

Te nautaki hanganga 2021-51 Infrastructure strategy 2021-51

Executive summary

Greater Wellington's Infrastructure Strategy tells you how we plan to manage our infrastructure over the next 30 years. To support the extraordinary region: thriving environment, connected communities, resilient future vision we have for the region, this strategy defines the nature of the challenges we face, our approach and options for dealing with those challenges; and the implications of these actions while ensuring intergeneration equity.

The Infrastructure Strategy is informed and delivered by the following asset management plans -

- Water supply
- Public transport
- Flood protection
- Regional parks
- Environmental science
- Harbours

The Wellington region needs to respond to some big challenges. As well community wellbeing and climate action considerations, there is also infrastructure under-investment, Wellington being home to more people, structural and legislative reforms, and ensuring financial sustainability and equability. These are the key challenge we face;

- Achieving carbon neutrality
- Improving resilience
- Managing critical infrastructure
- Affordability

Introduction

Infrastructure is the Council's biggest area of activity (regulator, funder and provider): Greater Wellington is responsible for over \$1 billion of assets. The core infrastructure assets we own for bulk water supply, flood protection, and public transport constitute the majority of Greater Wellington's asset value, and require our largest annual operating expenditure commitments. These assets all enable and support our activities and outcomes for the region.

Greater Wellington also has a critical kaitiakitanga role in ensuring the wellbeing of our local communities and environment.

Scope of Strategy

The strategy identifies our significant issues, the most likely scenarios and significant decisions we need to make, against the 30 year timeframe.

Greater Wellington manages the following infrastructure portfolios:

- Water supply
- Public transport
- Flood protection
- Regional parks
- Environmental science
- Harbours

While all are important to achieving vision, not all portfolios will face the significant issues identified, or will the issues affect each asset group equally and, in some cases, at all.

The Infrastructure Strategy provides details of the level and timing of investment needed to operate, replace, renew and upgrade existing facilities and the Financial Strategy outlines the required rating and debt levels to fund these investments. Together the two strategies outline how Greater Wellington intends to balance investment in assets and services with affordability.

What has changed since 2018?

Greater Wellington prepared its first Infrastructure Strategy as part of the 2015-25 Long Term Plan (LTP), and a second in the 2018-28 LTP. Much of the information and assumptions in these preceding strategies are valid today.

We have reviewed our 2018 strategy, and rather than starting from scratch, have used that as a base understanding that we need to take an enduring approach to making infrastructure decisions.

The type of work Greater Wellington needs to do and provide has not changed. However we continue to review and adjust how we operate and how we deliver our services.

The table (1) below summarises what the principal options and the issue they address in 2018 and their status in 2020.

Table 1

2018 Issue	Principle Options	Cost (2018)	Time	Status 2020
Ageing Infrastructure	Replacement of Kaitoke trunk water main	\$19 million	2018-21	As planned
	Waterloo and Gear Island aquifer wells replacement	\$9 million & \$19 million	2019-25 2028-35	As planned
	Lower Wairarapa Valley Development including George Blundell Barrage Gates	\$205 million	2018-48	As planned
	Replacement with Electro/Diesel Multiple Unit fleet	\$33 million	2023-24	As planned
	Rail station infrastructure renewal and upgrades	\$71 million	2019-29	As planned
	Real Time Information System replacement or renewal	\$19 million	2028-29	As planned
2018 Issue	Most Likely Scenario	Cost	Time	Status
Resilience	Ngauranga and Wainuiomata reservoir strengthening	\$5 million	2018 – 20	Wainuiomata underway Ngauranga reprioritised
	Cross harbour pipeline	\$116 million	2018-23	Reprioritised until 2031-35
	RiverLink and other Floodplain Management Plans	\$515 million	2018-48	Ongoing
2018 Issue	Most Likely Scenario	Cost	Time	Status
Affordability	Water Supply source development	\$320 million	2032-40	Ongoing
	Flood Protection provision of recreational and amenity facilities	\$16 million	2018-48	Ongoing
	Upgrade shelters and develop interchange hubs	\$8.3 million	2018-19	Complete
	Install integrated ticketing	\$48 million	2018-21	Ongoing
	Let's Get Wellington Moving	\$67 million	2021-26	Ongoing

There have also been undertakings that have had an impact on what and how we deliver services and when, including:

- The biggest change is New Zealand's declaration of a climate emergency and the corresponding Carbon Neutral Government Programme, which requires the public sector to achieve carbon neutrality by 2025. In 2019 Greater Wellington committed to an organisational target of carbon neutral by 2030.
- COVID-19 pandemic and recovery planning, and the economic stimulus initiatives undertaken by government and regional development agencies will require us to reprioritise capex commitments. The economic impact on our region and on Aotearoa New Zealand is still not understood and the duration of the global impact is difficult to determine.
- The government is progressing its infrastructure priorities of transport, housing and water, through new delivery mechanisms of Te Waihanga (Infrastructure Commission) and Taumata Arowai (water services regulator) in partnership with the outcomes focus of Waka Kotahi (Transport Agency) and Kainga Ora (Housing Agency).
- The Government's three waters reform will create a small number of entities responsible for drinking water, wastewater and stormwater services. Greater Wellington expect to still own the bulk water supply assets in 3 years time, and that they will transfer to a new water entity at some point in the following 10 years. Bulk water supply will be required throughout the establishment and transfer period, so we have planned and financed accordingly.
- The Government Policy Statement on Land Transport 2021 (GPS) provides national strategic transportation direction and priorities, and guides funding allocation by Waka Kotahi. The GPS also confirms the Government's commitment to the Let's Get Wellington Moving programme and support of the New Zealand Rail Plan (NZRP). The NZRP in turn identifies the future opportunities for the Wellington rail network and services.
- Since the last Infrastructure Strategy we have reviewed and revised our Metlink activities, our infrastructure, our communication and our people to improve both quality of service and interactions between the Metlink Group and our customers. Our asset management approach, responsibilities and controls ensure our asset management decisions align with our strategic priorities.
- The Wellington Regional Growth Framework is a spatial plan that will describe a long-term vision for how the region will grow, change and respond to key urban development challenges and opportunities. The Framework will identify regional infrastructure required - such as housing, three waters, public transport - in the context of climate change, resilience and natural hazards as well as the aspirations of mana whenua.

Our Strategic direction

Greater Wellington's infrastructure underpins our ability to deliver our vision, community outcomes and strategic priorities.

Our Vision

An extraordinary region – thriving environment, connected communities, resilient future

Our Purpose

Working together for the greater environmental good

Our Community Outcomes

We promote the social, economic, environmental, and cultural well-being of our communities through our community outcomes:

Thriving Environment – healthy fresh and coastal water, clean and safe drinking water, unique landscapes and indigenous biodiversity, sustainable land use, a prosperous low carbon economy

Connected Communities – vibrant and liveable region in which people can move around, active and public transport, sustainable rural and urban centres that are connected to each other, including mana whenua and mātāwaka Māori communities

Resilient Future – safe and healthy communities, a strong and thriving regional economy, inclusive and equitable participation, adapting to the effects of climate change and natural hazards, community preparedness, modern and robust infrastructure

Overarching Strategic Priorities

Improving outcomes for mana whenua and Māori – proactively engage mana whenua and mātāwaka Māori in decision making, and incorporate Te Ao Māori and mātauranga Māori perspectives, so we can achieve the best outcomes for Māori across all aspects of our region

Responding to the climate emergency – meeting the challenge of climate change by demonstrating leadership in regional climate action and advocacy, and ensuring our operations are carbon neutral by 2030

Adapting and responding to the impacts of COVID-19 – take a leadership role in responding to the economic consequences of COVID-19 and support the region's transition to a sustainable and low carbon economy

Aligning with Government direction – rise to the challenges set by Central Government to ramp up environmental protection and continue to provide high quality public transport services.

Infrastructure Strategy Principles

We take a principles approach to how we manage our assets, ensuring a consistent and considered approach.

- **Forward looking** – intergenerational equity. Infrastructure is future oriented – developed and managed with consideration for long-term use including future technology and population changes
- **Optimal** – Greater Wellington will optimise its infrastructure planning to take account of lifetime cost and demand factors
- **Adaptable** – We will build and develop assets that are resilient to social and environmental changes, including adverse events
- **Coordinated** – We develop our infrastructure in consultation with our major partners reflecting our part in the national system (central government, territorial authorities, Council controlled Organisations)

Our assets and the services they provide

Water supply

The bulk water supply assets include a network of pipelines, pumping stations, reservoirs, treatment plants and other assets. Greater Wellington owns the bulk water supply assets.

Greater Wellington provides bulk water supply to four of the region's cities - Wellington, Porirua, Hutt, and Upper Hutt. Those cities supply water to the end consumer through their local reticulation networks. Wellington Water Limited, a Council-controlled Organization owned by six local authorities, is contracted to manage the water supply activity on the council's behalf.

Assets	Levels of Service	Performance 2019/20
Distribution pipework 187 km	Safe and healthy water	
Treatment plants 4 No	Respectful of the environment	
Tunnels 9 km		
Water storage 3 No	Resilient networks support our community	
Pump stations 15 No		
Roads and tracks 45 km		
Raw water intakes & wells 2,688 No		
Aquifer wells 18 No		Sufficient water cannot be guaranteed to meet normal demand in a drought with a severity of greater than or equal to 1 in 50 years.

Metlink public transport

Greater Wellington plans, funds and operates the Metlink public transport network of train, bus and harbour ferry services throughout the region. We own and maintain parts of the public transport network including trains, railway stations, and bus shelters. We contract companies to operate the train, bus and harbour ferry services on our behalf - we do not own the buses or the ferries.

Assets	Levels of Service (2018)	Performance (against 2018 LOS)
Rail Rolling Stock Rail Station Infrastructure Bus Fleet Management Bus and Ferry Infrastructure Customer Information Assets	<p>Transform and elevate customer experience and use of Metlink passenger services</p> <p>Maintain and improve the performance and condition of Metlink assets</p> <p>Deliver services in accordance with the published timetable</p> <p>Provide accessible and accurate information on Metlink services to the public</p> <p>Provide a fares and ticketing system that attracts and retains customers</p>	<p> Rail and bus users not satisfied with their trip. Passenger transport boardings did not meet target</p> <p> Passengers satisfied with stop/station/wharf assets, but not satisfied with condition of shelters</p> <p> Reliability and punctuality of services did not meet targets</p> <p> Users not satisfied with the provision of information</p> <p> Measure changed in 2018/19</p>

Flood protection

We manage flood risk from the region's rivers and streams. We investigate flood hazards, develop floodplain management plans and maintain and build flood protection works in accordance with these plans. We also provide an advice and consultation service for internally and externally in relation to flood and erosion risks. In providing this activity we also enable public recreational use and enjoyment of river corridors and contribute to the restoration of the natural and cultural values of rivers.

Assets (number)	Levels of Service	Performance
Stopbank Reaches 1,095	Improve information and understanding of flood risk in the community	
Individual Structures 107	Infrastructure is managed to agreed level of service	
Bank Edge Structural 1,777		
Bank Edge Vegetative 1,539	Minimise the environmental impact of flood protection works	
Channel Assets 1,074	Improve community's resilience to flooding	
Berms Amenity 744		

Regional parks

Greater Wellington manages a network of regional parks for the community’s use and enjoyment. The network includes a range of unique natural areas for recreation and conservation. We plan for the future of the network, provide services and facilities for visitors and work with mana whenua and community groups to protect and restore the environment of regional parks.

Assets	Levels of Service	Performance
Amenity area 119	Maintain/enhance the Park experience	
Building 158	Provide on-park administration, information, public relations and by-law enforcement	
Environmental area 8		
Park furniture 319	Provide information, skills and support to encourage the public to contribute to park visitor services	
Heritage feature 90		
Information 1,557	Get more people in	
Land management area 6		
Production area 74	Work others to meet the recreational needs of current and future generations and protect values of regional significance	
Structure 886		
Track 213	Degraded environments are restored	
	Develop and implement conservation plans for high priority heritage sites	

Environmental science

We monitor rainfall, river flows, groundwater levels and quality, freshwater coastal water quality, air quality and land quality and biodiversity. We gather this information to carry out our regulatory functions, to monitor the state of the environment and measure the effectiveness of policy statements and plans, and to make the information available to the public.

Assets (number)	Levels of Service	Performance
72 river/flow monitoring sites 79 rainfall monitoring sites 84 groundwater level monitoring sites 5 lake level monitoring sites 5 wetland level monitoring sites 2 tide level monitoring sites 6 air quality monitoring sites 17 climate monitoring stations 3 turbidity monitoring stations	Environmental information is available in the right way to the right people at the right place and the right time for good decision making.	

Harbours

We provide aids to navigation to assist all users of the region's coastal waters to navigate safely. This includes providing accurate, relevant and timely information via our Harbour Communication Station (Beacon Hill).

Assets	Levels of Service	Performance 2019/20
Navigation Aids with lights 19 Unlit channel markers 6 Large floating steel buoys with lights 2 Signal station operated 24/7 1 Vessels 3	Provide safe and competent maritime management for commercial and recreational users of our region's waters.	 Maintaining our navigational safety equipment is critical and while we did not quite meet our targets by a very nominal amount, the equipment remained operational.

Critical assets

Central to managing risks, hazards and resilience is the criticality of assets. Critical assets are those that have a higher consequence of failure in terms of impact on the agreed level of service, the environment, the organisation's reputation or priorities, or economic and financial impacts.

A criticality framework is used to ensure a consistent approach to assessing the probability and consequence of failure. The criticality ranking aligns with the Global Criticality Rating subsequently developed by the New Zealand Treasury – National Infrastructure Unit. The criticality of all Greater Wellington's assets (1 (Significant) to 5 (Insignificant)) has been established and used to inform their lifecycle management.

More critical assets have prioritised asset inspections, maintenance renewal and investment strategies.

Asset management approach

Asset management is a core business process and integrated with all other business processes at Greater Wellington. The organisation has committed to best practice asset management. This means using practices to manage assets and long-term works programmes to deliver agreed levels of service, in the most cost effective manner, throughout their lifecycle.

Greater Wellington uses its asset management plans as a basis for, and to deliver, the Infrastructure Strategy.

Our approach is guided by the International Infrastructure Management Manual (IIMM). Asset management is a continuous exercise and Asset Management Plans are refreshed annually, and reviewed three yearly, to deliver activities and contribute strongly to Greater Wellington's priorities.

The three components of best practice asset management relevant to this strategy are:

- Lifecycle analysis
- Service levels and
- Future demand and risks

Lifecycle analysis

Greater Wellington uses a lifecycle management approach in its management of assets. We maintain our assets until they reach the end of their useful lives, when they are renewed, or upgraded. As such, we consider lowest long-term/whole of life cost (rather than short-term savings) when making decisions.

Asset knowledge and information is crucial; it underpins this Infrastructure Strategy, and the LTP, and enables evidence based- decision making. Our knowledge of our assets and forecasting capability has continued to grow – as part of the implementation of our new asset management information system – Ngā Tahī/TechOne. Our asset inventory is integral to optimise our assets useful life.

An asset's useful life is managed based on:

- Age and condition profile
- Performance and customer service issues
- Growth and changing demands
- Criticality and risk
- Ongoing maintenance requirements
- The differing economic lives of individual assets

The approach to determining condition varies, across asset groups, sub-groups and then has several condition criteria based on legislative, industry practice or service level criteria. Performance is determined against the measures against an assets level of service.

Condition, data confidence and asset management maturity are all based on 1 – 5 rating scales (table 2). These definitions all use the IIMM framework.

The criticality codes align with the Global Criticality Rating subsequently developed by the New Zealand Treasury – National Infrastructure Unit.

Table 2: Key for condition, data confidence, criticality and asset management maturity scales, all based on 1 – 5 rating scales

	Condition	Data confidence	Criticality	Maturity
1	Excellent	Systematic and fully optimised data programme	Significant, region wide, long term disruption and significant cost to restore service	Advanced – Programmes driven by optimised decision-making, risk management and service level/cost trade off. Improvement programme focus on maintaining ongoing practice
2	Some minor maintenance work is required	Reliable data in information system with analysis and reporting	Major disruption over an extended period	Intermediate – strategic context, analysis of condition and performance, customer engagement in LOS, ODM/risk applied to projects
3	Maintenance is required to return to the expected level of service	Sufficient information to support basic analysis	Moderate. Serious localised impacts and cost	Core – Approach to risk, condition and performance assessments, demand forecasts, 10 year financial and an improvement plan
4	Requires a significant up-grade	Basic/incomplete information based on assumptions	Minor service disruption	Basic – plan contains basic information on assets, service levels, planned works, and financial forecasts
5	The asset is unserviceable	No asset register	Negligible social or economic impact	Aware – intentions to develop Asset Management Plans

Table 3: Summary of Greater Wellington asset groups value, condition, reliability of asset data and criticality, covered by the Strategy

Asset Group	Replacement value	Overall condition	Data confidence	Criticality	Maturity
Water Supply	\$565.8 million (ODRC)	2 Minor defects only	2 Reliable	1 Significant – for the entire network	2 Intermediate
Flood Protection	\$493.7 million	2 Minor defects only	1 Highly Reliable	1 Significant – stop banks, flood gates, barrage gates, detention dams	3 Core
Public Transport	\$637 million (Rail only)	3 Maintenance required	2 Reliable	3 Moderate	2 Intermediate
Parks	\$84 million	2 Minor defects only	2 Reliable	3 Moderate	2 Intermediate
Environmental Science	\$6.6 million	2 Good	2 Reliable	2 Major – river and rainfall monitoring equipment	3 Core
Harbours	\$1.6 million	2 Minor defects only	2 Reliable	3 Moderate – for the Signal Station at Beacon Hill	4 Basic

Levels of service

Lifecycle management delivers level of service. Greater Wellington’s strategic priorities drive levels of service, which in turn influence timing and quality of maintenance, renewals and upgrade works. Levels of service are therefore the vital link between Greater Wellington’s priority areas and expenditure requirement, and account for expenditure differences between:

- Asset types (such as between Water Supply and Parks assets)
- Asset components (such as between bus stops and railway carriages)
- Asset sub-components (such as asset types differences between catchments/Floodplain Management Plans)
- Expenditure categories (such as between maintenance and renewals)

Capital development funding is categorised according to whether it predominantly meets levels of service, growth or renewals needs.

Future demands and risks

Section 101B(3)(b) of the Local Government Act requires local authorities to provide for the resilience of their infrastructure by identifying and managing risks. Infrastructure managers are obligated to integrate increasingly complex risks and challenges within decision-making processes. This includes the regulatory reforms, limiting carbon emissions, adapting to climate change, natural and man-made disasters and the structural ageing of infrastructure.

Risk management is about assessing and managing likelihood and consequences of an event happening, that will impact on the achievement of Greater Wellington’s priorities. In terms of identifying demand and risks, the Infrastructure Strategy uses our 10 year LTP assumptions to underpin the risks and impacts to our assets. The individual Asset Management Plans which inform this Strategy analyse the risks associated with the assets and activities and manage and mitigate those risks.

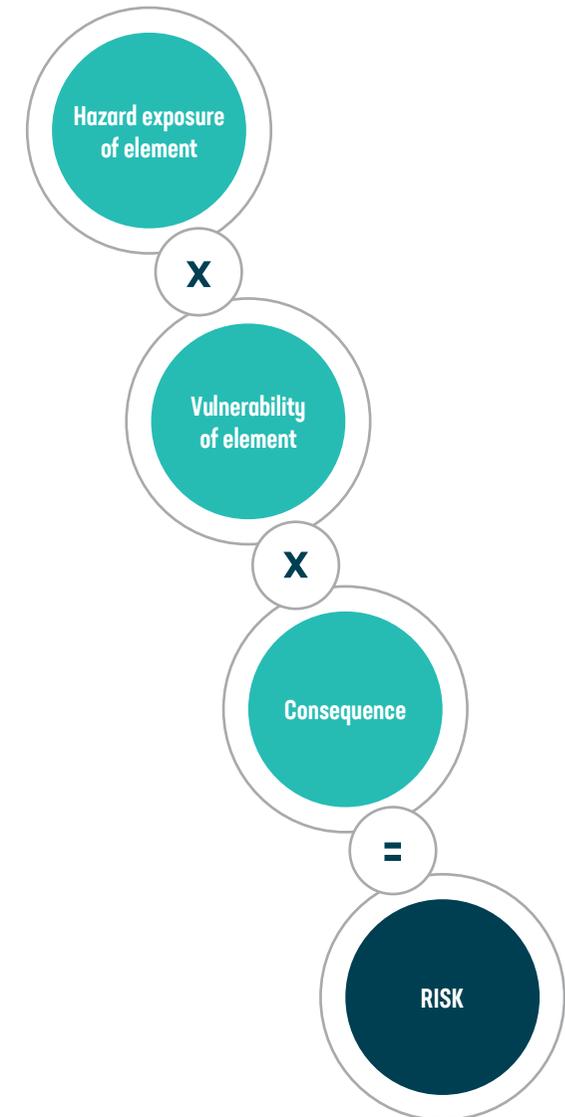
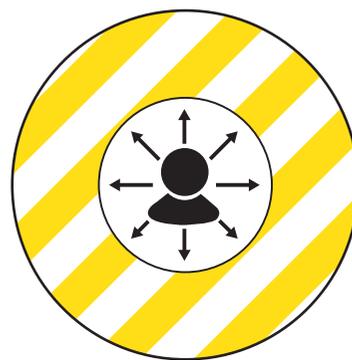


Figure 2.2: Risk screening approach

Environmental scan Big trends and risks

The world is ever changing, the future is here and quantum and paradigm shifts are happening around us in technology, with climate stability, our demographics. The following section is a scan of future local needs, as well as industry and global influences, and the impacts these will have for infrastructure delivery in the region.

As the new decade began, we were looking ahead at the opportunities and challenges. In the next 10 years people may walk on Mars, AI will predominate and insects may become part of our diet. Many companies are becoming less profit-focused, while taking a more active role to address climate change. The global population is ageing and diversifying. We will cycle more.



Then the COVID-19 pandemic struck the world, and stopped humanity in its tracks. We reflected, as never before, daily lifestyles and how we do business changed, pollution levels plummeted and nature reclaimed urban environments. We cycled more!

COVID19 has shown us what is possible in terms of rapid response and adaptation.

By harnessing what we've learnt, particularly local and national resilience and self-sufficiency, being socially responsible and working together we have been provided with an unprecedented opportunity to re-set our direction to achieve our vision.

What if 2020 didn't happen? What if this year was like the ones before?

Before COVID-19, the Wellington regional economy was strong and the population was expected to grow almost nine percent in the next 10 years. Over the short-term it is now estimated that the regional economy will be impacted and could be ten years before the economy recovers to pre-COVID-19 levels. In the short term unemployment and household income may challenge abilities to pay rates, potentially affecting our capex programme delivery. National economic stimulus spending may off-set this challenge and present an opportunity for local government to have a key role in economic recovery and transition.

Demographics

Our population is changing. We're growing, urbanising and ageing. The region's population growth is expected to slow in the near term (2021-2023) due reduced migration and economic activity, and then recover to levels similar to those experienced in recent years, to reach approximately 570,000 by 2030 (nine percent growth since 2020) and 632,000 by 2043 (20 percent growth since 2020). We expect higher growth rates expected in Porirua, north of Waikanae and the Wairarapa. The region is expecting between 46,000 and 68,000 more dwellings and 94,000 to 156,000 more people over the next 30 years.

Climate change impacts

The impacts of climate change are already being felt across the region and over the lifetime of this Strategy will be felt more keenly. Our natural environment will be negatively affected, there will be pressures on water supplies and quality, increases in predators, pests and new pathogens, and our communities could suffer negative health effects. Infrastructure and services provided will be under increasing pressure and risk.

Climate change is not a vague or uncertain set of predictions for the future; the science gives us predictability. How we respond requires deliberate, evidence based decisions in the short term, to enable our long-term, well-planned adaptation approach, including how, and where, we deliver assets and services.

Legislative and regulatory reforms

The infrastructure industry is in the midst of some disruptive, radical reshaping and transformative times. Legislative, statutory and regulatory change in all infrastructure fields is ongoing. The Government's Three Water Reforms, Freshwater Essentials Package, the overhaul of the Resource Management Act, the Climate Change Response Act and the Future of Local Government review will all influence how infrastructure is delivered and funded. We will likely see new governance roles and changing relationships and responsibilities for land-use, water supply and transport.

The infrastructure industry

Market dynamics have led to a skills shortage at all levels of the engineering industry from experienced consultants and contractors, to skilled labour. There a number of projects nationally and within the region which are limiting the availability of contractors and consultants to progress programmed works. The limited availability is also leading to increased costs, where received proposals have been as much as 50 percent over estimate. This is impacting budgets and timeframes for delivery. Consenting and engagement is 60 percent of capital costs, due to stronger environmental regulation and increasing expectations for positive environmental outcomes.

Ways of working

Increasing democratisation of our work, technological advances and growth of partnership models will provide opportunity to improve the quality of our services and outcomes for the community. There are growing expectations around transparency, participation, partnerships and different funding models. Internationally, a consensus seems to be growing that stimulus spending should be leveraged to achieve climate goals. Calls and commitments for a “green deal recovery” percolate through discussions of the post-pandemic future.

Technology and digital

Globally, advances in technology are ongoing, rapid and unpredictable, changing the way we live and communicate. Through open and big data and analytics, augmented reality, real-time adaptability, the Industrial Internet of Things (IIOT), and the Everything-As-A-Service (XaaS) consumption model, there are huge opportunities to strengthen business, governance, asset management and the services we provide the community. There will be raised expectations in our communities for more personalised services that connect more data sources in an increasingly timely and accessible manner. Robust security, privacy and transparency will remain both core principles and challenges.

Urban development

Our western coastal corridor from Tawa to Levin is predicted to have the highest rate of growth in the region. Increases in population will place pressure on our existing infrastructure, increase demand for new grey (concrete), carbon intensive assets and have potential to exacerbate threats to the health of our water, biodiversity and our contribution to the climate crisis. The National Policy Statement on Urban development (NPS-UD) is anticipated to enable and support growth. With any new development we face challenges such as housing quality and affordability, constraints with water supply, public transport accessibility and flood hazard risks.

The predicted and anticipated regional growth agenda, carbon reduction aspirations and a healthy environment are not mutually exclusive, but do pose planning and delivery challenges. We need to ensure urban development planning is cognisant of current and future infrastructure limitations, including flood risk, and compliance with increasing community expectations, environmental legislation and the ecosystem services values.

A coordinated, kaitiakitanga response is essential to wellbeing and resilience

Greater Wellington has a critical kaitiakitanga role in ensuring the well-being of our local communities and environment. We also need to continue to provide essential services while dealing with legislative and regulatory, climate and technology changes, all while the financial future is uncertain. These challenges can't be managed with a traditional approach.

Embracing a kaupapa Māori approach to our work programmes and services, specifically kaitiakitanga (intergenerational sustainability), and whanaungatanga (connectedness and relationships) of our people and whenua. Realising Te Mana o te Wai and managing all waters in a way that prioritises the health and wellbeing of the water (quantity, quality and ecology) is a first step of this approach.

Cross cutting and significant issues

These challenges are now explored in detail including what issues they present to Greater Wellington and how we plan to manage them.

To deliver the vision of an “Extraordinary Region – Thriving Environment, Connected Communities, Resilient Future” the significant issues for infrastructure identified are:

- Achieving carbon neutrality
- Improving resilience
- Managing critical infrastructure

All these significant issues are impacted by and influence the wicked cross cutting issue of affordability.

Significance is applied as per Greater Wellington’s Significance and Engagement Policy (2018).

It should be noted each of the significant issues does not affect each Greater Wellington asset group equally. In addition, the significant infrastructure issues are not mutually exclusive, and a change in one affects the others. The responses to each issue will have impact on capex forecasting- and affordability.

These issues are now explored in detail including what challenges they present to Greater Wellington and how we plan to manage them.

Achieving carbon neutrality

The rise in global temperatures is causing more volatile weather, having profound effects on biodiversity and ecosystems and threatening human health and well-being in numerous ways. To keep global temperatures from rising by more than 1.5°celcius, we need carefully planned, rapid transitions to achieve steep carbon emissions reductions. In the Wellington Region this will be primarily from transport, energy source and agriculture.

Because of the risk to our communities, in 2019 Greater Wellington declared a climate emergency. In doing so the Council adopted a goal of 40 percent reduction in Greater Wellington’s net emissions by 2025, and to be carbon neutral (have net zero emissions) as an organisation by 2030 and ‘climate positive’ (be absorbing more emissions than it is emitting) by 20351.

Our Carbon Neutral 2030 goal is supported by a 10-point action plan, a Carbon Neutrality Policy (2020) and a Climate Consideration Guide (2020) requiring options for adaptation and mitigation considered for all work.

Since 2001, Greater Wellington has measured its greenhouse gas emissions using the Global Protocol for Community Scale Greenhouse Gas Emissions Inventory.

In 2019 the Greater Wellington organisational emissions were independently verified by Toitū Envirocare.

It is acknowledged that directly or indirectly, infrastructure is a big carbon emitter and therefore has a pivotal role to play in achieving carbon neutrality. The greatest opportunities for organisational emissions reduction from our assets are in the public transport, ceasing stock in parks, and water supply activities (as well as corporate building energy and fleet improvements). Our land management, environment and parks activities provide opportunity for carbon capture and storage through reforestation and wetland enhancement.

Greater Wellington's carbon reduction will initially focus on reduction of operational emissions. We will achieve net zero carbon in operational energy emissions primarily through the electrification of the public transport network, ceasing grazing from the regional parks and investing in restoration, and working with Wellington Water Limited to decarbonise the bulk water supply network.

We intend to cease grazing and restore 128.5 hectares of rare wetland and dune forest in Queen Elizabeth Park, and restore 21.8 hectares of pasture land at Kaitoke Regional Park. This decision will accelerate Council's move to become climate positive by 2035.

Reducing carbon emissions from operational energy use is a key priority for Greater Wellington.

However carbon emissions associated with all lifecycle stages of an asset (materials, manufacturing, transportation, labour, initial construction, operation, renewal and upgrade and end-of-life) are substantial. Currently assets lifecycle carbon is not accounted for.

We acknowledge the need to consider lifecycle carbon impacts of both new and existing assets. Integrating a lifecycle approach to carbon when planning and delivering assets is an important step in reducing carbon emissions to achieve emission targets. As such we are exploring expanding the Carbon Neutrality Policy scope to encompass lifecycle carbon of assets.

Through our proposed Procurement Policy we are seeking to encourage carbon (and environmental and social) conscious purchasing.

As well as reducing carbon, local government is a major purchaser of goods and services, and by implementing sustainable procurement policies we accelerate progress towards a green, circular economy.

We are in the early days of our carbon neutrality journey. Reducing whole-of-life carbon will demand fundamental step changes at all levels of the organisation. Taking a lifecycle approach represents a greater level of commitment. The reduction challenge will lead to new ways of thinking and working, innovation in digital technologies, construction techniques and development of standard products, underpinned potentially by new infrastructure, policy and investment. The following table demonstrates the issues arising from achieving our carbon neutral aspirations and the options available to us.

Table 4:

Issues	Options	Most likely scenario	Value
<p>To achieve net carbon neutral in operational emissions we need to:</p> <ul style="list-style-type: none"> Phase out stock grazing from our regional parks Minimise gross emissions for the Metlink public transport fleet Reduce emissions associated with the abstraction, treatment and supply of drinking water 	<ul style="list-style-type: none"> Policy changes (low carbon consideration policy, energy and low carbon first) Change land uses Changes to levels of service Low carbon Acceleration Funding Low carbon initiatives and innovations New infrastructure, investment and policy Do nothing- submit to >2°C warming /accept climate crisis 	<ul style="list-style-type: none"> Bus Layover Decarbonisation 2023/24 -2025/26 Belmont (Waitangirua) recreational facilities, 2022-2024 (Low Carbon Accelerator Fund) Investigation and assessment of options water treatment and distribution. OPEX 	<p>\$4.3M</p> <p>\$830K</p>
<p>To achieve net carbon neutral and mitigate the lifecycle carbon of assets we need to:</p> <ul style="list-style-type: none"> Reduce carbon in newly-built assets and materials, manufacturing, transportation, operations, renewals and labour and end-of-life 	<ul style="list-style-type: none"> Policy changes (Lifecycle carbon) Capital Carbon Inventory PFSI (Permanent Forest Sink) registration of area review Low carbon Acceleration Fund New ways of thinking and working Innovation in digital technologies, construction techniques and development of standard products – i.e. cement free concrete, trenchless pipe construction or modular structures 	<ul style="list-style-type: none"> 'Toitu Te Whenua park-level master planning' 2021-2024 Low Carbon Acceleration Fund for some implementation. Direct operating expenditure from 2021/22 to 2023/24 Capital Carbon and Inventory for assets. 2021 OPEX 	<p>\$550K</p> <p>\$6.1M</p>

Improving resilience

For the Wellington region, natural hazard events and climate change pose risks to infrastructure, the environment, the economy and land use. Communities are already feeling the effects of climate change.

For Greater Wellington, resilience is a measure of the capacity of our communities, built environments, businesses, economy, infrastructure and natural ecosystems to respond and adapt to both sudden and slow moving changes, specifically growth, climate change and earthquakes. Resilience decisions we make anticipate, prepare for and adapt to changing conditions, seeking to lower the risks, vulnerability and consequences. Approaches can take a range of forms:

- Planning responses
- Adaptive design and engineering methods
- Behavioural change and education

To inform organisational understanding and asset management an initial, desktop risk assessment of Greater Wellington's built assets exposure to predicted impacts of climate change and natural hazard events have been undertaken². The results of the risk assessment are summarised in Table 5 below. The assessment provided an understanding of the most vulnerable assets, and the events having the most impact. The assessment will be used in the respective AMPs to progress and inform resilience and adaptation responses.

Table 5

Hazard, threat	Water	Public Transport	Flood Protection	Parks	Environmental Science	Harbours
Surface flooding	Moderate 6	High15	V High 25	Moderate 10	Low 4	Moderate 9
Landslips	Moderate 6	High15	V High 20	Moderate 9	Low 4	Moderate 10
Rainfall	Low3	High15	High15	Moderate 6	Low 4	Low 1
Coastal flooding	Moderate 6	Moderate12	V High 20	Moderate 9	Low 2	Moderate 9
Coastal erosion	Moderate 6	High15	V High 20	Moderate 9	Low 2	Moderate 10
High winds	Low 1	High15	V High 20	High15	Low 1	Moderate 6
Extreme temperatures	Low 1	High15	Moderate 10	Moderate 9	Low 1	Low 2
Fog & humidity	Moderate 6	Low 2	Low 2	Low3	Low 1	Moderate 10
Drought	Moderate5	Moderate 6	Moderate 8	Moderate 9	Low 1	Low 2
Wildfire	Moderate6	Moderate 6	Low 2	Moderate 9	Moderate 9	Low 1
Earthquake	Moderate 4	High 12	V High 25	Moderate 9	Moderate 9	Moderate 6
Liquefaction	Moderate 5	High 12	V High 20	Moderate 9	Low 2	Low 1
Tsunami	Moderate 5	High 12	High 12	Moderate 9	Moderate 6	Moderate 9
Volcano	Low 1	Low 2	Low 1	Low 2	Low 2	Low 1

Table 6: Greater Wellington’s risk assessment matrix. Risk is the result of consequence and the likelihood of an occurrence, and the key for the table above.

Likelihood	Almost Certain > 90%	▷	Low 5	Moderate 10	High 15	Very High 20	Very High 25
	Likely 75 - 90%	▷	Low 4	Moderate 8	Moderate 12	High 16	Very High 20
	Unlikely 50 - 75%	▷	Low3	Moderate 6	Moderate 9	High 12	High 15
	Highly Unlikely 25 - 50%	▷	Low 2	Low 4	Moderate 6	Moderate 8	Moderate 10
	Rare < 25%	▷	Low 1	Low 2	Low 3	Moderate 4	Moderate 5
			Δ	Δ	Δ	Δ	Δ
Level 1-5			Minor 1	Moderate 2	Significant 3	Major 4	Extreme 5
Concequence							

Surface flooding, from more intense and frequent rain events, and coastal flooding, associated with sea level rise, are the biggest risks identified to Greater Wellington assets and services, in some cases the impacts are being felt now. Consequently, Greater Wellington assets and activities on floodplains and/or in relative proximity to the coast are the most at risk, i.e. the lower Hutt Valley or Porirua. The risk to water supply from increased drought is currently considered moderate, but this risk will become more apparent in the life of this strategy.

The asset portfolios with the greatest risk profile are Flood Protection, Public Transport and Bulk Water Supply.

The exercise has demonstrated the range of effects on, and differences between, asset sub-groups and the potential damage faced. It has also emphasised the difference between consequence to asset and the consequence to service and differences within asset classes depending on location.

Also highlighted is the increasing risks to our services due to failure of other infrastructure or services owned, controlled or managed by third parties. Flooding of roads affects our public transport capability; power outages due to extreme temperatures or high winds would remove services such as traffic signals.

Similarly Fire and Emergency New Zealand rely on our water networks to fight fires.

Additionally, coastal whenua are of huge importance to mana iwi, with many important spaces located in coastal and/or flood prone areas, with limited options for retreat. Our kaitiaki and kaitiakitanga roles extends to our community and their wellbeing. How we approach these challenges needs to guarantee social wellbeing- now and into the future.

Improving the resilience of all our communities and assets is low risk/high impact approach – moving from a post event recovery costs position to investment in mitigation and adaptation that would limit the impact when adverse events do hit. The changes we need to make to reduce the risks to our communities are significantly less disruptive and cheaper if we make them now, proactively, rather than reactively.

Table 7: Demonstrates the issues around resilience and the options available to us

Issues	Options	Most likely scenario	Value
<p>The condition and configuration of the coastal rail network makes it vulnerable to service disruptions which have a flow on impact into the wider transport system. Noting: Greater Wellington doesn't own the rail network assets.</p>	<ul style="list-style-type: none"> • Policy changes – including fight or flight, mode changes • Work with TAs (and others) on land use changes • Partnership for new infrastructure investment and/or edge protection • Adaptive pathways and system thinking approaches • Risk management approach to service provision • Community and stakeholder awareness, partnership and adaptation approaches • Decrease to level of service • Change insurance • Initiatives and innovations construction techniques and development of standard products • Do nothing – accept the risk to assets and services 	<p>Asset renewals, including risk prioritisation, as a critical enabler of resilience and adaptation</p> <p>Work with KiwiRail on resilience and alternative solutions - e.g. ferries. OPEX</p>	
<p>Parks assets at risk from coastal erosion and undermining from sea level rise</p>	<ul style="list-style-type: none"> • Policy changes – including fight or flight, Managed relocation/retreat or retire from • Community and stakeholder awareness, partnership and adaptation approaches • Adaptive pathways and system thinking approaches • Rebuild or upgrade with new investment and innovation construction techniques • Work with TAs (and others) on land use changes • Decrease to level of service • Change insurance • Do nothing – accept the risk to assets and services 	<p>Queen Elizabeth Park Coastal Erosion Plan 2021/22-2023/24</p>	<p>\$2.34M</p>

Issues	Options	Most likely scenario	Value
Water supply network at risk from seismic events	<ul style="list-style-type: none"> • New investment for upgrades and renewal • Innovation construction techniques and development of standard products • Adaptive pathways and system thinking approaches • Change level of service • Partnership for investment • Do nothing – accept the risk to assets and services 	<p>Ground strengthening Waterloo Treatment Plant 2021-22</p> <p>Replacement of Kaitoke main, Silverstream Bridge 2021/22-2023/24</p> <p>Kaitoke Flume Bridge Seismic Upgrade 2021/22</p>	<p>\$4M</p> <p>\$30.5M</p> <p>\$4.2M</p>
We are not meeting our 1 in 50 year drought resilience level of service	<ul style="list-style-type: none"> • Reduce consumption (Smart Services implementation, Leak detection, reduce network pressure, Education and behaviour change) • Upgrading existing and new assets • New raw water source for growth • Different technology • Integrated planning and delivery with Regional Growth Plan • Partnerships and funding models • Do nothing • Decrease to level of service 	Te Marua capacity optimisation 2021-25 Investigations and planning for a new source. OPEX (while working with TAs to manage demand)	\$38.9M

Issues	Options	Most likely scenario	Value
<p>Urban development planning is cognisant of current and future infrastructure limitations, including flood risk, and compliance with legislation and the ecosystem services values</p>	<ul style="list-style-type: none"> • Policy changes – no new development on hazardous land. Managed relocation/retreat or retire from • Adaptive pathways and system thinking approaches • Community and stakeholder awareness, partnership and adaptation approaches • Work with TAs (and others) on land use changes • Vegetated ‘soft’ erosion edge protection • Critical stopbank building and /or reconstruction • Partnership for new infrastructure investment; edge protection • Stimulus funding and recovery approaches – i.e. Jobs for Nature and Provincial Development Unit • Decrease to level of service • Change insurance • Do nothing- accept the risk to assets and services 	<ul style="list-style-type: none"> • RiverLink over 10 years (to project completion) \$76.5M • Other flood plain management plan implementation over 20 years: \$60M <ul style="list-style-type: none"> - Waiwhetu - over 2024/25 – 2037/38 \$10.6M - Waikanae - to 2042/43 \$8M - Otaki - to 2037/38 \$12.8M - Lower Waitohu - to 2033/34 \$5.3M - Waiohine River - to 2027/28 \$13.9M - Te Kauru - 2024/25 to 2026/27 \$12.6M 	

Delivering critical assets

Our large critical infrastructure represents substantial historic investment and a significant investment in the future. This infrastructure provides vital services that our community derive significant wellbeing from. Operational and capital works help drive the local economy.

While we are facing urgent challenges in delivering these infrastructure and services. It could be tempting to cut back on infrastructure maintenance and new investments. But such decisions, deferring or reducing expenditure on assets now, risk losing the benefits of having prudently invested historically and end up costing more in the future while increasing the risk of asset failure and shortening the life of the asset.

As well as building new infrastructure, we need to use the infrastructure we already have more smartly. This means focusing on ways to better manage demand. For example – high per capita water consumption is putting pressure on our existing water sources and an ageing network is contributing to an increase in leaks and water loss. Both are driving agreement for new water sources, however water education, metering and

replacing old, leaking pipes ensures better use of water infrastructure, and are optimum options financially.

We are currently not meeting our Metlink Public Transport levels of service. Integral in meeting our Carbon Neutral 2030 goal, it is imperative we provide a safe, reliable, and resilient network. Keeping our public transport network fit for purpose and fit for the future requires ongoing investment in this LTP this means:

- targeted and catch up renewals in the rail network assets (owned by KiwiRail)
- targeted routine maintenance and renewals in assets owned by GWRL
- upgrades and investment across all Metlink assets to improve the level of service provided

It is understood that the status quo approach will not deliver the future the region needs in the short or long term. To address the funding, regulatory, skills and capability challenges requires a change of paradigm from the way we have often planned and managed the region in the past, to a sequential, multi-disciplinary, multi-agency approach.

With the councils across the region, and other stakeholder organisations, we have been thinking how we will respond and accommodate growth sustainably and resiliently through developing a 30 year Regional Growth Framework (with sight of 100 years).

It is recognised that integrated growth and spatial planning results in healthier, resilient, more productive local communities, homes and places. This integrated planning of core services and infrastructure, including water supply, transport and mobility, encourages alignment of service planning and mutually beneficial people-centred solutions.

We need to explore new streams of revenues for infrastructure assets and identify strategies for partnerships and investment programmes and procurement. Similarly we need to make evidence-based decisions at the macro scale to deliver services on the back of other major investment for the wellbeing of our community. We need to prioritise critical and strategic assets that directly contribute to deliver a thriving environment, connected, resilient, low carbon future.

As such it is likely that interdisciplinary, multi-benefit projects such as Let's Get Wellington Moving and RiverLink, delivered with other stakeholders, will replace single focused projects, deliver multi benefits and contribute to our priorities. Across public and private sectors we are redesigning how we work, combining people, teams and stakeholders collaboratively, powered by partnerships and Treaty-based relationships. These trans-disciplinary teams include engineers, ecologists and planners as well as social scientists can place the right priorities on how to best address the needs of people and their roles in the towns and communities.

Table 8: Outlines the issues for managing our critical assets and the options available to us

Issues	Options	Most likely scenario	Value
Need to improve capacity reliability and customer experience across the PT network to enable mode shifts and reduce transport emissions.	Strategic, integrated approach to growth planning – smart connections, Wellington Regional Growth Framework etc. Fund renewals and upgrades of critical assets New infrastructure, investment and policy Change or decrease Levels of Service Partnership and funding models to drive efficiencies Do nothing	Metlink Bus new Capex 2021/22-2049/50 Waterloo Interchange 2023-2026/27 Integrated ticketing solution from 2021/22-2023/24 Making shared and active modes attractive – upgrading rail station customer amenities 2023/24-2029/30	\$28M \$22M \$48.4M \$19M
Current infrastructure is not capable of safely accommodating additional trains, which restricts the options available to accommodate future demand	Fund renewals and upgrades of critical assets New infrastructure, Partnerships and investment Decrease level of service Do nothing	Infrastructure Commission funding for rail network upgrades between Wellington, Wairarapa and Palmerston North and Wellington Transitional rail – investment 100 percent Funding Assistance Rate (FAR)	\$200M
There is a small backlog of deferred water supply, flood protection and Metlink renewals which poses a growing risk to service reliability and performance.	Fund renewals and upgrades of critical assets Fund compliance and regulation driven activities Funding options – water levy, KiwiRail partnerships Decrease level of service Do nothing	Gear Island and Waterloo wells replacement 2022-2030/31 Kaitoke intake 2032-2036/37 Metlink Bus Capex renewals funded each year of Strategy Lower Wairarapa Development Scheme, including the George Blundell Barrage 2021/22 to 2050/51 Significant decision points to deliver major Floodplain Management Plans projects including: <ul style="list-style-type: none"> • Waiohin • Te Kauru (urban reach) 	\$18M \$36M 800k from 2021/22 to \$1.7M 2049/50 \$220.1M

Issues	Options	Most likely scenario	Value
<p>The average water use in the Wellington metropolitan region is 374 litres per person per day. This is significantly higher than the other major cities in New Zealand and comparable cities overseas.</p>	<p>Asset development – Advanced meter infrastructure (AMI, or “smart” meters) Demand Management (Leak detection, reduce network pressure, education and behaviour change) Decrease level of service Do nothing</p>	<p>Education and behaviour change in partnership with the TA (OPEX)</p>	
<p>Our water supply system is under increasing pressure, with growth relatively high demand and requirements to ensure ecological flows, pushing us towards the limits of our current system.</p>	<p>New raw water source and new assets for growth Upgrading existing assets Different technology (modular desalination) Integrated planning and delivery with Regional Growth Plan Partnerships and funding models Do nothing</p>	<p>Renewals and new assets to support growth in Porirua Pukerua High Level Pump Station 2032-35 Plimmerton pump station 2033-37 Judgeford Hills East High Level PS 2042-49 Investigations and planning for a new source. OPEX (while working with TAs to manage demand)</p>	<p>\$6M \$8M \$5M</p>
<p>Existing (and potential development) has a greater likelihood of flooding.</p>	<p>Vegetated ‘soft’ erosion edge protection Continue with traditional protection structure Integrated planning and delivery with Regional Growth Plan New policies - avoidance of inappropriate development in hazardous land – required Decrease levels of service Do nothing</p>	<p>Hutt River Erosion from 2022/23</p>	<p>\$14.8M</p>
<p>Increasing customer expectations, legislative requirements and increased and sustained demand for higher standard amenity and recreation facilities and ecological enhancement alongside provision of Parks and Flood Protection services.</p>	<p>Redesigning how we work, combining people, teams and stakeholders, powered by partnerships and Treaty-based relationships (i.e. Fit for Future (parks and flood protection collaborating to deliver asset and service) Programme and fund provision of recreational and amenity facilities Partnership / alternative funding and delivery mechanisms Non-compliance with legislative and statutory obligations (National Policy Statement – Freshwater, Aotearoa Biodiversity Strategy 2020, Regional Policy Statement etc.) Do nothing</p>	<p>Reframing our Floodplain Management Plans to deliver an agreed vision for regional rivers alongside implementing the code of practice river management activities. Including:</p> <ul style="list-style-type: none"> • Waiwhetu • Lower Wairarapa Valley Development Scheme <p>Use opportunities to partner with corporates and philanthropic organisations for planting and recreational amenity provision Wainuiomata Lower Dam loop track construction 2022-23</p>	<p>\$150k</p>

Issues	Options	Most likely scenario	Value
Increased demand and legislative changes have resulted in a higher level of service for monitoring of ecology, flood warning, groundwater quantity and quality and soils and climate.	<ul style="list-style-type: none"> Programme and fund asset development Partnerships and funding models Reduce levels of service Do nothing 	Installation and provision of regional-scale: <ul style="list-style-type: none"> • Climate monitoring sites • Ground water quality and level monitoring • Coastal and lake quality monitoring • Upgrading safety of structures 	\$362k 2021-23

Affordability

The key affordability pressures we face as a region are:

- Improving the resilience of our assets and services – especially bulk water supply and flood protection
- Achieving Carbon Zero 2030 and transitioning to a low carbon economy
- The Public Transport Operating Model (PTOM) requires long-term commercial partnerships with public transport operators
- Risks to project deliverability and cost escalation at all stages of planning, design and delivery of capital works (including engagement compliance, risk management, materials, bidding and delivery)
- Project resourcing, with increased demand on, and limited availability, of technical skills and engineering capacity and capability and disrupted international supply chains
- Changing legislative, statutory, regulatory and reforms
- Increasing community and environmental expectations
- Ability to pay is not uniform across the region

To mitigate these pressures and risks and deliver our large critical infrastructure, life cycle asset management is used to optimise the timing and scope of capex projects; balancing lifecycle cost pressures, and maintaining a healthy balance sheet.

Our assumptions and proposed 2021 LTP capital expenditure do-ability is considered reasonable using Audit New Zealand's framework.

The majority of our capital investment will be funded through debt, which will be paid back over an appropriate time period for the underlying asset. Operating expenditure is funded out of operating revenue. Rates and levies are set at a level to ensure that Greater Wellington achieves this objective.

How much needs to be invested?

Greater Wellington uses asset management to forecast the prudent expenditure needed to maintain, operate, renew, and replace these assets, giving certainty to annual expenditure.

Capital expenditure

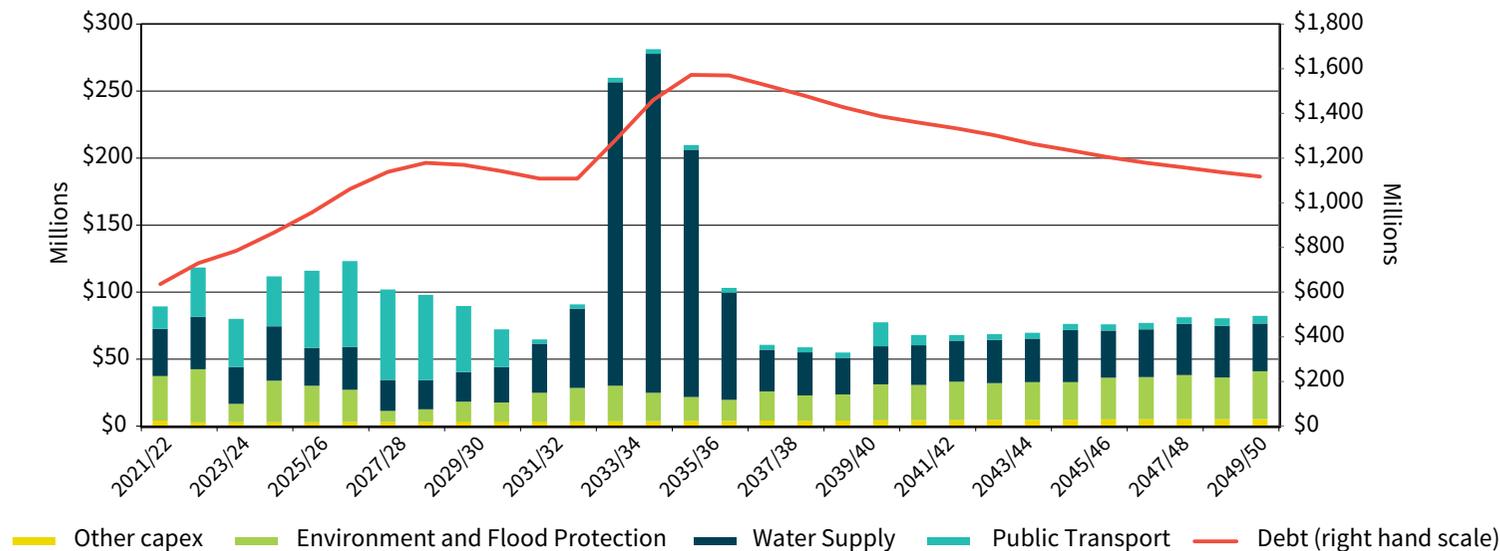
In maintaining levels of service, meeting priorities and addressing challenges, Greater Wellington expects to spend more than \$3,017 million on renewals and new capital between 2021/22 and 2050/51.

The peaks represent large investment that we need to manage from both an affordability perspective and with our organisational ability to manage the workload.

Figure 1, below shows forecast annual capital expenditure, and debt levels, under the most likely scenario for the whole of Council, including the three larger asset groups over the 30 years of this Strategy.

Figure 1: Forecast annual capital expenditure, and debt levels, for the three core asset groups over the 30 years of this Strategy.

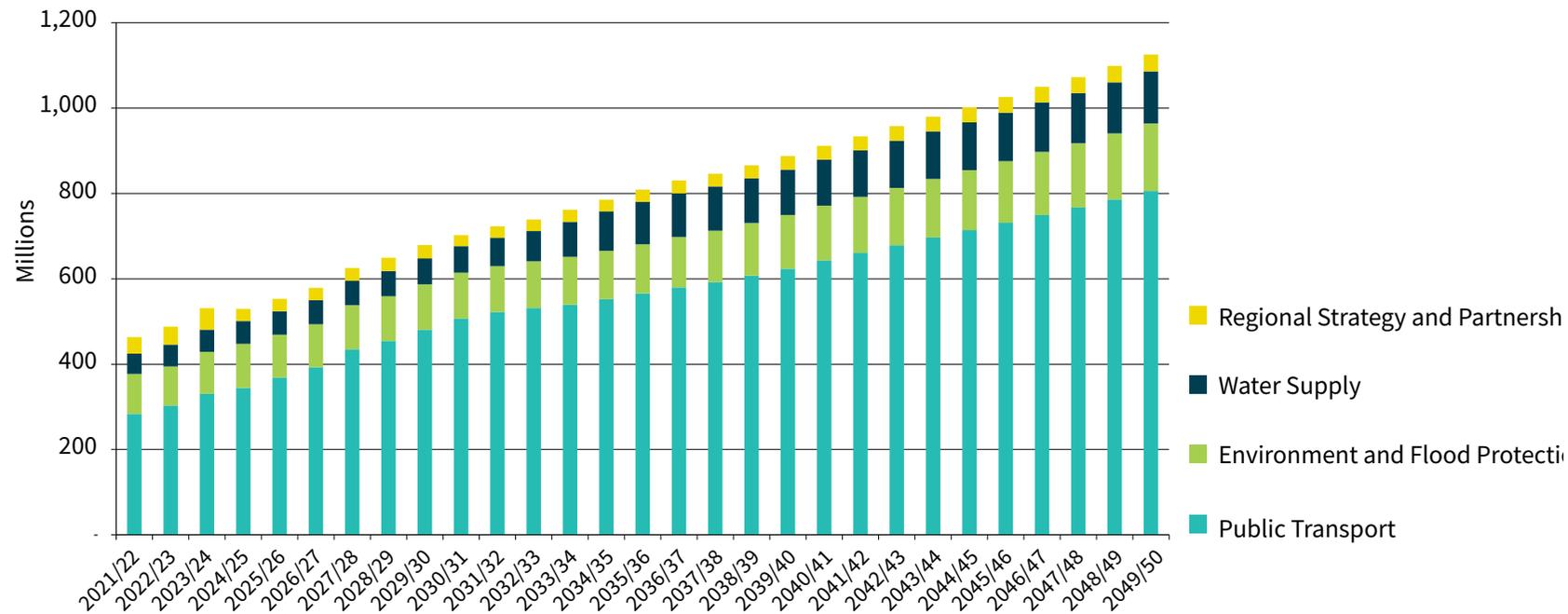
Capital expenditure and transport improvements



Operating expenditure

Over the life of the 10 Year Plan our operating expenditure is forecast to increase by 51.6 percent from \$463 million in 2021/22 to \$702 million in 2030/31. Figure 2 below provides a 30 year view of operating expenditure for each of Greater Wellington activity groups.

Figure 2: Operating expenditure per activity group



Part of these consequential operating costs is to support new capital including asset renewals and upgrades. Though operational efficiencies are a continual area for improvement and savings are being pursued in this area. The larger increases include:

- **Public Transport Network:** Our activity plans will require operating expenditure to increase by \$124 million (32 percent) over the next ten years to increase patronage, improve levels of services and to fund borrowing for the capital programme
- **Water Supply:** Our activity plans will require operating expenditure to increase by \$14 million (29 percent) to maintain our existing infrastructure and to fund borrowings for the capital programmes
- **Flood Protection:** Our activity plans will require operating expenditure to increase by \$4.4 million (18 percent) to maintain our existing infrastructure and to fund borrowing for the capital programme that includes investing in the RiverLink project

Principle options and significant decisions.

Fundamental to delivering the thriving environment, connected communities, resilient, low carbon vision we have for the Wellington region, while managing our infrastructure intergenerationally, we need to make some significant decisions about capital expenditure required over the 30 years.

For all issues the risk of deferring capital investment is not achieving the extraordinary region: thriving environment, connected communities, resilient future vision we have for the region.

Table 9: Includes what the decisions are, when we need to make those decisions, and the approximate scale or extent of the costs associated

Issue	Timing of project	Principal Option	Costs (\$000)	Level of Service impact	Risks and implications of deferring
Achieving Carbon Neutral	2022 - 2024	Belmont (Waitangirua) recreational facilities	\$830,000	Increase / New	Traditional build will not achieve Greater Wellington's 2030 carbon neutral goals
	2023/24 - 2025/26	Bus Layover Decarbonisation	\$4.3M	Increase / New	Reducing public transport emissions by decarbonising the fleet will assist achieve Greater Wellington's 2030 carbon neutral goals
Asset renewals as a critical enabler of resilience and adaptation	2021 - 2051	Deliver major Floodplain Management Plans projects	\$223M	Meet current	Not funding or deferring will put existing communities, services, assets and property at increasing risk
	2021 - 2024	Queen Elizabeth Park Coastal Erosion Plan	\$2.3M	Meet current	
	2021/22	Ground strengthening Waterloo treatment plant	\$4.4M	Meet current	
	2021/22-2023/24	Replacement of Kaitoke main, Silverstream Bridge	\$30.5M	Meet current	
	2021/22	Kaitoke Flume Bridge Seismic Upgrade	\$4.2M	Meet current	
Delivering an efficient, accessible, and low carbon public transport network	2021/22 - 2049/50	Metlink Bus new capex	\$28M	Meet current	Without work and investment we will continue failing to meet public transport levels of service
	2023 - 2026/27	Waterloo Interchange	\$22M	Meet current	
	2021/22 - 2023/24	Integrated ticketing solution	\$48.4M	Increase / New	
	2023/24 - 2029/30	Upgrading rail station customer amenities	\$19M	Increase / New	

Issue	Timing of project	Principal Option	Costs (\$000)	Level of Service impact	Risks and implications of deferring
Delivering an efficient, accessible, and low carbon public transport network	2023/24 - 2028/29	Wairarapa and Manawatu rail service and capacity enhancements.	\$745M	Increase / New	Without work and investment we will continue failing to meet public transport levels of service
Managing our critical assets	2022 - 2030	Gear Island and Waterloo wells replacement	\$18M	Meet current	Deferring or underfunding renewals presents a growing risk to service reliability and performance
	2032 - 2036	Kaitoke intake	\$36M	Meet current	
	2021/22 - 2049/50	Metlink Bus capex renewals	\$800,000 to \$1.7M	Meet current	
	2021/22 - 2050/51	Lower Wairarapa Development Scheme, including the George Blundell Barrage	\$220.1M	Meet current	
Meeting future demands	2021 - 2023	Installation and provision of regional-scale monitoring and structures	\$468,000	Increase / New	Failure to plan and invest in provision of infrastructure will not enable growth, dismiss intergenerational equity and affect future liveability and wellbeing
	2021 - 2025	Te Marua capacity optimisation	\$38.9M	Meet current	
	2021/22 - 2032/33	RiverLink	\$76.5M (Flood Protection only)	Increase / New	
	2032 - 2049	Water Supply assets to support growth	\$19M	Meet current	Water shortages during drought years and as demand from growth increases

Table 10: The impacts on levels of service from these decisions

Water Supply	<p>We do not propose any significant changes to our current levels of service for water supply</p> <p>The most likely scenarios will address the impacts, and maintain the levels of service for safe to drink, and continuous and secure supply</p>
Flood Protection	<p>We do not propose any significant changes to our current levels of service for flood protection in the short term of this strategy. Increased investment may be required to maintain levels of service in the face of climate change and sea level rise.</p>
Public Transport	<p>We do propose changes to our current levels of service for Public Transport.</p> <p>We set levels of service to ensure they are customer focused, address the issues that are important to the communities we serve, are technically meaningful, and align with our vision of providing an efficient, accessible and low carbon public transport network. Our public transport service also needs to contribute to the government’s strategic priorities for land transport. Therefore, we have realigned our levels of service with them and our corresponding strategic focus areas of facilitating mode shift (from private vehicle), maintaining a customer satisfaction rating greater than 92 percent for the overall trip, and achieving a 30 percent reduction in transport-generated emissions.</p> <p>Our levels of service are:</p> <ul style="list-style-type: none"> • Provide a consistent and high quality customer experience across the public transport network • Promote and encourage people to move from private vehicles to public transport and active modes (walking, scooter, active MaaS etc.) • Gross emissions for our public transport fleet will be minimised, reducing the offsets required to reach net carbon neutrality • Reduction of accidental death and serious injury on our public transport network to encourage safe behaviours <p>These changes represent:</p> <ul style="list-style-type: none"> • Longer term increases to levels of service • Investment programme to deliver these service improvements (frequency, integrated fares and ticketing, accessibility, renewals and decarbonising the fleet)

Conclusions

To support the vision we have for the Wellington region, this strategy defines the challenges we face, our approach and options for dealing with those challenges; and the implications of these actions while ensuring intergenerational equity.

The big challenges the region needs to respond include achieving carbon neutral 2030, improving our resilience and continuing to deliver our critical assets, while considering infrastructure affordability. As well as community wellbeing, Wellington being home to more people, structural and legislative reforms, and ensuring financial sustainability and equability.

Our principles shape how we plan and manage our assets consistently so it is future-oriented, adaptive, optimised and collaborative. Best practice asset management, by taking a lifecycle approach, helps navigate and provide certainty to the challenges faced. As such infrastructure provides community wellbeing, social prosperity and helps achieve our carbon neutral goals.