 2019, this had increase to $46,651, equivalent to 95% of the district average.

[5] Source: Far North District Economic Profile, Infometrics, https://ecoprofile.infometrics.co.nz/Far%2bNorth%2bDistrict

3. Key strategic links

3.1. Far North 2100

Far North 2100 (FN2100) is a high-level strategy which will be implemented via placemaking and spatial planning initiatives, including area plans. The strategy covers a period of 80 years and is intended to guide the implementation of the District's vision - setting direction for Council's various functions, while acknowledging the role Council plays in shaping the district. FN2100 is, at the time of writing this document, in draft and will be consulted on at the same time as this Infrastructure Strategy.

Because the Infrastructure Strategy is being developed concurrently with FN2100, full alignment of both will be evident in the next iteration of the Infrastructure Strategy in 2023. That said, the vision FN2100 seeks to achieve is He Whenua Rangatira– a district of sustainable prosperity and wellbeing.

3.2. Far North District Plan Review

A full review of the Far North District Plan is presently underway and is entering the final phase of the drafting process. The District Plan review has a strong focus on linking land use activities with the need to enable sustainable and resilient infrastructure. This focus is being driven in part by Section 31 of the Resource Management Act 1991 (RMA) which, among other things, requires a district plan to ensure that there is sufficient development capacity to meet the expected demands of the District. In addition, the District Plan objectives framework has been developed to address a number of significant resource management issues inherently linked to the long-term provision of infrastructure. Key relevant objectives identified as part of the District Plan review are summarised as follows:

- **Urban sustainability**: the scale, type and design of urban development will be applied to the availability or provision of infrastructure, servicing urban areas to enhance wellbeing
- **Affordable infrastructure**: optimise and protect the use, development and operation of existing infrastructure and ensure new infrastructure is resilient to meet the needs of the community
- **Hazard resilience and climate change**: climate change hazards are recognised and managed, promoting healthy, safe and resilient communities.

The draft District Plan will be released for public feedback in early 2021 and a proposed version notified in the last quarter of 2021. The District Plan review represents a key opportunity to achieve alignment between land use activities and the direction of this Strategy.

3.3. District Transport Strategy

The Integrated Transport Strategy addresses key transport problems faced by the District. These issues include safety and network resilience, addressing levels of service and climate change risks, planning for growth, community connectivity, and a shift to a multimodal transport response in urban areas. The Integrated Transport Strategy was formally endorsed by Council in December 2020 and has been used to inform the transport investment portfolio for the 2021-2024 Regional Land Transport Plan (RLTP) and the upcoming Long Term Plan 2021-31 (LTP). The strategic direction of the Integrated Transport Strategy has informed long-term direction of this strategy in respect of transport infrastructure.

3.4. Programme Darwin

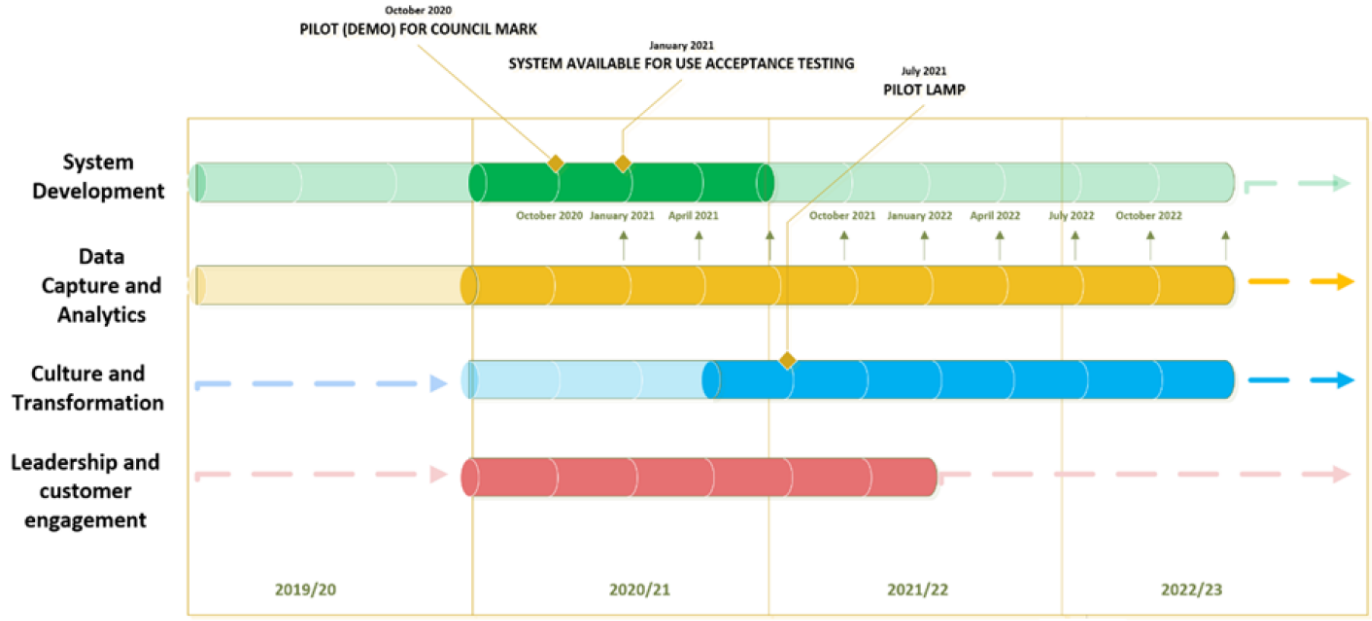
The current Infrastructure Strategy (2018-48) identified the need to improve the way we manage our assets as a strategic priority. Consequently, Council implemented a programmed approach to fundamentally transform our asset management. Programme Darwin was initiated in 2019 and contains four distinct work streams:

- **System development**, including full data cleaning and migration into the new system (INFOR) and integration with FNDC's existing IT infrastructure.

- **Data capture and analytics**, including ongoing condition assessment of assets in accordance with agreed prioritisation criteria and on-going analytic and reporting of INFOR data.
- **Culture and transformation**, integrating our improved asset management approach across the Council so that it becomes part of the culture of what we do. A key deliverable for this component is the development of living asset management plans (LAMPs).
- **Leadership and engagement**, ensuring the new asset management system is appropriately resourced, staff are given adequate training and key external stakeholders and elected members are engaged such that they are directly benefiting from the programme investment.

The timeline for the delivery of the above milestones is presented in **Error! Reference source not found.**.

Figure 4. Programme Darwin milestones and timing



To ensure the effective delivery of the programme, Council has a team dedicated to the delivery of the programme. System development of the new asset management system (INFOR) commenced in early 2019 and user acceptance and testing is expected to commence in early 2021. Data capture and condition assessment of critical assets is presently underway, and Council will develop a maintenance programme to enable the resourcing of on-going asset condition assessments to optimise asset life cycle management via a revised asset management approach. A budget of $9M over 10 years is being proposed via the Long Term Plan 2021-31 to resource asset condition for three waters assets. That budget will be part of the next long term plan process once the condition assessment programme has been underway for several years.

3.5. COVID-19 Economic Impact

The global economic and health crisis caused by the COVID-19 pandemic is expected to have long-lasting effects on New Zealander's way of life. Recent modelling undertaken by Business and Economic Research Limited (BERL[6]) indicates that while most industries are expected to recover over the next 10 years, the industries that make up much of the tourism sector (accommodation and food services, and arts and recreation) are unlikely to recover employment back to their pre-pandemic state for some time beyond 2030.

Even under the best-case scenario, the modelling predicts key tourism industries will be employing around 40% fewer people in 2030 compared to 2020. This has potentially significant implications for the Far North District, given the significant contribution tourism plays in supporting the local economy.

[6] Economic scenarios to 2030 - The post-COVID-19 scene. Prepared by Business and Economic Research Ltd, Hōngongoi 2020.

Post the level 4 lockdown, BERL worked with Treasury to determine the likely course of recovery for New Zealand. All acknowledge a far greater level of uncertainty this time around, which has led to departure from an assumed single scenario.

BERL projected three potential scenarios:

- Mid-scenario likely 5 to 7 year recovery (the most realistic)
- Faster rebuild likely 2 to 3 year recovery (unlikely)
- Stalled rebuild likely 7 years (worst case scenario)

The Local Government sector has been advised by BERL to plan for the mid-scenario.

The main Treasury assumptions built into the adjustors are:

- Borders remain closed until 1 Jan 2022 with possible safe zones/travel bubbles.
- Unemployment will likely peak at 7.8% between June 2021 and March 2022, with a recovery of at least two years but more likely four^{+} years.

While this seems at odds with the short-term effects on the economy, which have benefited from being community COVID-19 free, summer and Christmas, Treasury base their adjusters on a long-term view of the economy. For the Far North District, the biggest impact has and will continue to be on tourism, especially those reliant on the international market. Again, the impact over the high season will be lessened by increased domestic numbers. The Far North primary sector, especially food production, is seen to be very resilient to the detrimental effects on international trade and remains a growth industry.

However, the roll out of vaccines and both supply and public uptake will be the determinants for reopening borders around the world and enable the distribution of goods and services to return to pre-COVID levels.

3.6. Water and Wastewater Reform Programme

The Department of Internal Affairs (DIA) is leading a major reform programme for drinking water, wastewater and potentially stormwater. The reform was initiated to address challenges across the country associated with service delivery, including improving the reliability of asset information and addressing gaps in renewals funding. This has seen the development of new legislation and the creation of Taumata Arowai, a new water services regulator with the mandate to oversee and enforce a new drinking water regulatory framework, with an additional oversight role for wastewater and stormwater networks.

The reform process includes a national $761 million package designed to stimulate the economy for those councils that sign-up to a non-binding memorandum of understanding (MOU) in support of the reform programme. Council has signed the MOU and has secured $11.8M of this funding. Council plans to use this funding to establish new water sources for the Kaitaia and Kaikohe water supply schemes and update network modelling for our water, wastewater and stormwater assets. These three projects make up over $7M of the $11.8M grant funding. The remainder of the funding is proposed to be used for a few minor operational initiatives (such as professional fees for water safety plan development, and wastewater treatment management plans, contract services for leak detection and staff salaries for fixed term positions).

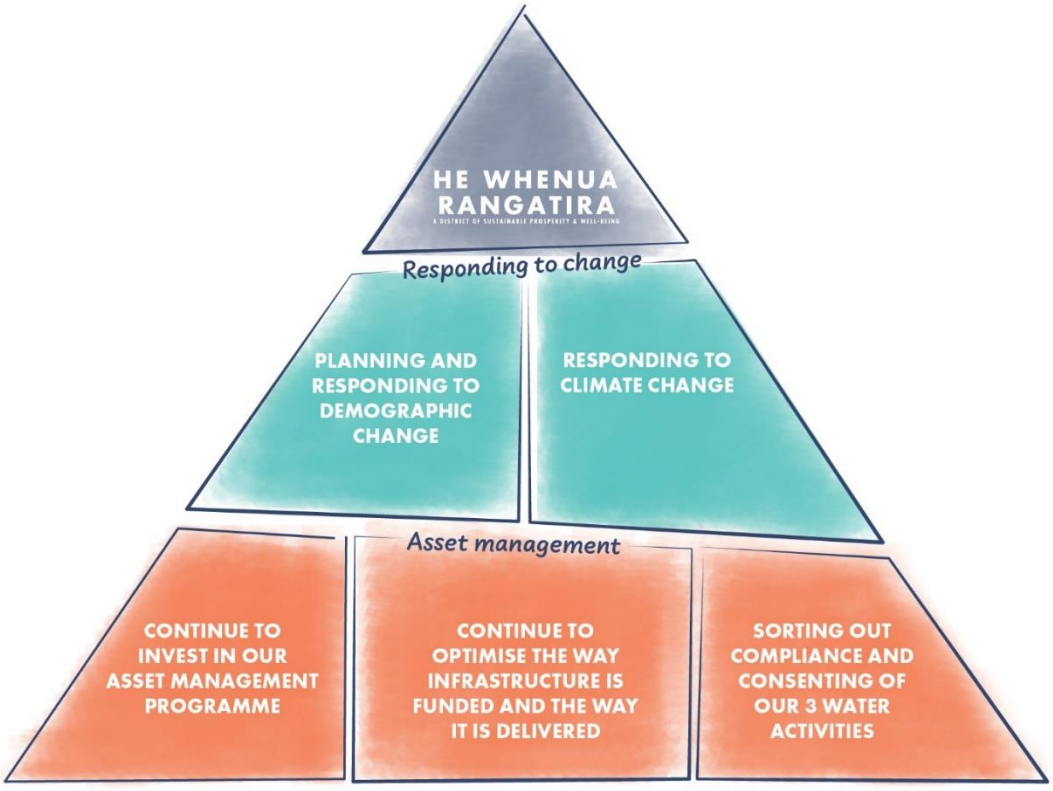
The next stage of the reform programme is likely to ask councils to opt-in to multi-regional groups which may form the basis for a new ownership and management model. The intention is for any new entities to commence operation in 2023, although this is by no means a certainty. The reform programme represents a significant shift in the way water infrastructure is managed in the long-term. Short-term, the stimulus package will go some way to minimising the financial impact of expenditure on the ratepayer while stimulating an economy that has suffered as a result of the water shortages and the pandemic.

4. Our significant challenges

This section identifies the significant infrastructure challenges the Far North District faces, our responses for managing the challenges, and what the responses mean for our communities. Infrastructure is the platform on which community wellbeing is built. Therefore, the way we manage and deliver infrastructure will play an important role in achieving the district vision - *He Whenua Rangatira*. Our goal for this strategy is to provide strategic direction for the long-term delivery of infrastructure that will support the district vision. Our responses to the challenges we have identified have been developed with that goal in mind.

Our District's significant challenges can be grouped into two key themes: managing our assets and managing change. Setting strategic responses that will enable Council to be better stewards of the assets we manage on behalf our communities is the foundation of this strategy. Good asset management paves the way for addressing our second key theme: managing change. Our responses to managing change inherently rely upon our ability to make good decisions about how to invest in and manage our assets. The key challenges, how we intend to respond to these challenges and how these responses pave the way to achieve our District vision is depicted in Figure 5 below.

Figure 5. The below diagram gives a visual guide on how our asset management challenge, and the associated responses, contribute to achieving the District vision.



4.1. Managing our assets

Our three waters assets (drinking water, wastewater and stormwater) have historically been subject to a (largely) age-based approach to asset renewals, with limited strategic planning to optimise renewals alongside key externalities such as demographic change, natural hazard resilience, economic growth and land use change. This approach, has made it difficult to make strategic decisions around infrastructure investment, leading to a poorly-optimised approach to asset renewals. Council has made some good progress to improving our renewals approach by developing network renewal models for each of the three waters and a simple risk-based approach has been developed to prioritise renewals within the 10-year programme. Councils confidence in the asset data used develop this model is considered

to be reliable to highly reliable[7]. However, condition data for individual assets is limited and a condition assessment programme is needed to validate the renewals model – which is give improved confidence in the renewals model.

A key strategic response to this issue is for Council to undertake an ongoing condition assessment and network modelling programme for Council's three waters assets. The condition assessment programme will take time and the renewals proposed in this LTP for the three waters assets are based on a hybrid model. This model uses condition and maintenance information where it is available rather than age as an indicator for renewal. Likewise, the lack of network modelling has affected our ability to develop non-rate-based infrastructure funding mechanisms (e.g. development contributions). Council has prioritised network modelling across its key growth areas (Doubtless Bay, Paihia and Kerikeri) in order to allow growth related investment requirements for these areas to be determined and associated alternative (non-rate based) funding arrangements to be considered as soon as practicable.

Asset information for our transport network is in substantially better shape. Transport asset renewals are based on condition as that information is more readily available and has a high degree of accuracy. However, improved investment decision-making around proactive road strengthening and maintenance is needed in order to enhance road condition, safety and resilience.

Council's infrastructure represents a considerable investment and plays a major role in providing for the wellbeing of Far North communities. Infrastructure enables communities to lead meaningful and productive lives, grow businesses, and connect with each other. The way we make our decisions will have a direct and lasting impact on the wellbeing of our communities and sound investment decisions hinge on good asset management. To support community wellbeing in the best way possible, we need to ensure our asset management practices are aligned with best practice. Programme Darwin's vision is to lead best practice enterprise asset management in New Zealand. This strategy needs to align with that vision because it is critical to achieving the community outcomes identified by Council and it will require a long-term investment in gathering asset information, resourcing the ongoing management and integration of our asset management system, and continuing to enhance our asset management culture.

4.1.1. Response 1: Continue to invest in our asset management programme

The 2018 Infrastructure Strategy signalled the need for a shift in the way asset management is implemented, pointing to sound asset management as the foundation to addressing the other significant infrastructure issues set out in that same strategy. This remains the case for this iteration of the Strategy. Council has acted on the direction set by the 2018 strategy, initiating substantive steps to improve asset management practices through Programme Darwin.

Broadly there are two themes to the programme: developing tools to support sound asset management practices; and improving our asset management culture. The former is nearing completion with the finalisation of a new enterprise asset management system (INFOR), with data migration completed towards the end of 2020. 2021 will see ongoing integration with Council's systems, including the development of a living asset management plan (LAMP) for our three waters assets and district facilities (such as halls, sports grounds and open spaces). The LAMP will draw data directly from INFOR, significantly reducing the labour requirements for asset management plan development and ensuring consistency with council's asset management data. Over the same year, the programme includes a full suite of people and culture initiatives aligned with the new data management and reporting system. This includes development of an on-going asset condition assessment to improve the data quality and integrity of the asset management system.

Despite the various initiatives that have been put in place to improve our asset management approach, asset management will remain a significant issue for Council until the benefits of the programme have been fully realised. Realistically, these benefits will not start to become apparent until the next Infrastructure Strategy in 2024. Accordingly, it is considered essential that asset management remain a strategic priority considering the fundamental

[7] This confidence rating is drawn from our 2019 Stormwater Valuation Report and 2018 Water and Wasteater Valuation report, both prepared by Campbell Consulting limited. The Data confidence grading used in those report is defined in the NZ Infrastructure Asset Grading Guidelines – Water Assets (NZWWA 1999).

role sound asset management planning contributes to addressing other significant infrastructure issues and ultimately achieving the community outcomes identified by Council.

Principal options

These are the key significant decisions Council has made to respond to the continued need to invest in our asset management programme.

Condition assessment programme

At present Council has low confidence in underground asset condition, particularly for stormwater. Condition information that has been collected has typically been in the form of one-off reports or surveys used for short term decision making rather than building a picture of overall asset condition across our networks. Good information about our assets is the foundation to lifecycle management, allowing for more resilient and cost-effective infrastructure.

With the deployment of our new INFOR asset management system, we now have a robust platform on which we can store and analyse asset information. Council intends to commit expenditure towards an on-going programme of condition assessment for our three waters assets over the 10 year period of the LTP 2021-31. The purpose of this work is to enable better decision making around when we replace our assets in accordance with the asset management approach developed as part of Programme Darwin. As better data and information is gathered, the strategy is to optimise lifecycle management and improve integration between asset management, district planning and our financial strategy.

What it means for our communities

This decision will enable Council to optimise the way we invest in infrastructure, focusing on lifecycles and whole-of-life costs, resulting in a more cost-effective infrastructure delivery approach and more resilient assets. Council intends to commit $10M over the 10 year period of the LTP towards conditions assessment for our three waters assets. It is assumed that the condition assessment programme will be required throughout the term of the strategy at an equivalent amount to that which has been budgeted for years 1-10.

Network modelling programme

Three waters reticulation networks comprise of many kilometres of underground pipes of varying sizes. Network modelling enables Council to understand how these assets perform now and how they will perform in the future as various catchments within each network grow. Network modelling allows Council to make informed decisions about when it is best to replace assets and to what specification considering growth trends. Modelling is a critical component of asset lifecycle management and for supporting district planning, particularly within the ambit of Section 31 of the Resource Management Act 1991[8]. Network modelling will allow us to predict investment requirements to service future growth, which is essential to implementing non-rate based funding mechanisms for future infrastructure delivery.

What it means for our communities

Council has identified $3M is intended to be allocated to network modelling from the $11.8M grant funding that is available under the Three Waters Reform stimulus package. Should funding be approved, Council will be required to spend the funding by the end of year one of this strategy. This is a very limited timeframe and there is a risk that some of the modelling work will not be delivered within that timeframe due to the number of schemes that require modelling, the resourcing requirements to project manage $3M of expenditure, and the availability of contractors to undertake the work. Should that be the case, any outstanding modelling work may need to be funded from Council's rates income.

Network modelling is an on-going process and each model needs to be updated periodically to consider the latest information (e.g. growth data, population forecasting information, new condition information). Network modelling should be treated as an on-going programme of work that continues beyond the completion of the modelling work undertaken as part of the stimulus package.

Beyond Programme Darwin

[8] Section 31 requires Councils implement and review policies and methods for ensure that there is sufficient development capacity in respect of housing and business land.

Programme Darwin commenced in 2018 and represents a series of projects that make up a continuous improvement programme for Council's asset management approach. The projects under the programme include initiatives to capture, store and analyse asset data to enhance the basis for making investment decisions; in addition to initiatives intended to ensure improvements in the culture and staff resourcing for asset management. The programme has made substantial headway insofar as developing an enterprise asset management system and resourcing the personal required to successfully migrate our asset data into the new system. However, the programme represents a long-term investment in the continuous improvement of council's asset management approach, and the resourcing of personal, data capture, and training will be required beyond the conclusion of the programme implementation.

What it means for our communities

The long-term follow through with Programme Darwin's initiatives will result in increased operational expenditure as Council continuously improves its asset management approach. Whilst this operational expenditure will have an impact on rates, it is expected the improvements in Council's asset management approach brought about by this investment will result in savings elsewhere (e.g. through lifecycle optimisations), potentially new funding streams (e.g. development contributions) and a more resilient infrastructure network.

4.1.2. Response 2: Optimise the way infrastructure is funded and delivered

At present, rates are the primary means of funding infrastructure. The 2021 Financial Strategy has assumed that the costs of infrastructure services will continue to rise faster than general inflation over the 10 year term of the Long Term Plan 2021-31 in accordance with the Local Government Cost Index (LGCI). This means rates will increase above the level of inflation over the term of the Long Term Plan 2021-31.

The Integrated Transport Strategy also identifies limited funding to deliver on the district transport requirements as a key strategic problem that requires addressing through the transport strategy. As identified, the Far North District has high levels of deprivation, suggesting that many parts of the community may find sustained rates increases difficult to afford. This issue has the potential to become acute over the term of the 10-year financial strategy because of the forecasted decrease in tourism spending and unemployment caused by the COVID-19 pandemic. Moreover, towards the latter parts of this strategy, population aging is forecast to become more pronounced, further exacerbating the issues around people's ability to pay for infrastructure. The implications of climate change are predicted to impact on our levels of service without substantial investment.

Our strategic response to these changes has two broad themes, optimising the way we fund infrastructure; and working with communities to change the way we provide services whilst supporting community wellbeing. The former theme is something that we plan to work towards over the first five years of this strategy, with the intention of initiating changes as part of the LTP 2024-34 process. The second theme represents a gradual shift in the way services are delivered. To be successful, we acknowledge it is important to work with communities, other local authorities, and central government to ensure decisions achieve the best balance between supporting community wellbeing and optimising the cost of infrastructure delivery on communities.

Principal options

Revenue Review

A significant challenge we face is paying for the public services our communities require to maintain a quality standard of living. Most of the money that pays for these services comes from individual households through rates. Balancing the cost of delivering infrastructure services across a large geographic area with a low population density is a significant challenge – particularly considering the high levels of deprivation across much of the district.

The financial strategy identifies that rates increases above inflation will be required year on year to meet the rising costs of providing infrastructure. It is not possible to maintain current levels of service without significant capital and operating expenditure. A shift in the way infrastructure is funded is likely to be required to maintain sustainable levels of rates whilst delivering the ongoing infrastructure investment required to support community wellbeing.

As part of the LTP 2021-2031, Council is exploring funding options that could lessen the financial burden on those who can least afford it. This could include a shift from a general rate calculated on a property's land value to a general rate based on capital value, or a transition out of targeted rates for water and wastewater schemes. Consultation on options commenced in October 2020 and the feedback from that work will be used to develop options for consultation through the LTP.

In addition, as better asset data and modelling comes in, Council will be in a better position to consider non-rate based funding mechanisms, such as development contributions. Council intends to introduce a new development contributions policy and charges as soon as possible. This can only be achieved in concert with Programme Darwin's delivery of core asset capacity and condition data, which will not be available until June 2021, too late to implement a new policy and charges for 1 July 2021. Given that a Development Contributions policy can only be adopted alongside a Long Term Plan, Council plans to amend its Long Term Plan 2021-31 in its first year to consult on and adopt a policy for implementation on 1 July 2022.

What it means for our communities

The purpose of the revenue review is to enable the development of a more equitable method of recovering the costs of council services. In effect it is a means of determining the most appropriate way to distribute the rates burden taking into account the socioeconomic challenges many of our ratepayers and communities face.

Work with communities around level of service changes

Levels of service are the service outcomes for a particular activity or service area against which performance can be measured. A number of these service levels reflect statutory requirements. For example, compliance with drinking water standards or resource consent conditions. Others link back to how customers receive the service, for example how frequently customers experience unplanned interruptions with the transport network or how quickly Council responds to water supply outages.

Capital expenditure in the Long Term Plan 2021-31 (i.e. the first 10 years of the Infrastructure Strategy) is focused on maintaining levels of service to which the Far North communities have come to expect from core infrastructure. These levels of service are described in the LTP. The approach to maintaining levels of service reflects the direction of the 2020 Asset Management Plans, which identify an investment strategy which focuses on maintaining legal requirements and existing service delivery levels.

The foundation of this strategy – managing our assets – is expected to enable Council to optimise our investment decisions to ensure our infrastructure investments provide for a more resilient infrastructure network that is managed in a fiscally responsible way. Despite this workstream, and even assuming significant Government investment as part of the three waters reform, it is unlikely that it will be affordable to provide the same levels of service that our community receive now in 30 years' time. This is due in large part to the implications of climate change on the services we provide: low lying roads will be subject to an increased frequency of inundation, water supply schemes will be subject to a greater duration of restrictions, and our stormwater network may not have the capacity to achieve the levels of service we are accustomed to today.

Our strategy is to work with our community to understand the levels of service required to support their wellbeing, taking into account population ageing and the inevitability of climate change and its effects on service delivery.

What it means for our communities

A gradual shift in level of service provision can be expected towards the later years of this strategy, although it is not possible to meaningfully predict specifically what these changes will look like. This option is not about making these decisions now, but rather to engage with and to prepare our communities for the changes ahead because there remains time to adapt to these changes provided we invest in planning and research throughout the early years of this strategy.

4.1.3. Response 3: Sorting out our statutory requirements

A number of Council's wastewater treatment plants do not comply with the resource consents authorising the discharge activities. Examples include Taipa, Ahipara, Kaikohe, Paihia and Opononi-Omapere wastewater treatment plants, all of which do not meet one or more treatment quality requirements. Moreover, a number of Council's water supplies are river takes and the resource consents for these include minimum flow requirements intended to protect downstream aquatic habitat. It is not uncommon for the minimum flow requirements set down in the resource consents to be breached each summer at a number of our water supply sources.

Council's response is to invest in its water and wastewater infrastructure to improve levels of compliance and the resilience of these assets. Financial consideration for these investments will need to take into account changes in the statutory setting created by the recently released National Policy Statement for Freshwater Management 2020 (NPS Freshwater 2020) and central government's reforms to potable water supply delivery and the broader reforms to three waters services.

The NPS Freshwater 2020 in particular has created additional financial uncertainty for three waters providers, representing the latest iteration of a policy statement that has been in a state of flux since it was first introduced in 2011. Northland Regional Council (NRC) has partially given effect to earlier versions of the NPS through its recent plan review process which is nearing the conclusion of its appeals phase. Although the current regional plan review process is able to give a sense of direction that the implementation of the NPS Freshwater 2020 will take, because NRC need to bring the implementation of the NPS through the Te Mana o te Wai provisions of the NPS and the Schedule 1 requirements of the RMA, there will remain uncertainty around the specific implications of the NPS Freshwater 2020 until the plan review process has been notified. The notification of the plan review is expected to be towards the end of 2024. The investment requirements identified in this Strategy to address the non-compliance

issues have been done so taking assumed standards required as part of the NPS Freshwater 2020 for financial planning purposes. Investment requirements will be further refined through future options analyses.

Principal options

Investing in our three waters assets to improve compliance
Council proposes to undertake upgrades at several wastewater treatment plants in order to meet resource consent requirements during the first several years of this strategy. These investments include:

- Upgrading the Taipa wastewater treatment plant in 2021 ($7M)
- Upgrading the Opononi Wastewater treatment plant in 2021-2022 ($4.8M)
- Reducing wastewater overflows in Kaitaia between 2021 and 2025 ($10M) and upgrading the wastewater treatment plant ($11M)
- Upgrading the Kaikohe wastewater treatment plant over 2022-2024 ($9M)
- Constructing a new Hihi wastewater treatment plan in over 2021-2022($5.9M)

What it means for our communities

Investing in our wastewater schemes to improve compliance will ensure Council operates in a manner that meets environmental regulations, ensuring that our wastewater treatment activities result in appropriate environmental outcomes. Whilst these investments represent substantial capital investment over the early years of this Strategy, the investment is required to meet legal oblations relating to wastewater treatment quality.

Planning for investments required to address future statutory requirements

In addition to the immediate investment requirements needed to improve our resource consent compliance it is likely the implementation of the NPS Freshwater 2020 will result in the need to invest in both our water and wastewater schemes to achieve the regulatory framework of the Regional Plan once it has given effect to the NPS. Because the specifics around these requirements are not yet known, it is not possible to develop any meaningful assumptions other than any new regulatory requirements are unlikely to come into effect until the end of 2024. Even after that time, the new regulatory framework will not have immediate effect on our schemes because they will continue to be able to operate under their existing resource consents until those consents expire.

What it means for our communities
Council will be working closely with Northland Regional Council as it advances its regional plan review to give effect to NPS Freshwater 2020. Doing so will allow Council to develop well informed assumptions as it develops the next iteration of the 30-year infrastructure strategy. Council's continued focus on improving its asset management processes and culture will also enable better financial planning around likely investment requirements for future resource consent applications, enabling Council to improve our budgeting process for future upgrade requirements.

4.2. Managing Change

The Far North will experience significant changes over the 30-year term of this strategy. Changes in the climate caused by global warming is predicated to result in a greater frequency of weather extremes (drought, extreme rainfall, flood events) and exposure to coastal hazards associated with rising sea levels. Owing to the historic rate of greenhouse gas emissions, and the current emission trajectories, global warming and its effects on climate change, will affect our communities well beyond the 30-year term of the Strategy. Those effects will become more acute towards the end of this century. The infrastructure planning, and associated investment decisions, we make throughout the term of the Strategy will have a bearing on the resilience of our core infrastructure and the associated resilience of our communities towards the later part of this century.

The National Climate Change Risk Assessment for New Zealand[9] concludes that the risk of maladaptation due to the application of practices, processes and tools that do not account for uncertainty and change over long timeframes is an extreme risk that requires urgent attention. The 30-year Infrastructure Strategy has a role to play through giving Council and communities a platform for setting the direction of future planning and infrastructure delivery including considering the National Climate Change Risk Assessment for New Zealand.

Preparing for and supporting future demographic changes is a further area that requires a strategic response through this Strategy. Our east coast communities are forecast to grow disproportionality faster than other built areas in the Far North, while a number of our more isolated rural communities are forecast to experience population decline. In addition, changes in our population structure over the term of this strategy as a result of population aging will result in communities with a higher proportion of people on fixed incomes and with differing needs compared to today's populations. The forecasted change in population structure will place a greater emphasis on the need to deliver infrastructure that is as cost effective whilst optimising levels of service to cater for the needs of changing populations. Our more isolated rural communities also tend to be areas with higher levels of deprivation compared to our east coast communities which, in combination with population decline and ageing, can make these communities inherently less resilient to the effects of climate change. Ensuring that the right infrastructure is delivered at the right place and at the right time to support growth and adapt to demographic change is critical to our economic development and the wellbeing of our communities.

4.2.1. Response 1: Responding to climate change

Climate change is predicted to result in rising sea levels and marked changes in weather patterns. Whilst the effects of climate change are being experienced now, there remains time to plan for climate change with our communities so we can support adaptive responses to a phenomenon that has the potential to fundamentally change the way many of our communities live.

Adaptation approaches will potentially bring significant financial implications or drastically changed levels of service for some communities. An important response to climate change and hazard management in general, is building resilience into the infrastructure network. Fundamentally, resilience is about the ability to absorb the effects of a disruptive event, recover, and adapt to mitigate adverse impacts of future events. This definition of resilience can apply equally to infrastructure or community resilience. An important point, however, is that a resilient community relies on resilient infrastructure.

Principal options

Implement the Climate Change Roadmap

In 2020 Council adopted a Climate Change Roadmap. Two key goals of the roadmap are to achieve more resilient infrastructure taking into account the effects of climate change and working with Far North communities to prepare for and adapt to the impacts of climate change. The Climate Change Roadmap includes initiatives intended to deliver on these goals over the 10-year LTP period in addition to long term goals that are intended to be fulfilled within the period covered by the Strategy. Addressing the implications of climate change is also a key driver within Council's 80-year strategy (FN2100), and so is seen as one of FNDC's key strategic responses to achieving the district Vision: He Whenua Rangatira - a district of sustainable prosperity and wellbeing.

What it means for our communities

Implementing the Climate Change Roadmap is the principal means by which Council intends to prepare for climate change. It will enable Council to respond rapidly to future requirements set down by the Climate Change Commission under the Climate Change Response Act 2002. Work to be completed early in the roadmap programme includes substantial development of research and policy to inform decision making around infrastructure delivery and land use

[9] Ministry for the Environment. 2020. *National Climate Change Risk Assessment for Aotearoa New Zealand: Main report – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Pūrongo whakatōpū*. Wellington: Ministry for the Environment.

planning, along with the development of community engagement plans intended to work with communities to advance responses to climate change. Future iterations of the Infrastructure Strategy will be able to draw from this work – enabling Council to improve its long-term investment decisions considering the implications of climate change.

4.2.2. Response 2: Planning for and responding to demographic change

Projected structural changes in the Far North's population have the potential to affect productivity due to reduced levels of labour force participation caused by population aging. This can have consequences for the long-term affordability of infrastructure delivery because there is a risk of the economy (and people's income) stagnating compared to the long-term costs of constructing, renewing and operating infrastructure. Supporting productivity growth by encouraging the right development in the right place is a key strategic response to the challenges presented by our changing demographics because productivity growth can sustainably off-set the effects on economy associated with reduced labour force participation. Moreover, predicting and, where possible, influencing future demographic change is a key ingredient for optimising the affordability of our infrastructure because it ensures we can better deliver infrastructure that meets the needs of communities throughout the entire asset lifecycle.

Principal options

Integrate strategic infrastructure delivery with land use planning

Council has a substantial role to play when it comes to influencing growth and development in the District. Through the District Plan, Council can enable certain types of development in places where it is considered most appropriate and discourage inappropriate development in areas where such development is poorly suited to achieving desired environmental outcomes. Our second strategic response is to support development in the right places by better integrating land use provisions with infrastructure, and to discourage development that relies on infrastructure in locations where those services cannot be delivered, or where services may be compromised in the future due to hazards (e.g. sea level rise, flooding, drought). In addition, as part of the plan making process, Council is required to make sure the plan enables enough development capacity to meet expected demands. This process includes making sure our infrastructure has sufficient capacity to service future demand and any zone changes intended to provide additional development capacity. Programme Darwin also has a major role to play in our integration of land use planning with infrastructure because the outcomes of that work programme are intended to enable informed decision making around infrastructure delivery including network capacity, lifecycle optimisation and demand.

What it means for our communities

Council is currently undertaking a full review of its District Plan. The plan review process will update the policy direction and rules that influence where development occurs. The review presents a significant opportunity to line up our infrastructure delivery with land use planning. This integration will help us to better time when we deliver major capital projects needed to support development because we will be able to forecast development changes with greater confidence. In addition, the district plan review provides an opportunity to start signalling to communities where changes in levels of service, or servicing limitations, may occur towards the end of the strategy term, enabling people to start making more informed decisions around investments taking into account future servicing constraints.

Importantly, the District Plan review process to date has highlighted that there is a need to consolidate urban growth to existing urban zoned land. As a result of this focus area, it is likely that we will see more enabling provisions for compact urban development in existing urban zones compared to the current plan.

5. Managing our assets over the next 30 years

Section 101B of the LGA requires that councils outline the most likely scenario for managing infrastructure assets over the term of the Strategy. The most likely scenarios for water, wastewater, stormwater and the transport infrastructure are set out in the sections below and have been developed taking into account the assumptions contained within Appendix 1, the principal options contained in the significant challenges section above, and the direction and constraints set out in the LTP and Financial Strategy. Forecasts over years 1-10 of the Strategy are based on those contained within the LTP 2021-31. Investment decisions over years 1-3 have the highest levels of certainty and confidence. Decisions between years 4 to 10 have less certainty and timing and costs associated with those investments may change as a result of future financial planning decisions undertaken as part of future long term plans. Investment decisions beyond year 10 have high levels of uncertainty and should be treated as indicative only. This uncertainty is largely because the assumptions Council uses to forecast investment requirements (e.g. population change, development trends, asset replacement timing) become very uncertain. For these reasons, the indicative estimates provided beyond year 10 should not be considered a budget. These figures represent Council's best estimate taking into account the uncertainty inherent in forecasting investment requirements several decades into the future and so represent indicative costs only. As our asset management approach matures it can be expected that levels of certainty around future investment requirements will be improved. Information relating to asset lives is in provided in Appendix 2.

Please note all financial information is inflation-adjusted.

5.1. Water supply activity

Council-owned water supply assets include eight schemes that deliver potable water for domestic, commercial and industrial use. Four major towns in the district account for 70% of the reticulation network. The sources of raw water include surface water (five schemes), underground water via bores (three schemes), and one scheme utilises both surface water and underground water sources. Key assets across the eight schemes include nine treatment plants, 32 reservoirs, 333km pipelines and 18 pumping stations, servicing nearly half the district population (around 25,000 people). All schemes are universally metered with the metered volume being the basis for the recovery of the operational portion of the costs associated with the water supplies. The capital associated costs are recovered via a targeted water capital rate. The optimised replacement cost of our water supply schemes is $126.75M.

5.1.1. Asset performance

Water supply schemes are performing well in terms of quality. Bacteriological and protozoa water quality standards are met consistently, apart from where users are connected to raw water supplies before the treatment plants. The majority of the reticulation meets fire flow standards, however increasing main size is required in some locations. A number of the schemes that rely on surface water takes are sensitive to dry weather conditions because the resource consents authorising these takes usually require taking to cease at mean low flow. Investment in our water supply schemes is required to improve resilience.

Key issues

- Limited raw water sources, and/or contingency supply during severely dry weather poses a risk to meeting summer demand for some schemes (e.g. Rawene and Kaitaia)
- Condition information for individual underground assets is limited
- Treatment capacities at larger schemes (Paihia and Kaitaia) are approaching their limits
- Major investment in the Kerikeri water supply scheme will be required to service growth

5.1.2. Indicative expenditure estimates

The estimated expenditure for Council's water supply activity is set out below. The forecast expenditure from year ending 30 June 2021 to 2031 is provided in **Error! Reference source not found.** below at one-year intervals.

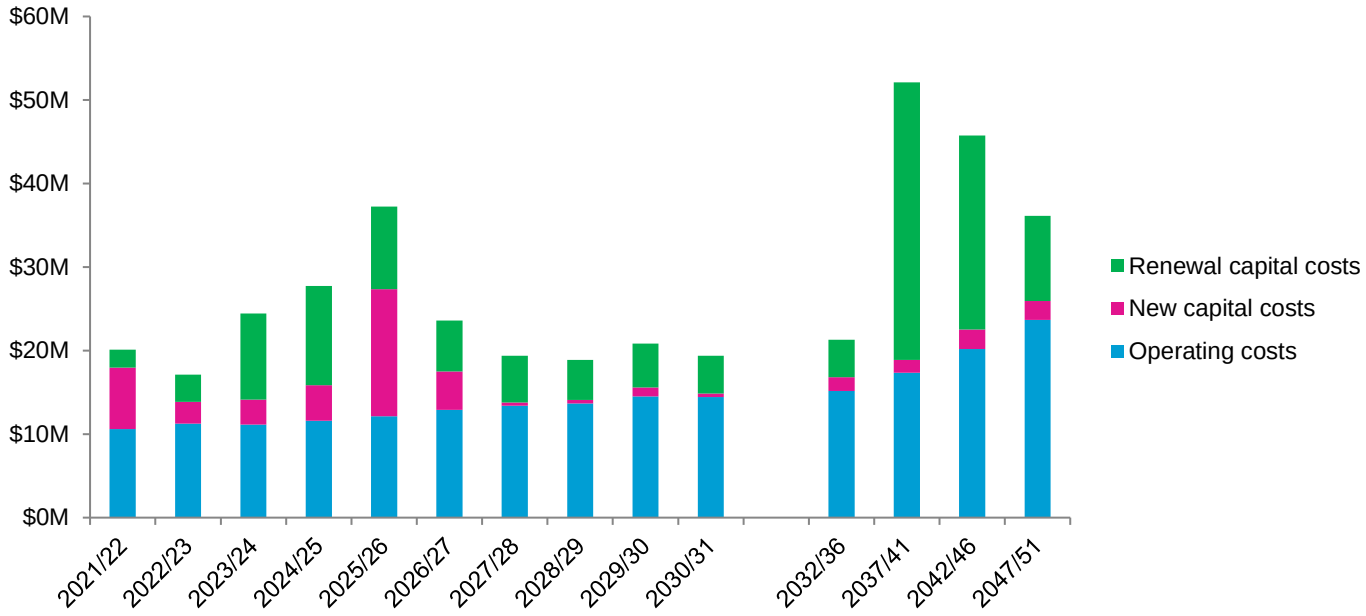
Estimates from 2032 to 2051 are provided in five yearly increments and depict average estimated expenditure over the five year periods.

Asset life assumptions is are as follows:

- Assumed average asset life for all water assets is approximately 62 years
- Water pipes average lifespan is 70 years
- Water treatment plants average lifespan is 30 years.

These asset life assumptions have been used to forecast our asset renewals.

Figure 6. Forecast capital and operating expenditure Council water supply activity from 2021 to 2051. Note costs for years 2032 to 2051 represent indicative estimates of average annual expenditure within each five-year period.



5.1.3. Significant expenditure decisions

Significant expenditure decisions associated new projects to improve levels of service with Council's water supply activity are set out in Table 1.

Table 1. Significant capital expenditure decisions for Councils water supply activity associated with projects to improve levels of service.

Projects	Description	Timing	Estimated cost
Sweetwater borefield, Kaitaia.	Development of the Sweetwater borefield and pipeline to improve Kaitaia water supply scheme resilience	Year 1	$4.9M
New raw water connection at Lake Waingaro.	The current raw water connection requires replacing and is subject to breakage. This is a critical asset for the Kerikeri town supply.	Year 3	$2.8M
Kerikeri water treatment plant upgrade.	Investment in a new treatment plant that will improve the treatment of the water supply scheme.	Years 4-5	$6.6M
Upgrade to the water main to the Heritage Bypass.	Improvements to the pipeline capacity to better service demand.	Year 5	$9.7M

Projects	Description	Timing	Estimated cost
Water source improvements	Estimated investments requirements to improve water resilience across the district beyond the 10 year budgeting horizon of the LTP.	Years 10-30	$39M

In addition to the capital expenditure set down in Table 1, Council forecasts major capital expenditure will be required between 2037 to 2051 to replace ageing assets, with average annual expenditure ranging from $10M to $33M over that period. This renewals profile is uncertain however due to the limited information available regarding the condition of our assets and is based only on the expected asset lives of our underground water supply assets.

5.2. Wastewater

There are 16 Council owned and operated wastewater schemes (with 15 treatment plants) within the District that provide wastewater collection, treatment and disposal services for domestic, commercial and industrial customers. There is also one non-operating scheme at Matauri Bay. The 16 schemes combined include 409 km of pipelines and 155 major pumping stations. Generally, the network is performing adequately, but there are significant challenges in meeting consent compliance and inflow and infiltration is significant at a number of our schemes (notably Kaitaia and Kawakawa). The optimised replacement cost to our wastewater supply schemes is $200.48M

5.2.1. Asset performance

Generally, the network is performing adequately, but there are significant challenges in meeting consent compliance and anticipated future consent standards.

Key issues

- A number of wastewater treatment plants are not capable of complying with the treatment quality standards required by the discharge resource consents. Ongoing compliance issues are occurring at Paihia, Opononi, Ahipara, Taipa and Kaikohe wastewater treatment plant
- Unacceptable risk of failure of the Hihi treatment plant in the near term
- Stormwater infiltration into the reticulation is becoming a big issue for Kawakawa, Kaitaia and Kaikohe
- Condition information for individual underground assets is limited
- Disposal of sludge from wastewater treatment plants is not effectively managed

5.2.2. Indicative expenditure estimates

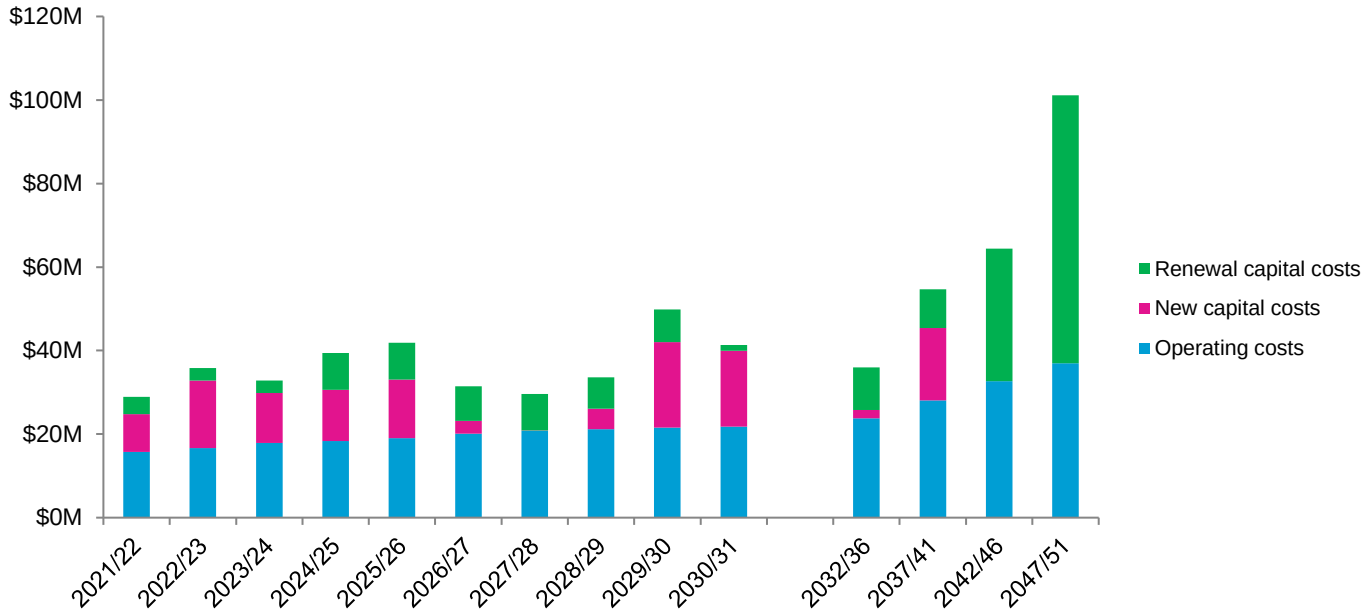
The estimated expenditure for Council's wastewater activity are set out below. The forecast expenditure from year ending 30 June 2021 to 2031 is provided in

Figure 7 below at one-year intervals. Estimates from 2031 to 2051 are provided in five yearly increments and provide average estimated expenditure over the five years covered.

Asset life assumptions is are as follows:

- Assumed average asset life for all water assets is approximately 60 years
- Water pipes average lifespan is 76 years
- Water treatment plants average lifespan is 34 years.

Figure 7. Forecast capital and operating expenditure Council wastewater activity from 2021 to 2051. Note costs for years 2032 to 2051 represent indicative estimates of average annual expenditure within each five-year period.



5.2.3. Significant expenditure decisions

Significant expenditure decisions associated new projects to improve levels of service with Council's wastewater activity are set out in Table 2.

Table 2 Significant capital expenditure decisions for Councils water supply activity associated with projects to improve levels of service.

Project	Description	Timing	Estimated cost
Opononi wastewater treatment plant upgrade	It is anticipated a higher quality of treated effluent will be required as a result of the renewing of the discharge consent in 2019. Until the consent is granted, the extent of works and final costs cannot be accurately determined.	Years 1-2	$4.9M
Hihi wastewater treatment	The main concrete structure is in poor condition and requires replacement. There is an unacceptable risk of failure.	Years 1-2	$6M
Taipa wastewater treatment plant upgrade	Upgrade to the Taipa wastewater treatment plant to meet the requirements of a new resource consent.	Years 1 - 3	$7.6M
Kaikohe wastewater upgrade	It is anticipated a higher quality of treated effluent will be required as a result of the renewing of the discharge consent in 2021. Until the consent is granted, the extent of works and final costs cannot be accurately determined	Years 2-5	$13.5M
Kaitaia wastewater scheme improvements	Improve the treatment quality in line with the likely treatment quality set down in a new resource consent.	Years 3-5	$13.1M
Reducing wastewater overflows in Kaitaia	Major investment is required to upgrade the Kaitaia scheme in order to reduce the frequency of untreated wastewater overflows	Years 1-5	$10.7

Project	Description	Timing	Estimated cost
Kerikeri wastewater upgrade	Upgrade to the wastewater treatment plant to service growth.	Years 7-10	$35M
Ahipara wastewater treatment plant upgrade	Upgrade to the Ahipara wastewater treatment plant to meet the anticipated future resource consent requirements.	Years 8 - 9	$7.4M
Supporting growth in and around Kerikeri / Waipapa	Expand the Kerikeri wastewater scheme and/or Waipapa scheme to service all residential, commercial and industrial land within Waipapa (phase 3 of above project).	Year 15-18	$96M

In addition to the capital expenditure set down in Table 2 above, Council forecasts major capital expenditure will be required between 2042 to 2051 to replace ageing assets, with average annual expenditure ranging from $32M to $64M over that period. This renewals profile is uncertain however due to the limited information available regarding the condition of our assets and is based only on the expected lives of our underground water supply assets.

5.3. Stormwater

The Council maintains and manages stormwater schemes within 22 defined urban areas in the Far North, servicing approximately 15,000 properties. The stormwater management systems include approximately 132km of pipes (predominantly concrete), approximately 37km of open drains and overland flow paths and 14 detention ponds.

5.3.1. Asset performance

Generally the stormwater network can be considered fit for purpose. However, there are some large-scale river-generated flooding issues at Waipapa, Kaitaia, Kaeo and Moerewa that require a combined response from Council and Northland Regional Council.

Key issues

- Condition information is limited and much of it is out of date
- Catchment management plans, including catchment modelling, was completed in 2010, but the plans have not been integrated into the broader asset management framework, and they now need updating
- Lack of planned maintenance is the leading cause of failures because maintenance is reactionary and based on complaints
- Overland flow paths are poorly regulated or documented, resulting in localised flooding as a result of development in these areas. There is also a lack of clarity around who is responsible for some stormwater assets
- Development (i.e. buildings and structures) over underground assets has been poorly regulated resulting in difficulty maintaining some assets and risks to the assets and nearby buildings

5.3.2. Indicative capital expenditure estimates

The estimated capital expenditure for Council's stormwater activity are set out below. The forecast capital expenditure from year ending 30 June 2021 to 2031 is provided in **Error! Reference source not found.** below at one-year intervals. Estimates from 2031 to 2051 are provided in five yearly increments and provide average annual estimated expenditure over the five years covered.

Figure 8. Forecast capital and operating expenditure Council stormwater activity from 2021 to 2051. Note costs for years 2032 to 2051 represent indicative estimates of average annual expenditure within each five-year period.

5.3.3. Significant expenditure decisions

Significant expenditure decisions associated new projects to improve levels of service with Council's wastewater activity are set out in Table 3 below. Renewals expenditure is forecast to be relatively consistent year on year, with average annual renewals expenditure forecast to be promptly $5.5 million per annum over the term of this strategy.

Table 3 Significant capital expenditure decisions for Councils stormwater activity associated with projects to improve levels of service.

Project	Description	Timing	Estimated cost
Kaitaia upgrade	Kaitaia stormwater upgrade	Years 1-4	$1.67M
Moerewa stormwater improvements	Moerewa stormwater upgrade	Years 1-4	$2M
Kaikohe upgrade	Kaikohe stormwater lines	Years 4-6	$4.1M
Districtwide stormwater improvements	An average year on year investment of $0.68M over the term of the strategy to improve the stormwater network.	Years 1-30	$61M

5.4. Transport

Transportation forms Council's largest asset group with roading, footpaths and car park assets accounting for 81% of Council's core assets. Key transport assets include 2,507 km of roads (34% sealed and 66% are unsealed), 723 bridges, 217km of footpaths, 87km of cycleways and a vehicle ferry service across the Hokianga Harbour.

5.4.1. Asset performance

Generally, the transport activity group's performance is acceptable, but there are a number of areas that could be improved, particularly in around safety, resilience, bridge renewals, and freight efficiency.

Key issues

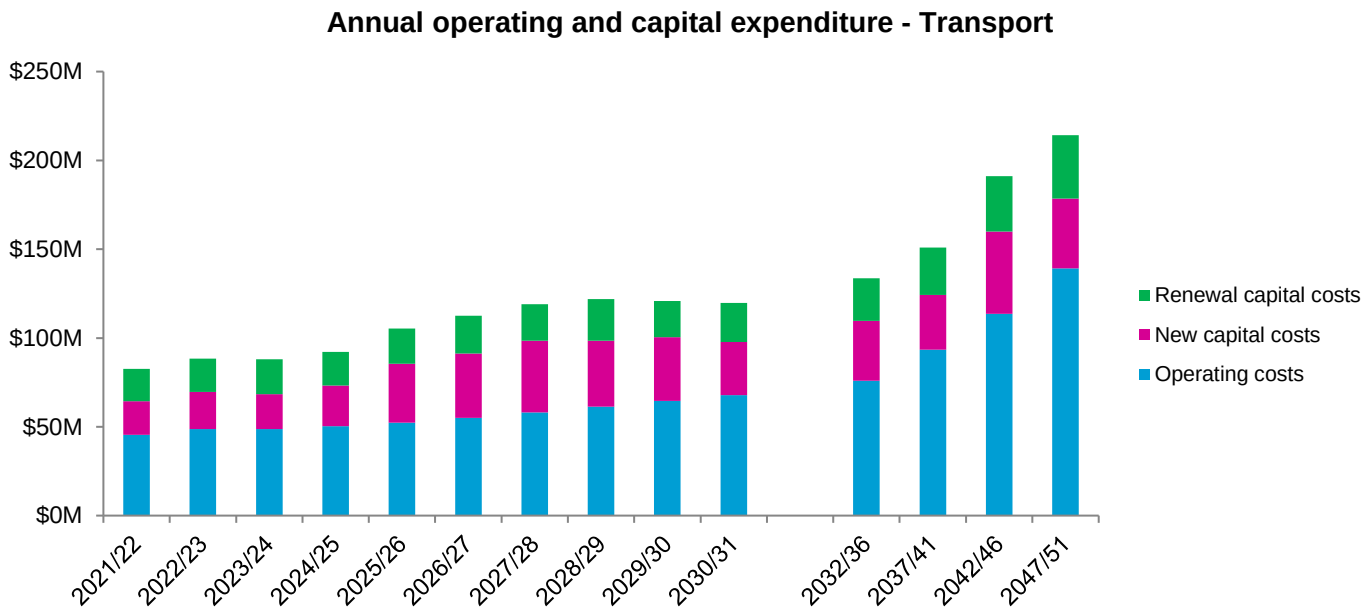
Key issues for the Far North's transport system are:

- Poor safety record with an increasing rate of death and serious injury crashes
- A largely unsealed network which is subject to high forestry traffic volumes resulting in poor condition and dust impacts
- Few transport links with the rest of the region which are prone to slips and flooding during storm events resulting in many road closures
- Many isolated coastal communities which are heavily reliant on a vulnerable road network for access
- There are a high number of weight restricted bridges which is limiting the efficiency of the freight network
- Lack of transport choice in most communities which contributes to higher levels of social deprivation
- Council's bridging stock is in poor condition, making the transport network more vulnerable to failure

5.4.2. Indicative capital expenditure estimates

The estimated capital expenditure for Council's transport activity is set out below. The forecast capital expenditure from year ending 30 June 2021 to 2031 is provided in **Error! Reference source not found.** at one-year intervals.

Figure 9. Forecast yearly capital expenditure for Council's transport activity from June 30 June 2021 to 2031



5.4.3. Significant expenditure decisions

Significant expenditure decisions associated new projects to improve levels of service with Council's transport activity are set out in Table 4 below. Average annual renewals expenditure over the first 10 years of this strategy is forecast to be approximately $20M per annum. Renewals expenditure is estimated to increase to an average of approximately $35M per annum in the last five years of this strategy. The majority of this expenditure is for road resurfacing, unsealed road metaling, sealed road rehabilitation and structure replacements (mainly bridges).

Table 4. Significant capital expenditure decisions for Councils transport supply activity associated with projects to improve levels of service.

Project	Description	Timing	Estimated cost
Unsubsidised dust seals	Sealing of critical risk roads that pose a threat to public health through dust generation	Years 1-5	$15M
Develop the Twin Coast Cycle Trail to support tourism growth	Develop the Twin Coast Cycle Trail in line with strategic case	Years 1-12	$33M
New footpaths	Development of new footpaths over the next 30 years	Years 1- 30	$20M
Safety improvements	Safety improvements, including street lighting infills and traction seals	Years 1 - 30	$140M
New cycleways	New cycleways to improve transport modes	Years 1 - 30	$142M
Improve freight productivity to improve productivity growth	Strengthen and maintain key forestry routes and bridges to enable HPMV and 50MAX vehicles throughout the term of this strategy	Years 2-30	$47M
Kerikeri transport network improvements	Improvements to the network capacity in response to growth in and around Kerikeri	Years 4-24	$80M

6. Significant Assumptions

We have made assumptions in preparing this Strategy and our significant infrastructure decisions as below

Assumption	Description	Level of Certainty
Climate change will occur	Climate change projections will be generally in line with the IPCC predictions and Northland specific effects will include, by 2100: Seasonal rainfall patterns will change - with eastern areas experiencing up to 20% less rainfall in spring and up to 10% increase in summer and autumn. It is expected drought frequency will increase by 10%. Mean annual flows in rivers will decrease. Sea levels are expected to rise by anywhere from 20cm to 1m. The frequency of storm events may decrease, although there is some uncertainty with this projection.	**Medium** Potential impact – there is a degree of certainty about the potential impacts of climate change. However, the timing for those impacts remains uncertain, particularly the magnitude of sea level rise. The impact of the uncertainty around the timing climate change impact is considered to be minimal provided Council asset management approach is agile enough to consider new information as it comes in, in respect to climate change impacts.
Growth or decline in demand will occur in line with the forecasts prepared by .id, February 2020.	Demographic change will follow the forecasts prepared by .id, February 2020.The population is forecast to increase at a rate of approximately1.6% per annum between 2020 to 2043, resulting in a total population of approximately 78,000 people by 2043. Most of this growth is projected to occur in the Far North's main urban centres (Kaitaia, Kaikohe, Kerikeri and Paihia). The 65+ demographic is predicted to represent a big component of population change over the next 20 years with the demographic representing 32-37% of the population along several east coast communities between the Bay of Islands to Doubtless Bay.	**Medium** Potential impact – there is a risk the population projections could follow high or low population projection scenarios. High scenario will result in demand increasing more rapidly than expected. Underestimating growth may result in insufficient capacity, affecting levels of service. Overestimating growth will result in oversupply, increasing costs.
Levels of service remain static for years 1 to 10 but may need to change	Levels of service will remain generally unchanged for the 10-year period covered by the 2021-2031 Long Term Plan. Service levels will change beyond that period in response to the need to supply cost effective infrastructure considering the constraints presented by climate change, demographic change and the socio-economic challenges the district faces.	**Low** Potential impact – changing levels of service will be a key response to managing several significant infrastructure issues identified in the Strategy. However, the nature, extent and timing of these changes is highly uncertain because limited research and planning has been completed to fully understand the consequences of climate change, population decline and population aging It is therefore not possible to factor level of service changes into financial projections.

Assumption	Description	Level of Certainty
Improvements to our asset information, planning and delivery will improve our ability to optimise infrastructure lifecycles strike the best balance between maintenance, operations and renewals costs	Lifecycles of significant assets, including underground assets, is optimised to strike the best balance between maintenance, operations and renewals costs.	**Medium** Potential impact – the current lifecycle management approach is not well defined, relying on a reactionary approach based on age and asset failure. Condition based information is also limited for individual underground assets. The level of certainty around the current assumption is therefore medium. The impact of the medium uncertainty is that the financial forecasts contained in this strategy assume we reach an optimised renewals approach over the longer term and if we do not then the cost savings assumed from improved approaches to asset management will not materialise and we may have more reactive renewals.
Legislated reform of Three Waters services will take place.	FNDC will continue to collaborate with the Crown on the reform programme for the ongoing provision of water, wastewater and stormwater services that was introduced to local authorities in 2020. Draft legislation is expected to be out for public consultation in late 2021. Local authorities have been advised that any substantive change will not occur before the 2023/24 financial year.	**Low** Potential impact – while we are anticipating that there will be change to the ownership and delivery of three waters in the next ten years, we are not able to say with certainty what those changes will be. This LTP has been developed on the basis that it is business as usual for the delivery of three waters, but that change is very likely over the mid-term (3-5 years).
The COVID-19 pandemic will affect our communities for several years.	The global economic and health crisis caused by the COVID-19 pandemic is expected to have long-lasting effects on New Zealander's way of life. Recent modelling undertaken by BERL[10] indicates that while most industries are expected to recover over the next 10 years, the industries that make up much of the tourism sector (accommodation and food services, and arts and recreation) are unlikely to recover employment back to their pre-pandemic state for some time beyond 2030. Even under the best-case scenario, the modelling predicts key tourism industries will be employing around 40% fewer people in 2030 compared to 2020. This has potentially significant implications for the Far North District, given the significant contribution tourism plays in supporting the local economy.	**Low** Potential impact – the COVID-19 pandemic is a highly dynamic situation on both a global and national scale. Vaccinations will potentially see a reduction in the term of the impacts of the pandemic. New Zealand still remains at risk of future outbreaks, which can have an immediate and pronounced impact on our local economy and the wellbeing of our communities.

[10] Economic scenarios to 2030 - The post-COVID-19 scene. Prepared by Business and Economic Research Ltd, Hōngongoi 2020.

7. Asset lives

Potable Water: Average for all water assets is approximately 62 years

- Water pipes average lifespan is 70 years
- Water treatment plants average lifespan is 30 years

Wastewater: Average for all wastewater assets is 60 years

- Pipes average life span is 76 years
- Pump stations average lifespan is 35 years
- Treatment plants average lifespan is 35 years

Stormwater: The average life span of all pipes is 92 years

Transport: The average of sealed roads is 30 years; unsealed 25 years

- Sealed roads have two main components: a pavement structure and a sealed surfacing. Council designs pavement structures to achieve a 30-year life; applying surfacing to the structure at the time of construction, then waterproofing at year two, resurfacing again after year 12 to optimise the lifecycle of the road.
- Unsealed roads also have a pavement structure and a surfacing treatment, but the structure has a lesser design life to achieve a 25-year life. The surfacing is a sacrificial treatment that consists of a bound granular material usually made up of aggregate that is smaller (GAP30) than the pavement structure. Accepted industry research suggests that this surfacing loses approximately 20-25mm of aggregate per year when normal maintenance practices are undertaken. The surfacing component of an unsealed road is generally applied at 75mm thickness and is expected to last 3-5 years with the correct maintenance practices.

The life expectancies for both sealed and unsealed roads can vary, and in the Far North District are affected by the types and volumes of traffic that use the road. Heavy forestry use accelerates failure whilst lower overall traffic use extends lifecycles. The approach FNDC are taking through collaboration with the Northland Transport Alliance (NTA) should see overtime a better outcome of the lifecycle management of the district roads.