Te Tahua Taungahuru Te Mahere Taungahuru 2018-2028

The 10-year Budget

Long-term Plan 2018-2028

Volume 2: Our detailed budgets, strategies and policies
Part 1: Our key strategies
Chapter 1.3: Infrastructure Strategy

Auckland Council
Te Kaunihera o Tāmaki Makaurau

He Mihi

Tērā tō waka te hoea ake e koe i te moana o te Waitematā kia ū mai rā ki te ākau i Ōkahu.
Ki reira, ka mihi ake ai ki ngā maunga here kōrero,
ki ngā pari whakarongo tai,
ki ngā awa tuku kiri o ōna manawhenua, ōna mana ā-iwi taketake mai, tauiwi atu.
E koro mā, e kui mā i te wāhi ngaro, ko Tāmaki Makaurau tā koutou i whakarere iho ai, ki ngā reanga whakaheke, ki ngā uri whakatupu – ki tō iti, ki tō rahi.
Tāmaki – makau a te rau, murau a te tini, wenerau a te mano. Kāhore tō rite i te ao.
Tō ahureinga titi rawa ki ngā pūmanawa o mātou kua whakakāinga ki roto i a koe.
Kua noho mai koe hei toka herenga i ō mātou manako katoa.
Kua ūhia nei mātou e koe ki te korowai o tō atawhai, ki te āhuru o tō awhi, ki te kuku rawa o tō manawa.
He mea tūturu tonu whakairihia, hei tāhuhu mō te rangi e tū iho nei, hei whāriki mō te papa e takoto ake nei.
Kia kōpakina mātou e koe ki raro i te whakamarumaru o āu manaakitanga.
E te marae whakatutū puehu o te mano whāioio, e rokohanga nei i ngā muna, te huna tonu i ō whāruarua i ngā hua e taea te hauhake i ō māra kai, i ngā rawa e āhei te kekerihia i ō pūkoro. Te mihia nei koe e mātou.
Tāmaki Makaurau, ko koe me tō kotahi i te ao nei, nōku te māringanui kia mōhio ki a koe, kia miria e te kakara o te hau pūangi e kawe nei i ō rongo.
Ka whītiki nei au i taku hope ki ngā pepehā o onamata, ki ōku tūmanako mō āpōpō me ōku whakaritenga kua tutuki mō te rā nei.
Tāmaki Makaurau, tukuna tō wairua kia rere.

Let your canoe carry you across the waters of the Waitematā until you make landfall at Ōkahu.
There, to greet the mountains, repository of all that has been said of this place,
there to greet the cliffs that have heard the ebb and flow of the tides of time, and the rivers that cleansed the forebears of all who came,
those born of this land and the newcomers among us all.
To all who have passed into realms unseen, Auckland is the legacy you leave to those who follow,
your descendants – the least, yet, greatest part of you all.
Auckland – beloved of hundreds, famed among the multitude, envy of thousands. You are unique in the world.
Your beauty is infused in the hearts and minds of those of us who call you home.
You remain the rock upon which our dreams are built.
You have cloaked us in your care, taken us into the safety of your embrace, to the very soul of your existence.
It is only right that you are held in high esteem, the solid ground on which all can stand. You bestow your benevolence on us all.
The hive of industry you have become motivates many to delve the undiscovered secrets of your realm,
the fruits that can still be harvested from your food stores and the resources that lie fallow in your fields.
We thank you.
Auckland you stand alone in the world, it is my privilege to know you,
to be brushed by the gentle breeze that carries the fragrance of all that is you.
And so I gird myself with the promises of yesteryear, my hopes for tomorrow and my plans for today.

How this 10-year Budget 2018-2028 is arranged

Finding your way around the three volumes

Volume 1: An overview of our 10-year Budget

Part 1: Provides an introduction to our 10-year Budget including decisions made on the key issues which were consulted on. Our plan for the next 10 years includes a brief overview of the plans, strategies and budget that has been adopted by the Governing Body.

Part 2: Contains our prospective financial statements for 2018-2028 and other key financial information.

Part 3: Report from the Auditor General.

Part 4: Provides Supplementary information on how to contact the council, its structure and people. Glossary of terms and key word index.

Volume 2: Our detailed budgets, strategies and policies

Part 1: Our key strategies – including a Summary of The Auckland Plan 2050, discussion on Māori Identity and Wellbeing and Auckland's 30-year Infrastructure strategy and Financial strategy.

Part 2: Our Activities – key information on what services Auckland Council delivers, performance measures and budget.

Part 3: Our policies – Revenue and Financing policy, Funding impact statement (including the rating mechanism), Financial reporting and prudence benchmarks, Local board funding policy, Allocation of decision making responsibility for non-regulatory activities, Summary of Significance and Engagement policy and CCO Accountability policy.

Part 4: Summary of the Tūpuna Maunga Authority Operational Plan 2018/2019.

Part 5: Our Council-controlled organisations.

Part 6: Supplementary information – Glossary of terms and Key word index.

Volume 3: Local Board information and agreements

Part 1: Provides information on local boards, the development of local board plans and agreements and a summary of planned local board expenditure for 2018-2028.

Part 2: Contains specific information for each of the 21 local boards, including a local board agreement (outlining local activity initiatives and budgets for 2018/2019), and an introductory section that provides context for the agreement.

Part 3: Supplementary information – Glossary of terms and Key word index.

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Part 1: Our key strategies
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1.3 Auckland's 30-year Infrastructure Strategy

Section one: Introduction and Context

The services provided by well-functioning infrastructure networks underpin the success of Auckland as a place to live, visit and invest. Auckland needs infrastructure that can cope with increasing demand as the city grows, a changing environment and that meets community expectations for service delivery.

Infrastructure investments have long-term consequences for the future of Auckland. They will influence the form of our city and how well it functions for future generations. Auckland Council's expenditure on creating and maintaining infrastructure is of a magnitude that investment decisions are important for the ongoing financial well-being of Auckland Council and ratepayers.

This strategy takes a medium to long-term view of Auckland's Infrastructure, covering the period to 2048. The strategy explains:

- Auckland Council's infrastructure portfolio, role in providing infrastructure and the contribution this makes to our strategic outcomes
- The significant infrastructure challenges and opportunities facing Auckland over the next 30 years, and our responses to these
- The key infrastructure decisions
- An overview of the anticipated investment in infrastructure by Auckland Council to 2048.

Supporting assumptions used in development of this strategy are outlined in section five.

This strategy should be read in conjunction with the Financial Strategy, which sets out the current financial constraints of funding the anticipated investment in infrastructure and options for different funding mechanisms.

The strategy covers Auckland Council group assets required under section 101B of the Local Government Act 2002 and other assets with a high value and level of expenditure that make a high contribution towards achieving Auckland's strategic outcomes. Asset covered include:

- transport assets - public transport, roads and footpaths
- water assets - wastewater, water supply and stormwater, including flood control
- community assets - parks and community facilities.

Some of the infrastructure issues discussed in this strategy (such as housing outcomes and the development of the city centre and town centres) necessarily involve multiple categories of infrastructure. A key element of this strategy is the need to take a coordinated approach to infrastructure investment across the council group.

Table 1.1: Auckland Council's Infrastructure Portfolio
Auckland Council and its Council-Controlled Organisations have an extensive infrastructure portfolio, with the current value of assets across the infrastructure types covered by this strategy estimated to be $30 billion. This represents about two thirds of total group assets.

Transport $9.3 billion	• 7452km roads • 7137km footpaths • 41 rail stations • 21 wharves • 15 bus and busway stations • 10 multi-storey car park buildings • 818 pay by plate units
Stormwater $4 billion	• 6000km of stormwater pipes • 541 ponds and wetlands • 150,000 manholes
Water Supply $3.6 billion	• 12 dams • 13 bores and springs • 3 river sources • 15 water treatment plants • 91 reservoirs • 9096km water pipes
Wastewater $4.4 billion	• 7999km wastewater pipes • 515 wastewater pump stations • 18 wastewater treatment plants
Community Services $8.6 billion	• 32 regional parks • 3575 local parks • 190 sports parks • 54 cemeteries • 55 libraries • 191 community halls / centres • 42 recreational/aquatic facilities • 40 art facilities

Delivering Auckland's Infrastructure

Auckland's infrastructure directly supports how well the city and region functions. Decisions on infrastructure investments are important to achieving the outcomes identified in the overarching strategy for the region, the Auckland Plan 2050 (see figure 1.1), which was adopted in June 2018.

Auckland Council has a number of roles in the planning and delivery of infrastructure and is a major investor across a broad range of infrastructure types. It is a facilitator, working with other infrastructure providers to deliver affordable services to residents and businesses. It also has a regulatory role; designating, consenting, monitoring and developing new planning rules and policy for infrastructure.

Responsibilities for the infrastructure subject to this strategy are spread across the council group, including the Council-Controlled Organisations (CCOs) Auckland Transport and Watercare Services Limited.

While this strategy focuses on infrastructure for which Auckland Council is responsible, other public and private organisations play important roles in the delivery of infrastructure networks, depending on either the type or scale of infrastructure. Figure 1.2 illustrates responsibilities for infrastructure delivery in Auckland.

Figure 1.1: The Auckland Plan 2050

The Auckland Plan 2050 establishes outcomes, focus areas and direction for the long-term development of Auckland. The plan guides the actions of Auckland Council, including the CCOs, and provides direction to align decision making about growth and infrastructure investment between the public and private sectors.

The Auckland Plan 2050 identifies three long-term infrastructure challenges and opportunities:

- Coordinating investment and planning to enable growth
- Enhancing the performance of Auckland's infrastructure
- Creating resilient infrastructure networks.

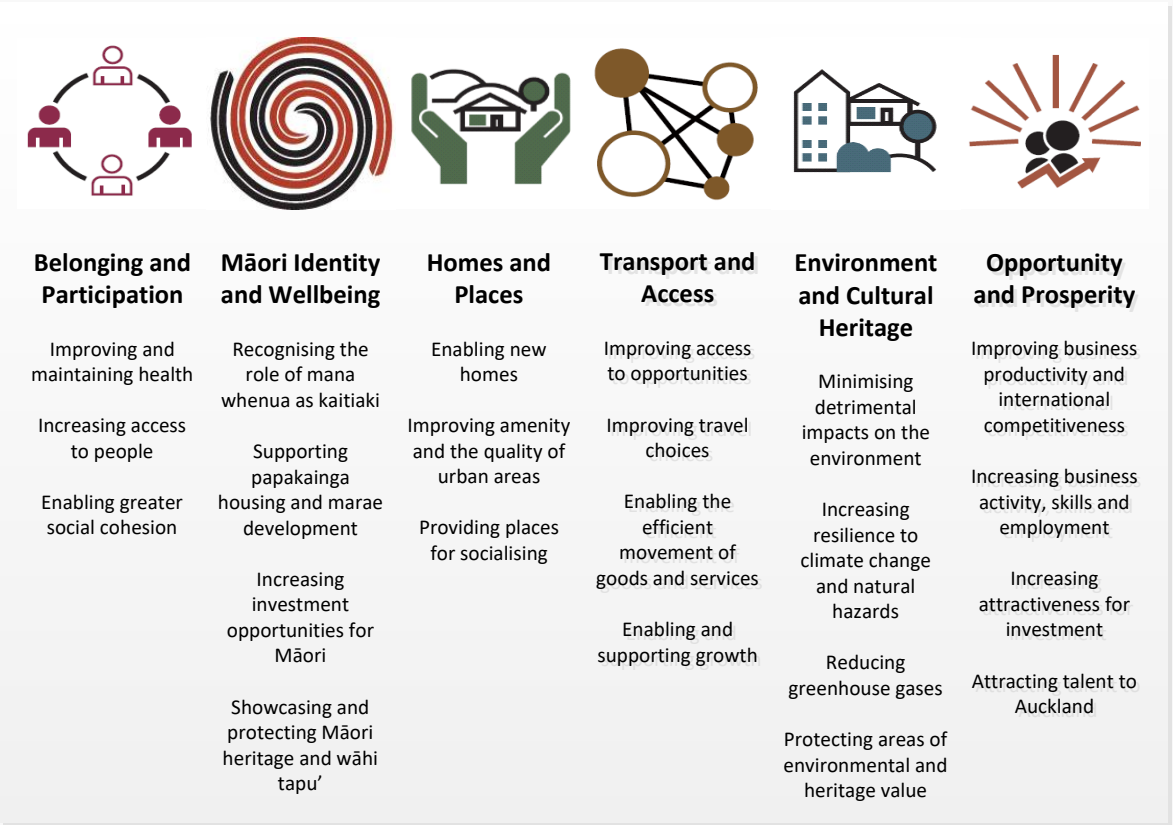
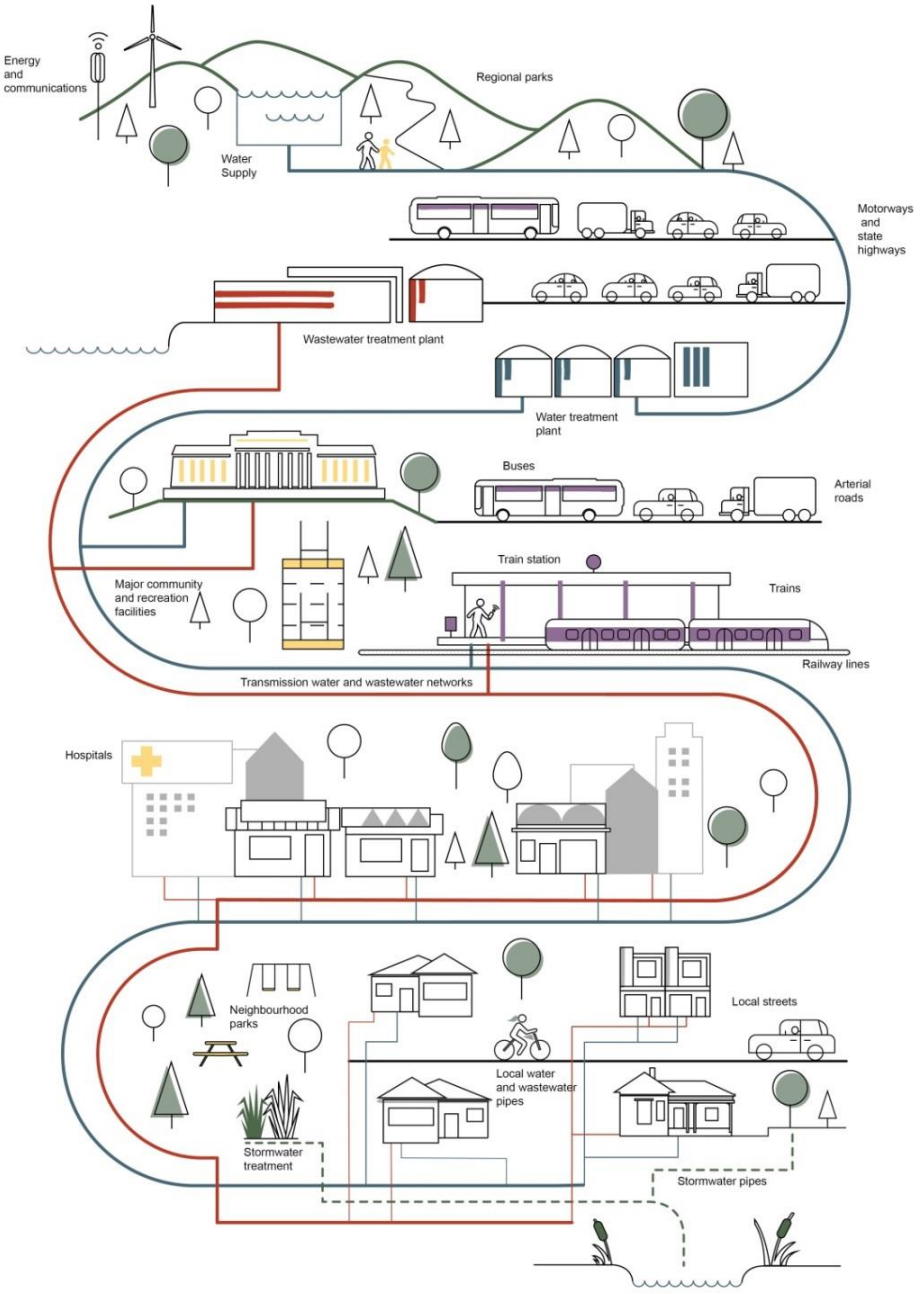


Figure 1.2: Delivering Auckland's Infrastructure

Delivering Auckland's infrastructure requires co-ordination across a number of public and private organisations depending on the type or scale of infrastructure. Typically:

- Government provides state highways, railway lines, and some social infrastructure such as schools and hospitals. It also subsidises other transport infrastructure.
- Auckland Council, including its council-controlled organisations, provides arterial roads, public transport systems, water supply, wastewater and stormwater networks and social infrastructure such as community facilities and parks.
- Developers initially construct local streets and pipe networks which are then vested with council to own and maintain.
- Energy and communications infrastructure is typically supplied by private utility companies.



Auckland over the next 30-years

Many infrastructure assets last for a long time and provide services for several decades. How Auckland grows and changes over the next 30-years and beyond will affect the performance of current infrastructure and future investment needs. Some of the changes expected to Auckland's people, environment and economy over this time that will influence infrastructure are discussed below.

People:

Auckland is a fast-growing city with a current population of 1.7 million. Over the next 30 years the city could grow by another 720,000 to reach 2.4 million. This means another 313,000 dwellings and 263,000 jobs for Auckland. The rate and speed of growth in Auckland puts pressure on infrastructure to cater for increased demand and enable the additional housing and business space needed to provide for a larger population.

Demographic changes will also affect the demand for, and the range of, services that need to be delivered by Auckland's infrastructure. Over the next 20 years, there will be increasing numbers of older people and they will make up a greater proportion of Auckland's population. Households are expected to decrease in size, from approximately 3 to 2.7 people per dwelling. The population is also expected to become more ethnically diverse, with Pacific and Asian people expected to make up a larger proportion of Auckland's population

Environment:

The latest State of the Environment (2015) report shows that while Auckland's air quality has improved significantly, marine and freshwater sites have been polluted by sediments and contaminants arising from development, building and industrial activities.

Auckland's population growth places increasing pressure on the environment. The development of 15,000 hectares of future urban land identified in the Unitary Plan could cause further degradation if not managed carefully. Increasing density in the existing urban area has the potential to exceed the capacity of existing infrastructure if investment does not keep up with growth.

Climate change is expected to have a variety of implications for Auckland's infrastructure networks. The most recent climate change projections indicate warming temperatures, less annual rainfall in the north but more in the south and stronger winds. More frequent and severe weather events are expected. The specifications of some infrastructure may no longer be adequate to deal with more rainfall, or a warmer climate. Sea-level rise will increase risks for assets on the coast from inundation and erosion.

Economy:

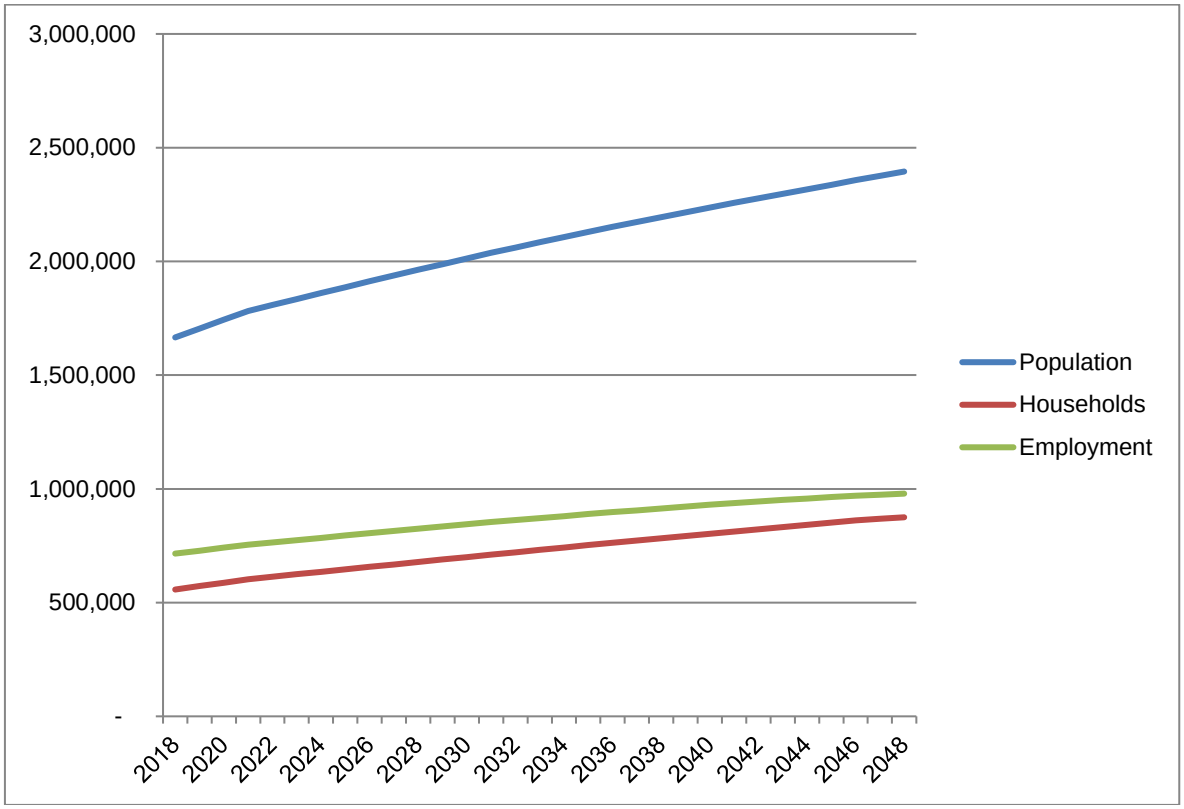
Auckland is New Zealand's main commercial centre, generating 38 per cent of New Zealand's Gross Domestic Product (GDP). The relative scale of Auckland compared with the rest of New Zealand is expected to continue to grow over the next 30 years. For example, Auckland's growth in the last two years is higher than the projected growth for Wellington over the next 30 years and 75 per cent of growth in the working age population (15 - 64 years) to 2043 will be in Auckland. The resilience and performance of Auckland's infrastructure is important for New Zealand's success, as more people and economic activity are concentrated in Auckland.

While employment is relatively dispersed across the region, further growth in the professional service sector is expected to concentrate employment in fewer, larger centres. This has implications for the transport network, as more people need to move to fewer locations during peak times.

Inter-regional connections between Auckland, Hamilton, Tauranga and Northland are important for economic and social success. Collectively, these areas are home to over half of New Zealand's population and generate more than half of the national gross domestic product. Auckland's ports also play a vital role connecting New Zealand to the rest of the world. Roughly 31 per cent of New Zealand's total trade passes through the Ports of Auckland and Auckland Airport accounts for 75 per cent of international arrivals and approximately 15 per cent

of foreign trade by value. Auckland's transport system needs to provide efficient access through the region and to the ports.

Chart 1.1: Auckland population, household and employment forecasts 2018 - 2048



Section two: Auckland's long-term infrastructure challenges, opportunities and responses

The population and economic growth anticipated in Auckland over the next 30 years, together with environmental pressures, present a number of infrastructure-related challenges and opportunities including:

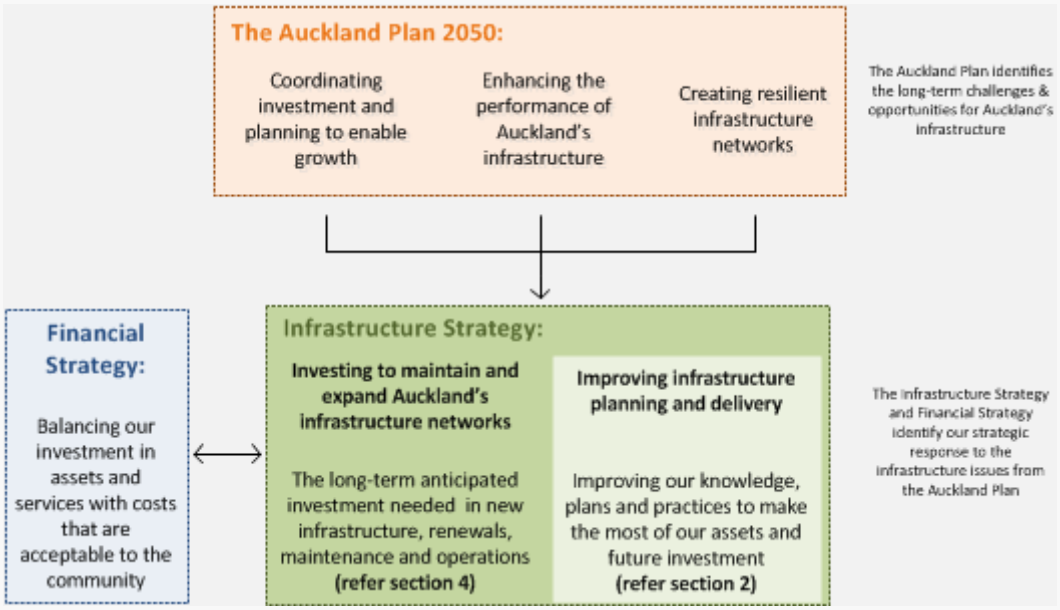
- coordinating investment and planning to enable growth
- enhancing the performance of Auckland's infrastructure
- creating resilient infrastructure networks.

There are two elements to Auckland's strategic response to these challenges and opportunities.

Significant investment is needed to maintain and expand infrastructure networks. Without an appropriate infrastructure investment response, there will be a significant reduction in council service levels in key areas such as transport, water quality and access to community services. Our proposed investment is outlined in the 30-year investment scenario (section 4) of this strategy. The current financial constraints of funding the anticipated investment and options for different funding mechanisms are outlined in the Financial Strategy, Section 1.4 of this document.

Auckland must also improve how infrastructure is planned and delivered to ensure future investments, and current assets, make the greatest possible contribution towards achieving the outcomes sought for the region, and deliver value for money.

Figure 2.1: Auckland's long-term infrastructure challenges, opportunities and strategic response:



This section of the strategy identifies key strategic responses, and examples of current initiatives, that are being progressed across the council group to improve how infrastructure is planned and delivered to address the long-term challenges and opportunities.

Coordinating investment and planning to enable growth

The next 30 years will require significant investment in infrastructure. Coordinated action between public and private infrastructure providers and the development sector is needed to enable the scale of development required to accommodate Auckland's growth. It is crucial that this investment is coordinated and aligned with growth, in order to minimise the opportunity costs of under-utilised assets, increase Auckland's productivity and achieve better environmental outcomes.

The National Policy Statement for Urban Development Capacity requires the provision of surplus capacity in infrastructure networks to accommodate fluctuations in the rate of growth and to meet housing and business needs over the short, medium and long-term. Ensuring that infrastructure networks have sufficient capacity to service growth is critical. This will require alignment between the expansion of bulk strategic water and transport networks, and investment in local infrastructure, particularly in areas where significant growth is planned to occur.

The scale of construction needed to cater for Auckland's growth also poses challenges to the operation of existing infrastructure networks. Aligning forward work programmes (i.e. 'dig once') allows for more efficient delivery and is less disruptive to existing communities. Construction impacts, such as additional heavy vehicle movements, may increase maintenance requirements for existing networks.

Strategic responses include:

- ***Providing clear direction on the future location and timing of expected growth and infrastructure provision,*** such as refreshing Auckland's long-term development strategy (see figure 2.2).
- ***Collaborating with central government on long-term infrastructure investment plans,*** such as the Auckland Transport Alignment Project.
- ***Improving co-ordination across the council group to respond to major development and infrastructure programmes,*** such as establishing the Development Programme Office.
- ***Aligning forward work programmes,*** such as developing an online portal to share information on planned projects and upcoming events to enable alignment between infrastructure providers.

Figure 2.2: The Auckland Plan 2050 Development Strategy

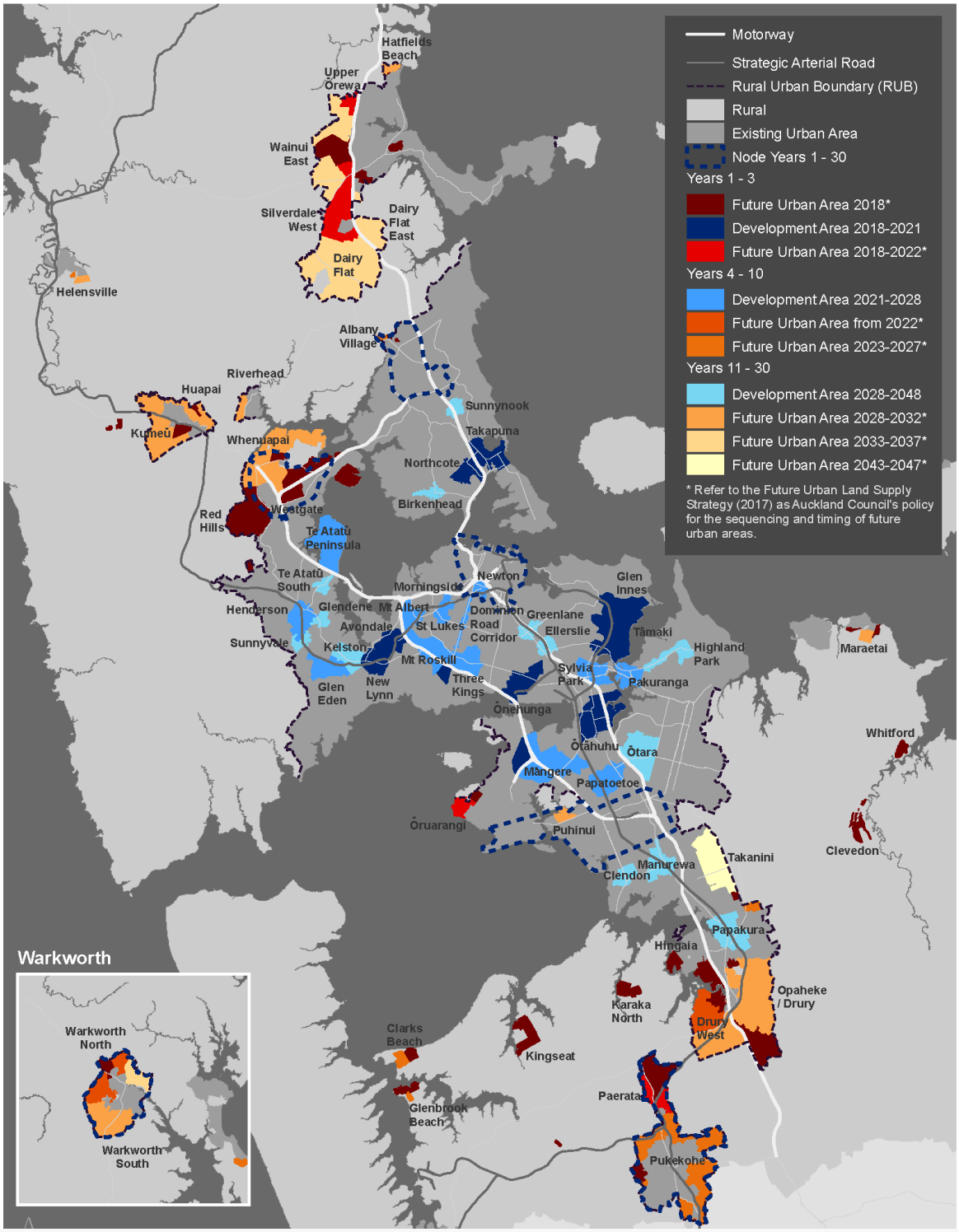
The Auckland Plan 2050 Development Strategy is a key tool for integrating growth and infrastructure over the next 30-years. The development strategy aligns the location and timing of investment across the council, CCOs, central government and the private sector by identifying:

Strategic Infrastructure Networks (refer figures in section 4)
Strategic networks influence where and when significant urban growth can occur. They provide bulk services in public transport, roads, water, and wastewater. Projects to expand strategic networks often require substantial public investment and have long lead-in times.

Future Urban Areas (refer figure 2.2)
Future urban areas are presently rural areas that will be urbanised in the future. They are currently not serviced with infrastructure needed to support urban development. Investment is required in bulk infrastructure to service these areas before they can develop, and then local infrastructure is required as they grow.

Nodes and Development Areas (refer figure 2.2)
Nodes and development areas are locations with the existing urban areas that are expected to grow significantly. Investment is required to ensure local infrastructure networks in these areas have capacity to keep up with growth.

Figure 2.2: The Auckland Plan 2050 Development Strategy



Enhancing the performance of Auckland's infrastructure

Even without the pressure of anticipated changes in Auckland's population over the next 30-years, Auckland's current infrastructure assets require maintenance, renewal and replacement. Regional disparities in service provision, resulting from historical underinvestment, need to be addressed.

Dealing with ageing and obsolete infrastructure

Some of Auckland's infrastructure is getting old and will need replacing. The investment in renewing ageing infrastructure is expected to significantly increase in the next three decades. For example, pipe networks established during Auckland's post-war urban expansion between the 1940s and 1960s are expected to require renewal from the 2020s onwards.

In addition, some infrastructure systems are becoming obsolete, do not meet modern standards or changing community needs. For example, the combined sewer and stormwater system in parts of the isthmus is prone to overflows, which have negative social and environmental impacts. Many older community buildings require investment to address hazards such as asbestos or seismic risk, and to ensure they are fit-for-purpose for changing community needs. Replacing ageing infrastructure presents opportunities to improve the environmental performance and resilience of networks, while increasing the capacity to provide for growth.

Differences in service provision and standards

Disparities in performance across different parts of Auckland need to be addressed. For example the transport network provides comparatively poor access to employment opportunities from south and west Auckland. Planned investment in strategic infrastructure networks, such as the construction of the City Rail Link, will help to address these issues as it will decrease travel time, particularly from the western urban area.

When Auckland Council was established it inherited an infrastructure portfolio built by predecessor local authorities with different policies, specifications and business practices. While the design and specification of assets and the levels of service provided need to be appropriate for different locations and communities, clear requirements for the provision and specification of infrastructure are essential to provide certainty for developers, and enable efficiencies in asset design, construction and maintenance over the entire asset lifecycle.

Demand management and emerging technologies

Demand management and emerging technologies will improve the performance of existing infrastructure networks and defer the need for some future investments. The ability to collect and analyse data on a large scale will improve understanding of how individuals and households use infrastructure systems and will allow for more targeted investment. For example, advancements in transport technology such as autonomous vehicles and real-time road user pricing, are expected to increase the capacity of existing roads and improve environmental outcomes. Demand management techniques, such as user pays for water and wastewater services, incentivise the efficient use of infrastructure.

Strategic responses include:

- ***Standardising requirements for the provision and design of infrastructure***, by updating policies and technical guidelines such as the Subdivision Code of Practice and the Auckland Design Manual.
- ***Using new technology to make better use of existing infrastructure,*** such as trialing smart water meters and investigating smarter transport pricing.
- ***Improving asset information and analysis*****,** such as developing the Smart Growth Portal to improve understanding of asset condition and capacity to inform development planning.

Creating resilient infrastructure networks

Auckland's infrastructure needs to be resilient and able to cope with disruptive events (such as natural disasters) and on-going stresses (such as climate change). It needs to be able to respond to the evolving needs of Aucklanders, as well as the possibility of human error.

Understanding the consequences and likelihood of failure, and also the changing demands on our infrastructure systems, allows us to better manage risks to these networks.

Failure of Auckland's critical infrastructure networks poses significant risks. These assets are prioritised in investment programmes and in emergency contingency planning, as they are essential for Auckland to function (see figure 2.3). For example, the planned investment in water infrastructure allows Watercare to continue to manage Auckland's water supply in full compliance with the six fundamental principles of drinking water safety for NZ identified by Havelock North Drinking Water Inquiry.

Auckland's infrastructure systems also need to be resilient to evolving trends. Improving resilience is a driver for investment in infrastructure networks, as well as guiding policies, regulations and specifications.

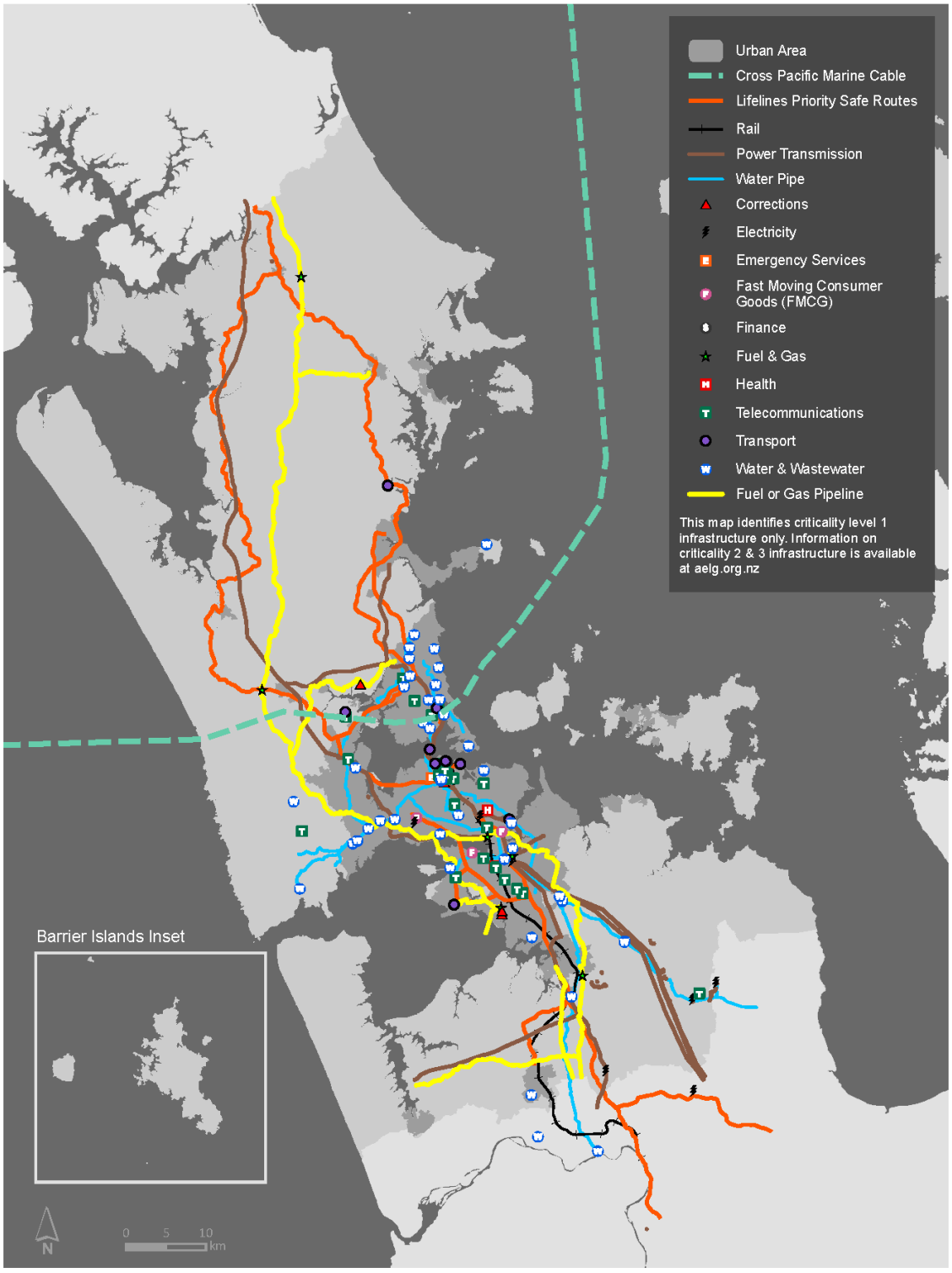
There is inherent uncertainty about the type, timing and impacts of change. It is important to consider how resilient planned investments are to emerging changes, as well as the possible impact on the operation of current networks. Ensuring our investments deliver multiple benefits, such as providing for growth while also enhancing the environment, health and improving resilience is essential. For example, using green infrastructure that achieves water management outcomes, while also enhancing biodiversity, recreation and urban amenity.

Strategic responses include:

- ***Increasing knowledge of risks to infrastructure networks,*** such as developing a Natural Hazards Risk Management Action Plan and undertaking new research on the impact of climate change on Auckland.
- ***Avoiding development in land subject to hazards,*** such as flooding, ground instability and coastal inundation, *by updating policies and regulations* such as the Auckland Unitary Plan.
- ***Improving understanding of the dependencies, implications and responses to failure of infrastructure networks*****,** particularly working with other critical infrastructure providers through the Auckland Lifelines Group.
- ***Adopting resilient design principles*****,** such as applying Water Sensitive Design principles to development of the stormwater network, or ensuring new community buildings are multi-functional and can provide for a diverse range of uses.

Figure 2.3: Auckland's critical infrastructure

Note: Not all critical infrastructure identified is owned or managed by Auckland Council



Section three: Key decisions

Addressing Auckland's long-term infrastructure needs

Auckland Council undertakes strategic long-term planning with key stakeholders, including central government and the community to understand the demand for infrastructure over the next 30-years.

Given that significant progress has been made on defining and agreeing the long-term infrastructure demand, the most important decision currently facing Auckland is balancing the timing of when we invest in that infrastructure with the need to keep Auckland an affordable place to live, work and do business.

The projects proposed in Auckland's strategic plans exceed the short – medium term funding available for the first decade (2018-2028) due to:

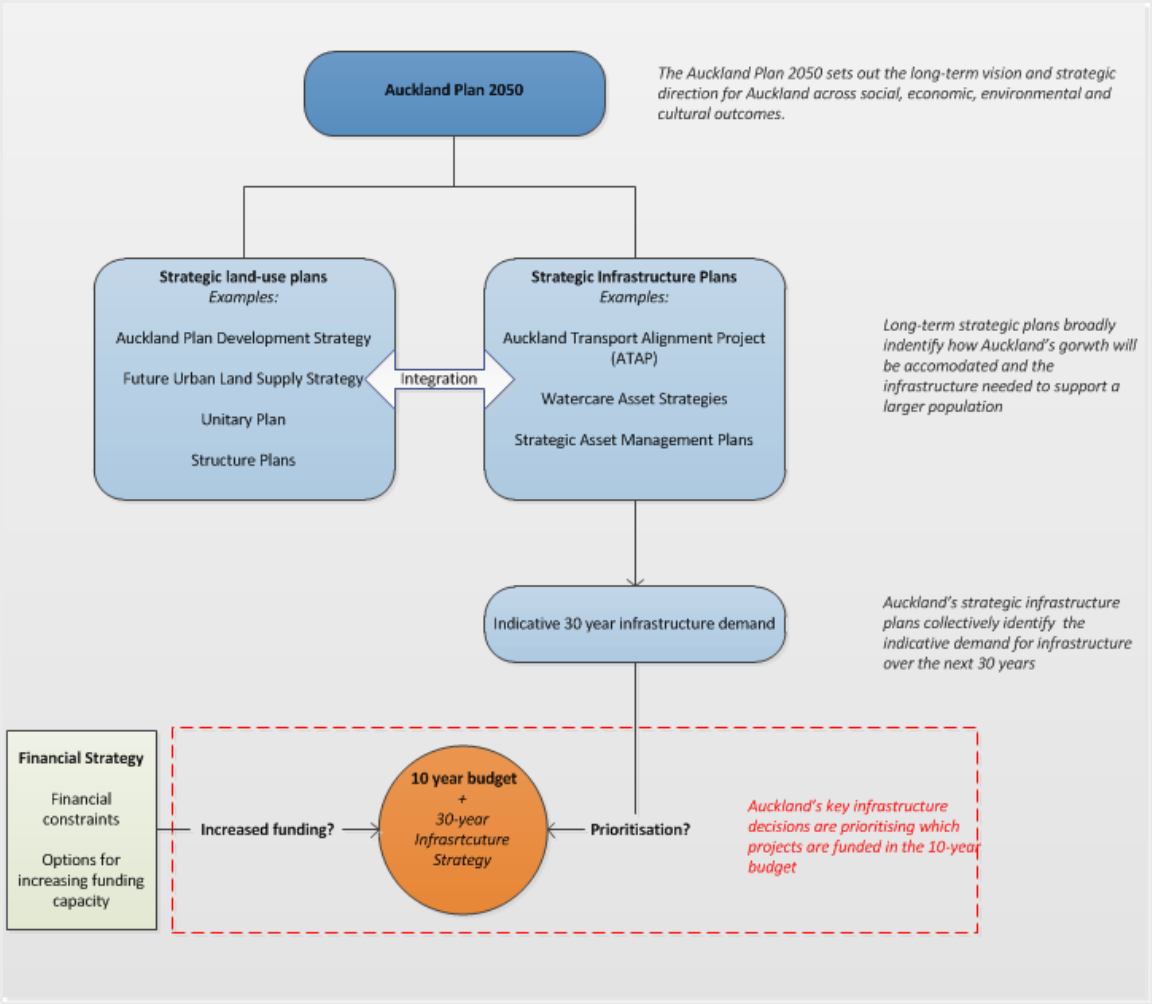
- rapid growth
- increasing expectations and service levels
- addressing deficits and equity issues in current provision
- financial constraints.

Given these conditions are expected to continue for the foreseeable future, there will be an ongoing need to prioritise the infrastructure requirements identified in strategic plans with available funding capacity over the next 30-years. The Financial Strategy sets out the options for funding, prioritisation and the need to balance the investment in infrastructure identified in strategic plans with costs that are acceptable to the community.

This section outlines the key decisions that need to be made to balance infrastructure requirements with affordability.

Figure 3.1 shows how our long-term strategic planning identifies demand for infrastructure over 30 years. The key decision is balancing, through the 10-year budget process, the demand for investment in infrastructure against our current funding capacity.

Figure 3.1: Auckland's key infrastructure decisions:



Project level decision-making

The major individual infrastructure programmes and projects identified by Auckland's long-term infrastructure and land use plans are outlined in section 4 of this strategy along with details of the approximate cost, timing and location of these projects. The timing of the programmes and projects identified reflect a baseline scenario under current financial settings.

Decisions on major infrastructure projects are made at a number of stages, such as when strategic plans, budgets and business cases are adopted, or contracts awarded. The information in section 4 indicates the decade in which infrastructure is expected to be needed, and approximate timeframe for when investment decisions will be confirmed. Strategic infrastructure plans are regularly reviewed in response to changes in the rate and location of growth and other factors.

Due to the strategic outlook of these plans, options for projects in the long-term (years11-30) are considered at a general level. Projects are subsequently refined, alternatives considered and the need confirmed closer to when demand for the infrastructure is expected to occur. Options expected to be considered include:

- the delivery mechanism
- the staging and timing of implementation
- the technical solution, including:
  - approximate route or location
  - possible construction methodology
  - capacity required.

Many projects in the 10-year budget are already committed, such as the City Rail Link, Central Interceptor and a number of park acquisitions. Additionally, the need to maintain and renew existing assets is generally prioritised before funding new capital projects. This means that without additional funding streams, there is often relatively limited 'discretionary' funding available for new capital investments within each 10-year budget.

Key infrastructure decisions

Taking into account all of the above, seven key infrastructure investment decisions were considered for the 10-year budget 2018-2028. These address the most immediate aspects of the long-term infrastructure challenges and opportunities. The key infrastructure investment decisions were:

Table 3.1: Key infrastructure investment decisions for the 10-year budget 2018-2028

Key decision area	Co-ordinating investment and planning to enable growth	Enhancing the performance of Auckland's infrastructure	Creating resilient infrastructure networks
Transport Choices	X	X	X
Water quality improvement programme		X	
Coastal management and response to climate change			X
Renewal of community facilities		X	
Community assets to support growth and development	X		
City Centre investment timing and 2021 events	X		
Progressing urban development	X		

The follow section outlines each key infrastructure decision and the final decision that is included in the 2018 10-year budget and 30-year investment scenario (section 4). As required by legislation the following section also sets out the other principal options that we considered.

As a result of feedback from consultation, and further development of options while finalising the 10-year budget, some options have been refined and vary from those included in the draft Infrastructure Strategy and consultation budget.

Transport Choices

Without an appropriate infrastructure investment response, there will be a significant reduction in transport service levels. For example:

- 25 per cent of Auckland's arterial roading network is now congested in the morning peak compared to 18 per cent three years ago.
- Congestion outside peak times and on weekends is also becoming more frequent with over 10 per cent of the network now experiencing inter-peak congestion.
- Auckland has also seen a near-doubling in road deaths and serious injuries over the past five years.

ATAP set out a $28 billion investment package (local and central government combined) that seeks to balance transformational change while addressing the critical transport challenges that Auckland currently faces. The key outcomes expected from the ATAP package include:

- Supporting substantial growth in rapid transit corridors, to enhance capacity and the potential for housing growth.
- Initial support to enable greenfield development where around 30 per cent of Auckland's growth is expected to occur.
- Support for an increase in public transport and cycling mode share, with flow on benefits for health, safety, the environment and congestion.
- Improved access as a result of more congestion free alternatives for travel and changes in land use enabled by rapid transit investment.
- A 60 per cent reduction in deaths and serious injuries on Auckland's transport network, from 813 in 2017 to no more than 325 by 2027.
- Improved environmental outcomes through the provision of lower carbon alternatives for travel and by encouraging less single-occupant travel.

As part of the overall ATAP package, the council is planning $12 billion of capital investment over the next 10 years (representing the combined programmes of Auckland Transport, City Rail Link Limited and Crown Infrastructure Partners). This investment will help progress key ATAP outcomes as follows:

- Increasing total public transport boardings from 88.4 million in 2016/2017 to 149.7 million by 2027/2028
- Improving the productivity of key arterial roads in the morning peak by 14 per cent by 2028, which when combined with increased public transport usage and provision for walking and cycling will support the ATAP outcome of maintaining congestion at 2016 levels
- Reducing deaths and serious injuries on local roads by 60 per cent compared to 690 in the year to December 2017, which when combined with safety improvements for state highways and walking and cycling will support the ATAP objective of reducing deaths and serious injuries on the total Auckland network by 60 per cent

This investment will also ensure that we look after our existing assets and ensure that at least 80 per cent of our urban roads meet maintenance standards in terms of ride quality.

Key decision: The level of investment in transport infrastructure and funding mechanism	
Final decision for this 10-year Budget	Option B, $12 billion of capital investment in transport over 10-years supported by a regional fuel tax
Option A: Rely on existing funding tools	A $9 billion capex investment package in transport over 10 years. This level of investment will primarily deliver renewals and committed projects, including: • committed projects such as City Rail Link and electric trains • renewals and ongoing operational requirements • minor safety improvements • Some high priority projects, e.g. Eastern Busway Committed projects, such as the City Rail Link and Eastern Busway, will improve access to the City Centre and public transport services from the east. Some support is available to enable new greenfield growth areas in the North and South. Additional safety projects, new investment in public transport infrastructure, walking and cycling, optimisation and technology, and road capacity are unable to be funded at this level of investment. The current challenges of escalating congestion, rising deaths and serious injuries on the roading network, negative environmental impacts from transport and supporting housing growth will not be addressed.
Option B: Implement the ATAP package, enabled by a regional fuel tax	A $12 billion capex investment package in transport over 10 years enabled by a regional fuel tax of 10 cents per litre plus GST. This level of investment enables implementation of the April 2018 ATAP package. Projects in the overall programme, partly funded by the regional fuel tax, include: • Bus priority improvements • City Centre bus infrastructure • Improving Airport access • Eastern Busway (formerly AMETI) • Park and Rides • Electric trains and stabling • Downtown ferry redevelopment • Road safety • Active transport • Penlink • Mill Road corridor • Road corridor improvements • Network capacity and performance improvements • Growth related transport infrastructure This option is expected to achieve the key outcomes of the ATAP package, such as supporting growth in transit corridors and greenfield development areas, increasing public transport and cycling mode share, improving access by providing congestion free alternatives for travel, reducing deaths and serious injuries and improving environmental outcomes.
Option C: Entire Auckland Transport capital programme identified in the Regional Land Transport Plan	If additional funding is available the delivery of lower priority projects could be advanced. Examples of projects currently not funded in the Regional Land Transport Plan include: • New bus station at Grand Drive (Orewa) • Level crossing safety improvements and grade separation • Some ferry terminal upgrades and other ferry improvements • Enhanced park and ride programme • Some supporting growth infrastructure in the North, North-west and South This option would cost substantially more the $12 billion programme in option B. It would be challenging for council and central government to finance and for the construction sector to deliver within the first decade. Projects would likely be delivered over a longer period.

Water quality improvement programme

Auckland has a significant issue of pollution of its waterways across the region. There are areas of Auckland's beaches, harbours, streams and aquifers that are significantly affected by poor water quality. Many waterways and beaches are unsafe for swimming after storm events, and some beaches are permanently closed to swimming. This is a result of pollution from a number of sources including:

- wastewater overflows from the combined sewer network when stormwater overwhelms the system capacity
- pollution from road run-off
- sedimentation from urban and rural land use
- old or poorly maintained onsite wastewater systems (septic tanks etc.)
- impacts from farming such as livestock in streams and fertiliser runoff.

The Water Quality Improvements Programme of work has been developed to address these issues. The key projects and outcomes are as follows:

- stormwater upgrades and wastewater/stormwater separation in the Western Isthmus
  - reduces overflows into the Waitematā and Manukau harbours
  - beaches from Meola Reef to the Viaduct will be swimmable
  - reduction in intermittent beach closures
  - rehabilitation of Western Isthmus streams
  - reduces demand on the waste water network from stormwater, allowing greater housing intensification in the Western Isthmus catchments.
- infrastructure for stormwater contaminant removal across the region
  - reduction of sediment into the Kaipara Harbour
  - reduction in stormwater contaminants across the region.
- rehabilitation of urban and rural streams
  - improves the ecological health of the streams and reduces flow of contaminants into harbours
  - enables urban development in areas such as Oamaru creek in East Tamaki
  - stabilises areas of high stream erosion, reducing sedimentation in the harbours and protecting property and infrastructure.
- introduction of a proactive regional septic tank monitoring programme
  - develop a regional database of onsite systems, their design parameters and maintenance records
  - first step in identifying the individual properties contributing to the degradation of beaches and waterways, such as at Piha, Bethells Beach, and Little Oneroa on Waiheke
  - develop a warrant of fitness style scheme to ensure the systems perform.

Key decision: Introduction of a targeted rate to accelerate the implementation of the Water Quality Improvement Programme	
Final decision for this 10-year Budget	Option B, delivery of programme by 2028.
Option A: Status quo funding Delivery of Programme by 2048	Costs in line with current budgets and deliverable with current funding sources, continues with existing works included in the Asset Management Plans of Watercare and Healthy Waters. The benefits of the Water Quality Improvement Programme would be realised over a 30-year timeframe. Includes Central Interceptor project and some stormwater upgrades. Reduces the number of locations in the Western Isthmus that experience wastewater overflows every time it rains from 43 points to 31 points by 2028. The number of overflow points in the Western Isthmus that spill more than twice a year reduces from 218 to 214 by 2028.
Option B: Delivery of programme by 2028	Accelerate the delivery of the Water Quality Improvement Programme, realising the benefits over a 10-year timeframe. The programme includes: • leveraging the investment in Central Interceptor by bringing forward investment in the Western Isthmus from outer years of Asset Management Plans to achieve improved water quality outcomes within ten years • infrastructure for stormwater contaminant removal across the region • rehabilitation of urban and rural streams • introduction of regional septic tank monitoring. By 2028 overflow points on the Western Isthmus is expected to be reduced to 10 locations that are anticipated to overflow 2-6 times per year on average. Reduced faecal contamination of waterways from onsite wastewater systems in high risk areas. Reduced sediment runoff in to the Kaipara Harbour. Additional funding requirement of $856 million between 2019 and 2028.

Coastal management and response to climate change

Auckland Council owns and manages approximately $350 million of coastal protection, access and amenity related assets over Auckland's 3,200km of coastline. These form part of the roading and community asset categories described elsewhere in this strategy depending on the specific function of the each asset. We consider them as a related group here because they face a common issue.

Historic underinvestment in these assets has primarily addressed reactive works only and resulted in an asset base that is in relatively poor condition with insufficient funding available to renew all damaged assets for the next 10-years. The predicted impacts of climate change, coupled with failing assets, has led to community groups requesting improved coastal protection, with calls to better manage our coastal assets.

An Auckland Council Coastal Management Framework was developed to help the council better manage its coastal assets, and to better mitigate the risks associated with coastal erosion and the combined effects of predicted climate change. This framework will enable the council to move from the current default position of reactionary 'like-for-like' renewals to a prioritised work programme that is based on improved asset management planning underpinned by business cases leading to improved asset investment.

Consultation on the proposed budget options for coastal assets led to a wider discussion about funding responses to climate change, which is leading to increasing numbers of extreme weather events, causing storm damage and landslips. There is a need to respond quickly to infrastructure damage that arise from frequent storms, and fund urgent or emergency works. Funding is also needed to proactively address areas at risk of landslips.

Key decision: The level of funding for renewal and management of coastal assets and responding to climate change	
Final decision for this 10-year Budget	Option B, strategic approach
Option A: Reactive investment when assets fail. (status quo)	Coastal assets are replaced when perceived to be in poor condition, within limited budget.. Maintenance expenditure continues at previous levels. There is no asset management plan driving the forward work programme and implementation is based on local budgets, making large projects difficult to plan and fund. Assets are replaced on or after failure until funding is exhausted, with approximately six per cent of assets renewed in next 10-years. Maintenance budgets will not be sufficient to address or resolve deterioration issues. This option is expected to reduce service levels from coastal protection, access and amenity assets over time due to deterioration and the combined effects of coastal erosion and predicted climate change. Increases the risk of disruption to services.
Option B: Strategic approach.	Introduces a delivery model where asset replacement is based on prioritised need for protection and development of new assets. This requires initial investment to develop coastal compartment management plans that include public engagement, which will then inform a region wide coastal asset management plan (AMP). The operational funding required for the development of compartment management plans and a coastal asset management plan is $1 million over the first two years of the 10-year budget. Approximately $200,000 operational budget will be required annually between 2021 and 2028. The AMP will more accurately inform future funding requirements. As an interim measure, the increased capital investment required is estimated to be $11 million over the first three years of the budget (in addition to the $19 million of funding in the status quo option), and an additional $79 million between 2021 and 2028.

Key decision: The level of funding for renewal and management of coastal assets and responding to climate change

	In addition to funding for management of coastal assets, the climate change response fund will establish new funding for the management of non-coastal assets, such as land slips on council land. The fund consists of: • a pro-active capex budget of $2 million per annum • a $20 million reactive fund that will be rolled over annually until the fund is exhausted. This option provides a higher level of service than option A and mitigates some risks of disruption to services.
Option C: Replace assets when assessed to be in poor condition, and new works.	Involves replacing assets when they are assessed to be in poor condition, infrequent new works, and construction of the Orewa seawall during the first two years of the 10-year budget. Current demand for renewals and larger scale interventions is assumed to continue. Without the benefit of a coastal asset management plan, it is accepted that capital expenditure would be more ad-hoc and therefore potentially higher. Total capex has been estimated at $150 - $200 million between 2019 and 2028. The assessment of future demand for capital investment assumes that up to 35-40 per cent of assets could require replacement and additional work in the next 10 years without prioritisation in place. This option is less likely to deliver long term sustainable solutions than option B.

Renewal of community facilities

Auckland's portfolio of community facilities is aging and faces a range of challenges such as weathertightness, asbestos and seismic strength issues. The financial impacts of asbestos, seismic and weathertightness are still being quantified based on the outcome of the asset condition reviews across the portfolio.

Due to demographic and social changes in the community, many of our facilities are no longer fit for purpose or reflective of community needs. Services and assets need to respond to pervasive technology and changing demand patterns.

Key decision: The level of funding for renewal of community assets (parks, recreation and community facilities)	
Final decision for this 10-year Budget	Option A, baseline
Option A: Baseline	Funding of $961 million has been allocated to renewals for 2019-2028. Primarily funds renewal of critical assets, resulting in increasing reactive maintenance and operational costs. Will require renewal expenditure to be carefully prioritised to ensure maximum value for money taking into account asset condition, community needs and asset utilisation. There is a risk of decreased levels of service over the longer term as assets are only renewed when critical, resulting in deteriorating assets which increases the risk of failure and asset closure. Mitigation of this risk requires a focus on creating a fit for service portfolio through trade-offs between ageing facilities, disposal of assets and investigation of optimisation opportunities to mitigate impacts on service levels. This may mean some facilities that are not well utilised (or not meeting current community needs) are not replaced, and instead investment is focused on new facilities that are more fit for purpose. This represents an increase from the 2015-2025 LTP of $200 million.
Option B: Significant increase above baseline	Significant increase of $759 million above baseline over 10-years. Fully funds the renewal of appropriate assets keeping the portfolio in a good condition but will require more resources to deliver. Minimal trade-offs with continued optimisation options to ensure assets are fit for purpose. Funding requirement of $1.72 billion between 2019 and 2028.

Community assets (parks, recreation and community facilities) to support growth and development

Auckland's forecasted growth is expected to increase demand for community assets (parks, recreation and community facilities) including:

- the provision of parks and recreation networks in future urban areas
- increased use of parks and recreation facilities in the existing urban area due to intensification
- re-development of existing and provision of new multi-purpose facilities to support rapidly growing and diverse communities
- additional provision of land for cemeteries (including development)

Key decision: The level and focus of investment in providing for growth and diversity in community assets (parks, recreation and community facilities)	
Final decision for this 10-year Budget	Option B, moderate increase above baseline
Option A: Baseline	Minimal provision of new community assets (parks, recreation and community facilities) to provide for growth and diversification. Results in a lower level of provision than identified in the council's adopted policy. This option includes: • committed projects • cemetery land acquisition and development • park acquisition and associated infrastructure development limited to key priority areas only • new community facilities in Takanini , Westgate and Flat Bush • new pool and leisure centre in Flat Bush Requires optimisation of existing assets and improved service delivery to maintain the existing level of service. Funding requirement of $1.5 billion between 2019 and 2028.
Option B: Moderate increase	Limited provision of new community assets (parks, recreation and community facilities) to provide for growth and diversification. Results in a lower level of provision than identified in the council's adopted policy. In addition to Option A this option includes: • open space acquisition and associated infrastructure development limited to priority greenfield and brownfield areas, including an additional $200 million above the baseline option • new community facility in Avondale • new pool and recreation facility in Avondale/New Lynn by 2028 • investigation and business case for a new pool in the north west, with delivery in the second decade • establishment of a Sport and Recreation Facilities Investment Fund with additional capital expenditure of $100 million to create a total fund of $120 million. The objective of the fund is to allow the council to deliver on the Sports Facilities Investment Policy (under development) and provide value for money by leveraging external investment

Key decision: The level and focus of investment in providing for growth and diversity in community assets (parks, recreation and community facilities)	
	• additional funding of $170 million to support delivery of the community related One Local Initiative Programme (excludes sub-regional projects) Total funding requirement of $2.1 billion between 2019 and 2028 This option will require optimisation of existing assets and improved service delivery to maintain the existing level of service.
Option C: Substantial increase	Moderate additional provision of community assets (parks, recreation and community facilities) to provide for growth and diversification. Achieves a lower level of provision than identified in the council's adopted policy. In addition to option B this option includes: • acquisition of new parks and associated infrastructure in line council policy, and limited additional park development • some further provision of community facilities in key priority areas Optimisation, improved access and capacity within the network will primarily meet growth requirements and maintain existing service levels. Total funding requirement of $2.41 billion between 2019 and 2028.

City centre investment timing and 2021 events

Auckland's city centre is an increasingly important 'economic engine' for both the region and the whole of New Zealand, and has experienced growth significantly above forecasts over the last five years. Auckland is likely to be the host city for two key and high profile events in 2021, namely the America's Cup (AC36) and APEC, which have the potential to provide significant economic and legacy benefits for Auckland and New Zealand.

The City Centre Masterplan (CCMP) presents a 20-year vision that sets the direction for Auckland's city centre as its cultural, civic, retail and economic heart. It presents a vision of a city centre that is more family, pedestrian and environmentally friendly. The City Centre Masterplan identifies numerous projects to implement the vision, requiring investment in stormwater, transport and community services infrastructure.

The city centre investments encompass four integrated programmes of works, including:

- America's Cup 36 Infrastructure – delivers infrastructure for the America's Cup event as well as a legacy for the city centre. The total forecasted cost of this programme is $123 million, of which $66 million is funded by central government.
- Downtown – Delivers a connected and accessible waterfront, prepares for growth of cruise and ferry services and supports activation of Queens Wharf. This programme aligns with the America's Cup event in 2021. Total forecasted cost of this programme is $430 million.
- Midtown and Uptown – delivers improved pedestrian and public spaces around key transport hubs. The programme is aligned with, and leverages off, development opportunities from the City Rail Link, bus infrastructure, and the New Zealand International Conference Centre. Total forecasted cost of this programme is $430 million (including $95 million for stage 2 and 3 of the Victoria Linear Park and Wellesley Street streetscape and amenity upgrade)
- Wynyard Quarter and Westhaven – progresses planning and engagement for Wynyard Point, builds on the success of the waterfront's regeneration and continues to deliver an accessible and sustainable waterfront. Total forecasted cost of this programme is $144 million.

Key decision: The timing of implementation of the City Centre Masterplan	
Final decision for this 10-year Budget	Option B, fund complete downtown programme
Option A: Baseline $911 million	At the baseline level of funding the downtown programme is unable to be completed in time for the America's Cup and APEC events in 2021. As a result, the full economic and legacy benefits of these events will not be realised, such as making the downtown more family, pedestrian and environmentally friendly. Delivery of the entire downtown programme is at risk due to the interrelationship between projects in this area. Stages 2 and 3 The Victoria Linear Park and Wellesley Street streetscape and amenity upgrade will not be able to be delivered in the midtown programme. The opportunity to leverage benefits from substantial transport investments in the midtown area, such as the City Rail Link and the Wellesley Street Bus Corridor project, will be reduced. The America's Cup 36 Infrastructure programme and the Wynyard Quarter and Westhaven programmes are fully funded.
Option B: Fund complete downtown programme $966 million	Option B enables the downtown programme to be fully completed in time for the America's Cup and APEC events in 2021. The America's Cup 36 infrastructure programme and the Wynyard Quarter and Westhaven programmes are fully funded.

Key decision: The timing of implementation of the City Centre Masterplan	
	This is expected to deliver the following benefits: • Align the city centre's development with the America's Cup 36 and APEC events in 2021. • Leverage off opportunities from the City Rail Link, bus infrastructure and other transport infrastructure developments, to minimise disruption and maximise efficiency • Alignment of council family investments, public and private developments to achieve a holistic outcome • Supporting growth – continue to improve access into the city and create high quality public spaces for people to live, work and play Stages 2 and 3 of the Victoria Linear Park and Wellesley Street streetscape and amenity upgrade would not be delivered in the midtown programme in the first decade. The opportunity to leverage benefits from substantial transport investments in the midtown area, such as the City Rail Link and the Wellesley Street Bus Corridor project, would be reduced. Additional funding sources such as further development contributions, targeted rates and private sector investment could be implemented to fully deliver the midtown and uptown programme once the costs and timings of these projects are confirmed.
Option C: Fund all programmes $1,061 million	Option C fully funds all programmes, including midtown and uptown. This option provides a greater degree of certainty of funding and delivering the uptown and midtown programme timed with completion of the City Rail Link and Wellesley Street Bus Corridor Project.

Progressing urban development

A number of town centres have been identified as priorities for regeneration through Panuku Development Auckland. These town centres are known as Transform, Unlock and Support locations. Urban regeneration of existing town centres across Auckland contributes to the delivery of the Auckland Plan and the following priorities:

- leverages the investment in the transport network (existing and planned), in particular public and active transport
- facilitates housing through intensified development to help ease the shortage of housing and improve affordability
- protects the environment by updating tired centres with more sustainable and resilient development and reduces sprawl onto rural land
- makes Auckland a great place to live, work, play and visit, as an inclusive city which celebrates its unique mana whenua identity and cultural diversity, driven by place making and engagement.

Successful regeneration and development requires investment in amenity and infrastructure upfront to build community support, homeowner demand and private sector interest. All categories of infrastructure covered by this strategy are relevant to success regeneration of these areas. Panuku has a balanced strategy for each location combining commercial development, place making and activation, public realm upgrades and other public good investment. Panuku also works closely with a range of Crown agencies including Housing New Zealand (HNZ) in a number of locations (e.g. Manukau, Avondale, Northcote, Onehunga).

Key decision: The number of Transform and Unlock areas to be progressed within the next 10 years	
Final decision for this 10-year Budget	Option B, credible progress
Option A: Baseline	Funding requirement of $344 million over 10-years. Enables completion of legacy projects at Hobsonville, Ormiston, Wynyard Central Stage 1, and slower progress towards implementation in Transform Manukau. Implementation progress will be limited to commercial sales of sites and completion of legacy projects. Strategic and commercial value is not achieved from the sale of council-owned sites and the overall impact of the Panuku programme is small and incremental. Does not optimise opportunities to work with partners including HNZ. In the majority of locations local board and community aspirations will not be met until a much later date.
Option B: Credible progress	Option B includes additional funding from asset sales of $406 over 10-years and amendments to repayment periods for the Strategic Development Fund. Additional funding of $406 million can be allocated to the Transform and Unlock Programme (excluding the waterfront) from the reinvestment of the proceeds of property sales. Locations that can be funded through the sale and reinvestment of assets have been prioritised. These include the Transform locations at Manukau and Onehunga along with the Unlock locations at Avondale, Henderson, Hobsonville, Northcote, Ormiston, Papatoetoe, Panmure and Takapuna. A longer repayment period has been agreed for the Strategic Development Fund for acquiring properties that facilitate complex, larger developments.

Looking ahead: longer-term decisions

Beyond the seven key infrastructures investment decisions considered for the 10-year budget 2018-2028, decisions will be required in the future about infrastructure investments over the remaining two decades of this strategy.

The major projects and programmes identified in the 30 year investment scenario of this strategy reflect current plans and assumptions. While there is a reasonable degree of certainty about the investment identified in the first decade, projects identified in decades two and three (2028-2048) are more conceptual, and are likely to change in response to future needs.

This section of the strategy identifies some of the key decisions that we expect will be required in the future about our longer-term infrastructure investments and some of the key options and choices we will need to consider. At this stage, the timing of when we will make these decisions is unclear and while some cost estimates are included in the 30 year scenario, further work will be needed to determine the likely scale and extent of each decision.

Water

A range of responses are likely to be required to meet Auckland's long-term drinking water requirements. Beyond the next decade, decisions about investment in water infrastructure may include:

- The future sources of Auckland's drinking water
- The extent to which new technologies might increase water supply
- The extent to which demand management can help to reduce water consumption.

Watercare's water asset strategy, which is reflected in the 30-year investment scenario of this strategy, presents a package of inter-related investments that provide a safe, resilient supply of drinking water that will meet Auckland's forecasted growth. It includes major investments in the Waikato and western treatment plants to service metropolitan Auckland. This is complimented with significant investment in the transmission network and reservoirs, including a second Waikato pipeline by 2048.

New technology, such as water recycling, may provide alternative options for sourcing some of Auckland's future drinking water. Smart water metering, pricing and other demand management initiatives may reduce per-capita consumption, reducing demand for some new investments.

Wastewater

Auckland's population growth and increasing environmental expectations require a substantial investment in wastewater infrastructure. Watercare's wastewater asset strategy, which is reflected in the 30-year investment scenario of this strategy, presents a package of inter-related investments that will meet Auckland's long term wastewater needs. This includes upgrades to the two major wastewater plants at Mangere and Rosedale, construction of the Central and Northern Interceptors and augmentation of the southern interceptor to service the metropolitan area of Auckland. Major upgrades to sub-regional treatment plants at Snells Beach, Army Bay and Waiuku are also planned.

The investments in the first decade of this strategy establish the core network that will meet Auckland's medium to long-term wastewater needs. Major investments in the second and third decades aim to augment the network established in first decade. As such, longer term decisions about wastewater investments are more likely to focus on the quality of treatment that is required.

Stormwater

The Water Sensitive Design approach to stormwater and flooding management adopted by the council means that, beyond the first decade, the majority of stormwater investments are expected to be relatively small projects in response to where and when grow occurs.

The largest investment currently identified in the second and third decades is the southern future urban area programme, which will enable urban development of a number of areas subject to significant flooding constraints including Opaheke, Drury and Takanini. Decisions will be required about the optimal technical solution to address flooding in this area, and given the relatively small area of benefit of this investment, the appropriate funding mechanism for this investment.

Community services

While demand for community services is expected to increase over the next 30-years, there is a high degree of uncertainty about future demand due to:

- the rate and distribution of population growth
- demographic changes, such as increasingly diverse communities
- changes in recreational trends, such as an increase in informal recreation
- a higher proportion of medium and high density housing, which typically have less private open space
- increasing expectation to deliver services to meet demand.

There is also uncertainty about the adequacy of the existing network of community facilities into the future. Auckland's portfolio of community facilities is aging and faces a range of challenges such as weathertightness, asbestos and seismic strength issues. Due to demographic and social changes in the community, many facilities are no longer fit for purpose or reflective of community needs.

Beyond the first decade, these factors will mean there is a continuing need to review the portfolio to ensure the provision of community facilities will meet changing community needs and provide value for money. Long-term decisions about investment in community facilities may include:

- the type of facilities provided by council
- the role of council in delivering community services, such whether as service is best delivered by the council, a community organisation, or in partnership
- the optimal level of provision and network that will meet future community needs
- whether facilities that are not well utilised or meeting community needs are replaced.

Transport

Between 2015 and 2018 Auckland Council worked closely with the government through the Auckland Transport Alignment Project to develop a recommended long-term strategic approach to transport in Auckland. This included an indicative 10-year package of priority investments, which formed the basis of the 10-year budget, and has informed the 30 year investment scenario identified in this strategy.

Looking beyond the next decade, ATAP identifies some key decisions that will need to be made in the future, such as:

- the alignment, mode and timing of further major investments
- the extent to which transport challenges should be addressed through demand management (e.g. road pricing) rather than infrastructure investment
- the extent to which new and developing transport technologies (e.g. ridesharing, connected and autonomous vehicles) can help address our transport challenges.

These are discussed further below:

Future major investments

The 10-year transport programme will complete much of Auckland's rapid transit network and continue the targeted development of the strategic roading network. Further improvements to these networks are identified in ATAP as future priorities, and are shown indicatively in the 30-year investment scenario of this strategy. Key future decisions on these projects may include:

Longer-term transport decisions:	
Future investment	**Key decisions**
Rail network development	• What track upgrades to the rail network are required to reduce passenger and freight conflicts? • What track, station and rolling stock upgrades are required to enable express and inter-city train services?
North Shore rapid transit (City centre to Takapuna and Orewa)	• What can extend the life of the current Northern Busway? • Is light-rail the right mode for North Shore rapid transit? • What alignment should North Shore rapid transit follow, especially through future greenfield areas? • How should rapid transit integrate with a potential future road crossing of the Waitemata Harbour?
Upper Harbour rapid transit (Westgate to Albany)	• What type of corridor and mode (e.g. shoulder bus lanes, full busway, light rail etc.) is most appropriate for this corridor? • Where should future stations be located and how should they integrate with the rest of the public transport network?
Additional Waitemata Harbour Crossing (road)	• What is the optimal timing of the investment? • What is the exact route for the project? • What associated upgrades to the rest of the transport network might be required to maximise the project's benefits? • How does the project integrate with North Shore rapid transit?
Cross isthmus rapid transit (New Lynn to Onehunga)	• What route should this corridor follow? • What mode should this corridor be? • Where should the stations be located and how should this corridor integrate with the rest of the public transport network?
Access to Ports of Auckland	• What scale of improvement is required? • What upgrades are still necessary if the Port moves from its current location?
Supporting greenfield growth	• What is the right alignment and form for projects supporting greenfield growth? • How will major investments support the desired urban form in greenfield growth areas?

The role of demand management (e.g. road pricing)

ATAP highlighted that achieving a step-change improvement in the performance of Auckland's transport network would only be possible through a greater focus on travel demand, particularly through moving to directly incentivising more efficient travel patterns through road pricing. ATAP also highlighted that substantial further work would be necessary before road pricing should be implemented. A joint Council-Government project investigating road pricing is currently underway.

Key future decisions around transport technology may include:

- What are the impacts on travel affordability, and what mitigation might be required, particularly for lower income residents who face long commutes?
- What are the impacts on overall accessibility to jobs, education and services?
- What investments that improve travel choices (e.g. improving public transport and cycling infrastructure) need to be completed before road pricing should be implemented?
- What investments will be more, or less, necessary with road pricing in place?

The role of developing transport technologies

Developing technologies like connected and autonomous vehicles (including public transport), especially when combined with ride-sharing, have the potential to fundamentally reshape the way transport is used and provided, blurring the boundaries between private and public transport. These developments could create several benefits, including increasing the number of vehicles that can travel on a road at the same time and reducing deaths and serious injuries from traffic incidents. There is also a risk that these technology advances could create negative effects, particularly if they lead to large-scale growth in vehicle travel or poorer quality street environments.

While rapid technological progress is anticipated, it's hard to know which developments will be successful or when we will be able to use them. Key future decisions around transport technology may include:

- What regulation is required to maximise benefits and minimise the risks from new technologies?
- What investment in upgrading infrastructure will be necessary to maximise the benefits from new vehicular technology?
- How might the delivery of public transport services evolve over time due to changing technology?
- What investments may no longer be required, or may be required earlier, if the pace of technology developments and uptake is different to what we expect?

Section four: 30-year Investment Scenario

Investment in council infrastructure is constrained by funding availability. This scenario reflects the $26 billion of funding available in the first decade (2019-2028) for capital expenditure with the funding tools as set out in the Financial Strategy in Part 1.4 of this volume.

This section outlines what we consider to be the most likely scenario for the management of the council's infrastructure assets over the next 30 years. If additional funding becomes available, the council may be able to accelerate investment in improving infrastructure provision across the region.

The scenario consists of three parts:

- total projected expenditure by infrastructure type over the next 30-years
- projected annual capital and operational expenditure for each infrastructure type between 2019-2048
- a summary of major projects and programmes included in the 30-year scenario.

Overview of projected expenditure by infrastructure type:

Table 4.1: Total expenditure by infrastructure type 2019-2048

Infrastructure type	Capital expenditure	Operating expenditure
Roads and footpaths	$25.0 billion	$27.1 billion
Public transport	$19.7billion	$44.6 billion
Total Transport	**$44.7billion**	**$71.7 billion**
Water supply	$7.7 billion	$10.7 billion
Wastewater	$11.6 billion	$18.0 billion
Stormwater	$6.1 billion	$7.0 billion
Total Water	**$25.4 billion**	**$35.7 billion**
Community Services	$18.5 billion	$27.8 billion
Total infrastructure investment	**$88.6 billion**	**$135.2 billion**

Note: The financial projections for transport infrastructure are for Auckland Transport expenditure only. Some major NZTA and KiwiRail investments are identified in the summary of major transport programmes and projects to provide context for the council investment in transport infrastructure.

Chart 4.1: Projected capital expenditure by infrastructure type

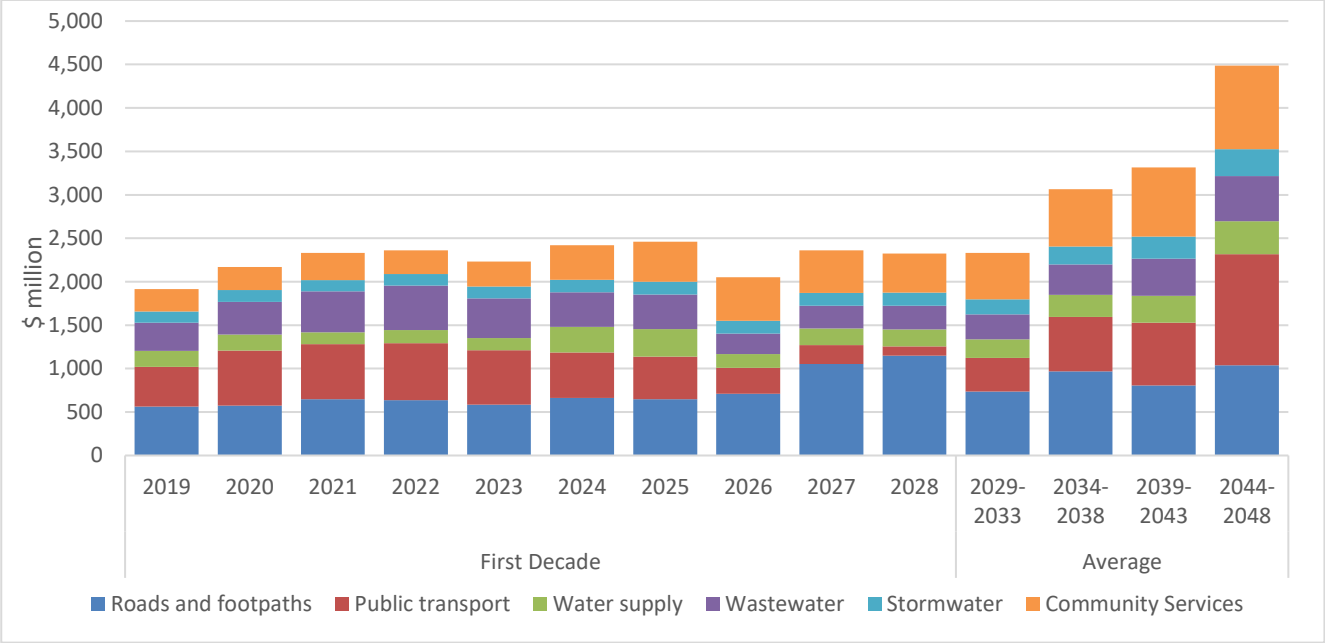
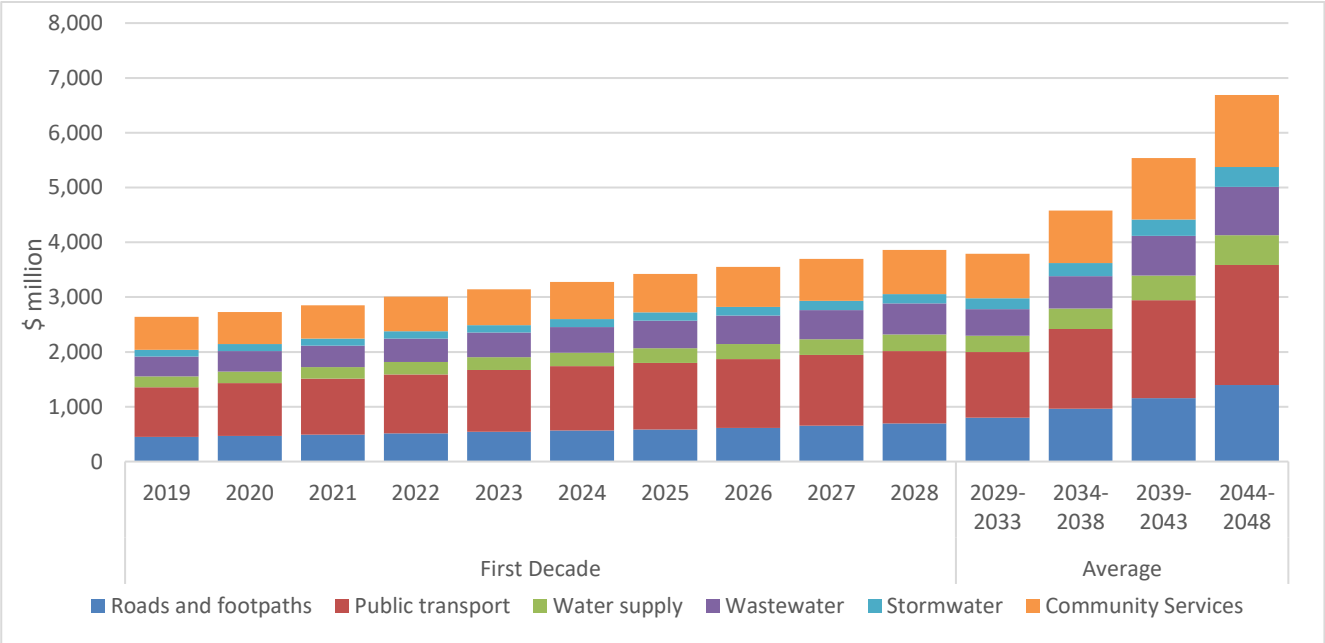


Chart 4.2: Projected operational expenditure by infrastructure type



Roads and footpaths

Chart 4.3: Projected capital expenditure

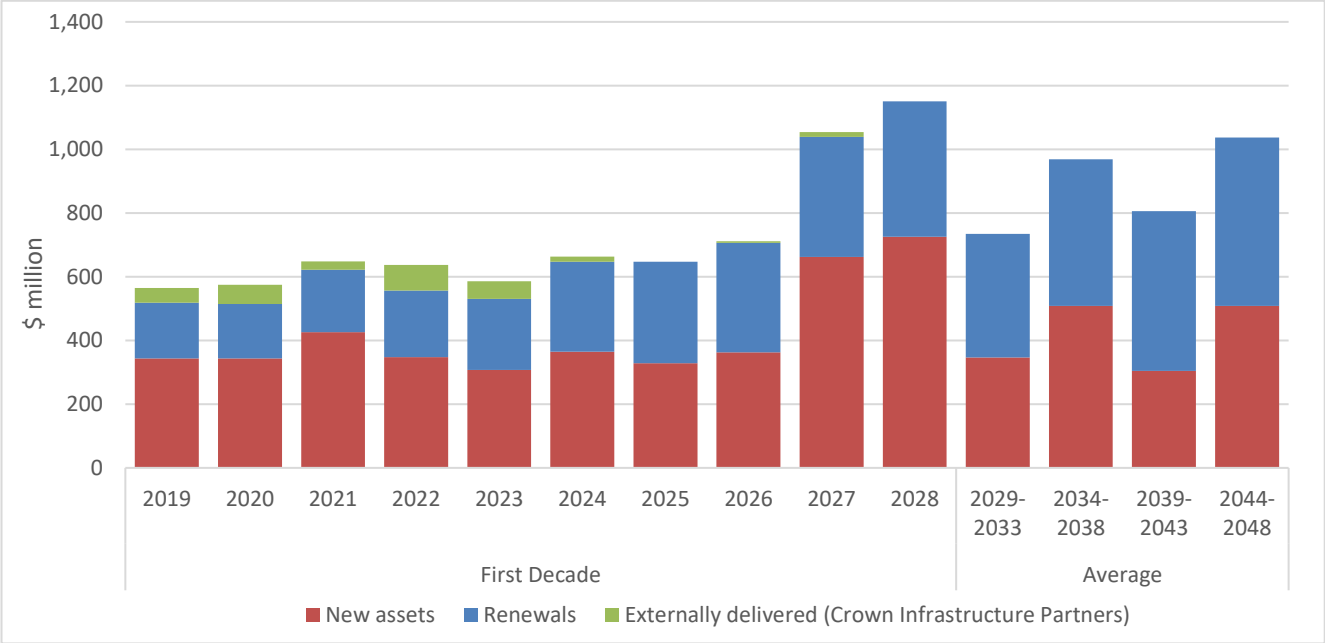


Chart 4.4: Projected operating expenditure

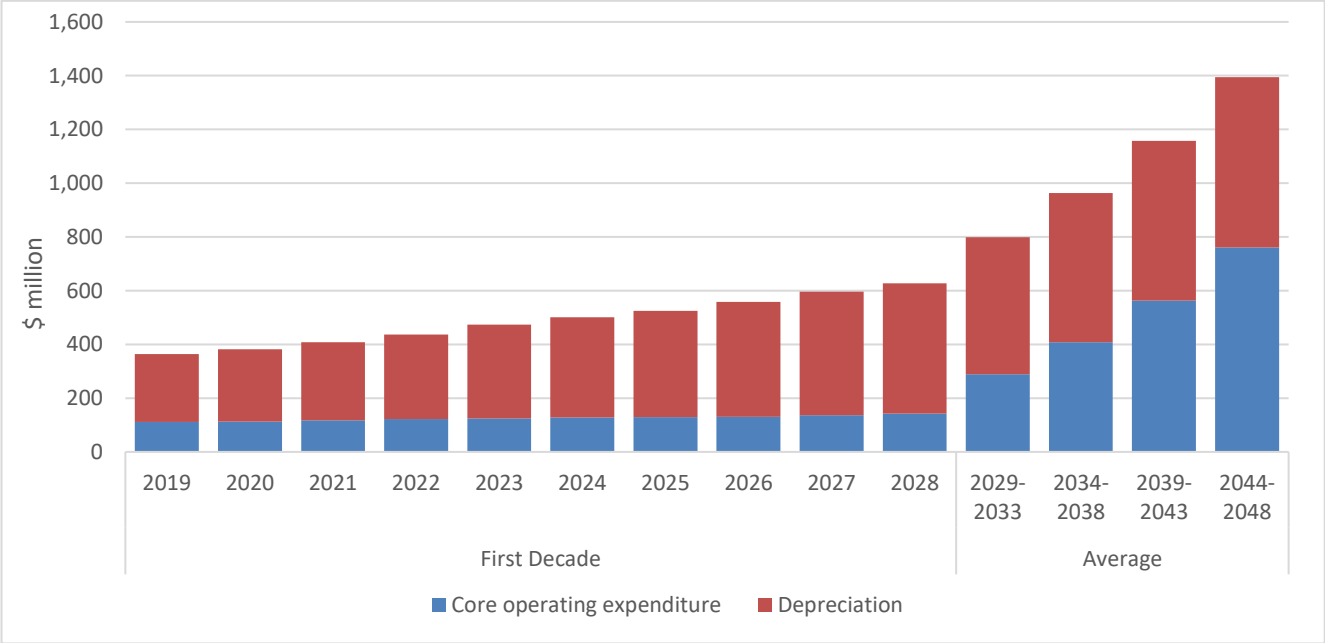


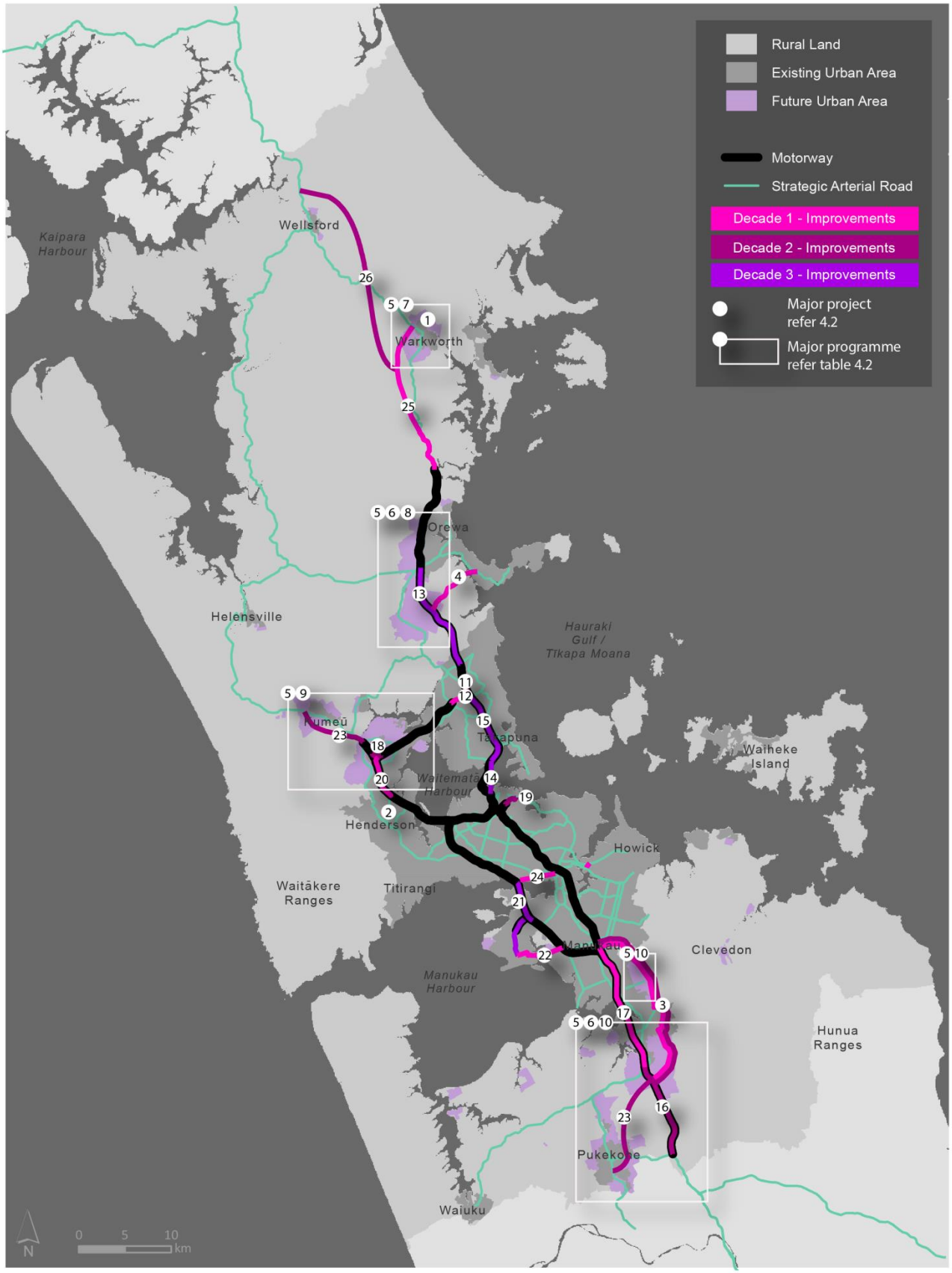
Table 4.2: Roads - major programmes and projects

Project	Description	Map reference	Nominal $ (millions)		
			Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039-2048
Auckland Transport initiatives					
Matakana Link Road	A connection between State Highway 1 and Matakana Road.	1	89		
Lincoln Road Corridor Improvements	Improvements to Lincoln Road between Henderson and SH16, including bus priority measures	2	85		
Mill Road	A new arterial road between Manukau and Drury (delivered in two stages)	3	507	875	
Penlink	A new connection between the Northern Motorway and the Whangaparāoa Peninsula	4	200		
Network Capacity and Performance Improvements	Interventions to optimise specific routes through initiatives such as synchronisation of traffic signals, best-use of road layout, and addressing traffic restrictions		290	Continuing programmes	Continuing programmes
Walking and Cycling Programme	Walking and cycling programmes, including completion of Urban Cycleways Programme, improving city centre access, access to RTN stations, walking and cycling in metropolitan areas, and providing new footpaths		536	Continuing programmes	Continuing programmes
Safety Programme	A programme of investment to address safety and operational deficiencies across AT's road, motorcycle, pedestrian and cycle networks, including safety improvements in high risk urban and rural roads and intersections		703	Continuing programmes	Continuing programmes
Growth-related initiatives delivered by Auckland Transport and Crown infrastructure Partners					
Local Residential Growth Fund	A fund to provide transport infrastructure to support local residential housing growth		391	350	350
Greenfields Transport Infrastructure (Auckland Transport)	Infrastructure programme to support high priority greenfield areas. Projects include upgrading Trig Road and new Redhills and Wainui connections	5	300		
Crown Infrastructure Partners	Delivery of growth related projects in the North and South	6	360		
The following roading, public transport and active transport investment has been identified to enable development of future urban areas. Some projects will be funded and delivered by Auckland Transport in decade 1using the greenfields transport infrastructure fund or by Crown Infrastructure Partners.					
	Warkworth	7		221	
	Wainui, Silverdale and Dairy Flat	8		769	1,342
	Whenuapai, Redhills, Kumeu, Huapai and Riverhead	9		1224	53

Table 4.2: Roads - major programmes and projects

Project	Description	Map reference	Nominal $ (millions) Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039-2048
	Pukekohe, Paerata, Drury West, Drury-Opaheke and Takanini (excluding Mill Road)	10		925	161
	NZTA initiatives				
Northern Motorway (SH1) Improvements	Safety and capacity upgrade of SH1 between Greville Road and Upper Harbour Drive	11	576		
	A new SH1 / SH18 motorway-to-motorway connection	12			
	SH1 improvements north of Albany, including bus shoulder lanes from Albany to Silverdale	13	332		
	Additional crossing of the Waitematā Harbour	14			TBC
	SH1 widening Constellation to Onewa Road and provision of south-facing ramps at SH1 / SH18 interchange	15			TBC
Southern Motorway (SH1) Improvements	Capacity and safety improvements from SH1 / SH20 interchange at Manukau to Bombay	16	480		
	Improvements at various points along SH1 to improve access / egress, improve throughput and reduce travel times			TBC	
	SH1 widening Hill Road to Papakura	17			TBC
Northwestern Motorway (SH16) Improvements	Completion of SH16 / SH18 motorway-to-motorway connection	18		TBC	
	Improvements / extension of SH16 to provide improved access to Grafton Gully and the Port	19		TBC	
	SH16 widening Te Atatu to Westgate	20		TBC	TBC
South West Motorway (SH20 and SH20A) improvements and improved northern airport access	SH20 and SH20A widening Mangere Bridge to Mangere Town Centre to Airport	21			TBC
State Highway 20B Improvements	Capacity improvements along SH20/SH20B	22	459		
New strategic roads to Kumeu and Pukekohe	New road connections to the Kumeu and Pukekohe growth areas	23		TBC	
East West Link (revised)	Improved access to key freight destinations	24	800		
Connecting Northland (SH1 improvements)	Puhoi to Warkworth	25	778		
	Warkworth to Wellsford	26		TBC	

Figure 4.1: Roads - major programmes and projects



Public transport

Chart 4.5 - Projected capital expenditure

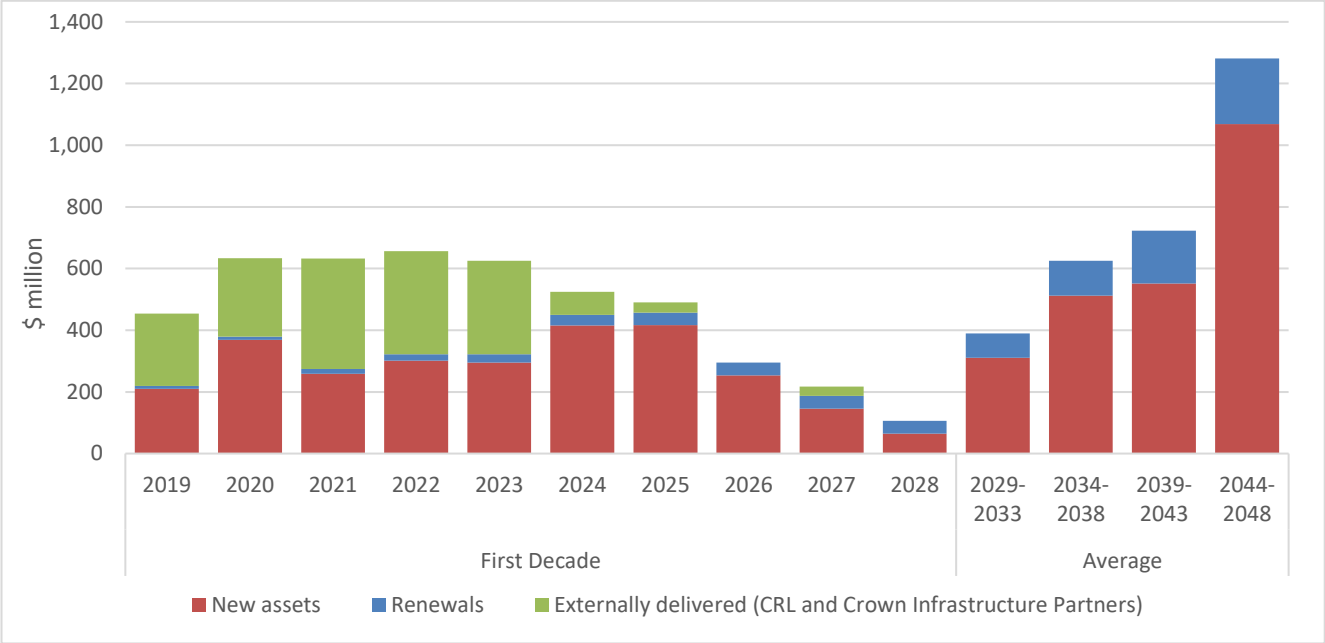


Chart 4.6 - Projected operating expenditure

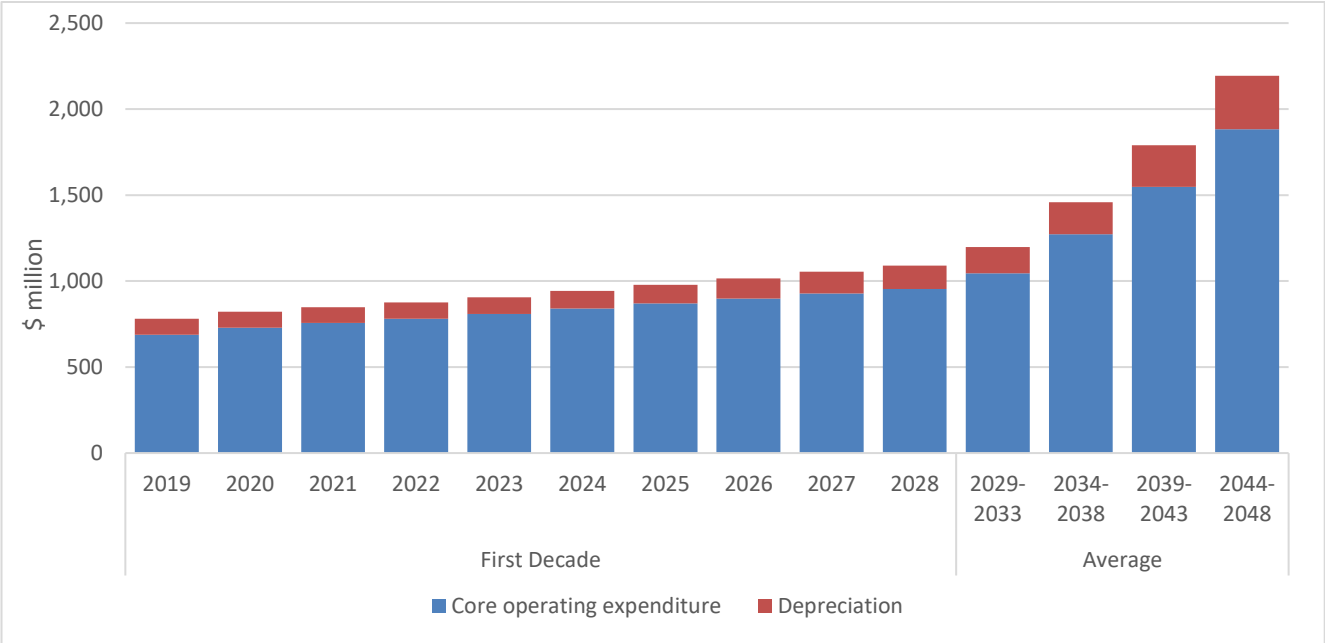
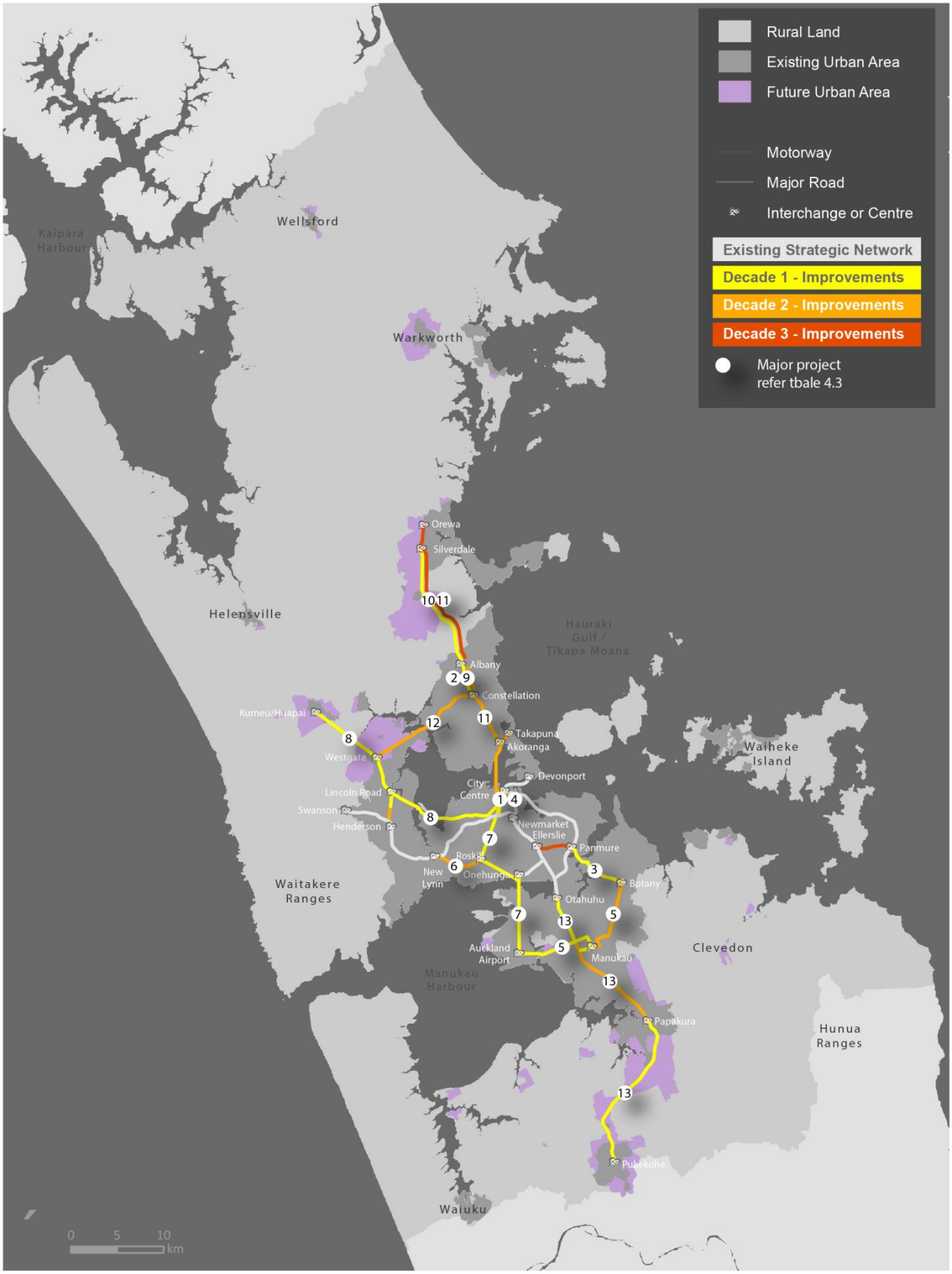


Table 4.3: Public transport – major programmes and projects

Project / Programme	Description	Map Reference	Nominal $ (millions) Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039 - 2048
City Rail Link					
City Rail Link	An underground rail line linking Britomart and the city centre with the existing western rail line near Mt Eden	1	2,852 (net of asset sales and including government contribution)		
Auckland Transport Initiatives					
Northern Busway Stations	A new station at Rosedale and improvements to Constellation Station associated with the extension of the Northern Busway to Albany	2	117		
Eastern Busway	Projects in south east Auckland to improve transport choices and connections in the area, including a busway between Panmure, Pakuranga and Botany, the Reeves Road Flyover and Morrin to Merton Connection	3	923	271	
Park and Ride Programme	Delivery of new and extended park'n'ride facilities to enhance access and increase patronage on the rapid and frequent public transport networks		81		
Electric train fleet expansion	Acquisition of additional electric trains and stabling to provide increased train frequencies and provide additional capacity to respond to patronage growth		509	410	768
CBD Bus Infrastructure Improvements	Delivery of bus infrastructure in the CBD, including bus priority along Wellesley Street; a new Learning Quarter bus interchange; and a new Downtown bus interchange.	4	161		
Airport to Botany RTN via Manukau and Airport Access Improvements	Programme to improve airport access, including Puhinui bus-rail interchange upgrade and a range of other measures including localised bus priority and walking/cycling improvements	5	79	317	
New Lynn to Onehunga rapid transit		6			123
NZTA initiatives					
Light Rail	A light rail connection between the City Centre and Auckland Airport.	7	1,815		

	A light rail connection from the City Centre to Westgate-Kumeu (possibly staged with buses in the interim)	8			
Northern Busway	Northward extension of the Northern Busway between Constellation and Albany Station	9	309		
	Improvements to SH1 between Albany and Orewa to improve the travel time reliability, including provision of bus shoulder lanes between Albany and Silverdale	10	332		
Rapid Transit – City Centre to Takapuna and Orewa	A rapid transit connection from the City Centre to Takapuna and Orewa	11		TBC	TBC
Upper Harbour Rapid Transit	A rapid transit connection between Westgate and Constellation Drive	12		TBC	TBC
	Below Track Rail				
Auckland Rail Development	Additional rail infrastructure to support strong growth in PT passenger trips and freight carried by rail. Includes electrification to Pukekohe, third / fourth mains along the Southern Line, and an Auckland Train Control Centre	13	751	Below-track rail	Below-track rail
Level crossing improvements	Safety improvements at level crossings across the Auckland region, including level crossing closures, pedestrian level crossing improvements and level crossing grade separations		239	Below-track rail	

Figure 4.2: Public Transport – major programmes and projects



Water supply

Chart 4.7: Projected capital expenditure

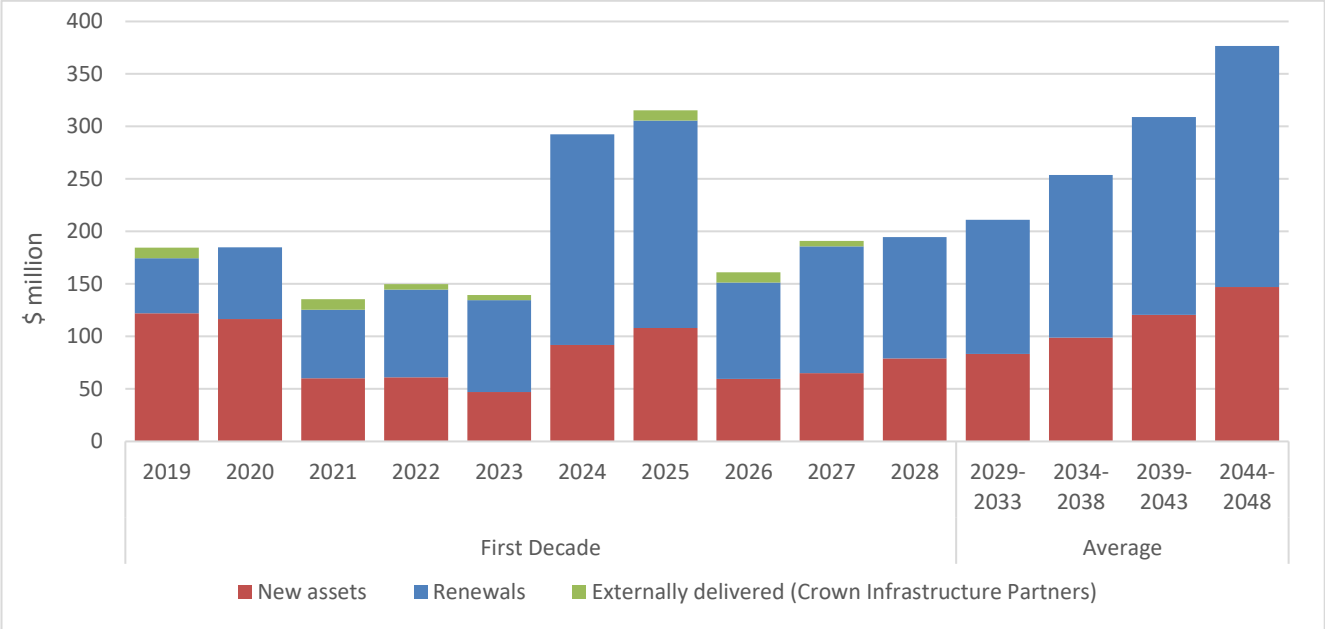


Chart 4.8: Projected operating expenditure

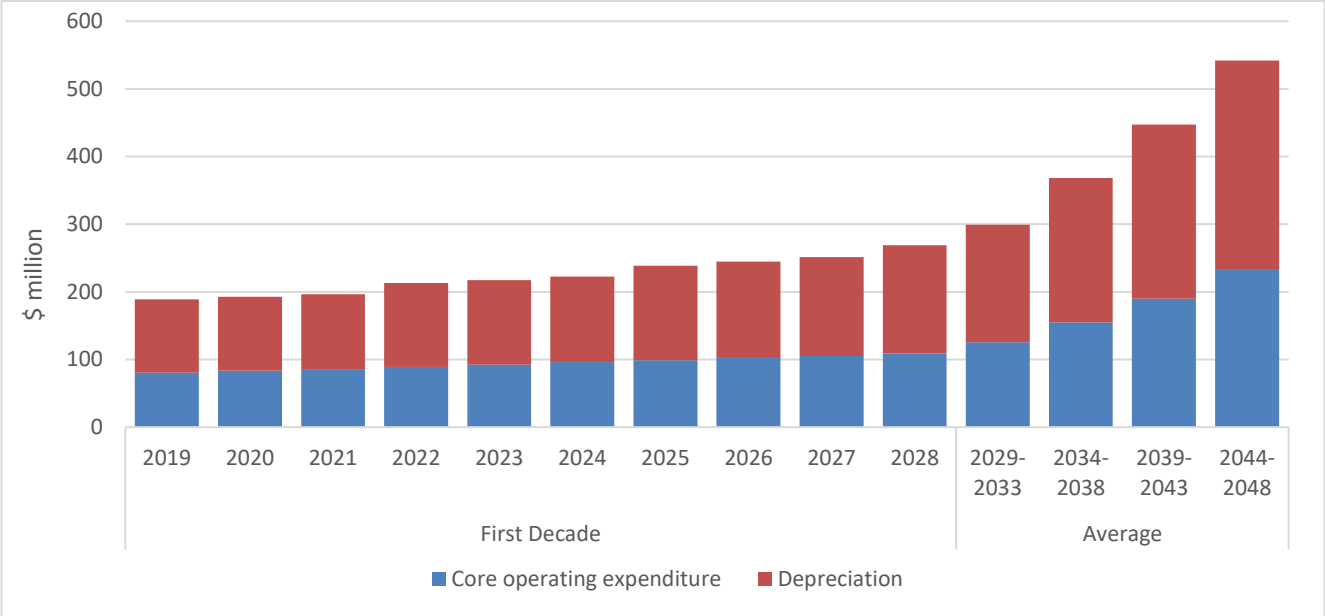
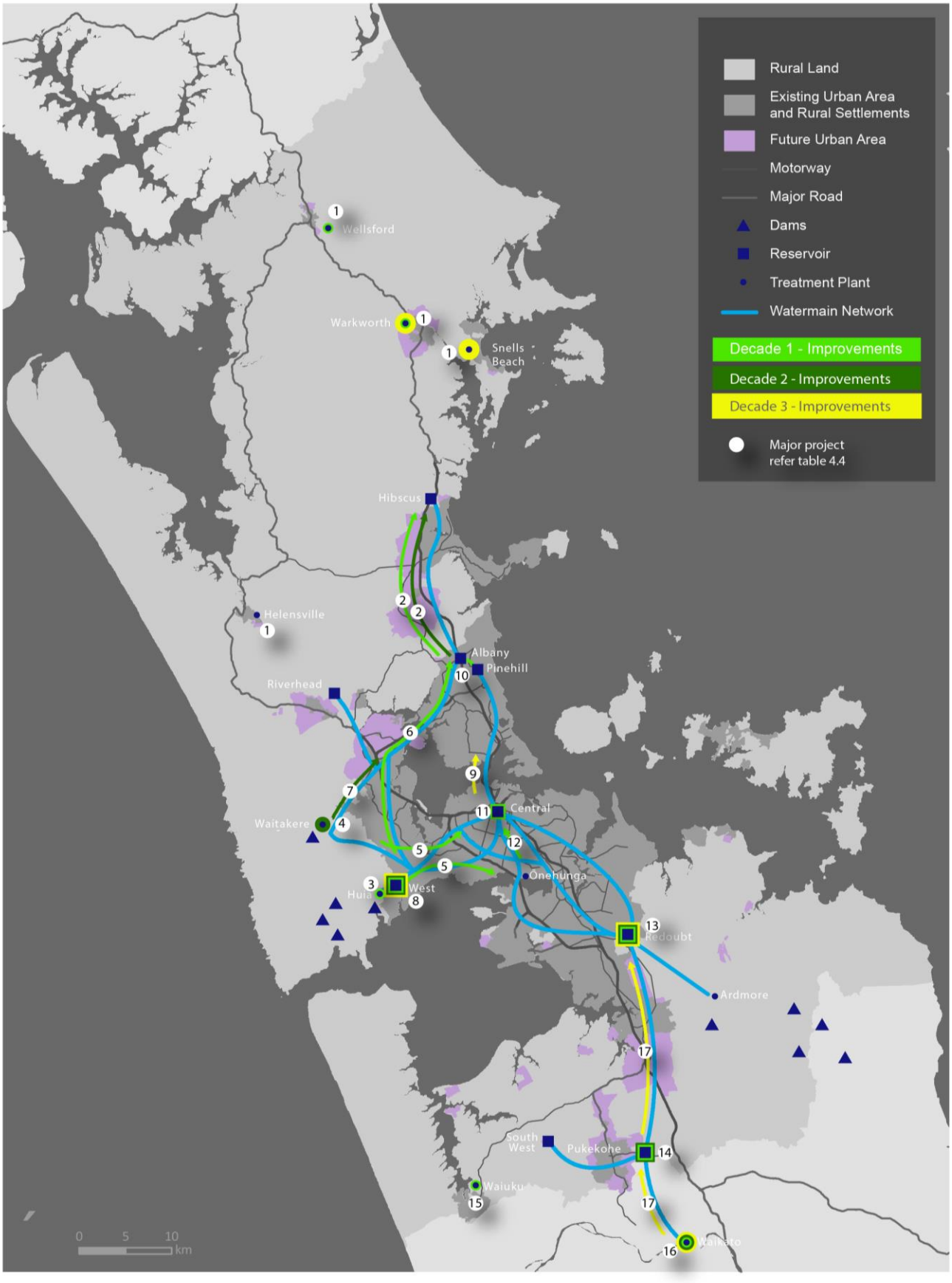


Table 4.4: Water supply – major programmes and projects

Programme / project	Description	Map reference	Nominal $ (millions)		
			Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039 -2048
North of Albany water supply programme	Upgrade of Wellsford , Helensville, Warkworth and Snells Beach water supply systems	1	$61	$170	$105
	Orewa No.1 watermain replacement, Hibiscus Coast boost pumping and an additional watermain from Albany to Orewa.	2			
North West water supply programme	Replacement of the Huia Treatment Plant	3	$731	$201	$221
	Replacement of Waitakere Treatment Plant	4			
	Replacement of Huia 1 and Nihotupu 1 watermains	5			
	Construction of the North Harbour 2 watermain between Huia and Albany.	6			
	Construction of Waitakere 2 watermain	7			
	Increase in capacity of western reservoirs	8			
North Shore water supply programme	New watermain connection across the Waitematā Harbour to the North Shore	9	$11	$77	$270
	New transmission pipeline between Albany and Pinehill reservoirs	10			
Central water supply programme	Increase in capacity of central reservoirs	11	$103	$68	$83
	Completion of the Hunua 4 watermain	12			
South water supply programme	Increasing capacity of Redoubt reservoirs	13	$136	$358	$1185
	Increasing capacity of Pukekohe reservoirs	14			
	Upgrade of Waiuku water supply systems	15			
	Increasing capacity of the Waikato Treatment Plant	16			
	Second water pipeline from Waikato Treatment Plant to Redoubt Reservoirs	17			

Figure 4.3: Water supply – major programmes and projects



Wastewater

Chart 4.9: Projected capital expenditure

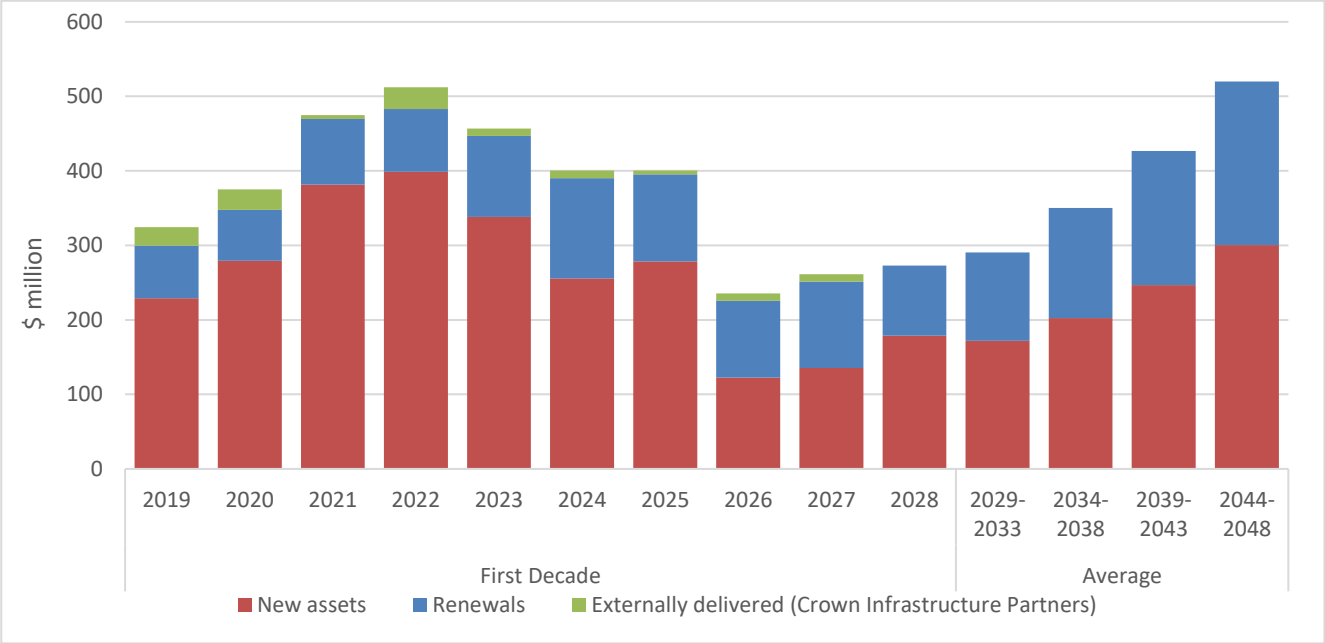


Chart 4.10: Projected operating expenditure

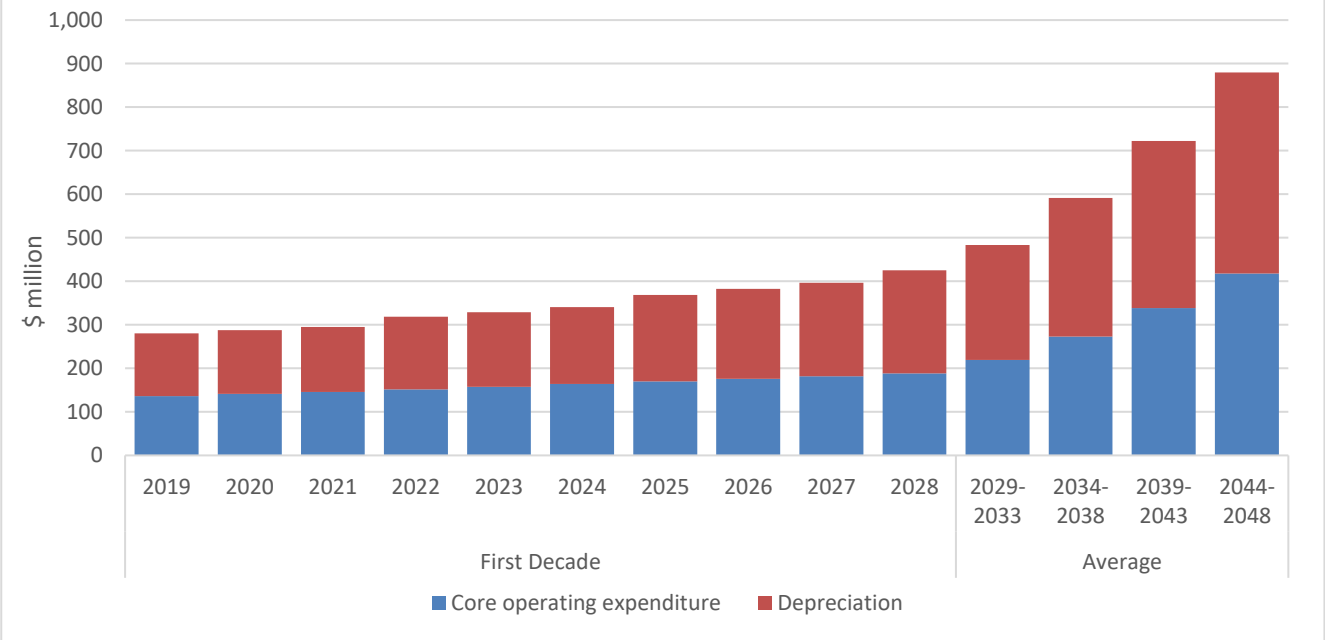
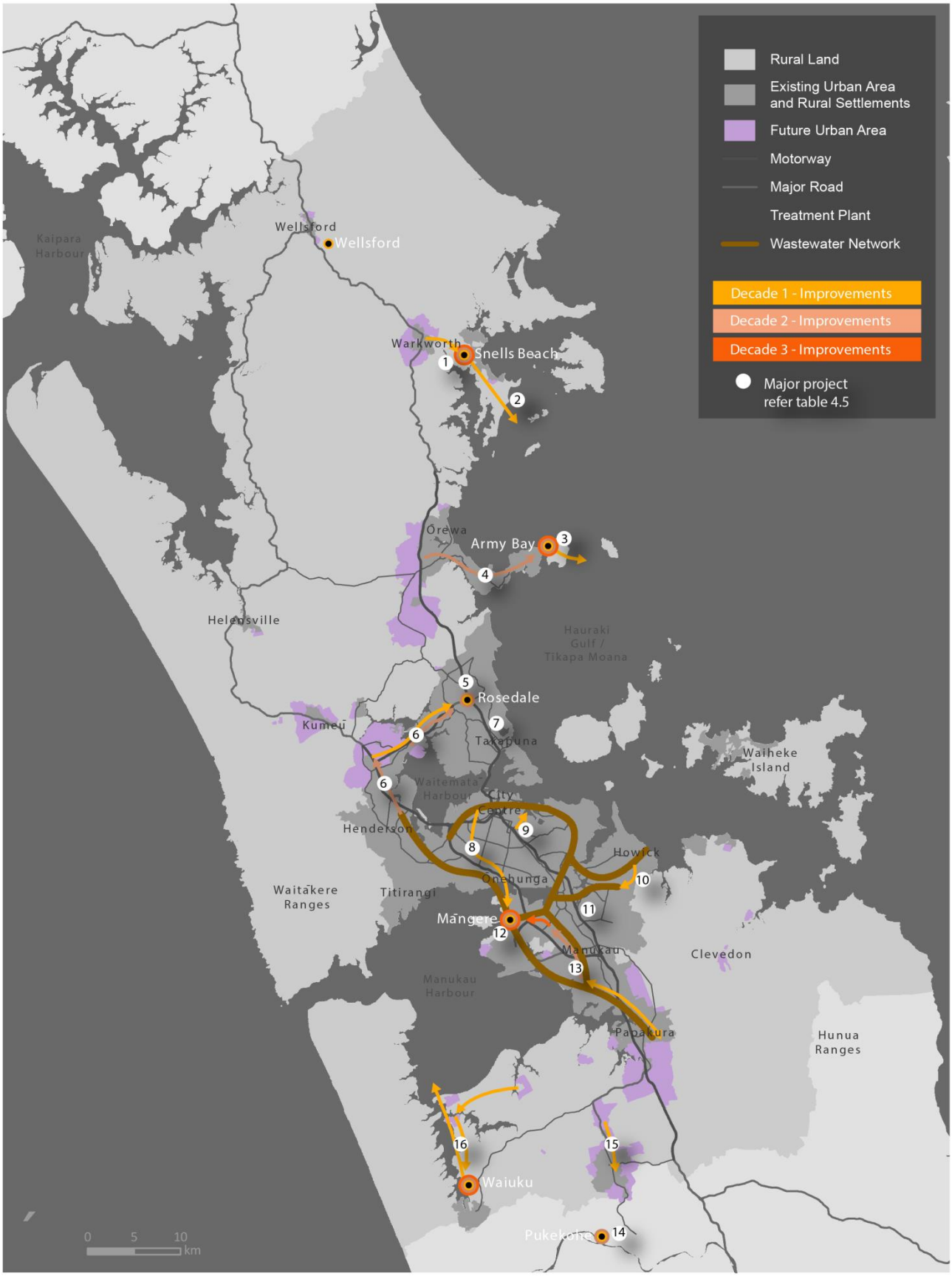


Table 4.5: Wastewater – major programmes and projects

Programme / Project	Description	Map Reference	Nominal $ (millions)		
			Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039 - 2048
North East sub-regional wastewater treatment plant catchment	A new sub-regional treatment plant at Snells Beach and staged increases in capacity	1	$199	$113	$46
	Upgrade to outfall and construction of a new transmission pipeline from Warkworth	2			
Army Bay wastewater treatment plant catchment	Upgrade of treatment plant and outfall	3	$82	$168	$506
	Improvements to transmission network to provide for growth in Wainui, Silverdale and Dairy Flat future urban areas	4			
Rosedale wastewater treatment plant catchment	Increasing the capacity of Rosedale Treatment Plant	5	$400	$518	$85
	Construction of the Northern Interceptor to divert flows from West and NW Auckland to Rosedale Treatment Plant	6			
	Upgrades to North Shore trunk sewer and pump stations to reduce overflows	7			
Mangere wastewater treatment plant catchment	Construction of the Central Interceptor	8	$2125	$327	$637
	Newmarket Upgrades	9			
	Improvements to Howick Diversion	10			
	Otara Catchment	11			
	Increasing the capacity of Mangere Treatment Plant	12			
	Puketutu Island Project				
	Augmentation of the Southern Interceptor	13			
Pukekohe wastewater treatment plant catchment	Increasing the capacity of the Pukekohe Treatment Plant	14	$126	$19	$436
	Conveyance improvements from Pukekohe to the treatment plant	15			
South West sub-regional wastewater treatment plant catchment	Construction of a new sub-regional treatment plant and transmission network between Waiuku, Clarks Beach and Glenbrook	16	$134	$26	$46

Figure 4.4: Wastewater - major programmes and projects



Stormwater

Chart 4.11: Projected capital expenditure

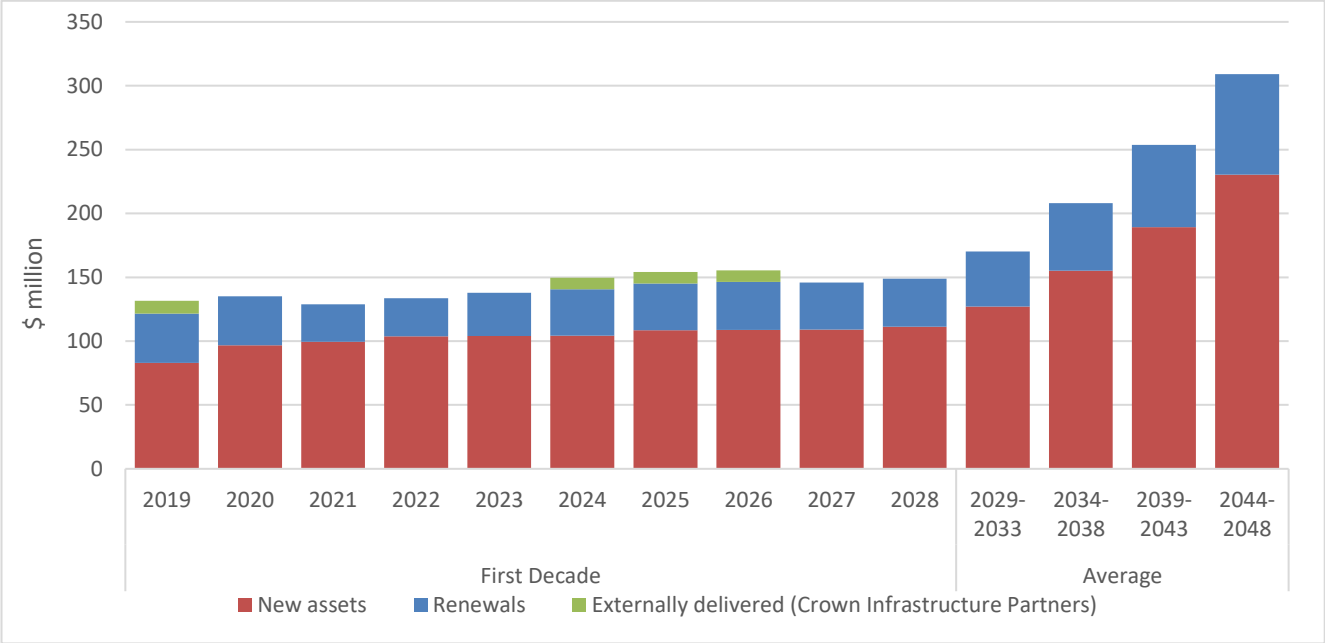


Chart 4.12: Projected operating expenditure

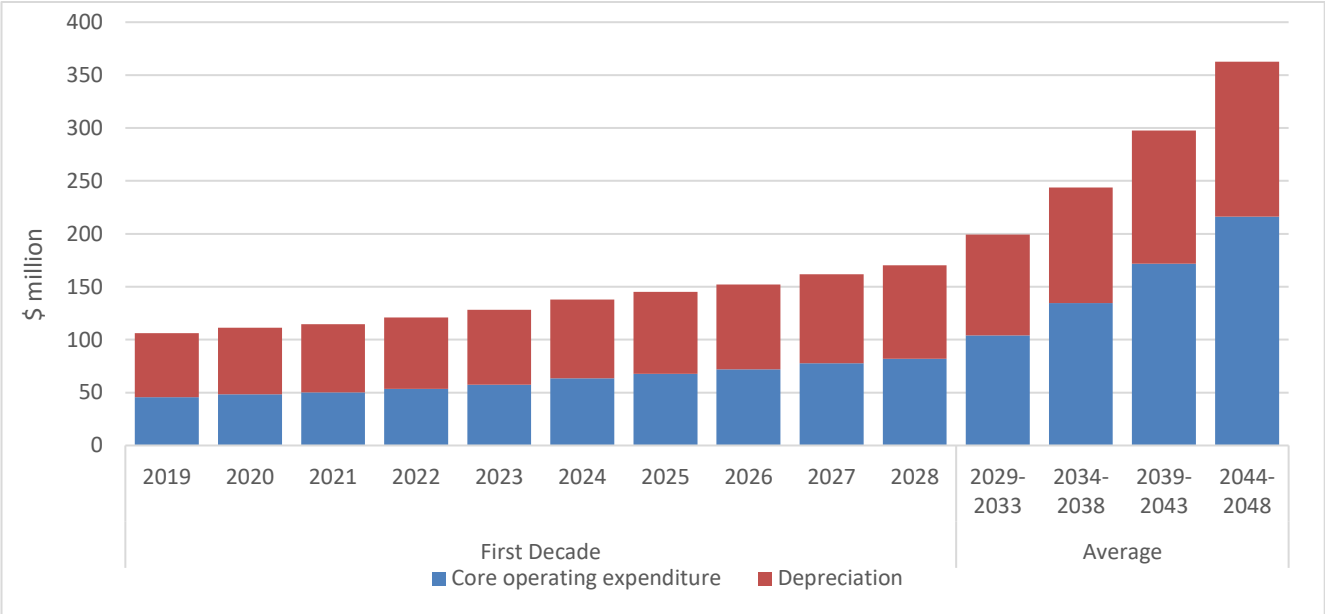


Table 4.6: Stormwater - major programmes and projects

Project / Programme	Description	Map reference	Nominal $ (millions)		
			Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039 - 2048
North future urban area programme	Provision of stormwater infrastructure to enable development of Warkworth, Wainui, Silverdale and Dairy Flat future urban areas	1	$35	$99	$49
Existing urban area growth programme	Provision of stormwater infrastructure to enable growth in the existing urban area	2	$209	$461	$329
North west future urban area programme	Provision of stormwater infrastructure to enable development of Whenuapai, Kumeu, Huapai, Riverhead and Red Hills future urban areas	3	$45	$85	$49
Western Isthmus Water Quality Improvement programme	A programme of wastewater and stormwater improvements to improve water quality and provide for growth. Includes current projects: • Picton Street Separation • St Marys Bay / Masefield Beach Upgrade	4	$395	TBC	TBC
Ports of Auckland Outfall Upgrade project	Installation of new stormwater pipe from Quay Street across Ports of Auckland to the Waitematā Harbour.	5	$39	$0	$0
Oakley Walmsley & Underwood Park stream upgrade project	Upgrading culverts and widening of Oakley Creek through Walmsley Park to convey flood flows to enable intensification and redevelopment in the upper catchment. Total project cost is $21m, remaining expenditure is $6m	6	$6	$0	$0
Takanini Cascades and Grove Rd McLennan Culvert project	A new open channel and culvert to service the Takanini 2a and 2b Growth Areas. Includes land purchase Total project cost is $82m, remaining expenditure is $17m	7	$17	$0	$0
Artillery Drive Tunnel to inlet project	A tunnel from McLennan Park to Pahurehure Inlet to service the Takanini Growth Areas. Total project cost is $25m, remaining expenditure is $1m	8	$1	$0	$0
Takanini School Rd Area 6A_6B and Popes Rd project	A pipeline along Takanini School Road and a stormwater pond Total project cost is $22m, remaining expenditure is $6m	9	$6	$0	$0
South future urban area programme	Provision of stormwater infrastructure to enable development of Pukekohoe, Paerata, Drury West,Drury/ Opaheke and Takanini future urban areas	10	$69	$117	$980

Figure 4.5: Stormwater - major programmes and projects

Community services

Chart 4.13 - Projected capital expenditure

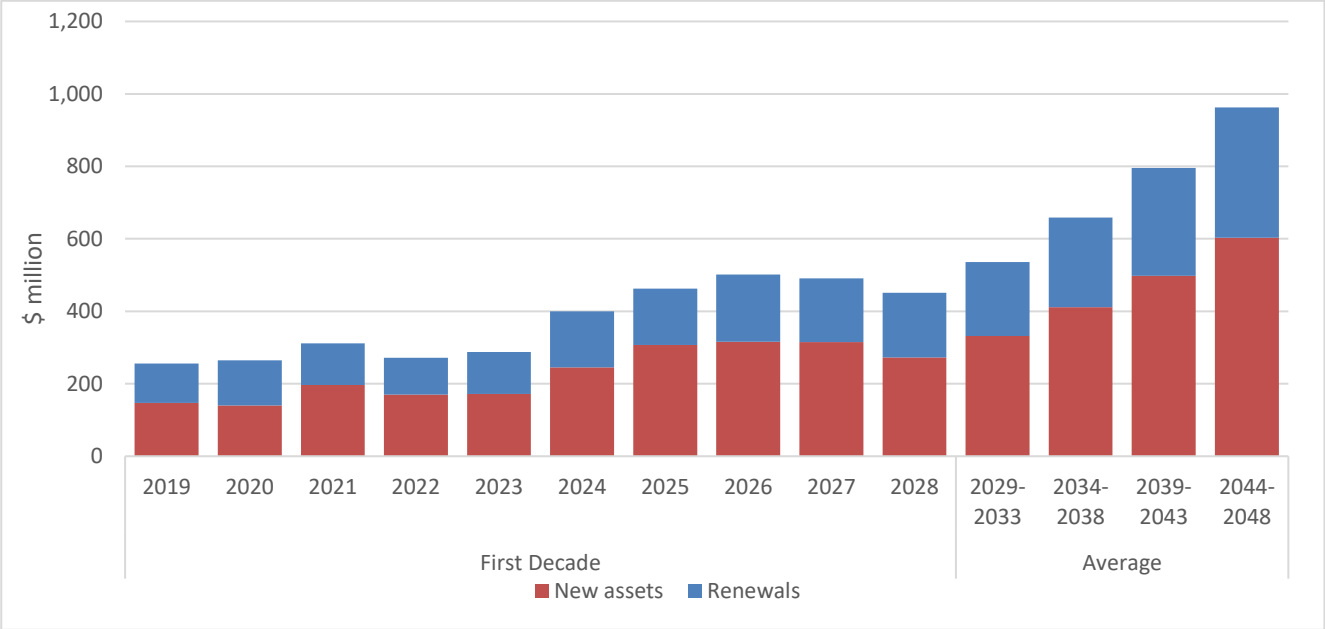


Chart 4.14 - Projected operating expenditure

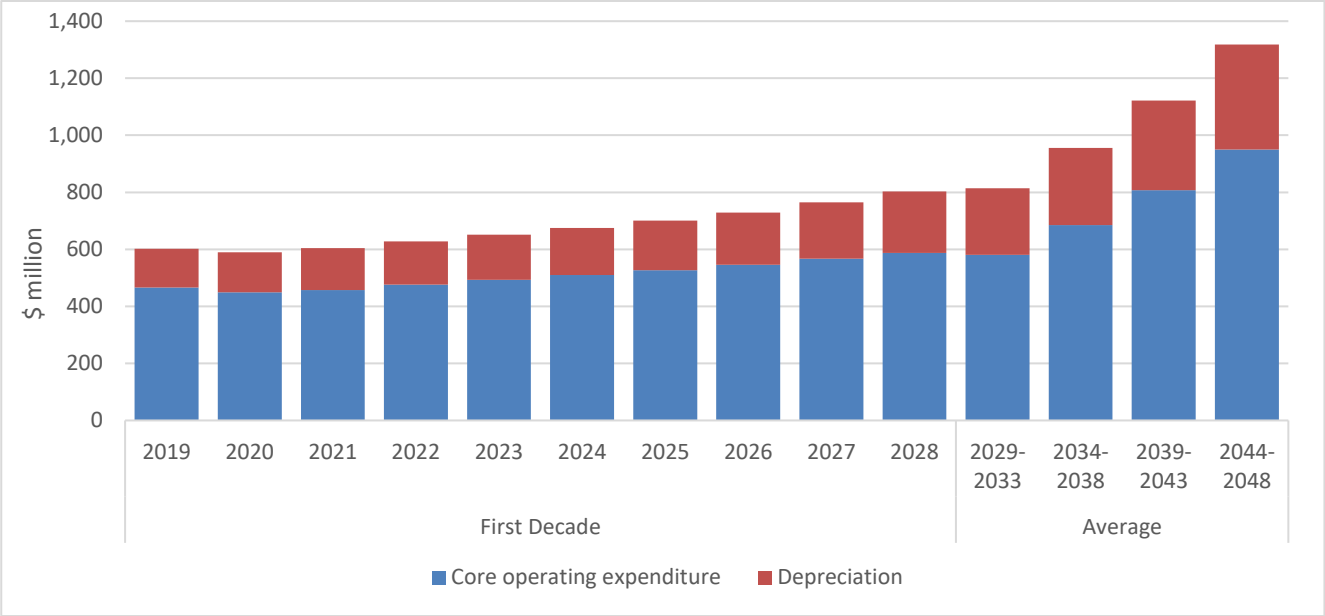
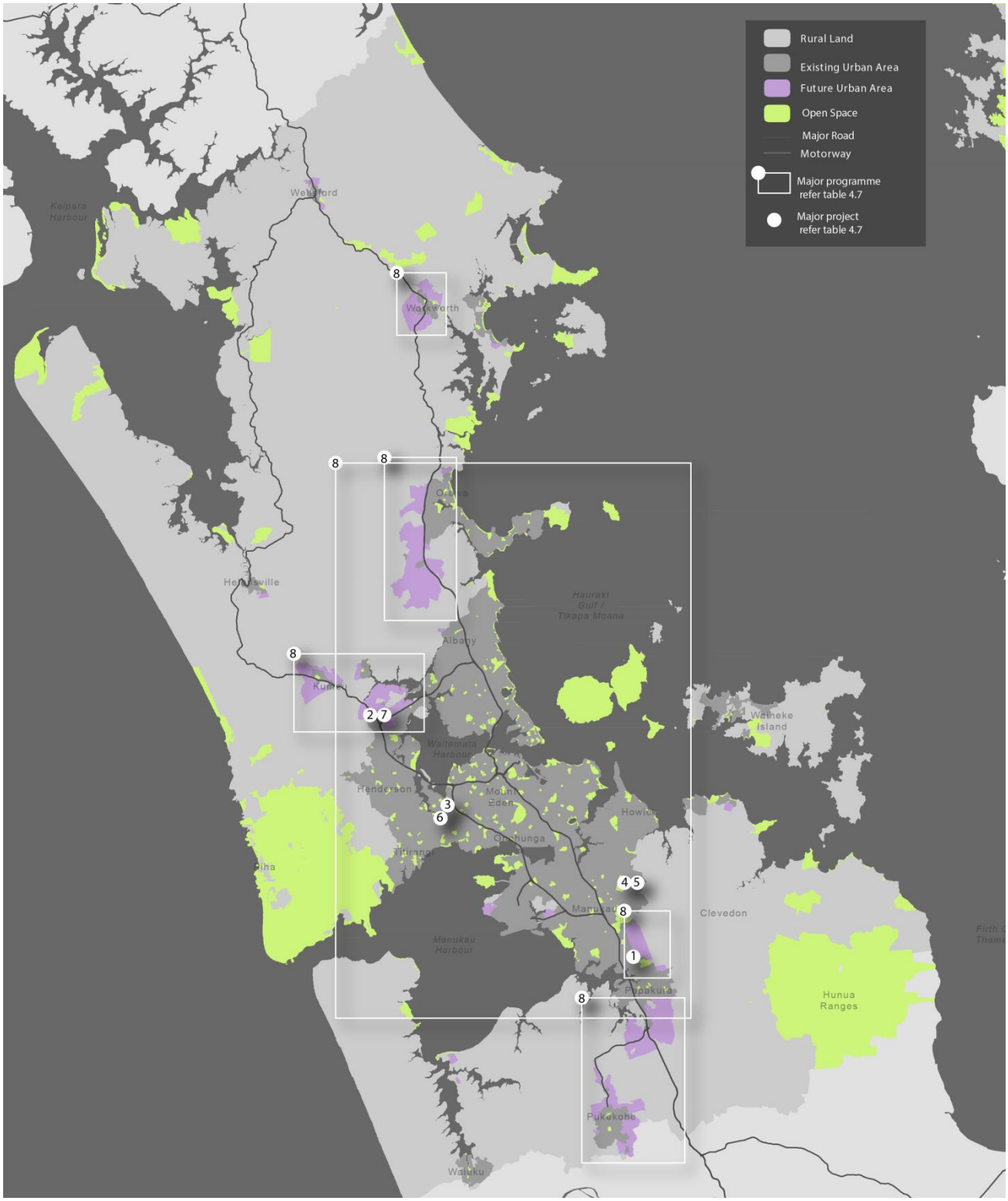


Table 4.7: Community services – major programmes and projects

Project / Programme	Description	Map Reference	Nominal $ (millions) Decade 1 2019-2028	Decade 2 2029-2038	Decade 3 2039-2048
Community assets growth programme	Provision of new libraries and community centres. Investment in decade one includes: • Takanini multi-purpose facility • Westgate multi-purpose facility • Avondale library & community centre • Flat Bush library & community centre Investment in decades two and three includes, but is not limited to Wainui, North West, Paerata, Glen Innes, Mangere, St Heliers and Drury.	1 2 3 4	$75	Continuing programme	Continuing programme
	Provision of new pools, leisure and recreation centres, including: • Flat Bush pool and leisure centre • Avondale/New Lynn pool and recreation centre • North-west pool	5 6 7	$152	$120	Continuing programme
Acquisition and development of open space in brownfield and greenfield growth areas	Acquisition including, but not limited to, additional open space in Whenuapai, Wainui/Silverdale, Paerata and Opaheke/Drury	8	$696	$859	$381
	Local Park development		$484	Continuing programme	Continuing programme
Sport and Recreation Facilities Investment Fund	Establishment of a Sport and Recreation Facilities Investment Fund to deliver on the Sports facilities Investment policy (under development) and provide value for money by leveraging external investment.		$120	Continuing programme	Continuing programme

Figure 4.6: Community services – major programmes and projects



Section five: Supporting assumptions

Asset life cycles

Asset life-cycle assumptions inform forecasts of future maintenance and renewal requirements. Renewals and maintenance are interrelated. Maintenance levels can hasten or delay the need for renewals, and if renewals are deferred, this can increase maintenance costs to ensure assets continue to deliver agreed levels of service.

Although there are specific asset renewal and maintenance strategies for different asset classes, a similar performance risk approach is used across the council and CCOs. This focuses planned renewal programmes on critical assets and places less priority on non-critical assets, which may be renewed or replaced once they fail.

There is a degree of uncertainty with asset data across the council group due to issues such as the quality of historical records, the costs and practicality of inspecting underground assets, unknown effective lifespans (the length of time the asset functions adequately) for some types of assets. The reliability of asset data for transport and water assets is generally good, with less certainty for some community assets. This may result in less certainty in forecasts of future operational and renewal costs for community assets.

The wide range of asset lives in the tables below reflects the variety of assets within each asset group.

Transport

The future life cycle costs of transport are dominated by the road network which represents 88 per cent of Auckland Transport's depreciable assets as at June 2017.

Within the road network the main assets are the road carriageway, which has a life of 50 years for arterials and 100 years for local roads, and the associated pavement surface which has a life of between 10 and 15 years. Footpaths have a life of between 25 and 50 years and bridges 99 years.

Auckland Transport uses a condition-based forecasting model to optimise long-term renewals investment across its asset portfolio. Renewal work is focused on critical or highly utilised asset groups, particularly structures including bridges, retaining walls, ferry facilities, bus shelters and rail assets. Non-critical assets are assessed less frequently, which may result in earlier asset failure than forecast.

Table 5.1: Transport asset values and useful lives

Asset group	Number / length	Current value ($m)	Asset life (years)
Roads and footpaths			
Roads	7452 km	6135	10-120
Bridges, major culverts, underpasses	1258	836	25-110
Footpaths	Footpaths – 7137 km Cycleways 326 km	806	15-43
Traffic systems	Signs – 111,293	81	15-30
Street lighting	Traffic systems – 45,201	124	15-30
Parking	Buildings -10 Open carparks – 415	169	7 -100
Public transport			
Train stations	41	580	5-99
Rolling Stock (trains)	57 electric trains 10 diesel trains	435	2-35
Bus Stations	15 bus stations 1520 bus shelters	80	10-99
Wharves	21 ferry wharves	67	50-100

Water

Pipe assets account for a high proportion of the total value of Auckland's water assets, being approximately 70 per cent for stormwater and 64 per cent for water and wastewater. Considerable emphasis is placed on understanding the condition of pipe networks to address the uncertainty surrounding buried assets. Stormwater assets owned by Auckland Transport are also identified in table 5.2.

Table 5.2: Water asset values and useful lives

Asset group	Number / length	Current value ($m)	Asset life (years)
Water supply			
Water supply dams	11	285	200
Raw water aqueducts and tunnels	36	100	80 to 150
Water mains	9,096	2,374	36 to 100
Water reservoirs	89	191	80 to 100
Valves	82,600	113	30 to 100
Hydrants	41,404	51	30 to 100
Wastewater			
Wastewater Pipes	7,999km	2,726	50 to 167+
Manholes	165,610	740	90
Stormwater			**(see note)**
Pipes and culverts (minor)	AT = 244km AC = 6200 km	AT = 167 AC =2,766	128
Channels (including kerbs)	AT =4,097 km, (Surface water channel), 8,566 km (kerb and channel) AC =377km	AT = 691 AC =77	148
Manholes	AT = 6,233 AC =145,238	AT =25 AC =608	128
Catchpits	AT =59,715 AC =6,673	AT =146 AC =10	104
Pump Stations	AC = 3	AC = 1	90
Inlets and outlets	AC = 25,019	AC = 120	114
Soakholes	AT =2,467 AC = 361	AT =34 AC =5	80
Ponds	AC = 492	AC = 238	100
Water quality devices	AC = 436	AC = 17	55
Service connections	AC = 127,235	AC = 128	128

Note: asset life information for stormwater assets is the averaged effective asset life.

Community services

Table 5.3: Community Services asset values and useful lives			
	Number / length	**Current value ($m)**	**Asset life (years)**
Open Spaces			
Regional Parks	13,328 assets, 40,988 ha	8,600	10-50
Cemeteries	7,040 assets, 290 ha		10-50
Coastal assets	2186 assets, 21.9 ha		10-50
Utilities	110 assets		60-100
Sports and local parks	43,073 assets, 5,141 ha		3-40
Community Infrastructure			
Buildings	2,009 assets, 209 ha		30-80

Demand for services

A common driver for Auckland's demand for infrastructure services is the significant population, household and employment growth forecast to occur between 2018- 2048. Additionally, the expansion of the urban area by approximately 15,000 hectares during this period will necessitate investment in infrastructure networks to service future urban areas.

A consistent growth model has been used across the council group for the 10-year budget that distributes future population, household and employment growth into approximately 557 sub-areas across the region.[1] The model version used for forecasts in this strategy and 10-year budget 2018-2028 is ART i11v3. There is some uncertainty with long-term growth projections, including where growth is expected to occur within the region. The council monitors growth and updates its long-term infrastructure plans to address variations in the rate or location of growth.

Table 5.4: Demand for transport services		
	2018	**2048**
Road network		
Daily AM Vehicle trips	484,000	740,000
Total vehicle kilometres travelled	28,900,000	44,200,000
Public transport network		
Daily AM public transport trips	61,000	169,000
Modelled AM bus service Km	24,000	61,000
Modelled AM rail service Km	1,780	7,700
Modelled AM ferry service Km	1,100	1,500
Active transport network		
Daily active (cycling and walking) trips	500,000	940,000

[1] Includes two sub-areas that are now located in the Waikato following the Auckland local government reforms in 2010.

Table 5.5: Demand for water services		
	2018	2048
Water supply		
Population Serviced	1,500,000	2,150,000
Annual Average Demand (Metropolitan Source Abstraction)	413 MLD	545 MLD
Wastewater		
Population Serviced	1,550,000	2,230,000
Annual Demand	451 MLD	610 MLD
Stormwater		
Impervious coverage in Auckland region	6%[2]	20%
Impervious coverage in urban area	31%	64%
Environmental changes	• average annual rainfall patterns decreasing by 1-3% by 2040 and 3-5% by 2090 • more frequent heavy rainfall events and westerly winds • a rise in sea-level of between 0.28 and 0.98 between 1990 and 2100	

Table 5.6: Demand for community services		
	2018	2048
Weekly visits to leisure centres	175,000	See notes below:
Weekly participants in active sports	89,732	
Weekly visits to community centres, halls and facilities	92,000	
Annual visits to regional parks	6,450,000	
Annual visits to libraries	118,000,000	
Annual visits to arts and cultural centres	272,000	

Future demand for services provided by parks and community assets are not currently quantified. While demand is expected to increase over the period of this strategy, there is a high degree of uncertainty of future demand for community services due to:

- the rate and distribution of population growth
- demographic changes, such as increasingly diverse communities
- changes in recreational trends
- a higher proportion of medium and high density housing, which typically have less private open space
- increasing expectation to deliver services to meet demand.

The impact of this uncertainty will be to change the quantum, type and location of investment in community infrastructure to meet demand. We will continue to monitor and assess this over time so that we can respond appropriately.

[2] Based on most recent data using 2008 aerial photography

Levels of service

There is a range of factors, in addition to growth and renewal, which necessitates the need to upgrade or replace assets or to provide new ones. These factors are categorised as level of service improvements and include regulatory compliance and risk mitigation provisions.

The council's levels of service statements and performance measures illustrate the expected performance of Auckland's infrastructure under the 30-year investment scenario. Future levels of service for transport and community services are less confident due to uncertainty about future funding levels in these areas. Additional information on levels of service is available in asset management plans.

Table 5.7: Transport levels of service

		2018 - 2028	2028 - 2038	2038 - 2048
We specify, contract for and promote public transport services and provide safe, high quality public transport infrastructure	Total public transport boardings (millions)	Increasing to 150	Increasing to 225	
	The percentage of public transport trips that are punctual	95%	90 - 95%	90 – 95%
	The percentage of passengers satisfied with public transport services	85%	80-85%	80%
We provide safe, high quality and efficient local roads, footpaths and cycle ways for pedestrians, cyclists, public transport users and drivers	Road maintenance standards (ride quality) as measured by smooth travel exposure (STE) for all urban and rural roads:			
	Rural	90%	90%	90%
	Urban	80%	80%	80%
	Average AM peak period lane productivity across 30 monitored arterial routes	Increasing to 24,000	Increasing to 26,500	Increasing to 28,500
	Proportion of freight network operating at Level of Service C or better during the inter-peak	85%	85%	85%
	The change from the previous financial year in the number of deaths and serious injuries on the local road network, expressed as a number	Reduce by average of 50 per annum by 2028	Decreasing to less than 277 DSI per annum consistent with Vision Zero approach.	

Table 5.8: Water levels of service

		2018 - 2028	2028 - 2038	2038 - 2048
Water supply				
We provide Aucklanders with a reliable supply of safe water	The extent to which Watercare's drinking water supply complies with part 4 of the drinking-water standards (bacteria compliance criteria)	100%	100%	100%
	The extent to which Watercare's drinking water supply complies with part 5 of the drinking-water standards (protozoal compliance criteria)	100%	100%	100%

Table 5.8: Water levels of service				
		2018 - 2028	2028 - 2038	2038 - 2048
	The total annual number of complaints received by Watercare about any of the following: a) drinking water clarity b) drinking water taste c) drinking water odour d) drinking water pressure or flow e) continuity of supply f) Watercare's response to any of these issues expressed per 1000 connections to the local authority's networked reticulation system	≤10	≤10	≤10
	The percentage of real water loss from Watercare's networked reticulation system	≤13%	≤13%	≤13%
	The average consumption of drinking water per day per resident	Decreasing from 266 to253	253	253
	Wastewater			
We collect and treat Auckland's waste water in a safe and sustainable way	The annual number of dry weather overflows from Watercare's sewerage system, expressed per 1000 sewerage connections to that sewerage system	≤10	≤10	≤10
	Compliance with the Watercare's resource consents for discharge from its sewerage system measured by the annual number of: a) abatement notices b) infringement notices c) enforcement orders d) convictions received by Watercare in relation to those resource consents	a) ≤2 b) ≤2 c) ≤2 d) 0	a) ≤2 b) ≤2 c) ≤2 d) 0	a) ≤2 b) ≤2 c) ≤2 d) 0
	Stormwater			
We manage the stormwater network to minimise the risks of flooding to Aucklanders	The number of flooding events that occur and the associated number of habitable floors affected per 1000 properties connected to Auckland Councils stormwater network	< 1 per 1000	< 1 per 1000	< 1 per 1000
	The median response time to attend a flooding event, measured from the time that Auckland Council receives notification to the time that service personnel reach the site	< 2 hours	< 2 hours	< 2 hours
	The number of complaints (reported blockage in stormwater network) received about the performance of the stormwater system per 1000 properties connected to Auckland Councils stormwater system	< 3 per 1000 per annum	< 3 per 1000 per annum	< 3 per 1000 per annum
	The percentage of response time during storms to close stormwater manholes within three hours	90%	90%	90%

Table 5.8: Water levels of service

		2018 - 2028	2028 - 2038	2038 - 2048
We manage our harbours and waterways through sustainable management of the stormwater network	Auckland Council Stormwater compliance with resource consents for discharge from its stormwater system, measured by the number of: a) abatement notices; and b) infringement notices; and c) enforcement orders; and d) successful prosecutions, received in relation those resource consents	None	None	None

Table 5.9: Community services levels of service

		2018 - 2028	2028 - 2038	2038 - 2048
We provide and maintain cemeteries, memorial areas and facilities for families, friends and visitors	Percentage of visitors satisfied with the presentation of cemeteries	81%	81%	81%
We provide safe and accessible parks, reserves and beaches	The percentage of residents who visited a local park in the last 12 months	83%	83%	83%
	The percentage of the public who have used a regional park in the last 12 months	76%	76%	76%
	The percentage of park visitors satisfied with the overall quality of their visit	96%	96%	96%
	The percentage of users who are satisfied with the overall quality of local parks	73%	73%	73%
We provide library services and programmes that support Aucklanders with reading and literacy, and opportunities to participate in community and civic life	The percentage of customers satisfied with the quality of library service delivery	85%	85%	85%
We provide art facilities, community centres and hire venues that enable Aucklanders to run locally responsive activities, promoting participation, inclusion and connection	The number of participants in activities at art facilities, community centres and hire venues (million, per annum)	6.1	6.8	7.4

The 10-year Budget. Long-term Plan 2018-2028. Volume 2: Our detailed budgets, strategies and policies.

ISSN 2624-0300 (Print)
ISSN 2624-0319 (Online)

ISBN 978-1-98-855582-9 (Print)
ISBN 978-1-98-855583-6 (PDF)

3-volume set.
ISBN 978-1-98-855588-1 (Print)
ISBN 978-1-98-855589-8 (PDF)

Auckland Council
Te Kaunihera o Tāmaki Makaurau