New Plymouth District Council

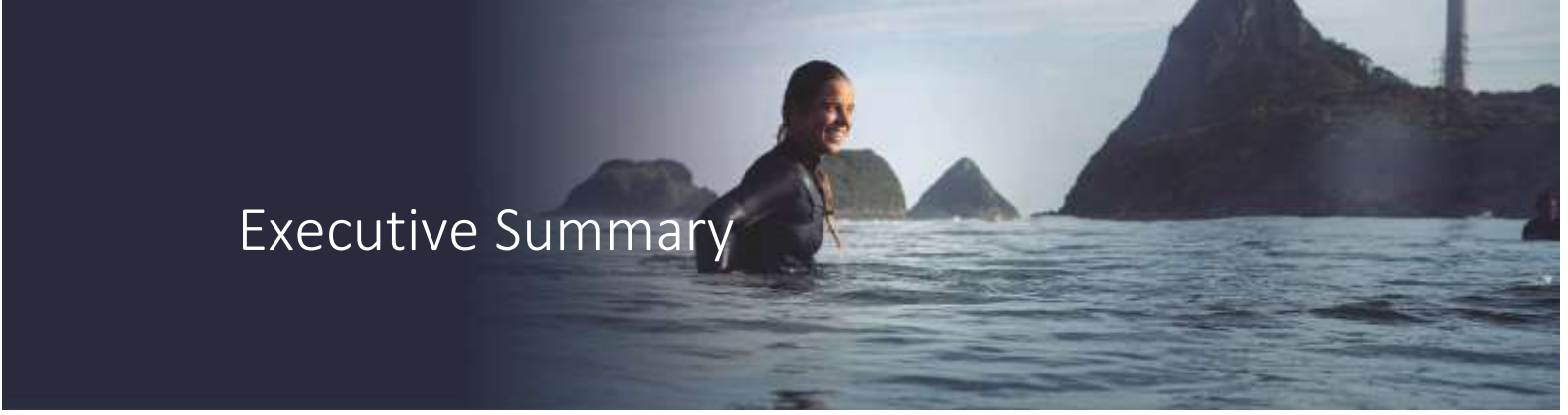
TRANSPORTATION

Asset Management Plan

2024 – 2034

Te Kaunihera-ā-Rohe o Ngāmotu
New Plymouth District Council

Contents



Executive Summary

New Plymouth residents are blessed with living in New Zealand's sunniest province and enjoy a fantastic way of life in our Sustainable Lifestyle Capital. Our farmlands are productive, world leading and sustainable, and our high-performing energy sector entices the cream of the world's workforce to live and work here.

The Purpose of the Plan

This Asset Management Plan (AMP) details information about infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The AMP defines the services to be provided, how the services are provided and what funds are required to provide over the 2024-2034 planning period. The AMP links to the 2024-2034 Long-Term Plan produced by New Plymouth District Council in 2024, and this considers a 10-year planning period.

Asset Description

This plan covers the transportation network which is a key facilitator of journeys. The transportation network comprises:

- Sealed Roads
- Unsealed Roads
- Structures
- Drainage
- Traffic Services
- Footpaths and Cycleways

The above infrastructure assets have replacement value estimated at $1,279,724,444.

Levels of Service

An increase in funding from the last LTP is required to adopt the recommended programme.

The main service consequences of not adopting the recommended programme include:

- Users of high-volume roads will have a worse travel experience.
- The number of fatal and serious injury crashes will increase.
- Unplanned events will close more roads.
- Poor economic decisions and funding will not be available to operate, maintain and renew assets.
- Poor communication will result in decision makers rejecting applications, sub-optimal decision making and projects not proceeding.
- Increase in motor vehicle usage, will result in poor health outcomes, no alignment with global and national environmental sustainability targets and unattractive urban spaces.

Future Demand

The factors influencing future demand and subsequent impacts on service delivery are created by:

- Population growth and decline
- Demographic change
- Change in land use.
- Economic growth and Waka Kotahi's view (Arataki)
- Modal change
- Development of recreational areas
- Future customer expectations
- Increase in freight including logging trucks
- Climate change impacting network resilience

These demands will be approached using a combination of manging existing assets, upgrading existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risk and managing failures.

- Utilise the Integrated Transport Framework currently in development
- Forward planning to provide appropriate and accessible transportation access to parks and open spaces
- Infrastructure audits of road, footpaths, and crossings to determine their suitability for an ageing demographic
- The establishment of a transportation reference group to support the forward planning of transportation infrastructure
- Respond to and deliver infrastructure improvements that will support the mobility movement of ageing persons
- Lowering levels of service for footpaths and sealed pavements

Lifecycle Management Plan

What does it cost?

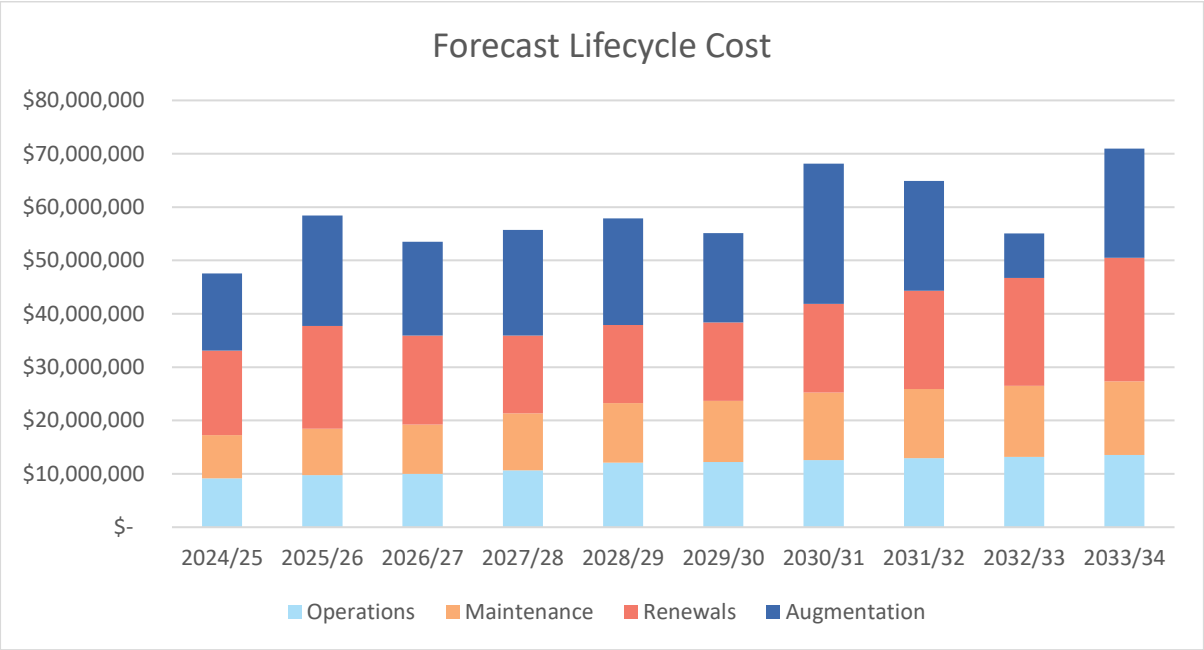
The forecast lifecycle costs necessary to provide the services covered by this AMP includes operation, maintenance, renewal, acquisition (augmentation), and disposal of assets. Although the AMP may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AMP is the forecast of 10-year total outlays, which for the Transportation asset class is estimated as $587,247,506 or $58,724,751 on average per year.

Financial Summary

What we will do

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. The informed decision making depends on the AMP emphasising the consequences of Planned Budgets on the service levels provided and risks.

Due to large inflation costs, an increase in budget from the last NLTP is required to provide the same level of service. Figure values include predicted inflation. This is subject to NZTA funding allocation.



We plan to provide transportation services for the following:

- Operation, maintenance, renewal and acquisition of roads, structures, drainage, footpaths/cycleways and traffic services to meet service levels set by NPDC in annual budgets.
- Road to Zero Projects
- Local Road Improvement Projects
- Walking and Cycling Projects
- Road extensions, road widenings and geometric improvements

What we cannot do

If there is a shortfall between available funding and the recommended programme, the council will take a risk-based approach when planning activities by utilizing the One Network Framework. Areas with a higher place and movement rating will be prioritised first as this will provide the best value for money. Things we can no longer afford to do include:

- Maintaining percentage of poor and very poor footpath condition below 1% - new target of 3%
- Maintaining average Smooth Travel Exposure above 90% - new target of 85% minimum

Managing the risks

An increased budget from last NLTP is required to maintain the same level of service.

The main risk consequences are:

- Users of high-volume roads will have a worse travel experience.

- The number of fatal and serious injury crashes will increase.
- Unplanned events will close more roads.
- Poor economic decisions and funding will not be available to operate, maintain and renew assets.
- Poor communication will result in decision makers rejecting applications, sub-optimal decision making and projects not proceeding.
- Increase in motor vehicle usage, will result in poor health outcomes, no alignment with global and national environmental sustainability targets and unattractive urban spaces.

We will endeavour to manage these risks within available funding by:

- Prioritising available funding to critical assets or critical routes
- Prioritising available funding based on ONF classification (higher classification – higher level of service)
- Undertaking appropriate engagement to manage community expectations

Monitoring and Improvement Programme

Key assumptions made in this AMP are:

- Inflation between December 2019 and July 2024 is predicted to be 30% which has huge cost implications on delivery.
- There is a primary focus on resilience in the wake of Cyclone Gabrielle and the GPS – this includes an increase in activities such as:
    - Increased drainage maintenance
    - Increased resurfacing (waterproofing)
    - Removal of hazardous trees
- Assets with an unknown condition rating do not affect renewals forecasts (complete condition assessments included in improvement plan)

Assets requiring renewal are identified from either the asset register or through deterioration modelling.

- The timing of capital renewals based on the asset register is applied by adding the useful life to the year of acquisition or year of last renewal,
- Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems and may be supplemented with, or based on, expert knowledge.

Both methods were used to forecast the renewal lifecycle costs for this AMP.

This AMP is based on a data confidence rating of 'B' Minor Inaccuracies with an accuracy range of about 10% as per the IPWEA A-E confidence grading system. This is considered reliable.

The next steps resulting from this AMP to improve asset management practices are:

- Complete condition ratings on all asset classes
- Increase resurfacing programme.
- Increase drainage maintenance.
- Increase in environmental renewals.
- Renew hazardous concrete lighting poles.
- Remove hazardous trees

1. Introduction

Contents

1.1. Background

This Transportation AMP outlines how New Plymouth District Council (the Council) will contribute to the community outcomes and priorities identified in the 2021-2031 Long Term Plan (LTP or the 10 Year Plan). It sets out the rationale for investment in and activities on the Council's transportation network and how the Council will deliver the services required for the district's ratepayers and road users to go about everyday business and life.

This document follows Waka Kotahi's Activity Management Planning[1] guidance, and therefore describes how the Council's Transportation Team will maintain, operate and plan for transportation activities. This approach helps the Council and Waka Kotahi determine that the right work is being done at the right time and for the right reasons.

1.2. The New Plymouth District

The New Plymouth district (the district) is on the west coast of the North Island facing the Tasman Sea, north of the Stratford district and South Taranaki district, and south of the Waitomo district.

With an area of 2,324km^2, the district is the tenth largest district in New Zealand (NZ). It is made up of New Plymouth city (the city), the largest centre, and several surrounding settlements that support smaller communities and lifestyle living. The city is the focus for the Taranaki's (or the region's) economy, which is dominated by dairy farming, oil, natural gas and petrochemical exploration. The city is also the region's financial centre and home to Port Taranaki – the only deep-water port on the west coast of NZ.

It is well known that New Plymouth serves as the region's tourism centre. New Plymouth Airport is a significant regional airport in New Zealand, which is located 11 kilometres north of the city centre.

The district is currently experiencing high population growth and is expected to grow by 8.3% over the next 10 years meaning that New Plymouth's population of 86,700 in 2021 is forecast to have a population of 93,000 by 2031. The population is expected to increase to approximately 105,000 by 2050 showing a 21% increase from the population in 2021. A significant proportion of those residents will be aged 65 years and over (from 19% (16,473) in 2021 to approximately 30% (31,470) in 2051). To support a vibrant and resilient district well into the future, it is important that infrastructure assets are managed both prudently and sustainably through future periods of growth and other pressures.

[1] https://nzta.govt.nz/planning-and-investment/learning-and-resources/business-case-approach-guidance/how-to-use-the-business-case-approach/activity-management-plan-example-tool/

Figure 0-1 below shows the extent of the New Plymouth district.

FIGURE 0-1 - EXTENT OF THE NEW PLYMOUTH DISTRICT

1.3. The Transportation Network

The transportation network is a key facilitator of journeys. It enables the movement of people and goods (via freight) to make national, regional and local road journeys effectively, efficiently and safely, which in turn helps support a thriving NZ. At a national level it connects New Plymouth to other cities, producers and markets, air and seaports and supports NZ's global competitiveness. Locally, it connects businesses, communities, families and friends with customers, services, work, play and each other. The districts transportation network is shown below in **Figure 0-2**.

FIGURE 0-2 - MAP OF THE DISTRICT'S ROADING NETWORK

The forming, surfacing, sealing, grading of roads and road shoulders, along with traffic management and control devices, allows for safe, efficient and sustainable travel by motor vehicles, cyclists and pedestrians. Streetlights are provided for the safety of all road users during night-time hours.

While there is a legal requirement, there is also a community expectation - demonstrated by consultation, complaints and requests - that the Council will ensure regulatory compliance to maintain a safe and healthy community and to ensure environmental standards are met.

This Transportation AMP covers the Council's transportation assets, including the following:

1. **Pavements** (includes Sealed and Unsealed roads)
   The total length of the NPDC roading network is 1,309km as classified by the ONF (see **Section 6.2** below).

2. **Structures** (includes bridges, large culverts and retaining walls)
   The Council owns a total of 255 bridges including tunnels and large diameter culverts (>3.4m^2 cross sectional area) and 326 retaining walls in the transportation network.

3. **Stormwater drainage** (includes kerb and channels, road culverts, surface water channels and berms)
   Stormwater drainage assets consist of different types of open or piped facilities. The Council owns approximately 2,443km of kerbs and channels located predominantly in the urban area, and approximately 65km of culverts (with cross sectional area <3.4m^2) predominately in the rural environment. Although kerbs and channels are almost exclusively located in the urban

network, they are sometimes used as an alternative to water tables in the rural areas where verge space is restricted or to avoid cutting a batter.

4. **Traffic services** (includes traffic signals, streetlights, traffic signs, traffic control devices, safety barriers and bus shelters)
   These are summarised as follows:
   - Features: 34 asphaltic, bluestone and concrete speed humps
   - Islands: 325 islands
   - Road markings: 486km
   - Traffic signals: 25 (urban) locations[2], six of which are NPDC's own installations and the remaining 19 are State Highway installations. The 19 sets managed on behalf of Waka Kotahi are located at intersections within the State Highway network.
   - Street lighting: 11,111 lanterns owned by NPDC in the district. Lighting for roads has three categories, namely carriageway, amenity and flag lighting. For safety reasons standalone lighting is usually on high poles.

5. **Footpaths and cycleways** (includes pedestrian access ways and road berms)
   The Council owns footpaths covering a total surface area of approximately 882,000m^2. This includes steps, crossings and berms related to footpaths. Most footpaths are constructed of concrete or seal, apart from in the New Plymouth Central Business District (CBD) where for a higher amenity value clay pavers, blue stone and interlocking blocks have been installed.

6. **Environmental and emergency works** (includes environmental protection activities and emergency response works).

1.4. Background

An Asset Management Plan (AMP) follows a business case approach that clearly defines the problems and contextual state of the district and understanding of the cause, and scale of benefits of addressing the problems. The AMP approach filters whether a problem is worth investing more time and resources going forward. The business case approach is based on the Better Business Case guidance prepared by the NZ Treasury as illustrated below in **Figure 0-3**.

[2] https://www.npdc.govt.nz/services/transportation/maintenance/traffic-lights/

FIGURE 0-3 - NZ TREASURY BUSINESS CASE APPROACH

The business case also seeks to make sure during the lifecycle of a programme that the reasons for doing it are still sound, and that it clearly links back to the organisation's infrastructure and other organisational priorities and issues and delivers agreed Levels of Service.

1.5. Asset Management Plan Development

AMPs form the cornerstone of an effective asset management system. The ISO 55000 series of standards for asset management clearly defines the importance of AMPs: they provide the roadmap for achieving value from physical assets by optimising cost, risk and performance across the asset lifecycle.

AMPs define the implementation activities necessary to realise an organisation's activity management objectives which translate the strategic intent of the organisation. The relationship and interdependencies of asset management policy, strategy, objectives, and planning to achieve those objectives clearly demonstrates how important organisational alignment is to the creation of AMPs.

The Council implemented an Asset Management Policy in 2019 that provides a framework for consistent practise of asset management within the organisation. The outcomes targeted by the Asset Management Policy are:

"1. Ensuring our assets are resilient and continue to meet the needs of our community.

2. Ensuring that we maintain the condition of our infrastructure assets to make sure they perform as required.

3. Investing in infrastructure assets so we can service a growing number of residents and businesses to ensure the district remains an affordable and desirable place to live".

The Asset Management Policy has been updated to better align with the Council's updated vision (see Section 2: Strategic Case)

The multidisciplinary Asset Management Steering Group (AMSG) is tasked with the delivery of the Asset Management Policy. The current focus of the AMSG is to review the Asset Management Policy and group terms of reference, develop and implement an overarching asset management framework and to drive asset management improvements into the organisation.

1.6. Implementation of the Asset Management Plan

The Infrastructure Group is largely responsible for managing the resources to implement and deliver the activities included in the AMP.

The Infrastructure Manager is responsible for day-to-day operations, and maintenance, renewal and augmentation of the transportation systems in accordance with the LTP, Annual Plan and AMP. The Infrastructure Manager is also responsible for overall management of resources to achieve plans, including the balance of internal and contract resources.

The Transportation Manager is responsible for the delivery of day-to-day operations, and maintenance and renewals of the transportation network, including managing internal and contract resources. The Network Delivery Lead in the Transportation Team has a team of contract engineers responsible for coordinating and managing the internal and external resources required for delivery.

1.7. One Network Approach

Putting the customer at the heart of business has informed the adoption of a One Network Approach to the way the Council works with its partners to plan, maintain, operate and develop the transport system. The One Network Approach recognises that customers desire efficient journeys across the transport system, irrespective of which agency is responsible for that aspect of the journey.

1.8. One Network Framework

Te Reinga Maimoa (a collaborative initiative between Waka Kotahi, Local Government NZ and Road Controlling Authorities (RCA) of NZ) developed the One Network Framework (ONF). The One Network Framework (ONF) acknowledges that streets serve as locations for people to live, work, and enjoy themselves in addition to being conduits for the movement of people and products. The ONF is made to increase community vitality and liveability while also enhancing traffic safety. The ONF categorises roads into 12 functional categories within two street families (urban and rural). The urban family consists of (Local Streets, Urban Connections, Activity Streets, Civic Spaces, Main Streets, City Hubs and Transit Corridor). The rural family consists of (Rural Roads, Rural Connections, Peri-Urban, Stopping Places, Interregional Connections)

1.9. Relationship with other Plans and Documents

AMPs are a key component of the strategic planning and management of the Council, with links into the areas illustrated in **Figure 0-4**.

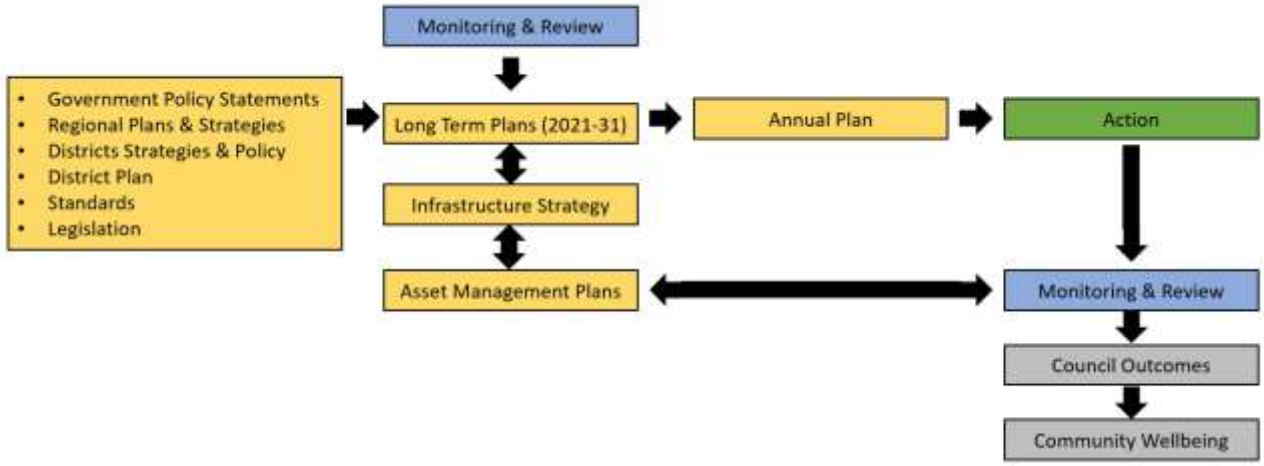


FIGURE 0-4 - INTEGRATED PLANNING FRAMEWORK AND LINKAGES

Table 1-0-1 shows the cyclic planning relationships between AMPs and plans, reports and other documents. Further information is provided in Section 2: Strategic Case of this AMP.

TABLE 1-0-1 - CYCLIC PLANNING RELATIONSHIPS WITH PLANS, REPORTS, AND OTHER DOCUMENTS

Plans/Documents	Description	Frequency
Government Policy Statement on land transport (GPSLT)	The GPSLT sets out the Government's priorities for expenditure from the National Land Transport Fund over the next 10 years.	The GPSLT is updated every three years. The 2024 GPSLT is under development at present.
Long Term Plan (LTP)	The LTP sets out the Council's agreed vision and outcomes for the district. The framework of the LTP is in line with the requirements of the Local Government Act 2002 (LGA). The LTP will assist the Council in promoting sustainable practices as well as assisting the community to determine over time what 'outcomes' could and should be, and links to the Council's vision.	The LTP is updated every three years and is currently being updated for issue later in 2024.
Annual Plan	The works identified in the AMP should automatically become the basis on which future Annual Plans are prepared.	Must be produced in the intervening years between LTPs as a reflection of the corresponding year of the 10 Year Plan. Every third year the Annual Plan is embedded in the LTP.

District Plan	The District Plan is the primary document that manages land use and development within NPDC's territorial boundary. It contains rules that relate to development or land use proposals.	As required under the Resource Management Act 1991 (RMA).
Contracts	The service levels, strategies and information requirements contained in the AMP become the basis for performance orientated contracts for service delivery.	As required.
Annual Report	The Annual Report is the mechanism to report back to the community, showing the Council's achievements against Annual Plan and LTP targets.	Must be produced every year to report progress against LTP outcomes and work programmes.
AMPs	Levels of Service, growth, risk, maintenance, renewal and development works and strategies are identified and budgeted for within AMPs. This information automatically feeds into the LTP.	Should be reviewed and aligned every year prior to the LTP and Annual Plan process – reviewed every three years (minimum).

1.10. Scope of this Asset Management Plan

The scope of this AMP is detailed below in **Figure 0-5.**

FIGURE 0-5 - SCOPE OF THIS AMP

Executive summary	Summary of core components of all the sections below, which is separate for publication and distribution to elected representatives, the community and council staff.
Introduction	Overview of the area / region, brief statistics such as population, employment and the economy. A snapshot of the transport activity is also summarised to provide the reader with a quick understanding of the extent of services provided.
Strategic Case	Outlines the vision, goals and objectives of the asset group. Corporate strategic initiatives and community outcomes are linked to demonstrate how the transport activity contributes, and the rationale for Council's involvement. Key business drivers, linkages to strategic documents, key partnerships and stakeholders are also covered in this section.
Customer Levels of Service	Levels of Service define the quality of the delivery of the transport activity against which service performance can be measured. Infrastructure planning enables the relationship between Levels of Service and the cost of the service (the price / quality relationship) to be determined. The relationship can then be evaluated in consultation with the community to determine the required Levels of Service minimum requirement that the customer is prepared to pay for. Service standards provide the basis for the lifecycle management strategies and work programmes.

	This section sets out the strategy that the asset owner will adopt in relation to its infrastructure assets. The 'key demand drivers' that influence growth and demand are assessed in detail, as well as the impacts and management thereof, with a view to forward planning so that the needs of individuals, communities and the contribution to the wider region can be sustained.
	This section describes the core business and key service providers and their roles and responsibilities in delivering services. The organisational structure that supports these services externally and internally is also detailed. An overview of expenditure and funding needs is also included to provide a snapshot of current and future needs.
	The Lifecycle section provides the broad strategies and work programmes required to achieve the goals and standards outlined in the AMP. This section presents the Life Cycle Management plan for each asset group, including the following: A detailed description of the assets in physical terms, key issues, Levels of Service and risks, operations, maintenance, renewal and development strategies.
	The Projects and Financial Forecasts section outlines the short term (three year), medium term (five year) and long term (10 year) financial requirements for the operation, maintenance, renewal and capital needs for transport, based on long term strategies and Levels of Service outlined earlier in the AMP. Funding sources and potential issues are identified and key assumptions in preparing financial forecasts are noted. A summary of asset valuation by asset group is also outlined.
	This section covers the key business processes in place that supports asset management and the strategic risk management implemented by the asset owner relevant to the transport activity. This includes an assessment of Information Technology (IT) and business systems, an overview of business continuity planning, emergency management and business risk associated with the ownership and management of the infrastructure assets. The AMP is also assessed against the Office of the Auditor General's Criteria for advanced asset management (NZ) plus any relevant legislation or industry standards. The key to ongoing success is to plan, review and monitor the ongoing update of the AMP, including key milestones and responsibilities. How the organisation intends to do this is documented in this section.
	The Improvement Plan is integral to continually improving processes and practices to ensure the ongoing development of Asset Management practices towards an appropriately advanced level. It qualifies current business practice, identifies indicative timescales, priorities, and human and financial resources required, and measures progress toward an identified future position. A full gap analysis across the transportation activity has been undertaken, which targets and drives business improvement and therefore delivers goals and outcomes.

2. Strategic Case

Contents

2.1. Introduction

This section provides the strategic context for the transportation activity. It outlines the relevant legislative and strategic objectives, and the key partners and stakeholders for the transportation activity.

Figure 0-1 illustrates how strategic documents align for the transportation activity. It shows how the LGA and Land Transport Management Act 2003 (LTMA) align with the relevant strategic documents at the national, regional and local level that influence the development of the Transportation AMP, Levels of Service and the delivery of the transportation activity.

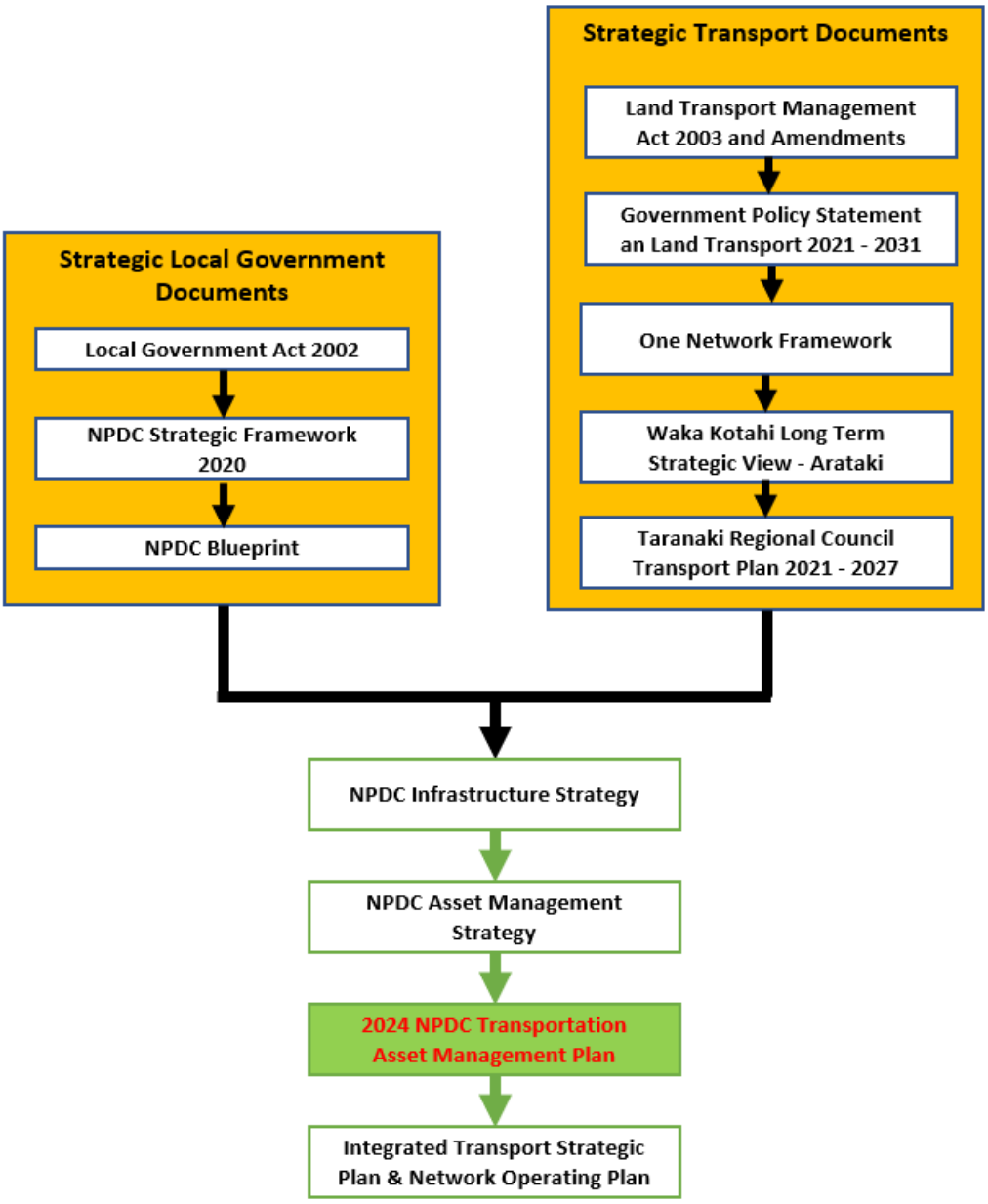


FIGURE 0-1 - STRATEGIC ALIGNMENT BETWEEN NATIONAL, REGIONAL, AND LOCAL DOCUMENTS

2.2. Strategic Transport Documents

2.2.1 Land Transport Management Act 2002 and Amendments

The LTMA sets out requirements and process for development of the Council's Land Transport Programme, provides a framework for receiving funding from Waka Kotahi and allows for the establishment of future toll roads under certain conditions. The LTMA also requires the Minister of Transport to issue a Government Policy Statement (see **Section 2.2.2**).

2.2.2 Government Policy Statement

The Indicative Government Policy Statement on Land Transport (GPS 2024) 2024/25 – 2033/34 was published in February 2023 and outlines the Government's strategy for land transport investment through the National Land Transport Fund. It guides investment over the next 10 years and provides guidance to decision makers about where the Government will focus resources, consistent with the purpose of the LTMA. The GPSLT is issued by the Minister of Transport every three years and has recently been drafted following the public consultation period.

The GPSLT sets out four strategic priorities to guide investment as shown in **Figure 0-2**.

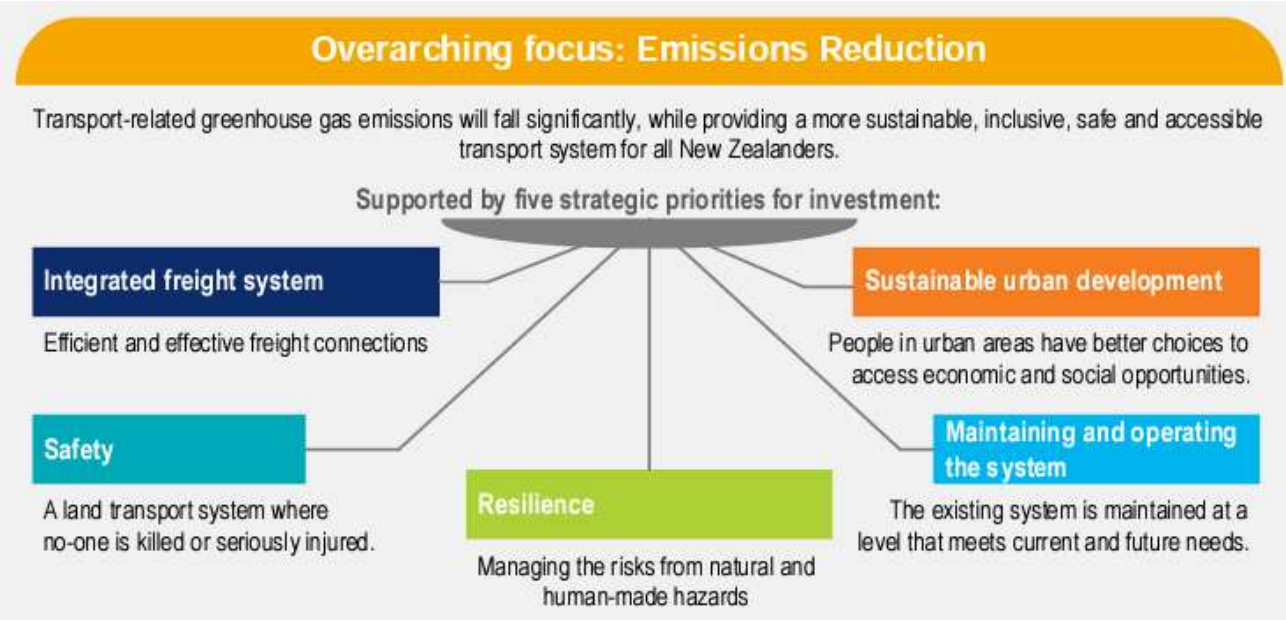


FIGURE 0-2 - GPSLT STRATEGIC PRIORITIES FOR INVESTMENT (GPSLT)

These strategic priorities are underlined by the following key themes throughout the GPS:

- Inclusive access – New Zealand will transition towards a more equitable and affordable transport system.
- Healthy and safe people – reduced exposure to high concentrations of land transport related air pollution, increased safety for alternative modes such as walking and cycling.
- Resilience and security – implementation of the National Adaptation Plan to manage the impacts of climate-related impacts on critical infrastructure.

2.2.3 Waka Kotahi's Long Term Strategic View – 2021-2031

Arataki sets out Waka Kotahi's 10-year view of what is needed to deliver on the Government's current priorities and long-term objectives for the land transport system. Arataki is made up of place-based summaries (one national, three pan-regional and 14 regional) that tell a land transport system story. These are framed by five step changes (improve urban form, transform urban mobility, significantly reduce harms, tackle climate change and support regional development) where the need for change has been identified. These step changes are in response to six key drivers that will shape the future of land transport (demographic change, climate change, technology, customer desire, changing economic structure and funding challenges). All of these inform what the Council needs to do across six levers (policy and regulation, spatial and place-based planning, network design and optimisation, investment, economic tools, education), either directly or in partnership with others to deliver the Government's objectives for the land transport system. **Figure 0-3** shows Waka Kotahi's strategic approach.

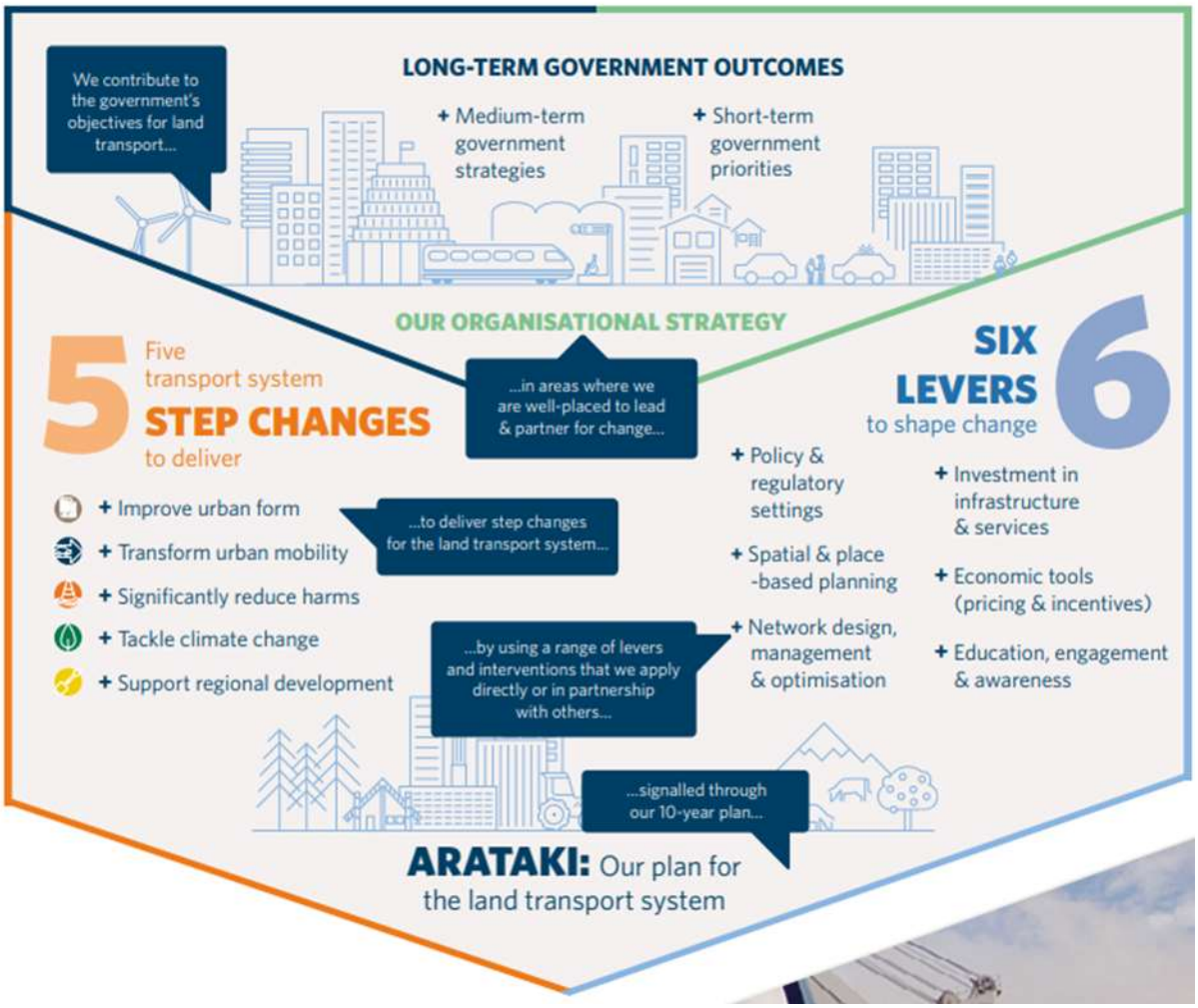


FIGURE 0-3 - WAKA KOTAHI STRATEGIC APPROACH (WAKA KOTAHI)

At a glance the focus of Waka Kotahi in Taranaki is to help create a safer, more resilient transport system that supports economic and regional growth, encourages increased use of public transport, walking and cycling in New Plymouth across all transportation networks. Further information is provided in Section 4: Growth and Demand of this AMP.

Arataki Version 2 considers the impacts of the COVID-19 pandemic over the next 10 years on the economic structure and demographic change, as these are two key drivers on the land transport system. Given the relative resilience of the Taranaki economy, no significant changes are expected in the nature, scale and location of transport demand over the medium to long term. The 10-year outlook remains largely unchanged.

2.2.4 Waka Kotahi Arataki – Taranaki Regional Summary

Arataki outlines the context for change, current and future pressures on the land transport system, how these pressures will shape the land transport system and the challenges and opportunities that Waka Kotahi and its partners need to consider and respond to. The key step changes and areas of focus outlined for the Taranaki region in 2021-2031 are:

- Improved urban form: the shared pathway will enhance existing communities, supports an increase in active mode use and improves the safety of the transport system
- Transform urban mobility: The shared pathway will support improvements to walking and cycling networks
- Significantly reduce harms: the shared pathway will provide a separated facility for walking and cycling
- Tackle climate change: The shared pathway supports low carbon emission transport

2.2.5 Ministry of the Environment Emissions Reduction Plan

The first New Zealand emissions reduction plan was published in May 2022, and it contains strategies, policies and actions for achieving the first emissions budget, required by the Climate Change Response Act 2002. It identifies transport as one of the largest sources of greenhouse gas emissions in New Zealand (at 17 per cent of gross emissions) and therefore identifies the following key actions:

- Reduce reliance on cars and support people to walk, cycle and use public transport including by:
    - Improving the reach, frequency and quality of public transport and making it more affordable for low-income New Zealanders
    - Increasing support for walking and cycling, including initiatives to increase the use of e-bikes.
    - Ensuring safer streets and well-planned urban areas.

2.2.6 One Network Framework

The One Network framework (ONF) recognises that streets not only keep people and goods moving, but they're also places for people to live, work, and enjoy. The ONF is designed to contribute to improving road safety and building more vibrant and liveable communities. Movement and Place has many uses at the strategic network planning and development level, as well as at the detailed

project level. It marries network-wide and local considerations. At its heart, the ONF organises transport links by their place and movement roles into road and street types. The ONF is a tool to help establish priority uses, performance measures and potential interventions for each road and street type. The new street families are shown below in **Figure 0-4**.

FIGURE 0-4 - ONF STREET FAMILIES

2.2.7 Taranaki Regional Council Land Transport Plan

NPDC has been working with Taranaki Regional Council (TRC) to develop the Regional Land Transport Plan (RLTP) for Taranaki 2024-2030, however this document has not yet been completed and therefore this AMP relies upon the 2021-2027 version. The **vision** of the 2021-27 document is:

"A vibrant, resilient and connected region, with safe roads and liveable places".

The six-transportation focused **strategic objectives** are:

1. **Integrated** – An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness.
2. **Enabling** – An effective, efficient and resilient land transport system that enhances economic wellbeing, growth and productivity in the Taranaki region and beyond.
3. **Safety** – A safe transport network increasingly free of death and serious injury.
4. **Accessible** – A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.

5. **Resilient and responsive** – A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
6. **Environmentally sustainable** – An energy efficient and environmentally sustainable land transport system."

The **headline targets** that have been set for the next 10 years (to 2031) to focus on specific elements of the RLTP's 30-year Vision are:

1. **Improving safety** – A reduction in deaths and serious injuries.
2. **Increasing mode shift** – More trips made by walking, cycling and public transport throughout the region.
3. **Improving reliable connectivity** – Less travel disruption for road traffic

A series of policies and measures (methods) have been identified by TRC to achieve the objectives identified above.

2.3. Strategic Local Government Documents

2.3.1 Local Government Act 2002 and Amendments

The LGA sets the statutory requirements for:

- Establishing minimum Levels of Service standards
- Frequency of reviewing Levels of service standards
- Degree of community consultation and level of information provided
- Mandatory performance measures for five infrastructure activities, including transportation
- Requirement to review the cost-effectiveness of the current arrangements for meeting needs of the community
- Identification of council outcomes and priorities for the district or region
- Frequency of the preparation and adoption of the LTP
- Mandatory preparation and adoption of a 30-year Infrastructure Strategy that underpins each LTP

The LGA brought about some significant changes to the way councils operate, with a focus on community consultation and participation and the promotion of social, economic, environmental and cultural wellbeing of communities in the present and in the future.

The enactment of the LGA Amendment Act 2010 has seen a focus towards improved transparency, accountability and financial management, with emphasis in Schedule 10 on financial reporting. Section 3 (1) of Schedule 10 requires that council's report in the LTP the capital expenditure (CAPEX) budgets to:

1. Meet additional demand for an activity
2. Improve the Level of Service
3. Replace existing assets

This has implications for asset management planning, which must address:

- Demand – In relation to estimated additional capacity and the associated costs and funding sources. Section 4: Growth and Demand of this AMP covers this in more detail.
- Levels of Service – Intended Levels of Service performance targets and other measures by which actual Levels of Service provision may be meaningfully assessed, and the estimated costs of achieving and maintaining identified Levels of Service, including sources of funding. Section 3: Levels of Service of this AMP covers this in more detail.
- Renewals – Including maintenance renewal and upgrades. This is covered in considerable detail in Section 6: Lifecycle of this AMP.

The LGA Amendment Act 2014 requires the development of an Infrastructure Strategy to identify significant infrastructure issues for councils over a 30-year period, the principal options for managing those issues, and the implications of those options. AMPs provide key inputs into the LTP, supporting LTP functions and forecasts as well as providing certain information for the Infrastructure Strategy. Infrastructure assets not only provide an essential platform for economic advancement, but also increasingly deal with recreational, artistic and cultural pursuits to support the wellbeing of communities.

2.3.2 New Plymouth District Council's Strategic Framework 2023

The Council's Strategic Framework is set out below.

The **Vision** is a:

Sustainable lifestyle capital

The **Mission** statement is:

To provide our people with an innovative and resilient district that restores mauri, protects our environment and supports a successful economic transition, while providing quality infrastructure and leadership through operational excellence

The Goals are:

Trusted	Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.
Thriving communities and culture	Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori

Environmental excellence	Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.
Prosperity	Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and economic performance.

Three guiding themes have been identified to guide the Asset Management and Network Planning Team and to prioritise investment in asset infrastructure over the 10-year period of the AMP. The Three themes have been translated into specific asset management objectives as detailed as follows:

1. **Resilience and adapting to climate change.** As we grow, build new assets and renew our existing infrastructure we must ensure we build in resilience to issues from natural hazards including, volcanic and seismic activity, sea level rise, coastal erosion, flooding events and droughts, along with the forecast impacts of climate change. Wherever possible our solutions should work with the natural environment and existing features of the landscape.
2. **Providing for sustainable growth and the changing needs of our community.** It is important that we manage infrastructure provision in existing and developing areas of the district to support:
    a. population growth
    b. the aspirations of Māori
    c. the changes driven by different demographics
    d. evolving ways of working; and
    e. improving environmental outcomes.
3. **Ensuring our existing assets remain fit for purpose.** We need to ensure that we invest in maintaining, renewing or replacing our existing infrastructure assets to preserve and extend their useful life while ensuring that the assets also:
    a. meet the changing needs of the community
    b. respond to increasing standards for public health and safety
    c. reflect Te Ao Māori by working with, and improving, our natural environment
    d. mitigate our impact on climate change.

2.3.3 New Plymouth District Council Long Term Plan 2021

Information for the LTP is provided in **Table 1-1** in **Section 1: Introduction** of this AMP and **Section 2.3.1** above.

2.4. Local Government Strategy Documents

2.4.1 New Plymouth District Council Infrastructure Strategy

NPDC's Infrastructure Strategy provides strategic direction for infrastructure assets. The Infrastructure Strategy identifies the significant infrastructure issues the district is likely to face over the next 30 years. The Infrastructure Strategy is not a 30-year budget. Rather, it takes a long-term view of the infrastructure and services communities will need over time, and how the Council might provide them.

As well as identifying the key issues, the Infrastructure Strategy details the options for managing these issues and the implications of each of these options. The Infrastructure Strategy identifies the four guiding drivers (see **Section 2.3.2** above), which has led to the following General Infrastructure Problem Statements:

Resilience and adapting to climate change

As we grow, build new assets and renew our existing infrastructure we must ensure we build in resilience to issues from natural hazards including, volcanic and seismic activity, sea level rise, coastal erosion, flooding events and droughts, along with the forecast impacts of climate change. Wherever possible our solutions should work with the natural environment and existing features of the landscape.

Providing for sustainable growth and the changing needs of our community

It is important that we manage infrastructure provision in existing and developing areas of the district to support:

1. population growth
2. the aspirations of Māori
3. the changes driven by different demographics
4. evolving ways of working; and
5. improving environmental outcomes.

Ensuring our existing assets remain fit for purpose

We need to ensure that we invest in maintaining, renewing or replacing our existing infrastructure assets to preserve and extend their useful life while ensuring that the assets also:

1. meet the changing needs of the community
2. respond to increasing standards for public health and safety
3. reflect Te Ao Māori by working with, and improving, our natural environment
4. mitigate our impact on climate change.

2.4.2 New Plymouth District Council Asset Management Strategy

The Asset Management Strategy is a high-level overview of the Council's asset management system, policy, plans, lifecycle management, data, improvement programme and risk management processes. It summarises the strategic approach for the significant activity areas, being

Transportation, Parks and Open Spaces, Property, Stormwater and Flood Protection, Wastewater, Water Supply, and Waste Management and Minimisation, and describes the general principles that are applied to all types of assets.

2.4.3 Network Operating Plan and Integrated Transport Framework

The Council has been working on two transport projects to determine how to plan and manage transport for the district over the short- and long-term periods. The short-term planning has been captured in the New Plymouth Network Operating Plan and the long-term planning has been captured in the New Plymouth Integrated Transport Framework.

The Network Operating Plan is a multi-modal transport planning tool that helps to prioritise transport projects throughout the network. The Integrated Transport Framework focuses on the implications of the district's growth and the strategic responses required to meet transport needs over the next 30 years. The project is ongoing; however, the ILM process undertaken at the start of the project has been used to inform the Level of Service measures in **Section 3: Levels of Service** of this AMP.

2.4.4 New Plymouth Accessibility Strategy (2021)

The Accessibility Strategy outlines the goals to create an accessible built environment that promotes social, economic, environmental and cultural well-being. A key component of this is transport accessibility, with the strategy supporting:

- Providing affordable, safe, sustainable and easy transport options
- Additional investment in bus stops, end of journey facilities, shared paths and cycle lanes
- Divesting from private transport and supporting alternative transport options to avoid congestion
- Encouraging a change in transport behaviour

2.4.5 Linkages between National, Regional, and Local Outcomes

The clear links between the GPS strategic priorities, ONRC customer outcomes, the RLTP and the Council's goals identified above are provided in Table 2-0-1.

TABLE 2-0-1 - LINKAGES BETWEEN NATIONAL, REGIONAL, AND LOCAL OUTCOMES

GPSLT Strategic Priorities	ONRC Customer Outcomes	RLTP Objectives	Council Goals
Safety: A land transport system where no one is killed or seriously injured.	**Safety**: How road users experience the safety of the road.	**Safe**: A safe transport network increasingly free of death and serious injury	**Thriving Communities and Culture:** Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori

Sustainable urban development: People in urban areas have better choices to access economic and social opportunities	**Accessibility**: The ease with which people are able to reach key destinations and the transport networks available to them, including land use access and network connectivity. **Amenity**: The level of comfort experienced by the road user and the aesthetic aspects of the road environment that impact on the travel experience of road users in the road corridor.	**Accessible**: A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation. **Integrated:** An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness. **Environmentally sustainable**: An energy efficient and environmentally sustainable land transport system.	**Trusted**: Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.
Resilience: Managing the risks from natural and human made hazards	**Resilience**: The availability (and restoration) of service to users of each road when there is a weather or emergency event, whether there is an alternative route available, and the information provided to the road user.	**Resilient and responsive**: A transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.	**Environmental excellence**: Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.
Integrated freight system: Efficient and effective freight connections **Maintaining and operating the system**: The existing system is maintained at a level that meets current and future needs	**Reliability**: The consistency of travel times that road users can expect. **Cost efficiency**: Value for money and whole of life cost will be optimised in the delivery of affordable customer Levels of Service.	**Enabling**: An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth and productivity in the Taranaki region and beyond.	**Prosperity**: Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and economic performance.

2.5. Other Key Legislation, Policy, and Planning Documents

The following sections provide details for the relevant documents listed below:

- Statues
- National standards, strategies and statements
- Regional infrastructure vision
- NPDC policies, standards, strategies and guidelines

2.5.1 Statutes

Resource Management Act 1991 and Amendments

The RMA is NZ's primary legislation dealing with the management of natural and physical resources. It provides a national framework to manage land, air, water and soil resources, the coast, subdivision and the control of pollution, contaminants and hazardous substances.

In terms of transportation assets compliance with provisions of district and regional plans:

- Resource consents are obtained and / or renewed for all activities requiring a consent, including temporary activities
- All consent conditions are fulfilled, and any monitoring is carried out

Resource Management Act Reform

The Government plans to repeal the Resource Management Act and enact three new pieces of legislation this parliamentary term. The new laws are:

- Spatial Planning Act (SPA): Which requires the development of long-term regional spatial strategies to help coordinate and integrate decisions made under relevant legislation
- Natural and Built Environment Act (NBA): The main replacement for the RMA, to protect and restore the environment while better enabling development
- Climate Adaptation Act (CAA): To address complex issues associated with managed retreat, and funding and financing climate adaptation.

The Natural and Built Environment Bill and Spatial Planning Bill were introduced to Parliament on 15 November 2022. The Climate Change Adaptation Bill is likely to follow in 2023.

Civil Defence Emergency Management Act 2002 and Amendments

The Civil Defence Emergency Management Act 2002 requires councils to maintain and annually review emergency management plans that are accepted as being suitable by an independent review.

Building Act 2004 and Amendments

In NZ, the building of houses and other buildings is controlled by the Building Act 2004. It applies to the construction of new buildings as well as the alteration and demolition of existing buildings.

Health and Safety at Work Act 2015 and Amendments

The objective of the Health and Safety at Work Act 2015 is to promote the prevention of harm to all people at work, and others in, or in the vicinity of, places of work. The Act applies to all NZ

workplaces and places duties on employers, the self-employed, employees, principals and others who are in a position to manage or control hazards.

The emphasis of the law is on the systematic management of health and safety at work. It requires employers and others to maintain safe working environments and implement sound practice. It recognises that successful health and safety management is best achieved through good faith co-operation in the place of work and through the input of those doing the work.

Transit New Zealand Act 1989 and Amendments

Primarily provides a legislative framework for Waka Kotahi, but also includes requirements for other RCA. Section 42H (6) requires district transportation programmes to be in keeping with the national land transport strategy and any relevant regional land transport strategy. Section 42H (7) requires the programme to implement the regional land transport strategy.

Land Transport Act 1998 and Amendments

Controls aspects of road and traffic operations and includes traffic regulations, bylaws, and enforcement.

Traffic Regulations 1976 and Land Transport (Road User) Rule 2004

This legislation details Road Rules and Regulations to be adhered to and monitored. This affects the operation and use of transportation assets e.g., signage, speed limits, parking restrictions, installation of traffic signals (if appropriate in the future), and school patrols.

Land Transport Rule - Setting of Speed Limits 2017

The Rule establishes a new speed setting mechanism that is focussed on assisting RCAs to set safe and appropriate speed limits, in particular in areas where there are high-benefit cost opportunities for the optimisation of safety and efficiency.

Public Works Act 1981 and Amendments

Public works often cannot be carried out without affecting private landowners and their interests in land. For these reasons the Crown has legislative powers to compulsorily acquire land for public works so that public works proposals are not unreasonably delayed. A basic principle of the Act is that no person shall be deprived of land without receiving fair compensation.

Hazardous Substances and New Organisms Act 1996 and Amendments

The Hazardous Substances and New Organisms (HSNO) Act was enacted in 1996 with the hazardous substances related provisions of the HSNO Act coming into force in July 2001. Territorial authorities have an enforcement role in the following areas:

- Premises not covered by the other enforcement agencies (e.g., private dwellings and public spaces)
- Dangerous goods licensing during the transitional period of the HSNO Act
- Enforcing the HSNO Act when enforcing the RMA
- Functions transferred by other enforcement agencies

Telecommunications Act 2001, Electricity Act 1992, Gas Act 1992, Railways Act 2005 and Amendments

Provide utility operators and others with powers to use road corridors.

2.5.2 National Standards, Statements, and Policies

Waka Kotahi's Standards

The Council refers to the relevant documents contained with Waka Kotahi's register of network standards and guidelines – 3 July 2020 (online: https://www.nzta.govt.nz/resources/nzta-register-network-standards-guidelines/). This document contains up-to-date standards and guidelines in current use throughout NZ, including international documents.

National Policy Statement on Urban Development

The National Policy Statement on Urban Development (NPS-UD) 2020 came into effect on 20 August 2020 and replaced the National Policy Statement on Urban Development Capacity 2016. With some areas of NZ growing quickly, this policy statement aims to support productive and well-functioning cities, with adequate opportunities for land to be developed to meet community business and housing needs.

The major policies in the NPS-UD will impact the transportation network through the following:

- Intensification – Council plans will need to enable greater height and density, particularly in areas of high demand and access
- Car parking – Councils will no longer be able to require developers to provide car parking through their district and city plans
- Responsiveness – Councils must consider private plan changes where they would add significantly to development capacity, good outcomes and are well connected by transport corridors
- Wider outcomes – Councils are directed to give greater consideration to ensuring that cities work for all people and communities. Particular focus is given to access, climate change and housing affordability.
- Strategic planning – Councils are required to work together, produce "Future Development Strategies", which set out the long-term strategic vision for accommodating urban growth.
- Evidence and engagement – Councils must use a strong evidence base for their decision making and ensure they engage with Māori, developers and infrastructure providers.

National Policy Statement on Freshwater Management 2020

The National Policy Statement for Freshwater Management (Freshwater NPS) provides local authorities with an updated direction on how they should manage freshwater under the RMA. It came into force on 3 September 2020.

The major policies in the Freshwater NPS will impact the transportation network through the following:

- Construction and maintenance of infrastructure involving works in and around natural wetlands

- Reclamation of rivers
- Natural hazard works
- Works associated with natural wetland research and restoration
- Wetland utility structures
- Fish passage requirements

Road to Zero: New Zealand's Road Safety Strategy 2020-2030

Road to Zero (the Vision Zero Strategy) articulates the Ministry of Transport's vision, guiding principles for how the road network is designed and how road safety decisions are made, as well as targets and outcomes for 2030. The Vision Zero Strategy sets out five areas for focus over the next decade, and a framework for NPDC will hold ourselves to account. The Vision, focus areas and principles are summarised in **Figure 0-5**.

FIGURE 0-5 - THE VISION ZERO STRATEGY (SOURCE: MINISTRY OF TRANSPORT, ROAD TO ZERO: NEW ZEALAND'S ROAD SAFETY STRATEGY 2020-2030)

2.5.3 Taranaki 2050 Infrastructure and Transport Transition Pathway Action Plan

In August 2019, Venture Taranaki launched a co-designed Roadmap for how the region will transition to a low-emissions economy by 2050. A collaborative process has been used to further develop detailed actions across the 11 pathways the roadmap identifies. One of these pathways is Infrastructure and Transport, as demonstrated in the image below.

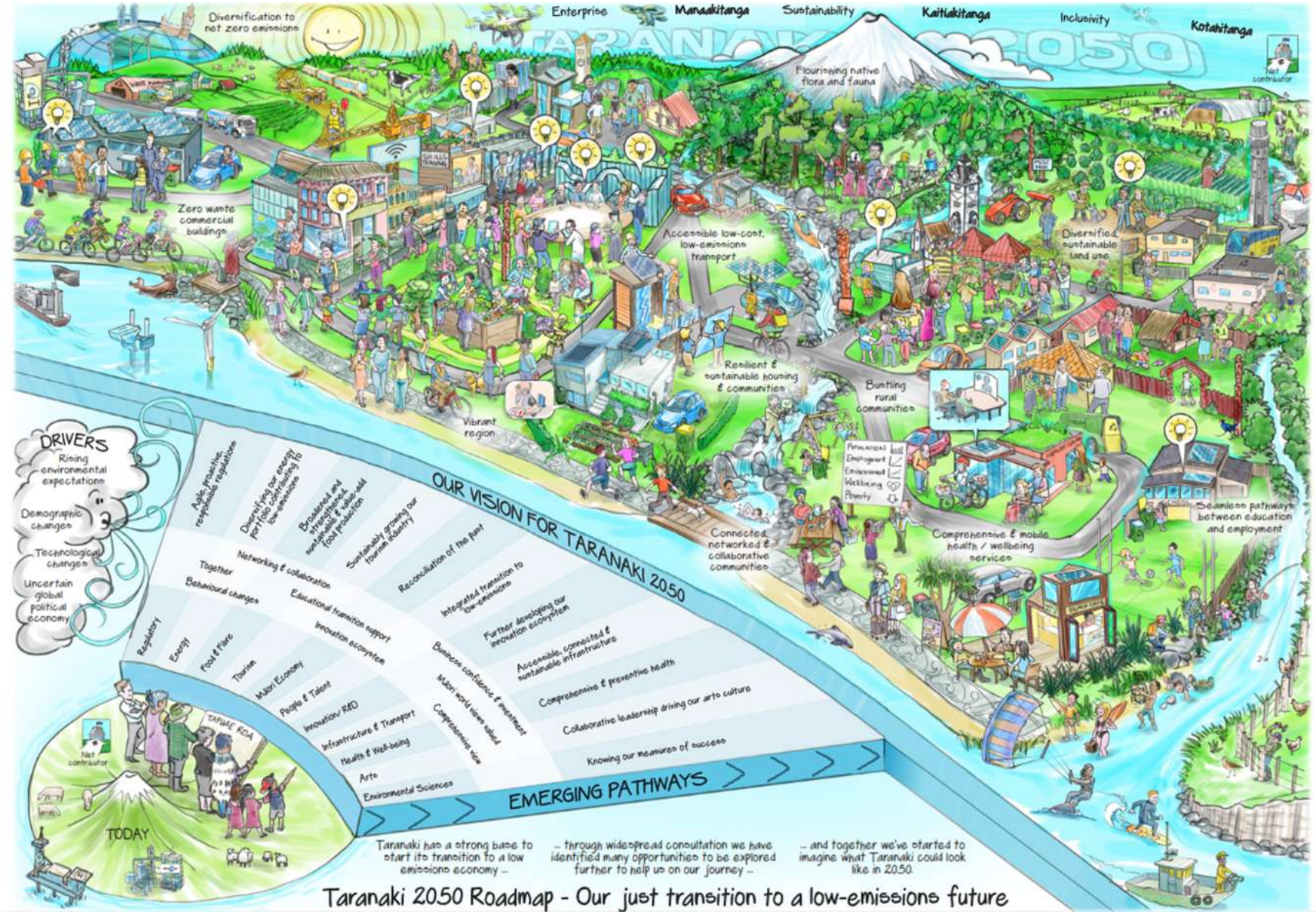


FIGURE 0-6 - NPDC 2050 ROADMAP

The Infrastructure and Transport Transition Pathway Action Plan describes the actions required to assist transport developments in Taranaki to achieve a low-emissions economy. It is primarily a record of an action framing process held with sector and regional participants in November 2019.

The 2050 Roadmap vision informed the development of an action statement at the Infrastructure and Transport workshops. This was:

> *"Taking a comprehensive view, design and invest in our entire infrastructure and transport ecosystems so they're integrated, affordable, resilient, sustainable (green), low emissions and inclusive for community well-being and commercial use by 2050. This will also provide meaningful and secure work, and community opportunities for generations to come".*

When participants reviewed the action statement against where things were currently at, the following focus areas were apparent:

1. Uncertainty of what infrastructure will be needed in the future to support the new economy
2. Affordability of the large amount of infrastructure renewal
3. Future workforce gaps to build and maintain infrastructure
4. The transport and infrastructure's contribution to emissions and sustainability goals
5. The importance of narrowing the digital divide

Based on the focus areas described, the following nine actions have been identified in order to achieve the 2050 vision:

1. Scenario planning to support an Infrastructure Strategy
2. A Taranaki infrastructure strategy
3. Recruitment pathways
4. Workforce skills hub
5. Advise on Taranaki's 2021-2027 RLTP
6. Community education platform
7. Fully digitally connected Taranaki
8. Competent digital citizens
9. Maximising data and information sharing

2.6. New Plymouth District Council policies, standards, strategies and guidelines

Table 20-2 details NPDC's relevant policies, standards, strategies and guidelines.

TABLE 20-2 - NPDC RELEVANT POLICIES, STANDARDS, STRATEGIES AND GUIDELINES

Document Name	Year	Purpose
Policies and Plans		
District Tree Policy	2006	The purpose of this policy is to outline the Council mandate regarding the stewardship of its tree resource and to provide consistency in decision making on the management of trees and bush remnants on Council administered land.
Enforcement of Vehicle Safety Requirements Policy	2001	The purpose of this policy is to authorise the Council's enforcement officers to issue infringement notices for invalid vehicle warrants of fitness, certificates of fitness and vehicle registrations.
Maintenance and Management of Formed Roads Policy	2012	To clarify the location and extent of formed roads the Council maintains and manages within the district.
Procurement Policy	2019	The purpose of this policy is to provide guidance to suppliers and Council staff to achieve the outcomes of the LTP and vision for the future. This policy provides clear intentions to suppliers, contractors and the community on the key areas the Council will consider throughout the procurement process. This policy and the Council's procurement manual outline the strategic approach that the Council will take to planning, sourcing and managing its procurement activities. The Council is committed to negotiating with suppliers in a fair, open and transparent manner, while ensuring maximum value for the procurement of goods, works and services.
Provision of Parking Facility on Road Reserve Policy	2012	The Council receives requests from schools, sports clubs and other community organisations to provide parking facilities on road reserves. This policy clarifies the Council's position on providing such facilities.
Temporary Road Closure and Disruption to Traffic Policy and Guidelines	2012	The purpose of this policy is to provide guidelines on the application process and rules pertaining to the closure of roads. The policy focuses on the temporary closure of roads and/or disruption to traffic for events and does not replace any legal requirements/implications relating to this.
Advertising Signs on Reserves Policy	2012	This policy outlines when and where advertising signage is permitted on NPDC reserves.
Closed Circuit Television (CCTV) Policy	2012	This policy outlines how the Council operates CCTV on NPDC owned and administrated locations (managed through the Transportation Team).
Milk Tanker Entranceways Policy	1997	This policy sets out the construction standards and NPDC's contribution to milk tanker entranceways.

District Plan	Operative 2005. The current Proposed District Plan (2019) is currently deliberating decisions following the hearing processes	The District Plan includes objectives, policies and rules that manage the adverse effects of activities on the environment with a focus on land use and subdivision activities.
Emergency management plans	Various	The emergency management plans set out the required actions for the Council teams to effectively mitigate, prepare for and respond to a major emergency involving the Council's operations and activities.
Standards		
Land Development and Subdivision Infrastructure Standard (local Amendments Version 3)	2019	This is based on the NZS4404:2010 – Land Development and Subdivision Standard. It sets out the minimum standards of technical performance and quality for the subdivision and development of land and infrastructure.
National Code of Practice for Utility Operators' Access to Transport Corridors	2019	The code sets out the processes and procedures for utility operations to exercise their right to the road corridor for the placement, maintenance, improvement and removal or utility structures.
Code of Practice for Temporary Traffic Management	2020	This is Waka Kotahi's best practice guideline and statutory requirements for temporary traffic management in NZ.
Strategies and Guidelines		
Austroads guidelines	Various	Austroads guides provide practical advice on the design, management and operation of road transport networks. The guidelines are funded by the Australian and NZ Governments and are continually updated based upon ongoing international and local research.
Accessibility Strategy	2009	This strategy sets out how the Council will contribute towards making the district more inclusive and accessible.
Art in Public Spaces Strategy	2008	The vision behind this strategy is for the district to be recognised nationally and internationally for excellence in public art. Art works in public places will be high quality public amenities that celebrate and enhance local culture, heritage and the environment.
Cycle Strategy	2007	This strategy sets priorities to plan, manage and promote cycling in the district. The goal is for New Plymouth to be

		"attractive and accessible for cycling for commuting and recreational journeys alike".
Major Events Strategy	2010	This strategy is to ensure that the district's limited resources are used as efficiently and effectively as possible to generate benefits for the community and those visiting the district.
New Plymouth Central Area Urban Design Framework	2013	This framework aims to better integrate, advise and direct the development of the Central Area in such a way as to achieve good urban design outcomes.
Parking Strategy	2013	The Council has prepared this strategy as a framework for how it will provide for and manage parking in the next 10 years.
New Plymouth Open Space, Sport and Recreation Strategy	2015	Sets the strategic direction for Council owned facilities, open spaces and features within them.

2.7. Partners and Key Stakeholders

The transportation services provided depend on the Levels of Service determined by the community. How the services are provided is determined by the Council in response to the requirements of both the key stakeholders and legislation. Key stakeholders are broadly defined as:

- Customers
- Elected members
- Iwi and hapu
- Other stakeholders (internal and external)

As part of the Council's systems thinking approach, all public calls to the Council regarding transportation are recorded and trends are monitored. A review of public calls and emails with respect to the transportation network for the past 5 years confirmed that the vision and core values remain current.

As the Council has improved its workflow and processes, the number of calls or emails on what matters to customers has shifted from efficient work practises and quality outcomes to timely intervention and informed customers. This reflects where effort has been placed in the past. Error! R eference source not found. shows the types of calls received over the past five years.

The numbers of calls and emails are tracked, with an objective of reducing the number of calls over time and in a timely manner. A reducing trend indicates that the Council is delivering the vision and meeting core values. A reduction in the number of calls also assists to improve efficiency as work can be undertaken in a more coordinated, proactive manner rather than in a reactive manner.

The categories where the number of calls have significantly reduced are street lighting and storm events. The reduction in calls relating to street lighting is most likely due to the implementation of light-emitting diode (LED) street lighting in 2016. The reduction in calls due to storm events is in part due to fewer storm events in 2019 and a more resilient transportation network.

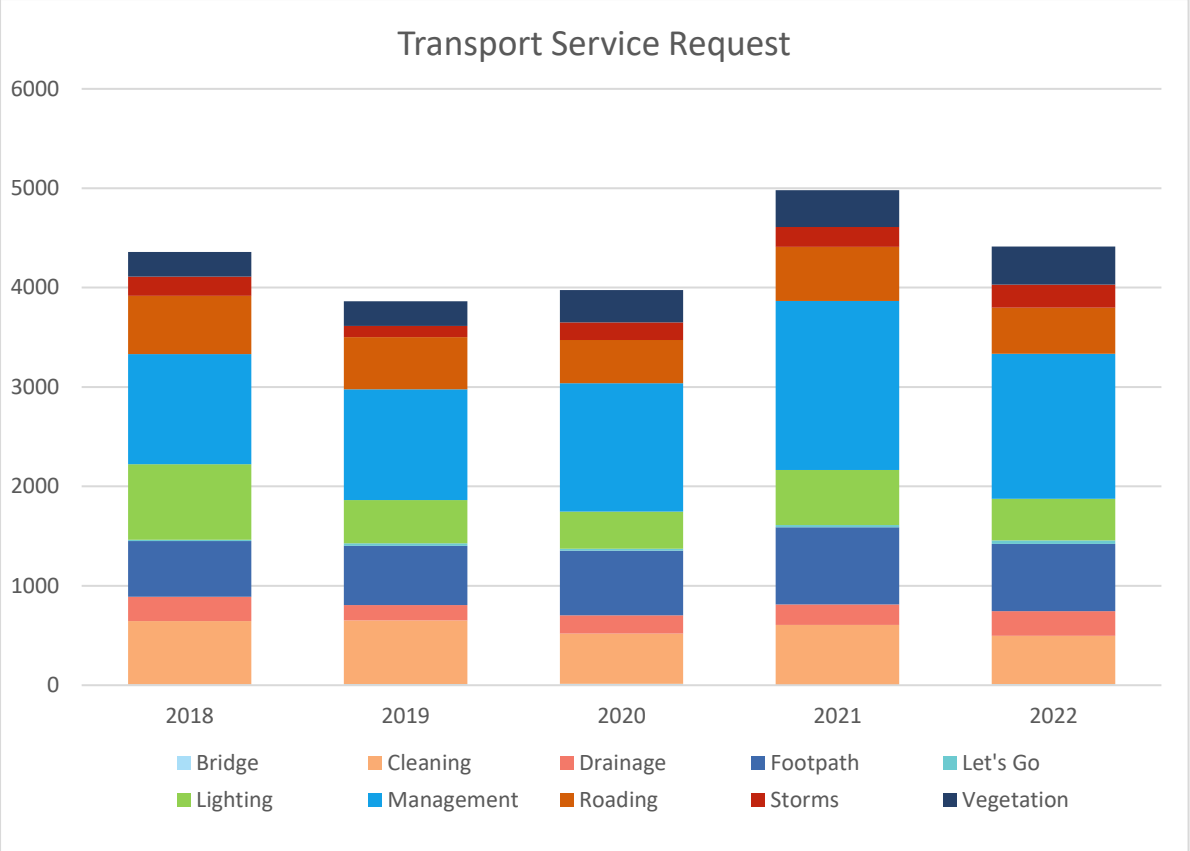


FIGURE 0-7 - CALLS TO NPDC FOR TRANSPORT RELATED SERVICE REQUESTS

2.7.1 Elected members

Elected members have a vital interest in transportation assets and represent the needs and views of the community. These are the Mayor, Councillors, Community Board and Committee Members.

2.7.2 Stakeholders - Internal

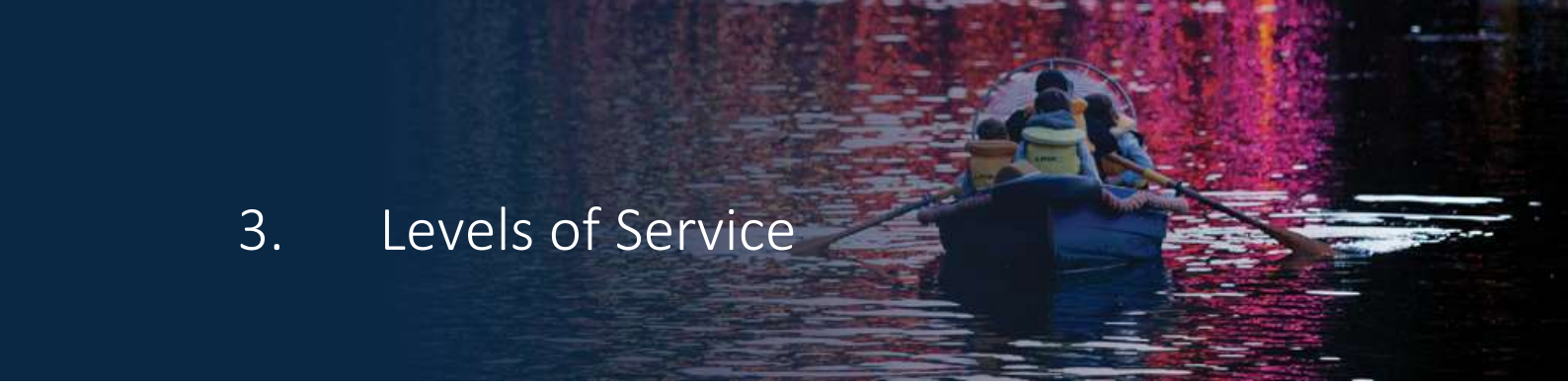
These are internal parties with an interest in the management of NPDC transportation assets:

- Staff from NPDC Transportation and Infrastructure Asset Management teams
- Regulatory and Customer Services
- Policy and Planning Officers
- Financial and Business Services staff
- Internal Auditor

2.7.3 Stakeholders – External

These are parties with an interest in the management of NPDC transportation assets, and include (but are not limited to):

- Communities using transportation network
- Iwi groups
- Waka Kotahi
- Ministry of Transport
- TRC
- Utility companies



3. Levels of Service

Contents

3.1. Introduction

Asset management planning enables the relationship between Levels of Service and the cost of the service (the price / quality relationship) to be determined. This relationship is then evaluated in consultation with the community to determine the Levels of Service they are prepared to pay for.

Levels of Service standards define the levels to which NPDC provides services to the community. Some standards are defined by industry guidelines (i.e., ONF) and others are defined in conjunction with the community and key stakeholders. These standards (or Levels of Service) provide a basis for determining whether assets need to be constructed, replaced, remanufactured, or maintained and if they assist delivery of road transportation outcomes. Levels of Service enable the Council's performance to be measured and reported against.

This section defines the Levels of Service the Council delivers to its customers and the measures which are used to identify the Council's performance in delivering these. It also identifies how Levels of Service for transportation activities contribute to the GPSLT, ONF, RLTP, Infrastructure Strategy and the Council's overarching goals, as well as details behind each of the Level of Service themes and where there are currently gaps in the knowledge of activities.

Figure 0-1 shows the high-level strategic linkages for Levels of Service.

FIGURE 0-1 - HIGH LEVEL STRATEGIC LINKAGES FOR LEVEL OF SERVICE

Transportation Levels of Service measures are provided by Waka Kotahi. As part of the process of embedding the ONF in the management of the district's roads, the way in which the Council has defined Levels of Service has changed.

A Programme Business Case (PBC) is currently being undertaken to establish an integrated programme of work to improve parts of the transport system that are not included as part of this Transport AMP. This includes public transport improvements including timetabling and infrastructure to support public transport or active mode improvements including new walking and cycling routes.

In summary, defined Levels of Service are used to:

- Inform customers of the proposed Level of Service
- Develop asset management strategies to deliver Levels of Service
- Measure performance against defined Levels of Service
- Identify the costs and benefits of services offered
- Enable customers to assess reliability, simplicity, quality, friendliness, and convenience to further streamline the process

In this context, Levels of Service define the quality of delivery for a particular activity or service against which service performance can be measured.

3.2. New Plymouth Problems and Opportunities

This section presents the investment story. It defines the problems and benefits of investment that were identified through the ILM process and Point of Entry discussion as described in the Asset Management Strategy.

3.2.1 Investment Logic Mapping Process

ILM is a series of structured workshops that bring together key stakeholders to ensure that there is early agreement on problems, outcomes and benefits before any investment decisions are made or a specific solution is identified. This process puts an emphasis on gaining a clear understanding of the problem, the consequence of the problem and the desired benefits – before looking at possible solutions.

The output of an ILM is usually a one-page investment story that sets out the problems and benefits in straightforward language that all stakeholders can understand.

The ILM process was undertaken at the start of the Integrated Transport Framework project. As outlined in **Section 2.4.4** of this AMP, the Integrated Transport Framework began in 2019, with the aim of understanding the implications of the district's growth and the strategic responses required to meet transport needs over the next 30 years. Through the ILM process several problems and benefits were identified.

An updated ILM has been completed to support the NPDC PBC. The problems and benefits for this Transport AMP have been taken from the previous AMP due to the alignment of the new problems and benefits being more suited for the PBC.

3.2.2 Defining the Problems

The first step in the ILM process is to define the problems. The problems are the reasons that action needs to be considered at this time. It is couched in negative terms and each problem statement should capture the essence of what is broken and the consequence.

The following problems were defined through the ILM process:

1. **Natural topography and layout of infrastructure makes it difficult to complete a trip using alternate transport modes, causing severance of the community and places the network at risk during a major event.**

   The district is dissected by numerous river valleys resulting in undulating topography, which provides additional challenges for pedestrians and cyclists. Transport links are currently formed where there are bridges, thus channelling users to network pinch points. The CBD is separated from urban New Plymouth by State Highway 45 (SH45) (the one-way system), which carries a significant number of daily freight movements to and from Port Taranaki parallel to the waterfront. In this location, it forms a barrier for people walking and cycling

from the outer suburbs to the waterfront, a key facility for people moving east-to-west on sustainable modes of transport.

2. **Not taking a "safe system" approach to a complex network has resulted in poor actual and perceived safety outcomes**.

   The number of serious and fatal crashes in the district has been increasing. Previously the focus has been on addressing specific crash types; however, it is now recognised that due to the random nature of the crashes in the district a safe system approach to address the complex network is required.

3. **Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poorly targeted investment and missed economic opportunities.**

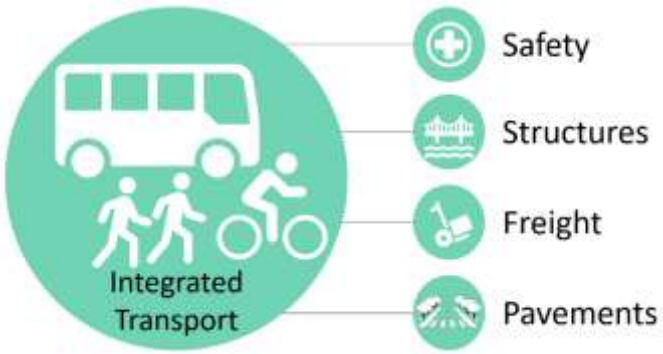
   The transportation network provides a vital link to significant industry across the region. An economic assessment of this industry was completed in 2019 and found that the investment required to maintain these links was not previously well understood and that NPDC is currently missing economic opportunities through deterioration of the network. Of particular concern is the condition of the bridge and structures throughout the network and the anticipated increase in freight over the next 10 years.

4. **Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces.**

   Public car parking is readily available, at a low cost (or free) throughout the city and town centres across the district which encourages the use of vehicles over more sustainable modes. The available public transport has a poor perception by some of the community. The freight network relies heavily upon the road network instead of the more sustainable rail network.

Across the four problem statements there is a lack of integrated transport planning to ensure that everyone can move safely throughout the district, and that all development is accessible by a variety of transport options. Improving integrated transport is fundamental to the problems defined above. The following diagram provides a summary of the key issues from the problem statements and these issues are discussed further in the AMP as funding is allocated to the major transportation projects over the next 10 years.

The key issues are carried throughout this AMP and the details on them are summarised as follows:



Integrated Transport 	Everyone should be able to move safely throughout the district. To achieve this land development needs to be in line with Council strategy and a variety of travel options needs to be available to everyone.
Safety 	A safe system approach to road safety needs to be considered in all planned work.
Structures 	The condition of bridges and structures throughout the network has significantly deteriorated due to underinvestment in recent years.
Freight 	The movement of freight across the region is anticipated to increase over the next 10 years and will put significant load onto council roads. The maintenance of roads along key freight routes or in key freight areas is likely to increase significantly and will require ongoing management.
Pavement 	The performance of Arterial roads is worsening, and the performance of Collector roads is currently improving. The Council wants to maintain a higher Level of Service for higher classification and trafficked roads as this provides a greater benefit to a greater number of people.

While the available evidence supports the problems identified, it is recognised that there are gaps in the evidence, particularly in relation to how the transportation network will perform with increasing growth in traffic volumes and the potential impact on travel times.

3.2.3 Benefits

The following benefits were identified through the ILM:

1. **Improved network performance**

   Ensuring the performance of the network for all modes of travel accommodates future growth was identified as a benefit.

2. **Improved safety outcomes**

   New Plymouth's medium to high rate of deaths and serious injuries was identified as requiring immediate focus.

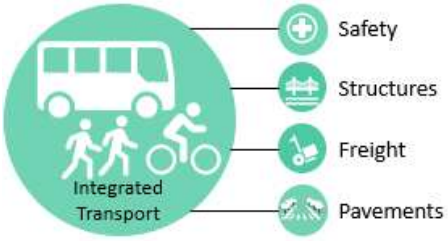
3. **Improved economic outcomes**

   It was agreed that the existing transportation network would stifle growth and limit private investment.

4. **Improved transport choices**

   A well-connected network has been identified as highly desirable strategic direction for the district.

The alignment of the identified problems and benefits is provided in Table 0-1.

Problem Statements	Benefit Statements	Strategic Response	Consequence of not adopting the recommended programme
Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event.		**Change risk profile:** Accepting greater risk across the network based upon the ONRC road classification.	Users of high-volume roads will have a worse travel experience. The number of fatal and serious injury crashes will increase. Unplanned events will close more roads.
Not taking a "safe system" approach to a complex network has resulted in poor actual and perceived safety outcomes.		**Programme adjustment:** Continue driver behaviour change programme. Develop network wide safety auditing of high-risk trends. **Change risk profile:** Carry on implementing the Vision Zero strategy.	The number of fatal and serious injury crashes will continue to increase.
Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poorly targeted investment and missed economic opportunities.		**Policy approach:** Creating new and updating existing policies to support good asset management practices. **Programme Adjustment:** Adjust activity work categories for good asset management practices. **Improve value for money:** Identify where the life of an asset can be extended at no or minimal extra cost.	This will lead to poor economic decisions and funding will not be available to operate, maintain and renew assets. Poor communication will result in decision makers rejecting applications, sub-optimal decision making and projects not proceeding.

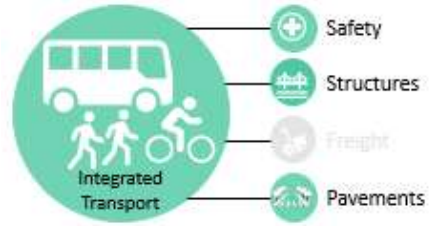
Problem Statements	Benefit Statements	Strategic Response	Consequence of not adopting the recommended programme
		Relationship approach: Improve the relationship with Waka Kotahi and Councillors through more reliable data that provides better guidance for decision makers.	
Infrastructure and societal habits encourage motor vehicle causing environmental damage, poor health outcomes and unattractive urban spaces.		**Policy approach:** Ensure any new policy encourages active modes of transport. **Programme adjustment:** Increased active mode transport mode share.	An increase in motor vehicle usage, will result in poor health outcomes, no alignment with global and national environmental sustainability targets and unattractive urban spaces

TABLE 0-1: STRATEGIC ALIGNMENT OF PROBLEM AND BENEFIT STATEMENTS

3.2.4 Strategic Alignment of Benefits

The problems and benefits identified in the ILM processes align strategically very well with the Draft 2024 GPSLT, as shown in Table 0-2.

TABLE 0-2: ALIGNMENT OF ITF BENEFITS AND THE GPSLT PRIORITIES

GPSLT - Priorities	Integrated Transport Framework - Benefits
Emissions Reduction: Transport-related greenhouse gas emissions will fall significantly, while providing a more sustainable inclusive, safe and accessible transport for all New Zealanders	Improved transport choices Improved safety outcomes Improved network performance
Integrated Freight System: Efficient and effective freight connections	Improved network performance Improved economic outcomes
Safety: A land transport system where no-one is killed or seriously injured	Improved safety outcomes
Resilience: Managing risks from natural and human-made hazards	Improved network performance
Maintaining and Operating the System: The existing system is maintained at a level that meets current and future needs	Improved network performance
Sustainable Urban Development: People in urban areas have better choices to access economic and social opportunities	Improved transport choices Improved economic outcomes

3.2.5 Investment Key Performance Indicators and Measures

The Investment Key Performance Indicators and measures for NPDC Transport AMP are provided in the following Table 0-3.

TABLE 0-3: THE BENEFITS, INVESTMENT KPI'S AND MEASURES FOR THE AMP

Benefits	Investment KPI	Measures
Improved safety outcomes	Improved actual safety	Decrease in the number of deaths and serious injury crashes
	Improved safety perception	Improvement in user safety perception percentage rating obtained via survey
Improved economic outcomes	Transportation network supports future growth	Percentage of residents satisfied with the overall quality of the district's roads

Benefits	Investment KPI	Measures
Improved transport choices	Increased use of alternative modes	Increase in modal share for alternative modes
	Improved community perception	Improvement in community satisfaction rating with alternative mode infrastructure servicing the district
	Improved alternative mode infrastructure	Increase in length of alternative mode infrastructure available within the district
Improved network performance	Improved network resilience	The percentage of the sealed local road network that is resurfaced

3.2.6 Updated ILM and Integrated Transport Programme Business Case

From the previous NPDC Transport AMP it was identified that there was an additional piece of work that is required to deal additional problems including public transport and active modes. The problems and benefits outlined below are will be used to support the development of the business case and the options to be assessed that come out of that.

The problems and benefits above are more suited for the Transport AMP due to connection with the infrastructure and assets that allow people to move across the New Plymouth district while the problems and benefits below focus on the services and infrastructure related to public transport and active modes which will be addressed as part of the PBC.

The problems that have been identified as part of the ILM process for the business case include:

1. Public transport is not a competitive, convenient to access from active modes or perceived relatively safe travel option resulting in low public transport use and poor customer experience.
2. The urban areas have mainly developed with low density developments resulting in high usage of private vehicles and increasing transport costs for the community, especially lower socio-economic groups.
3. The network is configured to prioritise private vehicles (including freight) over other modes resulting in issues across the city and towns including severance (centres on SHs, between the coast and communities and residential areas and key destinations), and declining amenity (noise, vehicle traffic, dust and pollution)
4. A fragmented network for active modes (walking, cycling and micro-mobility) with poor (unsafe) connection resulting in safety issues, poor perception of the network and low active mode uptake.

The benefits that have been identified include:

1. Public transport is accessible, convenient and the preferred mode of transport for many

2. Decreased reliance on cars as the primary mode of transport and increased walking, cycling and public transport use
3. Improved access to amenities (coast, schools, services) along engaging and enjoyable transport corridors
4. A safe and connected city and towns to walk and cycle with active and healthy communities

An ILM process was undertaken to derive Key Performance Indicators (KPIs) and their measures for each of the benefits. The specific KPIs from the ILM are provided in Table 0-4.

TABLE 0-4: ALIGNMENT OF BENEFITS, INVESTMENT KPI'S AND MEASURES FROM THE NPDC INTEGRATED TRANSPORT FRAMEWORK PROGRAMME BUSINESS CASE

Benefit	Investment KPIs	Measures
Public transport is accessible, convenient and the preferred mode of transport for many	Improve public transport network access, reliability, and travel times	Public transport travel times (average, variability)
		PT user surveys/annual satisfaction surveys
		% of population within 400/800m PT walking catchments
		Public Transport mode share for journey to work/school trips
Decreased reliance on cars as the primary mode of transport and increased walking, cycling and public transport use	Reduce private vehicle reliance/ transport related emissions, and increase mode shift	CO_2 transport related emissions
		Journey to work by single occupancy vehicle and VKT per capita
		% of PT use, walking and cycling for journey to work trips
		% of walking and cycling for journey to school trips
Improved access to amenities (coast, schools, services) along engaging and enjoyable transport corridors	Improved multi-modal access to key amenity locations	Level of Service for pedestrians and cyclists on key routes
		Comparative travel times between (e.g., PT and private vehicle) between key locations
		Percentage of residents living within x distance (walking catchment) of local centres
	Positive impact on local centres, network productivity and utilization	Percentage of residents living within x distance (walking catchment) of local centres
		Foot traffic in the CBD and town centres and average length of visit
		Percentage of freight on key arterial corridors and average freight delivery times

A safe and connected city and towns to walk and cycle with active and healthy communities	Improve the safety and attractiveness of active mode networks for all users (e.g., children)	Deaths and serious injuries for active mode users
		% of primary cycling network, which is safe, separated and continuously connected
		Pedestrian wait times/crossing delay in urban/town centres
		Safety risk/exposure for active modes

3.2.7 New Plymouth District Council Service Level Targets and Performance

The Transportation Service draws on several performance measures defined by the Council and prescribed by the ONRC and the Department of Internal Affairs (DIA) non-financial performance measures in order to measure and manage the transportation service levels and standardise road network performance.

The performance targets have been grouped by theme, and align with the ONRC, for the following areas:

- Safety

How road users experience the safety of the road

- Resilience

The availability and restoration of each road when there is a weather or emergency event, whether there is an alternative route available and the road user information provided

- Amenity

The level of travel comfort experienced by the road user and the aesthetic aspects of the road environment (e.g., cleanliness, comfort / convenience, security) that impact on the travel experience of road users in the road corridor

- Accessibility and Sustainability

The ease with which people are able to reach key destinations and the transport networks available to them, including land use access and network connectivity.

Table 0-5 details the source of the performance measure and groups them into the service level themes above which have been defined to enable linkage between the Council's Levels of Service and those defined by the ONRC framework and DIA.

Any changes to the Level of Service KPI's needs to be approved by Councillor's through the official NPDC process.

TABLE 0-5: LEVEL OF SERVICE

Level of Service (NPDC provide)	No.	Performance Measure	Source	Actual (Financial Year 2019/20)	Actual (Financial Year 2022/23)	Target 2023/24	Target 2024/25	Target 2025/26	By 2033/34
Safety Provide a roading network that is safe for all road users	1	Number of fatal and serious injuries on the network	ONRC	27no.	27 no.	Reducing	Reducing	Reducing	16 no.
	2	Number of fatal and serious injury crashes on the network	DIA	25 no.	25 no.	Reducing	Reducing	Reducing	15 no.
	3	Number of fatal and serious injuries to vulnerable users	ONRC	12 no.	11 no.	Reducing	Reducing	Reducing	7 no.
	4	The change from the previous financial year in the number of fatality and serious injury crashes on the district's local roading network.	NPDC		+4	Reducing	Reducing	Reducing	40% reduction from 2019/20 baseline
Resilience Appropriately maintain the district's sealed roads	5	The minimum percentage of the sealed local road network that is resurfaced	DIA and NPDC	4%	4.7% *(NPDC target 4%)*	5%	5%	5%	5%
Amenity	6	Smooth Travel Exposure (STE) –	ONRC and	Regional: N/A	Regional: 83.2%	85%	85%	85%	87%

Level of Service (NPDC provide)	No.	Performance Measure	Source	Actual (Financial Year 2019/20)	Actual (Financial Year 2022/23)	Target 2023/24	Target 2024/25	Target 2025/26	By 2033/34
Provide good quality district roads. Respond to service requests in a timely manner		roughness of the road (% of travel on sealed roads which are smoother than a defined threshold)	DIA and NPDC	Arterial: 72.4% Primary Collector: 88.3% Secondary Collector: 88.8% Access: 88.2% Low Volume: 92.9%	Arterial: 76.6% Primary Collector: 88.5% Secondary Collector: 89.2% Access: 85.9% Low Volume: 83.9% **Average: 85%** *(NPDC target 89%)*				
	7	Sealed road peak roughness (National Association of Australian State Roading Authority (NAASRA) Threshold)	ONRC	<u>Urban</u> Regional: N/A Arterial: 134 no. Primary: 127 no. Secondary: 143 no. Access: 144 no. Low Volume: 148 no.	<u>Urban</u> Regional: 110 no. Arterial: 130 no. Primary Collector: 137 no. Secondary Collector: 145 no. Access: 158 no. Low Volume: 184 no.	<u>Urban</u> Regional: 110 no. Arterial: 130 no. Primary: 140 no. Secondary: 140 no. Access: 150 no. Low Volume: 170 no.			

Level of Service (NPDC provide)	No.	Performance Measure	Source	Actual (Financial Year 2019/20)	Actual (Financial Year 2022/23)	Target 2023/24	Target 2024/25	Target 2025/26	By 2033/34
				Rural Arterial: N/A Primary: 96 no. Secondary: 121 no. Access: 139 no. Low Volume: 156 no.	Rural Arterial: 86 no. Primary Collector: 90 no. Secondary Collector: 118 no. Access: 137 no. Low Volume: 165 no.	Rural Arterial: 110 no. Primary: 120 no. Secondary: 130 no. Access: 150 no. Low Volume: 180 no.			
	8	Sealed road average roughness	NPDC	Average 105 no.		<110 no.	<110 no.	<110 no.	<110 no.
	9	The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the timeframe specified in the LTP	DIA and NPDC	97.8%	98%	95%	95%	95%	95%
	10	Percentage of residents satisfied with the overall	NPDC	78%	51%	60%	60%	60%	66%

Level of Service (NPDC provide)	No.	Performance Measure	Source	Actual (Financial Year 2019/20)	Actual (Financial Year 2022/23)	Target 2023/24	Target 2024/25	Target 2025/26	By 2033/34
		quality of the district's roads							
Accessibility and Sustainability Provide a high quality and safe footpath network Provide a quality and safe cycle network	11	The percentage of residents satisfied with the quality and safety of the district's cycle network	NPDC	84%	71%	85%	85%	85%	85%
	12	The percentage of footpaths that meet the Levels of Service and service standards in current condition surveys, as set out in this AMP	DIA and NPDC	88% Good or excellent	94%	90% (NPDC: More than 90% of footpath length surveyed in good or excellent condition)			
	13	The footpath length recorded as failed	DIA and NPDC	0.3%	3% (NPDC target less than 1% of footpath length recorded as failed)	<3%			
	14	Proportion of network not available to Class 1 heavy vehicles and 50MAX vehicles	ONRC	26%	26%	26%	26%	26%	26%

3.2.8 Level of Service Summary

Figure 0-2 to Figure 0-5 below show how the Levels of Service identified above are linked across national, regional and local levels.

FIGURE 0-2: LEVEL OF SERVICE SAFETY STRATEGIC ALIGNMENT

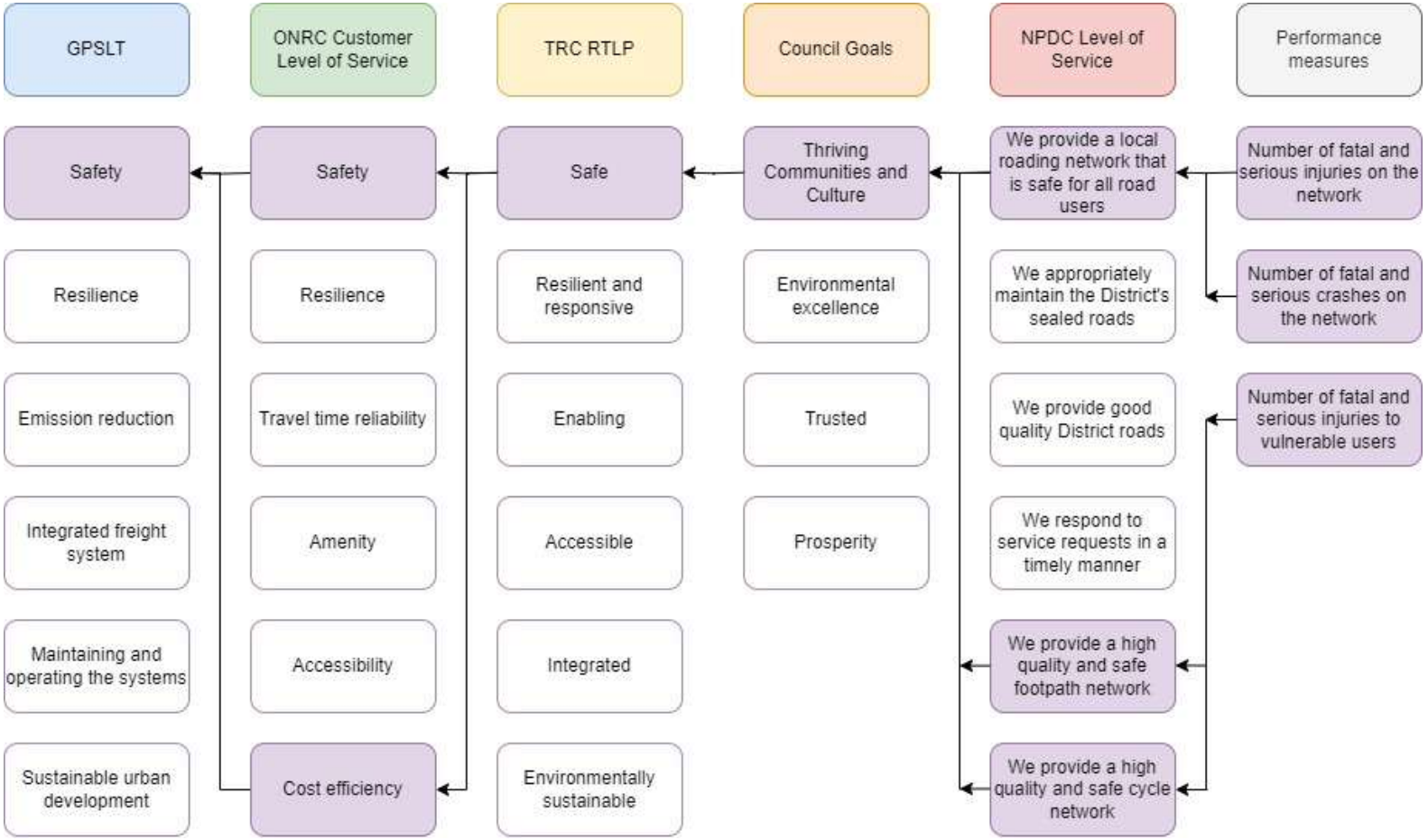


FIGURE 0-3: LEVEL OF SERVICE RESILIENCE STRATEGIC ALIGNMENT

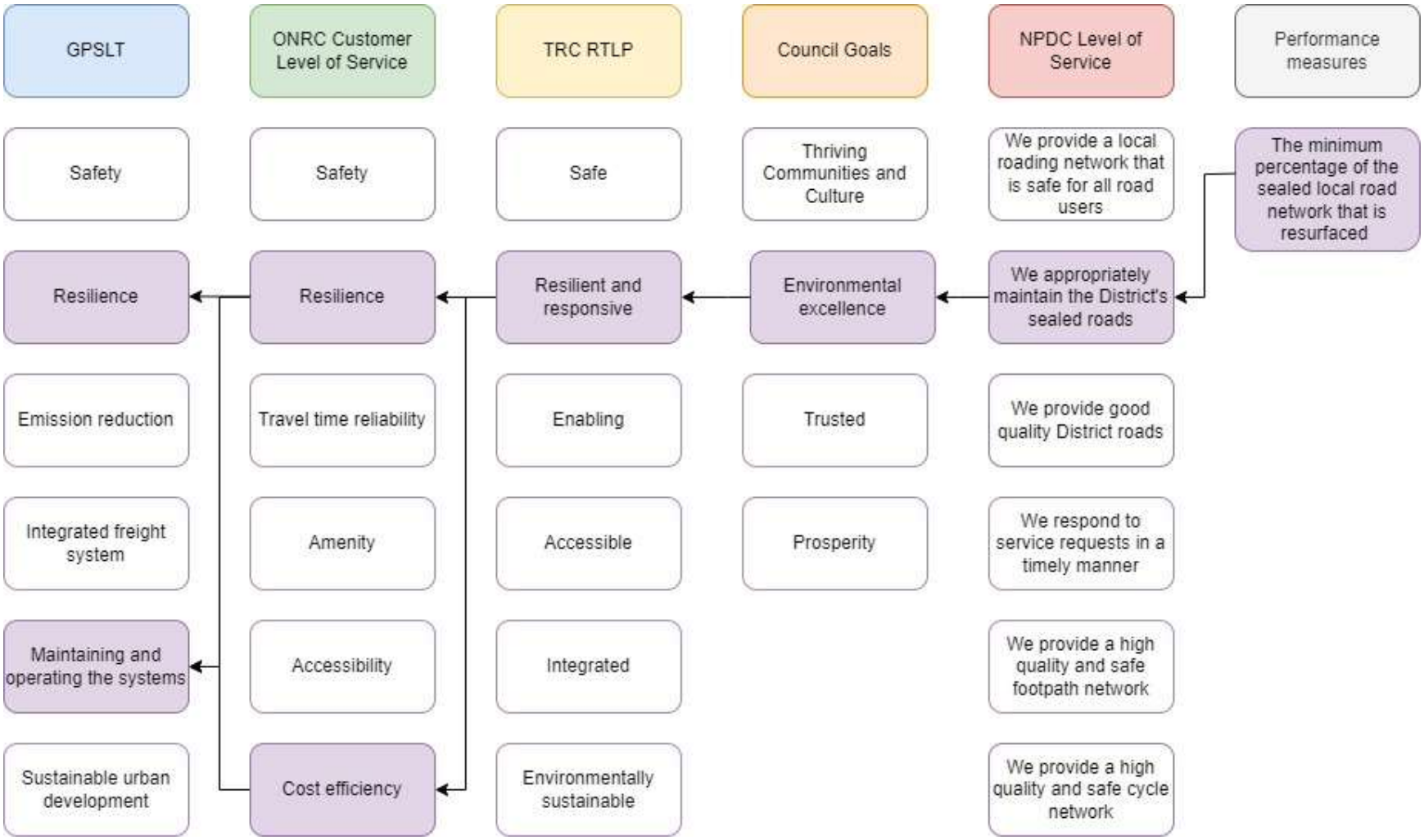


FIGURE 0-4: LEVEL OF SERVICE AMENITY STRATEGIC ALIGNMENT

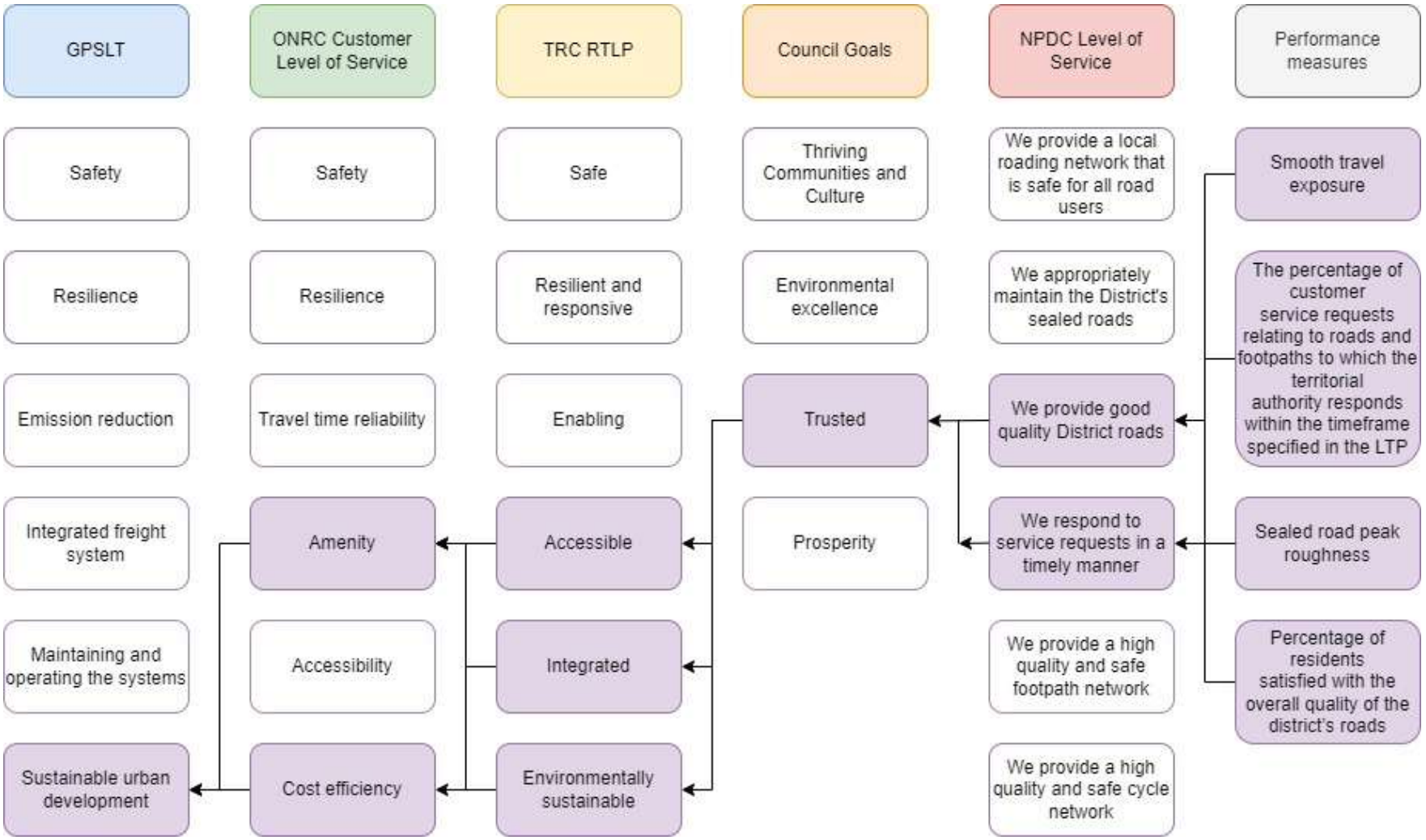
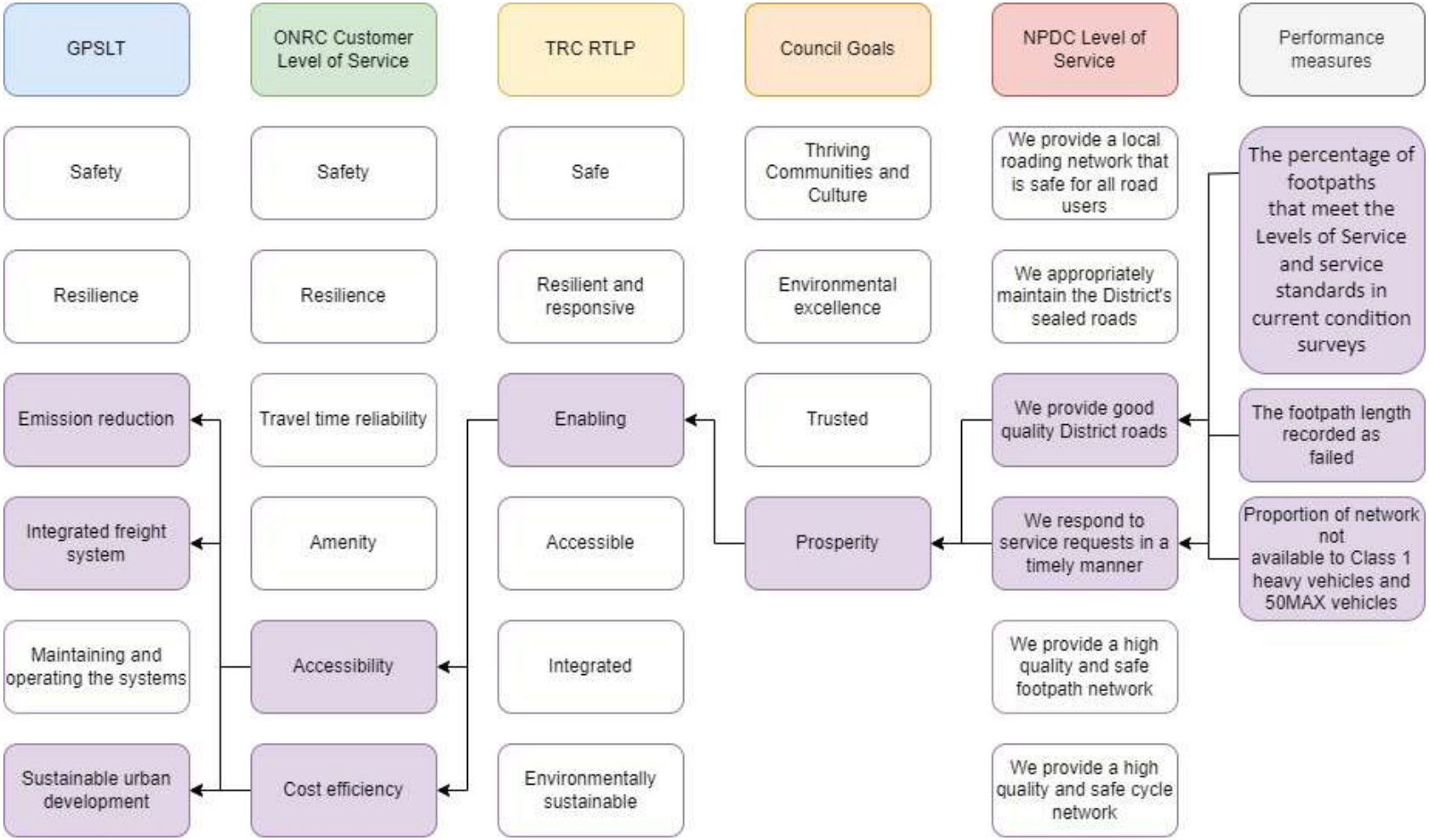


FIGURE 0-5: LEVEL OF SERVICE ACCESSIBILITY AND SUSTAINABILITY STRATEGIC ALIGNMENT



3.3. Evidence Base

3.3.1 Safety

Objective

The Council will provide a transportation network that is safe for all road users.

Current Performance

Key Performance Insights

The number of fatal and serious crashes on NPDC roads has been decreasing over the last five years and these crash trends are shown in this section.

Crash data used for performance monitoring only includes crashes which result in fatalities or serious injury. The number of crashes on the district's network which result in serious injuries or fatalities are typically too small when split by classification to develop a meaningful trend. The total number and percentage of total crashes provide a more useful analysis. Further detail of the current performance of each measure is outlined under the relevant heading below.

Number of Fatal and Serious Injuries

The number of fatal and serious injuries sustained in crashes on the district's network over the last 10 years is provided in Table 0-6. This Level of Service measure is from the ONRC Safety Customer Outcome 1 measure. It should be noted that the number of fatal and serious injuries in a year is often higher than the number of fatal and serious injury crashes, as more than one person is sometimes injured in a single crash.

TABLE 0-6: THE NUMBER OF FATAL AND SERIOUS INJURIES SUSTAINED IN CRASHES ON THE DISTRICTS ROADS

Reporting Year	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)	Total
2012/13	2	1	5	3	1	13
2013/14	2	2	7	0	0	11
2014/15	4	2	2	2	1	12
2015/16	4	1	11	1	1	20
2016/17	2	6	8	3	0	22
2017/18	3	5	5	2	0	15
2018/19	4	3	14	2	2	32
2019/20	7	2	13	4	1	27
2020/21	1	5	7	4	1	18
2021/22	6	3	5	3	1	19
2022/23	0	7	15	2	0	24

Throughout the course of the last 10 years (2013 – 2023) the percentage of DSIs on all roads under the control of the New Plymouth District Council has decreased. However, there are trends within each road classification, with Access and Arterial roads experiencing a decrease while the largest increases were seen on secondary collector roads. There was a notable decrease in crashes in 2020 and 2021 when New Zealand was under Covid restrictions, and many more people were working from home.

The Level of Service targets for all safety measures from the 2030/31 financial year are based upon the New Zealand Vision Zero Strategy. This states that New Zealand is aiming for a 40% reduction in fatal and serious crashes by 2030, and therefore this is NPDC's target.

Number of fatal and serious injury crashes on the district's network over the last 10 years is provided in Table 0-7. This measure is from the DIA – Non-Financial Performance Measures Rules 2013, Performance measure one (road safety).

TABLE 0-7: NUMBER OF FATAL AND SERIOUS INJURY CRASHES IN THE DISTRICT

Reporting Year	Fatal Crashes	Serious Crashes	Total Fatal & Serious Injury Crashes
2012/13	1	16	17
2013/14	3	7	10
2014/15	3	9	12
2015/16	1	19	20
2016/17	0	23	23
2017/18	2	11	14
2018/19	3	25	28
2019/20	2	22	24
2020/21	1	18	19
2021/22	3	16	19
2022/23	2	23	25

Table 0-8 shows an increasing trend in fatal and serious crashes on the district's roads.

TABLE 0-8: FATAL AND SERIOUS CRASH TYPES BY YEAR

Crash type	2022/23		2021/22		2020/21		2019/20		2018/19	
	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change
Fatal	2	-1	3	+2	1	-1	2	-1	3	+1
Serious	23	+7	16	-2	18	-4	22	-3	25	+14

Vulnerable Users (Pedestrians, Cyclists and Motorcyclists)

The vulnerable user crash data over the last five years is shown in Table 0-9. This Level of Service measure is from the ONRC Safety Technical Output 9 measure: Vulnerable users.

TABLE 0-9: VULNERABLE USER CRASHES

DSI Counts	Bicycle Crashes	Pedestrian Crashes	Motorcycle & Moped Crashes	Total Vulnerable User Crashes	Percentage of DSI
2017/18	1	2	3	6	42.86%
2018/19	4	3	3	10	35.71%
2019/20	3	3	5	11	45.83%
2020/21	2	5	6	13	68.42%
2021/22	3	2	5	10	52.63%
2022/23	2	3	6	11	57.89%

Looking at the data for the 2022/23 financial year it illustrates that vulnerable users on New Plymouth's Road network were involved in a high number of the fatal and serious injury crashes throughout the district. Additionally, following the 2022/23 financial year the total percent of vulnerable users' involvement is trending back towards the peak of 68% in 2020/21

Excluded Performance Measures

The following performance measures are not included in the Level of Service Measures Table 0-5 because trends are not clear due to the low number of crashes on the network. The network wide trends are instead captured in three safety measures in Table 0-6 to Table 0-9.

The performance measures identified by the ONRC, but not reported on as a Level of Service measure, are discussed in detail below.

Collective Risk (fatal and serious injury rate per kilometre)

The collective risk is the ONRC Safety Customer Outcome 2 measure. This measure has not been identified in the Level of Service Table 0-5 as the data is already identified by the "ONRC Safety Customer Outcome 1: the number of fatal and serious injuries on the network". For completeness, the NPDC collective risk for each ONRC road category is provided in Table 0-10.

TABLE 0-10: COLLECTIVE RISK BY ONRC CATEGORY

Outcome Measure	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
Length of network (km)	32.4	60.4	353.6	526.7	334.5
Collective risk rating (10 years to 2022/23)	0.099*	0.050*	0.020	0.004	0.002
Compared to Provincial Centres Peer Group	0.087	0.039	0.014	0.006	0.002

*Crash sample length is below 65kms. Risk calculations may be distorted due to small sample size.

Personal Risk (fatal and serious injury rate by Traffic Volume)

The personal risk is the ONRC Safety Customer Outcome 3 measure. This measure has not been identified in the Level of Service table as the data is already identified by the "ONRC Safety Customer Outcome 1: the number of fatal and serious injuries on the network". For completeness, the NPDC personal risk for each ONRC road category is provided in Table 0-11.

TABLE 0-11: PERSONAL RISK BY ONRC CATEGORY

	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
NPDC	4.116*	5.223*	7.634	6.341	14.983
Provincial Centres Peer Group	3.794	5.208	6.365	8.116	10.308

*Crash sample length is below 65kms. Risk calculations may be distorted due to small sample size

The personal risk on Council's roads currently sits above the Peer Group for Arterial, Secondary Collector and Low Volume roads. The personal risk for these road categories follows the same trend as was found in the Collective risk Table 0-10

Permanent Hazards

The ONRC Safety Technical Output 1 measure is based on permanent hazards. The aim is for all permanent hazards to be marked consistently across NZ. Permanent hazards are marked so that road users are guided safely throughout the network. If they ae not signed and / or marked there are significant risks to road users.

The condition of the permanent signage marking hazards has not been audited in the past and therefore data is not available on the condition of the district's signage.

Temporary Hazards

The ONRC Safety Technical Output 2 measure, is based on temporary hazards. NPDC's Traffic Management Team manage any disruption to traffic as a result of construction and other operations. The Transportation Team process Traffic Management Plans (TMPs) and undertake a dedicated audit process whereby around 5% of TMPs received by the Council are audited each month. These audits include some sites that have been chosen at random as well as sites where a complaint has been made to the Council. The Council can receive TMPs for between 100 and 200 sites a month.

Due to the subjective nature of the traffic management auditing process, the audit pass to fail rate is not considered an appropriate measure of the quality of traffic management within the district, therefore, this technical output is not included as a measure of Level of Service.

Sight Distance

The ONRC Safety Technical Output 3 measure, is a measure of the available sight distance at intersections. This technical output is not included as a measure of Level of Service as it is considered that the cost to audit this measure outweighs the benefits gained. The crash data has not identified vegetation, unauthorised signs or other items placed within the road reserve as a crash trend on the network.

Loss of Control of Wet Roads

The ONRC Safety Technical Output 4 measure, is a measure of loss of control on wet roads. The highest number of reported serious injuries and fatalities (DSI) attributable to loss of control crashes on wet roads in any one year, over the last five-year period was 3 crashes in 2022/23 year.

Loss of Driver Control at Night

The ONRC Safety Technical Output 5 measure, is a measure of loss of control crashes at night. The highest number of loss of driver control at night crashes, in any one year, over the last five-year period, was 4 crashes which occurred in 2019/20 and 2022/23.

Intersections

The ONRC Safety Technical Output 6 measure, is a measure of fatal and serious injuries at intersections. The highest number of intersection crashes, in any one year, over the last five-year period, was 15 crashes in 2018/19. In the most recent year (2022/23), 12 DSI crashes were reported at intersections.

Hazardous Faults and Cycle Path Faults

The ONRC Safety Technical Outputs 7 and 8 measure the maintenance related hazards on the road (Output 7) and cycle paths (Output 8) requiring evasive action by road users and cyclists (e.g., detritus, ponding water / potholes). The community will typically remove detritus from the road network or phone in an issue to the Customer Service Team. When detritus needs to be removed, the contractor attends within half a day. NPDC believes this measure would not provide any benefit.

Roadside Obstructions

The ONRC Safety Technical Output 10 measures, is a measure to ensure that roadside areas are maintained free from unauthorised obstructions and prevent new hazards from developing. This measure has been excluded as NPDC believes the cost of measuring this Level of Service outweighs the benefit provided.

User Safety Perception

The NPDC Integrated Transport Strategy measure “Improvement in user safety perception percentage rating obtained via survey” was identified to meet the KPI of improved safety perception.

Bridge Inspections

All bridges are inspected and maintained to ensure that they are in an effective operating condition. Works are programmed under the existing bridge maintenance budgets, or when the Council becomes aware of damage that represents an immediate risk to road users. Inspections of all

bridges are undertaken on a two-yearly cycle, with in-depth inspections of bridges every six years. Barriers and railings on these bridges are inspected and programmed for repair as part of this activity.

Inspections of guardrails and barriers not on bridges is currently undertaken by Network Inspectors, but these inspections are not scheduled and do not review the structural integrity of barriers.

3.3.2 Resilience

Objective

The Council will appropriately maintain access to the district's roads and structures.

Current Performance

The percentage of the sealed local road network that is resurfaced.

This measure is from the DIA – Non-Financial Performance Measures Rules 2013, Performance Measure 3 (maintenance of a sealed local road network). At present 5% of the sealed local road network is resurfaced> NPDC has set a minimum target of 5% in the coming years.

Excluded Performance Measures

The following performance measures from the ONRC are not included in the Level of Service Measure Table 0-5, with the reasoning outlined below.

Number of Journeys Impacted by Unplanned Events

The ONRC Resilience Customer Outcome 1 measure, is the number of journeys impacted by unplanned events. Over the most recent 12-month period, the Council reported zero journeys impacted by unplanned events.

With no major unplanned events occurring, there were no recorded impacts to any journeys on the network. Over recent years the district has experienced very few unplanned events that impact journeys, and therefore the ONRC Level of Service measure is not included as a performance measure for NPDC.

Number of instances where road access is lost

The ONRC Resilience Customer Outcome 2 measure is the number of instances where road access is lost. This measure is directly related to the ONRC Resilience Customer Outcome 1 measure, and therefore is not included as a Performance Measure for NPDC.

Table 0-12 shows the stormwater protection levels required for different community assets. General standards are defined in the NZS4404:2010 – Land Development and Subdivision Standard, as amended by the local amendments.

TABLE 0-12: STORMWATER PROTECTION LEVELS REQUIRED FOR DIFFERENT COMMUNITY ASSETS

Asset Type	AEP (%)	Return Period (Years)
Building 1st floors	1	100
Road Culverts (urban)	10	10
Commercial / Industrial / Public Land	10	10
Road Culverts (rural)	2	50
Residential Land	20	5
Parks / Reserves / Sports Grounds	20	5
Bridges	1	100

3.3.3 Amenity

Objective

The Council will provide good quality district roads and respond to service requests in a timely manner.

Current Performance

Smooth Travel Exposure

The ONRC Amenity Customer Outcome 1 measure, is a measure of STE roughness of the road (percentage of travel on sealed roads which are smoother than a defined threshold). This same measure is required by the DIA, Performance measure 2, defined as "the average quality of ride on a sealed road network, measured by smooth travel exposure".

The STE on the district's roads, over the past five years is provided in Table 0-13.

TABLE 0-13: SMOOTH TRAVEL EXPOSURE BY ROAD TYPE

Year	Regional	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
2018/19	-	88.4%	84.6%	88.7%	83.2%	83.5%
2019/20	-	72.4%	88.3%	88.8%	88.2%	92.9%
2020/21	-	79.8%	87.2%	89.3%	88.5%	93.3%
2021/22	77.8%	78.2%	89.9%	89.5%	86.5%	83.9%
2022/23	83.2%	78.2%	89.9%	89.5%	86.6%	83.9%

The percentage of travel on sealed roads which are smoother than a defined threshold (STE roughness) on the district's road network was increasing up until 2020/21 on all roads except the Arterial roads in the district. In the following years the STE has remained consistent on all roads

throughout the district. From 2021/22 the same contractor has been utilised to undertake the work providing consistent methods of data collection, removing the possibility of large variance in data each year.

Peak Roughness

The ONRC Amenity Customer Outcome 2 measure, is a measure of peak roughness based on a NAASRA score for each ONRC road classification, by rural and urban roads. The Peak Roughness on the district's roads for urban and rural roads are provided in Table 0-14 and Table 0-15, respectively.

TABLE 0-14: SEALED ROAD PEAK ROUGHNESS ON URBAN ROADS

Year	Regional	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
2018/19		104	127	146	171	183
2019/20		134	127	143	144	148
2020/21		114	116	130	144	146
2021/22	124	126	137	143	157	184
2022/23	110	130	137	145	158	184

TABLE 0-15: SEALED ROAD PEAK ROUGHNESS ON RURAL ROADS

Year	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
2018/19	-	99	111	157	193
2019/20	-	96	121	139	156
2020/21	-	90	115	138	152
2021/22	92	89	118	136	162
2022/23	86	90	118	137	165

Average Roughness

The ONRC Amenity Technical Output 1 measure, is a measure of average roughness based on a NAASRA score for each ONRC road classification, by rural and urban roads. The Average Roughness on the district's roads for urban and rural roads are provided in Table 0-16 and Table 0-17, respectively.

TABLE 0-16: AVERAGE ROUGHNESS OF URBAN SEALED ROADS

Year	Regional	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
2018/19	-	62	79	87	108	128
2019/20	-	94	91	101	105	108
2020/21	-	88	91	96	104	107
2021/22	96	94	100	103	115	131
2022/23	83	96	101	105	116	130

TABLE 0-17: AVERAGE ROUGHNESS OF RURAL SEALED ROADS

Year	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
2018/19		71	78	102	116
2019/20		72	88	102	110
2020/21		68	86	101	109
2021/22	71	68	87	101	116
2022/23	73	68	88	103	118

Response to Customer Service Requests

The DIA – Non-Financial Performance Measures Rules 2013, performance measure 5 (response to service requests) identifies the percentage of customer service requests relating to roads and footpaths to which the Council responds within the timeframe specified in the LTP.

This data is collected by NPDC and analysed quarterly throughout the year. For the most recent 2022/23 year 98% of customer service requests were responded to within the specified timeframes. The number of transport related requests has remained consistent over the previous five years. The target of 95% is currently met.

Percentage of residents satisfied with the overall quality of the district's roads

The annually commissioned NRB survey provides the Council with an indication of the satisfaction levels of its residents across several areas. The most recent survey indicates the satisfaction with the quality of the district's roads has reduced to 56%.

Excluded Performance Measures

The following performance measures from the ONRC are not included in the Level of Service Measures Table 0-5, with the reasoning outlined below.

Aesthetic Faults

The ONRC amenity Level of Service 'Technical Output 2: Aesthetic Faults' has been excluded as NPDC believes the cost of measuring this Level of Service outweighs the benefits provided.

3.3.4 Accessibility and Sustainability

Objective

The Council will provide high quality, safe footpath and cycle networks

Current Performance

The percentage of residents satisfied with the quality and safety of the district's cycle network

Each year in the NRB survey the Council records the percentage of residents satisfied with the quality and safety of the district's cycle network. For the most recent year (2022/23) it was found that 71% of residents were satisfied with the quality and safety of the cycle network.

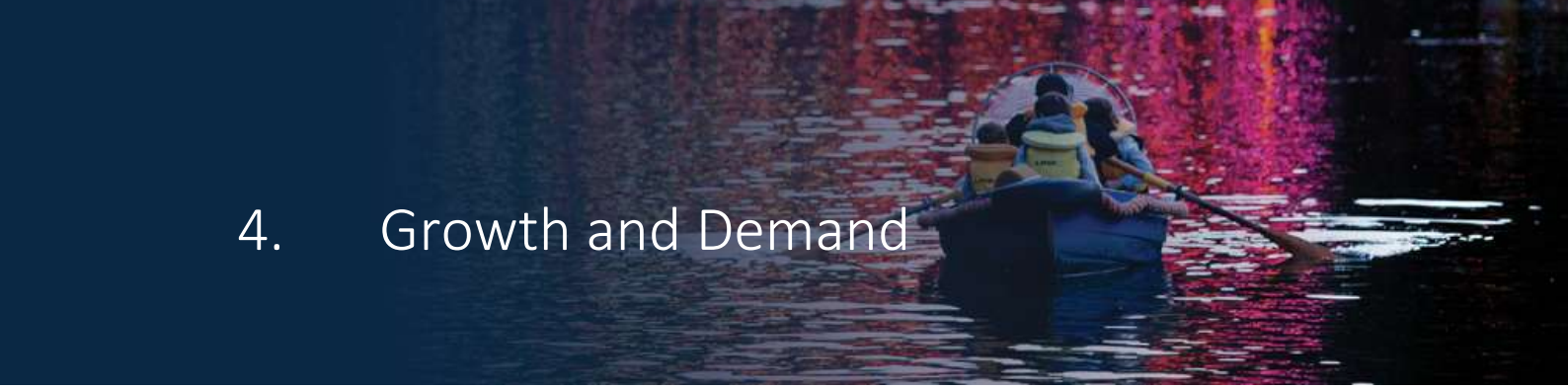
The percentage of footpaths that meet the Levels of Service and service standards

The measure is required by the DIA, Performance Measure 4 (condition of footpaths within the local road network) and is defined as "The percentage of footpaths within a territorial authority district that fall within the level of service or service standard for the condition of footpaths that is set out in the territorial authority's relevant document (activity management plan)".

The most recent survey found that 94% of footpaths met this standard.

Proportion of Network not available to Class 1 heavy vehicles and 50MAX vehicles

The ONRC Accessibility Customer Outcome 1 measure, is a measure of the proportion of the network not available to Class 1 heavy vehicle and 50MAX vehicles. At present, 26% of the network is not available to Class 1 heavy vehicles and 50MAX vehicles.



4. Growth and Demand

Contents

4.1. Introduction

Asset management planning relies on forecasts and the identification of other factors to understand the demand on the transportation network. There are several factors that influence customer demand on the transportation network, and these have been grouped into the following areas:

- Population growth and decline
- Demographic change
- Change in land use
- Economic growth and Waka Kotahi's view (Arataki)
- Modal change
- Development of recreational areas
- Future customer expectations
- Traffic data and growth
- Investment and growth opportunities

This section describes the Council's growth forecasts, their impact on transportation network demand and how the Council proposes to deal with this impact.

The latest growth projections for the district were developed in March 2022. The projections include resident population and household numbers for the region, comprising the New Plymouth, South Taranaki and Stratford districts. The projections cover a 30-year period up until 2051 and are driven to a significant extent by economic as well as demographic factors.

The growth model was developed to use the projection of employment growth to inform the projection volumes of net migration and to ultimately derive the projected population and household numbers. As a result, the population projections for the district are essentially informed by the economic prospects of the region. The growth projection, namely housing capacity was also informed by analysis of NPDC's Proposed District Plan and discussions with NPDC staff, including a workshop.

The projections are based on the normal economic and demographic trends, though have factored in the potential implications of COVID-19 on the population and economy.

The medium growth scenario is typically used to reflect a stable or a steady increase in resident population. The medium growth scenario is considered most appropriate for the Council's long-term planning.

4.2. Population Growth/Decline

Based on the growth projections, with a population of 87,700 in 2022, the district has approximately two thirds of the region's population. The projections indicate that under a medium growth scenario in the district, the population is expected to reach 104,900 in 2051. This means the district will grow by approximately 20% by 2051 and will require an addition of 11,592 houses. Previous projections

for the district were for a static or declining population. The expected increase in population has required a significant shift in thinking and focus on long term planning.

In view of the LTP planning period, the district population is forecasted to grow by 7,200 people (8.3%) over the life of the 2021-2031 LTP (10 years). This will equate to a growth of approximately 386 houses per annum in the first five years and a growth of 332 houses per annum (average) in the second five years.

The highest level of growth is projected to occur in New Plymouth in the eastern suburbs of Fitzroy, Glen Avon, Bell Block and the south-western suburb of Hurdon. Population decline is expected to occur in the rural areas around Inglewood (Everett Park and Mangaoraka) and south of Omata. This forecast aligns with the areas identified for growth in the Proposed District Plan, particularly Bell Block in the short term and Smart Road future growth area in the long term.

4.3. Demographic Change

The age profile within the district is changing over time. It is anticipated that there will be an increase in the number of people aged 65 and over, from 19% (16,651) of the total population in 2021, to approximately 30% (28,256) in 2051.

Forecasting indicates that the district will continue to experience a natural increase in population up to 2051 (the difference between births and deaths, i.e., the ability for the population to grow naturally), although the ageing population means the rate of natural increase will decline consistently over the next 30 years from 2020. As net migration into NZ is projected to plateau in the coming years, and as the region is required to transition away from emissions intensive industries, net migration into the region is projected to decline gradually to levels below 700 individuals per annum from approximately 2,029.

This shift may bring an increased demand for infrastructure that is highly accessible and will likely mean a greater proportion of the population will be on a fixed income.

The Council has a dedicated ageing strategy which highlights the need to provide infrastructure and services that allow the safe and easy movement of ageing persons throughout the district. The strategy details the key actions the Council undertakes in ensuring an accessible network that caters for the elderly. These include:

- Forward planning to provide appropriate and accessible transportation access to parks and open spaces
- Infrastructure audits of roads, footpaths and crossings to determine their suitability for an ageing demographic
- The establishment of a transportation reference group to support the forward planning of transportation detailed infrastructure
- Respond to and deliver infrastructure improvements that will support the mobility movement of ageing persons

4.4. Change in Land Use (e.g., Subdivision Development or Rural Land Use Changes)

The Proposed District Plan identifies the urban growth elements. NPDC recognises the importance of consolidating and directing the location of the growth of the district through managing subdivision and development in areas that are available or may be part of a future growth area. This promotes the sustainable management of the district's natural and physical resources.

A common theme of previous District Plan changes is the desire to change the zoning to cater for growth. These plan changes involved rezoning large areas of rural land to residential.

The Proposed District Plan defines development areas as areas which are suitable for urban growth purposes, where a Structure Plan applies. The Proposed District Plan states that a Structure Plan should address the need for the activity to provide *"connected transport networks that allow ease of movement to, from and within the Development Area"*[3]. The Future Urban Zone (FUZ) areas are those areas which have been identified as suitable for both business and residential urban growth. The FUZ provides the long-term land supply for the district[4].

The District Growth Map (shown in **Figure 0-1**Error! Reference source not found.) provides an indication of the development land use changes set to occur in the district over the next 30 years and identifies the following areas for development:

- Undeveloped industrial land
    - Bell Block, south of State Highway 3 (SH3)
- Undeveloped residential land
    - Significant amount of land in:
        - Bell Block, north of SH3
        - Hurdon
        - Highlands Park
- Rezoned Residential areas
    - Small parcels of land accessed from Brooklands Road and Carrington Road
    - Spotswood
    - Westown
- Development Areas (0-10 years growth forecast)
    - Bell Block
    - Carrington Road

[3] Part 3: Development Areas, DEV1 – Bell Block Area Q Structure Plan Development Area (DEV1-P5.7b)

[4] Section 32 Report Future Urban Growth – Proposed District Plan

- Junction Road
- Hurdon

- FUZ (10-30 years growth forecast)
  - Smart Road
  - Frankley and Cowling Road
  - Bell Block
  - Oakura
  - Waitara

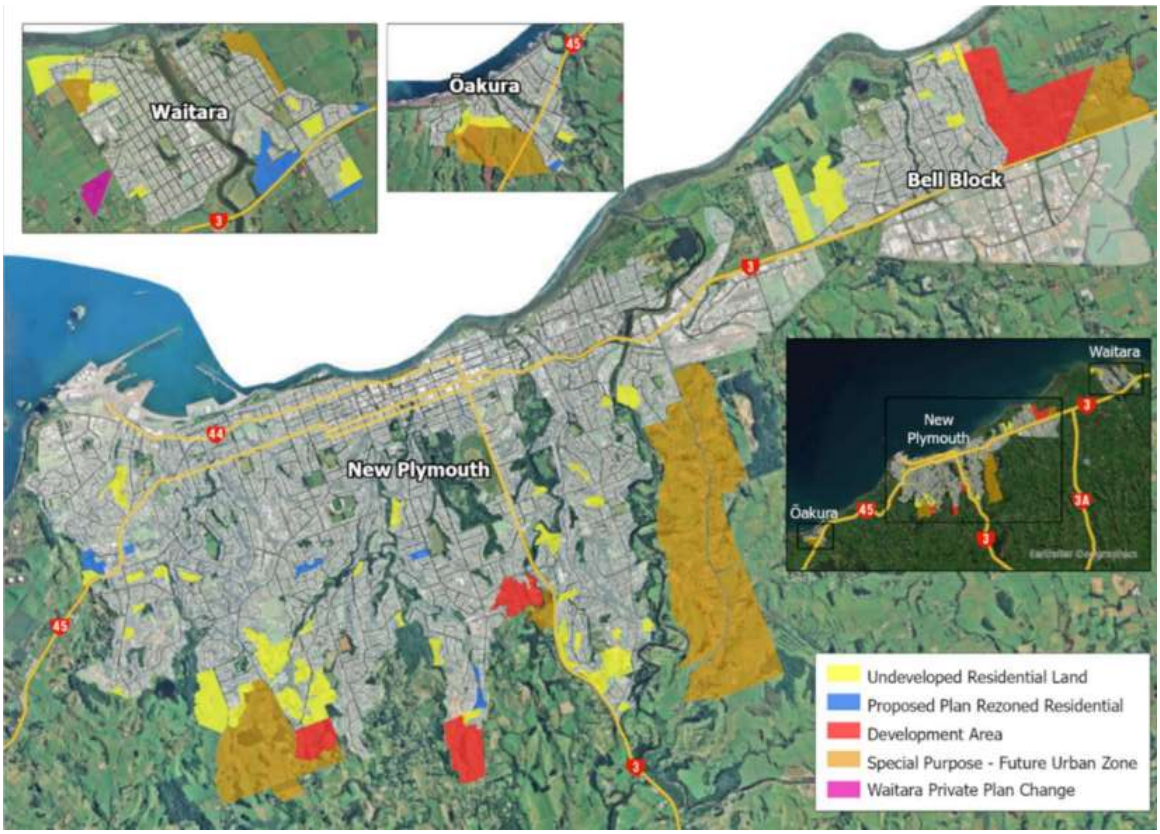


FIGURE 0-1 - NEW PLYMOUTH GROWTH MAP

Significant development and land use change can impact the traffic make-up, patterns and volumes on the network. This can have implications for network performance, maintenance and management.

Based on the Development Areas identified in **Figure 0-1** a significant amount of greenfield residential development is to occur at the periphery of the existing residential areas. The Council recognises that it is less expensive for people to build in underdeveloped areas; however, this leads to more traffic using the Arterial Road network and puts significant pressure on the State Highway

network. Though it takes time to develop public transport networks and active mode connections, access improvements will be required.

Development around Bell Block will place pressure on the State Highway transport network, with significant amounts of residential and industrial development, resulting in higher traffic volumes on the State Highway network. To accommodate the increase in traffic volumes several changes are currently planned with some underway for SH3 between Henwood Road in Bell Block and Princess Street in Waitara. This work incorporates wider safety improvements and is planned to be completed by the end of 2028.

The significant residential development of Smart Road will result in greater traffic volumes through the signalised intersection of Smart Road and SH3. The transportation movements associated with this residential development will be investigated as part of the Integrated Transport Strategy.

Development on the western side of New Plymouth is more easily accommodated on the transportation network, with planned development on a smaller scale. Across the district, State Highway connection is important when considering the transport implications of any development, as in many areas the State Highway is the primary Arterial Road.

Over and above the areas discussed above, the Proposed District Plan's Structure Plans provide specific guidance to developers in relation to road layout, connections, access and other infrastructure elements related to Development Areas. This allows areas to be planned with sufficient detail at an early stage to ensure that essential services, parks and reserves, and the transportation network achieve connectivity within the area and with the surrounding area in a cohesive manner.

4.5. Economic Growth and Waka Kotahi's View (Arataki)

Waka Kotahi's Arataki[5] is outlined in **Section 2: Strategic Case** of this AMP. Taranaki's place-based summary[6] provides some insight into Waka Kotahi's view of the region's future demand, growth and direction as it relates to the land transport system. Understanding this view assists the Council in planning, managing and delivering a transportation activity that aligns with Waka Kotahi's priorities and responses, and enables a collaborative approach between the Council and Waka Kotahi in doing so. Whilst it is noted that the regional summary for Taranaki is concerned with the region as a whole and not the district alone, it provides insights into the region as viewed through a district lens as detailed in Figure 0-2.

[5] https://www.nzta.govt.nz/planning-and-investment/planning/arataki/

[6] 2021-2031 Regional Summary Taranaki – Version 1.1

Travel management of growth	Climate change	Road safety
It is important that growth in housing and employment in and around New Plymouth, including new facilities like schools and healthcare, is managed in a way that reduces dependency of private vehicles and average journey length.	Only a small proportion of Taranaki's Road network is likely to be impacted by sea level rise resulting from climate change. However, networks in the north and east of the region are expected to come under increased pressure from storm intensity combined with relatively unstable	While Taranaki has relatively low levels of total DSI crashes compared to other regions, the location of the crashes indicates increased risk on the networks in and around New Plymouth and Hāwera, SH3 between these two centres, and high-risk rural roads.
Economic performance	**Heavy vehicles**	**Existing demand**
The region's economic performance is underpinned by two high-income, export-oriented sectors: dairy farming and processing, and the oil and gas industries. Both sectors have experienced relatively low commodity prices since 2014, and the region faces a challenge to diversify as part of the transition to a low-emissions economy.	Currently heavy vehicles travel 75 million kilometres on Taranaki Roads every year, driven by the oil and gas, dairying and forestry sectors. This has a significant impact on local roads.	New Plymouth's transport networks are generally well connected and fit for purpose, with capacity to accommodate projected traffic volumes in most areas. The key area of pressure on the transport system is the link between New Plymouth city centre and the residential and business growth areas to the east of the city (Bell Block).
Aging population	**Sustainable transport**	**Employment trends**
New Plymouth District will have a higher number of people aged 65 years and over, so ensuring good access for senior residents will be important to ensure they remain socially connected, active and able to participate in their communities.	Walking and cycling levels are above the national average supported by ongoing investment in infrastructure. Public transport services are limited and focused on access to essential services.	While employment in service industries is growing in the New Plymouth urban area, manufacturing continues to be important. Expanded forestry harvesting over the next decade will increase freight movement in the south and east of the region.
Forestry	**Transition 2050**	
Harvesting of forest blocks is forecast to peak over the next decade, increasing freight movements to Port Taranaki and placing pressure on the maintenance of road networks in the south and east of the region.	Waka Kotahi will look for ways to support initiatives to diversify the region's economy as part of a transition to a low-missions economy.	

FIGURE 0-2: SUMMARY OF WAKA KOTAHI ARATAKI TARANAKI

In addressing the above points Waka Kotahi are focussing effort on the following areas in the region in the coming 10 years (2021-2031)[7]:

Improving urban form:

- Waka Kotahi will engage in planning processes to support a well-integrated and well-designed land use and transport system

Significantly reducing harms across safety and health:

- Waka Kotahi will support implementation of the Vision Zero Strategy for NZ and deliver better health outcomes through initiatives that target step changes around urban form, increased access to public transport and active modes and efforts to reduce carbon emissions

Transforming urban mobility:

- Waka Kotahi will support improvements to walking and cycling networks, public transport services and the development of the New Plymouth Network Operating Framework

Tackling climate change:

- Waka Kotahi will engage in local planning processes to avoid development in increased risk areas, ensure urban form and transport planning supports reductions in emission, private vehicle travel and average trip length
- Waka Kotahi will enable continuous improvement in network resilience through maintenance and renewals, and low cost / low risk investment

The reach of these focus areas is indicated below in Figure 0-3**.**

[7] 2021-2031 Regional Summary Taranaki – Version 2 – Areas of Focus: Taranaki 2021-2031 – Waka Kotahi

FIGURE 0-3 - REGION STEP CHANGES (WAKA KOTAHI ARATAKI 2021-31 TARANAKI SUMMARY V2)

4.6. Modal Change

The mode share (journey to work) data for New Plymouth as captured by the previous four censuses is shown below in **Table 0-1.**

TABLE 0-1 - CENSUS MODAL SPLIT TRAVEL TO WORK

Travel mode		Year			
		2001	2006	2013	2018
Vehicle	Number of trips	18,618	22,563	24,243	31,200
	%	83.7%	82.6%	84.8%	92.0%
Public transport	Number of trips	165	132	168	219
	%	0.7%	0.5%	0.6%	0.6%
Active transport	Number of trips	2,316	2,490	2,715	2,490
	%	10.4%	9.1%	9.4%	7.3%

The data indicates an increasing percentage of trips taken to work by vehicle and public transport since 2006. The number of active mode trips as a percentage of total trips on the network has decreased from the 2013 Census to the latest Census (2018).

Quality assessments undertaken by Stats NZ indicate that although most key data was either of very high, high, or moderate quality, there is some data that is poor or very poor due to lower-than-expected participation. The data of very poor quality is absentees (people not at home during census

night), iwi affiliation, and family / household information. Of relevance in this case, the overall quality of travel to work data for 2018 was rated as moderate by Stats NZ and poor by an External Data Quality Panel.

In comparison to the Census data the Council conducts cycle and pedestrian counts to understand active mode trips on the network. Pedestrian counts are conducted using pedestrian counters which are placed at a variety of park locations throughout New Plymouth. The counters are used to inform the use of recreational areas, but also provide some insight into the changing demand for pedestrian facilities in the different counter locations. As discussed in **Section 3: Levels of Service** of this AMP, improvements into the count programme are currently being investigated.

Cycling cordon counts are undertaken on a single day every March across 10-11 sites throughout New Plymouth. Counts have taken place every March since 2016. The latest count was undertaken in March 2023. The counts give an indication as to how the cycle network is being used and provide insight into the diversity of the cycling population. A summary of the counts is provided in Table 0-2.

TABLE 0-2 - NEW PLYMOUTH ANNUAL CYCLIST CORDON COUNT

Year	Male	Female	Total	Change from last year
2016	339	75	414	N/A
2017	257	80	393	-5%
2018	299	157	456	16%
2019	358	148	506	11%
2020	534	167	701	39%
2021	328	134	462	-34%
2022	427	168	595	28%
2023	394	165	559	-6%

NPDC has multiple data collection posts which are located along the major walking and cycling routes throughout New Plymouths urban centre. These collection points provide live and up to date data regarding the use of these walkways. A summary of this data is shown in Table 0-3 and Table 0-4.

TABLE 0-3 - PEDESTRIAN VOLUMES ON KEY NEW PLYMOUTH WALKWAYS

Site	July 2021	January 2022	July 2022	January 2023	Seasonal Change (%)
Coastal Walkway: Port to Kawaroa	149	717	85	763	**Summer: + 6%** **Winter: - 43%**
Coastal Walkway: Wind wan to East-End	321	1191	191	3745	**Summer: + 214%** **Winter: - 40%**
Coastal Walkway: Hickford Park to Bell Block	76	176	40	155	**Summer: - 12%** **Winter: - 47%**
Huatoki Walkway	56	113	25	126	**Summer: + 9%** **Winter: - 55%**
Pukekura Park: Fillis Street Entrance	257	916	115	4802	**Summer: + 424%** **Winter: - 55%**
Te Henui Walkway	82	256	45	257	**Summer: + 0.3%** **Winter: - 45%**

TABLE 0-4 - CYCLING VOLUMES ON KEY NEW PLYMOUTH WALKWAYS

Site	July 2021	January 2022	July 2022	January 2023	Seasonal Change (%)
Coastal Walkway: Port to Kawaroa	75	917	53	910	**Summer: - 0.7%** **Winter: + 30%**
Coastal Walkway: Wind Wand to East-End	172	1507	153	1739	**Summer: + 15%** **Winter: - 11%**
Coastal Walkway: Hickford Park to Bell Block	54	519	9	424	**Summer: - 18%** **Winter: - 83%**
Huatoki Walkway	14	85	6	98	**Summer: + 15%** **Winter: - 57%**
Pukekura Park: Fillis Street Entrance	0	0	0	0	**Summer: N/A** **Winter: N/A**
Te Henui Walkway	108	342	24	364	**Summer: + 6.4%** **Winter: - 77%**

The above data collection points in Table 0-3 and Table 0-4 were selected as they cover a large proportion of New Plymouths main walking and cycling pathways. These sites were selected to provide a better understanding of the overall walking and cycling figures in New Plymouth.

- **Coastal Walkway: Port to Kawaroa** – This site covers the western most section of New Plymouths Coastal Walkway. The length of this section is approximately 1.5km long and is situated between the eastern end of the Lee Breakwater in proximity to Port Taranaki through to Kawaroa Park which borders the districts largest public aquatic centre.
- **Coastal Walkway: Wind Wand to East-End** – This site is situated within a highly traffic section in the middle of the New Plymouth Coastal Walkway. This section is approximately 2.1km between New Plymouth's largest landmark the Wind-wand through to one of New Plymouths most popular beaches.
- **Coastal Walkway: Hickford Park to Bell Block** – This site is located within the northern most section of the New Plymouth Coastal Walkway. The length of this section is approximately 1.2km and is situated within an urban centre to the north of the New Plymouth CBD.
- **Huatoki Walkway** – This site is situated on the southern edge of New Plymouths CBD. The total length of the walkway is 3.1km however, the counter is situated in the third closest to the CBD.
- **Pukekura Park: Fillis Street Entrance** – This site is situated at the main gates at the northern end of Pukekura Park. These gates experience significant amounts of pedestrian traffic throughout the year and is boosted during the festival of lights period. However, cyclists are restricted from riding through the park leading to **Table 0-4** having a zero count.
- **Te Henui Walkway** – This site is situated along the eastern end of New Plymouths CBD. The walkway is under bush for most of its entirety, which may be a reason that throughout the winter months the number drop of so significantly. The walkway extends through from the base of Cumberland Street through to East End beach reserve.

4.7. Development of Recreational Areas

The development of recreational areas can increase the traffic demand on the transportation network but will also encourage residents to be more active and can often lead to an increase in walking and cycling trips. The Proposed District Plan identifies three different Open Space and Recreational Zones which have been identified with the purpose of providing open space areas for a range of different activities:

- Natural Open Space Zone:
    - A low level of development and built form is anticipated within this zone to retain the natural / biodiversity values within natural open space areas
- Open Space Zone:
    - Open space for passive and active leisure and recreational activities along with associated facilities and structures. These include Te Henui walkway, East End Reserve and Pukekura Park.
- Sport and Active Recreation Zone:
    - It is generally accepted that the level of development in this zone is higher than other Open Space and Recreational zones and that the sport and recreational activities that

are anticipated to take place in this zone can generate traffic effects in surrounding neighbourhoods.

The New Plymouth Open Space, Sport and Recreation Strategy was approved by the Council in 2015 and sets the strategic direction for Council owned facilities, open spaces and features within them. The supporting background document identifies the importance of planning tools in improving accessibility between existing and new open spaces.

Some significant recreational developments planned in the district in the future require significant transport planning in order to complement the existing transportation network. These developments and their impact are listed below:

- Destination Play:
    - This is an opportunity for the people of New Plymouth coming together to create something amazing for our people and will reflect on New Plymouths unique cultural heritage.
    - The playground will encourage healthy lifestyle choices for New Plymouth residents with its connectivity with the Coastal Walkway.
    - Encouraging sustainable low carbon emission transportation options to access the playground is at the forefront of the developments planning process.
- Tuparikino Community Hub:
    - The purpose of the Hub is to have a collective central space for communities in New Plymouth to come together and engage in a range of formal sports as well as a multi-use play space.
    - The infrastructure associated with the community hub and the opportunities it provides residents aligns with NPDC's vision of becoming a sustainable lifestyle capital.
    - The planning of implementing low carbon emission transportation options that fit seamlessly into the existing local transportation network is currently underway.
- Waitara to Mangāti Walkway Extension:
    - The purpose for the walkway extension is to provide both communities better connections for walking and cycling.
    - The improvements again help New Plymouth to reach the Councils vision of a sustainable capital providing high quality infrastructure and encouraging active modes of transport.
    - The project is at the detailed design stage.

4.8. Traffic Data and Growth

4.5.1 Traffic Counting

NPDC has a dedicated traffic counting program associated with the Council's maintenance activities. Traffic volume data is used to assist with planning, prioritising network improvements, road design, and road safety.

NPDC completes approximately 250 traffic counts per year throughout the district, with the counting programme carried out based on road hierarchy and need. Traffic counting data is collected every five years on the New Plymouth network, except for unsealed roads where data is collected every 10 years. All traffic data is uploaded to the Council's Geographic Information System (GIS) maps and made available by the Council in the form of Metro count files. Traffic counting allows the Council to manage and coordinate improvements on the transportation network and inform road safety and temporary traffic management decisions.

4.5.2 Traffic Growth

The Proposed District Plan has indicated some potential areas for growth, as shown below in **Figure 0-4.**

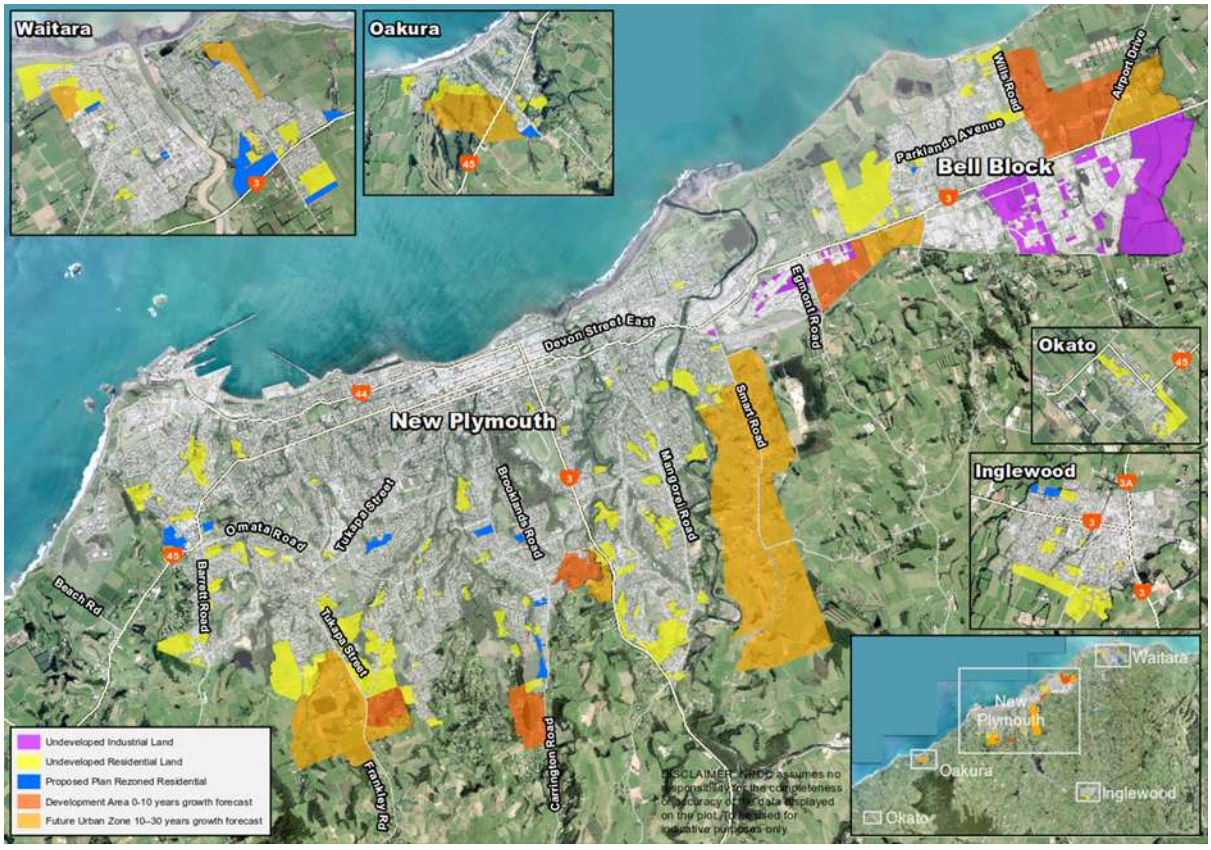


FIGURE 0-4 - PROPOSED GROWTH AREAS OUTLINED IN NPDC PROPOSED DISTRICT PLAN

The dark orange areas with red circles around them represent those regions where structure plans have been put in place for growth over the next ten years. Bell Block has two of these zones (1 and 2), with residential construction permitted in the region north of SH3 between Wills Road and Airport Drive. To accommodate this growth, extensive modifications to SH3 are planned.

The second area in Bell Block (2) is zoned for industrial development and is adjacent to Egmont Road. The connections with SH3 are being investigated by Waka Kotahi for improvements to better accommodate the traffic generated following the completion of the development.

The next three areas highlighted for growth are on the southern fringes of New Plymouth. Area 3 is accessed from Junction Street. A Traffic Impact Assessment has been completed and is stored in the Council's Enterprise Content Management (ECM) system (reference: ECM#7918180). The Structure Plan covers 17ha creating approximately 151 lots and thus a daily traffic flow of 1,510 vehicles per day (VPD) and a peak hour traffic flow of 151 vehicles per hour (VPH). This level of increased traffic is unlikely to change the ONF classification of the surrounding roads. However, it is possible that it will impact on the performance of the one lane bridge over Te Henui Stream.

Area 4 is approximately 30.7ha and is the continuation of a recent Development Area accessed from Huatoki Street. It will have connections to Carrington Road and the prior construction. A similar lot yield to Junction Street will result in the creation of 307 lots, 2,920 VPD of daily traffic (based on 9.5 visits per lot/day), and peak hour flows of around 300 VPH. It is expected that Carrington Road will be the primary route for most of the traffic generated from following the completion of the development.

The last identified area (5) is land accessed from Frankley Road and Patterson Road and is approximately 19.5ha in area. The area has some areas of steep terrain and therefore the maximum expected yield is likely to be of the order of 175 lots; however, there are 11 existing dwellings within the area so the increase will be 164 lots. These are likely to generate of the order of 1,560 VPD and 156 movements in the peak hour. Traffic will have the option to utilise Tukapa Street or Frankley Road to gain access to the city and therefore the impact on either route is unlikely to have significant adverse impacts on the surrounding network.

There are other areas of zoned but undeveloped land identified in the map (coloured yellow), timing of the development of these areas is unknown at this time. These lots in isolation are unlikely to generate significant volumes of lots and thus lower traffic volumes generated and unlikely to significantly affect the local roading network.

The areas shaded orange are likely to be developed beyond the 10-year horizon and will be considered as part of the Integrated Transport Strategy.

4.9. Investment for Demand and Growth Opportunities

The Council typically has three reasons for purchasing land for the transportation network. These reasons are:

1. To build new roads to add resilience to the network caused by growth
2. Corridor widening to accommodate future transport demands (such as to provide footpaths through residential areas, that were previously rural) and to address boundary inconsistencies along a road frontage
3. To improve visibility at intersections, corner properties are purchased so corner splays can be designated before the property is then sold on

5. Business Case

Contents

5.1 Programme Business Case

5.1.1 Introduction

The Programme Business Case for the transportation activity provides the case for investment in transportation assets to ensure a safe, efficient, and sustainable transportation network exists now and into the future. It allows the Council and its co-investor, Waka Kotahi, the opportunity to consider a transport corridor management programme (or combination of, programmes) to adopt by allowing a trade-off to be made between risks and benefits.

A systematic approach is required in the development of the Programme Business Case for the transportation activity to ensure that key messages in the investment story are adequately communicated to investors. The Programme Business Case also demonstrates an understanding of the strategic objectives for the transportation activity by a strong linkage to the benefits and problems identified in **Section 3: Levels of Service** of this AMP.

The Programme Business Case pulls together the key investment related information from other sections of this AMP and summarises them into a succinct synopsis of the case for investment in the transportation activity. The Programme Business Case development process is shown in Figure 0-1Figure 0-1**.**

Strategic alignment identified in Section 2 has been carried forward into Strategic Alignment in Section 3, any areas greyed out show little or no alignment.

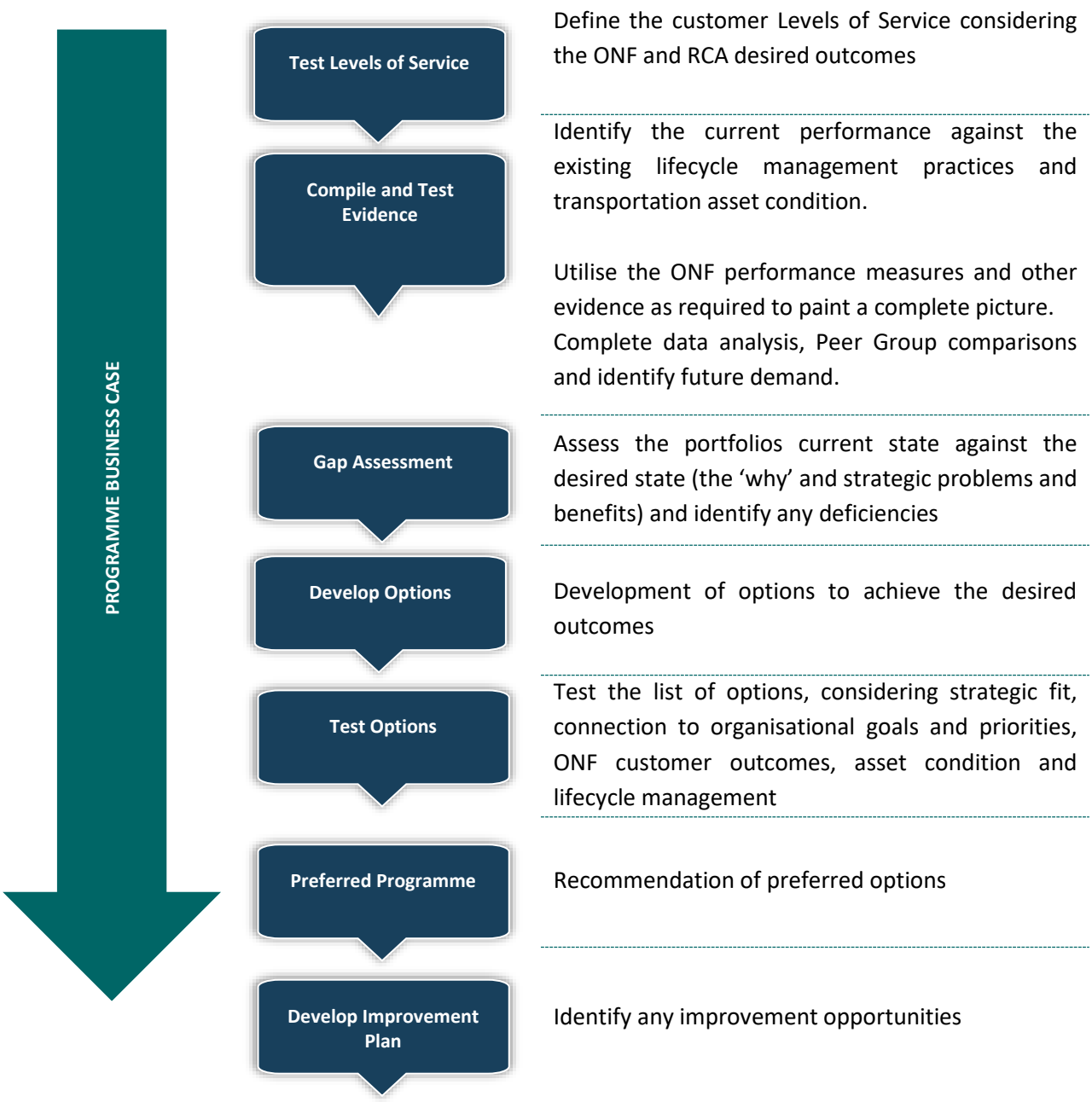


FIGURE 0-1 - THE PROGRAMME BUSINESS CASE DEVELOPMENT PROCESS

5.1.2 Investment Summary

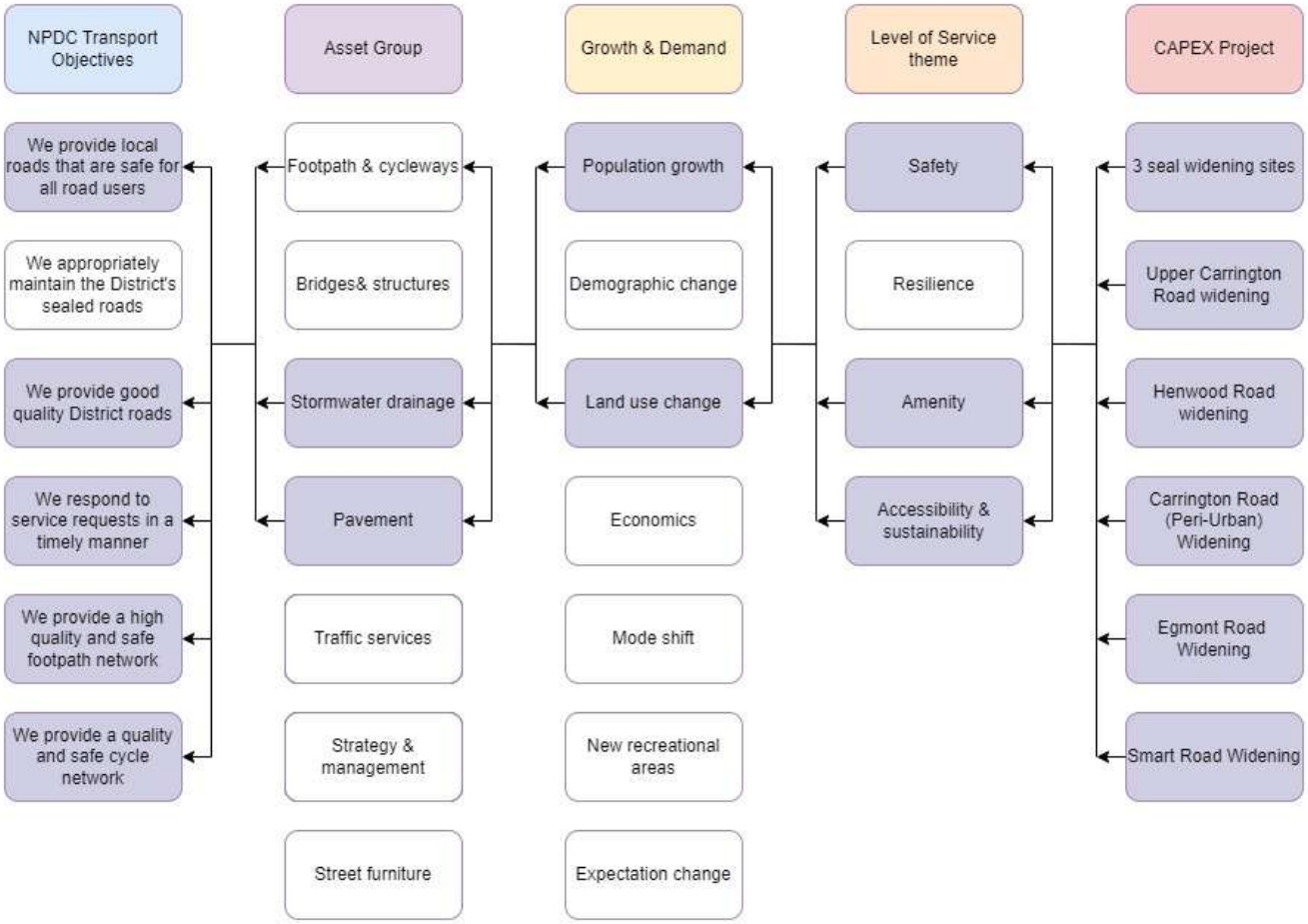
Section 3: Level of Service of this AMP identified the following benefits for investment in the transportation activity:

- Improved network performance
- Improved safety outcomes
- Improved economic outcomes.
- Improved transport choices

Investment in the transportation activity is described in detail in this section. The investment strategies to realise these benefits are summarised for each of the three main investment categories:

- Maintenance and operations
- Renewals
- Capital Improvements

The investment alignment of projects is provided in the following diagrams.


NPDC Transport Objectives
Asset Group
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We provide local roads that are safe for all road users
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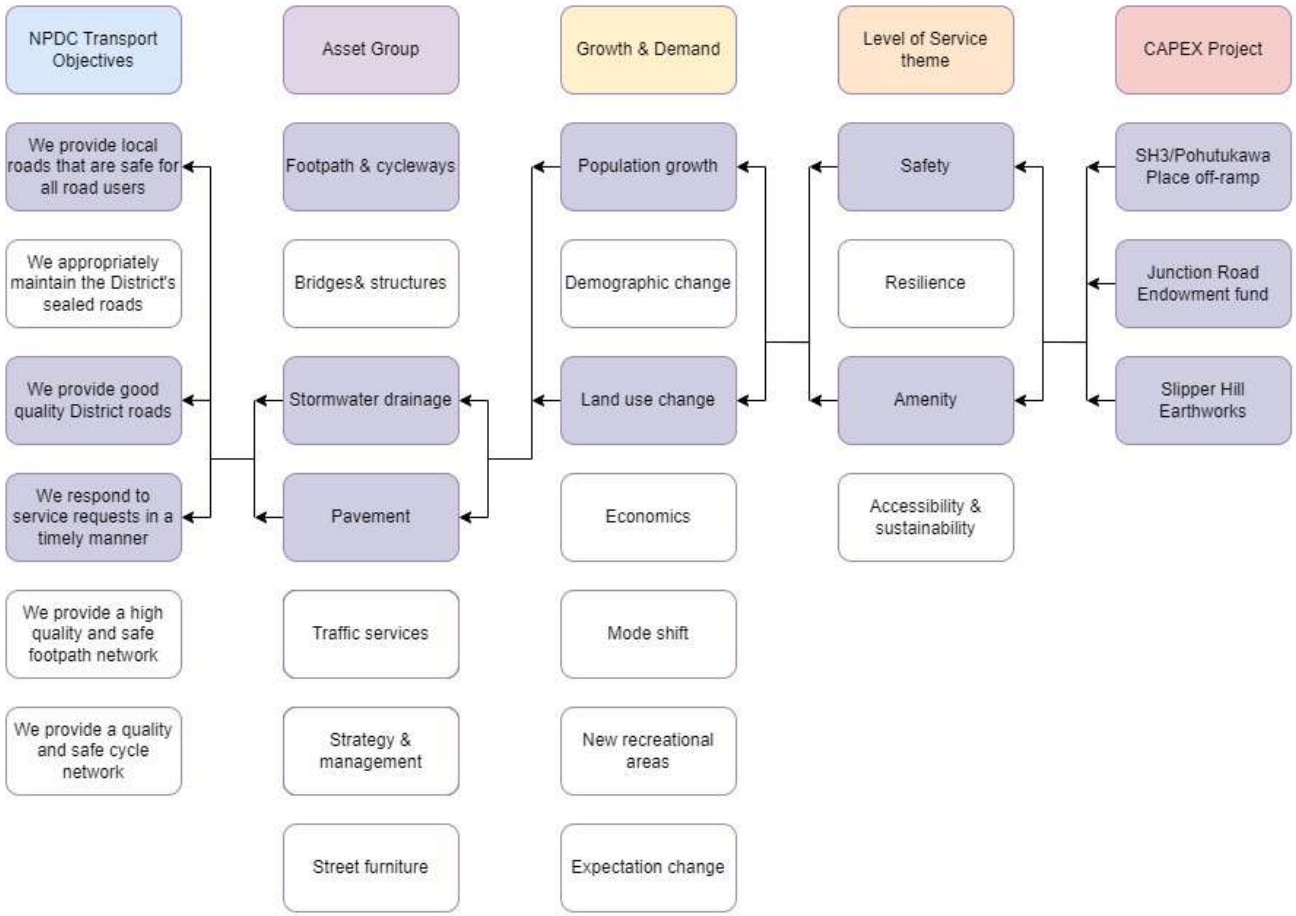
Street furniture
Population growth
Demographic change
Land use change
Economics
Mode shift
New recreational areas
Expectation change
Safety
Resilience
Amenity
Accessibility & sustainability
3 seal widening sites
Upper Carrington Road widening
Henwood Road widening
Carrington Road (Peri-Urban) Widening
Egmont Road Widening
Smart Road Widening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Street furniture
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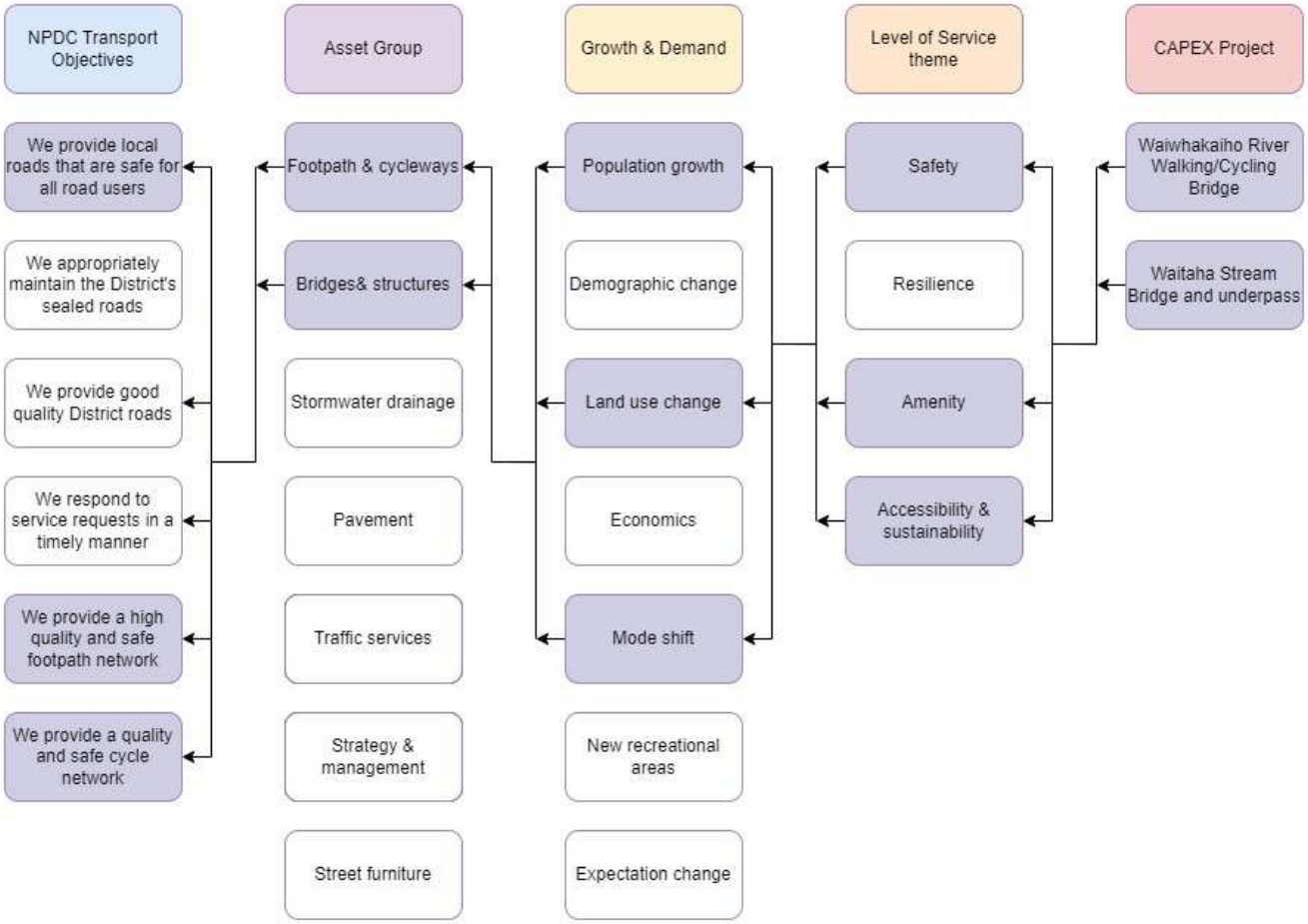
Safety
Resilience
Amenity
Accessibility & sustainability
SH3/Pohutukawa Place off-ramp
Junction Road Endowment fund
Slipper Hill Earthworks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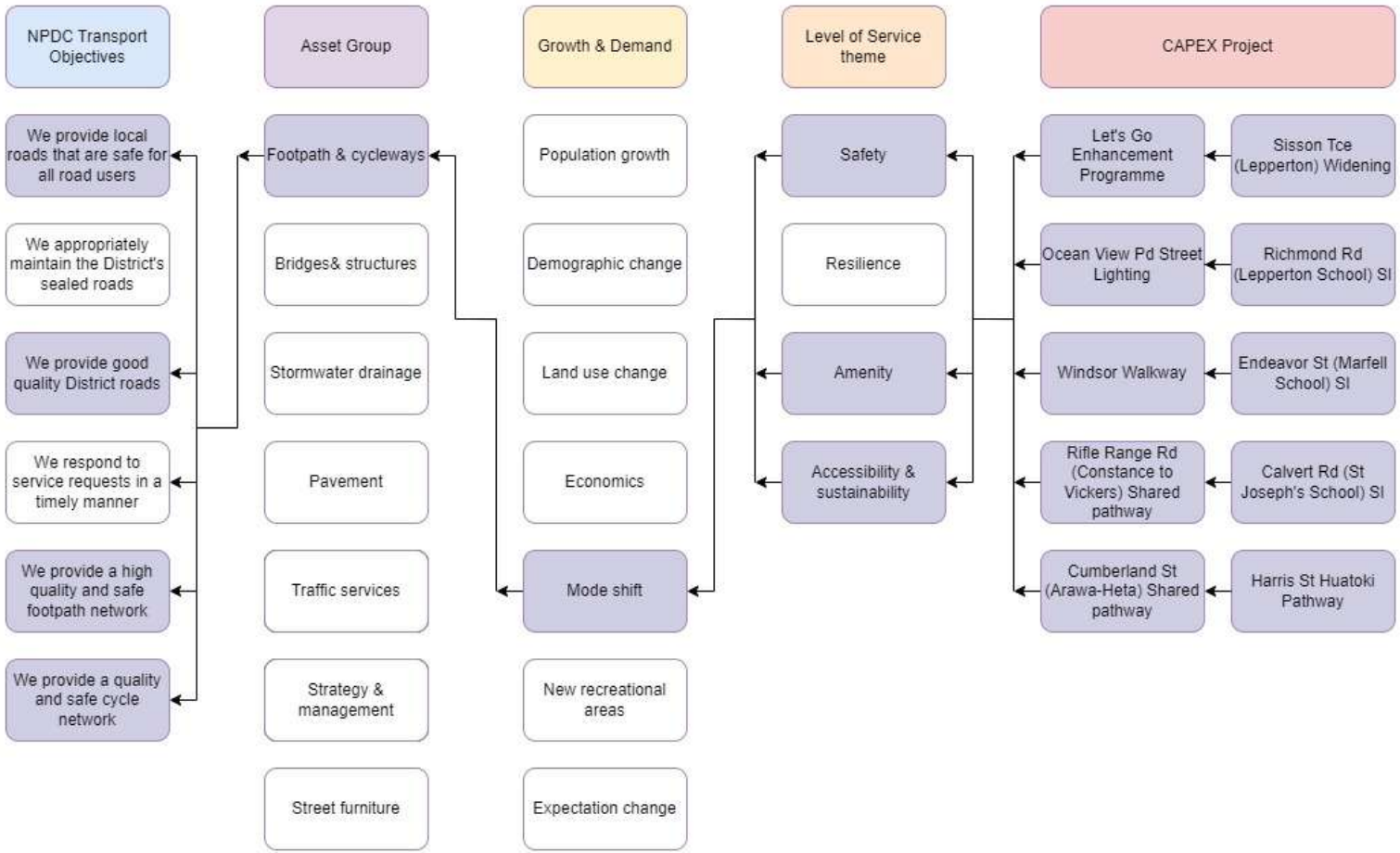
Waiwhakaiho River Walking/Cycling Bridge
Waitaha Stream Bridge and underpass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Population growth
Demographic change
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Economics
Mode shift
New recreational areas
Expectation change
Safety
Resilience
Amenity
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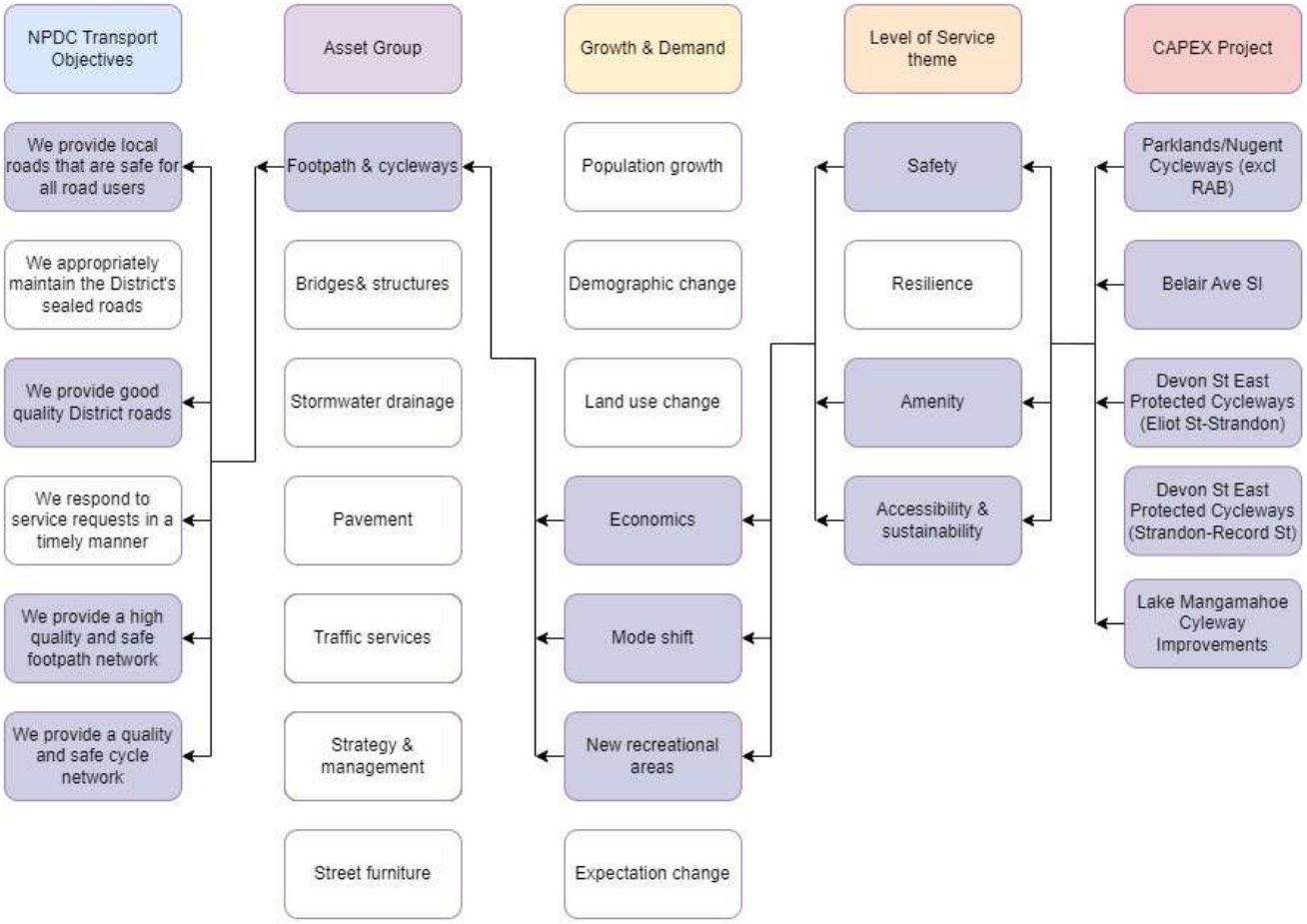
Let's Go Enhancement Programme
Sisson Tce (Lepperton) Widening
Ocean View Pd Street Lighting
Richmond Rd (Lepperton School) SI
Windsor Walkway
Endeavor St (Marfell School) SI
Rifle Range Rd (Constance to Vickers) Shared pathway
Calvert Rd (St Joseph's School) SI
Cumberland St (Arawa-Heta) Shared pathway
Harris St Huatoki Pathway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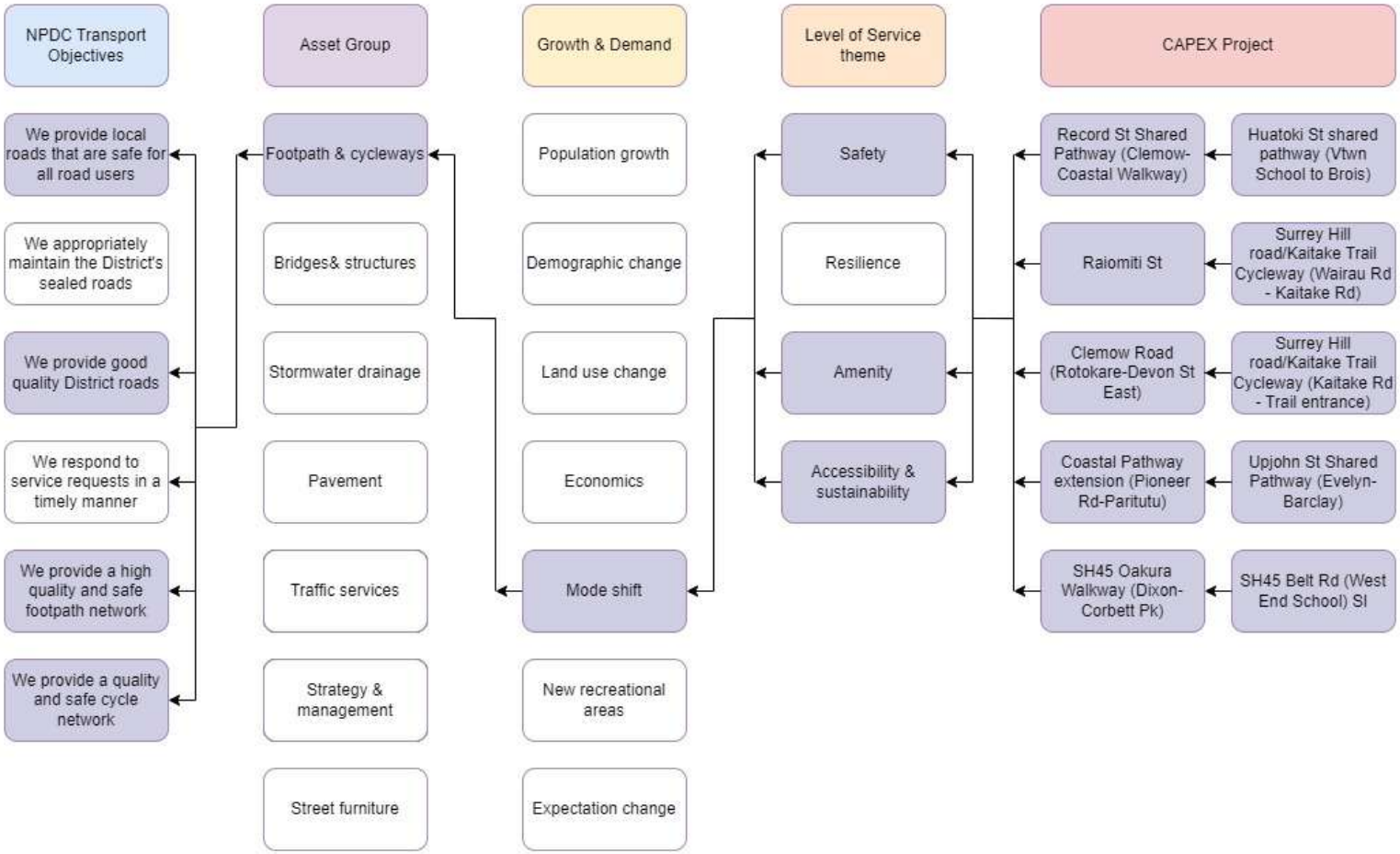
Parklands/Nugent Cycleways (excl RAB)
Belair Ave SI
Devon St East Protected Cycleways (Eliot St-Strandon)
Devon St East Protected Cycleways (Strandon-Record St)
Lake Mangamahoe Cyleway Improvements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Mode shift
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Resilience
Amenity
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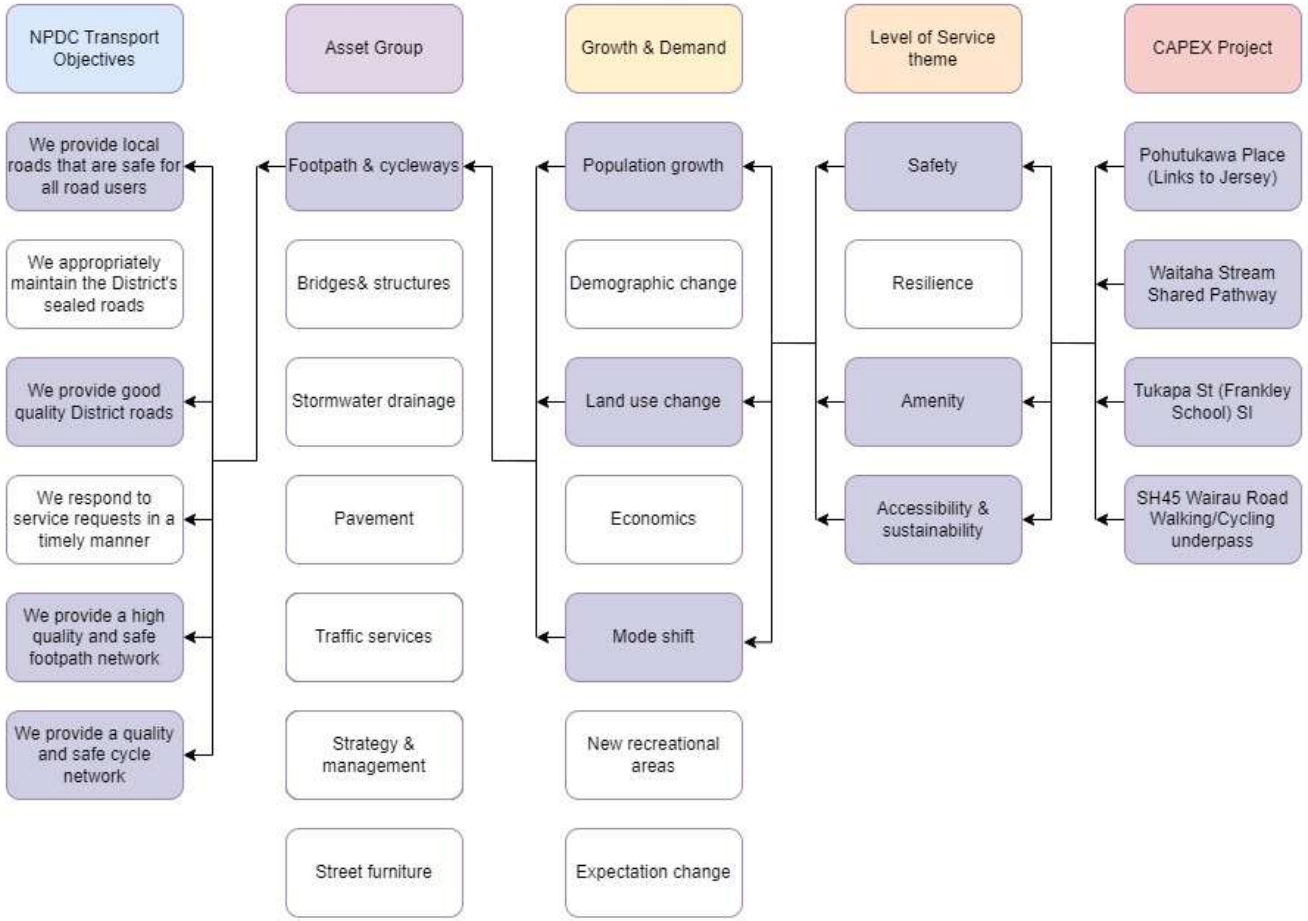
Record St Shared Pathway (Clemow-Coastal Walkway)
Huatoki St shared pathway (Vtwn School to Brois)
Raiomiti St
Surrey Hill road/Kaitake Trail Cycleway (Wairau Rd - Kaitake Rd)
Clemow Road (Rotokare-Devon St East)
Surrey Hill road/Kaitake Trail Cycleway (Kaitake Rd - Trail entrance)
Coastal Pathway extension (Pioneer Rd-Paritutu)
Upjohn St Shared Pathway (Evelyn-Barclay)
SH45 Oakura Walkway (Dixon-Corbett Pk)
SH45 Belt Rd (West End School) Sl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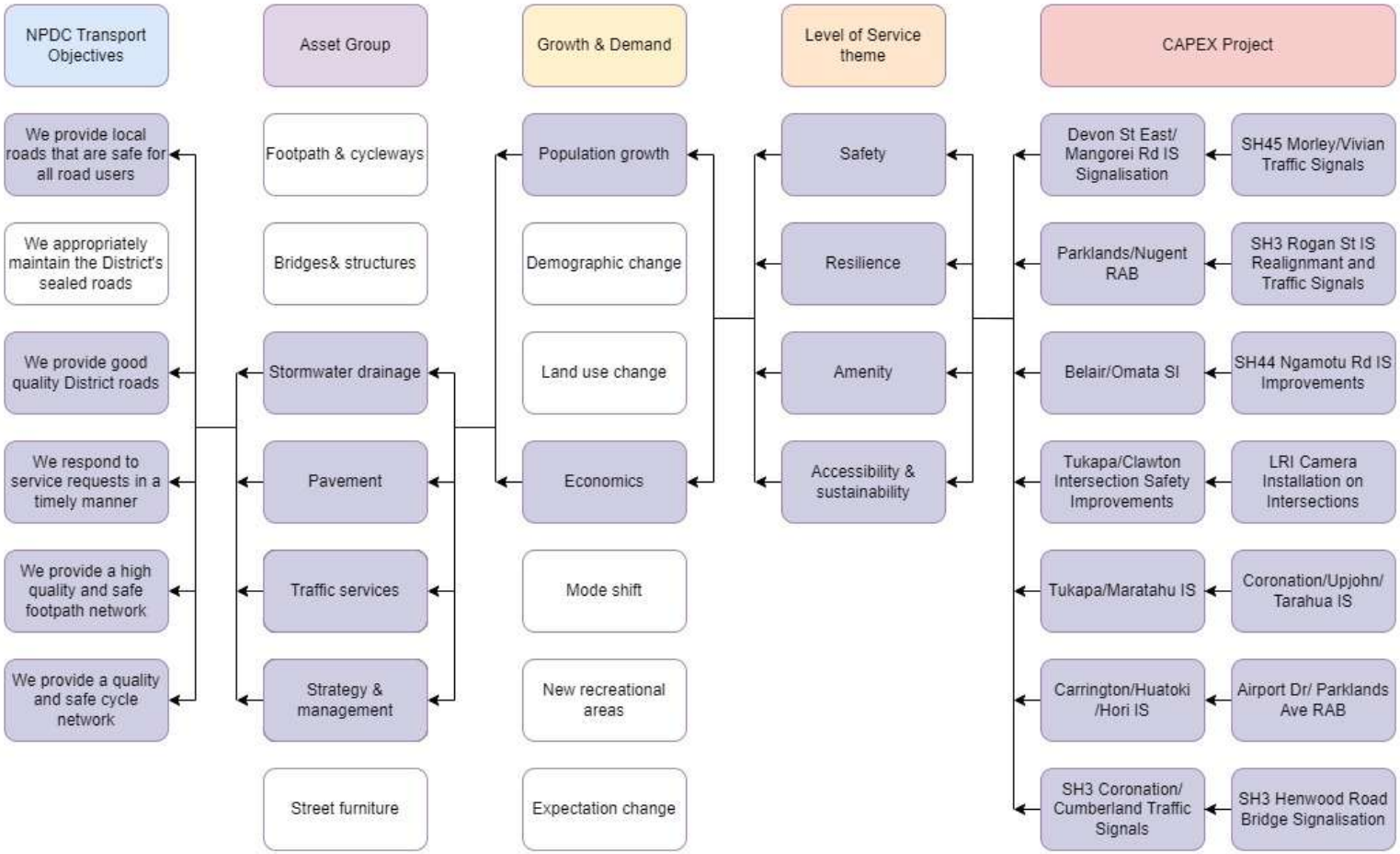
Waitaha Stream Shared Pathway
Tukapa St (Frankley School) SI
SH45 Wairau Road Walking/Cycling underpass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Pavement
Traffic services
Strategy & management
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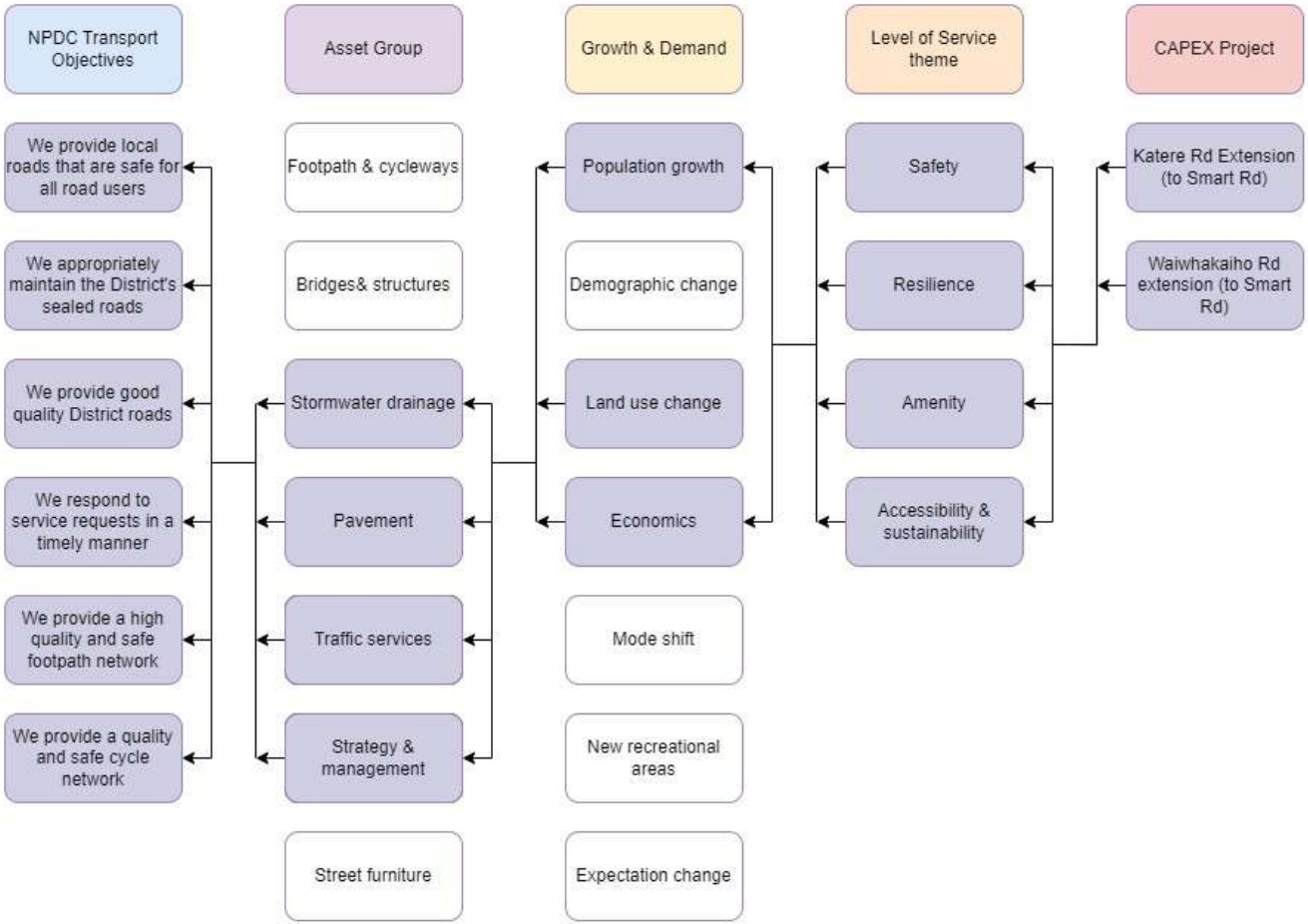
Population growth
Demographic change
Land use change
Economics
Mode shift
New recreational areas
Expectation change
Safety
Resilience
Amenity
Accessibility & sustainability
Devon St East/ Mangorei Rd IS Signalisation
SH45 Morley/Vivian Traffic Signals
Parklands/Nugent RAB
SH3 Rogan St IS Realignmant and Traffic Signals
Belair/Omata SI
SH44 Ngamotu Rd IS Improvements
Tukapa/Clawton Intersection Safety Improvements
LRI Camera Installation on Intersections
Tukapa/Maratahu IS
Coronation/Upjohn/ Tarahua IS
Carrington/Huatoki /Hori IS
Airport Dr/ Parklands Ave RAB
SH3 Coronation/ Cumberland Traffic Signals
SH3 Henwood Road Bridge Signalisation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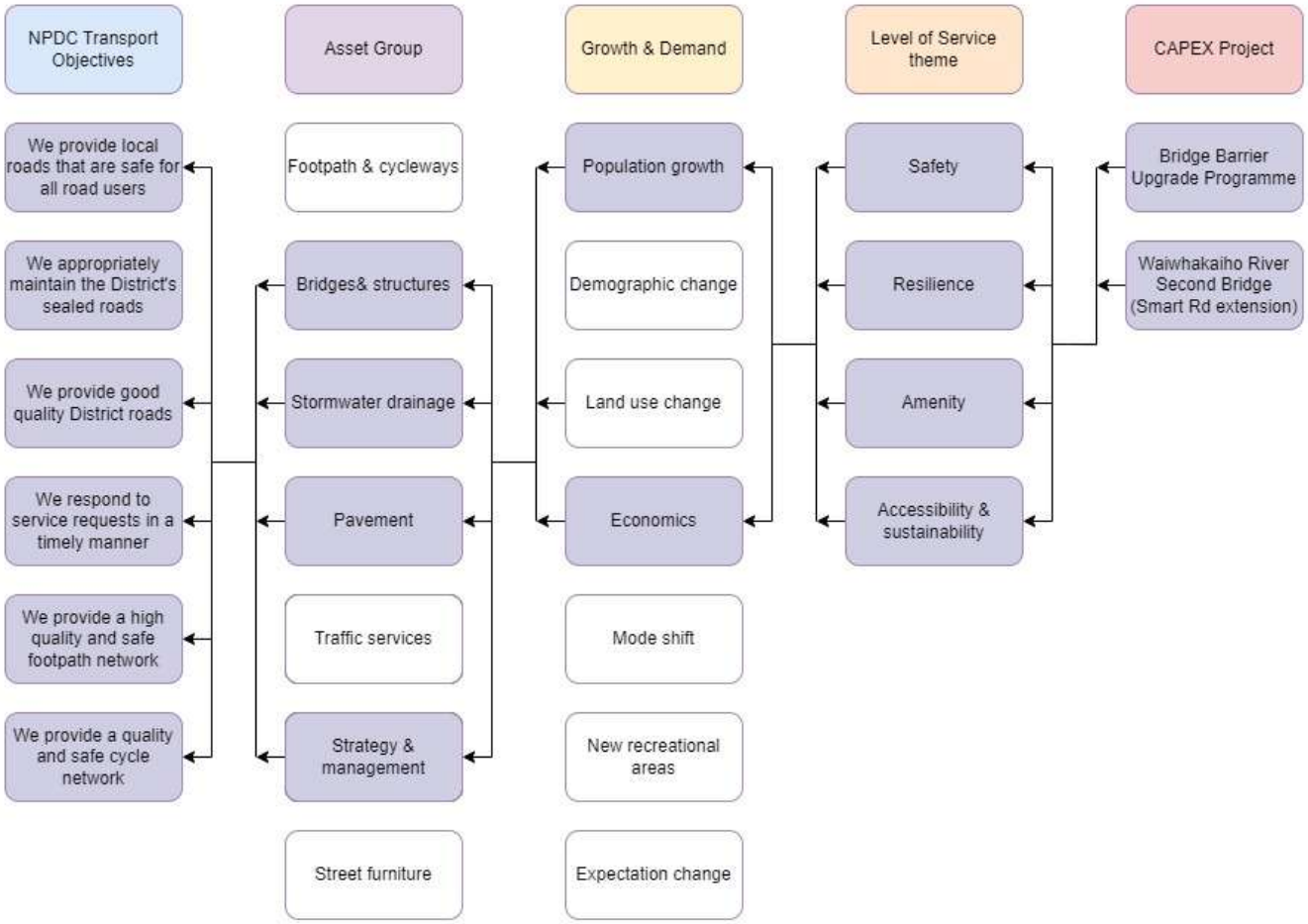
Katere Rd Extension (to Smart Rd)
Waiwhakaiho Rd extension (to Smart Rd)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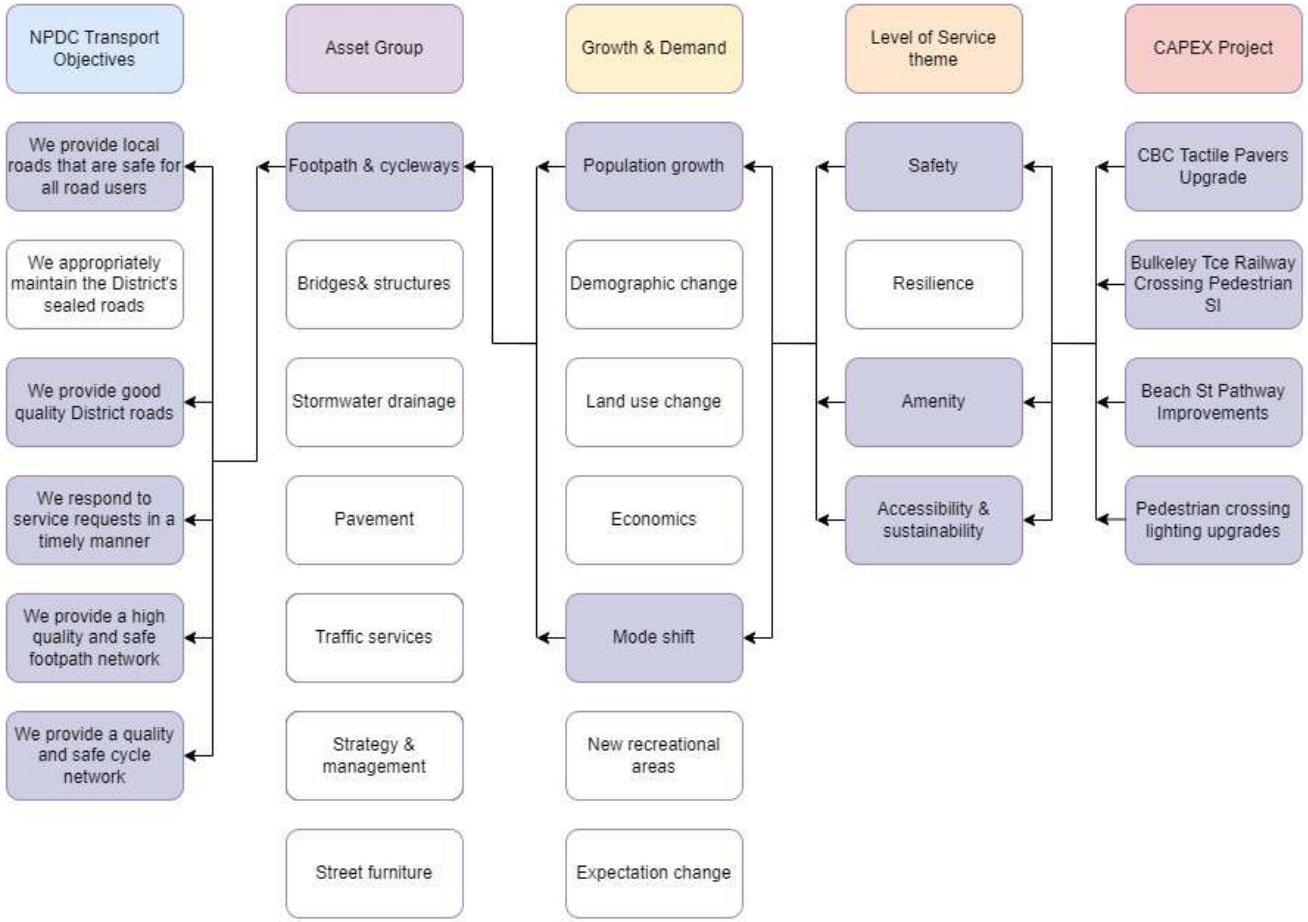
Bridge Barrier Upgrade Programme
Waiwhakaiho River Second Bridge (Smart Rd extension)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Mode shift
New recreational areas
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Resilience
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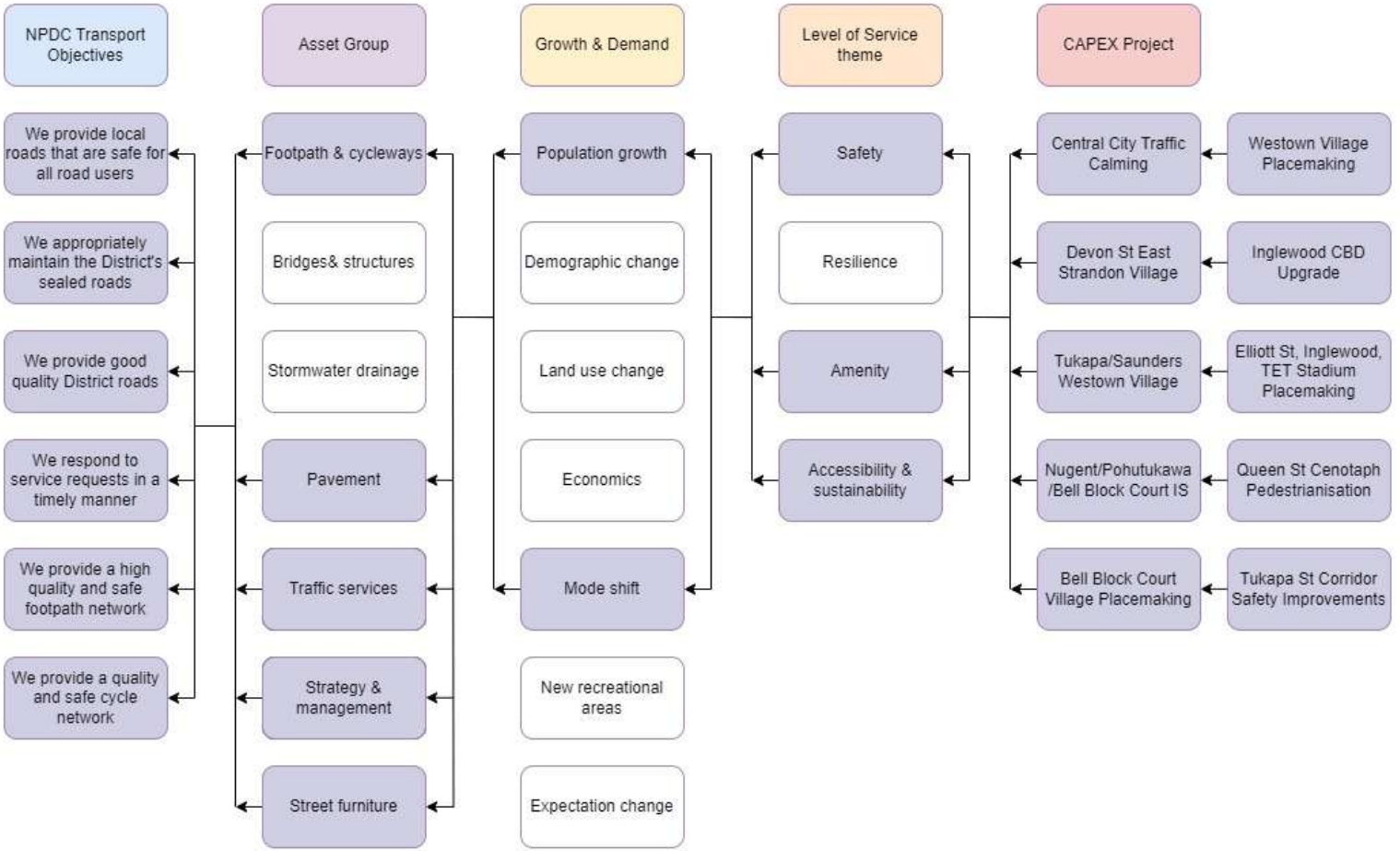
CBC Tactile Pavers Upgrade
Bulkeley Tce Railway Crossing Pedestrian SI
Beach St Pathway Improvements
Pedestrian crossing lighting upgrades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New recreational areas
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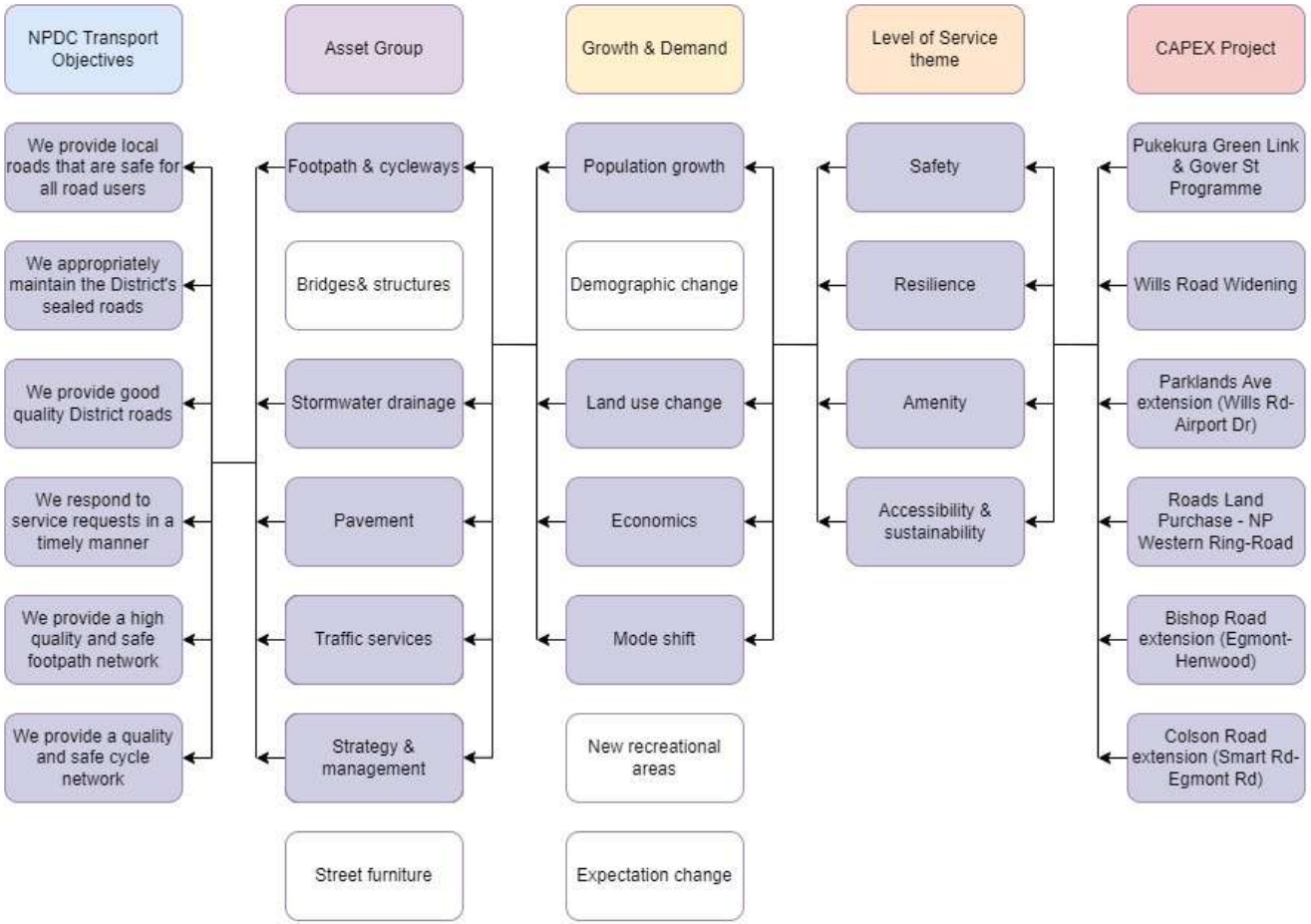
Central City Traffic Calming
Devon St East Strandon Village
Tukapa/Saunders Westown Village
Nugent/Pohutukawa /Bell Block Court IS
Bell Block Court Village Placemaking
Westown Village Placemaking
Inglewood CBD Upgrade
Elliott St, Inglewood, TET Stadium Placemaking
Queen St Cenotaph Pedestrianisation
Tukapa St Corridor Safety Improvements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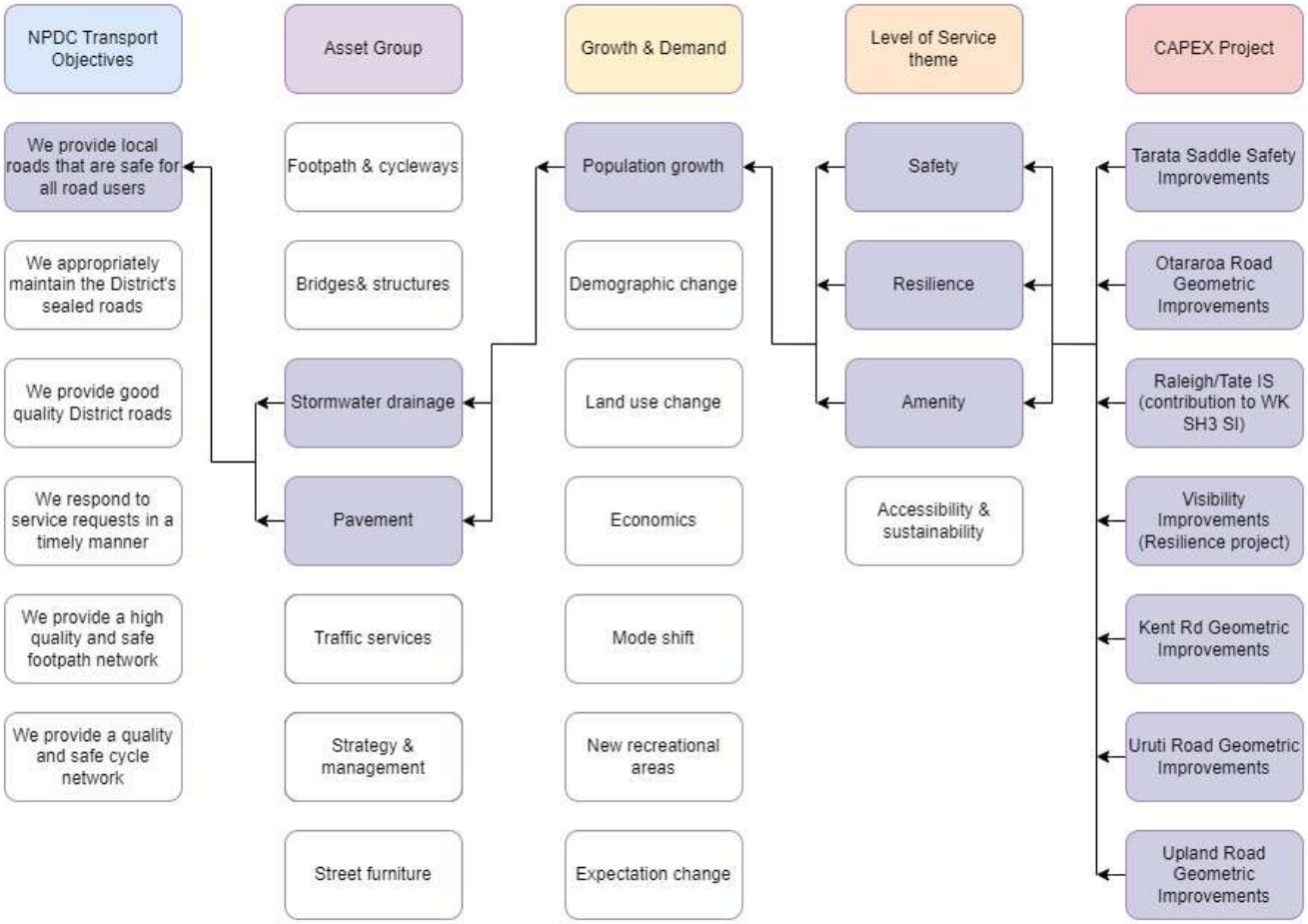
Pukekura Green Link & Gover St Programme
Wills Road Widening
Parklands Ave extension (Wills Rd-Airport Dr)
Roads Land Purchase - NP Western Ring-Road
Bishop Road extension (Egmont-Henwood)
Colson Road extension (Smart Rd-Egmont Rd)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Economics
Mode shift
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Resilience
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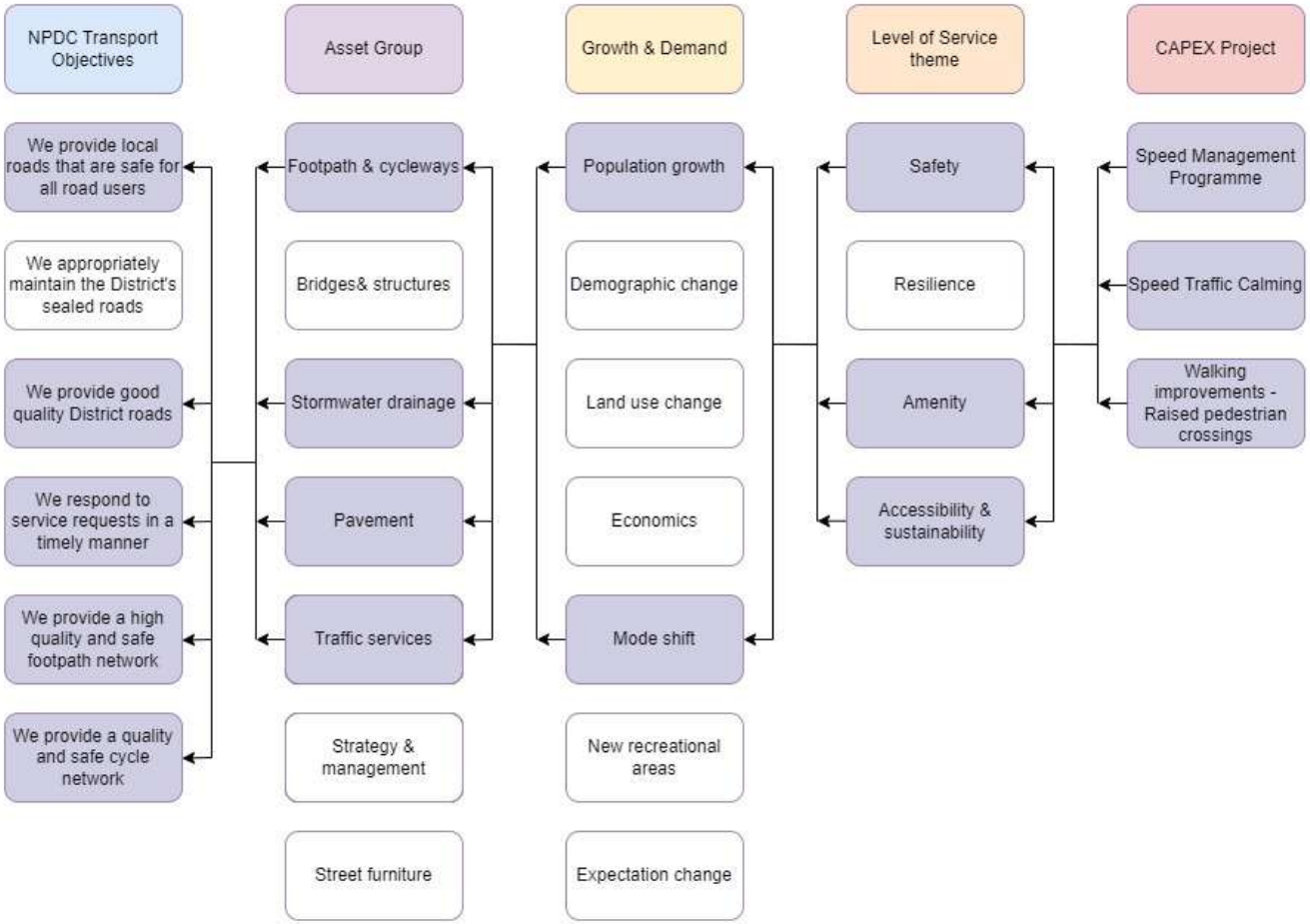
Tarata Saddle Safety Improvements
Otararoa Road Geometric Improvements
Raleigh/Tate IS (contribution to WK SH3 SI)
Visibility Improvements (Resilience project)
Kent Rd Geometric Improvements
Uruti Road Geometric Improvements
Upland Road Geometric Improvements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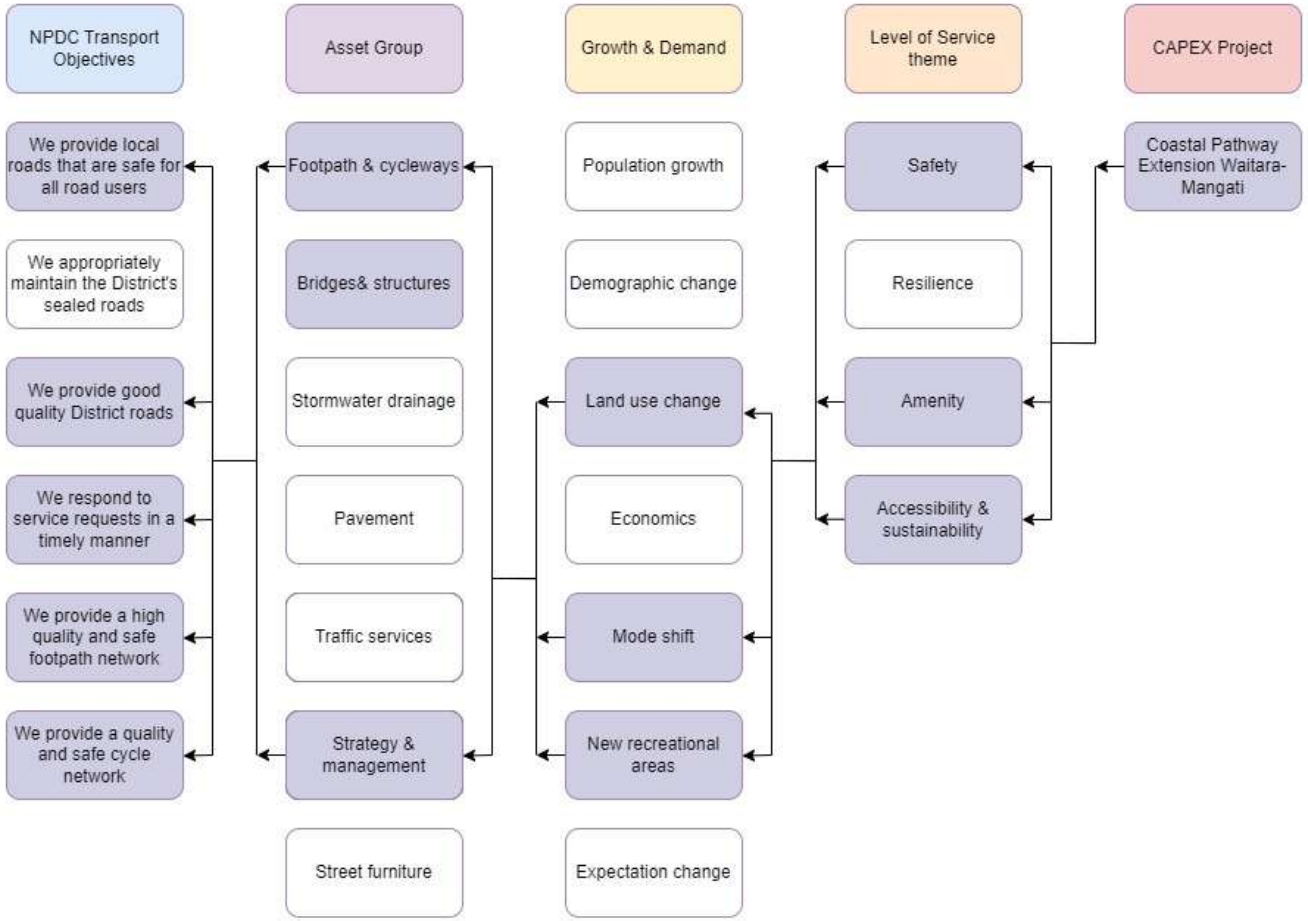
Speed Management Programme
Speed Traffic Calming
Walking improvements - Raised pedestrian crossings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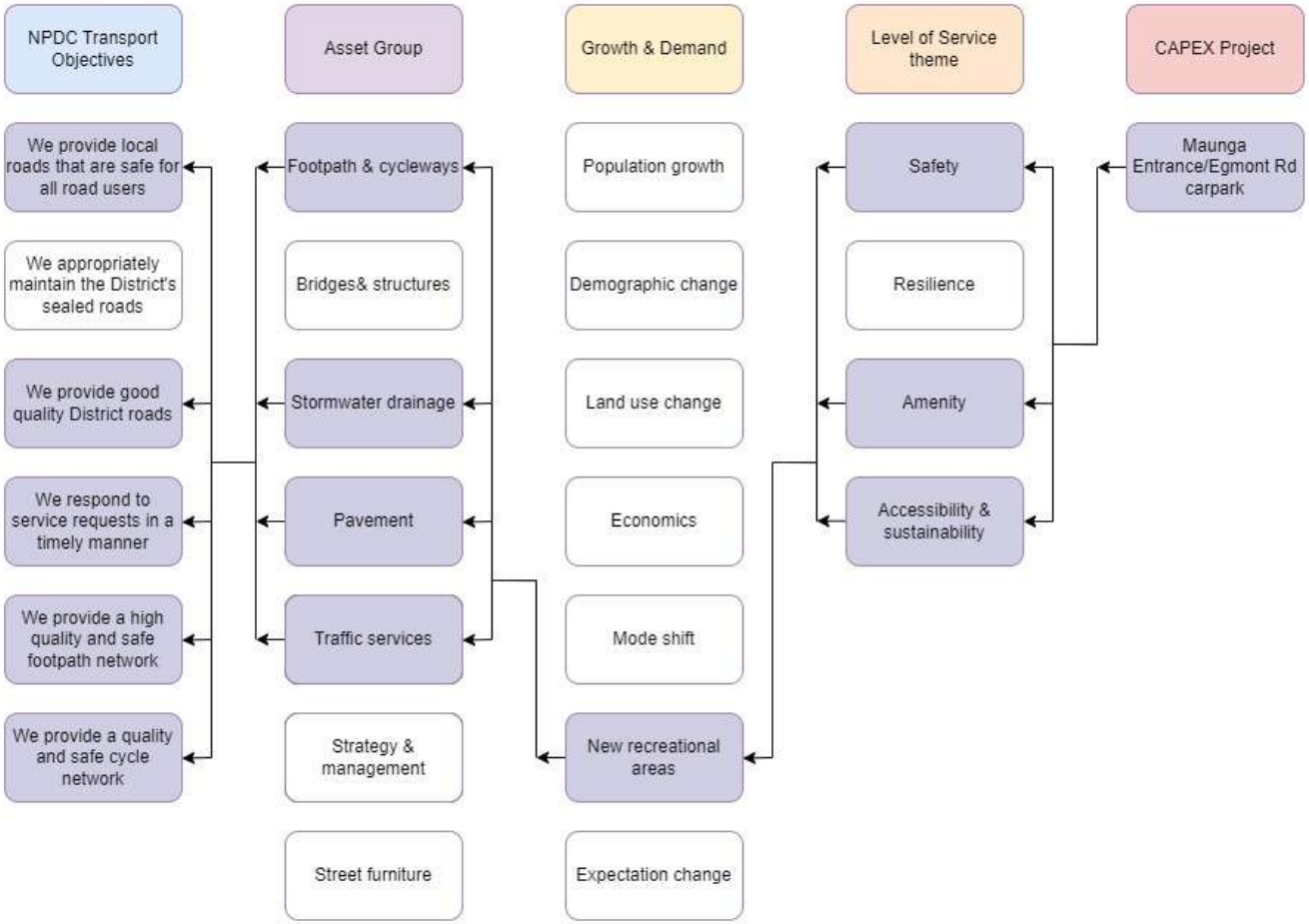
Coastal Pathway Extension Waitara-Mangati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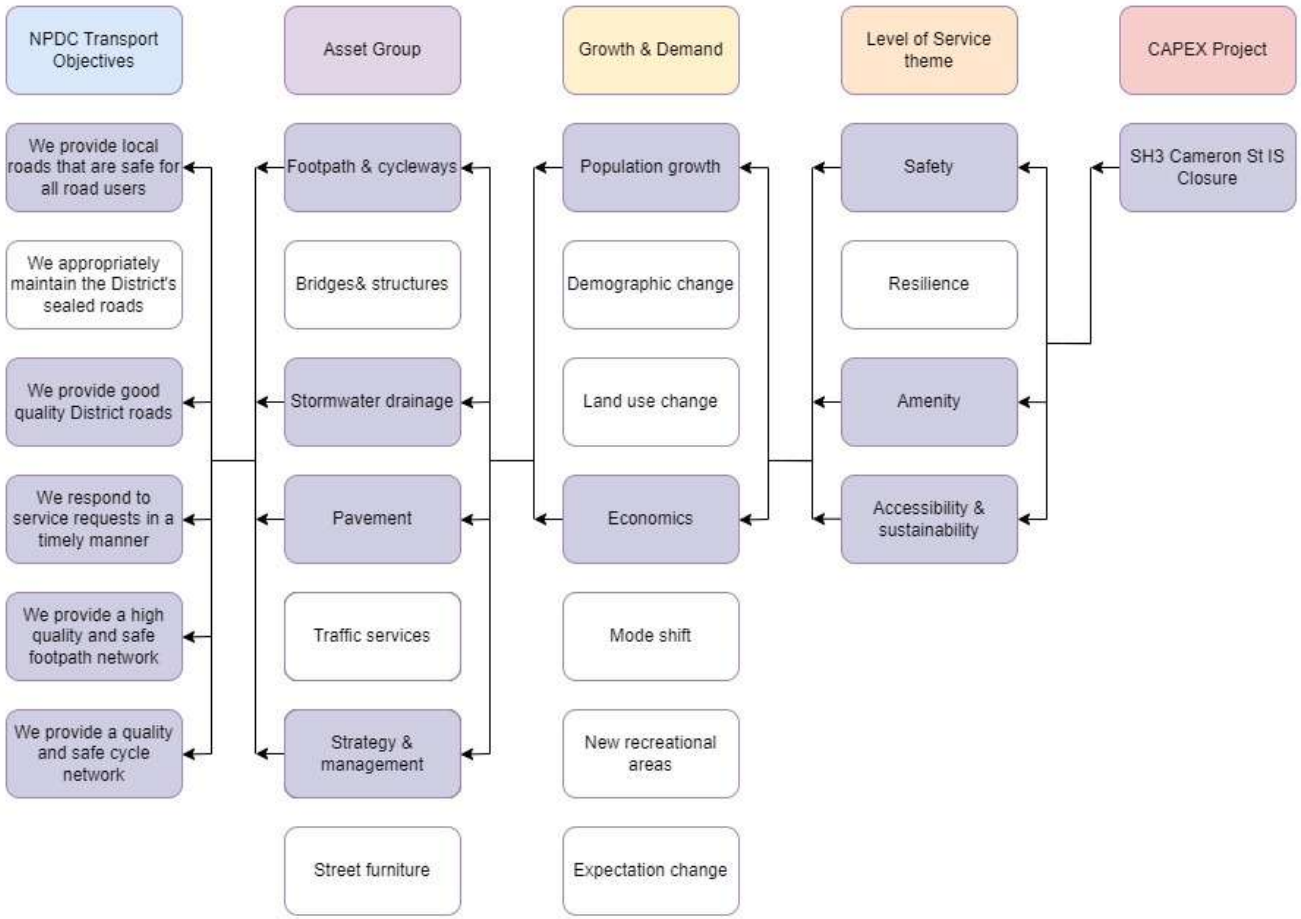
We provide a quality and safe cycle network
Footpath & cycleways
Bridges& structures
Stormwater drainage
Pavement
Traffic services
Strategy & management
Street furniture
Population growth
Demographic change
Land use change
Economics
Mode shift
New recreational areas
Expectation change
Safety
Resilience
Amenity
Accessibility & sustainability
Maunga Entrance/Egmont Rd carpark


NPDC Transport Objectives
Asset Group
Growth & Demand
Level of Service theme
CAPEX Project
We provide local roads that are safe for all road users
We appropriately maintain the District's sealed roads
We provide good quality District roads
We respond to service requests in a timely manner
We provide a high quality and safe footpath network
We provide a quality and safe cycle network
Footpath & cycleways
Bridges& structures
Stormwater drainage
Pavement
Traffic services
Strategy & management
Street furniture
Population growth
Demographic change
Land use change
Economics
Mode shift
New recreational areas
Expectation change
Safety
Resilience
Amenity
Accessibility & sustainability
SH3 Cameron St IS Closure

5.1.3 Options Assessment

The following sections analyse options for addressing the problems and issues identified in the Strategic Case.

For the assessment of the data, peer group analysis and option assessment, a 3-point rating system has been used as shown below:

Symbol	Level of Service	Cost of Activity
	Our level of service is greater than our peer group or KPI target. (We can afford to drop our level of service)	We spend less per km/lane km compared with our peer group. (Understand why we can deliver for less as this may be an industry learning opportunity)
	Our level of service is similar to our peer group or meets our KPI target. (Our level of service is about right)	We spend similar per km/lane km compared with our peer group. (Continue to look for ways to improve cost efficiency)
	Our level of service is worse than our peer group or does not meet our KPI target. (Further work is required to determine why we are not meeting our level of service)	We spend more per km/lane km compared with our peer group. (Understand what is causing this - approach peer groups that are doing well in this area).

5.2. Sealed Road

5.2.1 Work Categories

111 Sealed Pavement Maintenance

212 Sealed Road Resurfacing

214 Sealed Road Pavement Rehabilitation

341 Low Cost/Low Risk Improvements

(Associated activities: 113 Routine Drainage Maintenance and 213 Drainage Renewals)

5.2.2 Links to Strategic Case

<table>
<tr><td>GPSLT Objectives</td><td colspan="4">Efficient and effective freight connections
A land transport system where no-one is killed or seriously injured.
Managing the risks from natural and human-made hazards
People in urban areas have better choices to access economic and social opportunities.
The existing system is maintained at a level that meets current and future needs</td></tr>
<tr><td>RLTP Objective</td><td colspan="4">An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness.
An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond.
A safe transport network increasingly free of death and serious injury
A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.
A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
An energy efficient and environmentally sustainable land transport system.</td></tr>
<tr><td rowspan="2">Council Goals</td><td>Trusted</td><td>Thriving Communities and Culture</td><td>Environmental Excellence</td><td>Prosperity</td></tr>
<tr><td>Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating</td><td>Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori</td><td>Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.</td><td>Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and</td></tr>
</table>

	leadership and excellence.			economic performance.

ONRC Customer Outcomes	**Safety**	Sealed pavement improves safety by providing a smooth and even surface, reducing the risk of accidents and injuries caused by potholes or uneven terrain.
	Resilience	Sealed pavement enhances the resilience of roads and pathways by protecting them from weathering and erosion. It helps prevent damage caused by water infiltration, reducing maintenance needs and increasing the lifespan of the pavement.
	Amenity	Sealed pavement contributes to the overall aesthetic appeal of an area, enhancing its visual appeal and creating a more pleasant environment for pedestrians, cyclists, and drivers.
	Accessibility	Sealed pavement improves accessibility by providing a reliable and comfortable surface for all users, including individuals with mobility challenges. It allows for easier movement and facilitates access to various amenities and services.
	Cost Efficiency	Sealed pavement can lead to cost savings in the long run. While initial installation costs may be higher compared to other options, sealed pavement requires less maintenance and repair over time, resulting in reduced overall costs.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the road pavement asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces	
Strategic Response to Problem Statements	**Change risk profile:** • Allowing Low Volume and Access Roads to deteriorate to align with ONRC. **Programme adjustment:** • Increasing resurfacing to improve waterproofing – improving lifecycle cost of sealed pavement. • Adjusting work categories related to carriageways to allow for more focused work that aligns with ONF. **Policy Approach:**	

	• Reverting sealed roads to unsealed roads. • Reverting uneconomic roads to paper roads. **Improve value for money:** • Increasing preventative maintenance to reduce overall lifecycle cost. **Relationship approach:** • Improve the relationship with Waka Kotahi, Elected Members, Iwi and Hapu through more reliable carriageway data that allows for informed decision making.
Benefits of Addressing the Problem:	**Natural topography and layout challenges:** • Improved Transport Choices: Addressing the difficulties posed by the natural topography and layout allows for better planning and integration of alternative transport modes such as pedestrian paths, cycle lanes, and public transport. This enhances connectivity within the community, reducing severance, and providing accessible options for various modes of transportation. • Improved Network Performance: Properly managing and maintaining sealed roads can improve their resilience during major events like heavy rainfall or flooding. Implementing effective drainage solutions and erosion control measures helps reduce the risk of damage, ensuring the continued access to critical areas during emergencies. **Safe system approach for complex networks:** • Improved safety outcomes: Taking a 'safe system' approach to the design and management of sealed roads improves safety for all road users. Implementing measures such as proper signage, traffic calming, pedestrian crossings, and road markings can reduce the risk of accidents and improve both actual and perceived safety. **Understanding the value of transport infrastructure:** • Improved Economic Outcomes: Recognizing the value that sealed roads provide to the community and regional economy allows for more informed decision-making regarding targeted investments. Well-maintained roads facilitate the movement of goods and people, supporting economic activities and growth in the region.
Risk of Not Addressing the Problem:	**Natural topography and layout challenges:** • Risk of limited transport options: Without addressing the difficulties posed by the natural topography and layout, alternative transport modes may not be integrated effectively. This can lead to limited transport options, making it challenging for community members to access essential services and activities.

	• Severance of the community: The lack of connectivity and access to alternative transport modes can lead to severance within the community, isolating certain areas and hindering social interactions and economic activities. • Vulnerability during major events: If the road pavement and drainage are not adequately designed to handle major events like floods or landslides, the infrastructure may be at a higher risk of damage and disruption, further isolating the community during emergencies. **Lack of a 'safe system' approach:** • Risk of limited transport options: Without addressing the difficulties posed by the natural topography and layout, alternative transport modes may not be integrated effectively. This can lead to limited transport options, making it challenging for community members to access essential services and activities. • Severance of the community: The lack of connectivity and access to alternative transport modes can lead to severance within the community, isolating certain areas and hindering social interactions and economic activities. • Vulnerability during major events: If the road pavement and drainage are not adequately designed to handle major events like floods or landslides, the infrastructure may be at a higher risk of damage and disruption, further isolating the community during emergencies. **Poor understanding of infrastructure value:** • Missed economic opportunities: Ignoring the value of transport infrastructure and failing to make targeted investments can lead to missed economic opportunities. Inadequate road pavement may hinder efficient transportation of good and services, affecting regional economic growth and competitiveness. • Increased maintenance costs: Neglecting the value of road pavement can result in underfunding for maintenance and repairs, leading to increased deterioration of roads and higher long-term maintenance costs.

5.2.3 Levels of Service

The levels of service associated with Sealed Roads are as follows:

ONF Transport Outcomes

Inclusive Access – Smooth Travel Exposure

Inclusive Access – Peak Roughness

Safe Travel – Wet Roads

Customer Levels of Service:

ONRC Cost Efficiency 1 – Pavement Rehabilitation

ONRC Cost Efficiency 2 – Chipseal Resurfacing

ONRC Cost Efficiency 3 – Asphalt Resurfacing

Department of Internal Affairs:

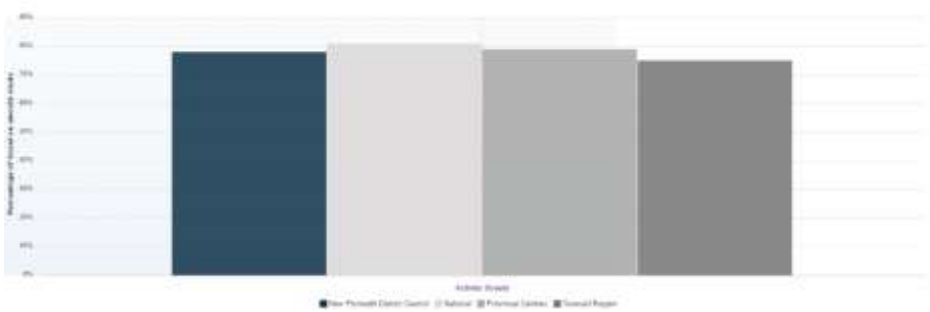
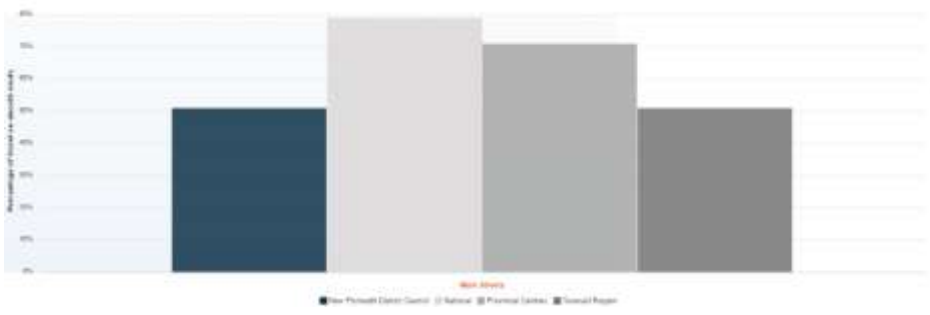
The minimum percentage of the sealed local road network that is resurfaced.

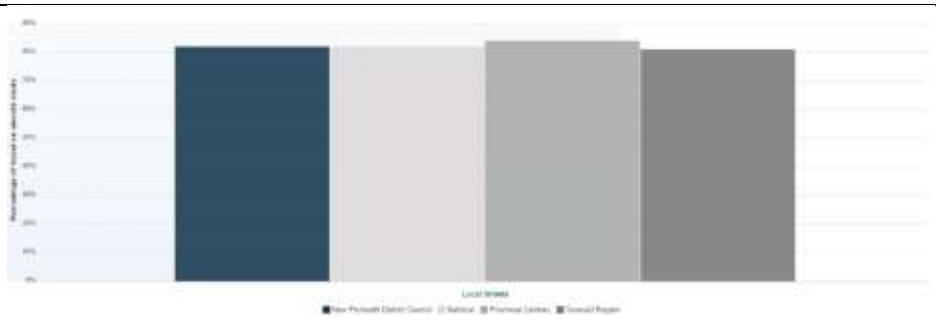
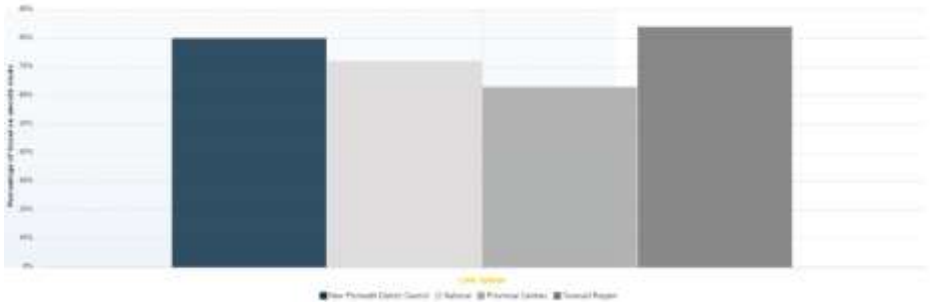
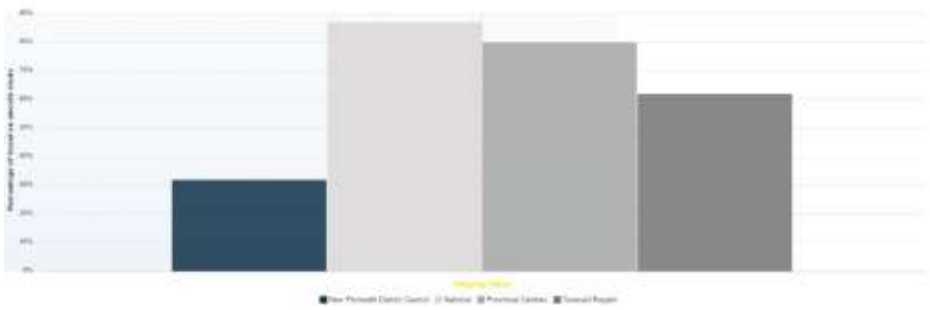
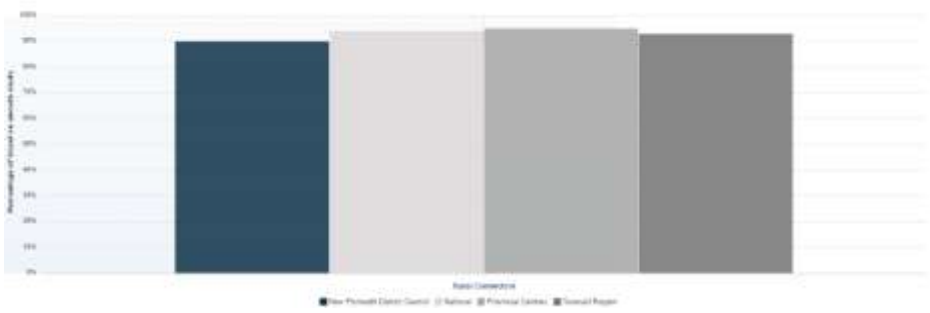
The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the timeframe specified in the LTP.

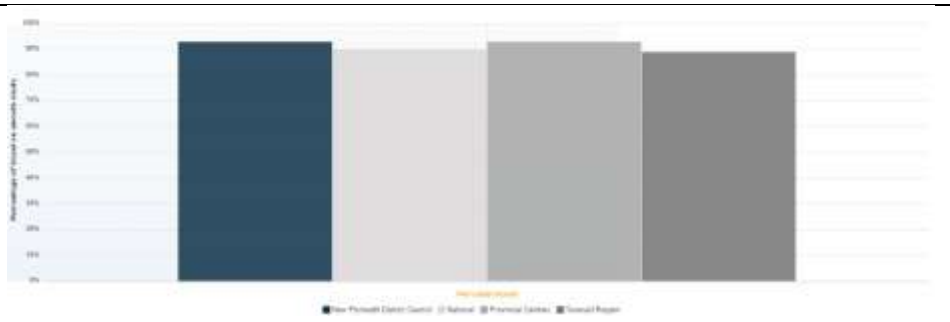
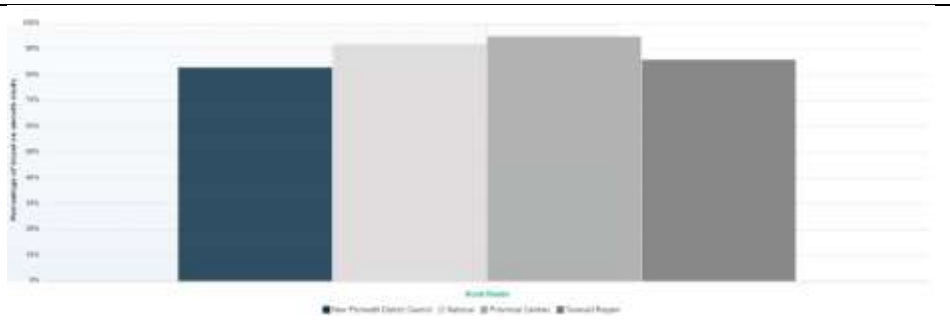
New Plymouth District Council:

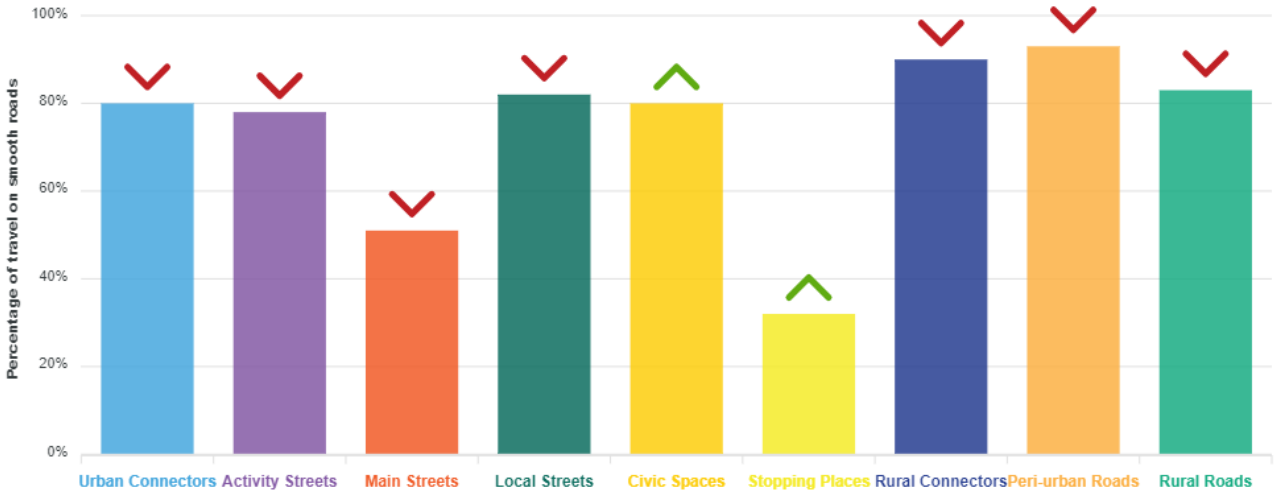
Percentage of residents satisfied with the overall quality of the district's roads.

5.2.4 Evidence and Gap Analysis

Measure	ONRC	Evidence
Inclusive Access – Smooth Travel Exposure	Urban Connectors 	
	Activity Streets 	
	Main Streets 	

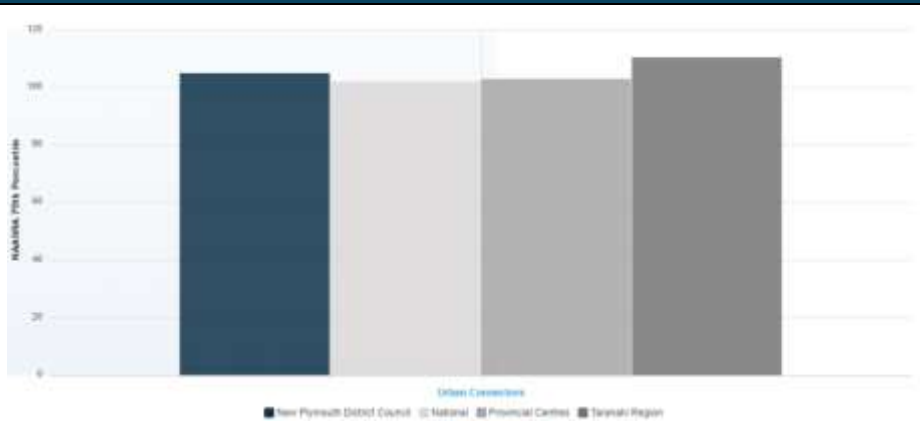
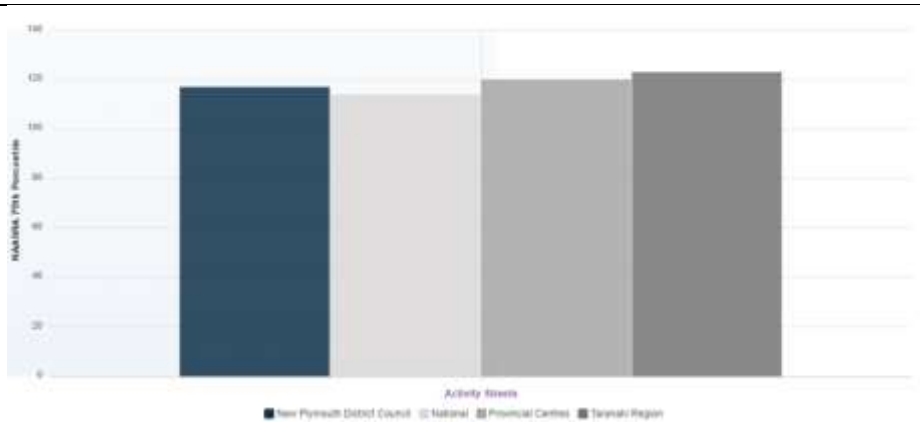
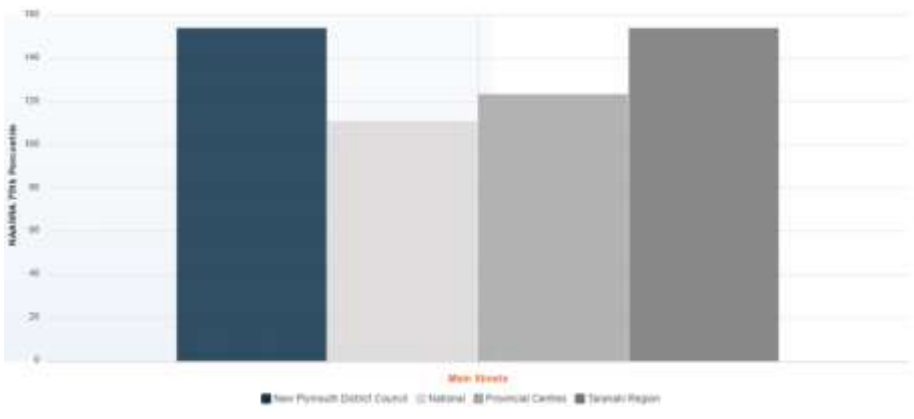
	Local Streets 	
	Civic Spaces 	
	Stopping Places 	
	Rural Connectors 	

	Peri-urban Roads	
	Rural Roads	



Generally, the councils smooth travel exposure is similar to our peer groups and the national average. Apart from Civic Spaces and Stopping Places, our network is showing a deteriorating trend. It is also noted that Main Streets and Stopping Places are significantly worse than the rest of the ONF categories, however these categories only make up 1km and 0.2km respectively and targeted investment would drastically improve these categories.

Overall, further maintenance and renewals is required for sealed pavement maintenance to improve the deteriorating condition of the network.

Measure	ONRC	Evidence
Inclusive Access – Peak Roughness	Urban Connectors 	
	Activity Streets 	
	Main Streets 	

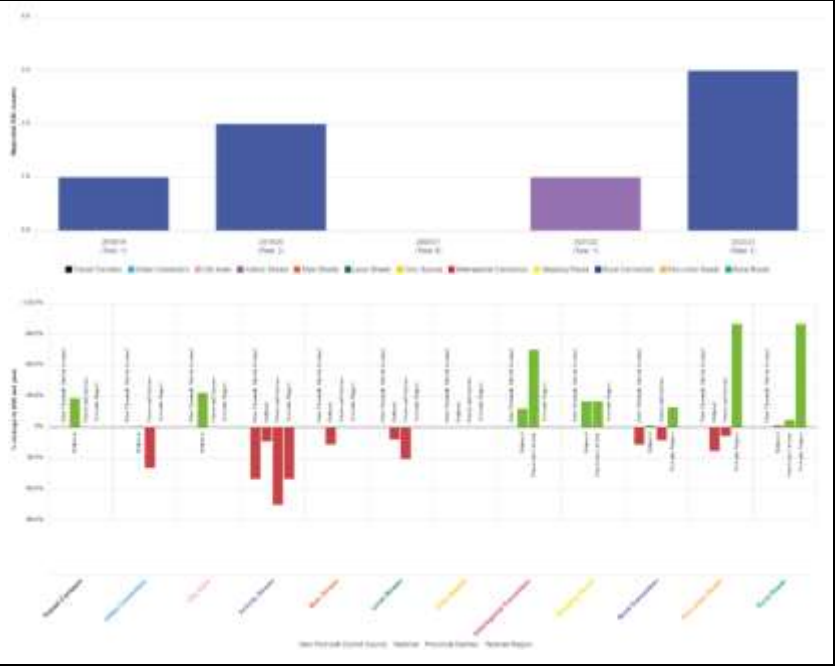
	Local Streets	
	Civic Spaces	
	Stopping Places	
	Rural Connectors	

	Peri-urban Roads	
	Rural Roads	

The above data shows the councils 75th percentile peak roughness generally aligns with national and peer groups or is slightly worse. Much like the smooth travel exposure, 'Stopping place' is performing poorly, however only makes up 0.2km so targeted investment could quickly improve this section.

The general trend of connectors performing better than local streets and rural roads shows a good spread of level of service.

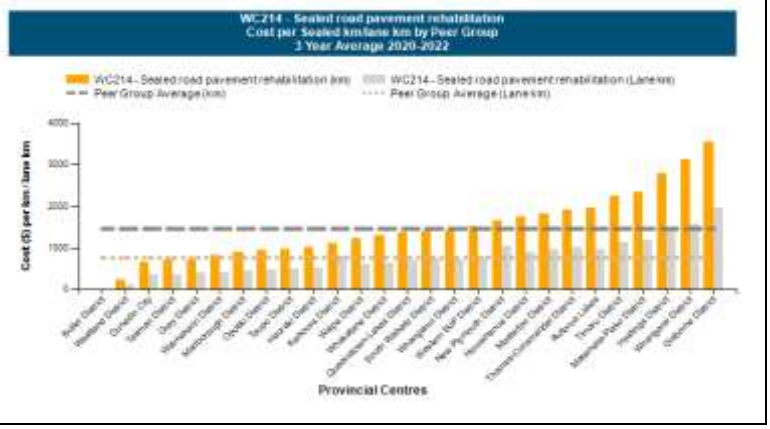
Targeted pavement maintenance and renewals of some of these rougher sections will help drive the 95th percentile down, especially where the NAASRA is close to 200 (Local Streets and Main Streets).

Measure	Assessment	Evidence
Safe Travel – Wet Roads		

New Plymouth is trending downwards for Activity Streets and Rural Connectors however there have only been 7 crashes attributed to loss of control on wets roads in the last 5 years.

An increased chipseal programme would help improve skid resistance across the network.

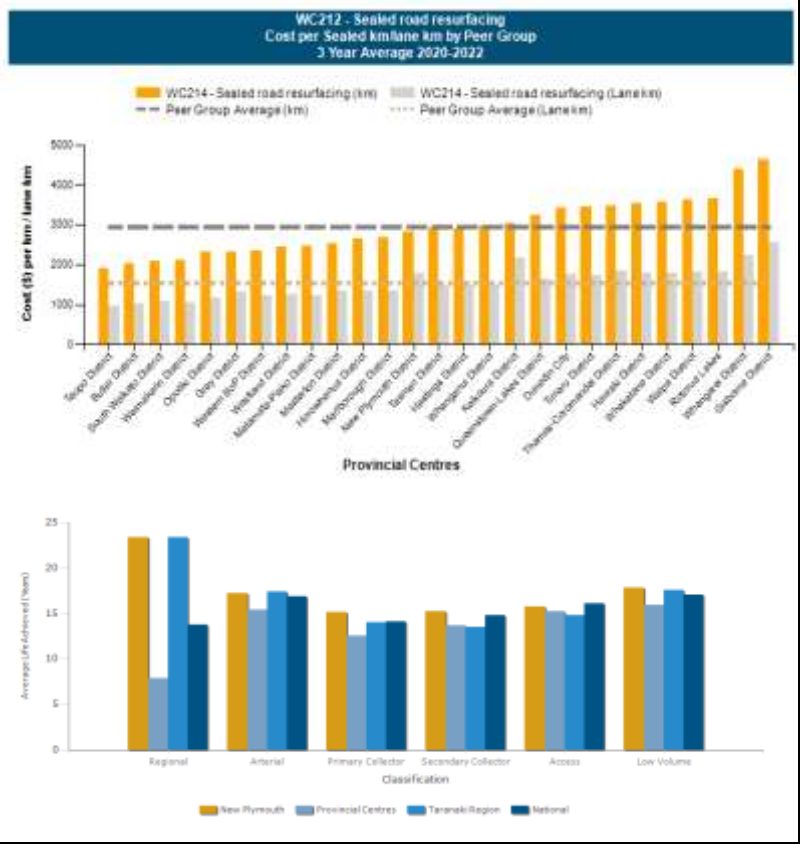
It is noted that there is too little data to be statistically reliable because there is either two years or more with no reported injuries, or fewer than 6 injuries reported overall.

Measure	Assessment	Evidence
ONRC Cost Efficiency 1 – Pavement Rehabilitation		

*New Plymouth is slightly above average compared with its peer group; however, this is because there has been a greater number of Structural Asphalt (SAC) Rehabilitations in the last few years. This is a lot more expensive than granular, however it provides a greater level of service for cars and

cyclists and minimises the disruption during construction. It is very hard to justify SAC using a Net Present Value (NPV) calculation, however we believe long-term this will provide a higher level of service and minimise disruptions with a 'do it once, do it right' approach.

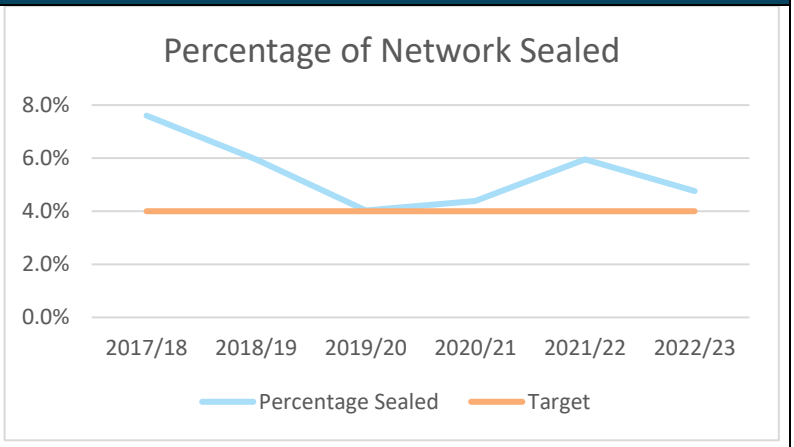
Heavy vehicles have also been using sections of the New Plymouth District Council network to rat-run to the port. These local roads were not originally designed to take these loadings and has therefore eaten into the assets life much quicker than expected. The integrated Transport Plan will address this in the long term, but the rehabilitations needed to be completed to bring the roads back to an acceptable level of service.

Measure	Assessment	Evidence
ONRC Cost Efficiency 2 – Chipseal Resurfacing and ONRC Cost Efficiency 3 – Asphalt Resurfacing		

NPDC is in the middle of its Peer Group for sealed road resurfacing. Typically, the Council spends more than the Peer Group due to the need to import aggregate. Taranaki aggregate has a low Polished Stone Value and a low crushing resistance which make for poor surfacing aggregate. Previously NPDC has sat above its Peer Group due to the large cost of importing materials; therefore, to have moved to the middle of its Peer Group it is likely there has been improvements in business processes creating better 'value' for money'.

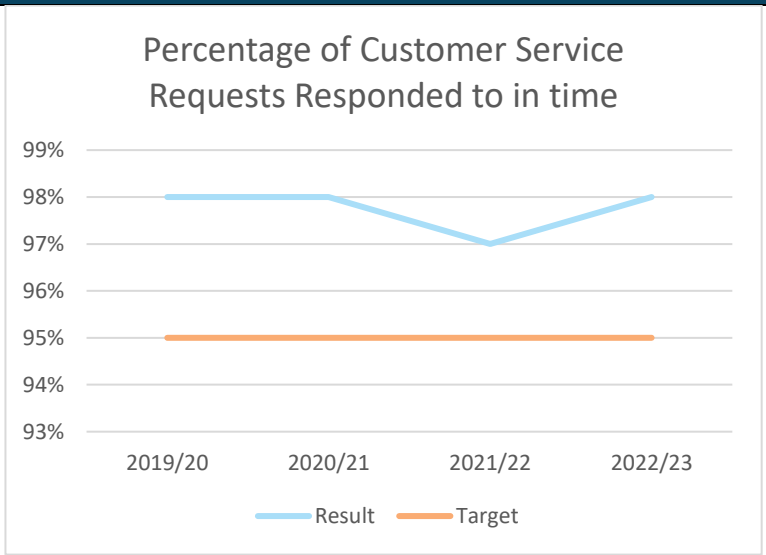
Chipseal surfacing in the district is generally lasting the same amount of time as the Peer Group, except for Regional and Arterial roads which are lasting longer. The Council must be careful to ensure that sealed surfaces are performing the function they are intended for and that underlying pavement structures are not being compromised.

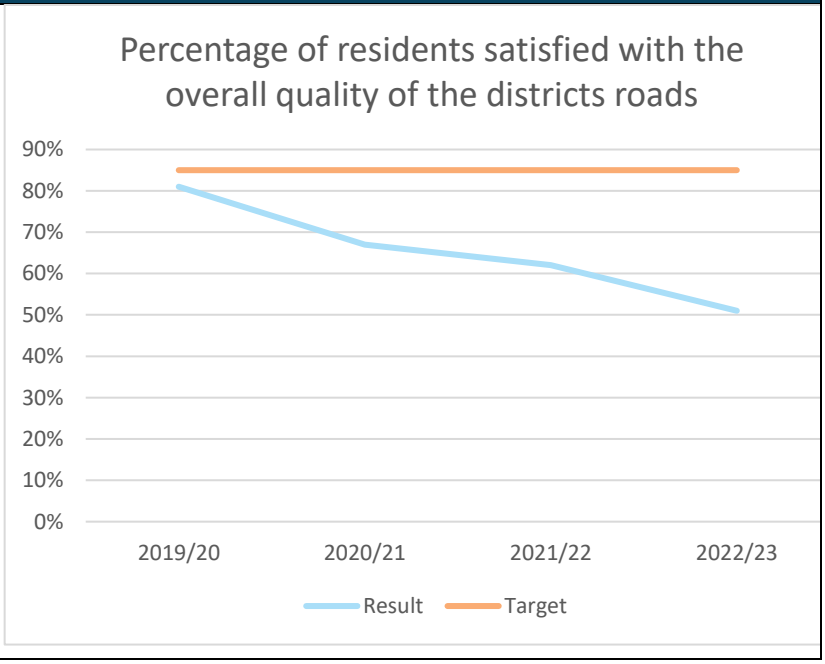
It is important that inspections of those sections of road (highlighted as having reached their predicted design lives) are undertaken to ensure that the information within the RAMM database is a true reflection of the network and that resurfacing is undertaken as dictated by its condition.

Measure	Assessment	Evidence
The minimum percentage of the sealed local road network that is resurfaced.		

Although New Plymouth is meeting its target of resurfacing at least 4% a year, it is important to note this would not benefit the network long term as this would mean the average life to achieve is 25 years – currently our seals last on average 16 years. A more appropriate target would be 6%.

Because of the location of New Plymouth being on the West Coast and in the rain shadow of Taranaki Maunga, it is prudent to keep up with resurfacing to maintain a waterproof pavement. Not doing this will result in an increase in sealed pavement maintenance and sealed pavement rehabilitations.

Measure	Assessment	Evidence
The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the timeframe specified in the LTP.		

Measure	Assessment	Evidence
The percentage of residents satisfied with the overall quality of the district's roads (NRB survey).		

The survey shows community dissatisfaction is due to potholes, quality, and lack of maintenance, and road surface issues. Comments in the survey suggest these concerns are largely about community dissatisfaction with state highways rather than NPDC's local roads.

Although the state highway network may be affecting survey results, targeted pavement maintenance and renewals of poorly performing, high ONF categorised roads should help improve the public's confidence.

5.2.5 Options to be considered

Based on the above data and the problem statements, the following options have been considered for addressing the sealed pavements:

Option	Description	Benefits / Consequences
Increased chipseal programme	Increase the chipseal programme to address the growing bow wave of aging seals. This preventative activity will reduce the amount of sealed pavement maintenance and sealed pavement rehabilitations. There is approximately 300 lane kilometres of seal past its design life with another 200 lane kilometres due in the next 3 years. Large inflation has driven the cost of delivery up. We were delivering chipseal on average for under $8/m2, now it is closer to $9/m2	Cost Efficiency – Will reduce the whole of life cost of sealed pavement
Network wide MSD Data Collection	Collect MSD data on the whole network. This would provide insight into remaining life of network which would benefit future planning, but also the data can be back calculated to estimate pavement thickness – this would be optimum for pavement maintenance as you can assess treatments prior to striking the ground (less than 200mm is insufficient for stabilising).	Cost efficiency – A greater understanding of the life cycle of our pavement will help predict future renewals costs and enable to flat line the programme so it can be delivered in a manageable and affordable way. Amenity – Understanding where pavements may fail prematurely can help deliver better decision making around Smooth Travel Exposure and roughness.
Large chip or Single Coat Chip Seals	Use large chip or single coat chip seals for future reseals where possible and appropriate to improve waterproofing and extend seal life, particularly on approved High Productivity Motor Vehicle (HPMV)	Cost Efficiency – this will extend the life of chip seals

Option	Description	Benefits / Consequences
	routes. Reduce use of small chip void fill seals by limiting use to low stress urban roads or rural access and low volume roads.	
Use of non-M/4 aggregate	Currently New Plymouth only uses M/4 aggregate for pavement maintenance and renewals. New Plymouth can afford to accept a level of risk by using non-M/4 aggregate on Access and Low Volume Roads.	Cost Efficiency – this will reduce the cost of pavement maintenance and renewals.
Increase in drainage maintenance	The current expenditure only allows New Plymouth to complete water tabling and high shoulder once every 15 years on each road. New Plymouth has a high level of rain fall relative to other places in New Zealand and mudstone that is prone to over slips and under slips in the Eastern sections of the network.	Cost Efficiency – An increase in drainage maintenance
Increase in short overlays	For roads with thin pavements, completing stabilisations and dig-outs will help in the short term, but will eventually need rehabilitation. Increasing pavement depth by doing short overlays will help build up the thin pavement and leaves the option to stabilise later in the lifecycle. These short overlays are generally 100m in length and are completed when it becomes more cost efficient than dig outs/stabs.	Cost Efficiency – Improve lifecycle cost of pavement
Returning sealed roads to unsealed	Some of the logging routes require a large amount of pavement rehabilitation to maintain an acceptable level of service – turning some of our sealed roads into unsealed during the harvesting period would make it cheaper to maintain these routes.	Cost efficiency – Will increase whole of life cost on logging routes
Fabric Seals	Fabric seals are an effective, inexpensive method of waterproofing and stress alleviation, mitigating the effects of reflective cracking in pavements while extending pavement life. Performance assessment and cost comparisons of various treatments show that Fabric Seals can provide up to 100% longer life for up to 30% additional investment.	Cost efficiency – will increase the life of the pavement giving a better whole of life cost
Emulsion Stabilisation/ Dustex	Emulsion stabilisation costs approximately 34% more than cement stabilisation, however, produces around a third of the carbon emissions. Additional benefits include improved waterproofing, leading to a larger window prior to sealing (approximately 3 weeks) and quicker to deliver meaning more sites can be achieved in the same period as cement	Environment – Emulsion stabilising has approximately 66% less car emissions when compared with cement stabilisation.

Option	Description	Benefits / Consequences
	stabilisation. This is important in building resilience as the district is susceptible to large amounts of rainfall. Dustex is another waterproofing product than can increase the window prior to sealing by an additional 3 weeks. This costs approximately $1/m^2.	
Sharing crews between TNOC and NPDC	Due to NPDC and TNOC sharing the same contractor, there are some efficiencies that can be gained by sharing crews when jobs are located near each other. Currently asphalt jobs can be programmed together where the roads are adjacent to each other and due at the same time. TNOC is also looking at using emulsion in 2024-27 which means resealing can also be planned together.	Cost Efficiency – By sharing the resource, we can reduce the cost of site establishment including traffic management.
Removing uneconomic roads – private driveways that don't service the community.	NPDC has a few roads that have relatively high costs compared with the usage of the roads. By reverting some of these roads back to paper roads, the Council can then divert this money to roads that need money spent on them and are well used.	Cost Efficiency – By reducing maintenance and renewals costs on uneconomic roads, we can then reinvest this into roads that are economical to maintain.

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Increased chipseal programme	JunoViewer modelling and age profile of treatment lengths shows there is a bow wave of reseals coming. Historical under spending and recent jumps in inflation has been the cause of this. Although the network is in relatively good condition, it is aging and will be a matter of time before we start exhibiting an increase in pavement surface defects. With the amount of rainfall our network gets, it is very important to maintain waterproofing. The target for the Council is to complete	Sealed Road Condition/ Cost Efficiency	Good	Improved	W/C 212: $1,000,000

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	approximately 6% of the network per annum.				
Network wide MSD Data Collection	Undertaking MSD data on our Regional, Arterial and Collector network will give us a greater understanding of remaining life on our network – this data will be imperative in modelling for future forecasting.	Amenity/ Cost Efficiency	Good	Improved	W/C 151: $90,000 (once off)
Large chip or Single Coat Chip Seals	There is approximate 5% increase for larger chip/single coat chip (due to larger chip requiring slightly more bitumen) – this is expected to add an additional 2-3 years to the surface lifecycle. There are flow-on affects for extending the life of seal including savings in establishment costs and traffic management.	Cost Efficiency	Average	Neutral	Utilize current budget
Use of non-M/4 aggregate	AP40 outside of the M/4 specification can still be a quality material. There is low risk in using this for Access and Low Volume roads or temporary patches. The material can be 15-20% cheaper.	Cost Efficiency	Good	Neutral	Utilize current budget.
Increase in drainage maintenance	Drainage maintenance is one of the truest forms of preventative maintenance. Studies from the Taranaki Network Outcome Contract (TNOC) showed sealed pavement maintenance costs can drop on average by 70% if intervened at the right time. It is difficult to quantify the savings as there are many benefits to maintaining a good drainage network i.e., increased pavement and surface life, prevention of	Amenity/ Cost Efficiency	Excellent	Improved	W/C113: $670,000 (Covered in the Drainage section)

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	under slips occurring which requires expensive retreat or retaining and decrease in maintenance costs.				
Increase in short overlays	Completing short overlays will help build up thin pavements. It is not expected to cost more money but be better use of current sealed pavement maintenance budget. Smooth Travel Exposure is expected to improve as instead of having multiple joins from several patches, it will be one join either side.	Amenity/ Cost Efficiency	Good	Improved	Utilize current budget.
Returning sealed roads to unsealed	Returning sealed roads to unsealed will see a drop in level of service as vehicles will have to travel slower to their destinations. It is expected there will be a large increase in unsealed pavement maintenance and unsealed road metalling, however this will be balanced by a large reduction in sealed pavement maintenance and sealed pavement rehabilitations. It will be much easier to react to work outside of construction season as we won't need to worry about sealing, and it will give us the opportunity to build up the pavement to a sufficient thickness.	Cost Efficiency	Good	Improved	Cost savings will depend on roads.
Fabric Seals	Use of fabric seals will help increase the life of pavements that are starting to crack and are losing waterproofness, however, are not quite due for a rehabilitation. This product is also useful where flushing has occurred as it will stop the	Cost Efficiency	Good	Improved	Utilize current budget.

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	excess binder coming through on new seal layers.				
Emulsion Stabilisation/ Dustex	Currently 100% of our stabilisations use cement. If we switch to emulsion, we can reduce our carbon footprint along with additional waterproofing benefits compared with cement. The cost difference is approximately a third more.	Environment	Good	Improved	W/C:111 +$500,000
Sharing crews between TNOC and NPDC	Sharing crews and resources are preferred when a cost saving can be made – this is typically where we can save on establishment fees of crew, plant, materials, and traffic management.	Cost Efficiency	Good	Improved	N/A
Removing uneconomic roads – private driveways that don't service the community.	By removing uneconomic roads, we can divert the money back to roads with higher usage that also need maintenance and renewals.	Cost Efficiency	Good	Improved	Cost savings will depend on roads.

Note: For increase in drainage maintenance there is currently no crew that fulfils this. This crew will require three FTEs and a truck, trailer mounted water blaster, digger plus traffic Management.

5.2.6 Options Assessment

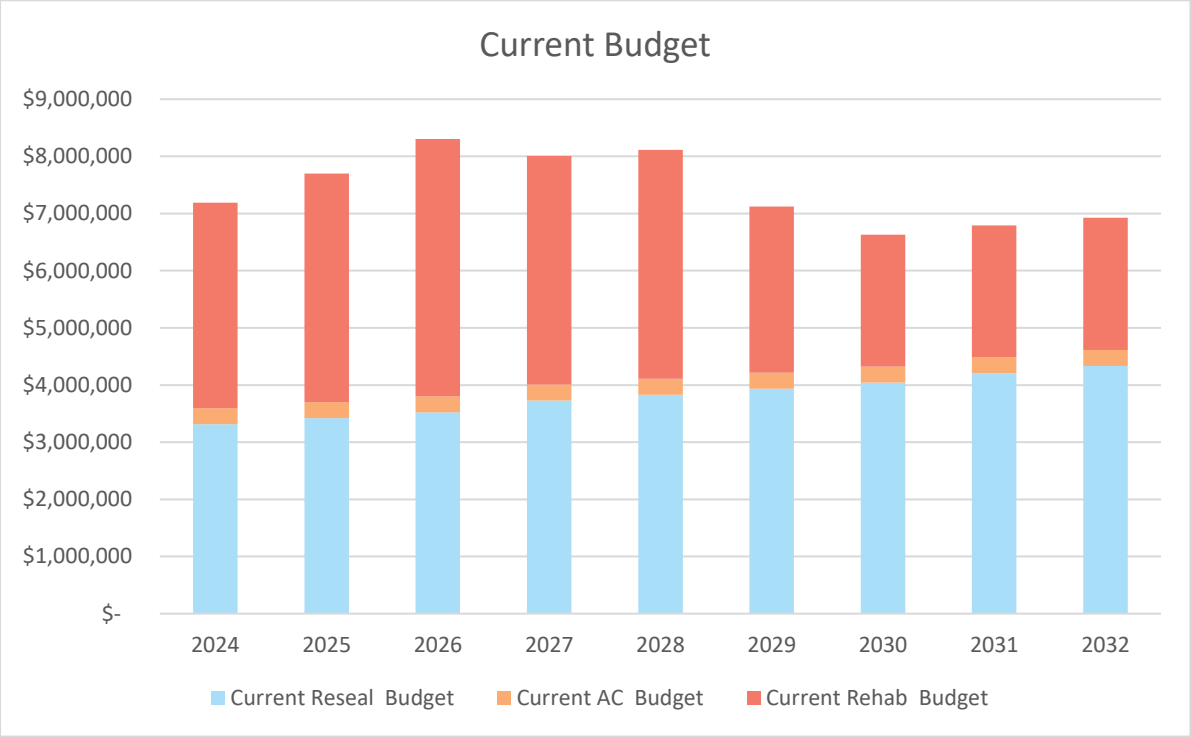
Deteriorating Modelling

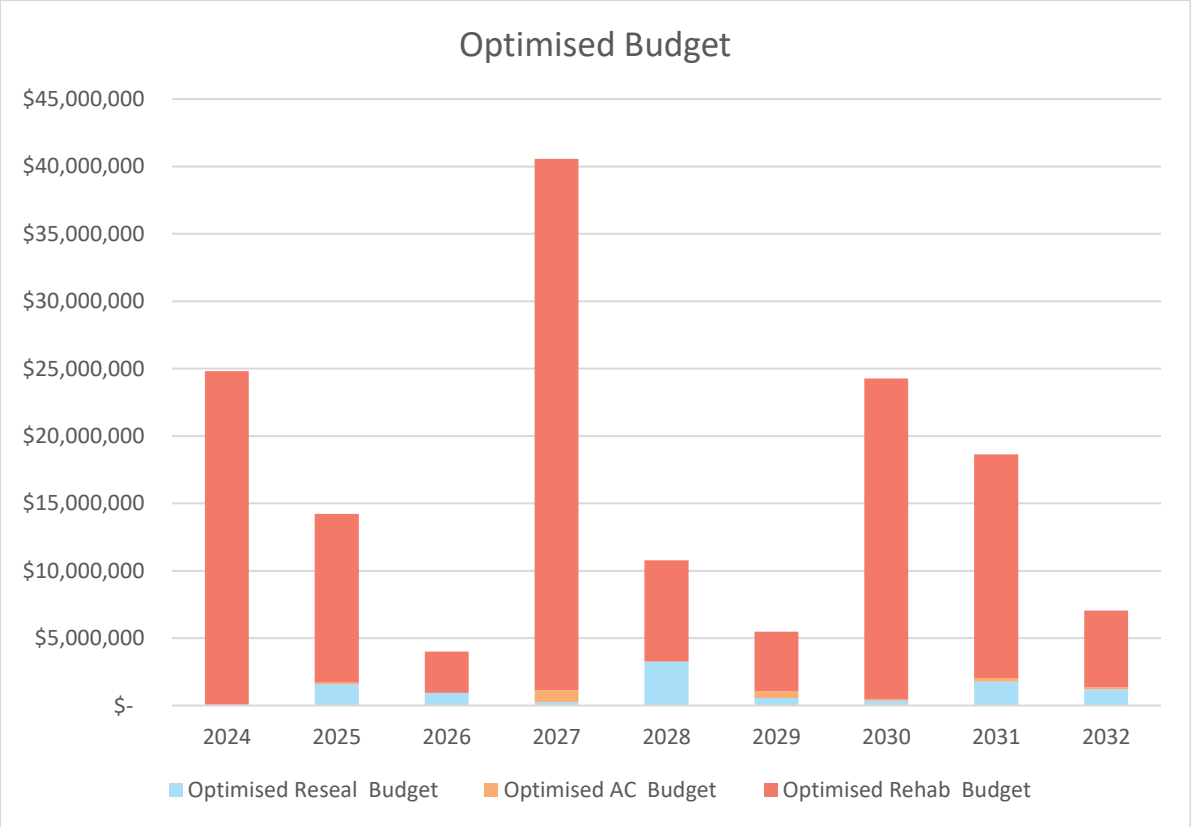
Optimisation using JunoViewer modelling was undertaken in March 2023 and has indicated the likely pavement and surface condition trends over the next 10 years based on 3 different funding scenarios.

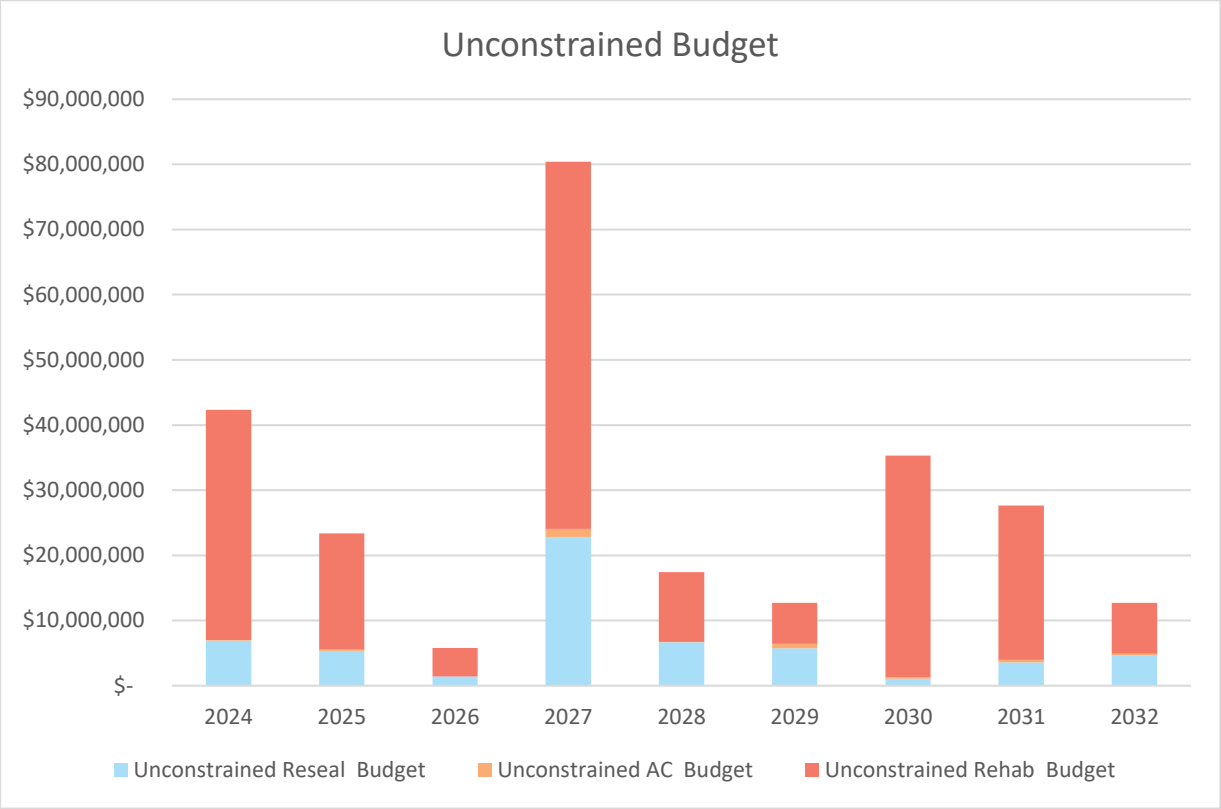
The three model scenarios tested include:

- Current Budget – the model output utilises the same budget approved during the 21-24 LTP.
- Optimised – the model output utilises a middle ground between current budget and unconstrained to put some tension on the model.
- Unconstrained – the model output utilises an unlimited budget.

Below show the budget outputs for the 3 scenarios:







Pavement/surface defect scored are derived from the collection of all faults and from the bins below. The collection of all faults data is collected and for each treatment length, the quantity of all the faults determines the score by calculating the percentage of the total area covered in faults across each treatment length. Each treatment length is then given a score based on this and deteriorated into the future using the TPM families.

Score	Very Good	Good	Fair	Poor	Very Poor
% Covered	0	0.2	2	6	>15

Current budget:

With the current rehab budget, there will be a slight decline in pavement condition, where the percentage of 'Poor' and 'Very Poor' will increase from 5% in 2023 to 6% in 2027, and 12% in 2032.

TABLE 0-1: CURRENT BUDGET PAVEMENT SCORE

Score	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Very Good	79%	79%	80%	78%	47%	5%	1%	1%	1%	1%
Good	11%	10%	10%	4%	35%	79%	80%	79%	69%	10%
Fair	5%	6%	6%	14%	12%	8%	10%	9%	19%	77%
Poor	3%	3%	3%	3%	5%	7%	8%	9%	6%	6%
Very Poor	2%	2%	2%	1%	1%	1%	2%	2%	5%	6%

Under the current reseal budget, the model can maintain surface conditions.

TABLE 0-2: CURRENT BUDGET SURFACE SCORE

Score	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Very Good	79%	82%	86%	88%	61%	20%	18%	19%	20%	24%
Good	6%	6%	6%	1%	28%	71%	74%	73%	51%	14%
Fair	5%	5%	4%	7%	3%	3%	2%	0%	22%	55%
Poor	5%	4%	3%	4%	6%	4%	5%	6%	3%	3%
Very Poor	5%	2%	1%	1%	1%	1%	1%	2%	4%	4%

Optimised Budget

In the optimised budget, the Pavement Scores are improving in the first 5 years but then deteriorates due to the reseal budget restriction in the early years. Surface conditions are also deteriorating due to the same reseal budget. There is a limitation on rehabilitations, the logic is once a rehabilitation has been completed, it will get maintained by resurfacing before another rehabilitation is triggered. By giving a small reseal budget it also limits the number of rehabilitations that can be triggered.

TABLE 0-3:OPTIMISED BUDGET PAVEMENT SCORE

Score	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Very Good	79%	81%	82%	79%	49%	6%	3%	3%	4%	4%
Good	11%	10%	9%	4%	34%	77%	78%	79%	69%	7%
Fair	5%	6%	6%	14%	12%	10%	9%	6%	14%	77%
Poor	3%	3%	3%	3%	5%	6%	9%	11%	10%	9%
Very Poor	2%	1%	1%	0%	1%	1%	1%	1%	3%	4%

TABLE 0-4: OPTIMISED BUDGET SURFACE SCORE

Score	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Very Good	79%	79%	80%	80%	53%	8%	6%	7%	7%	7%
Good	6%	6%	6%	0%	28%	74%	76%	76%	48%	5%
Fair	5%	5%	5%	10%	6%	6%	5%	0%	28%	71%
Poor	5%	5%	4%	5%	8%	8%	8%	12%	8%	7%
Very Poor	5%	5%	4%	4%	5%	5%	5%	5%	9%	10%

Unconstrained Budget

The unconstrained budget shows the percentage of network for Pavement in 'Poor' and 'Very Poor' is maintained between 2023 and 2032 and the Surface Score is improved from 10% in 'Poor' and 'Very Poor' in 2023 to 1% in 'Very Poor' in 2032 however this comes with huge costs.

TABLE 0-5: UNCONSTRAINED PAVEMENT SCORE

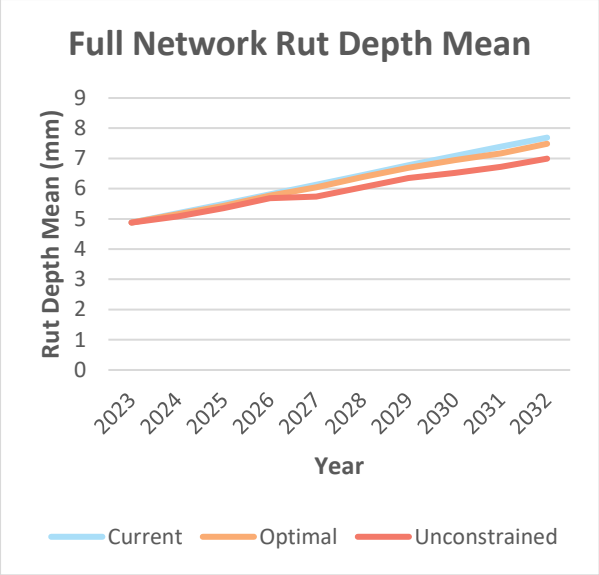
Score	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Very Good	79%	82%	83%	81%	52%	13%	9%	10%	11%	9%
Good	11%	10%	8%	3%	32%	73%	79%	76%	68%	14%
Fair	5%	5%	6%	13%	11%	9%	5%	9%	17%	72%
Poor	3%	2%	2%	2%	4%	6%	7%	5%	3%	3%
Very Poor	2%	0%	0%	0%	0%	0%	1%	1%	1%	2%

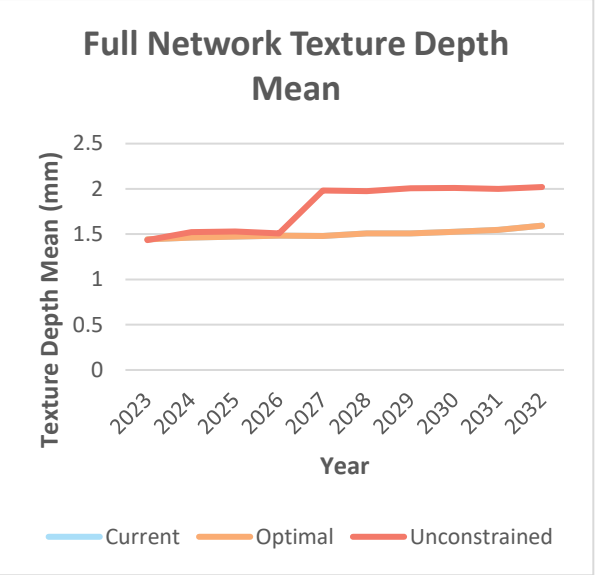
TABLE 0-6: UNCONSTRAINED SURFACE SCORE

Score	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Very Good	79%	89%	92%	92%	83%	74%	73%	69%	68%	58%
Good	6%	6%	3%	0%	12%	22%	24%	29%	23%	33%
Fair	5%	2%	2%	5%	2%	2%	1%	0%	8%	9%
Poor	5%	2%	2%	2%	3%	1%	1%	1%	0%	0%
Very Poor	5%	1%	1%	1%	1%	1%	1%	1%	1%	1%

Rut and Texture Depth of Whole Network

The below graphs show minimal benefit to the rut depth mean and texture depth mean even with significantly increased funding scenarios.





5.2.7 Preferred Options

Deterioration modelling showed the current condition of the pavement indicates that it is in good shape across all ONRCs. However, due to budget limitations, the model is facing challenges in maintaining the pavement condition, and it is projected to decline slightly. On the other hand, surface conditions are being well maintained.

Therefore, the preferred options include:

- Increasing resealing despite being in relatively good condition to address the growing bow wave of aging seals.
- Maintaining pavement rehabilitation budget as opposed to decreasing it as forecast in the last NLTP.
- Increase drainage maintenance (budgeted for in drainage section)
- Collect networkwide MSD data.
- Start utilizing emulsion stabilisation.

5.2.8 Financial Impact

The following table shows the financial impact of the options selected (note some of the costs have been rounded):

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
111	Sealed Pavement Maintenance	+$500,000/year for emulsion stabilisation.	+$500,000/year
113	Drainage Maintenance	+$670,000/year for increased drainage maintenance	Budgeted for in drainage section
151	Network and Asset Management	+$90,000/ 5 years for MSD data	$90,000/ 5 years
212	Sealed Road Resurfacing	+$1,000,000 /year to address aging network.	$1,000,000/year

5.2.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

- Increase chipseal programme
- Network wide MSD data collection
- Use of non-M/4 aggregate
- Increase drainage maintenance
- Increase in short overlays
- Returning sealed roads to unsealed
- Fabric seals
- Emulsion stabilisation/Dustex
- Sharing crews between TNOC and NPDC
- Removing uneconomic roads

5.3. Unsealed Roads

5.3.1 Work Categories

112 Unsealed Pavement Maintenance

211 Unsealed Road Metalling

(Associated Activities – 113 Routine Drainage Maintenance, 213 Drainage Renewals)

5.3.2 Links to Strategic Case

GPSLT Objectives	• Efficient and effective freight connections • A land transport system where on-one is killed or seriously injured. • Managing the risks from natural and human-made hazards • People in urban areas have better choices to access economic and social opportunities. • The existing system is maintained at a level that meets current and future needs.			
RLTP Objective	• An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness. • An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond. • A safe transport network increasingly free of death and serious injury • A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation. • A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change. • An energy efficient and environmentally sustainable land transport system.			
Council Goals	Trusted	Thriving Communities and Culture	Environmental Excellence	Prosperity
	Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.	Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori	Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.	Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and economic performance.

ONRC Customer Outcomes	**Safety**	Unsealed pavement with gravel or other loose materials can offer increased traction, reducing the risk of skidding in certain conditions.
	Resilience	Unsealed pavement can provide better drainage than sealed pavement, allowing water to infiltrate and minimizing the risk of standing water or hydroplaning.
	Amenity	Unsealed roads can blend more naturally with the surrounding landscape, preserving the rural or natural character of an area. This can be particularly appealing in scenic or environmentally sensitive regions
	Accessibility	Unsealed pavements are a cost-effective option for enabling access to remote destinations.
	Cost Efficiency	Unsealed pavement typically has lower upfront costs compared to sealed pavement, which may be advantageous in budget-limited situations.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the road pavement asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces	
Strategic Response to Problem Statements	**Change risk profile:** • Allowing Low Volume and Access Roads to deteriorate to align with ONRC. **Programme adjustment:** • Adjusting work categories related to carriageways to allow for more focused work that aligns with ONF. **Policy Approach:** • Continue implementing the data improvement plan. **Improve value for money:** • Reverting uneconomic unsealed roads back to paper roads **Relationship approach:**	

	• Improve the relationship with Waka Kotahi, Elected Members, Iwi and Hapu through more reliable carriageway data that allows for informed decision making.
Benefits of Addressing the Problem:	**Natural topography and layout challenges:** • Improved Network Performance: Properly managing and maintaining unsealed roads can improve their resilience during major events like heavy rainfall or flooding. Implementing effective drainage solutions and erosion control measures helps reduce the risk of damage, ensuring the continued access to critical areas during emergencies. **Safe system approach for complex networks:** • Improved Safety Outcomes: Adopting a 'safe system' approach to the design and management of unsealed roads improves safety for all road users. Implementing measures like appropriate signage, speed management, and regular road maintenance can reduce the risk of accidents and improve both actual and perceived safety. **Understanding the value of transport infrastructure**: • Improved Economic Outcomes: Gaining a better understanding of the value that unsealed roads provide to the community and regional economy allows for more informed decision-making regarding targeted investments. Well-maintained unsealed roads facilitate the transportation of goods and services, promoting economic opportunities and development in rural or less-developed areas.
Risk of Not Addressing the Problem:	**Natural topography and layout challenges:** • Vulnerability during Major Events: If unsealed roads and their drainage are not adequately designed to handle major events like floods or landslides, the infrastructure may be at a higher risk of damage and disruption. This can isolate the community during emergencies, hindering access to critical services and evacuation routes. **Lack of a safe system approach for complex networks:** • Increased Safety Hazards: Not adopting a 'safe system' approach to road design and management can lead to increased safety hazards. The absence of safety measures like delineation can result in a higher likelihood of accidents, leading to injuries and fatalities among road users.

	Poor understanding of infrastructure value: • Increased Maintenance Costs: Neglecting the value of unsealed roads can result in underfunding for maintenance and repairs, leading to increased deterioration of roads and higher long-term maintenance costs.

5.3.3 Levels of Service

ONRC Customer Outcomes:

N/A

Customer Level of Service:

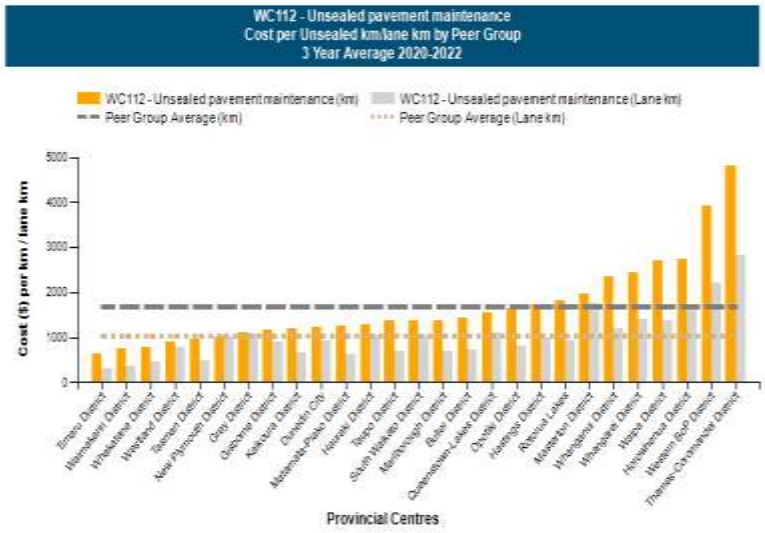
WC112 – Unsealed pavement maintenance

Cost per Unsealed km/lane km by Peer Group 3 Year Average 2020-2022

WC211 – Unsealed Road metalling

Cost per Unsealed km/lane km by Peer Group 3 Year Average 2020-2022

5.3.4 Evidence and Gap Analysis

Measure	Assessment	Evidence
WC112 – Unsealed pavement maintenance Cost per Unsealed km/lane km by Peer Group 3 Year Average 2020-2022		

Measure	Assessment	Evidence
WC211 – Unsealed Road metalling Cost per Unsealed km/lane km by Peer Group 3 Year Average 2020-2022		

New Plymouth spends slightly above average in Unsealed Road Metalling and well below average for Unsealed Pavement Maintenance when compared with our peer groups. This is because historically we have created thick pavement layers through metalling rather than thin running coats. This has led to robust pavements with few defects, and when these defects arise, a quick grading remedies the issues.

5.3.5 Options to be considered

Based on the above data and the problem statements, the following options have been considered for addressing the unsealed pavements:

Option	Description	Benefits / Consequence
No metalling	Continue to repair potholes and grading programme. Stop unsealed road metalling.	Cost Efficiency – Will reduce unsealed road metalling cost but will result in decreased level of service over the longer term. Maintenance costs are also likely to increase
Maintain status quo	Continue current level of spending to maintain level of service	Cost Efficiency – This would keep us in the middle of our peer groups while maintaining an appropriate level of service.
Increase in maintenance metalling	Increase maintenance metalling to build up pavement layers	Cost Efficiency – An increase in pavement layers will lead to reduced unsealed pavement maintenance
Unsealed Road Modelling	Collect All Faults data on unsealed network and model utilising JunoViewer.	Cost Efficiency – By utilizing deterioration modelling, we can optimise maintenance and unsealed road metalling rather than responding on a reactive basis.

Option	Description	Benefits / Consequence
Drainage Improvements	Increase high shoulder and water table maintenance and validate appropriate culvert size	Cost Efficiency – This will extend the life of the pavement which improves whole of life cost. A reduction in pavement maintenance is also expected (up to 70%).
Seal remaining unsealed network	Seal the remaining 169km of network (13%).	Cost efficiency – Unsealed pavement maintenance and unsealed road metalling would be reduced to no cost, however there would be a large upfront cost of $4.8m in surfacing costs to do this, not including any pavement work that may be needed.
Demote unsealed roads	Demote underutilised unsealed roads to paper roads.	Cost Efficiency – Demoting underutilized unsealed roads to paper roads will reduce the length of network that needs maintaining.
New quarry source	Utilise Everett Road blend rather than Awakino to reduce haul costs for Southern network	Cost Efficiency – Decreasing the hauling distance of aggregate will reduce the overall cost to deliver metal for the Southern portion of our network.
Reduction in level of service of Tarata Road due to Forestry	Due to the large volumes of logging trucks and thin pavement on Tarata Road, it is no longer sustainable to maintain a sealed pavement. Approximately 40% of the road is due for rehab in the next 3 years. Revert 7.8km to unsealed giving a total length of unsealed of 9.7km.	Cost Efficiency

5.3.6 Options Assessment

Unsealed Road Condition

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
No metalling	No metalling will ultimately lead to a decreasing pavement thickness as the metal gets pushed off the road, this will in turn lead to more defects with a greater whole of life cost long term.	Cost Efficiency	Poor	Worse	W/C112: +$600,000 W/C 211: -$500,000
Maintain status quo	Maintaining the same expenditure will keep us within the middle of our peers which is where we want to be. We get relatively low customer service requests for unsealed roads compared with sealed, so the level of service appears appropriate. Approximately 4% of customer service requests that fall under the Roading category are related to unsealed roads.	Cost Efficiency	Good	Neutral	N/A
Increase in maintenance metalling	An increase in maintenance metalling will see our pavement thicknesses improve over time, however we already have sufficient pavement depth in most places so the benefit will unlikely weigh up the additional cost.	Cost Efficiency	Moderate	Neutral	W/C:211 +$100,000
Unsealed Road Modelling	Carrying out an unsealed pavement model will provide a 10-year programme for unsealed pavement maintenance and maintenance metalling. We already have a JunoViewer License and inspectors, so the only cost is inferencing and storage fee of GoPro videos by Lonrix.	Cost Efficiency	Good	Better	W/C 151: +$5,000
Drainage Improvements	Drainage maintenance is one of the truest forms of preventative maintenance. Studies from the		Good	Better	W/C 113: +$130,000

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	Taranaki Network Outcome Contract (TNOC) showed sealed pavement maintenance costs can drop on average by 70% if intervened at the right time. It is difficult to quantify the savings as there are many benefits to maintaining a good drainage network i.e., increased pavement and surface life, prevention of under slips occurring which requires expensive retreat or retaining and decrease in maintenance costs.				
Seal remaining unsealed network	Sealing the remaining unsealed network is a huge cost upfront, however because the pavement has sufficient thickness, it would likely need heavy investment in pavements as well not included in the $4.6M estimate.	Cost Efficiency	Neutral	Better	W/C 212: $4.6m
Demote unsealed roads	New Plymouth has a few roads that only service one or two houses – selling these roads to the owners of these properties or demoting to paper roads would mean the council would no longer need to maintain these roads.	Cost Efficiency	Good	Better	N/A
New quarry source	Utilizing another quarry source will drop cartage costs, however quality will need to be monitored. The Awakino metal has historically performed well and may be worth the extra cartage costs. Further testing would be required.	Cost Efficiency	Good	Neutral	N/A
Reduction in level of service of Tarata Road due to Forestry	By reverting some of Tarata Road to unsealed, we can reduce our renewals costs by approximately a third. This also allows us to provide a faster turnaround time for reactive	Cost Efficiency	Good	Worse than sealed, but high level of unsealed	W/C 112: $32,0000/ Year W/C 211: $565,000/

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	maintenance as we can complete works in winter (sealed pavement maintenance can only be completed in summer).				Year W/C113: $235,000/ 5 years

5.3.7 Preferred Options

The preferred option is to maintain status quo and keep the unsealed pavement maintenance and unsealed road metalling budgets similar to the 2021-24 NLTP budgets. We are also interested in carrying out deterioration modelling and increasing drainage maintenance on the unsealed network. Tarata Road will need further funding to increase maintenance metalling and grading due to a drop in level of service from sealed to unsealed – this will reduce the sealed pavement maintenance and renewals costs.

Demoting unsealed roads is not a decision that can be made at a delivery level, so further investigation is required. This will be added to our improvement plan.

5.3.8 Financial Impact

The following table shows the financial impact of the options selected (note some of the costs have been rounded):

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
112	Unsealed Pavement Maintenance	$32,000/year	$32,000/year
113	Routine Drainage Maintenance	$130,000/year	Budgeted for in drainage section
211	Unsealed Road Metalling	$565,000/year	$565,000/year
151	Unsealed Road Modelling	+$5,000 every 3 years	+$5000 every 3 years

5.3.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

- Look into the demotion of unsealed roads into paper roads.
- Collect unsealed All Faults using a GoPro and AI inferencing and then complete deterioration modelling.

5.4. Structures

5.4.1 Work Categories:

114 Structures Maintenance

215 Structural Component Replacement

216 Bridges and Structures renewals

5.4.2 Links to Strategic Case

<table>
<tr><td>GPSLT Objectives</td><td colspan="4">Efficient and effective freight priorities
A land transport system where no-one is killed or seriously injured.
Managing the risks from natural and human-made hazards
People in urban areas have better choices to access economic and social opportunities.
The existing system is maintained at a level that meets current and future needs.</td></tr>
<tr><td>RLTP Objective</td><td colspan="4">An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness.
An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond.
A safe transport network increasingly free of death and serious injury
A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.
A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
An energy efficient and environmentally sustainable land transport system.</td></tr>
<tr><td rowspan="2">Council Goals</td><td>Trusted</td><td>Thriving Communities and Culture</td><td>Environmental Excellence</td><td>Prosperity</td></tr>
<tr><td>Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.</td><td>Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori</td><td>Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.</td><td>Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and economic performance.</td></tr>
</table>

ONRC Customer Outcomes	**Safety**	Structures provide a safe passage for pedestrians, cyclists, vehicles, and water flow. Properly constructed structures reduce the risk of accidents and ensure the safety of users.
	Resilience	Well-designed structures are built to withstand various environmental conditions, such as floods, earthquakes, and heavy loads. They enhance the resilience of infrastructure by withstanding natural forces and minimising damage.
	Amenity	Well-designed structures can add to the visual appeal of an area. For example, iconic bridges often become landmarks and can boost tourism and local pride.
	Accessibility	Structures like bridges and culverts enable accessibility by providing crossings over obstacles such as rivers and roadways. They ensure smooth transportation, routes and promote connectivity between different areas.
	Efficiency	While structures may have a higher upfront cost compared to simple alternatives, their long-term cost efficiency comes from their extended lifespan and reduced maintenance needs. Durable structures require less frequent repairs and replacements, leading to cost savings over time.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the Stormwater drainage asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces	
Strategic Response to Problem Statements	**Change risk profile:** • Risk to remain unchanged as structures are a critical asset. **Programme adjustments:** • The consequence of underspending in maintenance has been realised and this has created a bow wave of expensive replacements. • The programme will need to incorporate structures along the Coastal Walkway that are vested with the Transport Services **Policy Approach:** • Implementation of rigorous inspections for all structures, not just bridges.	

	• With the structures along the Coastal Walkway being vested from the Parks and Open Spaces Service to the Transportation Service, a robust inspection programme will need to be developed to incorporate these assets. **Improve value for money:** • Increasing maintenance and component renewals to defer further bridge replacements. **Relationship approach:** • Improve the relationship with Waka Kotahi, Elected Members, Iwi and Hapu through more reliable carriageway data that allows for informed decision making.
Benefits of Addressing the Problem:	**Natural topography and layout challenges:** • Improved Transport Choices: Addressing the difficulties posed by the natural topography and layout allows for better planning and integration of alternative transport modes such as pedestrian bridges, cycleways, and pedestrian-friendly walkways. This enhances connectivity within the community, reducing severance, and providing accessible options for various modes of transportation. • Improved Network Performance: Properly designed and maintained structures can improve infrastructure resilience during major events like floods or earthquakes. Well-engineered bridges, culverts, and retaining walls can withstand natural forces, minimizing damage, and ensuring continued access to critical areas during emergencies. **Safe system approach for complex networks:** • Improved Safety Outcomes: Taking a 'safe system' approach to the design and management of structures improves safety for all users. Implementing safety features such as guard rails, sight rails, and delineation can reduce the risk of accidents, ensuring a safer environment for pedestrians, cyclists, and motorists. **Understanding the value of transport infrastructure:** • Improved Economic Outcomes: Recognizing the value that well-designed structures provide to the community and regional economy allows for more informed decision-making regarding targeted investments. Efficiently constructed and maintained bridges and culverts facilitate the movement of goods and services, promoting economic opportunities and development. **Encouraging sustainable transport and urban spaces:** • Improved Transport Choices: Implementing structures that support alternative transport modes and pedestrian-friendly urban spaces can

	reduce motor vehicle usage, leading to lower greenhouse gas emissions and environmental damage.
Risk of Not Addressing the Problem:	**Natural topography and layout challenges:** • Limited Connectivity: Not addressing the difficulties posed by the natural topography and layout can lead to limited transport options, making it difficult for community members to access essential services and activities. This can result in severance within the community, isolating certain areas and hindering social interactions. • Vulnerability during Major Events: If structures are not designed to address natural topography challenges, the infrastructure may be at a higher risk during major events like floods or landslides. Inadequate design and lack of resilience can disrupt transportation routes, posing safety risks and hindering emergency responses. **Lack of a safe system approach for complex networks:** • Poor bridge design: Not taking a safe system approach can result in poor facilities for pedestrians and cyclists on bridges. Speed, width and protection should be considered. **Poor understanding of infrastructure value:** • Missed Economic Opportunities: Ignoring the value of transport infrastructure and not making targeted investments can lead to missed economic opportunities. Inadequate infrastructure may hinder the efficient movement of goods and services, affecting regional economic growth and competitiveness. • Increased Maintenance Costs: Neglecting the value of structures can result in underfunding for maintenance and repairs, leading to increased deterioration of the infrastructure and higher long-term maintenance costs.

5.4.3 Levels of Service

ONRC Customer Outcomes:

ONRC Resilience C01 – The number of journeys impacted by unplanned events.

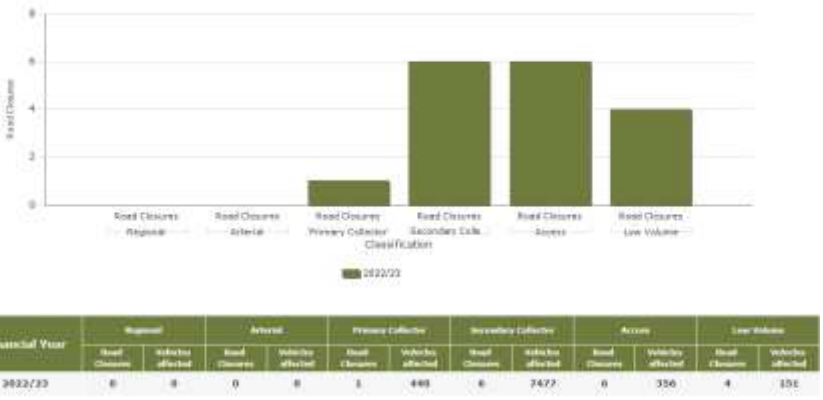
ONRC Resilience C02 – The number of instances where road access is lost.

ONRC Accessibility C01 – Proportion of the network not available to Class 1 heavy vehicles and 50MAX vehicles

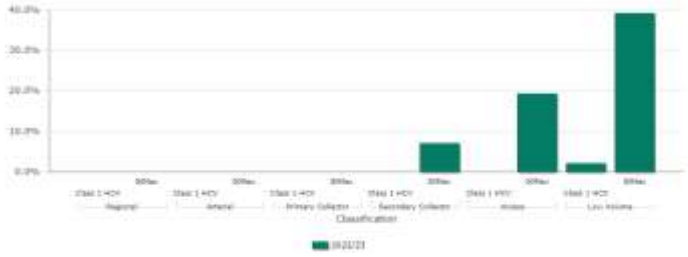
5.4.4 Evidence and Gap Analysis

Measure	Assessment	Evidence
ONRC Resilience C01 – The number of journeys impacted by unplanned events.		

The council had no road closures in 2022/23 where there wasn't a viable detour. It is noted that occasionally when road access is lost in the rural areas, farmers will often clear up the slip themselves so that they can gain access – especially when the slip is small.

Measure	Assessment	Evidence
ONRC Resilience C02 – The number of instances where road access is lost.		

The council only had 17 instances where there were road closures with no detour provided. Generally, this only affected lower ONRC categories.

Measure	Assessment	Evidence
ONRC Accessibility C01 – Proportion of Network not available to Class 1 heavy vehicles and 50MAX vehicles		

5.4.5 Options to be considered

Based on the above data and the problem definition, the following options have been considered for addressing the drainage systems:

Option	Description	Benefits / Consequence
No structural work	Routine maintenance only. No structural component replacements or bridges and structures renewals. This will run down the assets leading to decreased level of service i.e., more weight and 50MAX restrictions.	Cost Efficiency – will reduce structural component replacement and bridges and structures renewals but will increase maintenance costs and will have higher whole of life costs in the long term. Accessibility – will reduce accessibility for freight and 50MAX vehicles over time. Resilience – Risk of structure failure resulting in completed loss of access increased
No bridge and structure renewals	Routine maintenance and structural component replacement where required to maintain assets in their current condition. Unlikely practicable with several bridges approaching end of life and many buried corrugated metal culverts that are high risk.	Cost Efficiency – will reduce structural renewal costs but will increase maintenance and component replacement costs.
Specialist Inspections	Undertake specialist inspections for buried corrugated metal culverts, unlined water drive structures, unlined road tunnels, structures in poor condition.	Cost Efficiency – Will provide appropriate management strategies to provide greater understanding of whole of life cost.
Review Fish Passage Network	Undertake network review for structures likely to impede fish passages.	Compliance with ‘Fresh Water Plan for Taranaki and new requirements in the ‘National Environmental Standards for Plantation Forestry’.
Posting, HPMV and Rating Assessment	Complete Posting, HMPV and Rating Assessment of 4 structures currently restricting network access	Accessibility – Will improve accessibility across the network which creates improved resilience.
Maintain budgets from last NLTP	Maintain the structures maintenance, component replacement and renewal budget to the same level as the previous NLTP.	Cost Efficiency – Maintaining the increased maintenance and component replacement budget will help extend the lives of our structure’s assets, leading to a decreased life cycle cost. Accessibility – Maintaining the current budgets will mean we can maintain our level of service, so residents don’t lose access or have increased restrictions on structures
Increase budgets from last NLTP	Increase the structures maintenance, component	Cost Efficiency – Increasing the maintenance and component

	replacement and renewal budget to the same level as the previous NLTP.	replacement budget will help extend the lives of our structure's assets, leading to a decreased life cycle cost. Accessibility – Maintaining the current budgets will mean we can improve our level of service, so residents don't lose access or have increased restrictions on structures
Acquisition of Coastal Walkway Structures	Coastal Walkway assets previously owned by Parks have been transferred to Transport and will require an increase in maintenance budget due to the acquisition of additional assets.	Cost Efficiency – Currently rate payers are contributing 100% towards the maintenance and renewals of these assets, when 51% should be covered by Waka Kotahi as these assets are related to the movement of people.

5.4.6 Option Assessment

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
No structural work	Assume long term maintenance costs would double. This option is not practical because 50 bridges (30% of our bridge stock) are older than 80 years with an expected service life of 100 years.	Accessibility Cost Efficiency Resilience	Poor	Worse	WC114: +$1,070,000 WC215: -$2,300,000 WC216: $0
No bridge and structure renewals	This option would see the long-term maintenance and component renewals increase. This option is not practical as we have aging structures that are approaching end of life – we need to start working through the bow wave.	Cost Efficiency	Moderate	Neutral	N/A
Specialist Inspections	This option would help prioritise maintenance, component replacement and renewals of assets in a cost-efficient manner so that there are no unexpected failures.	Cost Efficiency	Good	Better	WC151: $50,000

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Review Fish Passage Network	Current practice is we react to abatement notices where our structures impede fish movement. This option would allow us to be proactive rather than reactive.	Compliance	Good	Better	WC151: $10,000
Posting, HPMV and Rating Assessment	This option would potentially increase the number of roads that are accessible to heavy vehicles, or alternatively identify structures that need strengthening/widening.	Accessibility	Good	Better	WC151: $20,000
Maintain budgets from last NLTP	Maintaining the budget from the previous NLTP will help us stay on top of structures that had previously had budgets stripped down leading to neglect of basic maintenance.	Accessibility Cost Efficiency	Good	Neutral	N/A
Increase budgets from last NLTP	An increase in budget from last NLTP will help improve the level of service, however this level of service is likely too high and there are other asset groups that would benefit more with additional funding.	Accessibility Cost Efficiency	Neutral	Better	WC214: +$200,000 WC215: +$400,000 WC216: +$1,000,000
Acquisition of Coastal Walkway Structures	An increase in maintenance and component renewals is required for additional assets.	Cost Efficiency	Good	Neutral	W/C 114: +$75,000 W/C 215: +$100,000

5.4.7 Preferred Options

The preferred option is to maintain the same budgets from the last NLTP for maintenance, component replacement and structures renewals. It is also preferred to complete specialist inspections, review the fish passage network, and complete the posting, HPMV and rating assessment.

With the acquisition of walkway assets from Parks, further budget is required to maintain and renew these assets. This transfer has amended a historical failure in which the assets were vested with the wrong group at council.

5.4.8 Financial Impact

The following table shows the financial impact of the options selected:

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
114	Structures Maintenance	$75,000 – Walkway Asset Acquisition	$75,000/year
215	Structural Component Replacement	$100,000 – Walkway Asset Acquisition	$100,000/year
216	Bridges and Structures Renewals	$6,125,000 – Urenui Swing bridge	$6,125,000 (once off)
151	Network and Asset Management	+$50,000 – Specialist Inspections +$10,000 – Fish Passage Review +$20,000 – HPMV Assessment	+$80,000 (once off)

5.4.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

- Undertake specialist inspections of:
    - Structural steelwork protective coating systems on steel structures
    - Buried corrugated metal culverts.
    - Unlined water drive structures
    - Unlined road tunnels
    - Specific condition related inspections
- Complete fish passage review
- Complete Posting, HMPV and Rating Assessment of 4 structures currently restricting network access:
    - Kent Road 7.947 Bridge No. 96
    - Makara Road 2.921 Bridge No. 300
    - Mangatete Road 0.725 Bridge No. 99
    - Old Mountain Road 1.472 Bridge No. 103

5.5. Drainage

5.5.1 Work Categories

113 Routine Drainage Maintenance

213 Drainage Renewals

5.5.2 Links to Strategic Case

<table>
<tr><td>GPSLT Objectives</td><td colspan="4">Efficient and effective freight priorities
A land transport system where no-one is killed or seriously injured.
Managing the risks from natural and human-made hazards
People in urban areas have better choices to access economic and social opportunities.
The existing system is maintained at a level that meets current and future needs.</td></tr>
<tr><td>RLTP Objective</td><td colspan="4">An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness.
An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond.
A safe transport network increasingly free of death and serious injury
A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.
A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
An energy efficient and environmentally sustainable land transport system.</td></tr>
<tr><td rowspan="2">Council Goals</td><td>Trusted</td><td>Thriving Communities and Culture</td><td>Environmental Excellence</td><td>Prosperity</td></tr>
<tr><td>Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.</td><td>Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori</td><td>Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.</td><td>Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and economic performance.</td></tr>
<tr><td></td><td>Safety</td><td colspan="3">Effective drainage systems help prevent the accumulation of water on roads, walkways, and other surfaces, reducing the risk of</td></tr>
</table>

ONRC Customer Outcomes		hydroplaning and slip-and-fall accidents. Proper drainage minimizes the potential hazards associated with standing water, ice, or flooding.
	Resilience	A well-designed drainage system enhances the resilience of infrastructure by efficiently managing water runoff during heavy rainfall or flooding events. It helps prevent erosion, water damage, and structural failures, increasing the longevity of roads, buildings, and other structures.
	Amenity	Well-designed drainage systems can be integrated into the landscape in a way that enhances the visual appeal of an area. For example, green infrastructure like bioswales and rain gardens can add greenery and beauty to urban spaces.
	Accessibility	Adequate drainage ensures that roads and walkways remain passable even during adverse weather conditions. It facilitates the movement of people and vehicles, promoting accessibility and connectivity throughout the area.
	Efficiency	Investing in effective drainage systems can lead to cost savings in the long run. By mitigating water-related damages, drainage reduces the need for frequent repairs and maintenance, saving money for both individuals and municipalities.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the Stormwater drainage asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces.	
Strategic Response to Problem Statements	**Change risk profile:** • Allowing Low Volume and Access Roads to deteriorate to align with ONRC. **Policy Approach:** • Continue implementing the data improvement plan. **Improve value for money:** • An improvement to data will allow targeted investment of drainage assets. **Relationship approach:**	

	• Improve the relationship with Waka Kotahi, Elected Members, Iwi and Hapu through more reliable carriageway data that allows for informed decision making.
Benefits of Addressing the Problem:	**Natural topography and layout challenges:** • Improved Network Performance: Properly designed and maintained drainage systems can effectively manage water runoff during major events like heavy rainfall or flooding. This helps prevent road closures and infrastructure damage, ensuring continued access to critical areas during emergencies. **Safe system approach for complex networks:** • Improved Safety Outcomes: Adopting a 'safe system' approach to drainage design reduces safety risks. Properly designed drainage systems prevent water accumulation on roads and walkways, minimizing the potential hazards associated with standing water, ice, or flooding. This contributes to better actual and perceived safety, providing a safer environment for all road users. **Understanding the value of transport infrastructure:** • Improved Economic Outcomes: Recognizing the value that drainage infrastructure provides to the community and regional economy allows for more informed decision-making regarding targeted investments. Well-designed drainage systems minimize disruptions to transportation during adverse weather conditions, promoting economic opportunities and growth in the region.
Risk of Not Addressing the Problem:	**Natural topography and layout challenges:** • Limited Accessibility: Not addressing the difficulties posed by the natural topography and layout can lead to limited transport options, making it difficult for community members to complete trips using alternative transport modes. This can result in severance within the community, isolating certain areas and hindering social interactions and access to essential services. • Vulnerability during Major Events: Inadequate drainage systems and poorly designed infrastructure can lead to increased risks during major events like heavy rainfall or flooding. Water accumulation on roads and walkways can disrupt transportation, isolate communities, and lead to infrastructure damage, posing safety risks during emergencies. **Lack of a safe system approach for complex networks:** • Safety Hazards: Not adopting a 'safe system' approach to drainage design can lead to safety hazards such as standing water and slippery surfaces. This increases the risk of accidents and injuries for all road users, undermining the overall safety of the transportation network.

	Poor understanding of infrastructure value: • Missed Economic Opportunities: Ignoring the value of drainage infrastructure and failing to make targeted investments can lead to missed economic opportunities. Poorly designed drainage systems can disrupt transportation and hinder economic activities during adverse weather conditions, impacting regional economic growth and development. • Increased Costs: Poorly planned and maintained drainage systems can lead to higher long-term costs associated with road maintenance and repairs. Inadequate drainage may cause infrastructure deterioration, requiring more frequent and costly interventions.

5.5.3 Levels of Service

ONF Transport Outcomes:

Safe Travel – Wet Roads (refer to Sealed Roads Section)

ONRC Customer Outcomes:

Resilience Customer Outcome 1 – Unplanned Closures with a Detour Provided (refer to Structures Section)

Resilience Customer Outcome 2 – The Number of Instances where road access is lost (refer to Structures Section)

Customer Levels of Service:

WC113 and 213 – Routine drainage maintenance and renewal cost per network km/lane km by peer group

5.5.4 Evidence and Gap Analysis

Measure	Assessment	Evidence
WC113 and 213: Routine drainage maintenance and renewal Cost per Network km/lane km by Peer Group		

New Plymouth is approximately in the middle of its peer group which is a good place to be. New Plymouth has relatively high rainfall when compared with the rest of New Zealand and is also prone

to slips and under slips in the North – Eastern part of the network due to weak Papa Rock (soft, blue-grey mudstone).

5.5.5 Options to be considered

Based on the above data and the problem definition, the following options have been considered for addressing the drainage systems:

Option	Description	Benefits / Consequence
Culvert Maintenance	Current resource only allows for roving maintenance patrol to clear inlets and outlets by hand. Having a dedicated resource to clear vegetation and debris, complete minor repairs and assess asset condition will help build resilience and provide a greater understanding of the networks condition.	Cost Efficiency – maintaining clean culverts is a lot cheaper than expensive pavement repairs or washouts due to blocked culverts. Resilience – Would reduce the likelihood of flooding and slips.
Drainage inspections	Only 20% of our drainage assets have a condition rating. It is estimated that it would take two years for a full-time drainage inspector to inspect the whole network.	Cost Efficiency – By understanding the condition of our network we can make more informed asset management decisions
Increased drainage maintenance	Current budget only allows for surface water channel maintenance and high shoulder maintenance of reseal sites. This does not allow for any other drainage work on the network.	Cost Efficiency – Will help reduce pavement maintenance and likelihood of over slips and under slips. Resilience – Reduces the likelihood of flooding and slips and increases lifecycle of pavement
Status Quo	Maintain current budget for drainage maintenance and renewals.	Cost Efficiency – Maintains current level of service. Resilience – this will likely see resilience stay the same or get slightly worse with greater weather events
No drainage renewals	Continue routine drainage maintenance with no drainage renewals	Cost Efficiency – Will reduce renewals cost but will likely lead to increased pavement maintenance costs. Resilience – Increased likelihood of flooding and slips
Upgrade culverts <300mm diameter to 375mm diameter RCRRJ pipes	During pre-seal repairs, upgrade any undersized culverts (needs catchment analysis to confirm if larger diameter required)	Resilience – Upgrading the undersized culverts will improve resilience on the network – especially during weather events which are

		increasing in frequency due to climate change.
Network Wide catchment analysis – summer student	Currently it is unknown how many culverts are undersized or how many culverts are needed. A network wide catchment analysis would help understand the likely risk and help us build resilience around future climate change where rain events are expected to be more frequent and severe.	Resilience – By completing a network wide catchment analysis, we can understand how many culverts are under capacity/ how many new culverts we may need and budget for this to improve network resilience.
Sump Lead Inspections	Sump Leads have previously been looked after by the 3 Waters team, however, with the reform, they will become Transports Assets and further work is required to understand the networks condition.	Cost Efficiency – Currently only a portion of Waitara has condition ratings for Sump Leads. CCTV inspections would help understand the network condition and risk we carry.
Rain Gardens	New subdivisions have been constructing rain gardens to treat stormwater run-off of roads. These are currently not being maintained.	Amenity – Poorly kept due to no maintenance budget has led to customer complaints. Environment – Not maintaining these gardens means the treatment of heavy metals will not be as effective leading to poorer environment outcomes.

5.5.6 Option Assessment

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Culvert Maintenance	Currently there is no resource to maintain culverts. A full-time crew could remove vegetation, clean the culverts, inspect, and update the condition in RAMM	Cost Efficiency Resilience	Good	Better	W/C113: $200,000
Drainage Inspections	With the increase of an additional drainage crew, the assets can be inspected and updated in RAMM.	Cost Efficiency Resilience	Good	Better	N/A
Increased drainage maintenance	Drainage maintenance is one of the truest forms of preventative maintenance. Studies from the Taranaki Network Outcome Contract (TNOC) showed	Cost Efficiency Resilience	Good	Better	W/C113: $800,000 ($130,000 Unsealed Roads,

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	sealed pavement maintenance costs can drop on average by 70% if intervened at the right time. It is difficult to quantify the savings as there are many benefits to maintaining a good drainage network i.e., increased pavement and surface life, prevention of under slips occurring which requires expensive retreat or retaining and decrease in maintenance costs.				$670,000 Sealed Roads)
Status Quo	Current maintenance budget allows for some minor culvert maintenance by patrol crews, roadside water channel maintenance, minor kerb and sump maintenance, street cleaning. and sump cleaning.	Cost Efficiency	Poor	Neutral	N/A
No drainage renewals	There would be a large increase in drainage maintenance and pavements will also likely see an increase in maintenance. The risk of flooding and culvert collapse would significantly increase over time too.	Cost Efficiency Resilience	Poor	Worse	N/A
Upgrade culverts <300mm diameter to 375mm diameter RCRRJ pipes	Current practice is to upgrade culverts to 375mm – a network wide catchment analysis will highlight how many culverts are undersized and the level of investment required to build resilience.	Resilience	Good	Better	Utilise Current Budget
Network Wide catchment analysis – summer student	This will provide a greater understanding of the cost involved with upgrading our stormwater network and improving resilience, especially for rural roads.	Cost Efficiency Resilience	Good	Better	W/C 151: $50,000
Sump Lead Inspections	Inspections are required to understand the level of risk	Cost Efficiency	Good	Better	W/C 113:

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	Transport is carrying with these newly vested assets.	Resilience			$100,000/ year
Rain gardens	By budgeting for the maintenance of these rain gardens we can bring these back to an acceptable level of service	Amenity Environment	Good	Better	W/C113: +$70,000/ year

5.5.7 Preferred Options

The preferred options include:

- Culvert Maintenance
- Increased high shoulder and water table maintenance.
- CCTV Inspections of Sump Leads
- Network wide catchment analysis

5.5.8 Financial Impact

The following table shows the financial impact of the options selected:

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
113	Routine Drainage Maintenance	+$200,000 for culvert maintenance +$800,000 for high shoulder and water tabling ($130,000 – Unsealed Roads, $670,000 for Sealed Roads) +$100,000 for CCTV inspections of Sump Leads +$60,000 for acquisition of rain gardens	+$1,160,000/year
151	Asset Management	+$50,000 for catchment analysis	$50,000 once off

5.5.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

- Continue with drainage inspections until we have completed a condition rating on 100% of our network – then prioritise inspections by ONF.
- Increase drainage maintenance.
- Inspect Sump Leads

5.6. Traffic Services

5.6.1 Work Categories:

122 Traffic Services Maintenance

123 Operational Traffic Maintenance

131 Level Crossing Warning Devices

222 Traffic Services Renewals

5.6.2 Links to Strategic Case

<table>
<tr><td>GPSLT Objectives</td><td colspan="4">Efficient and effective freight priorities
A land transport system where no-one is killed or seriously injured.
Managing the risks from natural and human-made hazards
People in urban areas have better choices to access economic and social opportunities.
The existing system is maintained at a level that meets current and future needs.</td></tr>
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An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond.
A safe transport network increasingly free of death and serious injury
A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.
A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
An energy efficient and environmentally sustainable land transport system.</td></tr>
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<tr><td>Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.</td><td>Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori</td><td>Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.</td><td>Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and</td></tr>
</table>

				economic performance.

ONRC Customer Outcomes	**Safety**	Traffic services, such as traffic lights, road signs, and speed limit enforcement, enhance road safety by regulating traffic flow and reducing the risk of accidents. They provide clear guidance to drivers and pedestrians, promoting safe behaviour on the roads.
	Resilience	Traffic services provide essential information and warnings to drivers, helping them navigate safely and avoid hazards. This is vital during adverse weather conditions or other emergencies.
	Amenity	Properly designed and maintained traffic services contribute to the overall amenity of an area by creating well-lit transport network.
	Accessibility	Traffic services, such as pedestrian crossings and accessible traffic signals, enhance accessibility for all users, including individuals with disabilities. They ensure that everyone can safely and conveniently navigate the road network.
	Efficiency	Efficient traffic services can lead to cost savings by reducing traffic congestion and travel times. This translates to lower fuel consumption and fewer greenhouse gas emissions. Additionally, optimized traffic flow decreases wear and tear on roads, reducing maintenance and repair costs.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the Stormwater drainage asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces	
Strategic Response to Problem Statements	**Programme adjustments:** • The transport model from the integrated transport plan will provide a gap analysis which will help identify future works to optimise the transport network. **Change Risk Profile:** • We are no longer accepting the risk of allowing the network to sit below RTS-5 minimum standards. This is a positive improvement supporting our alignment with the Waka Kotahi Vision Zero strategy.	

	Policy Approach: • Take a safe system approach when building new traffic services. **Relationship approach:** • Improve the relationship with Waka Kotahi, Elected Members, Iwi and Hapu through more reliable carriageway data that allows for informed decision making.
Benefits of Addressing the Problem:	**Safe system approach for complex networks:** • Improved Safety Outcomes: Adopting a 'safe system' approach to traffic services improves safety for all road users. Implementing measures such as, improved signage, road markings, and street signals and lighting can reduce the risk of accidents and improve both actual and perceived safety. **Understanding the value of transport infrastructure:** • Improved Economic Outcomes: Recognizing the value that traffic services provide to the community and regional economy allows for more informed decision-making regarding targeted investments. Well-designed traffic services can improve traffic flow, reduce congestion, and enhance transportation efficiency, promoting economic opportunities and growth in the region.
Risk of Not Addressing the Problem:	**Lack of a safe system approach for complex networks:** • Increased Safety Hazards: Not adopting a 'safe system' approach to traffic services can lead to increased safety hazards on the road. Lack of proper signage, and poorly designed intersections can result in a higher likelihood of accidents and injuries for all road users. **Poor understanding of infrastructure value:** • Missed Economic Opportunities: Ignoring the value that traffic services provide to the community and regional economy can lead to missed economic opportunities. Inefficient traffic management and congestion can disrupt the movement of goods and services, impacting regional economic growth and development.

5.6.3 Levels of Service

ONF Transport Outcomes

Safe Travel – Night

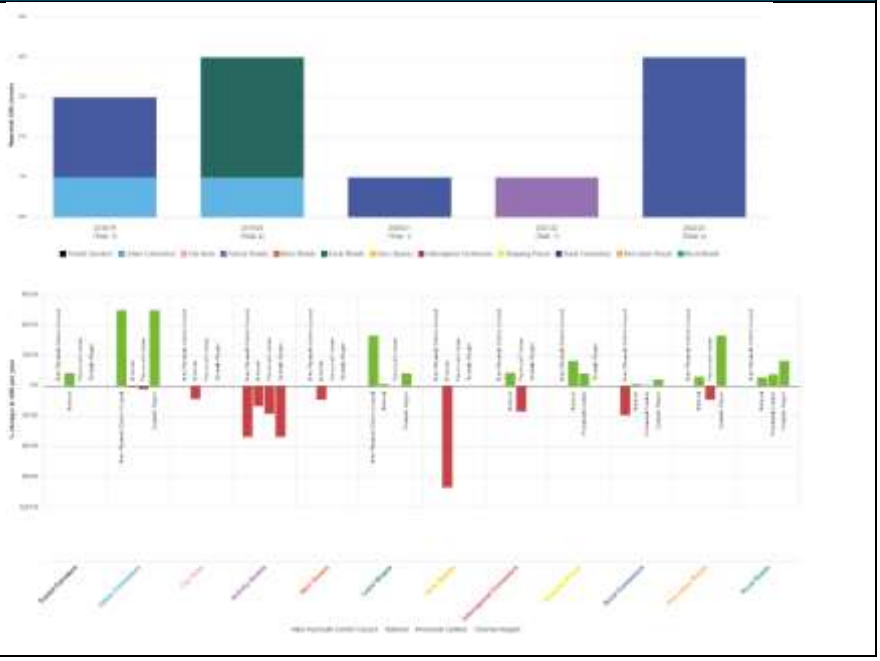
Safe Travel - Intersections

Customer Levels of Service:

WC122 & 222 – Traffic services maintenance and renewal Cost per Network km/lane km by Peer Group

WC123 – Operational traffic management Cost per Network km/lane km by Peer Group

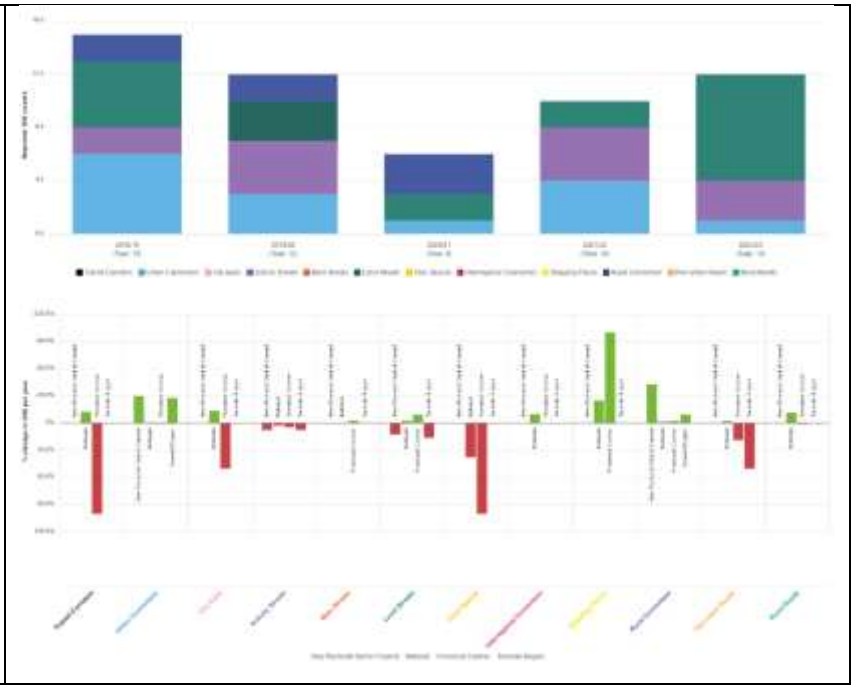
5.6.4 Evidence and Gap Analysis

Measure	Assessment	Evidence
Safe Travel – Loss of Driver Control at Night		

Data shows New Plymouth has a decreasing trend in Loss of Driver Control at Night and has a greater percentage change in DSI per year when compared with peer groups and nationally. It is noted that there is too little data to be statistically reliable because there is either two years or more with no reported injuries, or fewer than six reported injuries overall.

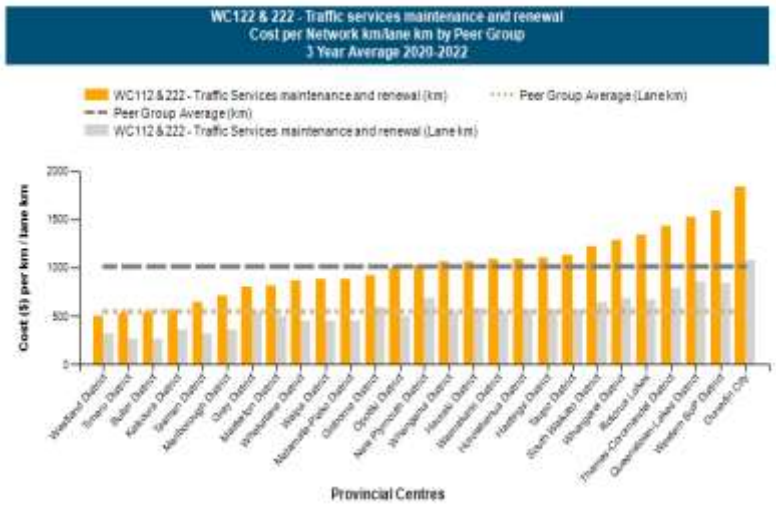
The one ONF Category that shows an increasing trend is the Rural Connectors. A targeted focus on traffic services maintenance and renewals would help improve this measure.

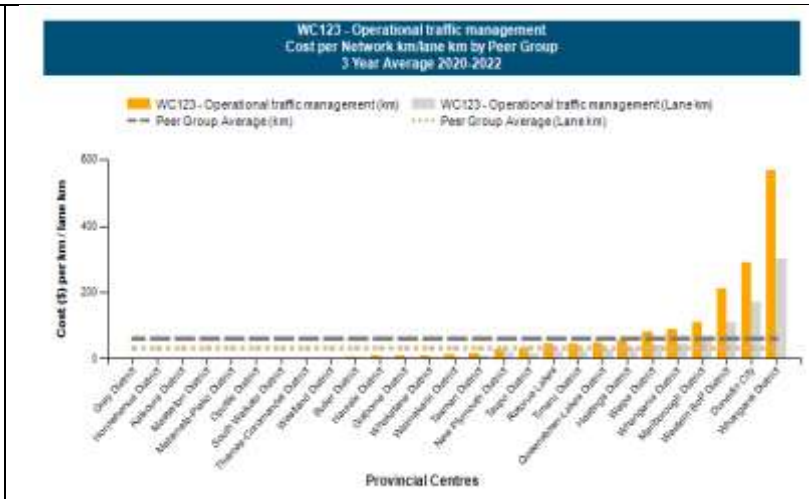
Measure	Assessment	Evidence

Safe Travel – Loss of Driver Control at Intersections		

The general trend shows crashes at intersections are decreasing for our Connectors; however, Activity Streets and Local Streets are getting worse.

By targeting Low Cost - Low Risk projects on Activity Streets and Local Streets we can improve the safety of some of these intersections. The Safer Speed review should also see improvement at intersections for these ONF groups.

Measure	Assessment	Evidence
WC122 & 222 – Traffic services maintenance and renewal Cost per Network km/lane km by Peer group		

WC123 – Operational traffic management Cost per Network km/lane km by Peer Group		

5.6.5 Options to be considered

Option	Description	Benefits / Consequence
Programme of Edge Marker Posts Renewals	Currently our patrol crews replace EMP and RRPM where they are broken, cannot be cleaned, or obviously missing however we have sections that are missing entirely. This needs to be a planned activity as the number of EMP's varies depending on the diameter of the curve.	Safety – will reduce the likelihood of loss of control at night.
Annual remarking	Road marking is refreshed to maintain condition and performance on a bi-annual basis with 50% of the network marked each year. Some critical markings i.e., 'Stop', 'Give Way' intersections and pedestrian crossings are marked on an as required basis. This would allow NPDC to carry out a full annual re-marking of all lines.	Safety – will reduce the likelihood of loss of control at night and intersections.
Thermoplastic line marking	Use and maintain thermoplastic markings on major intersections in New Plymouth that frequently require remarking	Cost Efficiency – The extra money spent on thermoplastic is saved by the whole of life cost (crew and traffic management not having to complete multiple trips to site).
Replacement of concrete light poles and underground joints	There are currently just under 1100 concrete/spun concrete light poles that need to be replaced. Need to increase budget to ensure we are replacing 300 per year – they are deteriorating faster than the remaining useful life states. A special inspection	Safety – concrete light poles that are at end of life are more likely to crack and fall on members of the public and/or their assets. Resilience – Removal of underground joints improves asset resilience and reduces maintenance costs.

	should be planned to help prioritise the renewal of these poles.	
Install remote sensor technology on LED lights	The LED lights on our network can house units which can be retrofitted to monitor defects on the network. This will allow the contractor to determine if the fault is a single light or a larger outage and enables the.	Cost Efficiency – Reduced maintenance costs as the contractor can diagnose issues from the depot
Maintenance of additional traffic lights	There will be an additional six locations upgraded with traffic signals over next 3 years. These include: • Girls High Pedestrian Crossing (Mangorei Road) • Lorna/Devon Street West Intersection (WK) • Tukapa/Saunders Intersection • Bell Block Roundabout • Morley Street/Vivian Street (WK) • Cumberland/Coronation (WK) These signalisation projects will be funded through the Low Cost/Low Risk Programme (LCLR) however additional funding will be required for ongoing maintenance of these assets.	Safety – The signalisation of these intersections will help improve safety for vehicles, pedestrians, and cyclists.
Camera Installation on intersections	Install cameras on each intersection – approximately 5k per intersection	Efficiency – live cameras allow operators at WTOC and NPDC to respond quickly and improve phase changes which creates a more efficient network. Cost efficiency – by capturing crashes that may damage our assets, it is easier to recover costs.
Upgrade lighting at pedestrian crossing	Some crossings on our network have poor lighting or no lighting which is outside the pedestrian crossing specification (waka Kotahi) Budget for $100k per year to upgrade 5 at a time	Safety – Currently hazardous for pedestrians to cross

5.6.6 Options Assessment

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Programme of Edge Marker Posts Renewals	Programming of the placement of edge marker posts would bring our network up to a standard where the roving maintenance patrol team can then maintain it.	Safety	Good	Better	W/C 222: +$50,000
Annual Remarking	This will allow for one full re-mark of the network per annum to make sure that markings are visible.	Safety	Moderate	Slightly Better	W/C 122: +$100,000
Thermoplastic line marking	Use of Thermoplastic on major intersections. Higher cost upfront is balanced by reduced number of visits and traffic management to site.	Cost Efficiency	Good	Slightly Better	N/A
Replacement of concrete light poles and underground joints	Replacement of 300 concrete light poles per year for four years would significantly reduce the risk to public and their assets.	Safety	Good	Better	W/C 222: +$585,000
Install remote sensor technology on LED lights	The size of our network doesn't warrant the council funding a 3-million-dollar CMS (Central Management System) project for little benefit.	Cost Efficiency	Poor	Better	W/C 222: +$3,000,000
Maintenance of additional traffic signals	The increase in maintenance is crucial in looking after the newly constructed assets.	Safety	Good	Better	W/C 123: +$50,000
Camera Installation on intersections	By installing cameras at intersections, operators can update phase change in real time to improve efficiency of the network – especially during events or crashes.	Efficiency	Good	Better	W/C 341: +$155,000
Upgrade lighting at pedestrian crossings	Currently the standard of lighting across pedestrian crossings is inconsistent. Upgrading poorly lit crossings and having a consistent network approach will make it	Safety	Good	Better	W/C341: $100,000/ year

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
	safer for pedestrians to cross at night.				

5.6.7 Preferred Options

The preferred options include:

- Programme of edge marker post renewals
- Replacement of concrete light poles
- Maintenance of additional traffic signals
- Camera installation on intersections
- Upgrade lighting at pedestrian crossings

5.6.8 Financial Impact

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
123	Operational Traffic Maintenance	+$50,000 – Additional traffic signals ($25k for Waka Kotahi, $25k for NPDC)	+$50,000/year
222	Traffic Services Renewals	+$50,000 – Edge Marker Post Renewal Programme +$585,000 – Replacement of concrete light poles	+$50,000 first year +$585,000/year/3 years
314	Low-Cost Low Risk	+$155,000 – Camera installation +$100,00/year – pedestrian crossing lighting	+$155,000 first year +$100,000/year

5.6.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

- Edge Marker Post Renewal Programme
- Replace concrete light poles.
- Camera installation on intersections.
- Upgrade lighting at pedestrian crossings

5.7. Footpaths and Cycleways

5.7.1 Work Categories:

124 Cycle path Maintenance

125 Footpath Maintenance

225 Footpath Renewals

314 Low-Cost Low Risk

5.7.2 Links to Strategic Case

<table>
<tr><td>GPSLT Objectives</td><td colspan="4">Efficient and effective freight priorities
A land transport system where no-one is killed or seriously injured.
Managing the risks from natural and human-made hazards
People in urban areas have better choices to access economic and social opportunities.
The existing system is maintained at a level that meets current and future needs.</td></tr>
<tr><td>RLTP Objective</td><td colspan="4">An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness.
An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond.
A safe transport network increasingly free of death and serious injury
A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.
A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
An energy efficient and environmentally sustainable land transport system.</td></tr>
<tr><td rowspan="2">Council Goals</td><td>Trusted</td><td>Thriving Communities and Culture</td><td>Environmental Excellence</td><td>Prosperity</td></tr>
<tr><td>Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating</td><td>Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and</td><td>Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.</td><td>Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental</td></tr>
</table>

	leadership and excellence.	honouring Te Ao Māori		sustainability and economic performance.

ONRC Customer Outcomes	**Safety**	Footpaths and cycleways provide dedicated spaces for pedestrians and cyclists, separate from vehicular traffic, which enhances safety. This segregation reduces the risk of crashes between different road users, making it safer for everyone.
	Resilience	By providing alternative modes of transportation, walkways and cycleways help reduce the number of vehicles on the road. This alleviates traffic congestion, making it easier for emergency services to respond quickly during crises.
	Amenity	Footpaths and cycleways improve the overall amenity of an area by offering pleasant, green spaces for walking and cycling. They contribute to a more appealing and liveable environment, enhancing the quality of life for residents and visitors.
	Accessibility	Footpaths and cycleways promote accessibility by providing inclusive and barrier-free routes for pedestrians and cyclists. They allow people of all ages and abilities to move safely and independently through the area.
	Efficiency	Investing in footpaths and cycleways can lead to cost efficiency by reducing the need for road maintenance. As foot traffic and cycling decrease wear and tear on roads, the overall maintenance costs may be reduced in the long run.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the Stormwater drainage asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces	
Strategic Response to Problem Statements	**Change risk profile:** • Allowing Low Volume and Access roads to deteriorate to align with ONF. **Policy Approach:** • Carry on implementing data improvement plan. • Changes to council policy has meant a strategy of widening footpaths around schools and walkways to create a shared pathway.	

	• The integrated Transport Strategy will be written to actively encourage walking, cycling and public transport. **Improve value for money:** • By decreasing vehicle users, this will increase pavement and surfacing life, resulting in improved whole of life cost. **Relationship approach:** • Improve the relationship with Waka Kotahi, Elected Members, Iwi and Hapu through more reliable carriageway data that allows for informed decision making.
Benefits of Addressing the Problem:	**Natural topography and layout challenges:** • Improved Transport Choices: Walking and cycling infrastructure is less confined to the existing transport network and can create alternative transport options alongside natural topography. **Safe system approach for complex networks:** • Improved Safety Outcomes: Adopting a 'safe system' approach to footpaths and cycleways improves safety for pedestrians and cyclists. Implementing measures such as proper lighting, traffic calming, and separated lanes can reduce the risk of crashes and improve both actual and perceived safety, encouraging more people to use these alternative modes of transportation. **Understanding the value of transport infrastructure:** • Improved Economic Outcomes: Recognizing the value that footpaths and cycleways provide to the community allows for more informed decision-making regarding targeted investments. Well-planned and connected active transportation infrastructure can attract tourism, improve local businesses, and enhance the overall attractiveness of the urban environment.
Risk of Not Addressing the Problem:	**Natural topography and layout challenges:** • Limited Accessibility: Not addressing the difficulties posed by the natural topography and layout can lead to limited alternative transport options. Lack of footpaths and cycleways may cause severance within the community, isolating certain areas, and making it challenging for people to access essential services and activities. • Vulnerability during Major Events: Without proper footpaths and cycleways, the community may lack reliable alternative routes during major events like floods or road closures. This can lead to reduced mobility and hinder emergency responses during emergencies. **Lack of a safe system approach for complex networks:**

	• Safety Hazards: Not adopting a 'safe system' approach to footpaths and cycleways can lead to safety hazards for pedestrians and cyclists. Inadequate safety measures like lack of dedicated lanes, poor lighting, and improper crossings can increase the risk of accidents and injuries. **Poor understanding of infrastructure value:** • Missed Economic Opportunities: Ignoring the value of footpaths and cycleways and failing to invest in their development can result in missed economic opportunities. Well-planned active transportation infrastructure can attract tourists, support local businesses, and enhance the overall attractiveness of urban spaces. • Health and Environmental Impacts: Neglecting footpaths and cycleways in favour of motor vehicle usage can lead to increased environmental damage and poorer public health outcomes. Greater reliance on motor vehicles contributes to higher emissions, pollution, and a sedentary lifestyle, impacting both the environment and community health. **Encouragement of motor vehicle usage:** • Environmental Impact: Not promoting footpaths and cycleways can contribute to increased greenhouse gas emissions and environmental damage associated with motor vehicle usage. • Public Health: Overreliance on motor vehicles can lead to a sedentary lifestyle, contributing to poor public health outcomes, such as obesity and related health issues. • Unattractive Urban Spaces: Neglecting the development of footpaths and cycleways can result in unattractive and car-dominated urban spaces, impacting the overall quality of life in cities and towns.

5.7.3 Levels of Service

ONF Transport Outcomes:

Safe Travel – Vulnerable Users

Customer Levels of Service:

The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the timeframe specified in the LTP (DIA)

The percentage of residents satisfied with the quality and safety of the district's cycle network (NPDC)

The percentage of footpaths that meet the Levels of Service and service standards in current condition surveys, as set out in this AMP (DIA)

5.7.4 Evidence and Gap Analysis

Measure	Assessment	Evidence
Safe Travel – Vulnerable Users		

The New Plymouth network has an increasing trend in crashes associated with vulnerable users. This is across Urban Connectors, Activity Streets, Local Streets, Rural Connectors and Rural Roads. Further investment in safe alternative modes of travel is required to reduce these increasing trends.

Measure	Assessment	Target	Result	Comment
The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the timeframe specified in the LTP (DIA)		95%	97.6% (2022/23)	2021/22: 97% - Achieved)
The percentage of residents satisfied with the quality and safety of the district's cycle network (NPDC)		85%	71% (2022/23)	The Waka Kotahi Communities at Rick Register supports the data from this survey. New Plymouth district is one of the riskiest places in New Zealand for road cyclists.

The percentage of footpaths that meet the levels of service and service standards in current condition surveys, as set out in the Transportation Asset Management Plan.		More than 90% of footpath length surveyed in good or excellent condition	94% (2022/23)	
Footpath length recorded as failed.		Less than 1% of footpath length recorded as failed	3% (2022/23)	During the last condition survey, only 0.3% of the footpath length was recorded as failed. This means the footpaths have deteriorated quite quickly over the last 3 years.

Further investment in maintenance, renewals and capital is required to improve the safety and quality of our walking and cycling network if we are to meet our targets.

5.7.5 Options to be considered:

Option	Description	Benefits / Consequence
Coastal Walkway Acquisition	The coastal walkway which is a key transport route for walking and cycling is currently maintained by the parks team. These assets should be in RAMM and funded as part of our walking and cycling network.	Cost Efficiency – Waka Kotahi and Council will share costs
Target seal/slurry seal footpaths	Previously NPDC had a slurry seal programme which kept the seals maintained. Since stopping this practice there has been a quick deterioration in condition for slurry seals. Restarting this programme would help prevent further deterioration.	Cost Efficiency – There is currently 59km of seal/slurry seal in fair condition that is deteriorating quickly. If we don't maintain these assets, we will have a bow wave that cannot be funded/resourced all at once.
Increase renewals programme	Currently there is 3% (16.4km) of our network in poor or very poor condition. Further investment is required to bring our network back in line with our DIA target of less than 1%.	Condition – Currently we are not meeting our DIA target of less than 1% in poor or very poor condition.

Option	Description	Benefits / Consequence
Increase capital improvements budget to cover footpath costs	Historically money has been used from the renewals budget to cover inflation/scope creep of capital improvements, this has a negative effect on whole of life cost when assets are being renewed early. If an asset is half-way through its life, then only half of the budget should come from renewals, the remainder should be included from capital improvements.	Cost Efficiency – Utilizing renewal budget for capital projects means an increase in whole of life cost. Renewing assets prematurely will also see an increase in poor and very poor assets as the budget is not getting used where it is needed.
Increase cycleway maintenance	Loose chip and debris can accumulate in cycleways which creates a hazard to cyclists. An increased sweeping cycle will reduce this hazard.	Safety – Roads that are free of loose chip/debris
Kerb and footpath build out of wide intersections.	New Plymouth has several intersections that are challenging for vulnerable users to navigate. Instead of renewing assets like for like, we could include kerb extensions, pedestrian/median refuges, and/or raised platforms to minimise crossing-distances, reduce vehicle speeds and assist pedestrians to cross.	Safety – The number of DSI's for our vulnerable users is getting worse. With an expected aging population, the number of vulnerable users on our network is going to increase so it is important we start addressing 'hard to navigate' intersections.
Improve kerb ramps	New Plymouth has several kerb ramps that are not appropriate for mobility scooters or wheelchairs. Some of the issues include: • Kerb ramps that don't lead to anywhere or the wrong direction. • Low points where the ramp meets the road surface where water collects. • Sharp gradients • Missing tactile indicators (for visually impaired)	Accessibility – Improving kerb ramps will allow accessibility for all members of our community – particularly aged and vulnerable users.
Replace all asphalt/slurry seals with concrete	Concrete has a far greater life span which makes it most cost efficient.	Cost Efficiency – has a greater whole of life cost

5.7.6 Options Assessment:

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Coastal Walkway Acquisition	Although there is no change in level of service, this option is better value for money for rate payers as funding will be share between rate payers and Waka Kotahi. Timber Replacement $40k/year. Concrete Repairs $30k/year Te Henui Resurfacing $10k/year. Huatoki Walkway Resurfacing $10k/year MaNgāti Walkway – Sole 2024 Avenue Path Renewal $100k once off MaNgāti Walkway - Antonia Street Path 2025 Renewal $80k once off $70k Walkway Renewals	Cost Efficiency	Good	Neutral	W/C 125: +$70,000 W/C 225: +$70,000 W/C 225: $20,000 W/C 225: $180,000 (once off)
Target seal/slurry seal footpaths	If the slurry seals were to all deteriorate to poor and very poor quickly, we would not have the budget or resource to bring us back to our desired level of service.	Cost Efficiency	Good	Slightly Better	Target current maintenance budget on slurry seals.
Increase renewals programme	Increasing the budget will enable us work towards meeting our DIA target in the long term. We have 16.4km of footpath in poor and very poor condition which equates to approximately $4.1m.	Condition	Good	Better	W/C 225: +$400,000
Increase capital improvements budget to cover footpath costs	Increasing the capital improvements budget will ensure the whole of life cost of assets is not affected.	Cost Efficiency	Good	Neutral	Funded through WC341

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Increase cycleway maintenance	Increasing the frequency of cycleway sweeping will improve the slow build-up of chip and debris, however a lot of the time cycleways need sweeping are due to reactive needs i.e., a recent storm, recent reseal or littering/smashing glass. – Sweep Arterials monthly in line with current carriageway sweeping frequency	Safety	Good	Slightly Better	W/C 124: +$10,000
Kerb and footpath build out of wide intersections.	Building out wide intersections will improve safety by slowing down turning vehicle, increasing pedestrian sight distance, and decreasing the time pedestrians needs to spend crossing the intersection.	Safety	Good	Better	Utilise current budget unless part of Low-Cost Low Risk project
Improve kerb ramps	Improving the kerb ramps and adding tactile indicators will increase the accessibility for all users in our district.	Accessibility	Good	Better	Utilize current budget unless part of Low-Cost Low Risk project

5.7.7 Preferred Options:

The preferred options include:

- Coastal Walkway Acquisition
- Target seal/slurry seal footpaths
- Increase renewals programme.
- Increase CAPEX budget to cover footpath costs.
- Kerb and Footpath build out of wide intersections.
- Improve kerb ramps.

5.7.8 Financial Impact

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
124	Cycleway Maintenance	+$10,000 – Increased sweeping	$10,000/yr.
125	Footpath Maintenance	+$70,000 – Walkway Acquisition	+$70,000/yr.
225	Footpath Renewals	+$400,000 – Increase Renewals Programme +$90,000 – Walkway Acquisition +$20,000 – Te Henui and Huatoki Resurfacing +$180,000 – Sole Avenue and Antonia Street	+$490,000/yr. (for 3 years then reassess condition) +$100,000 (2024) +$80,000 (2025)

5.7.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

- Increased sweeping of cycleways
- Acquisition of walkways from parks
- Increased footpath renewals

5.8. Environmental and Emergency Works

5.8.1 Work Categories:

121 Environmental Maintenance

221 Environmental Renewals

140 Minor Events

141 Emergency Work

5.8.2 Links to Strategic Case

GPSLT Objectives	• Efficient and effective freight priorities • A land transport system where no-one is killed or seriously injured. • Managing the risks from natural and human-made hazards • People in urban areas have better choices to access economic and social opportunities. • The existing system is maintained at a level that meets current and future needs.
RLTP Objective	• An integrated and collaborative approach to transport and land use planning that maximises transport effectiveness.

<table>
<tr><td></td><td colspan="4">An effective, efficient, and resilient land transport system that enhances economic wellbeing, growth, and productivity in the Taranaki region and beyond.
A safe transport network increasingly free of death and serious injury
A people-focused, multi-modal land transport system that caters for the different and changing needs of transport users, connects communities and enables participation.
A land transport system that is robust, responsive to changing needs and resilient to external influences, including climate change.
An energy efficient and environmentally sustainable land transport system.</td></tr>
<tr><td rowspan="2">Council Goals</td><td>Trusted</td><td>Thriving Communities and Culture</td><td>Environmental Excellence</td><td>Prosperity</td></tr>
<tr><td>Strengthening a treaty-based partnership with Tangata whenua and building partnerships with not-for-profit, private enterprise, and government to improve outcomes for all by demonstrating leadership and excellence.</td><td>Fostering connected, engaged, and safe communities that prioritize an equitable and inclusive approach, ensuring the well-being of all our people while embracing and honouring Te Ao Māori</td><td>Dedicated to simultaneously restoring ecosystems, mitigating environmental impacts, addressing the challenges of climate change, and efficiently delivering resilient infrastructure.</td><td>Strive to achieve a diversified, high-performing economy while ensuring equitable access to quality employment and opportunities for wealth-building and contributing to New Zealand's Inc's environmental sustainability and economic performance.</td></tr>
<tr><td rowspan="4">ONRC Customer Outcomes</td><td>Safety</td><td colspan="3">Environmental works, such as flood mitigation and erosion control measures, improve safety by reducing the risk of natural disasters and their potential impact on communities. Emergency works, like disaster response planning and infrastructure reinforcement, enhance preparedness and response capabilities during emergencies, safeguarding lives and property.</td></tr>
<tr><td>Resilience</td><td colspan="3">Both environmental and emergency works enhance the resilience of communities and infrastructure. Environmental measures protect against environmental hazards and support sustainable practices, while emergency works fortify critical infrastructure to withstand potential disasters and recover quickly from disruptions.</td></tr>
<tr><td>Amenity</td><td colspan="3">Fish passages and Rip Rap can enhance the visual appeal of waterways and provide opportunities for recreational activities like fishing and bird watching. This can increase the attractiveness of an area for residents and visitors.</td></tr>
<tr><td>Accessibility</td><td colspan="3">By addressing environmental challenges, such as flooding or landslide-prone areas, and promptly responding to emergencies, transport accessibility is improved. Ensuring smooth and reliable</td></tr>
</table>

		transport routes allows for easy movement of people and goods, benefiting communities and businesses alike.
	Cost Efficiency	Investing in environmental works can lead to long-term cost efficiency by preventing environmental damage that would otherwise require costly repairs and remediation. Similarly, efficient emergency response minimizes downtime and disruption, reducing economic losses associated with transport disruptions.
Linkage to Problem Statements	The following identified Problem Statements have relevance to the Stormwater drainage asset group: • Natural topography and layout of infrastructure makes it difficult to complete a trip using alternative transport modes, causing severance of the community and places the network at risk during a major event. • Not taking a 'safe system' approach to a complex network has resulted in poor actual and perceived safety outcomes. • Poor understanding of the value that our transport infrastructure provides for our community and regional economy has resulted in poor targeted investment and missed economic opportunities. • Infrastructure and societal habits encourage motor vehicle usage causing environmental damage, poor health outcomes and unattractive urban spaces	
Strategic Response to Problem Statements	**Policy Approach:** • Target fish passages and waterways for environmental purposes • Compliance with TRC consents • Earlier intervention before a resource consent expires to ensure consent requirements are met and abatement notices are avoided. **Programme adjustments:** • Proactive approach to consents as opposed to reactive. **Relationship approach:** • Improve relationship with TRC, landowners and Iwi and Hapu, especially around consents and spraying of noxious weeds in Stormwater channels.	
Benefits of Addressing the Problem:	**Natural topography and layout challenges:** • Improved Network Performance: Proper environmental protection can improve infrastructure resilience during major events like floods, landslides, or other natural disasters. Well-designed drainage systems, flood barriers, and emergency access routes can minimize damage, ensure continued mobility, and support efficient emergency responses. **Safe system approach for complex networks:**	

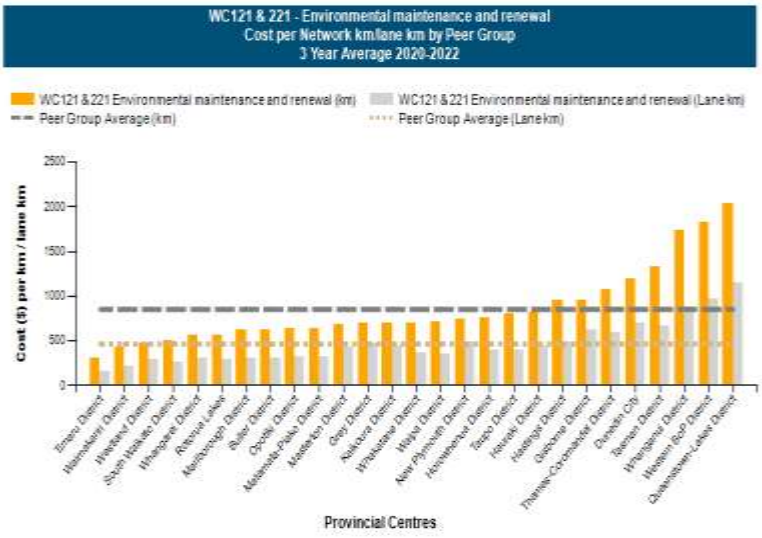
	• Improved Safety Outcomes: Adopting a 'safe system' approach to environmental and emergency works improves safety for all road users. Proper road design, traffic management, and the integration of safety features minimize the risk of accidents and injuries during normal operations and emergency situations. **Understanding the value of transport infrastructure:** • Improved Economic Outcomes: Recognizing the value that environmental and emergency works provide to the community and regional economy allows for more informed decision-making regarding targeted investments. Resilient infrastructure ensures business continuity during major events, supports economic activities, and minimizes the disruption caused by infrastructure damage.
Risk of Not Addressing the Problem:	**Natural topography and layout challenges:** • Limited Accessibility during Major Events: Not addressing the difficulties posed by the natural topography and layout can lead to limited transport options during major events like floods or road closures. This can result in severance within the community, hindering access to critical services and emergency routes. • Infrastructure Vulnerability: Without proper environmental works, infrastructure may be more susceptible to damage during natural disasters, leading to disruptions in transportation and emergency response efforts. **Lack of a safe system approach for complex networks:** • Increased Safety Hazards: Not adopting a 'safe system' approach to environmental and emergency works can lead to increased safety hazards. Poorly designed infrastructure and inadequate safety features can increase the risk of accidents and injuries for all road users and emergency responders. • Compromised Emergency Response: Inefficient emergency works can hinder the ability of emergency services to reach affected areas promptly, leading to delays in emergency response and rescue operations. **Poor understanding of infrastructure value:** • Missed Economic Opportunities: Ignoring the value of environmental and emergency works and not making targeted investments can lead to missed economic opportunities. Inadequate preparedness for major events can disrupt economic activities and hinder business continuity, affecting regional economic growth and development. • Increased Economic Losses: Failing to recognize the value of resilient infrastructure may result in higher economic losses during disasters, as infrastructure damage can lead to costly repairs, delays in recovery, and a negative impact on businesses and livelihoods.

5.8.3 Levels of Service

Customer Levels of Service:

WC121 and 221 – Environmental maintenance and renewal Cost per Network km/lane km by Peer group (3-year Average 2020-2022)

5.8.4 Evidence and Gap Analysis

Measure	Assessment	Evidence
WC121 and 221 Environmental maintenance and renewal cost per km/lane km by peer group (3 Year Average 2022-2022)		

New Plymouth's spend on environmental maintenance and renewals is about average for its peer group.

5.8.5 Options to be considered

Option	Description	Benefits / Consequence
Tree Removal	New Plymouth has several trees in the roading corridor that pose a risk to the public and need to be removed. Removing trees while they are smaller is more cost effective, the consequence of not being proactive in this space could mean a tree that costs $2000 could become $10,000. The risk of falling over also increases over time exponentially.	Safety – Removal of trees will reduce likelihood of crashes/damage to people and/or assets. Cost Efficiency – Removal of trees in the road corridor will help reduce the amount of detritus going into the surface water channels

Option	Description	Benefits / Consequence
Reduce Environmental Maintenance and Renewals	Reduce the environmental maintenance and renewals programme	Cost Efficiency – Reduced cost for Environmental maintenance and renewals Safety – Increased length in vegetation prior to spraying/mowing will lead to poorer safety outcomes. Amenity – Increased amount of rubbish and graffiti on the network.
Maintain Environmental Maintenance and Renewals	Maintain the current environmental maintenance and renewals programme	Cost Efficiency – Maintains the current number of rounds for mowing and spraying.
Increase Environmental Maintenance and Renewals	Increase the environmental maintenance and renewals programme	Safety – Decreased length in vegetation prior to spraying/mowing will lead to greater safety outcomes. Amenity – Less rubbish and graffiti on the network
Reduce budget for Minor Events	Reduce the budget from the current NLTP for Minor Events	Resilience – A reduction in budget could lead to slips from minor events blocking off roads for longer
Maintain budget for Minor Events	Maintain the budget from the current NLTP for Minor Events	Resilience – Slightly worse outcomes expected as climate change is increasing the number of minor events per year

5.8.6 Option Assessment

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Tree Removal	There is currently no additional budget to remove hazardous trees. We currently have 40 trees listed in our Hazardous Tree register in RAMM, but this list is expected to grow. Removing these trees will reduce the risk to members of the public and their assets.	Safety Cost Efficiency	Good	Better	WC121: +$300,000
Reduce Environmental	Reducing the environmental maintenance and renewals	Cost Efficiency	Poor	Worse	WC121:

Option	Assessment	Problem Addressed	Effectiveness	LOS Impact	Annual Cost
Maintenance and Renewals	programme will save money, however we will need to significantly reduce the number of spraying and mowing rounds, and a lot more litter is expected on the network – this leads to poorer safety and amenity outcomes.				-$450,000 WC221: -$150,000
Maintain Environmental Maintenance and Renewals	Maintaining the current budget for environmental maintenance and renewals	Cost Efficiency	Moderate	Neutral	N/A
Increase Environmental Maintenance and Renewals	Increasing number of abatement notices will mean larger number of fish passages will be required to be installed.	Amenity Safety	Good	Better	WC121: +$200,000 WC221: +$200,000
Reduce budget for Minor Events	Reducing the Minor Events budget means more of our surface water channels will be blocked from debris. This could lead to flooding, pavement deterioration and development of under slips.	Cost Efficiency	Poor	Worse	WC140: -$100,000
Maintain budget for Minor Events	Maintaining the current budget will mean we can deliver a similar level of service to the last NLTP.	Resilience	Moderate	Neutral	N/A
Urban vegetation	Clearing overhanging vegetation associated with traffic services in urban environment. This is currently not completed.	Safety Amenity	Good	Better	W/C 121: $150,000
Noxious weed spray	There is a growing expectation from regional authorities to remove pest plants in road reserve. Currently this is completed on an ad hoc basis.	Regulatory	Good	Better	W/C 121: $70,000

5.8.7 Preferred Options

The preferred option is to increase environmental maintenance to allow for the removal of hazardous trees on our network and maintain the environmental renewals budget. It is also preferred to increase the Minor Events budget to allow for an increase in weather events expected due to climate change.

5.8.8 Financial Impact

W/C	Description	Cost Impact	Overall Impact (excluding Acquisition and Escalation)
121	Environmental Maintenance	+$300,000 – Remove hazardous trees +$150,000 – Overhanging Vegetation in Urban $70,000 – Noxious Weeds $200,000 – Increased mowing/spraying	+$720,000/year

Note: Council should put aside $1,000,000 per annum for 141

5.8.9 Improvement Plan

Improvements that should be considered for inclusion in the next AMP are as follows:

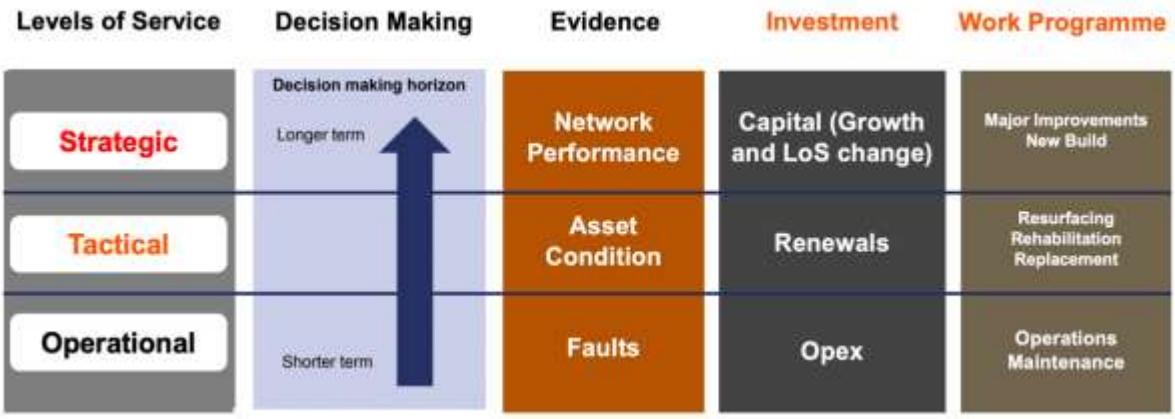
- Continue adding Hazardous Trees to the register in RAMM and prioritising based on Risk.

5.9. Differential Levels of Service

Differential Levels of Service (DLoS) is about taking a risk-based approach to managing assets within constrained budgets. Asset managers identify where higher or lower levels of service are appropriate across a portfolio of assets. This is often done on a risk basis but can also be driven by legislative or customer requirements.

A critical part of asset management planning is to consider different options for investment. Te Ringa Maimoa has built upon good practice found in the sector and have refined the LoS options process through collaborative development of a Decision Support Tool.

By grouping LoS into Strategic, Tactical and Operational sets, Te Ringa Maimoa were able to have sensible conversations about each of the different work programmes and budgets that went with these levels of service and isolate some of the decision making around operational issues which tended to dominate the conversation.



5.9.1 Scenario Map

The map below shows 5 different scenarios with 3 different level of service grades broken down into A, B and C. A refers to a higher level of service, B refers to maintaining the current level of service and C is a decrease in level of service.

The risk cost is based on the following:

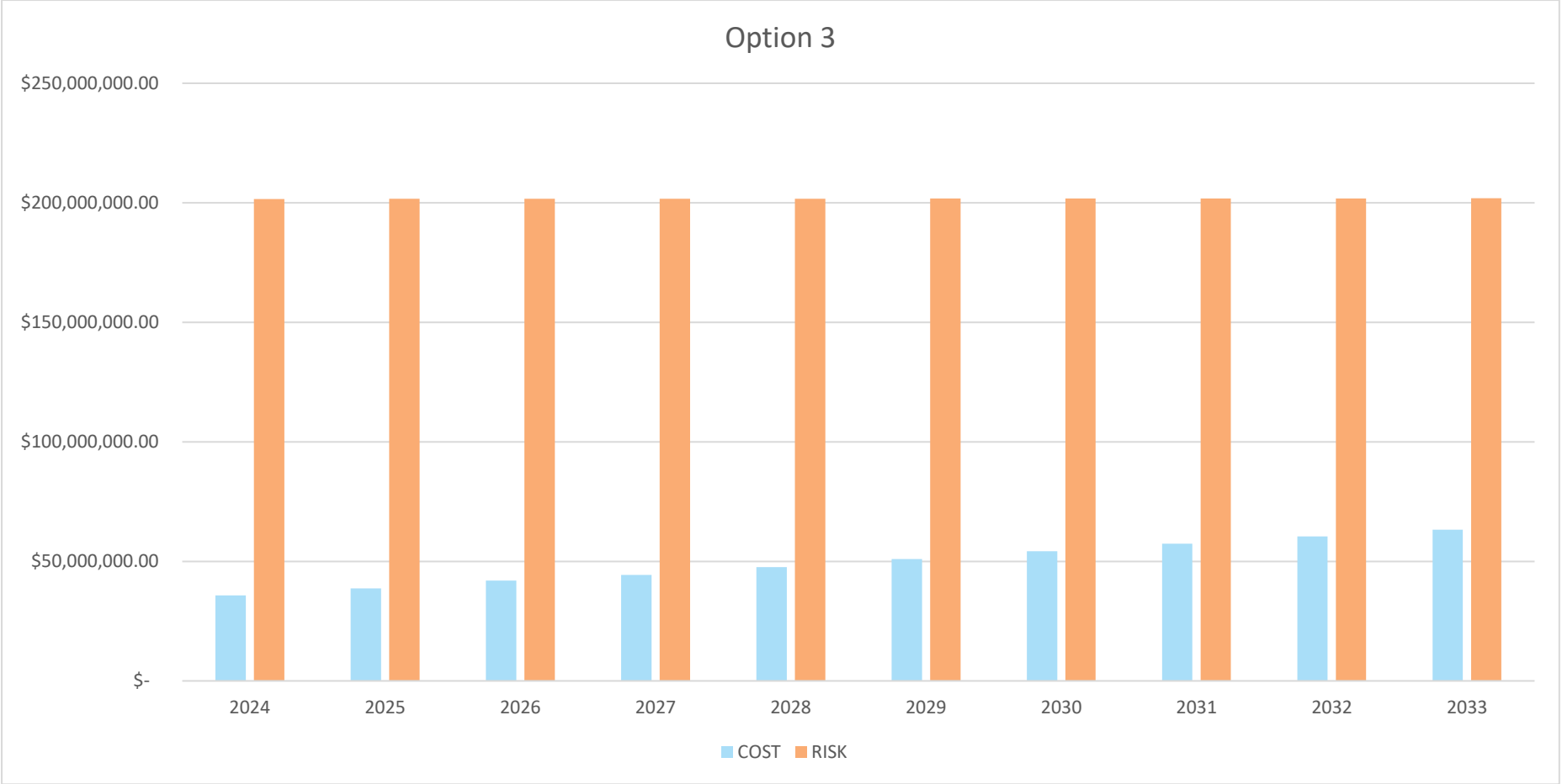
- Operational risk is based on the amount of current 'open faults' on our network.
- Tactical risk is based on the value of assets that are in 'poor' and 'very poor' condition.
- Strategic risk is based on the average number of DSIs on the New Plymouth network in the last 5 years and the value of statistical life (VOSL) which was $4,934,900 in 2022.

5.9.2 High Level Summary of Options

The below options were explored using the differential levels of service tool. The preferred option is 3.

Option	Summary	Benefits	Consequences
1	Large increase in Maintenance, Operations and Renewals and commitment of all Improvement Projects.	• Improved network condition • Improved network resilience • Reduced DSI's	• Large rates increase required which is unaffordable.
2	Moderate increase in Maintenance, Operations and Renewals to keep in line with inflation and all Improvement Projects.	• Maintain network condition. • Maintain network resilience. • Reduced DSIs	• Substantial rates increase required which is unaffordable.
3	Moderate increase in Maintenance, Operations and Renewals to keep in line with inflation. Some Improvement Projects, primarily focused on growth rather than road safety.	• Maintain network condition. • Maintain network resilience. • Maintain current level of DSIs	• Creates a bow wave of costs for the future
4	Maintain current Maintenance, Operations and Renewals budget but not in line with inflation. Some Improvement Projects, primarily focused on growth rather than road safety.	• Maintain current level of DSIs. • No increase in rates in the short term (larger overall costs in the future as the network can no longer be maintained and must be renewed).	• Network condition slowly deteriorates. • Network resilience slowly gets worse.
5	Decrease in Maintenance, Operations and Renewals and no Improvement Projects.	• No increase in rates in the short term (larger overall costs in the future as the network can no longer be maintained and must be renewed).	• Reduced network condition • Reduced network resilience • Increasing in DSI's

THREE	SERVICE
Safe Travel	The number of DSIs stays the same
Road Surface Condition	Road Surface condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Pavement Condition	Pavement condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Footpath Condition	Maintaining the current level of service will mean we remain just under the threshold for the DIA measure. The risk of someone tripping over and hurting themselves will remain the same.
Drainage Condition	Drainage condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Structures Condition	Structures condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Unsealed Roads Condition	Unsealed Roads condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Traffic Services Condition	Traffic Services condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Environmental Asset Condition	Environmental Asset condition is maintained, asset consumption is stabilised, and asset stewardship is marginal
Sealed Pavement Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Unsealed Pavement Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Footpath Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Routine Drainage Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Structures Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Emergency Response	Maintaining the current level of service will see around 75% of the damage remedied.
Network Services Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Cycle Path Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.
Environmental Maintenance	Maintaining the current level of service will see the number of faults on our network likely stay the same as we will remain fixing them at the same rate they form. This will maintain the current risk already on our network.


Option 3
$250,000,000.00
$200,000,000.00
$150,000,000.00
$100,000,000.00
$50,000,000.00
$-
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
COST
RISK

5.9.3 Preferred Option

The preferred option of differential level of service is option 3 – this option will mean the number of open faults on our network will roughly stay the same year on year (fixing the same number that appear year on year), the condition of our assets will roughly stay the same, and DSIs on our network should remain similar to current levels despite population growth.

A higher level of service is not recommended currently due to economic pressures and already high rates increases.

A lower level of service is also not recommended as an increase in faults on our network and increase in poor and very poor condition assets will lead to even greater costs in the future.

5.10. Data Quality

New Plymouth RAMM data quality used in the Te Ringa Maimoa Transport Insights tool has been assessed as follows. This data indicates that some improvements are required for:

- Pavement Renewal Programme as-builted
- Pavement Layer records have valid attribute data.
- Streetlight Replacement Activity
- Sign Replacement Activity
- Road Rating Condition
- Traffic Estimates are Maintained.

It is noted that NPDC no longer completes 'Road Ratings' and collects 'All Faults' to assess the condition of the network. NPDC intend to adopt the Consistent Condition Data Collection Standard which will likely supersede the traditional Road Rating Condition.

NPDC is also adopting the Traffic Count Estimate Programme which should see some great data improvements in relation to Traffic Estimates being maintained.

All improvement actions are added to NPDC's Data Quality Plan as well as the Improvement Plan.

2022/23

New Plymouth District Council
Asset Management Data Quality Report

Te Ringa Maimoa
Transport Excellence Partnership

The data quality of each RCA is assessed annually against a suite of data quality metrics. Each RCA metric result is compared against an expected standard and the distribution of all RCAs. The intent is for this report to identify potential issues with how the RCA's data is being collected, managed, and maintained. Further analysis will be required to determine if additional action is needed.

This report assesses the Road Asset Maintenance and Management (RAMM) data supporting asset management and associated decision support systems. For three metrics, renewal as-built data in RAMM is compared with the achieved renewal activity reported in the Waka Kotahi Transport Investment Online (TIO) system.

Refer to the following overviews for further information:

- Data quality framework; The intent and purpose of the data quality framework.
- Data quality dimensions; Why the three quality dimensions; accuracy, completeness and timeliness are important.
- Understanding the data quality results; How to read and understand the annual data quality reports.
- Frequently Asked Questions (FAQs) and detailed metric descriptions in Transport Insights.

Score

Overall Results

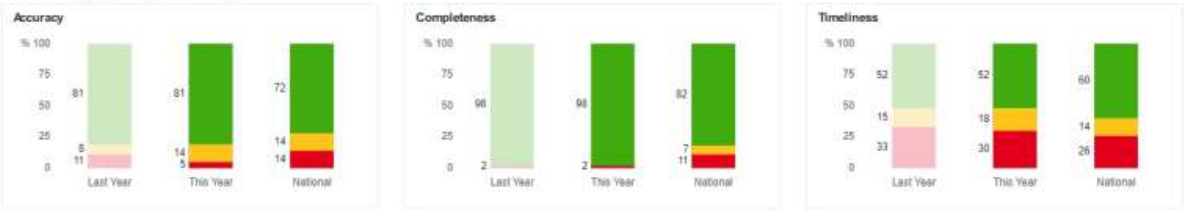
Expected Standard
Minor Issues
Major Issues

Import Date: 27th July 2023

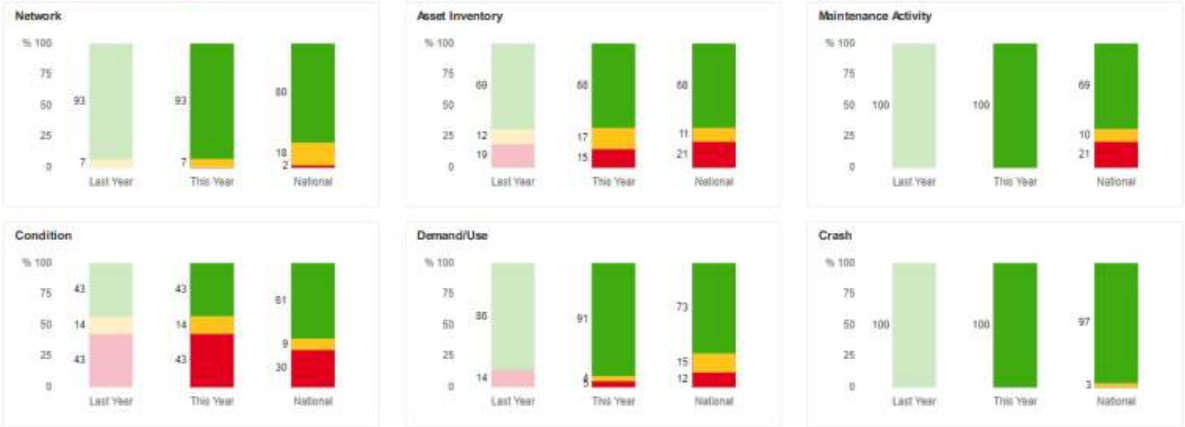
Data Source: This report uses RAMM data from the annual snapshot loaded onto Transport Insights by the RCA and data input into the Waka Kotahi Transport Investment Online (TIO) system by the RCA.

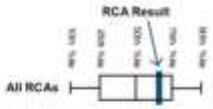
Results by Importance

Results by Quality Dimension

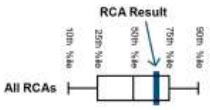


Results by Data Category

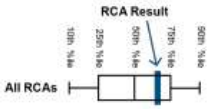




Cat	Sub	Ref	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend	
Network	Carriageway	CWAY1	Road network data complete	Accuracy	High			99.9	—	
		CWAY4	ONRC categories are assigned	Completeness	High		✔	100.0	—	
		CWAY7	Sealed/unsealed network correctly defined	Accuracy	High		✔	99.0	—	
		CWAY8	ONF categories are assigned	Completeness	High			100.0	—	
		CWAY2a[a]	Rural number of lanes matches carriageway width	Accuracy	Low		✔	100.0	—	
		CWAY2b[a]	Urban number of lanes matches carriageway width	Accuracy	Low		✔	98.8	—	
		CWAY6a[a]	Rural carriageways are generally not short	Accuracy	Low		✔	98.6	—	
		CWAY6b[a]	Urban carriageways are generally not short	Accuracy	Low		✔	99.8	—	
	Treatment Length	TREAT1	Treatment Length dimensions match sealed area	Accuracy	High			98.2	—	
		TREAT5	Treatment Lengths match renewals	Timeliness	High		✔	95.2	—	
		TREAT3	Treatment Lengths match major surfaces	Accuracy	Moderate		✔	98.4	—	
		TREAT2a	Treatment Lengths are generally not short	Accuracy	Low		✔	97.5	—	
		TREAT2b	Treatment Lengths are not too long	Accuracy	Low		✔	94.0	—	
Asset Inventory	Pavement & Surfacing	PAVE1[a]	Achieved pavement renewal programme as-built	Timeliness	High			0.0	NEW	
		PAVE2[a]	Pavement layer records have valid attribute data	Accuracy	High			98.3	▲	
		PAVE3[a]	Pavement layer records with Work Origin	Completeness	High			100.0	—	
		SURF1a[a]	Achieved chipseal resurfacing renewal programme as-built	Timeliness	High			100.7	—	
		SURF1b[a]	Achieved asphaltic concrete resurfacing renewal programme as-built	Timeliness	High			1059.3	▼	
		SURF2	Surface records have valid attribute data	Accuracy	High			100.0	—	
		SURF3	Surface records correctly located	Accuracy	High		✔	100.0	—	
		SURF4	Surface records with Original Cost	Completeness	High		✔	100.0	—	
		SURF5	Surface records with Work Origin	Completeness	High		✔	100.0	—	
		SURF6	Surface records newer than pavement	Accuracy	Moderate		✔	100.0	—	



Cat	Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Asset Inventory	Pathway	FOOT3	Footpath data valid	Accuracy	Moderate			13.0	—	
		FOOT5	Footpath asset known	Completeness	Moderate			99.6	—	
		FOOT2	Footpath asset records maintained	Timeliness	Low			3.5	—	
	Drainage System	DRAIN3[1]	Culvert data valid	Accuracy	Moderate			99.0	—	
		DRAIN5[1]	Culvert assets known	Completeness	Moderate			99.8	—	
		SWC3[1]	SWC data valid	Accuracy	Moderate			99.2	—	
		SWC5[1]	SWC asset known	Completeness	Moderate			100.0	—	
		DRAIN2[1]	Culvert asset records maintained	Timeliness	Low			2.8	▲	
		SWC2[1]	SWC asset records maintained	Timeliness	Low			1.8	—	
	Traffic Facilities & Streetlights	LIGHTS3	Streetlight replacement activity	Timeliness	Low			3.2	▲	
		LIGHTS4[1]	Streetlights data valid	Accuracy	Low			99.8	—	
		LIGHTS5[1]	Streetlights assets known	Completeness	Low			29.8	—	
		RAIL2	Railing asset records maintained	Timeliness	Low			4.8	▼	
		RAIL3[1]	Railing data valid	Accuracy	Low			99.3	—	
		RAIL4[1]	Railing assets known	Completeness	Low			99.6	—	
		SIGNS3[1]	Sign replacement activity	Timeliness	Low			5.1	—	
		SIGNS4[1]	Sign assets known	Completeness	Low			97.7	—	
		SIGNS5[1]	Sign data valid	Accuracy	Low			99.8	—	
		RETAIN3	Retaining wall data valid	Accuracy	Moderate			96.7	—	
	Structures	RETAIN3	Retaining wall data valid	Accuracy	Moderate			96.7	—	
		RETAIN5	Retaining Wall assets known	Completeness	Moderate			100.0	—	
		RETAIN2	Retaining wall asset records maintained	Timeliness	Low			7.3	▲	
Maintenance Activity	Maintenance Activity	MAINT2	Complete pavement and surface maintenance activity	Timeliness	High	COST EFFICIENCY	✓	12.0	—	
		MAINT4	Correctly located pavement, surface, shoulder and drainage maintenance activity	Accuracy	High	COST EFFICIENCY	✓	98.4	—	
		MAINT6	Level of pavement, surfacing, shoulder and drainage maintenance activity known	Completeness	High	COST EFFICIENCY		100.0	—	
		MAINT1	Consistency of pavement, surfacing and shoulder maintenance activity units	Accuracy	Moderate	COST EFFICIENCY		1.2	▼	
		MAINT3	Pavement, surfacing, shoulder and drainage maintenance activity known	Completeness	Moderate	COST EFFICIENCY		100.0	—	



Cat	Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Condition	Pavement & Surfacing	RATING1	Road rating data current	Timeliness	High			0.0	NEW	0 50 100
		ROUGH1	Roughness survey within 2.5 years	Timeliness	High		✓	93.9	—	80 85 90 95 100
		ROUGH2	Roughness data has valid location	Accuracy	High		✓	100.0	—	95 96 98 100
		RATING2[3]	Rating data locations valid	Accuracy	Moderate			NA	NEW	95 96 98 100
		HSD1	HSD rutting survey within 3 years	Timeliness	Low			93.7	—	40 60 80 100
		HSD2	HSD texture survey within 3 years	Timeliness	Low			91.8	—	40 60 80 100
		HSD3	HSD geometry survey within 5 years	Timeliness	Low			91.8	—	30 40 60 80 100
	Pathways	FOOT4	Footpath condition within 6 years	Timeliness	High	AMENITY		1.6	▲	0 50 100
	Drainage System	DRAIN4[1]	Culvert condition within 6 years	Timeliness	Moderate			32.9	▲	0 50 100
		SWC4[1]	Surface water channel condition within 6 years	Timeliness	Moderate			1.2	▲	0 50 100
	Structures	RETAIN4	Retaining wall condition within 6 years	Timeliness	Moderate			83.2	▲	0 50 100
Demand/Use	Traffic Count	COUNT1	Well targeted traffic count programme	Completeness	High	AMENITY, COST EFFICIENCY	✓	86.2	▲	25 40 60 80 90
		COUNT3	Traffic loading understood	Completeness	High	AMENITY, COST EFFICIENCY	✓	89.5	▲	25 40 60 80 90
		COUNT2	Traffic count programme activity on sealed network	Timeliness	Moderate	AMENITY, COST EFFICIENCY	✓	52.0	▲	0 20 40 55
	Traffic Estimates	ESTIM1	Network has traffic estimates	Completeness	High	AMENITY, COST EFFICIENCY	✓	100.0	—	95 96 98 100
		ESTIM2a[3]	Traffic estimates are maintained (High Volume to Arterial)	Timeliness	High	AMENITY, COST EFFICIENCY	✓	91.8	▲	0 50 100
		ESTIM2b[3]	Traffic estimates are maintained (Primary and Secondary Collectors)	Timeliness	High	AMENITY, COST EFFICIENCY	✓	78.6	▲	35 40 60 80 100
		ESTIM2c[3]	Traffic estimates are maintained (Access including Low Volume)	Timeliness	High	AMENITY, COST EFFICIENCY	✓	49.4	▲	45 60 80 100
		ESTIM4	Considered traffic loading	Completeness	High	AMENITY, COST EFFICIENCY	✓	98.1	—	90 95 100
		ESTIM5	Latest estimates align with counts	Accuracy	High	AMENITY, COST EFFICIENCY		98.2	—	70 80 90 100
Crash	Crash Data	CRASH1	Crash data is recent	Timeliness	Moderate	SAFETY	✓	0.0	NEW	0 5 10 15
		CRASH2	Crash records with valid location	Accuracy	Moderate	SAFETY	✓	99.8	—	95 96 98 100

5.11. NZTA Audits

5.11.1 Waka Kotahi Technical Audit Report (2019)

Summary

New Plymouth District Council's Road network is generally in good condition, but needs closer attention paid to routine maintenance. Joint inspections and clear guidance as to expectations should resolve this. The maintenance and management of tunnels was identified as a gap in Council's systems.

The number of annual deaths and serious injuries (DSIs) on New Plymouth's roads is comparatively high and increasing at a faster rate than peer councils. Road safety audit procedures are poor and do not comply with the Transport Agency funding rules. There is also a lack of consistency in the application of delineation against road classifications or national guidelines.

Recording data that is complete, timely and accurate is another area of improvement for Council. The Road Efficiency Group's (REG) report highlights specific areas for improvement. Work is required to ensure all assets are recorded and condition assessments undertaken on a regular basis, to better inform the activity management planning process.

Summary Audit Rating Assessment:

Subject areas		Rating Assessment*
1	Previous Audit Issues	N/A
2	Network Condition and Management	Some Improvement Needed
3	Activity Management Planning	Effective
4	Data Quality	Some Improvement Needed
5	Road Safety	Some Improvement Needed
Overall Rating		**Some Improvement Needed**

Recommendations

Recommended Actions		Implementation Date	Actions Taken
R2.1	Undertakes joint network inspections with contractors at regular intervals to align condition expectations and monitor implementation of repairs.	Commenced and ongoing	Monthly joint audits undertaken with contractor
R2.2	Investigates the underlying causes of downward trend in roughness on access and low volume roads and implements an action plan to address this trend.	Completed	

Recommended Actions		Implementation Date	Actions Taken
R2.3	Ensures that footpaths comply with the Transport Agency's Pedestrian Planning and Design Guide.	Discussions in progress with the Regulatory team to improve compliance and outcomes	
R2.4	Implements a regime of structural and geotechnical inspections of tunnels.	Commenced and ongoing	
R4.1	Resolves the data issues identified in the REG Data Quality report to improve data accuracy, completeness, and timeliness.	Commenced and ongoing	NPDC utilise MAX.quality to track existing and new errors in RAMM with actions added to Data Quality Plan.
R4.2	Considers undertaking 20% sealed road rating surveys at 200m intervals to improve network condition data representation.	Commended and ongoing	All Faults network condition rating commenced and ongoing.
R5.1	Ensures compliance with the Transport Agency funding rules that require Road Safety Audits for all renewal and improvement projects.	Immediate action taken	
R5.2	Undertakes a post-construction stage road safety audit of the Otaraoa Road culvert renewal project in accordance with the Road safety audit procedures for projects (May 2013) guidelines and implement recommendations as appropriate.	Immediate action taken	
R5.3	Develops and implements a rural road delineation strategy, aligned with ONRC, to ensure a safe and consistent driving environment during both day and night.	Being developed in line with RTS-5 guidelines	
R5.4	Review the 2009 Road Infrastructure Safety Assessment (RISA) Report and implement recommendations subject to ONRC and revised industry best practices.	Programme being developed to address outstanding issues identified in the 2009 RISA report, which are mainly related to R5.3	

5.11.2 Waka Kotahi Investment Audit (2022)

Summary

Waka Kotahi funds New Plymouth District Council's (the Council) land transport activity through its National Land Transport Programme (NLTP). The Council is responsible for the management of the land transport activity, excluding the state highways, within the New Plymouth District boundaries. This procedural investment audit was completed for the 1st of July 2019 to the 30th of June 2022 period. Funding assistance claims for two of the three financial years were reconciled against the Council's General Ledger. Sufficient audit trail was evident, along with successful transaction testing across work categories. Generally, Council has good financial practices in place, however an issue was identified during the review of the financial process that requires Council`s attention regarding the management of the Low Cost, Low Risk spreadsheet, whereby a condition of funding is not being met and this needs to be rectified for future audits. We also identified carried forward project expenditure which was not prior approved by Waka Kotahi. Whilst we managed to offset this expenditure in subsequent years, Council must ensure it seeks documented approval to claim any expenditure not meeting Waka Kotahi funding rules. New Plymouth District Council has a current Waka Kotahi endorsed Procurement Strategy. This strategy expires on the 30th of May 2025, however as per the rule 10.6 of the Waka Kotahi procurement manual the strategy is not published on Council's website, and this will need to be addressed. One physical works contract was reviewed for compliance with Waka Kotahi approved procurement procedures. It was consistent with Council's procurement strategy and Waka Kotahi procurement requirements with the contract having a duration of 10 years. A Waka Kotahi endorsement letter approving this variation was cited (refer to Appendix D). Council has a good programme for monitoring and reporting on the performance of network maintenance and renewal contracts. There are some good and effective contract management practices in place to ensure that New Plymouth District Council is getting value for money from its investments. Council staff understand the Road Safety Audit (RSA) process well. Council has satisfied the previous 2015 & 2019 audits recommendations.

Audit Summary Assessment

Subject Area		Rating Assessment
1	Previous Audit Issues	N/A
2	Financial Processes	Effective
3	Procurement Procedures	Effective
4	Contract Management	Effective
5	Professional Services	Effective
Overall Rating		**Effective**

Recommendations

The table below captures the audit recommendations. Agreed dates are provided for the implementation of recommendations by the approved organisation.

Recommended Actions		Implementation Date	Actions Taken
R2.1	Meets the condition of funding from the LC, LR Programme by updating actual project expenditure by the 31st of August of the FY recently completed.	Completed	N/A
R3.1	Ensure its endorsed Procurement Strategy is published on the Council's website	Procedure being developed for implementation	

6. Lifecycle Management

Contents

6.1. Introduction

The lifecycle management plan details how the New Plymouth District Council plans to manage and operate assets at the agreed levels of service (Refer to Section 3) while managing life cycle costs.

The lifecycle of assets involves the following phases:

- Acquisition/creation of new assets
- Maintenance and Operations of existing assets
- Renewal of existing assets which have reached the end of their useful life.
- Disposal of assets that are no longer required or obsolete.

6.1.1 Acquisition

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to NPDC.

Selection criteria:

Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the entities needs. Proposed upgrade and new works should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes.

6.1.2 Maintenance and Operations

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, asphalt patching, and equipment repairs.

6.1.3 Renewal

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is an acquisition resulting in additional future operations and maintenance.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or

- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e., condition modelling system, staff judgement, average network renewals, or other).

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g., replacing a bridge that has a 5-tonne load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g., condition of a playground).

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have a high use and subsequent impact on users would be significant,
- Have a higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.

6.1.4 Disposal

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation.

6.1.5 Asset Condition

Condition is measured using a 1-5 grading system (IPWEA, 2015 IIMM, Sec 2.5.4, p 2|80) as detailed in the table below. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however for reporting in the AMP results are translated to a 1-5 grading scale for ease of communication.

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned/and or routine maintenance required
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

6.1.6 Asset Hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery.

Previously New Plymouth had utilised the One Network Road Classification (ONRC) to provide asset hierarchy, The One Network Framework (ONF) evolves the ONRC to a two-dimensional classification framework focused on movement and place. The service hierarchy is shown below:

Service Hierarchy	Service Level Objective
City Hubs	City hubs are dense and vibrant places. They're the central point of a city where people spend time working, shopping, meeting people, and visiting entertainment venues and businesses. They support very high levels of through movement of people, particularly by public transport, walking and cycling.
Main Streets	Main streets generate high levels of on-street pedestrian activity by people working, visiting shops, businesses, and entertainment venues. They aim to support this while making sure there are excellent connections with the wider transport network. Main streets need to balance the interaction between on-street activity and movement of people and goods. They accommodate medium to high levels of people walking, cycling, using public transport, or driving through.
Activity Streets	Activity Streets provide access to shops, entertainment venues, community facilities and commercial, trades and industrial businesses for everyone. People spend a significant amount of time, working, shopping, eating, residing, and undertaking recreation. They support medium to high levels of people walking, cycling, using public transport, or driving through the area.
Civic Spaces	Civic Spaces are roads or streets that people are encouraged to spend time in and where people on foot can relax and move freely. There is usually street furniture and other amenities to encourage and support people to linger and spend time in these spaces. Very high numbers of pedestrians move around and through the space while there is little or no through movement for motor vehicles.
Local Streets	Local Streets primarily provide quiet and safe residential access for all ages and abilities. They are part of the fabric of our neighbourhoods and facilitate local community access. Local Streets are the most common and most diverse streets in urban areas. There are low levels of on-street activity and movement by people walking, cycling, and driving.
Urban Connectors	Urban connectors make it safe, reliable, and efficient for people and goods to move between different parts of urban areas. There are high levels of motor vehicle traffic, including freight. They often support public transport and provide major routes for people cycling. There are low levels of pedestrian activity associated with people moving along the road.

Service Hierarchy	Service Level Objective
Transit Corridors	Transit corridors make it fast and efficient for people and goods to move within urban areas. They are mass transit corridors for private motor vehicles, freight and public transport and include motorways and urban expressways. They are usually separated from surrounding land use so there are no people walking or cycling on these roads. Transit corridors also include heavy rail networks and busways.
Interregional Connectors	These are national State Highways that make it safe, reliable, and efficient to move people and goods between and within regions. These roads run through farmland and natural areas so there are low levels of roadside activity. These roads carry significant levels of motor vehicle traffic, including freight.
Rural Connectors	Rural Connectors make it easy for people and goods to move between different parts of rural areas and link Rural Roads with Interregional Connectors. They support an increased level of traffic moving through the area, while also providing access from the land they pass through. Land around rural connectors is usually farmland, and these roads may also run through national parks or other natural areas. There are low levels of roadside activity related to the way surrounding land is used.
Rural Roads	Rural Roads provide access to rural land. They are the most common and diverse roads in rural areas. There is low levels of traffic and roadside activity from local people going about their daily lives. Some Rural Roads are important for freight, collecting dairy and forestry and other primary produce from their source, while others, where volumes of vehicle traffic are very low, can provide safe and pleasant recreational and tourism routes.
Peri-urban Roads	Peri-urban roads provide access to residential property in rural settlements, lifestyle blocks, sub-divisions and on the edge of urban areas where the main surrounding land-use is residential, but at a lower level than that found in urban residential locations. There are low levels of local street activity with residents going about their daily lives. Levels of motor vehicle traffic and freight will range from very high to low, depending on whether the peri-urban road is connecting to an interregional connector or rural road.
Stopping Places	Stopping Places are rural destinations that increase activity on the roadside and directly uses the road for access. There are more people walking, cycling, and driving in these locations, including people often crossing the road.

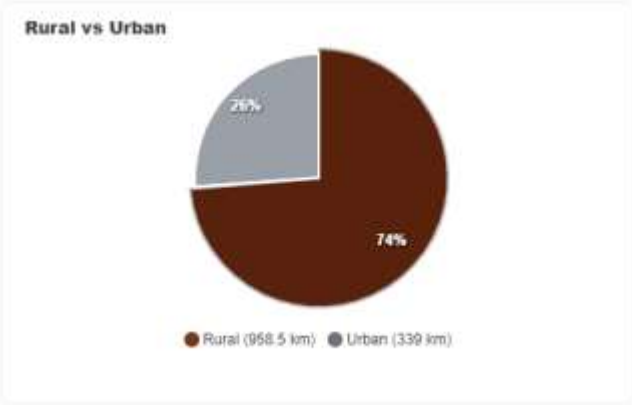
6.2. Sealed Roads

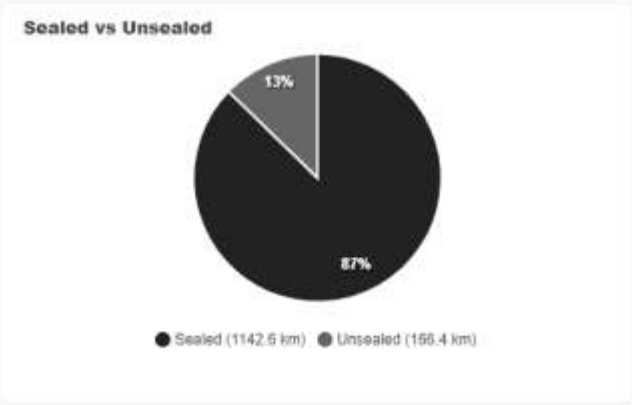
The purpose of managing these assets is to provide a pavement that is suitable for the effective movement of all road users. The surface must be suitable for all weather conditions and appropriate to its location and function in terms of skid resistance and smoothness. It must also have a structure suitable for current and future traffic loading requirements.

The table below shows a breakdown of the network according to ONF.

	ONF Category	Total Length (km)	Total Length (%)	Sealed (km)	Unsealed (km)	Lane (km)	Vehicle Journeys (m vkt)
URBAN	Urban Connectors	48.4	3.7%	48.4	0	96.6	84.2
	Activity Streets	19.7	1.5%	19.7	0	39.2	31.9
	Main Streets	1	0.1%	1	0	2	2.3
	Local Streets	258.6	19.8%	258.5	0.1	507.6	64
	Civic Spaces	11.3	0.9%	11.3	0	11.5	0.1
	Total Urban Network	**339**	**25.9%**	**338.9**	**0.1**	**656.9**	**182.4**
RURAL	Stopping Places	0.2	0%	0.2	0	0.4	0
	Rural Connectors	252.1	19.3%	252.1	0	456.2	66.9
	Peri-urban Roads	23.9	1.8%	23.9	0	42	4.7
	Rural Roads	682.3	52.1%	516.1	166.2	794.2	24
	Total Rural Network	**958.5**	**73.2%**	**792.3**	**166.2**	**1292.8**	**95.7**
	Unclassified	11.5	0.9%	11.4	0.1	21.5	2.1
	Total Network	**1308.9**	**100%**	**1142.6**	**166.4**	**1971.2**	**280.2**

The below figures show the proportion of network that is Rural vs Urban and Sealed vs Unsealed:





In addition to formed roads, there are approximately 710 km of partly formed and/or unformed roads. An unformed legal road (commonly called paper road) is land that is legally designated for road purposes but is not currently a formed carriageway. NPDC have adopted a policy for managing these unformed roads. This policy covers funding of improvements to unformed roads and the process for disposing of assets deemed surplus to requirements.

The NZ Walking Access Commission published a document in February 2011 titled 'Guidelines for the Management of Unformed Legal Roads'. This document is available for the Council's use in administrating unformed roads. The Council is yet to complete a detailed survey and analysis of hazards, structures and occupation on unformed roads. Once this has been done, recommendations will be made regarding the best strategies to manage risks.

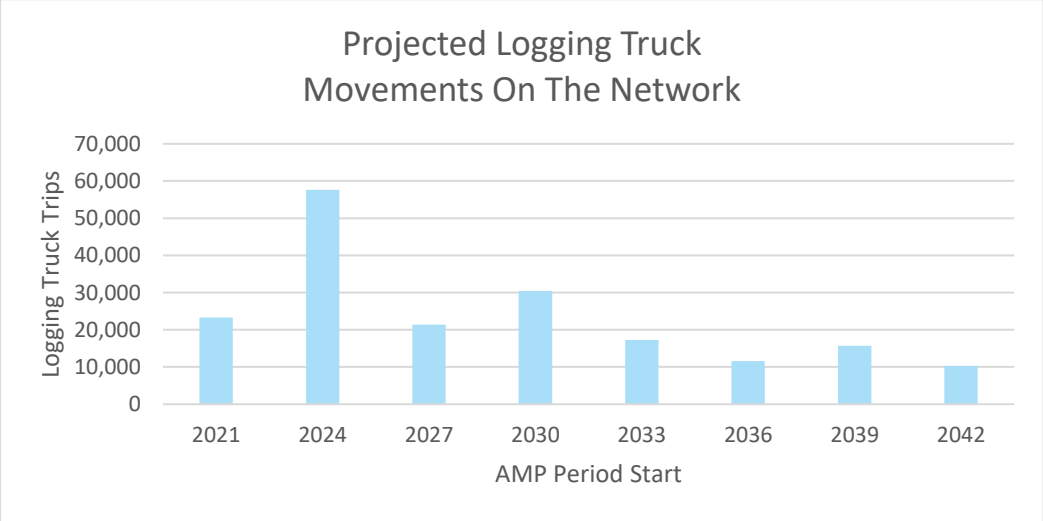
The roads are made up of several layers as shown in the table below:

Pavement Asset Group	Description
Road Formation	Cutting or filling of the natural ground/terrain to establish a suitable surface (subgrade) upon which the road is constructed
Subbase	Lower levels of metal construction, laid upon the subgrade
Basecourse	Upper, high quality metal layer (typically about 100-150mm thickness)
Top Surface	Final layer or top surface of material over which vehicles pass, typically asphalt, chip seal or running course for unsealed roads

Pavement Asset Condition and Performance

Pavement performance is measured by how well it meets the requirement to provide safe, smooth, all-weather access and does it have sufficient demand capacity for all vehicles. Carriageways are typically strong enough for the loads they are expected to carry. Arterial roads are designed and constructed for larger volumes of HCVs while access and low volume roads carry much fewer HCVs. HPMVs and 50MAX trucks are also using the network with numbers expected to increase over time, these are restricted to approved routes deemed capable of carrying the increased loads. Another concern is the effect of forestry related HCVs on the rural roads, which is already noticeable on the network. These roads were designed for low numbers of HCVs, not large volumes of logging trucks during winter months, which are consuming the asset at higher rate than anticipated.

A study is currently underway to identify the future impacts of logging trucks by identifying the known forested areas and their likely harvest times. This will allow better targeted intervention strategies moving forward. The figure below shows projected logging truck movements on the network.



Condition and Monitoring

HSD, Roughness and Condition Rating surveys enable trends in the condition of the network to be determined, comparisons made between the conditions of roads in different areas and assist in identifying sections of road that require closer inspection for maintenance and renewal treatments.

Roughness is a measure of the longitudinal profile of the road and is measured using specialised equipment mounted to vehicles which travel the network in both directions. The NAASRA count is the commonly used unit for the measurement of roughness. A high NAASRA count indicates a rougher road.

Roughness

The trends regarding roughness are a useful indicator of how effectively the pavement maintenance strategies are meeting the demands of increased traffic loadings and the network increasing in age. It is important to note that the road pavements are always in a state of decay and that as they age, their condition deteriorates and the cost of maintenance increases. The rate of deterioration is a function of the initial pavement strength, traffic loading and the maintenance effort applied.

Smooth Travel Exposure

The principal measure of sealed road performance in NZ is STE which reports the traffic volumes using roads of different roughness levels. This means that if the roads which have the highest traffic volumes are the smoothest on the network, then there will be a higher STE figure than if the roads with the least traffic volumes are the smoothest.

STE is a combination of roughness data and traffic loading. The ONRC reporting tool 'Performance Measures Reporting Tool (PMRT) allows councils to compare network data with their Peer Group, their region and nationally.

Maintenance and Operations Plan

In the past, machine collected data has been the mainstay for pavement analysis and performance measurement. The problem is that machine collected data is historical data and does not portray the full picture. The measures therefore become 'lag' measures.

NPDC's Network Inspectors routinely inspect the network identifying faults and assigning severity priority levels as per agreed intervention levels. Logged faults are collected electronically utilising Pocket RAMM in the field. Faults data identified form the basis of forward programmes for prioritising maintenance activities. These identified real time faults provide a view of the changing performance of the network that has led to the development of new types of 'lead' indicators performance measures.

This enhanced visual condition rating system; All Faults is a shift in how maintenance operations occur in NZ and shows that good infrastructure asset management practices are also good commercial management practices. Further information is provided in Section 8.8.4.

Each fault whether a pothole, or pavement dig out repair has a corresponding repair cost obtained from established contract unit rates. The sum of All Faults identified is established for the entire roading network.

Cost of All Faults = (unit area of the fault x unit rate)

Further, each defect is assigned a priority, 1 to 5 with 1 being new pavement assets with no defects and 5 being safety related faults requiring immediate repair (aligned with NAMS).

Severity Priority (SP) = (unit area of the faults x unit rate x priority)

Network condition is established from the following formula:

Condition = (SP/Unit area of the faults x unit rate)

The current network condition is sitting at a score of 3.37 (Fair) compared with the last NLTP which was 3.15 which shows a slight deterioration. Further investment is required to bring the score back to a 3.00. The drop is most likely due to the large cost inflation which means it costs a lot more to deliver the same amount of work. Where the network is green, it is improving, orange is no change and red is deteriorating. A typical target is to maintain the network at a 3. Or 'fair' condition. A 2 or 'good' condition is considered over investment, and you are probably doing too much preventative work while a 4 or 'bad' condition suggests you are spending too much on reactive work.

The All-Faults program relies on the Network Inspectors covering the whole network. Currently we have a full time Rural Inspector and are currently in the process of collecting Urban All Faults through GoPro footage and machine learning. The benefit of using GoPro footage and machine learning to identify the faults include:

- Safety – Inspectors no longer need to spend as much time on the road and no longer need to request a spotter on dangerous sections.
- Faster – Previously we allowed for our inspectors to complete 10km a day, now we could achieve around 400km.

- Consistent – Previously we had variance due to different inspectors, inspectors hauora on the day and different times of the day/weather.

The table below breaks down the condition of the network by ONC:

ONRC Category	Condition Rating
Regional	3.73
Arterial	3.18
Primary Collector	3.17
Secondary Collector	3.37
Access	3.45
Low Volume	3.38

Apart from the Regional roads, our roading shows the higher category ONRC roads have a lower score and a higher level of service through to lower ONRC roads with a higher score and a lower level of service – this is in line with Councils goals.

The Regional classified roads have seen great deterioration as they have equivalent loading to a highway (<400 heavy vehicles per day). Because the Regional roads only make up 0.2% of the network (2.9km) the high score of 3.73 can easily be brought down. Most sections that are deteriorating are triggered in our model for a rehabilitation in the next 5 years.

At any point in time the cost of repairing all identified faults and the overall condition of the roading network can be established. This is a practical output in:

- Analysing whether the network is improving or deteriorating based on the total value of repairs identified.
- Assessing deferred maintenance needs
- Highlighting budget deficiencies
- A reality check to determine whether existing maintenance strategies are working
- Establishing network condition

Advanced Pre-Reseal Repair Treatments

Advanced Pre-Reseal Repair Treatments Delivery of pre-reseal preparatory repairs the year prior to resurfacing treatments is considered best practice in pavement operations and enables resurfacing to be done at the most optimal time of the year rather than being delayed. An allowance has been made to move to this practice over time, bringing forward a portion of the following years preparatory repairs each year based on proximity of treatment lengths and improved operational delivery. This should allow the Council to deliver this work type within current resources, whilst moving to more advanced delivery of carriageway renewals. Urgent repair works can offset the pre-reseal programme and delay pre-reseal repairs. Currently the Council is 20% ahead of the current

year with a future long-term target (three years) of 100% of pre-reseal repairs completed a full year ahead.

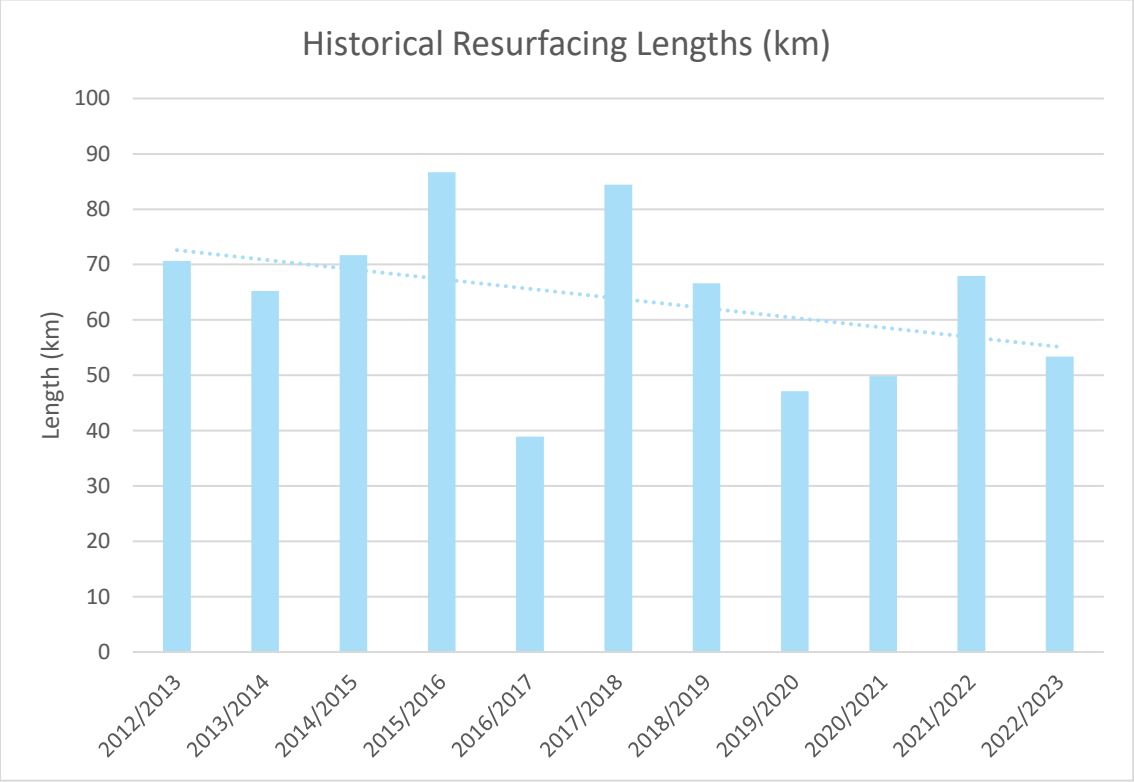
Renewal and Capital Works

Historical Surfacing Renewal Works

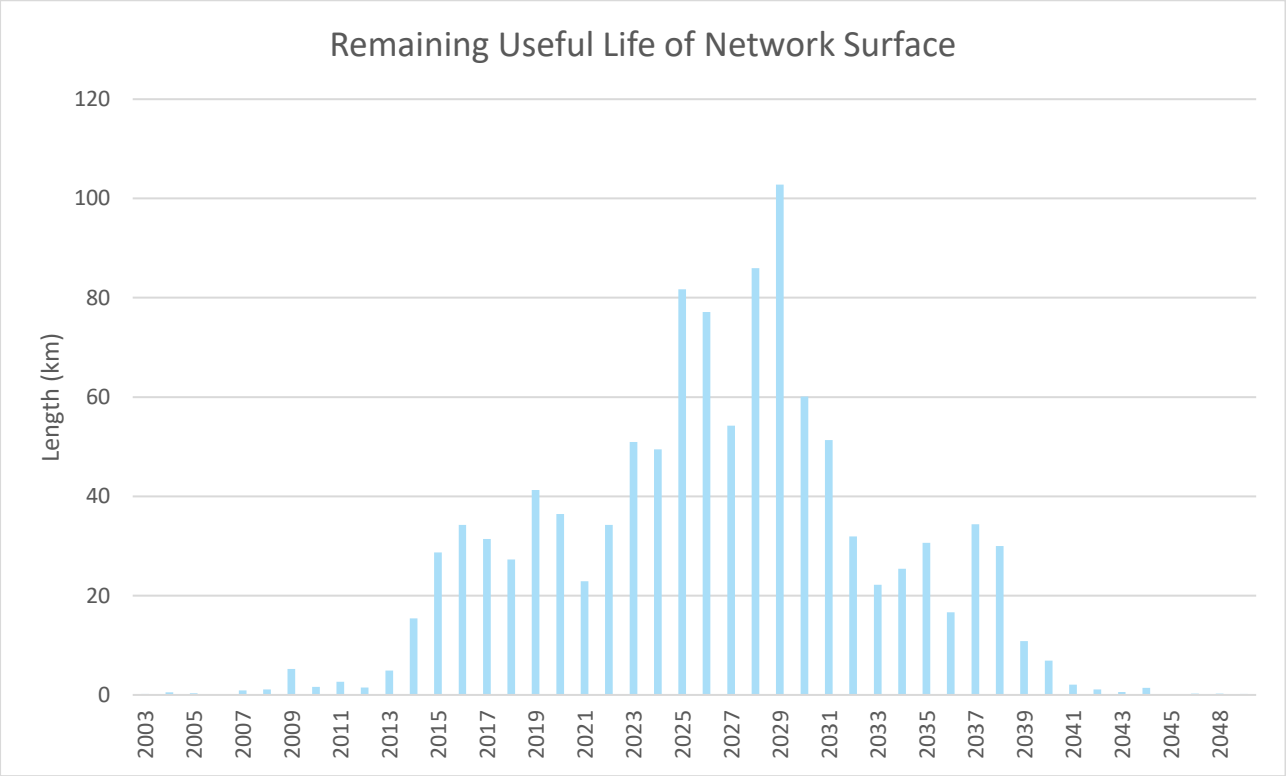
NPDC roads have relatively low traffic volumes compared to other RCA and failure due to wear only occurs in high stress areas. Typically, this is at points where heavy vehicles turn at intersections in industrial areas and at cul-de-sac turning heads. The main failure mode for chipseal surfacing is aging. This occurs when oxidation of the bitumen causes it to harden which accelerates cracking, chip loss and flushing/loss of texture when further compacted by traffic.

The figure below shows the length of resurfacing undertaken for the last 10 years. On average NPDC has resurfaced 64km a year, which equates to 5.6% of the network. This is the equivalent of a seal life of 17.9 years.

The appropriate target for council is to renew 6% of the network per year. Due to large inflation costs, the council has only achieved 5% for the 21-24 NLTP. Further investment is required over the next NLTP as we have a bow wave of aging seals that require renew. The consequence of not getting on top of these aging seals is loss of water proofing, leading to pavement failures which are much more expensive than simply resealing at an appropriate time.



The figure below shows the remaining useful life (RUL) of the surfaced network. To manage these assets well, it is important to spread the cost or 'flatten the curve' so that not all surfaces need to be renewed at the same time, creating a large expense. If NPDC continue to resurface at a rate of 5.6% of the network, this will continue to age the network and increase the length of network which exceeds the expected life. This should be monitored to ensure the Council is not under-investing.



The above graph shows there is approximately 290km of sealed network that is at the end of the design life. Age of surface is not the sole factor for renewal; however, it is a good trigger to inspect the surface and determine an appropriate outcome. The expected life for different surfacing types and traffic conditions are summarised I the table below. These values are the default seal age values in RAMM which are average values for NZ and not site specific; therefore, in some cases the seal can last much longer.

TABLE 0-1: NPDC EXPECTED LIFE PER SURFACING TYPE BY TRAFFIC VOLUME.

Surfacing Type	Traffic Volumes (VPD)						
	<100	100-500	500-2,000	2,000-4,000	4,000-10,000	10,000-20,000	>20,000
Asphaltic Concrete	25	23	22	20	18	15	10
OGPA	20	18	17	15	12	10	8
Slurry Seal	12	10	9	8	4	3	2
Reseal G2	16	14	12	11	10	9	8
Reseal G3	15	14	12	11	10	10	8
Reseal G4	15	14	12	11	10	10	8
Reseal G5	8	7	6	5	4	3	2
Reseal G6	6	5	4	3	2	1	1
Multi Coat Reseals (2/4)	18	16	15	15	14	10	9
Multi Coat Reseals (3/5)	16	15	15	15	12	10	8
Multi Coat Reseals (4/6)	15	14	12	12	10	10	8
Single Coat First Coat	3	3	2	1	1	1	1
Two Coat First Coat	4	3	3	2	2	1	1

Special Roads

NPDC will continue to maintain, operate and renew (when required) the section of Egmont Road (see figure below) leading to the North Egmont Visitor Centre in the National Park. This road is classed as a 'Special Purpose Road'. This section starts at RP22046 and ends at RP 28805 and is 6759m long. The section is also known as 'Radius Line Hostel Road'.

FIGURE 0-1: NPDC'S SOLE 'SPECIAL PURPOSE ROAD'

Pavement Capital acquisitions vested assets

New assets installed by developers to serve new domestic and non-domestic developments are usually vested in NPDC. Assets are built to the NZS4404:2010 – Land Development and Subdivision Standard. NPDC's specific requirements are defined in the NPDC, SDC and STDC adopted standard for Land Development and Subdivision Infrastructure, which is based on NZS4404:2010 with local amendments. NPDC assumes full responsibility for any assets vested with the Council and includes them in operations, maintenance and future renewal plans.

Seal Widening

Minimal seal widening has been carried out in recent years. Typically, the only seal widening that occurs is on rural roads where a widening will improve a safety aspect of the road or will improve the Level of Service for businesses that utilise these roads such as logging or agriculture.

Seal Extension

NPDC undertakes sealing of unsealed roads when these projects are economically justified with priority being given to the unsealed roads receiving the greatest use. The benefits arising from the sealing of unsealed roads are a smoother ride for motorists, reduced vehicle operating costs,

improved safety and capacity, a greater degree of security of access and the alleviation of the effects of dust on adjoining property owners and road users. There are no seal extensions planned in the short term.

Resurfacing Renewal Works

Resurfacing is undertaken periodically to retain the waterproofness of the sealed surface and good skid resistance. There are several defects that can result in a requirement to either reseal or repair the existing road surface. For example:

- Cracking
- Potholes
- Loss of waterproofing
- Flushing
- Chip loss (Scabbing and ravelling)
- Loss of texture/skid resistance

Pavement Rehabilitation Renewal Works

Road pavement rehabilitation renewals are required where the pavement layers are reaching the end of their design life and are showing signs of deterioration. Renewal works, rather than resurfacing, then becomes the best option when considering the whole-of-life costs of the pavement.

Regional roads, forestry routes and roads with quarries are the cause of concern at present based on current condition and increasing heavy vehicle volumes.

Deterioration Modelling and Forecasting

Historically a dTIMS model of the network was built in-house in 2001, however due to a lack of pavement information the model only gave limited insights into the performance of the network. There are several elements that dTIMS requires to enable a complete analysis to be undertaken. A review of the RAMM database identified several gaps that would affect the analysis. The primary gaps were the subgrade strength, pavement depths and pavement materials, particularly on the rural network.

In 2020, the Council moved to using JunoViewer as part of the term services contract. The benefit of JunoViewer is even small councils with minimum amounts of data can have a working deterioration model and build on it over time. Our initial model utilized All Faults data, pavement and surface age and ONRC. Since 2020, we have since incorporated HSD data and MSD data (pavement strength). The HSD data is important as you can measure rutting in your pavement over time and calculate a ‘rut-rate’ which can define the rate of deterioration for individual sections.

JunoIntelligence – Road Distress

JunoIntelligence (JI) is the umbrella name for multiple models including Asset Collection, however the Council is currently testing the Road Distress Model which collects road defects. It works by

running video footage collected by the Council using GoPro's, uploading this footage to the cloud where it is then inferenced using Machine Learning with the output being a list of 'All Faults' for pavement and surface.

The benefits of using JI over a traditional network inspector include:

- Safety- Inspectors no longer need to spend as much time on the road and no longer need to request a spotter on dangerous sections.
- Faster – Previously we allowed for our inspectors to complete 10km a day, now we could achieve around 400km.
- Consistent – Previously we have variance due to difference inspectors, inspectors hauora on the day, and different times of the day/weather.

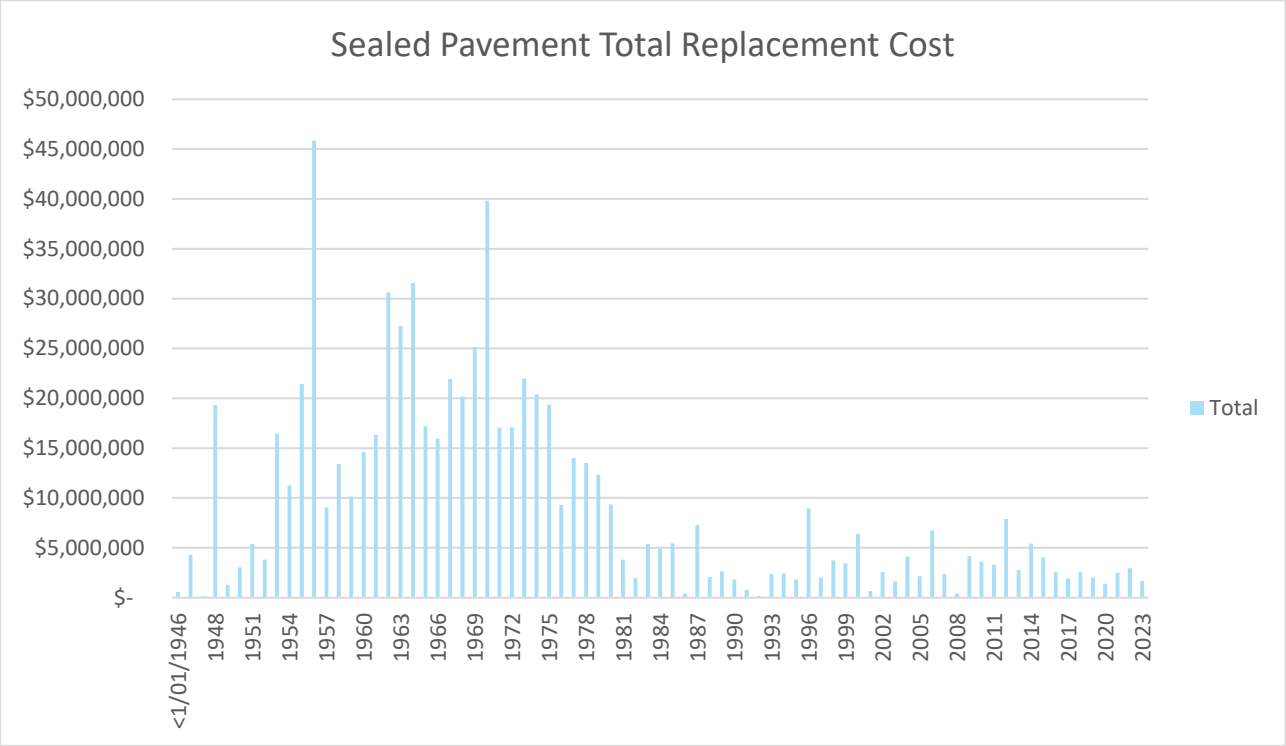
6.2.1 Background Data

Physical parameters

The assets covered by this AMP are shown in the table below.

Asset Category	Dimension	Replacement Value
Sealed – Formation	3,117 treatment lengths	$217,900,000
Sealed – Basecourse	3,117 treatment lengths	$133,549,372
Sealed – Subbase	3,117 treatment lengths	$239,731,100
First Coat Seal	3,117 treatment lengths	$64,904,018
Surface	3,117 treatment lengths	$61,622,283
Total		**$717,706,773**

The age profile of the assets is shown below:



All figures are shown in current day dollars.

There are many peaks all the way up until the late 70's however this is not a concern when renewing pavements. Provided roads have continuous maintenance there is no need to renew a road based on age. Roads are renewed based on condition and there are many reasons a road may be in poor condition including inadequate drainage, pavement thickness inadequate for loading or lack of historic maintenance.

Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in the table below:

Location	Service Deficiency (Cost of All Faults)
Tarata Road	$597,135
Devon Street East	$501,096
Otaraoa Road (Upper)	$252,946
Okau Road	$244,839
Devon Street West	$213,886

The Cost of All Faults is based on the Unit area of the fault multiplied by the unit rate. The five roads above have the highest total Cost of All Faults and make up 22% of all faults currently on our sealed network.

Asset Condition

Faults identified by inspectors and customer service requests are added to our open dispatch table in RAMM and then programmed based on priority and ONF.

Currently we utilize our All-Faults programme to monitor the condition of our unsealed network. With the roll out of the Consistent Condition Data Collection and RIMS Road Corridor Fault Assessment Guidelines we hope to give condition scores that are in line with national practice so that we can compare our condition with other networks – this is an item in our improvement plan.

The condition of our assets is shown below:

Network	Score
Sealed	3.34

A score of 3.34 means the network is in 'Fair' condition. The ideal target is a 3 -if the score is less than 3 you are likely over capitalizing, and if the score is above a 3 it is likely starting to deteriorate and requires greater intervention. With a score of 3.34 we should look at increasing investments, particularly on our roads classified as 'Regional'.

6.2.2 Operations and Maintenance Plan

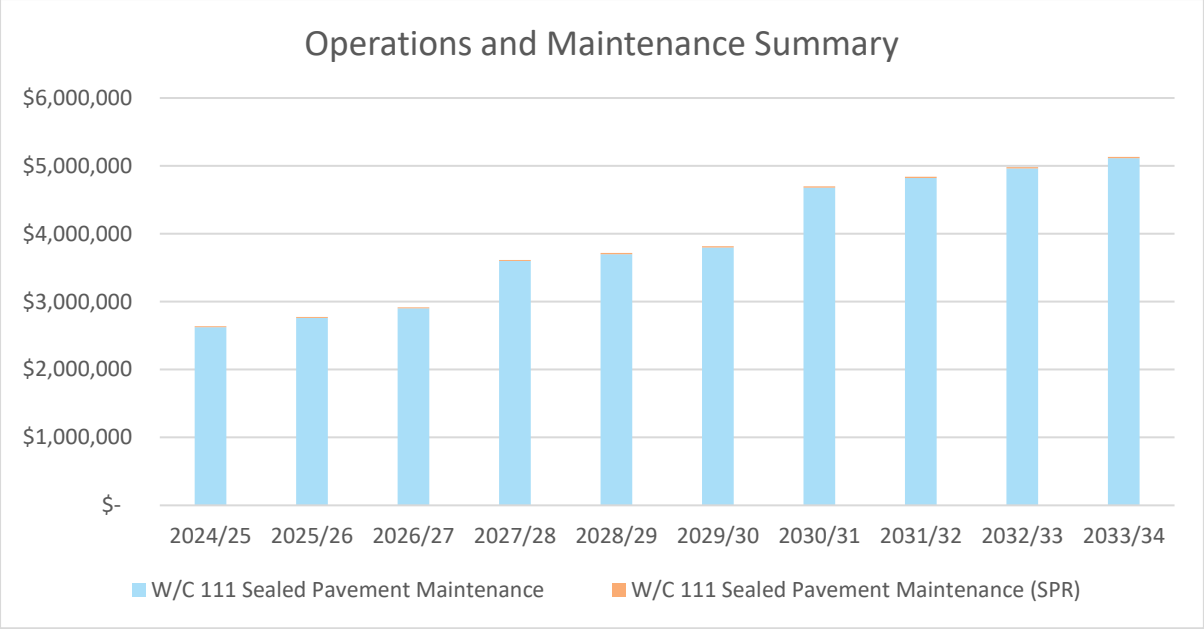
The trend in maintenance budgets is shown in the table below:

Year	Maintenance Budget $
2021/22	$2,152,300
2022/23	$2,010,000
2023/24	$1,650,000

The increasing cost to deliver the same level of service (increase in labour and materials), means the once appropriate maintenance budget is no longer appropriate and a decreased level of service is expected if we continue to fund the historic maintenance budget.

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.



All figures above include predicted inflation.

6.2.3 Renewal Plan

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in the table below. Asset useful lives were last review on 15th July 2022.

Asset (Sub) Category	Useful Life
Sealed - Formation	100 years
Sealed - Basecourse	80 years
Sealed - Subbase	150 years
First Coat Seals	80 years
Surfacing	(Refer to Renewal and Capital Works for expected life)

The estimates for renewals of Sealed Pavements are currently based on deterioration modelling using JunoViewer.

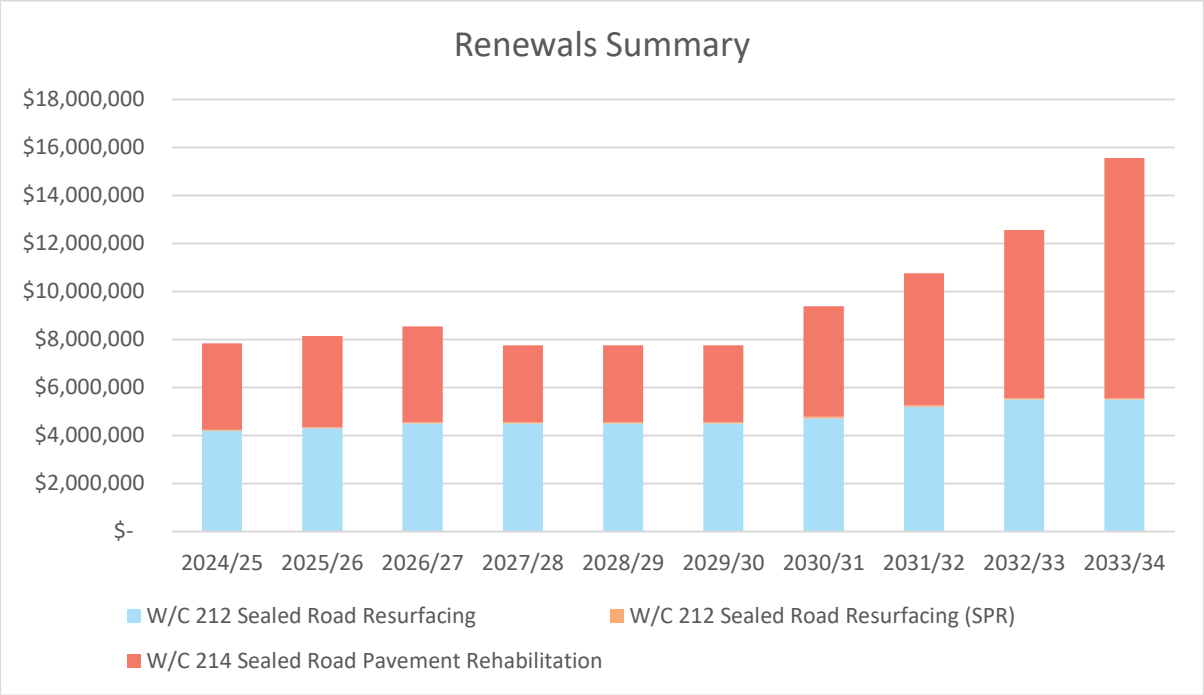
Renewal ranking criteria.

The ranking criteria used to determine priority of identified renewal proposals is detailed in the table below:

Criteria	Weighting
Condition	85%
Forestry	10%
Customer Service Requests	5%
Total	**100%**

Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.



All figures above include predicted inflation.

6.2.4 Acquisition Plan

Selection criteria

The priority ranking criteria is detailed in the table below:

Criteria	Weighting
Overarching Strategies	30%
Roading Hierarchy (ONF Gap Analysis)	30%
Safety Assessment	30%
Risk	10%
Total	**100%**

Summary of future asset acquisition costs

When an entity commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to

consider the cumulative value of the acquired assets being taken on by the entity. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown below.

The council is typically vested around 5 roads per year from subdivisions. The main cost associated with the acquisition of these assets is attributed to completing a second coat seal the year after we acquire these assets. We budget for these seals in our deterioration modelling so additional funding needs to be accounted for.

A future improvement would be to add a local amendment under NZS4404 so that developers are accountable for delivering the second coat as this cost should not be passed onto the Council.

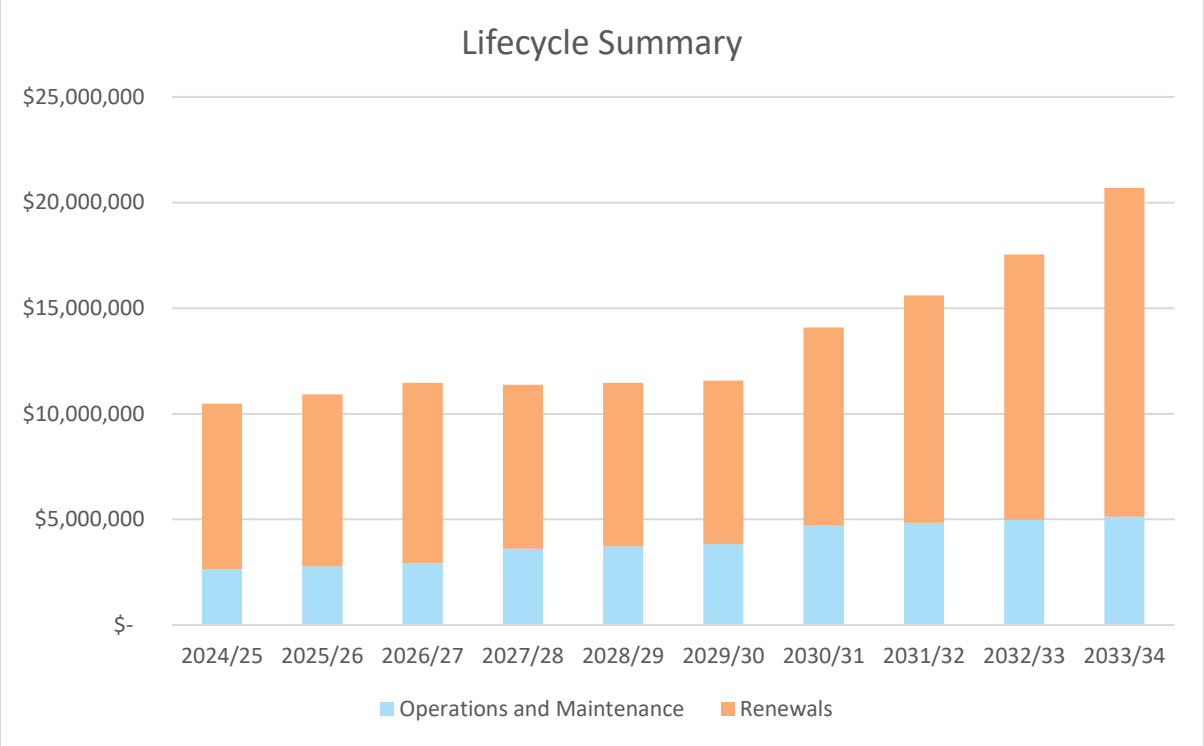
Other assets that will likely be acquired by the council in the long term include:

- A section of SH3 due to the Te Ara o Te Ata (Mt Messenger Bypass)
- A section of SH44 and SH45 if the East to West Ring Road is constructed.

6.2.5 Lifecycle

The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.



The consequence of not funding pavement and surface renewals and maintenance can have several negative impacts on transportation infrastructure and overall community. Some of the potential consequences include:

- Deterioration of roads: Without proper funding for pavement and surface renewals, roads and highways will deteriorate over time. Cracks, potholes, and other surface defects will worsen, leading to an uncomfortable and unsafe driving experience.
- Increased maintenance costs: Neglecting regular maintenance and renewals can lead to more extensive damage and the need for costly repairs in the future. It is generally more cost-effective to address minor issues promptly rather than waiting until they become major problems.
- Safety hazards: Poorly maintained roads pose safety hazards to motorists. Potholes and uneven surfaces can cause accidents, particularly for vehicles traveling at high speeds. Additionally, worn-out markings and signage can lead to confusion and increased risks on the road.
- Increased vehicle operating costs: Deteriorated Road surfaces can lead to increased wear and tear on vehicles. Potholes and uneven surfaces can damage tires, suspension systems, and other vehicle components, leading to higher maintenance costs for individual drivers.
- Traffic congestion and delays: Roads in disrepair may require temporary closures or reduced speed limits for repairs, causing traffic congestion and delays. Commuters and businesses can experience significant disruptions and increased travel times, which can have economic implications.
- Economic impact: Well-maintained roads and infrastructure are vital for economic growth and development. If roads are neglected, it can hinder commerce and transportation of goods, impacting businesses, productivity, and local economies.
- Public dissatisfaction: Poorly maintained roads and infrastructure can lead to public dissatisfaction and frustration. Citizens may perceive it as a failure of government to provide essential services, which can erode trust and confidence in public institutions.

6.2.6 Disposal Plan

Although there are no immediate plans to dispose of any pavement assets over the period of this AMP, as part of the improvement plan the Council will be looking into reverting uneconomic roads back to paper roads. We have a few roads and sections of roads on our network that cost a lot to maintain/renew and only serve a few people. This road could be better spent on roads with higher VKT's.

6.3. Unsealed Roads

The district has 169km of unsealed network which only makes up 13% of the network. These roads provide vital access to rural communities, which predominantly have low traffic volumes.

The issue with the unsealed network is that it caters for both light vehicles and heavy vehicles, this leads to different maintenance requirements. For light vehicles, a smooth and safe network is the Council's commitment; however, heavy vehicles require a suitably wide road built to withstand heavy wheel loads. Another key issue common amongst local authorities is Figure 83: Unsealed Carriageways on New Plymouth Network logging in rural areas. With the increase in HCVs on these rural roads, there has been an increase in loadings on pavements that were never designed to take these loads. Although the locations of forestry blocks are known, without knowing exactly when the trees will be logged creates another issue. The Council can try and target roads prior to harvesting to mitigate the damage, or simply wait and repair the damage to roads after harvesting has occurred. The preferable approach is to carry out any urgent repairs as a result of the logging traffic, but to wait until the logging has finished to complete any permanent repairs. NPDC has approached Community Boards in the past and advised them that the Level of Service will drop as a result of the activity i.e., some sections of sealed pavement reverting to unsealed. Renewal / maintenance works then happen once the logging is finished.

Programming:

Grading frequency is dependent on the following factors:

- Traffic Conditions (Average Annual Daily Traffic (AADT), HCV)
- Materials used on previous metalling programmes.
- Climate and rainfall
- Road cross-falls and grades
- Road width
- Existing road condition and pavement strength
- Drainage
- Level of Service and customer expectations (safety, defects and roughness)

Typically, unsealed roads require reactive maintenance as opposed to preventative maintenance due to extreme weather events. Network Inspectors frequently update the All-Faults data on these roads so any potential safety related faults can be kept on top of. In turn, this prevents NPDC from unnecessary spending on grading and metalling as all maintenance is targeted.

Maintenance and Operations

Maintenance of the unsealed roads is about keeping the asset functional and fit for purpose throughout the lifecycle. The unsealed network is inspected for surface profile, surface defects and ability to shed water to the adjacent roadside drains. Maintenance grading occurs twice per year based on current network condition and maintenance metalling programmed as required. Network classification informs the level of maintenance expected for each treatment length. Lower classification roads will have a higher tolerance of deteriorating condition, as the appetite for risk is higher due to the lower usage. Whereas high classification roads have a lower tolerance of risk and will subsequently be maintained to a higher degree. While a formal condition assessment or summary is not captured for unsealed roads the use of All Faults means the ability to highlight areas requiring maintenance or renewal activities (and as such) can ensure the expected Levels of Service are adhered to. As a minimum, the following information is needed to describe the planned and reactive maintenance regime of the unsealed road:

- Faults and defects (potholes, corrugations, rutting, soft spots, drainage etc.)
- Maintenance (per km, per ADT for HCV, per season, per aggregate type)
- FWP and Annual Plan
- MIS Codes

Inspections

The routine inspections focus on unsealed pavement assets and the obvious drainage assets include:

- Safety, line of sight (sight distance, vegetation encroachment), vegetation control and its effectiveness, customer requests
- Reactive maintenance (for example potholes, corrugations, flooding, loose aggregates, surface water runoff)
- Condition rating
- Visual check of known dropouts and clips

The detailed inspection drives the Capital Works (metalling renewal programme) and assists in fine-tuning the maintenance grading programme.

Post grading inspections include:

- Drainage assets (water table, culverts, cut outs, soak pits, marker posts, etc.) and their effectiveness.
- Visual check of known dropouts and slips
- A pre-grading inspection determines the scope and type of grading and is usually caried out by the rural inspector.

Renewal and Capital Works

The unsealed network is much more dynamic than the sealed network as it responds adversely to heavy rain, periods of dry weather, peak traffic flows and heavy loads. Unsealed roads usually require pavement renewal for one of two reasons:

1. Failure of the pavement structure in a similar manner to which occurs on sealed pavements.
2. Insufficient renewal of the metal surface, resulting in traffic running on the pavement structural layers, eroding and damaging them

Economic, social and legislative changes in recent years have all contributed to impacting the unsealed pavement network regarding its suitability for road users. Further details are provided below:

- Changing land use – the decline of pastoral farming and increase in alternative uses, particularly forestry and dairy farming, has increased loadings on the network.
- Transport economics – larger and heavier trucks have improved the economics of more remote properties and industries creating road user demand for improved roads.
- Legislative changes – have resulted in heavier and longer vehicles being able to be driven on any road without restriction and with no appreciable upgrading in the network.

  Unsealed roads pavement metalling is identified through inspection, network knowledge and maintenance need. Environmental factors can also influence programmes.

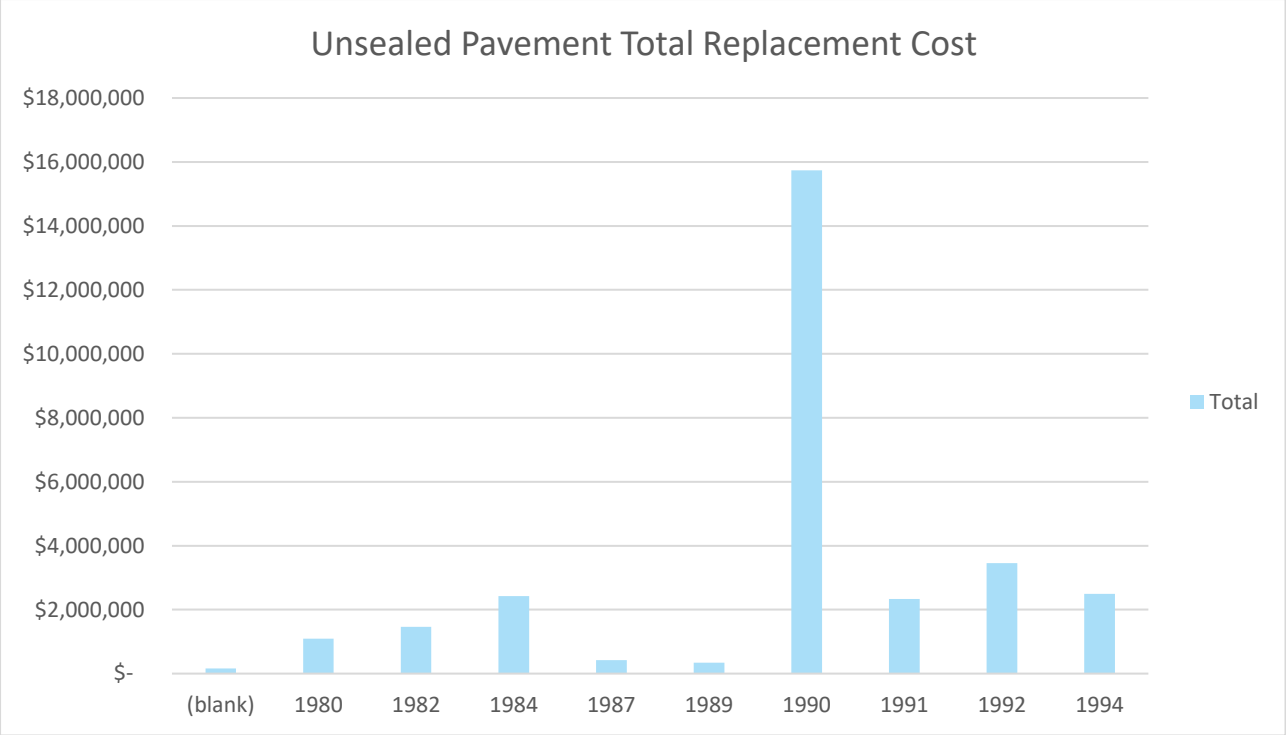
6.3.1 Background Data

Physical parameters

The assets covered by this AMP are shown in the table below.

Asset Category	Dimension	Replacement Value
Unsealed – Formation	114 treatment lengths	$9,451,760
Unsealed – Basecourse	114 treatment lengths	$5,437,912.43
Unsealed - Subbase	114 treatment lengths	$15,028,297.96
Total		**$29,917,970**

The age profile of the assets is shown below.



There is a large peak in 1990 that suggests we have large bow wave of renewals coming; however, this is a data error - the surface table hasn't been updated when maintenance metalling has occurred. An improvement item would be to update the surface table using data from the maintenance cost transaction table.

Because condition is the trigger for maintenance metalling rather than age, this is not considered an issue, however if we were to model the unsealed network in the future, it would be valuable to update this data.

Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in the table below:

Location	Service Deficiency (Cost of All Faults)
Hutiwai Road	$33,742
Waitaanga Road	$16,259
Okoki Road	$12,644
Okau Road	$12,326
Mangaonga Road	$6,408

The Cost of All Faults is based on the Unit area of the fault multiplied by the unit rate. The five roads above have the highest total Cost of All Faults and make up 76% of all faults currently on our unsealed network.

Asset Condition

Faults identified by inspectors and customer service requests are added to our open dispatch table in RAMM and then programmed based on priority and ONF.

Currently we utilize our All-Faults programme to monitor the condition of our unsealed network. With the roll out of the Consistent Condition Data Collection and RIMS Road Corridor Fault Assessment Guidelines we hope to give condition scores that are in line with national practice so that we can compare our condition with other networks – this is an item in our improvement plan.

The condition of our assets is shown below:

Network	Score
Unsealed	3.30

A score of 3.3 means the network is in 'Fair' condition. The ideal target is a 3 -if the score is less than 3 you are likely over capitalizing, and if the score is above a 3 it is likely starting to deteriorate and requires greater intervention. With a score of 3.3 we could do slightly more, but our budget is most likely appropriate for our level of service.

6.3.2 Operations and Maintenance Plan

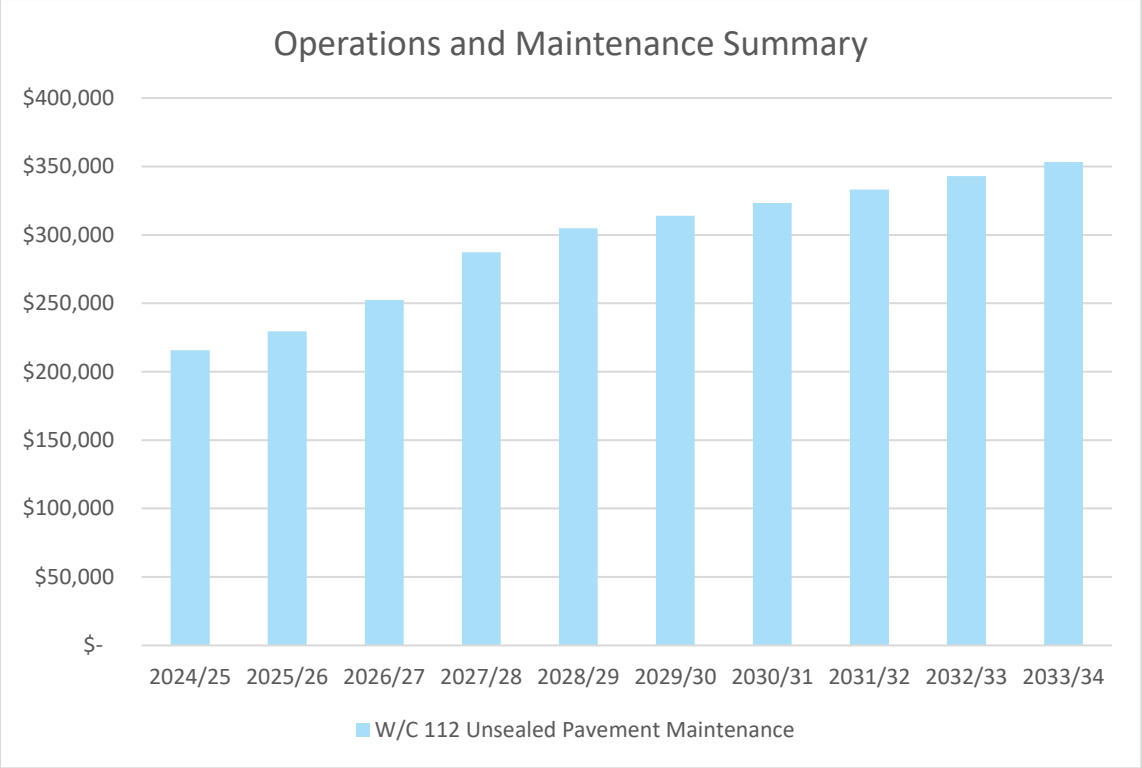
The trend in maintenance budgets is shown in the table below:

Year	Maintenance Budget $
2021/22	$150,000
2022/23	$150,000
2023/24	$150,000

Apart from the additional costs due to inflation, our unsealed pavement maintenance budget is appropriate for the level of service we provide.

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.



All figures above include predicted inflation.

6.3.3 Renewal Plan

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in the table below. Asset useful lives were last review on 15th July 2022.

Asset (Sub) Category	Useful Life
Unsealed - Formation	100 years
Unsealed - Basecourse	80 years
Unsealed - Subbase	150 years

The estimates for renewals of Unsealed Pavements are currently based on All-Faults data and local engineering judgement. An improvement item is to model the unsealed network using JunoViewer.

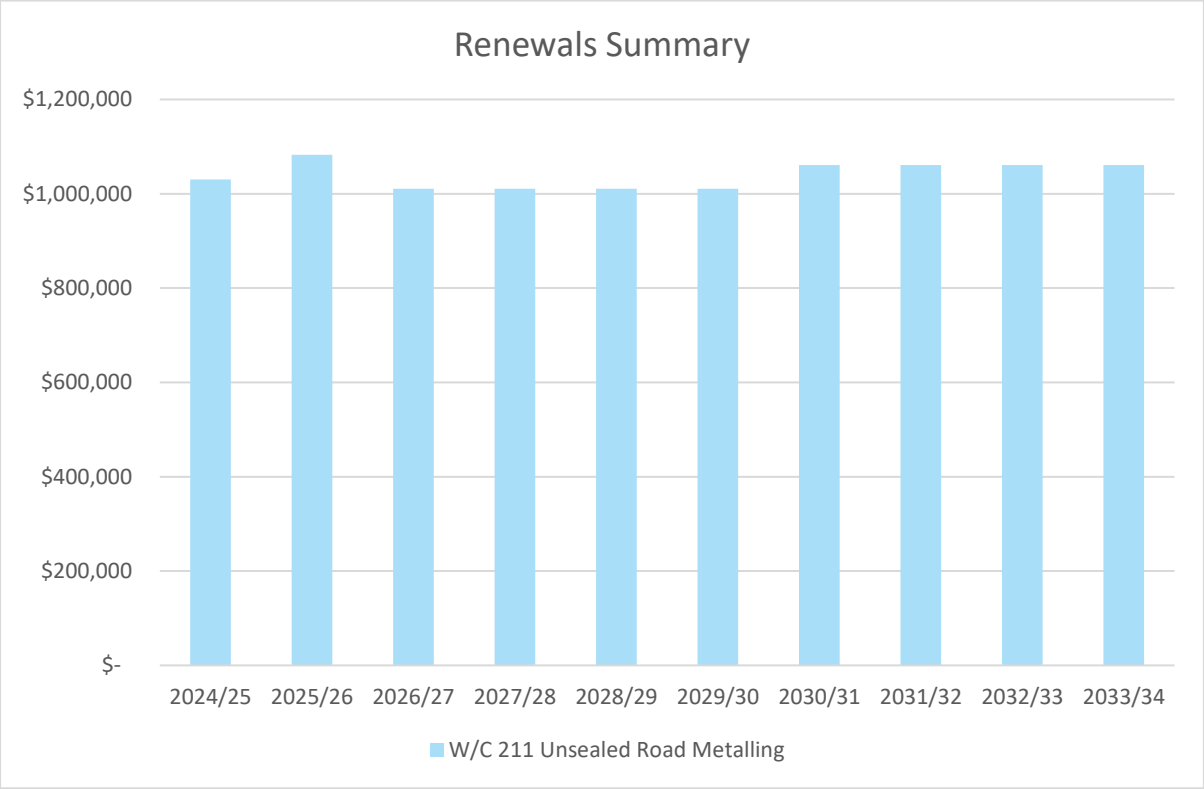
Renewal ranking criteria.

The ranking criteria used to determine priority of identified renewal proposals is detailed in the table below:

Criteria	Weighting
Condition	85%
Forestry	10%
Customer Service Requests	5%
Total	**100%**

Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.



All figures above include predicted inflation.

6.3.4 Acquisition Plan

Selection criteria

The priority ranking criteria is detailed in the table below:

Criteria	Weighting
Overarching Strategies	30%
Roading Hierarchy (ONF Gap Analysis)	30%
Safety Assessment	30%
Risk	10%
Total	**100%**

Summary of future asset acquisition costs

When an entity commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to

consider the cumulative value of the acquired assets being taken on by the entity. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown below.

The council is not expecting to acquire any unsealed sections of road in the next NLTP.

6.3.5 Lifecycle

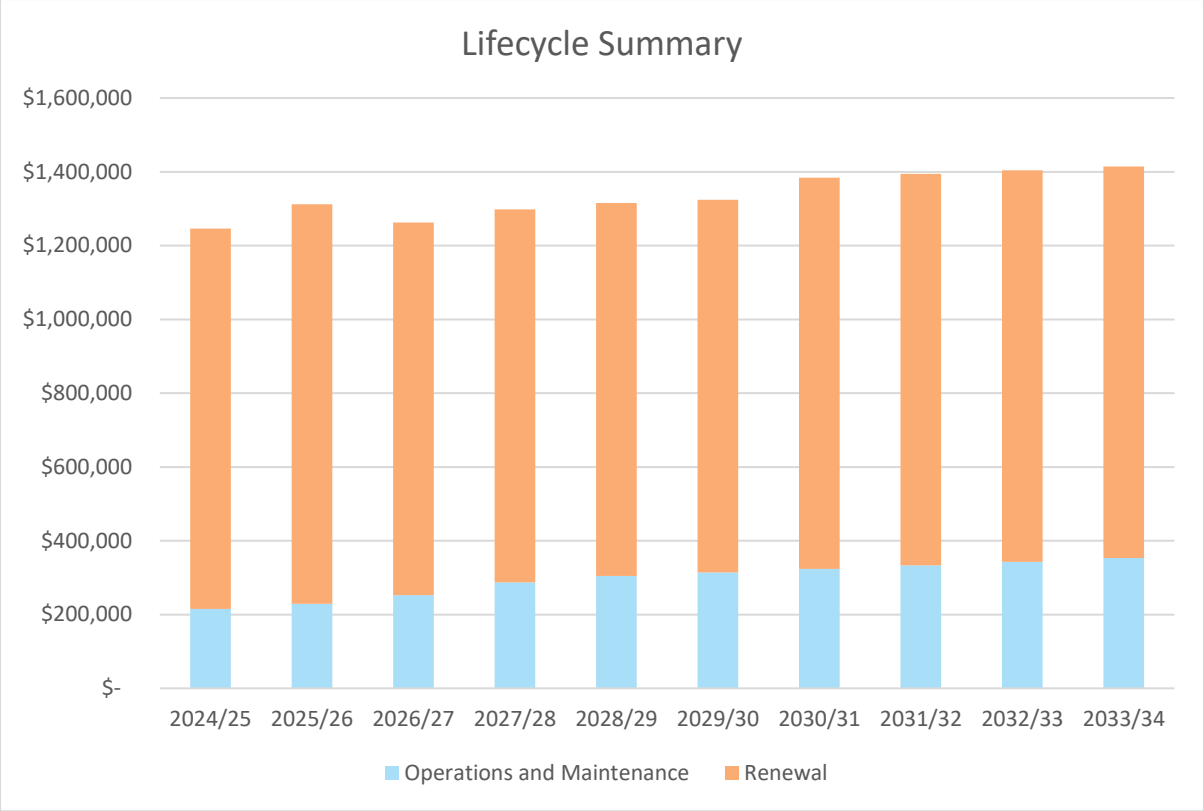
The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

6.3.6. Disposal Plan

Assets identified for possible decommissioning and disposal are shown in the table below. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in the table below. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Asset	Reason for disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
NPDC has no assets due for disposal				



The graph above shows a steady increase year on year based on predicted inflation. If the Council does not keep up with inflation, we will expect to see a decline in levels of service. The consequence of not funding unsealed road maintenance and metalling can have several negative impacts on transportation infrastructure and overall community. Some of the consequences include:

- Road deterioration: Unsealed roads are particularly susceptible to wear, and erosion caused by weather conditions, heavy traffic, and other factors. Without regular maintenance, the road surface can degrade quickly, leading to increased roughness, potholes, and corrugations. This deterioration makes the road less usable and can result in an uncomfortable and challenging driving experience.
- Reduced accessibility: Unsealed roads are often crucial for accessing rural areas, agricultural land, well sites, and recreational areas. If these roads are not adequately maintained, they can become impassable, restricting access to these locations. This can hinder economic activities, emergency response, and community connectivity.
- Safety hazards: Deteriorated unsealed roads can pose safety hazards to drivers. Rough surfaces, potholes, and corrugations can cause vehicles to lose control, leading to accidents and injuries. The lack of proper drainage and grading can also result in increased risks during inclement weather, such as flooding or mudslides.
- Increased maintenance costs: Neglecting maintenance of unsealed roads can result in more significant damage over time. As the road deteriorates, it may require more extensive repairs or reconstruction, which can be costly. Prompt and regular maintenance, including metalling, is

generally more cost-effective in the long run compared to allowing roads to deteriorate to a point where reconstruction is necessary.

- Impacts on local economies: Unsealed roads are often vital for industries such as agriculture, oil and gas, forestry, and tourism. If these roads are not maintained, it can impede the movement of goods, equipment, and services, leading to increased costs and decreased productivity for businesses. It can also deter tourists and visitors, impacting local economies that rely on tourism.
- Dust and environmental concerns: Unsealed roads can generate a significant amount of dust, especially during dry weather. This dust can affect the air quality in surrounding areas, leading to respiratory problems for nearby residents and potentially impacting vegetation and wildlife. Proper maintenance, including grading and watering, can help mitigate dust issues.
- Community dissatisfaction: Neglected unsealed roads can lead to frustration and dissatisfaction among residents. They may feel that their needs for safe and reliable transportation are not being adequately addressed, which can impact community well-being and trust in local authorities.

6.4. Structures

The purpose of bridges and large culvert structures is to provide continuous all-weather road access over rivers, streams and uneven terrain, supporting vehicles and ensuring the safety of road users. Retaining walls restrain soil to a slope that it would not normally keep to, protecting the networks assets and ensuring safety of road users. The continuous operation of this asset group is crucial to the transportation network. These assets are structurally engineered and are high risk and high value. They require proactive inspection and consequent maintenance, component renewal and ultimately full replacement. When properly designed and managed; however, they have a useful life that generally exceeds that of other transportation assets.

Excluding pedestrian only bridges, bridges generally qualify for Waka Kotahi funding assistance. There are exceptions such as those on very Low Volume roads. The key issues that relate to bridges, large culverts and retaining structures are:

- The identification of strategic structures (associated with Lifeline issues)
- Demand for bridge strengthening from industry related to HPMV and 50MAX HPMVs.
- Safety (e.g., bridge approaches)
- Protecting waterways
- Low historical maintenance expenditure creating a bow wave of work.

An external consultant has produced a report entitled “Road Structures Life Cycle Management Plan 2023” which covers known structures in the district in detail. This section of the AMP summarises the report.

Weight Capacity

There are currently nine bridges posted in accordance with the Heavy Motor Vehicle Regulations 1974, Regulation 11 Protection of Bridges.

These limits (which are advertised annually) comprise gross weight and axle weight limits and speed limits for heavy motor vehicles. Five of the bridges give access to a limited number of properties and typically would carry fewer than 25 vehicles per day. The posted restrictions reflect the fact that these structures were designed and built as part of a “Class 2” roading network which was limited to vehicles with lesser gross and axle weights than the current universal Class 1 limits. The Class 2 limit is 70% of Class 1.

Of the nine structures four may benefit from further assessment to refine the restriction or map their future. Two are aging suspension bridge structures for which Structure Specific AMPs are to be prepared to address multiple issues / vulnerabilities. The Huatoki Street bridge is in an urban area and is servicing increasing volumes of traffic. Replacement of this structure is planned to address multiple Level of Service issues. The remaining two bridges are deemed appropriate currently.

The figure below illustrates the distribution of posted bridges within the network. Structures highlighted in orange are structures which may not require posting if further assessment and / or material testing is undertaken. Structures highlighted in blue will require Structure Specific AMPs. Structures with red crosses have no proposed actions while the green cross in the red circle is the Huatoki Street bridge which has a planned replacement.

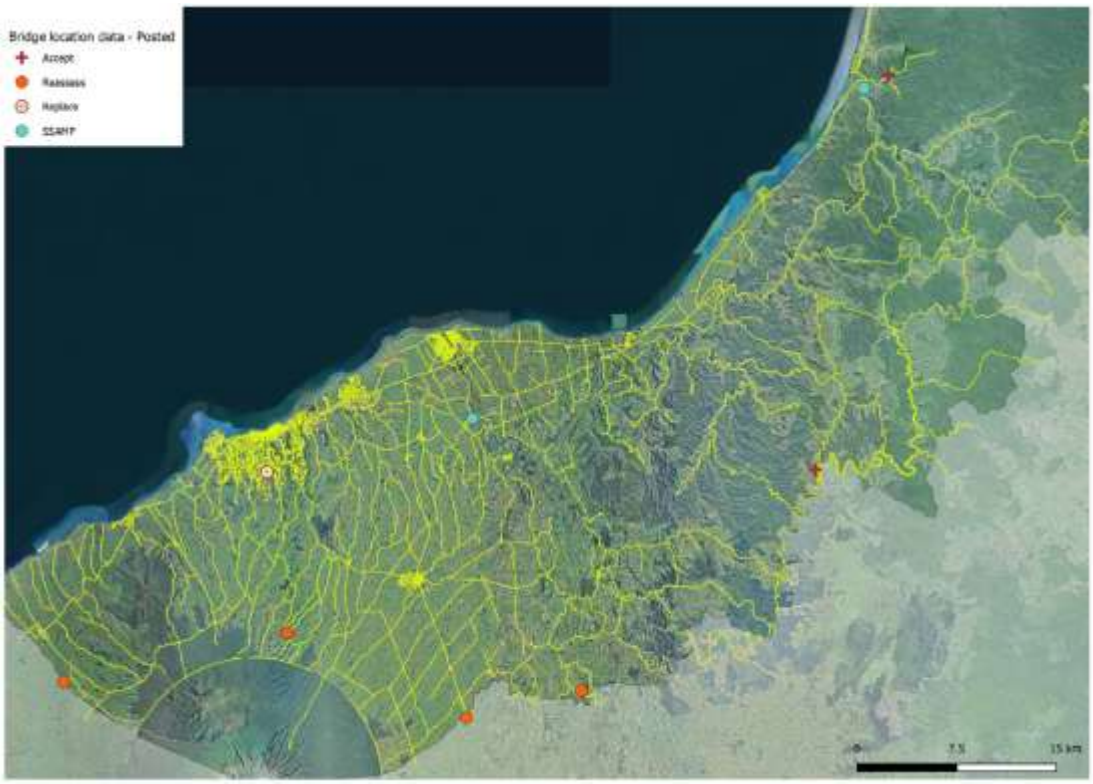


FIGURE 0-2: POSTED ROAD STRUCTURES

Traffic Capacity

There are currently 187 single lane structures on the transportation network. Most of these structures are on Low Volume rural roads. While single lane structures provide a lower Level of Service, the majority of the 187 structures are considered fit for purpose.

Notable exceptions to the above are the following:

- A series of single lane structures on Bedford Road South that regularly sustain damage from over width vehicles (suspected agricultural plant). Bedford Road South also serves as an emergency alternative route for SH3.
- Junction Street provides access across Te Henui Stream to the south of the city without accessing SH3. It currently carries a daily average traffic volume of 3,134. It is adjacent to planned growth areas in the Proposed District Plan which will increase delays at the bridge as development comes on stream. It is planned to increase the capacity of the bridge to two lanes.
- Carrington Road is also a route of increasing importance, particularly for tourism growth. Four (of eight) single lane structures on this route are on very poor alignment and present issues for tourist coaches travelling to / from Pukeiti. With the further development of cycle trails, pathways currently underway, there is potential for increased traffic volumes which will further present issues. Carrington Road could also serve as a bypass for SH45 in the event of a closure in the vicinity of Oakura.

The figure below shows the location of the width restricted bridges.

FIGURE 0-3: LOCATION OF WIDTH RESTRICTED BRIDGES

Structural Capacity

Bridges in the hill and high-country areas are susceptible to increased traffic volumes and weights from the developments in these areas e.g., forestry. This could potentially have a flow through effect as the forests reach maturity and are logged.

Apart from posted bridges there are no constraints on Class 1 compliant vehicles. The HPMVs routes will be typically determined by State Highway bypass routes which can be found on Waka Kotahi's Detour Routes website https://detours.myworksites.co.nz/.

Waterway Capacity

There are no significant problems with waterway capacity. Any minor problems are generally isolated to the smaller bridges. As with traffic capacity, any upgrading in waterway capacity warrants considering only when these bridges are replaced at the end of their serviceable lives.

In the eastern hill country and on the shoulders of Mount Taranaki, river channels are well contained in gullies and other natural low points. Peak flows can arrive at some sites very quickly and at high velocity, dependent on the intensity and duration of the storm event in the contributing catchment area. This can put significant pressure on waterway protection works, abutments and piers which can result in damage or losses. Debris build up at bridges can significantly reduce waterway capacity and cause turbulence and scouring around piers and abutments potentially resulting in undermining and instability of bridge and culvert structures. A proactive approach by TRC is required to actively manage catchments, particularly the effects of logging and allowing the stockpiling of debris in potential floodplains.

In lowland areas bridges and culverts generally have sufficient capacity to accommodate the flood flows in the formed channels they serve. During significant storm events overland surface flooding can cause disruption to the transportation network but these are not usually attributed to just the performance of individual bridges and culverts.

Planting, development and occupation of overland flow paths (flood berms) restrict flow paths and causes significant Level of Service issues. Another significant issue to be considered is 'sensitive' catchments. These are typically catchments of which the upper reaches are in steep country with the stream flowing onto flat land with a consequent sudden change in stream gradient. This often results in significant flooding in the lower reaches which is difficult to manage.

Side Protection

Few existing bridges and culverts have side protection (guardrails and barriers) which would meet current design standards. Single lane bridges with wheel guards seem to perform well as the vehicle angle of attack tends to be low. Many existing bridges are difficult to retrofit due to deck strength limitations; however, the approaches could be treated to achieve a reduction in risk.

Assessment of side protection of all existing structures is undertaken as part of the structural inspection regime. New structures should be rationally designed in accordance with current standards as appropriate to the environment and geometric constraints.

Natural Hazards

Bridges, culverts and structures are at risk from natural hazard events such as earthquakes, floods and the failure of attached and adjacent services e.g., water mains. Most bridges within the district were designed and constructed prior to 1980 when the first national guidelines for seismic design of bridges were published. It is only in recent times that adequate earthquake resistance has been incorporated into bridge designs. A seismic rise screening program should be based on network importance considering traffic volumes and alternative route availability. No earthquake risk assessment of the bridges in the district has been undertaken and this is a high priority risk item which is included as an action in Section 9: Improvement Plan of the AMP.

Operations and Maintenance Plan

Bridge Maintenance

General minor bridge and waterway maintenance and approaches maintenance is carried out as part of the Term Services Contract. A close working relationship between the Council, consultants and contractors ensures priority works are identified and completed with due haste and that budgets are monitored.

Operations and Maintenance Goals

Under the Road Maintenance Contract routine visual inspections occur as part of the contractor's general network inspection cycle. More detailed inspections are carried out during and after events that might threaten the safety or performance of bridges, such as floods, earthquakes or overloading.

Routine surveillance inspections check to identify:

- Waterway scouring or bed aggregation.
- Debris in the waterway and around piles and piers
- Damage or the deterioration of guardrails
- Wearing or loose timber deck planks
- Loose detritus on the deck
- Blocked deck drains
- Damaged signs and delineators

Maintenance programmes are developed from the schedules of defects identified during the inspections by both the network maintenance contractor and professional service consultant. Repair treatments and priorities are determined by considering the impact on:

- Public safety
- Traffic movement and road hierarchy
- Maintaining structural integrity and serviceability
- Future costs if the work is not done.

The works in the bridge maintenance programme are the most cost-effective responses to the needs identified, except where shorter term but lower cost remedies are selected when budget limitations apply, and safety is not compromised. From an asset management perspective, the following are also required:

- Protect the investment in assets by extending the life of the structure.
- Minimise repair costs.

In addition to the work identified through the routine inspections discusses above, other types of maintenance work can include:

- Repairing structural defects, e.g., concrete spalling, corroded fastenings, rotten timber, undermining of foundations
- Repairing or replacing damaged components, e.g., wheel guards and handrails
- Restoring protective coatings, e.g., painting
- Restoring or cleaning deck expansion joints
- Watercourse training
- Repairing road approach and abutment settlements
- Cleaning around bearings

Maintenance Standards

- Waka Kotahi's Bridge Inspection and Maintenance Manual
- TNZ S6 Bridges and other significant highway structures inspection policy
- TNZ S8 Tunnels management and inspection policy
- Other relevant NZ and other standards for design, construction and workmanship

Renewal and Capital Work

Renewals

Renewal is undertaken when a structure, or significant component has reached the end of its useful economic life, i.e., it is more economical to replace or rehabilitate the structure or component than to continue maintaining it.

Renewal can include:

- Replacement of an entire structure
- Replacement of individual structural components e.g., bridge deck, bearings, handrails
- Rehabilitation to restore the structural integrity of components, e.g., reinforcing repairs.

Reasons for renewals can include:

- Deterioration of the structure of component
- Damage to the structure or component via flood, earthquake or vehicle impact

- The waterway's characteristics have altered to the extent that the bridge can no longer pass the design flood flows.

Renewal needs are:

- Identified through routine and detailed inspections.
- Confirmed through detailed structural investigation.
- Validated by economic justification of net present value option consideration.

Renewal needs are identified, and priorities allocated, from inspections and specific structural inspections. The economics of renewing these bridges are then reviewed, by looking at the net present value of the various options, including the 'do minimum' option, for a 30-year analysis period.

Uneconomic Bridges

Economic assessment of bridges also requires the corresponding portion of road serving the bridge to be considered. The Waka Kotahi policy goes on to state "On application, [Waka Kotahi] will consider the eligibility of non-maintenance activities on uneconomic roading facilities for financial assistance on a case-by-case basis".

Consideration of divestment or retention of these bridge and culvert assets needs to be formalised to provide future direction for asset management and forecast expenditure.

Renewal Works Standards

Replacement bridges are built to modern engineering standards. They are usually constructed of concrete, although steel beams and concrete decks may be considered.

Single lane bridges are replaced with new single lane structures, unless there are known capacity issues or significant future growth forecast. The adopted width for new single lane bridges is 4.2m, which allows for any vehicle that will fit through a standard farm gate.

Two lane bridges are replaced with new structures with two 3.3m wide lanes and a footpath(s) where appropriate. When old bridges are replaced, the new structures are provided with protective railing or sight rails to current standards, regardless of the railings that were present on the previous structure. Bridges with spans of less than 5m or so are generally replaced with large culverts, as these are cheaper; however, in some circumstances resource consent requirements may require construction of a bridge to avoid the impact on a waterway.

Capital Bridge and Culvert Works

New improvement works fall into the following categories:

- Construction of new structures to allow land development or to achieve traffic efficiencies by providing links across significant features (waterways, grade separation – roads under and over, etc.,)
- Upgrading of existing structures to carry increased traffic or heavier loads than they were originally designed for.

- Provision of new bridges as part of land developments. There are normally fully funded by the site developer.

Development Strategy

The Council will generally only consider constructing a significant new bridge if the project is subsidised by Waka Kotahi.

The total benefits to road users and the land transport system, cost benefit ratios and first year rates of return are all calculated using the economic evaluation procedures found in Waka Kotahi's Economic Evaluation Manual.

If prioritisation is required, it will normally be by ranking projects in terms of Waka Kotahi's funding criteria. The Council may contribute to the cost of a non-subsidised bridge on a public road if there are strong reasons why it should be built, and provided the cost to the Council does not exceed its share if the bridge had been subsidised, though the Council may contribute less where there is reduced benefit to the wider public.

New bridges can also be funded through Development Contribution and Financial Contribution levies on new land development and subdivisions. These can be required in situations where a bridge is necessary to improve the roading connectivity between and within new and expanding development areas.

Disposal Plan

Bridges on roads which service single properties may be reviewed for disposal. The Council may decide that bridges identified in any review process for disposal will no longer be maintained by the Council but will be subject to a legally binding agreement with the adjacent property owner. The council could decide to either:

- Undertake routine inspections on these bridges, paid for by the adjacent property owner who will be responsible for all maintenance requirements identified, or
- Decommission the bridge to reduce potential Council liability.

All relevant costs of disposal will be considered when considering disposal options. These costs may include:

- Evaluation of options
- Consultation / advertising
- Obtaining resource consents
- Professional services, including engineering, planning, legal, survey.
- Demolition, site clearing or the cost of making safe.

The use of revenue arising from the sale of assets, or the source of funds required to dispose of assets, would be considered by the council at the time of its consideration of any asset disposal.

A bridge may be disposed of if it is uneconomic, unsafe or becoming so, and it is not in the public interest to maintain it in an appropriate safe condition. Disposal of bridges can be carried out in the following ways:

- Sale
- Gifted
- Demolished and replaced with a concrete ford.
- Demolition without replacement

There are no bridges, large culverts or retaining wall assets to be disposed of at this time, but this will need to be reviewed and reassessed during the life of this AMP. Typically, a structural asset is not disposed of, although maintenance is stopped. However, the asset is still inspected for defects as a duty of care to the public. An example of this is the bridge on Plantation Road (ID #430) which was vested with NPDC when Waka Kotahi realigned SH3.

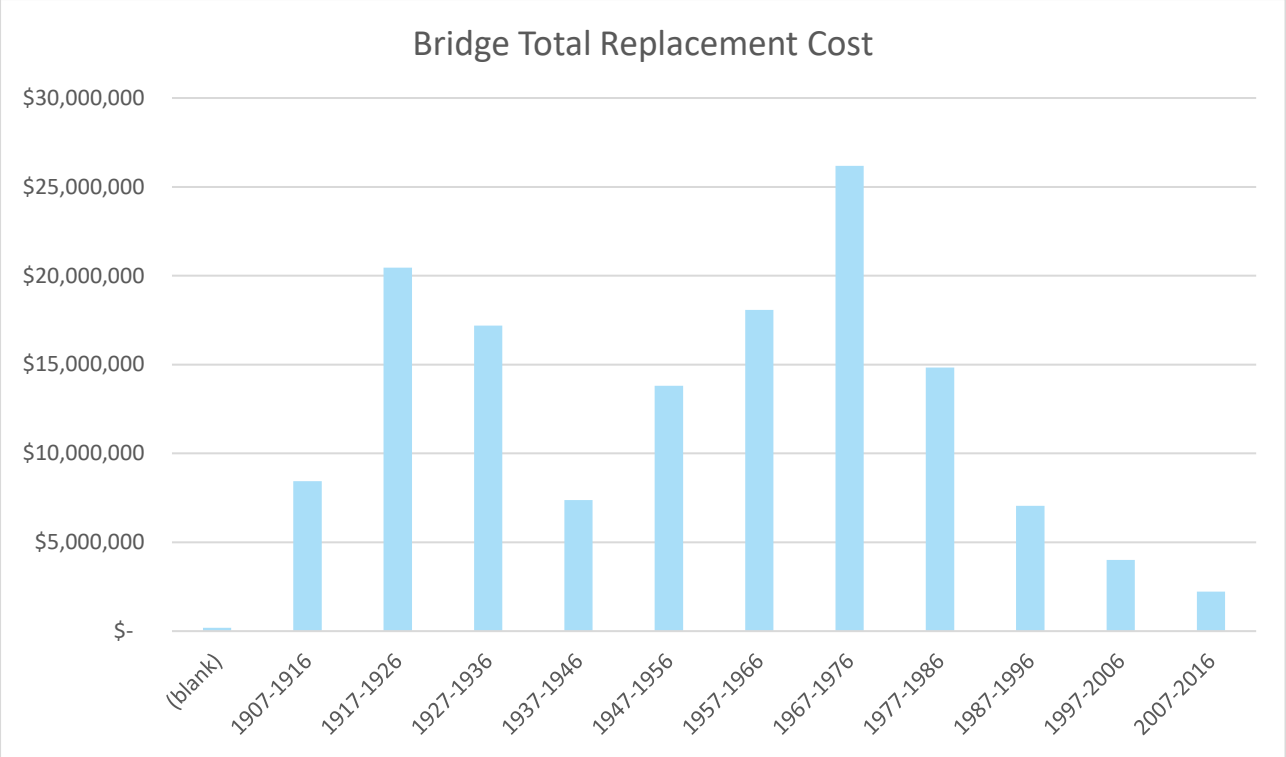
6.4.1 Background Data

Physical Parameters

The assets covered by this AMP are shown in the table below.

Asset Category	Dimension	Replacement Value
Bridges (including tunnels and large diameter culverts)	255	$139,977,959
Retaining Walls	326	$24,972,987
Total	581	**$164,950,946**

The age profile of the assets is shown below.

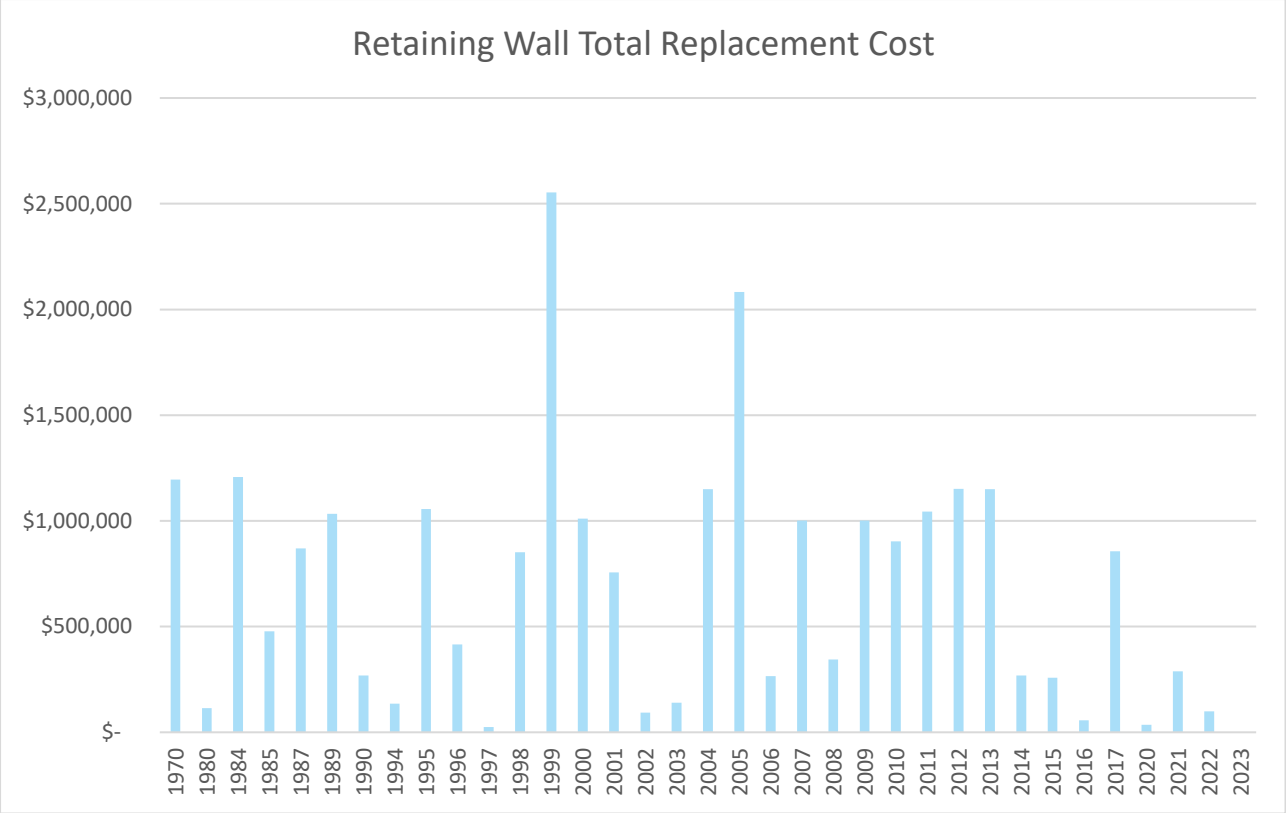


All figures are shown in current day dollars.

The average age is 63 years which is representative of the wider New Zealand bridge stock. With a typical expected service life of 100 years for bridges, this indicates that the bridge stock is aging, and that increased maintenance expenditure would be expected to maintain the current levels of service.

50 bridges (30% of the bridge stock) are older than 80 years.

Bridge 104a (Oxford Road), at 114 years, is the oldest recorded bridge on the network with a construction date of 1906. This in-situ concrete arch (widened in 1945) is in fair condition and can be expected to remain in service for many years subject to suitable maintenance and no required increase in level of service.



All figures are shown in current day dollars.

Based on recorded age, the average age of the retaining wall stock is 23 years which compares with an expected service life in the order of 80 years.

On this basis, the maintenance demands would be expected to be relatively modest, however, in the absence of any inspection records to confirm condition or maintenance history, it is not possible to confirm this is the case.

There are no retaining walls older than 50 years recorded in RAMM which raises questions over the data accuracy.

It is recommended that retaining walls be added to the inspection schedule and inspections of the entire network be completed as soon as possible to provide greater confidence in network condition and maintenance requirements.

Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in the table below:

Bridge Number	Location	Service Deficiency
38	Bedford Road (South) RP2.512	Narrow bridge – Replace existing superstructure with single lane superstructure complying with current recommended limits for single lane bridge.
138	Bertrand Road East RP2.257	Aging suspension bridge with numerous condition issues – Develop Structure Specific Asset Management Plan
63	Carrington Road RP14.620	Narrow bridge on poor alignment. Increasingly important route - Replace
65	Carrington Road RP18.854	Narrow bridge on poor alignment. Increasingly important route – widen structure.
68	Carrington Road RP19.860	Narrow bridge on poor alignment. Increasingly important route – widen structure.
59	Corbett Road RP3.714	Narrow bridge on busy road – Replace existing single lane with two-lane bridge
209	Huatoki Street RP1.362	Single lane three-span steel beam, timber deck bridge servicing residential and tourist traffic. Bridge has numerous levels of service issues – Replace structure
129	Inland Road North RP3.516	Disused corrugated metal underpass at end of life and no longer required – Remove and backfill.
214	Junction Street RP0.289	Narrow bridge on high volume road - Replace
96	Kent Road RP7.047	30kph restriction indicates approximately 10% below General Access Limits. But NPDC previously assessed as Class 65, Grade 1. – Review load assessment.
300	Makara Road RP2.921	Span was shortened by 1.15m several years ago. Need to confirm if this was accounted for in current posting. – Review load assessment.
99	Mangatete Road RP0.725	Previously assessed by NPDC as Class 90. Grade does not align with current posting – Review load assessment.
5	Mokau Road (SH3) RP37.262	Aging suspension bridge with numerous condition issues. *AADT value and % heavy clearly incorrect. – Develop Structure Specific Asset Management Plan.
192	Ngatoto Road (North) RP7.602	Bridge upgraded 1995. Speed limit appropriate for site/location.
103	Old Mountain Road RP1.472	Previously assessed as Class 100, Grade A. Should not require posting – Review load assessment.
169	Puke Road RP2.642	Prone to flooding, limited hydraulic capacity – Replace
274	Roa Road RP 0.119	Bridge upgraded 1995. Speed limit appropriate for site/location.

The above service deficiencies were identified from the Road Structures Life Cycle Management Plan 2023.

Asset Condition

Bridge structures are inspected in accordance with the current Waka Kotahi Bridge Inspection Policy (TNZ S6). Bridge structures are inspected with the frequency outlined in the table below:

FIGURE 0-4: BRIDGE STRUCTURAL INSPECTION FREQUENCY

Inspection Type	Inspection Frequency (Years)
General	2
Principal	6
Special	1
Posted Bridges	1
Others	As required and generally occur following a significant natural event

Superficial six-monthly inspections are undertaken by the contractor under the Term Services Contract. These inspections are carried out as part of the normal inspection cycle for the roading network.

Maintenance schedules prioritising maintenance, repairs and further inspections are prepared annually.

Culvert structures are also inspected in accordance with the current Waka Kotahi Bridge Inspection Policy (TNZ S6). Inspections are completed with the frequency outlined in the table below.

Structure Category	Inspection Frequency (Years)	
	General	Detailed
Large Culverts (>3.4m2) *	2	6
Major Culverts 1**	6	-
Major Culverts 2***	6	-

*Large Culverts: Waterway area greater than 3.4m2 treated as a bridge

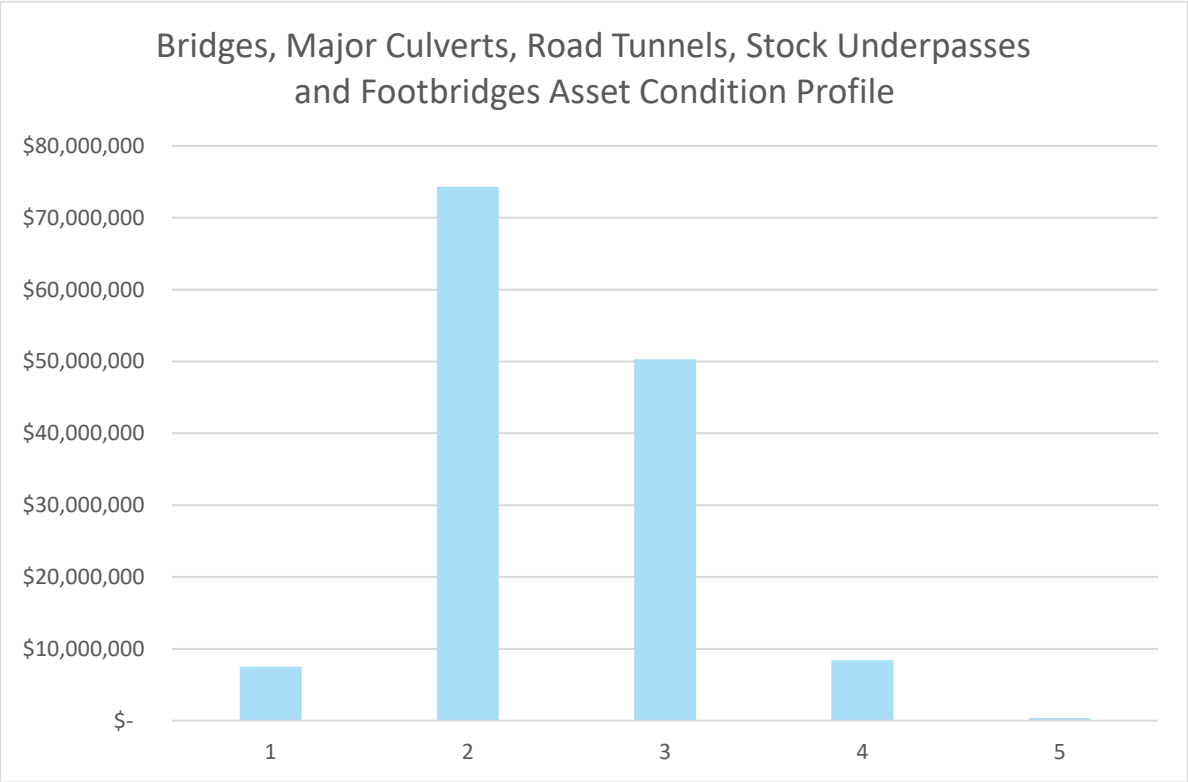
**Major Culverts 1: Culverts >900mm diameter (or equivalent area) and <3.4m2

*** Major Culverts 2: Culverts >600mm diameter (or equivalent area) and <900mm

Culverts of less than 600mm diameter or equivalent area are inspected every five years by the network maintenance contractor and include a superficial inspection of inlets, waterway and barrels prior to winter for potential blockage.

Inspections are reported on an appropriate form, which is then uploaded into RAMM. A Summary Report, and Maintenance Schedule prioritising maintenance, repairs and further inspections are prepared periodically by six zones, spanning across the district from west to east.

Retaining walls are scheduled for detailed inspections every 6 years. The inspection regime identifies condition, maintenance and renewal requirements.



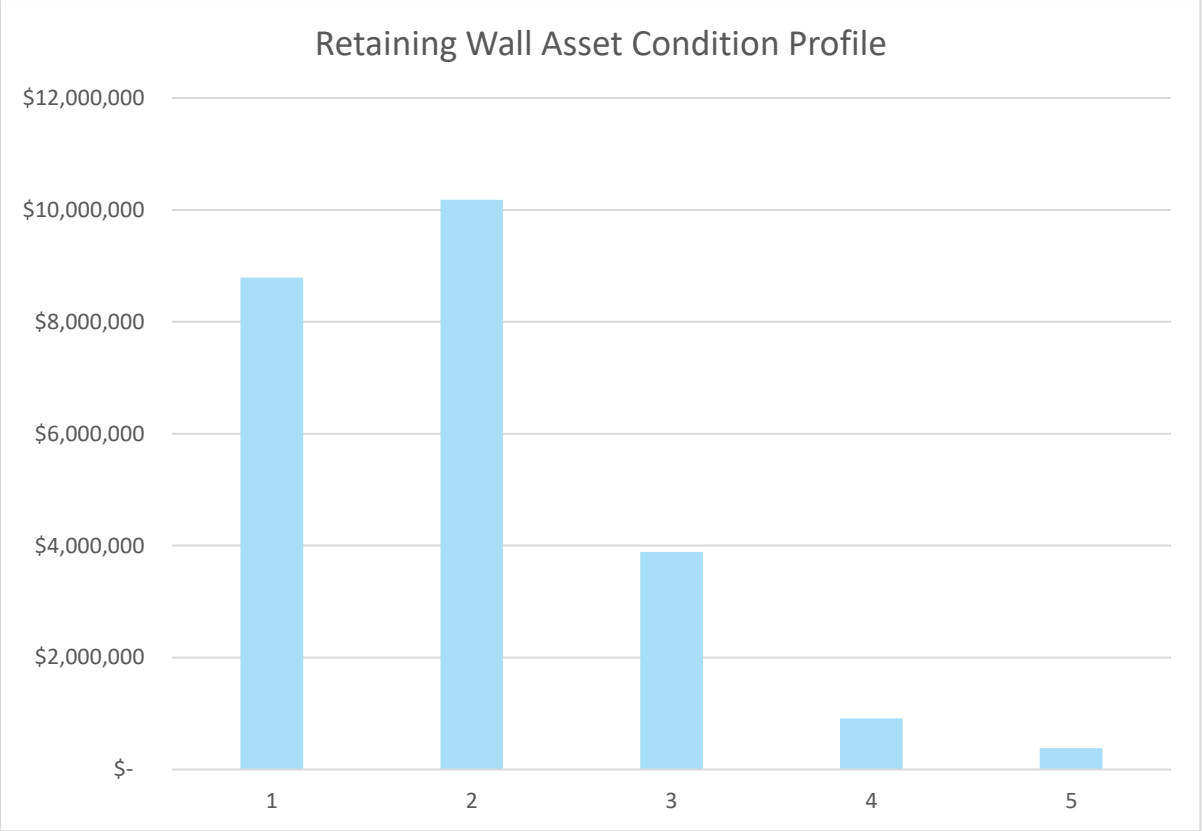
All figures are shown in current day dollars.

Based on the above, the network is in 'Good-Average' condition which is indicative of a healthy network with appropriate maintenance expenditure and programmes. Structures in 'Poor' condition is expected to have defects affecting performance/structural integrity and likely require intervention within 6-18 months. There are 53 structures (14% of network) rated in 'Poor' condition on the network. These structures are expected to be the focus of current and upcoming maintenance programmes.

There are two culverts rated in 'Very Poor' condition:

- Morley Street Culvert – No.22: Sever undermining of arch foundations.
- Wiri Road Culvert – Buried corrugated metal culvert at end of life.

It is recommended that, whenever significant works are completed that improve the condition rating of a structure to 'Average' or better, that a General Inspection and rerating of the structure be undertaken on completion of the works as a handover inspection. This will ensure currency of the overall network condition rating.



All figures are shown in current day dollars.

Based on the above, the network is in 'Good' condition. It is noted that there are 75 retaining walls that have not had a condition rating in the last 6 years. It is important that these retaining wall inspections are prioritised to validate the network is still in 'Good' condition.

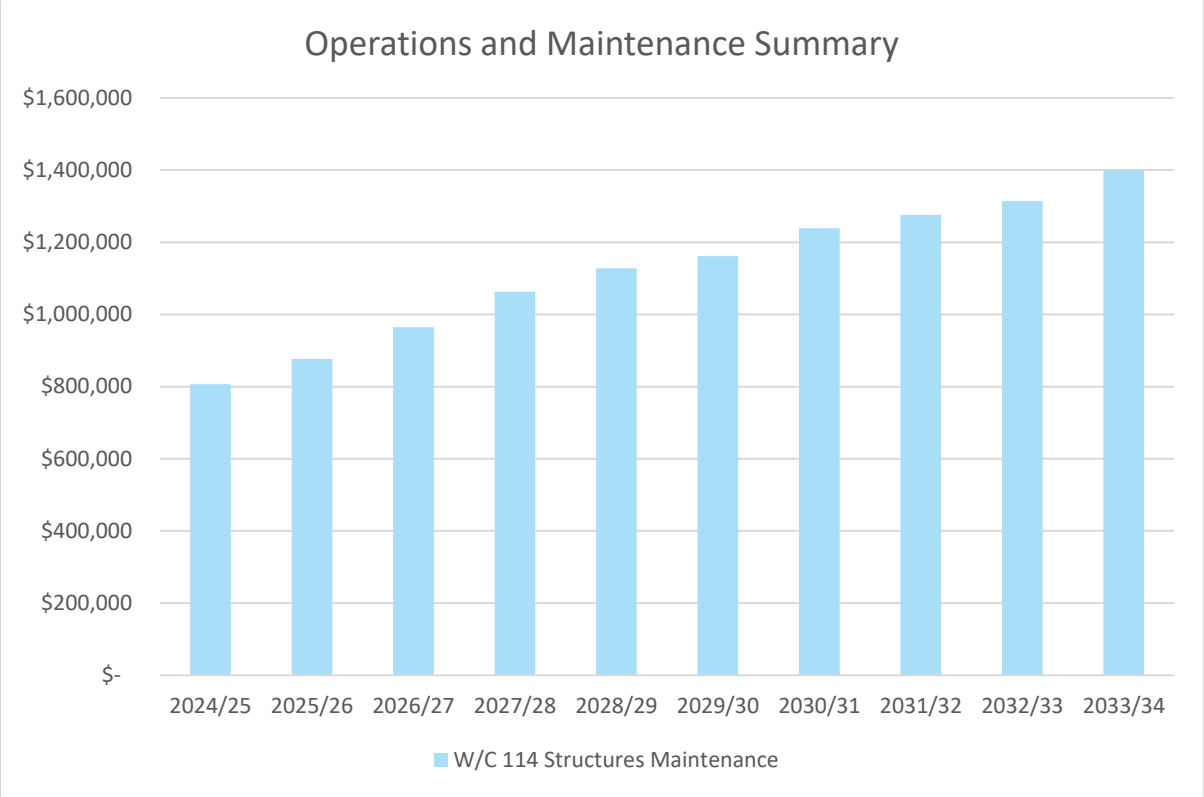
6.4.2 Operations and Maintenance Plan

The trend in maintenance budgets is shown in the table below:

Year	Maintenance Budget $
2021/22	$1,065,900
2022/23	$1,071,900
2023/24	$1,048,700

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget



All figures above include predicted inflation.

6.4.3 Renewal Plan

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in the table below. Asset useful lives were last review on 15th July 2022.

Asset (Sub) Category	Useful Life
Concrete Bridge	100 years
Box Culvert	100 years
Concrete Pipe	60 years
Aluminium Culvert	60 years
Steel Culvert	40 years
Earth Fille Arch	100 years
Ford	80 years
Pedestrian Bridge	80 years
Pedestrian Underpass	60 years
Road Tunnel	100 years
Steel Beams	70 years
Suspension	70 years
Timber	50 years
Twin Box Culvert	100 years

Retaining Wall - Block	80 years
Retaining Wall - Concrete	80 years
Retaining Wall – Reinforced Earth	80 years
Retaining Wall - Steel	80 years
Retaining Wall - Stone	50 years
Retaining Wall - Gabion	80 years
Retaining Wall – Stone- Rock	50 years
Retaining Wall - Timber	60 years

The estimates for renewals of structures are based on Asset Register data.

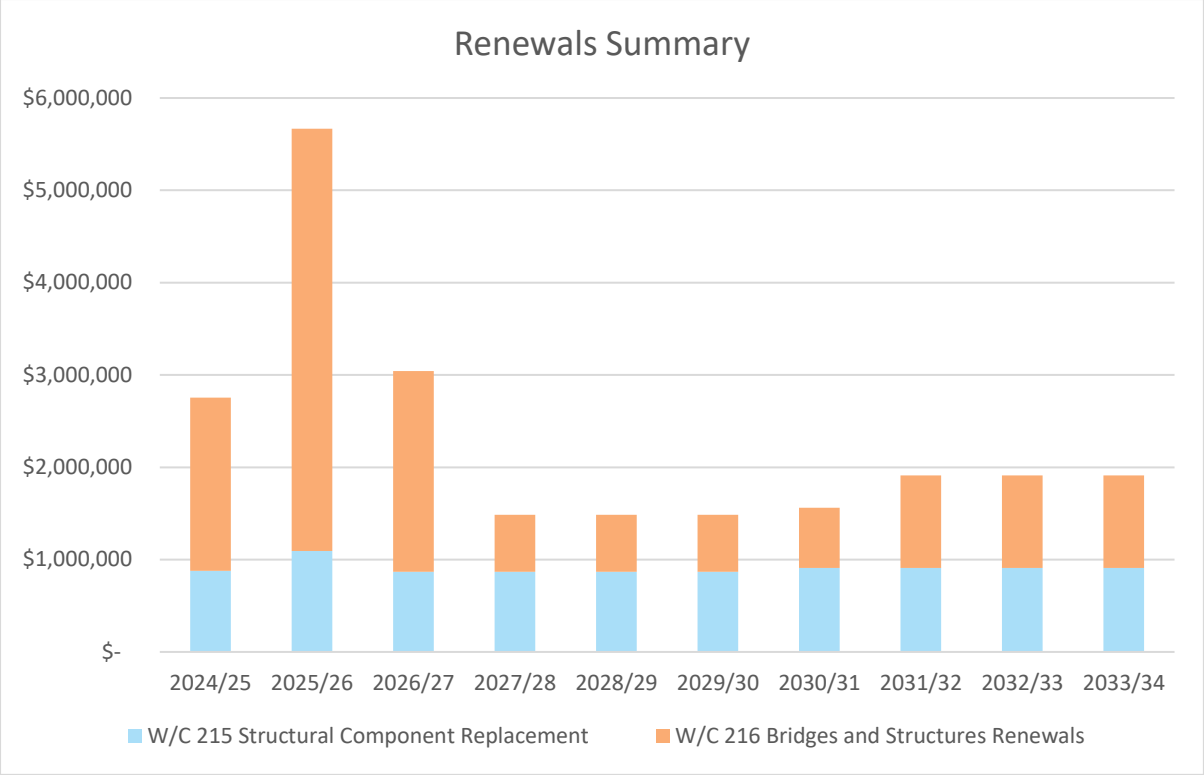
Renewal ranking criteria.

The ranking criteria used to determine priority of identified renewal proposals is detailed in the table below:

Criteria	Weighting
Condition	80%
Hierarchy (ONF)	10%
Safety	10%
Total	**100%**

Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.



All figures above include predicted inflation.

6.4.4 Acquisition Plan

Selection criteria

The priority ranking criteria is detailed in the table below:

Criteria	Weighting
Overarching Strategies	30%
Roading Hierarchy (ONF Gap Analysis)	30%
Safety Assessment	30%
Risk	10%
Total	**100%**

Summary of future asset acquisition costs

When an entity commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the entity. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown below.

Other assets that have been identified for acquisition include the Coastal Walkway Extension from Bell Block to Waitara. This will extend the current walkway by approximately 10km at a width of around 2.6m, giving a total length of around 23km.

This project will be built in stages, starting late 2023 and finishing in 2027:

- Stage 1 – From Waitara to the intersection of Brown and Tate roads (2023 – July 2024)
- Stage 2 – Bell Block to New Plymouth Airport (July 2024 – end of 2025)
- Stage 3 – From the intersection of Brown and Tate roads to New Plymouth Airport (end of 2025 – end of 2027).

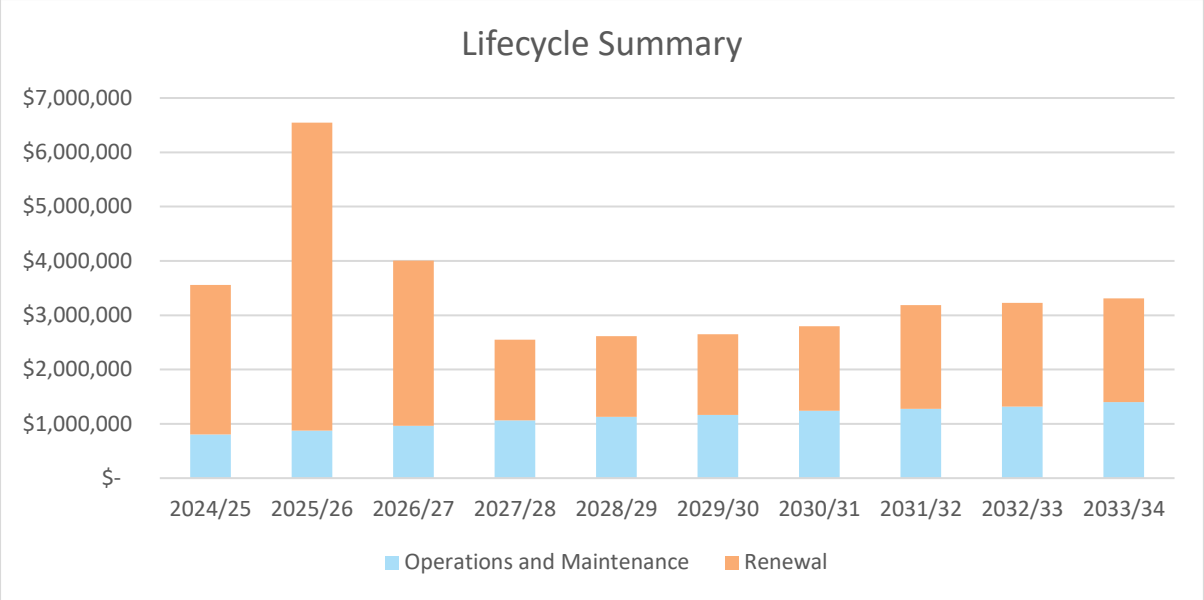
The expected assets and value are shown below.

Stage	Type	Width (m)	Length (m)	Estimate
1	Board Walk	2.6	274	$536,000
1	Board Walk	1.2	312	
2	Waitaha Stream Bridge	3.0		$428,000
3	Waiongana River Bridge	3.0		$1,103,000
Total			**586**	**$2,067,000**

6.4.5 Lifecycle

The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.



The consequence of not funding structures maintenance and renewals can have significant negative impacts on infrastructure integrity, public safety, and transportation efficiency. Some of the potential consequences include:

- Structural deterioration: Without adequate funding for structures maintenance and renewals in roading, infrastructure such as bridges, tunnels, and retaining walls can deteriorate over time. Lack of regular inspections, repairs, and preventive maintenance can lead to structural weaknesses, corrosion, and degradation. This can compromise the integrity of the structures and increase the risk of structural failures, putting public safety at risk.
- Increased risk of accidents and injuries: Neglected structures in roading can pose safety hazards to motorists, pedestrians, and cyclists. If bridges, tunnels, or other infrastructure elements develop structural issues or defects, there is an increased risk of accidents, collapses, or falling debris. These incidents can result in injuries or fatalities, endangering the lives of road users.
- Disruptions to transportation networks: Structures such as bridges and tunnels are critical components of transportation networks, facilitating the flow of traffic and ensuring connectivity. Insufficient funding for maintenance and renewals can lead to increased closures, weight restrictions, or reduced capacity of these structures. This can disrupt transportation networks, causing traffic congestion, detours, and delays for motorists, emergency services, and freight transportation.
- Costly emergency repairs: Neglecting structures maintenance can result in the need for emergency repairs or reactive interventions when structural issues are identified. Emergency repairs are often more expensive and can cause significant disruptions to transportation operations. Without adequate funding for proactive maintenance and timely renewals, the cost of repairs and rehabilitation can escalate, putting additional strain on already limited resources.
- Limited accessibility and mobility: If structures in roading are not adequately maintained or renewed, weight restrictions or closures may be imposed to ensure public safety. This can limit accessibility and mobility for certain vehicles, impacting commercial transportation, emergency

response, and public transit services. Reduced accessibility can also affect the connectivity of communities, causing inconvenience and isolation for residents.

- Detrimental impact on the economy: Infrastructure plays a vital role in supporting economic activities and facilitating trade. Neglected structures can hinder the movement of goods and services, impacting supply chains, logistics, and regional connectivity. Delays and disruptions caused by deteriorated structures can result in increased transportation costs, decreased productivity, and lost economic opportunities for businesses and communities.
- Public dissatisfaction and loss of trust: When structures in roading are not adequately maintained or renewed, it can lead to public dissatisfaction and a loss of trust in the government's ability to ensure infrastructure safety. Road users may perceive it as a lack of investment in public infrastructure, compromising their confidence in the authorities responsible for infrastructure management and maintenance.

To avoid these consequences, it is crucial to allocate sufficient funding for structures maintenance and renewals in roading. Regular inspections, proactive maintenance programs, timely repairs, and rehabilitation projects are necessary to ensure the integrity, safety, and efficiency of structures within transportation networks. By prioritizing structures maintenance, we can mitigate risks, enhance public safety, and maintain a reliable and resilient transportation infrastructure system.

6.4.6 Disposal Plan

Assets identified for possible decommissioning and disposal are shown in the table below. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in the table below. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Asset	Reason for disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Bridge 129 – Jury Underpass	Disused corrugated metal underpass at end of life.	24/25	$0 (owners are responsible for disposal costs of stock underpasses)	Minimal savings as landowner is responsible for maintaining asset – council pays for inspection of asset to mitigate risk.

6.5. Drainage

The purpose of stormwater drainage facilities is to adequately protect the road structure from water related damage, restrict excess runoff onto adjacent properties, keep the carriageway available and safe to traverse in all but extreme rainfall events, delineate the carriageway and provide some aesthetic and safety benefits.

Key issues relating to the asset group are:

- There is a programme in place to install kerbs and channels in some urban areas where there are currently none (e.g., Waitara, Inglewood)
- Other new works programmes (e.g., footpaths) depend on the kerb and channel program.

- Installation of kerbs and channels is heavily dependent on the availability of a piped stormwater system, and therefore linked to any improvement programmes for that system, managed by the Three Waters Team
- Maintaining effective rural roadside drainage is important to ensure pavements are well drained and to minimise lifecycle costs for pavements.
- Kerbs and channels are installed mainly in urban areas and are easily damaged by cars and heavy vehicles.
- Ponding areas in rural areas (stormwater culvert, inlets, outlets)

Open water channels / roadside drains in rural areas are defined as the area between the edge of the pavement shoulder metal-course and the bottom of the 'v' drain or water table. In order to maintain the effectiveness of the rural roadside drainage function this area must be maintained true to cross-section.

Stormwater culverts installed in rural areas and their associated drainage structures such as channels, sumps, headwalls, etc. provide drainage infrastructure for the rural road network. Most of these stormwater culverts are 300mm to 375mm in diameter, but there are some pipes up to 1m in diameter.

Drainage Asset Condition

Kerb and channel asset condition is based on the All-Faults inspection regime. Asset defects are logged and assigned a priority based on the severity of the defect. The Council uses the overall ratings for the whole pavement to derive the condition of kerbs and channels, based on the information used to select sections of pavement for renewal or rehabilitation.

Stormwater culverts and inlets / outlets are inspected during planned and reactive maintenance. A record of observations is compiled to assist or justify further repair works or renewals.

The Council does not formally capture condition ratings on the RAMM asset inventory for kerb and channel assets or stormwater culvert and inlet / outlet assets.

Typical modes of failure for kerbs and channels are:

- Lack of waterproofing – this is the key failure mode as leakage of water into pavement basecourse can accelerate pavement deterioration.
- Damage from heavy vehicles – kerbs can be subjected to heavy vehicle loads, particularly at changes in alignment (e.g., intersections)
- Ponding – channels may not perform adequately due to inadequate grade. This can be caused by settlement of the subgrade or the adjacent pavement.
- Deterioration arising from weak material and/or construction deficiencies – use of weak or non-compatible aggregates may result in reduced expected lives. Similarly, poorly constructed concrete kerbs and channels have typically shorter lives than well-constructed ones.

For rural assets the primary modes of failure for other drainage facilities are:

- Blockage or material failure of stormwater culverts causing ponding of stormwater and overflow over land or roads, resulting in scour and other damage.
- Accumulation of vegetation, detritus and other material in water channels. A key challenge is the loss of depth affecting the ability to remove and keep water below the pavement sub-grade level.

Operations and Maintenance

Urban

In urban areas, maintenance of kerbs and channels, and sumps is part of the Term Services Contract. Street cleaning is also an activity included in the contract. The function of the road determines the Level of Service. For example, a CBD will have a higher frequency of cleaning for aesthetic purposes.

Maintenance activities include repairing minor breakages and defects and replacing some short lengths of kerb and channel.

Rural

In rural areas, both stormwater culverts and water tables are maintained under the Road Maintenance Contract. This includes checking and cleaning stormwater culverts, minor repairs, vegetation control and other activities to ensure that water tables are kept clean and function effectively.

Water Channels

Maintenance of water channels involves mowing and total vegetation control using chemical spraying on the bottom of roadside drains on a cyclic basis, combined with targeted cleaning on a need only basis. A key environmental issue that has arisen in recent years is the establishment of noxious weeds. An increased amount of spraying is required to maintain these table drains.

Stormwater Culverts

NPDC maintain stormwater culverts as part of reactive maintenance; however, condition inspections as part of the Road Maintenance Contract also allow maintenance items to be planned where necessary.

Renewal and Capital Works

Urban

Most kerb and channel renewals are coordinated with the resealing programme. Kerbs and channels are relatively young (about 50 years) and most of the stock has not yet reached the end of one cycle.

Approximately 2km of kerb and channel is renewed per year and the following observations have been made:

- Because the stock is relatively young, the length of kerb and channel failing per year is relatively low. As the stock ages it is anticipated that the lengths requiring replacement per year will increase.
- The assumed effective life for these assets may be too short. Some local authorities in the North Island assume effective lives of 100 year, which is longer than NPDC's 80 years. However, it is important that failure modes are compared as well. NPDC will continue to review the effective life assumptions as more data becomes available.

Rural

Until NPDC has condition ratings for all stormwater culverts, it is difficult to give an accurate prediction of renewal requirements. Currently, the Council replaces stormwater culverts that have deteriorated to such an extent that they will adversely affect the integrity of the road.

The Council reforms roadside drains, when necessary, as identified through routine inspections.

As surface water channels and other drainage facilities continue to age, more investment in renewal may be required in order to maintain current reliability levels. There will be a greater understanding once the drainage inspections are completed.

To keep up with the planned rate of pavement renewals and allow sufficient expenditure to keep stormwater culvert assets safe and fit for purpose, the Council will need to continue to renew stormwater culverts and kerb and channel assets at similar rates to the 2021-24 NLTP. This will allow sufficient expenditure for kerb and channel renewal.

New assets installed by developers to serve new developments are usually vested in NPDC. Assets are built to the NZS4404:2010 – Land Development and Subdivision Standard. The Council assumes full responsibility for any assets vested in it and they are included in operations, maintenance and future renewal plans.

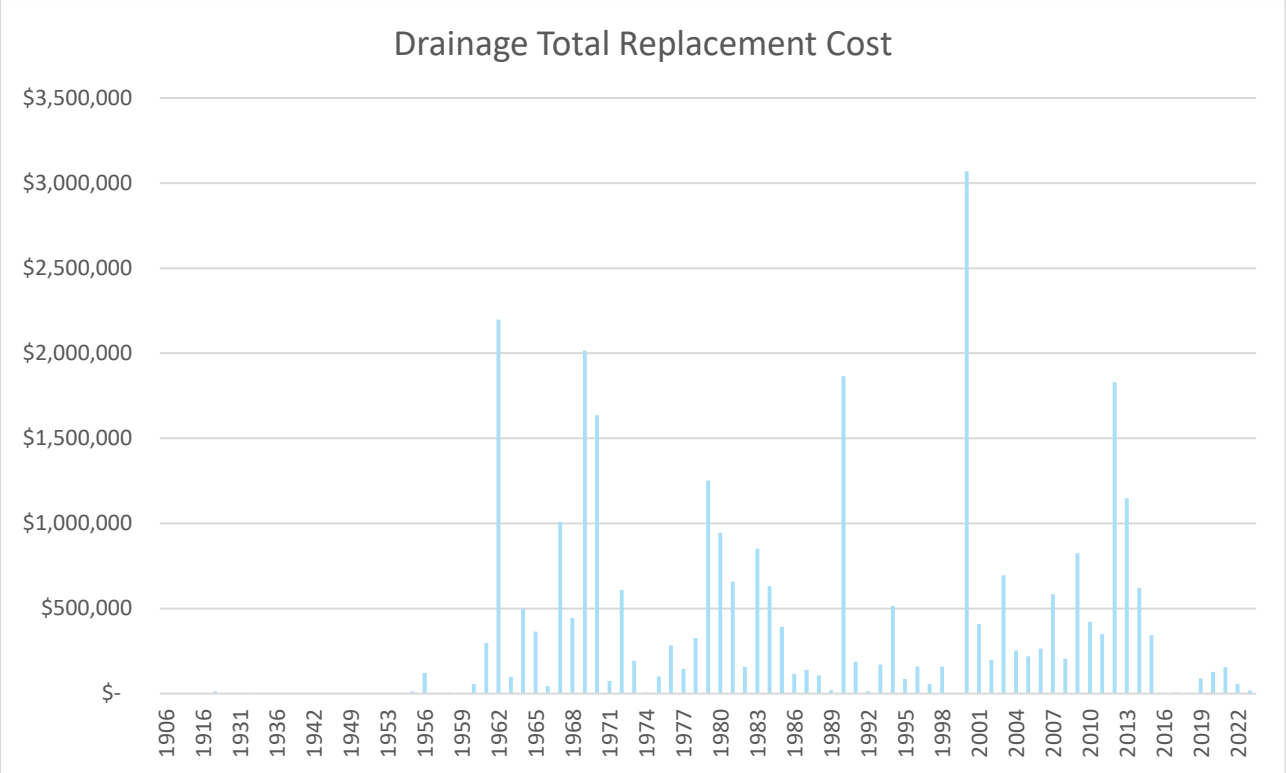
6.5.1 Background Data

Physical parameters

The assets covered by this AMP are shown in the table below.

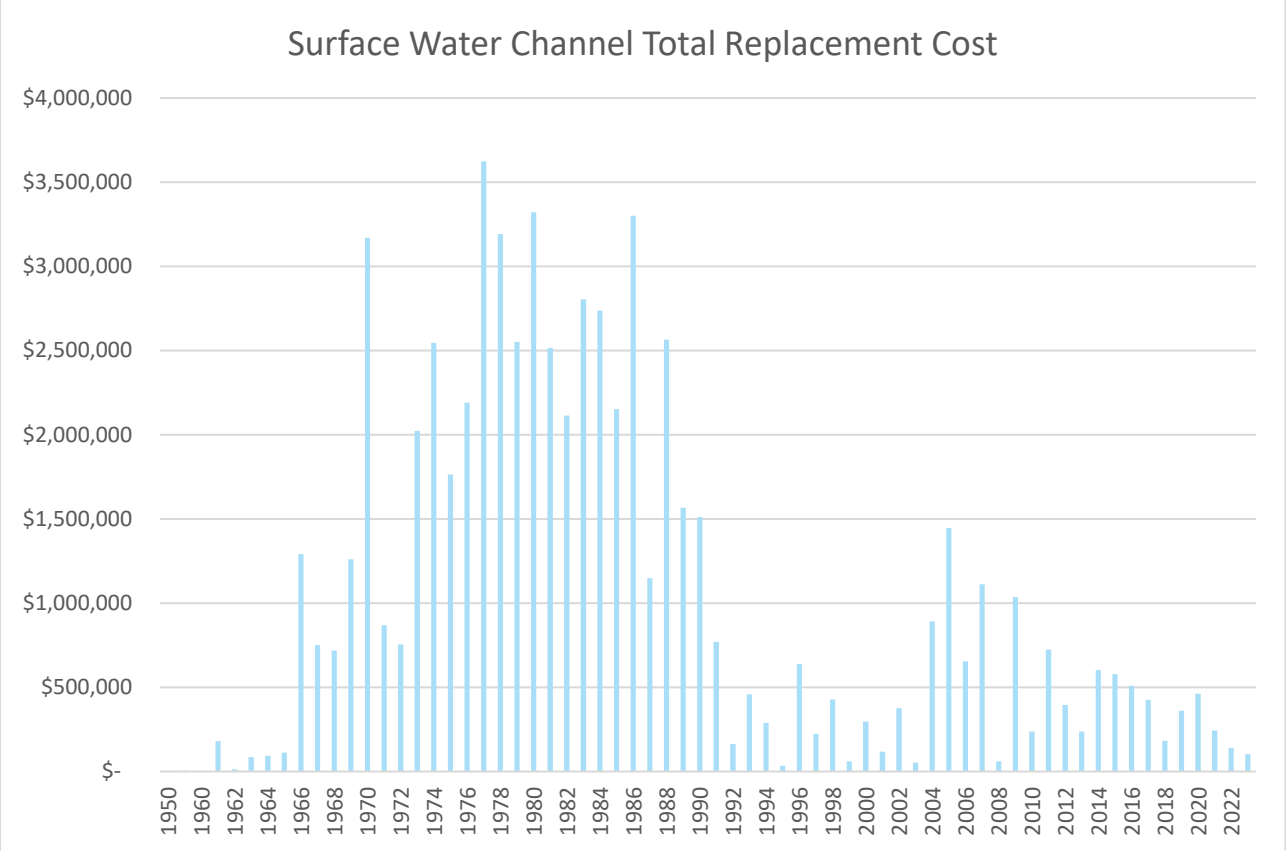
Asset Category	Dimension	Replacement Value
Drainage	64,565 metres	$30,467,902
Surface Water Channel	2,442,937 metres	$66,484,026
Total		**$96,951,928**

The age profile of the assets is shown below.



All figures are shown in current day dollars.

Many construction dates in our asset register have Christmas dates as approximations of the year the asset was constructed. Therefore, little emphasis should be placed around the age, and the condition should be one of the primary factors for renewals. Concrete culverts typically have a design life of 80 years, so there is no immediate concern, however the conditions should be monitored to ensure this is the case.



All figures are shown in current day dollars.

The above data shows most surface water channels were constructed between 1970 and 1990. Much like the drainage table, the surface water channel is predominantly made up of Christmas dates which means the year is an approximation and caution should be taken. There is no immediate concern. However, the condition should be monitored.

Asset capacity and performance

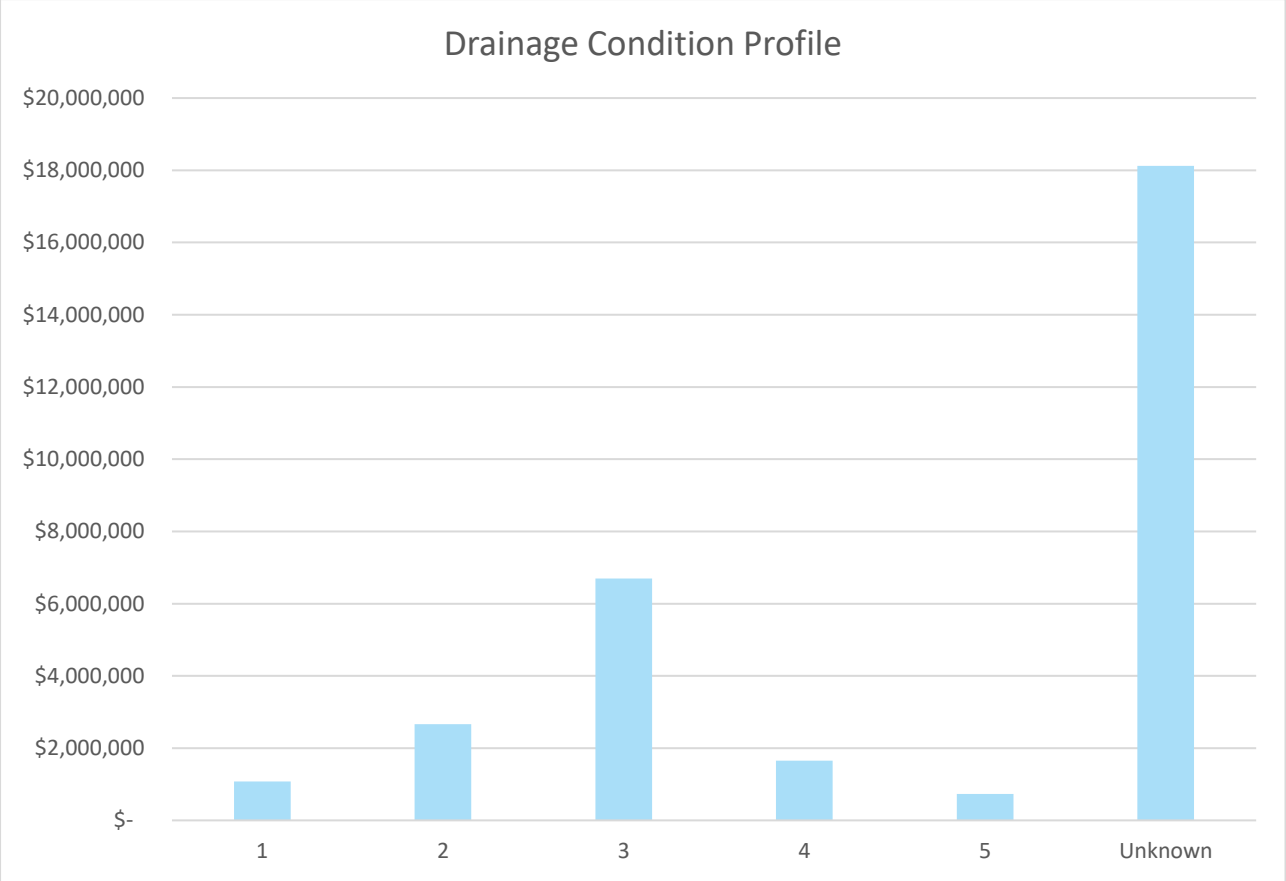
Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in the table below:

Location	Service Deficiency
Waitara	Urban environment with no kerb and channel
Clifton Ward	Large amounts of slips due to slope instability of papa rock
Rural Network	We have 50km of surface water channels that are less than 20mm below the seal edge and are deemed shallow

Asset Condition

Drainage condition data is collected by our rural inspector with the support of our network traffic counter. Faults identified by inspectors and customer service requests are also added to our open dispatch table in RAMM and then programmed based on priority and ONF.

The condition profile of our assets is shown below:



The data above shows our drainage assets are in 'Average' condition and there are many assets with no condition rating. With our current level of resourcing, it is very difficult for our inspectors to keep on top of their regular workload as well as inspection of drainage assets. A full-time drainage inspector, or dedicated crew who maintain the assets and update the asset record is required to improve this. Until we have condition data for all our drainage assets, there is a large risk that we could have a large bow wave of renewals and maintenance that we are unaware of; this could be very detrimental to the resilience of our network.

Currently there is no formal condition assessment for surface water channels. Kerb and channel renewals are identified and packaged together with footpath renewals or resurfacing/rehabilitation sites and work on rural surface water channels is identified by the rural inspector through use of dispatches and then programmed accordingly.

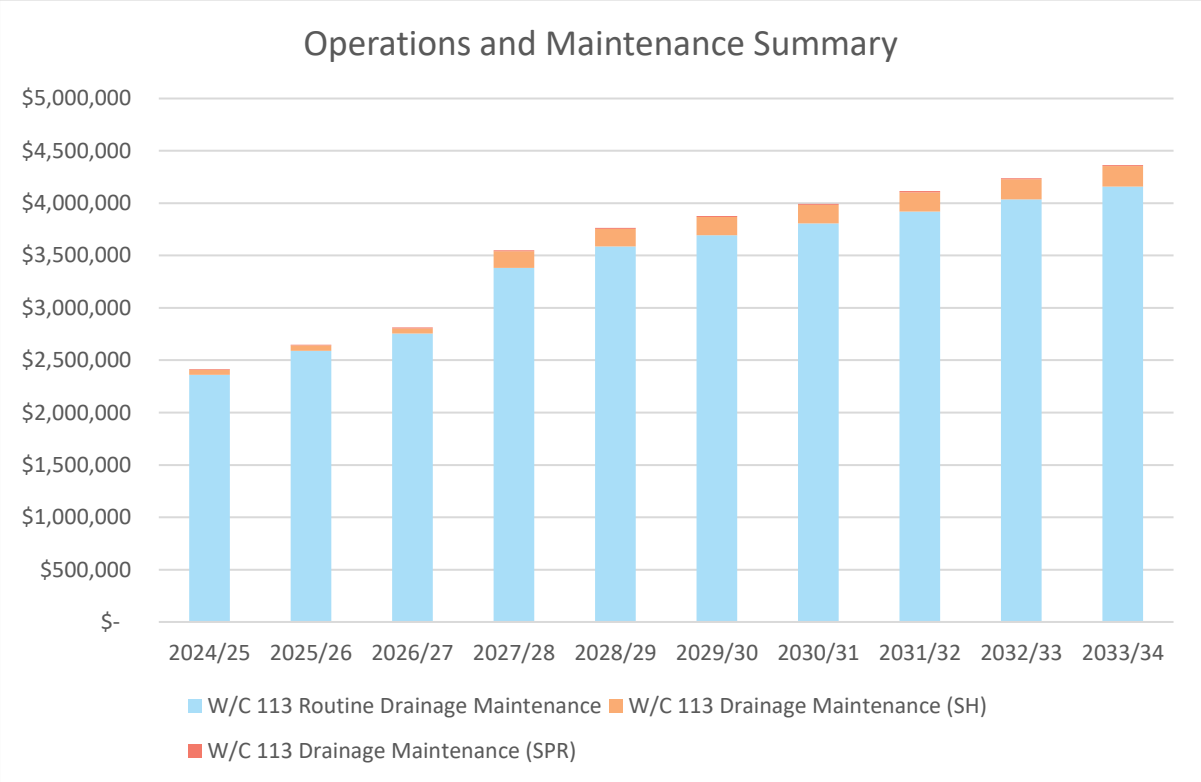
6.5.2 Operations and Maintenance Plan

The trend in maintenance budgets is shown in the table below:

Year	Maintenance Budget $
2021/22	$1,260,000
2022/23	$1,274,000
2023/24	$1,289,000

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget



All figures above include predicted inflation.

6.5.3 Renewal Plan

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in the table below. Asset useful lives were last review on 15th July 2022.

Asset (Sub) Category	Useful Life
Culvert - Concrete	80 years
Culvert - Other	50 years
Drop Chamber	80 years
Flume – ARMCO/Aluminium	50 years
Flume – HDPE/PVC	80 years
Flume – Wood/Steel	40 years
Ford	80 years
Manhole	80 years
Soak pit	80 years
Subsoil Drain	80 years
Dished Channel - Asphalt	50 years
Dished Channel - Concrete	80 years
Kerb and Channel	80 years

The estimates for renewals of drainage are based on Asset Register data.

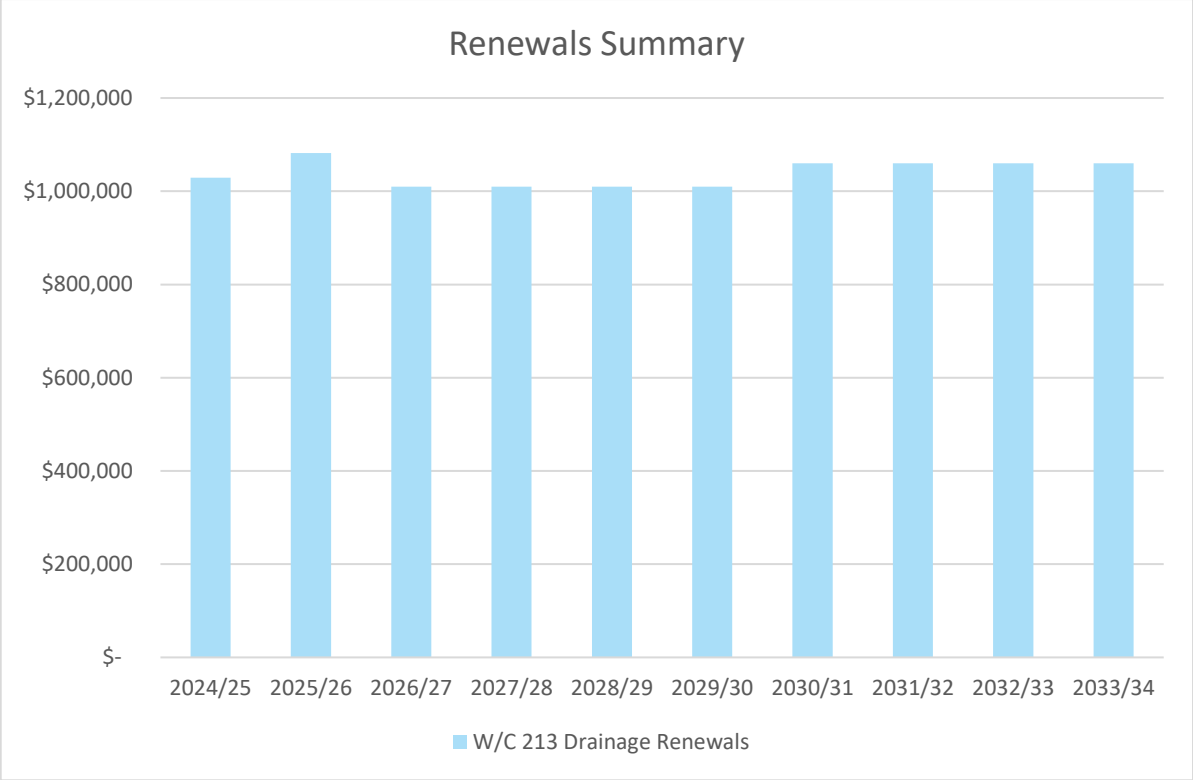
Renewal ranking criteria.

The ranking criteria used to determine priority of identified renewal proposals is detailed in the table below:

Criteria	Weighting
Condition	80%
Hierarchy (ONF)	10%
Safety	10%
Total	**100%**

Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.



All figures above include predicted inflation.

6.5.4 Acquisition Plan

Selection criteria

The priority ranking criteria is detailed in the table below:

Criteria	Weighting
Overarching Strategies	30%
Roading Hierarchy (ONF Gap Analysis)	30%
Safety Assessment	30%
Risk	10%
Total	**100%**

Summary of future asset acquisition costs

When an entity commits to new assets, they must be prepared to fund future operations, maintenance, and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the entity. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown below.

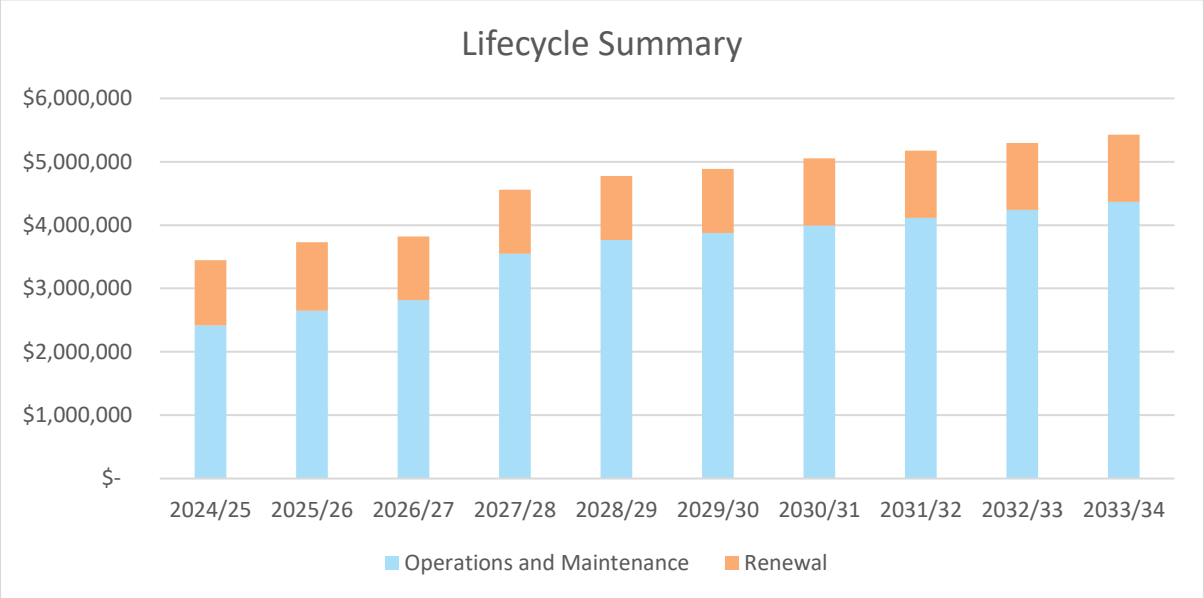
The council is typically vested around 5 roads per year from subdivisions which includes kerb and channel. These assets are vested in near new condition so are expected to have very minimal maintenance costs and should not have any renewals in the next 10 years. Costs associated with maintenance and renewals are already considered in the maintenance, operations and renewals costs although this is negligible.

Other assets that have been identified for acquisition include sumps and sump leads. These have historically been maintained by the waters team at NPDC, however with the reform, these assets will sit with the transportation team. Although there is a comprehensive list of sumps in RAMM, further work will be required to add sump leads and update the financial data associated with these assets.

6.5.5 Lifecycle

The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.



The consequence of not funding drainage renewals and maintenance can have significant impacts on infrastructure, public safety, and the environment. Some of the potential risks include:

- Flooding and water damage: Drainage systems, including stormwater drains, culverts, and surface water channels, are designed to carry excess water away from roads, properties, and urban areas. Without proper funding for drainage renewals and maintenance, these systems can become clogged, blocked, or damaged, leading to inadequate water flow and increased risks of

flooding. Flooding can damage roads, buildings, and other infrastructure, disrupt transportation, and pose risks to public safety.

- Property damage and loss: Inadequate drainage can result in water pooling around homes, businesses, and other structures. Over time, this can lead to foundation damage, water seepage into basements or lower levels, erosion of the surrounding land, and other structural issues. It can also damage landscaping, cause soil instability, and impact property values.
- Road deterioration: Poor drainage can contribute to the deterioration of road surfaces. When water is not effectively drained away, it can penetrate the basecourse, leading to weakened substructures and accelerated pavement deterioration. Waterlogged roads are more prone to cracks, potholes, and other surface defects, increasing maintenance and repair costs.
- Traffic disruptions and safety hazards: Inadequate drainage can result in water pooling on roadways, creating hazards for motorists. Puddles and standing water can reduce tire traction, increasing the risk of hydroplaning and accidents. They can also obscure road markings and signage, impacting visibility and driver awareness. As a result, traffic disruptions, congestion, and increased accident rates can occur.
- Environmental impact: Inadequate drainage can harm the environment in various ways. It can lead to soil erosion, sedimentation in water bodies, and contamination of water sources due to runoff carrying pollutants. Additionally, excessive water accumulation can harm vegetation and wetland habitats, disrupting ecosystems and biodiversity.
- Public dissatisfaction and trust issues: When drainage systems are not adequately maintained, it can lead to public dissatisfaction and frustration. Communities may feel that their concerns and safety are not being addressed, eroding trust in local authorities and their ability to provide essential services.

To mitigate these risks, it is crucial to allocate sufficient funding for drainage renewals and maintenance. Regular inspections, cleaning, repairs, and improvements to drainage systems can help prevent flooding, protect infrastructure, ensure public safety, and promote a healthy environment. The New Plymouth District has some of the highest volumes of rainfall in New Zealand, and with the predicted increase in weather events and severity due to climate change, there is a large risk of reduction in resilience and higher overall cost to the network due to the flow on effect of other work categories.

6.5.6 Disposal Plan

Assets identified for possible decommissioning and disposal are shown in the table below. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in the table below. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Asset	Reason for disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
NPDC has no assets due for disposal				

6.6. Traffic Services

Traffic services aid the safe and orderly movement of vehicular and pedestrian traffic and indicate road use restrictions and other information. A good standard of traffic services can contribute significantly to a safer transportation network. Street lighting provides agreed lighting levels in streets for the safe and efficient movement of vehicles, cyclists and pedestrians as per standard 'M30 - Specification and Guidelines for Road Lighting Design'.

Traffic signs provide guidance, delineation, warning, direction and information that is easy to see and understand and contributes to the safety and efficiency of the roading system. For convenience, EMPS and sight and guardrails are included in this category, as both also provide information to road users (as well as protection in the case of guard rails).

The key issues relating to traffic signs are:

- Traffic signs are relatively low cost but high visibility/high risk asset group. Their consistency and effectiveness can greatly affect driver behaviour.
- Vegetation, street furniture and other obstructions can impair the visibility of signs.
- Excessive signage can create confusion and visual pollution.
- The cleanliness and visibility of EMPS. EMPs are also prone to being damaged/knocked over by farming machinery.

Traffic facilities aid safe and orderly movement of traffic and contribute to the safety and efficiency of the roading system. Road markings include all measures applied or attached to the road surface to guide and regulate the movement of traffic. This includes various paint types and adhesive materials as well as Retroreflective Pavement Markers (RRPMs).

The key issues relating to traffic facilities are:

- Quality of markings, quality control of painted marking thickness
- The need for consistent delineation of cycleways (refer to New Plymouth Cycle Strategy 2007 and Waka Kotahi's Manual of Traffic Signs and Markings).
- Maintaining minimum visibility/reflectivity

Traffic signals provide traffic control facilities at major road intersections to reduce the potential for crashes and optimise the flow of traffic. They also regulate, guide and warn traffic including pedestrians. Their effectiveness depends on their design, maintenance, and construction. It also depends on effective coordination between signals if connected to the Sydney Coordinated Adaptive Traffic System (SCATS) and correct interpretation and timely reactions by road users. SCATS is an adaptive urban traffic management system that synchronises traffic signals to optimise traffic flow across a whole city, region or corridor.

Traffic signals are 'active' assets in that as well as maintenance and renewal, they require proactive management and operation.

The key issues relating to traffic signals are:

- Selecting appropriate intersections for operating traffic signals in a way that minimises long term costs and maintains the stated Level of Service
- Considering other appropriate treatment options which may be cheaper to operate but can deliver similar key road user benefits (e.g., safety)
- Most are State Highway traffic signals, owned by Waka Kotahi and manged by NPDC.
- Coordination between signals to achieve minimum total system delays and safety objectives.

Street lighting provides ambient illuminance levels on streets for safe and efficient movement of vehicles, cycles and pedestrians and contributes to general security.

The key issues relating to streetlights are:

- Reviewing lighting type to achieve efficiency and energy savings whilst providing an acceptable Level of Service and embracing new technology where supported by a business case.
- The desire for continuous and reliable under-veranda lighting in the CBD and for similar lighting to be applied to Inglewood and Waitara CBD areas. The needs for lighting consistency, especially at intersections.

Traffic signs

Signs contain a variety of information including:

- Regulation instructions that road users are required to obey.
- Warnings of temporary or permanent hazards which may not be self-evident.
- Directions and distances to destinations
- An indication of road user services and tourist features/establishments
- Other information of general interest to road users

Traffic facilities

Materials used for traffic facilities include:

- Waterborne and chlorinated rubber paints
- Raised RRPMs
- Thermoplastic road markings
- EMPS

Non-intersections Markings	Intersection markings	Miscellaneous markings
• Centre line and lane lines • Edge lines and shoulder markings • No overtaking lines/passing lines. • Median markings	• Centre lines/edge lines/lane lines • Lane arrows	• Messages and symbols • Pedestrian crossings

• Cycle lanes with green surface • Parking demarcation areas including blue surface for disability parks. • Bus stops • No stopping lines	• Wait lines/continuity lines. • Cycle lanes • Border lines/diagonal lines • No stopping lines	• Railway level crossings • Raised pavement markers. • Speed humps

To delineate rural roads EMPs made of plastic or similar flexible material are used. All components must be able to resist the weather and seasonal effects of the climate and be able to re-stand after being run over by a vehicle.

TNZ P/14 is the specification from Waka Kotahi for the installation of reflectorised pavement markers. To highlight traffic lanes and improve safety, RRPMs have been installed on many urban Arterial and Collector roads, especially in areas with substantial volumes of traffic. RRPM installation has also been generated through the Minor Improvements programme. RRPMs are also used on key rural roads (Arterials and key Collector roads) with annual average daily traffic counts greater than 1,000 (in accordance with the 'Road and Traffic Standards 5 – Delineation for Rural Roads' (RTS 5)).

Speed humps prevent speeding in certain road sections that require slow driving speeds and restrict the entrance of cars to residential areas or school districts. They are mainly installed in urban areas near schools, kindergartens, children's playgrounds, neighbourhood parks, housing complexes and shopping facilities. The primary purpose of traffic islands and speed humps is to improve flow of traffic, reducing the number of conflict points and reducing vehicle speeds.

Sight rails are generally constructed of light timber and painted white, sight rails have traditionally been used to highlight hazards such as curves, bridges, culverts, intersections and under slips. Using sight rails to protect road users against higher risk roadside hazards such as bridge abutments and steep banks is generally strongly discouraged. At these sites, a guardrail or other recognised barrier is appropriate.

Traffic Signals

NPDC operates traffic signals at 25 (urban) locations, six of which are the Council's installations. The remaining 19 are State Highway installations, located at intersections, and are managed by the Council on behalf of Waka Kotahi. As noted above, the Council operates the SCATS to coordinate multiple sets of traffic signals. The system consists of controllers, poles, lanterns, detectors in the pavement, pedestrian pushbuttons and assorted cabling. Currently 22 out of 25 intersections are linked to the SCATS.

Street lighting

Lighting for roads has three categories, namely carriageway, amenity and flag lighting. For safety reasons standalone lighting is usually on high poles. Further information is below:

- NPDC own all standalone poles.
- Poles that also carry power lines are owned by Powerco.
- Waka Kotahi installs and owns the lights on State Highways. NPDC arranges maintenance and power supply which is paid for by Waka Kotahi.

Amenity lighting in the roading context includes:

- Under-veranda lighting
- Any other lighting not directly related to the operation of those roads (e.g., up lighting for street trees, Festival of Lights etc.)
- Around 4,522 lanterns are attached to poles owned by others (predominantly Powerco). Therefore, these assets are influenced by the undergrounding strategies of others and could require NPDC to provide new poles in the future.
- Additional to the street lighting, there are 95 lights for the TSB Festival of Lights within the roading corridor.

Traffic Services Capacity/Performance

Performance issues for Traffic Services assets I the district generally relate to the accuracy of placement, visibility, reflectivity and conformity with standards.

Streetlight capacity and performance issues relate to light intensity, colour, reliability, safety and the urban areas covered. Major rural intersections may also be lit for safety purposes.

Street Lighting LED Technology

NPDC has completed a LED upgrade programme, except for a few lights on Tukapa Street that have bespoke light columns for which a suitable LED lantern is not available. The HPS lights will remain until such time as the streetscape is upgraded.

It is generally accepted by both Waka Kotahi and the EECA that LED lighting is the superior technology. The application of LED lighting is proving to be the lowest whole of life cost lighting option in almost all situations – both for new and renewal of existing installations. The current condition of street lighting is considered good as most bulbs on the network have been replaced in the last NLTP. There are a few exceptions along Tukapa Street (New Plymouth), Mclean Street (Waitara) and SH3 (Inglewood) where the bulbs are not currently compatible with the poles.

Operations and Maintenance Plan

Traffic services maintenance includes the maintenance of sight/guardrails and specifies:

- Minimum maintenance standards

- Frequency of routine inspections
- Response times to correct defects.

Problems with signs are routinely reported by the public, staff and elected members. These are passed on to the contractor for action via the All-Faults system.

Many sites and routes have had improvements to road markings, signage and railings over the last few years, which have been triggered by crash reduction studies, roading improvements and in response to public concerns and requests.

From a maintenance allocation perspective, funding for these assets is covered by the Waka Kotahi WC 122 – Traffic Services Maintenance.

Traffic Signals

The maintenance strategy for traffic signals can be described as one of "scheduled preventive maintenance". Programmed inspections at 13 / 26 / 52 weekly cyclic intervals are undertaken by the contractor, following clearly defined checks of components and scheduled replacement of lamps. The contractor is required to have on hand a ready supply and availability of consumable items.

A 24-hour, seven day a week emergency repair and accident callout response are required of the contractor. On-site attendance is within one hour of notification and temporary repair is initiated within 24 hours.

All the signals in the district including the State Highways utilise the SCATS and are managed by the Wellington Traffic Operations Centre.

Street Light Maintenance

Operations and maintenance activities and costs include:

- Power costs
- Planned maintenance inspections.
- Repairing/replacing damaged or unsound components e.g., lanterns, control gear, poles
- Planned bulk bulb replacement and structural defects.

Historically the maintenance regime has been to replace bulbs at failure instead of a bulk replacement of similar bulbs in an area. Following the upgrade to LED lights this may have to be reviewed as the long-term performance of the LEDs is determined.

The contractor is required to carry out a range of works and other functions including:

- Receiving and responding to complaints, either directly or via the Councils Service Request System
- Maintaining the RAMM Street Light Database
- Carrying out inspections and repairing faults and failures identified

- Replacing lamps
- Repairing and maintaining light fittings and poles
- Straightening poles and support arms
- Carrying out replacement programmes e.g., bulk changes of fluorescent lights
- Installing new lights

The street light network is inspected by the street lighting maintenance contractor for outages and damage at no less than monthly intervals. Inspection from a vehicle often suffices in ensuring that each individual lantern is operating in accordance with the lantern specification and that no pole is in danger of collapse.

To ensure safety to the public and continued security of the lanterns and columns the contractor undertakes a close personal inspection once every three months to:

- Visually inspect each column
- Visually check to ensure that covers for the control gear and/or housing at column bases are in place.
- Visually inspect the rigidity of column/base bolting/securing system
- Visually check the ready readability of any column numbering
- Check for suspected vandalism.

Once yearly checks of control and switching equipment is completed for electrical safety, including earthing of the installation equipment. The contractor is required to attend to faults and inoperative lights within the response times specified in the contract specification.

Programming requirements for the street lighting contract includes providing:

- Details of routine inspections
- Details of planned bulk replacement of lamps.
- Details of planned remedial or replacement work.
- Allowance for unplanned remedial work to meet response time requirements.

Faulty, accident damaged or vandalised lanterns, lamps, control gear columns and associated equipment will be repaired on demand and within the specified response timeframes.

The street lighting maintenance contractor is not responsible for the supply of the electricity necessary to run the lights. Most of the lights are on ripple control switches and power consumption is simply a function of the number of lights multiplied by the duration they are operating times a unit rate. There are number of flag lights and some lights in Tongaporutu, in northern Taranaki that are billed separately from meters, due to their distance from any significant street light circuits and a different supplier.

The Council seeks to recover the cost of accident damage from those responsible, usually following Police advice. On average three street light poles are hit each month by vehicles

Maintenance and Renewal Standards

All signs are designed, located and maintained according to the following standards:

- Waka Kotahi's Manual of Traffic Signs and Markings – Part 1. Traffic Signs
- Waka Kotahi Specification P/16: Road Markers
- Waka Kotahi's Specification M/14 1991: Marker Posts
- Waka Kotahi Specification P/12: Paint Application – Signs
- NZS 5414:1977 Specification for Construction of Traffic Signs
- The Electricity Act 1992 and Amendments
- The Electricity Regulations 1993 and Amendments
- The Contract Specification, Contract 22RM104 Street Light Maintenance Contract
- The relevant NZ and Australian Standards

Additional and more detailed standards are specified in the various physical works contracts. For example, all paints used for pavement markings meet the requirements of Waka Kotahi's Specification M/7. This includes the notes, which are in accordance with Waka Kotahi's Manual of Traffic Signs and Marking: Part II. Further:

- Waterborne road marking paint is used in the district.
- Raised pavement markers meet the requirements of Waka Kotahi's Specification M/12 including the notes.

Renewal and Capital Works

Traffic Signs

Traffic signs are renewed on a corrective basis. This means that although renewals are not planned on a large scale, their renewal is carried out when they fail to meet the standards in the MIS. The term corrective is used to emphasise that the Council has sufficient mitigation strategies and response times to prevent this being a risk to public safety.

The trigger for renewal works include:

- Replacement of obsolete, damaged, substandard and non-conforming signs identified during routine inspections.
- Renewals are undertaken according to the following priority:
    - Public Safety
    - Traffic Volumes
    - Convenience of road users
- The condition of the asset
- The economic/useful lives of the materials used.

Traffic Facilities

Road markings are refreshed to maintain condition and performance. Due to the advancements in paint technology the Council undertakes remarking at two yearly intervals.

Critical markings, including 'Stop' and 'Give Ways', are marked annually as well as roads that have recently been resurfaced. A move to thermoplastic road marking has reduced overall life costs of road markings - although there is an increase in cost of paint, there is a large saving in traffic management as crews do not need to remark roads as frequently.

Traffic Signals

The process outlined in priority order for selection for renewal works on traffic signals is below:

Site Condition Rating

Traffic Signal sites are visually checked every six months and condition rated every 12 months with the routine maintenance rounds.

Lanterns

Technology advances have meant that older incandescent and Quartz Halogen lanterns are now not available. Quartz Halogen and incandescent sites require regular changes of lamps to ensure failures are minimised.

Quartz Halogen and incandescent lamps are typically older and are condition rated accordingly but any sites with these lanterns should be programmed for renewals to LED so that maintenance and power cost benefits are achieved.

Associated Projects

If there are associated projects proposed, then it is of benefit to include traffic signal renewal within them i.e., if there are proposed integrated transport projects that intend to modify an existing intersection then incorporation of the traffic signals should be included. This could also mean the funding for potential upgrade work could come from capital budgets.

Reliability and Customer Requests

Usually, a component of a traffic signal can be replaced which may resolve a fault; however, sometimes this is not the case, and a technician may need to repeatedly visit a site to carry out repairs. These ongoing faults can cause repetitive customer requests / complaints. A renewal of either the controller or the entire site should be considered if this is the case.

Street Lighting

Asset renewal replacements are undertaken when a streetlight or a significant component of a light has reached the end of its economic life, e.g., lantern, brackets or pole. Renewals are reviewed regularly, with any deferred work reprioritised alongside new renewal projects and a revised programme is established where required.

Street Lighting Capital Works Plan

Streetlights are typically acquired or upgraded in the following circumstances:

- When new lights are provided by the Council where no streetlights previously existed
- When the Councils streetlights are installed and vested in the council as part of a new urban subdivision
- Through work to meet the Level of Service arising from:
    - Improvements in association with a street upgrading programme.
    - Safety Improvements
    - Improvements in association with undergrounding of overhead utility reticulation

The Council does not have plans to improve the existing street lighting other than in conjunction with other safety works. These works will be paid from the Low-Cost Low Risk programme.

Street Lighting Renewal Works Standards

When several adjacent lights are renewed at the same time, the installation is designed to the new lighting standards appropriate for that street. The new lanterns and poles are also required, where practicable, to be generally complementary in style and light colour with adjacent streets.

When individual light fittings are renewed, the new fitting is usually the most appropriate modern engineering equivalent of the failed fitting. Replacement poles will be lightweight galvanised sectional-steel poles (e.g., Octlite) of appropriate height. Exceptions to both practices occur when the adjacent poles are of a decorative type, in which case appropriate decorative poles and luminaries are used.

6.6.1 Background Data

Physical parameters

The assets covered by this AMP are shown in the table below.

Asset Category	Dimension	Replacement Value
Features	34 each	$402,196
Islands	325 each	$7,016,957
Markings	486,522 m	$402,873
Minor Structures	111 each	$3,384,499
Railings	22,059 m	$3,712,286
Signs and Posts	13,740 each	$4,945,664
Streetlights	11,111 each (light total)	$18,884,738
Traffic Signals	29 each (controller total)	$614,564
Total		**$39,363,777**

The age profile of assets is shown below:

Features:

Features include asphaltic, bluestone and concrete speed humps. Often these assets are renewed when pavement or surfacing work occurs. Therefore, the completeness, age and condition are not well documented in RAMM. Further work should be completed to improve this asset type.

Islands:

Traffic islands consist of grass, paving, block, concrete and planted landscaped areas. Planted areas are maintained on behalf by our parks team however any repairs or painting is completed on an ad hoc basis under our term services contract. Often traffic islands are built as part of Low-Cost Low Risk Projects and any maintenance or renewals are typically planned in conjunction with pavement, surface, kerb and channel or footpath woks. Therefore, the completeness, age and condition are not well documented in RAMM. Further work should be completed to improve this asset type.

Markings:

Markings on our network are renewed on a bi-annual basis with critical markings such as ‘Stop’ and ‘Give Way' updated on an annual basis. Due to the frequency of renewals, the council does not update the age or condition of the marking assets in RAMM. Further work should be completed to ensure completeness of the inventory data to ensure valuation is accurate.

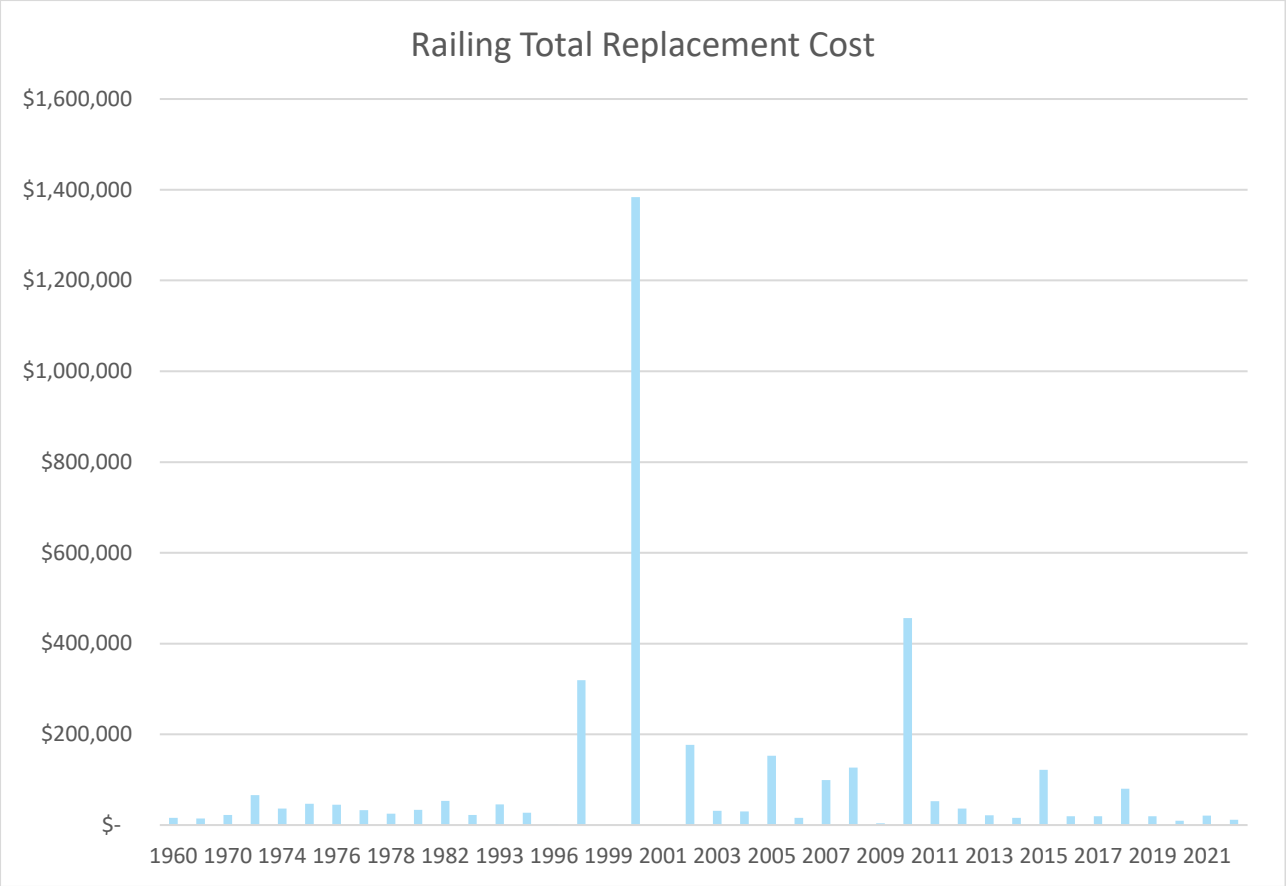
Minor Structures:

All figures are shown in current day dollars.

The data above shows there are a few peaks, however due to the relative cost compared with other asset groups in this AMP, the risk of many renewals due at the same time is relatively low.

Assets where the age is <1/01/1987 are missing construction dates and further work should be completed to update this data.

Railings:



All figures are shown in current day dollars.

The above graph shows a large spike in 2000, on investigation the install date consists predominantly of Christmas dates which suggest the install dates are unknown. Railings are often maintained or renewed based on condition, so although further work should be completed to update the install dates accurately, there is no major risk perceived from this spike.

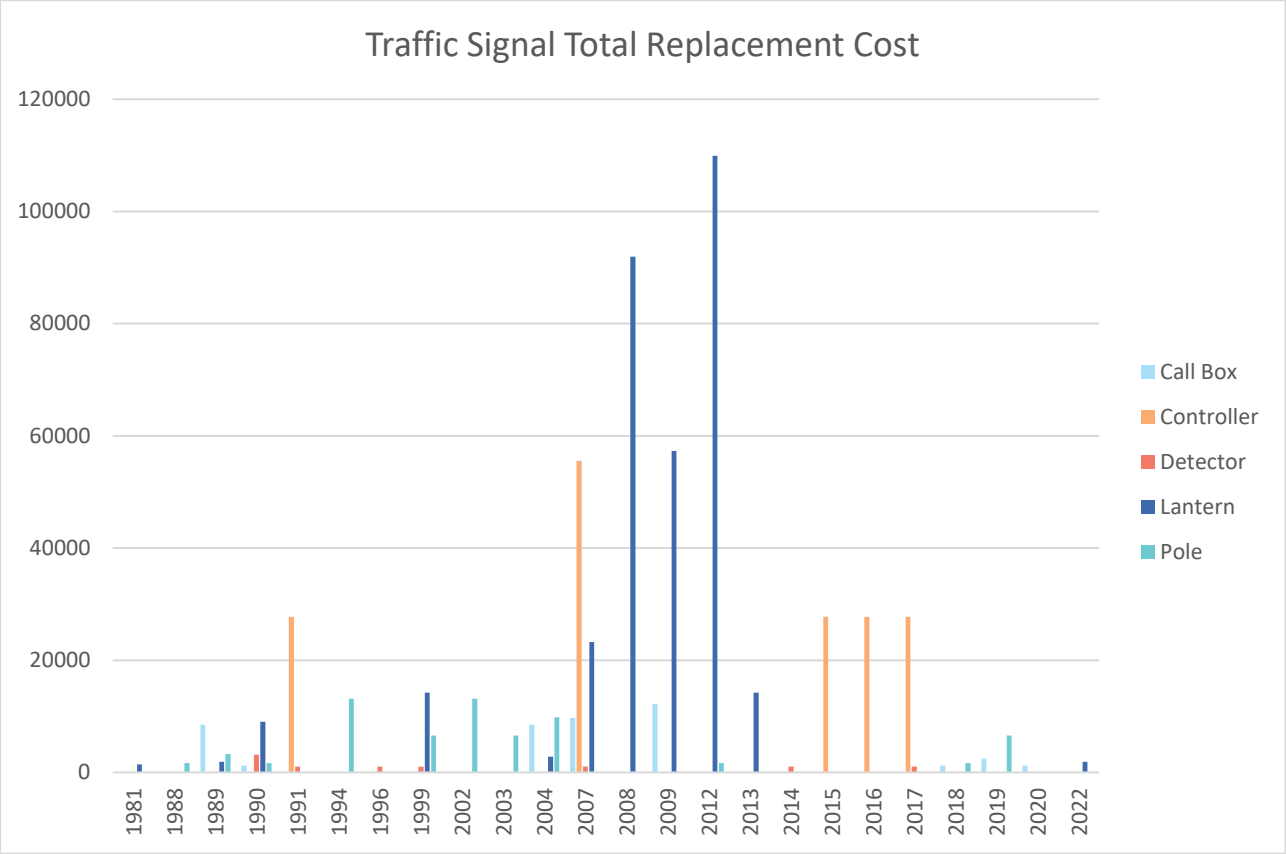
Signs and Posts:

Due to signs being renewed on a corrective basis, official condition ratings are not conducted on this asset type. Most signs have installation date set to a Christmas date in the year 2000, so age is not a good proxy for renewal either. Contractors are expected to update the installation date of new signs, so this data will improve over time.

Streetlights:

The street light installation dates mostly consist of null values or Christmas dates apart from the LED lights that were updated during the upgrade from Halogen bulbs. For this reason, age cannot be used as a proxy for renewals. The Council uses condition to trigger renewals, so there is no major risk for not having this data, however it is important that as renewals take place, the install date is updated going forward.

Traffic Signals:



All figures are shown in current day dollars.

The above graph shows there are a few peaks in 2008 and 2012 for Lanterns. There are many lanterns in poor condition (see Traffic Signal Condition Profile below), which aligns with the age profile. During the next NLTP the council should focus on renewing these lanterns in poor condition as there will likely be another bow wave of renewals the following NLTP too.

Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in the table below:

Location	Service Deficiency
Rural Network	There are many sections on our network where EMP are broken or missing.
Urban Network	There are many concrete poles that are deteriorating rapidly.
State Highway Network	The State Highway network still has Halogen bulbs that should be upgraded to LED.

Asset Condition

Traffic Service data is collected by a range of contractors and the associated asset classes they manage on behalf of the Council.

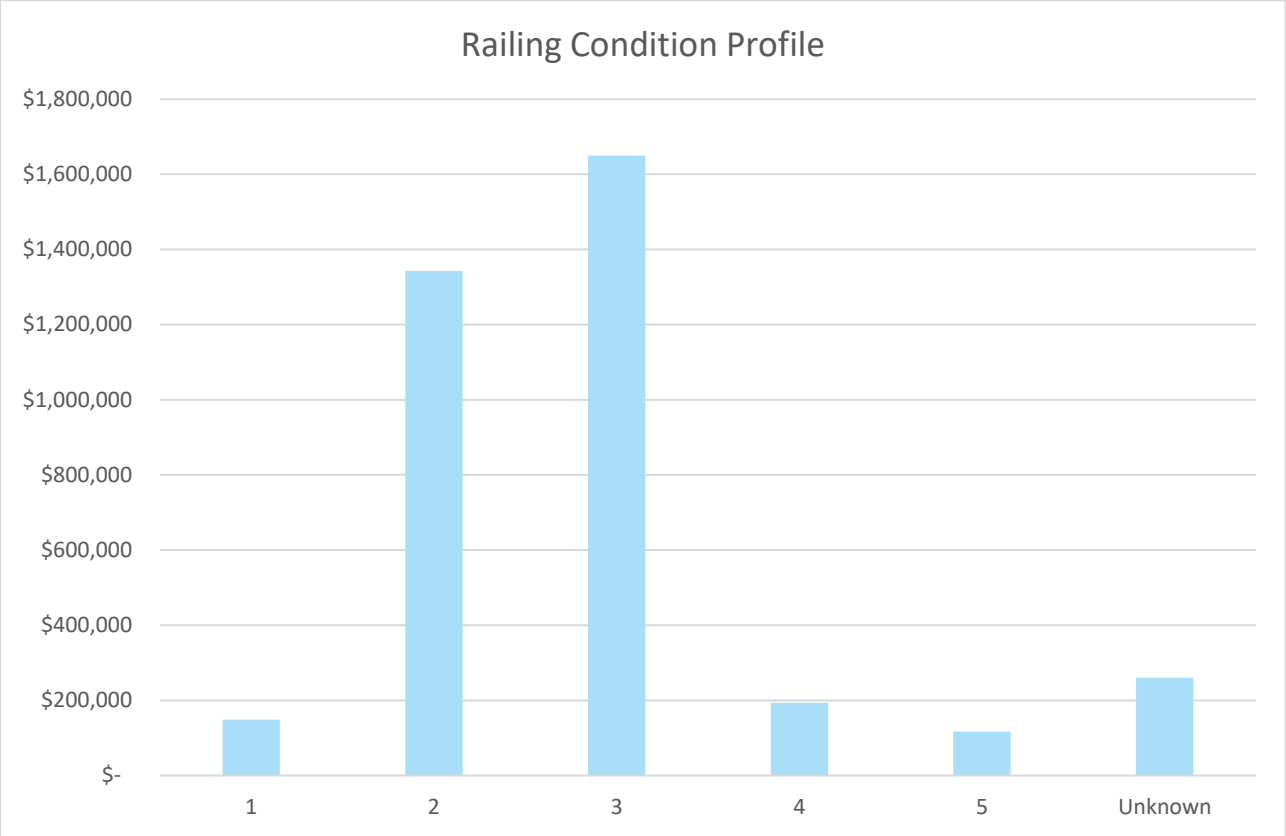
Faults identified by inspectors and customer service requests are also added to our open dispatch table in RAMM and then programmed based on priority and ONF.

The condition profile of our assets is shown below:

Minor Structures:

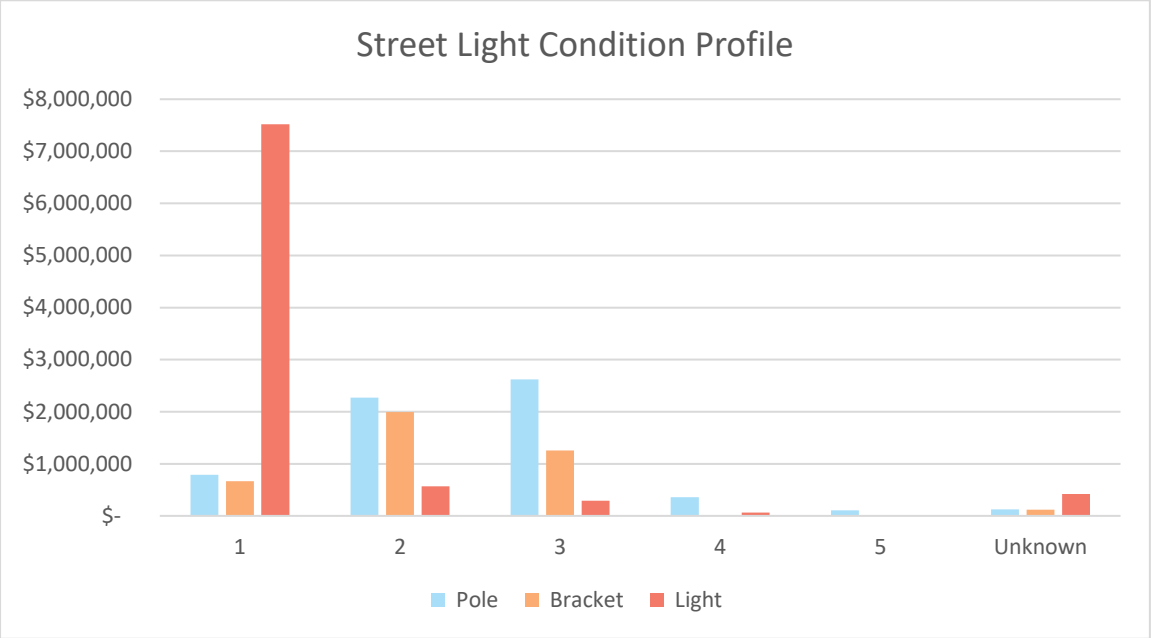
The above graph shows our minor structures are in good condition with a small number of assets requiring maintenance/renewals. Further work should be completed to condition rate the remaining assets that are currently unknown.

Railings:



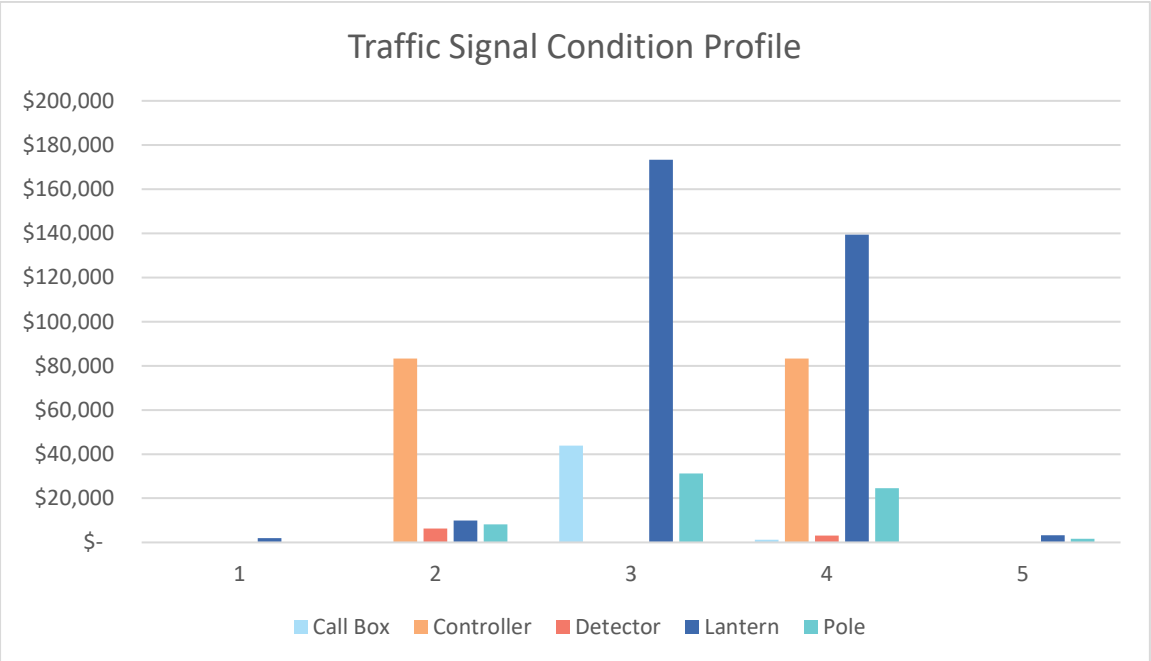
The above graph shows our railing stock is in good condition with a small number of maintenance/renewals required. Further work should be completed to update assets with unknown condition.

Streetlights:



The above graph shows that our poles, brackets and lights are in good condition. Most inspections were completed between 2017-2019 so caution should be taken as it has been highlighted as a risk that the concrete poles are deteriorating quickly. These concrete poles should be prioritised for inspection first to validate condition and help guide the approach for the renewal plan.

Traffic Signals:



The above graph shows that we have many lanterns and controllers in 'Poor' condition. Maintenance and renewals should be focused on these assets over the next NLTP. Although there is a high percentage of assets in poor condition, the relative cost when compared with other assets is quite low and therefore could be remedied quite easily.

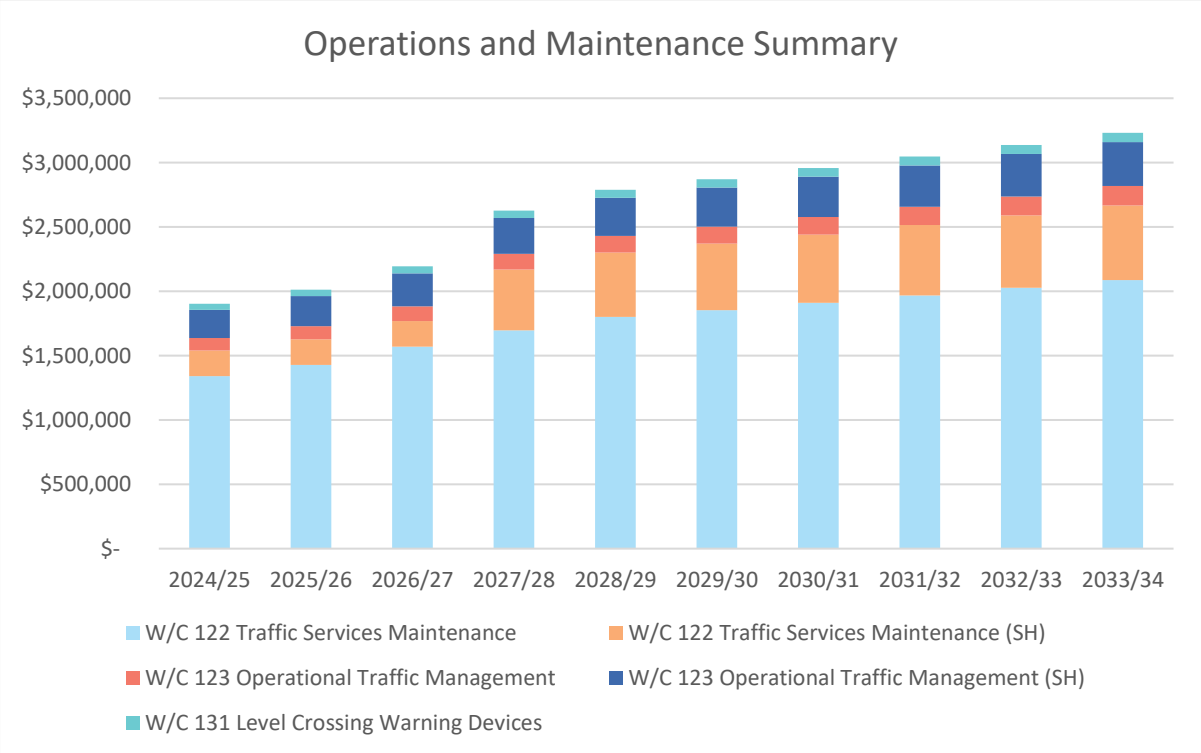
6.6.2 Operations and Maintenance Plan

The trend in maintenance budgets is shown in the table below:

Year	Maintenance Budget $
2021/22	$1,547,251
2022/23	$1,599,597
2023/24	$1,653,249

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget



All figures above show predicted inflation.

6.6.3 Renewal Plan

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in the table below. Asset useful lives were last review on 15th July 2022.

Asset (Sub) Category	Useful Life
Speed Hump - Asphalt	20 years
Speed Hump – Bluestone, concrete	30 years
Island – Hard Surface	50 years
Island - Planted	30 years
Markings	1 year
Shelters	30 years
Railings – Sight rails	50 years
Railings – Guard rails	40 years
Signs	10 years
Streetlights - Brackets	30 years
Streetlights - Poles	30 years
Streetlights - Lights	20 years
Traffic Signals - Controller	15 years
Traffic Signals – Detector Card	10 years
Traffic Signals - Lantern	30 years
Traffic Signals – Call box	30 years
Traffic Signals - Pole	30 years

The estimates for renewals of traffic services are based on Asset Register data.

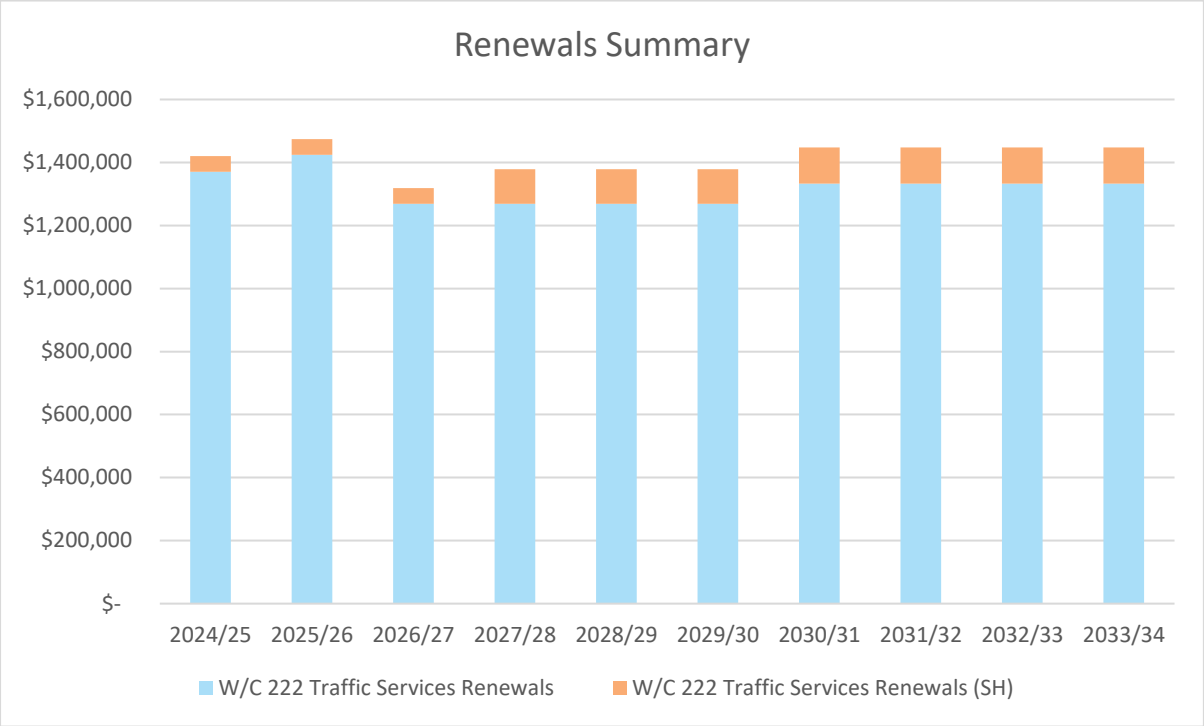
Renewal ranking criteria.

The ranking criteria used to determine priority of identified renewal proposals is detailed in the table below:

Criteria	Weighting
Condition	80%
Hierarchy (ONF)	10%
Safety	10%
Total	**100%**

Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.



All figures above include predicted inflation.

6.6.4 Acquisition Plan

Selection criteria

The priority ranking criteria is detailed in the table below:

Criteria	Weighting
Overarching Strategies	30%
Roading Hierarchy (ONF Gap Analysis)	30%
Safety Assessment	30%
Risk	10%
Total	**100%**

Summary of future asset acquisition costs

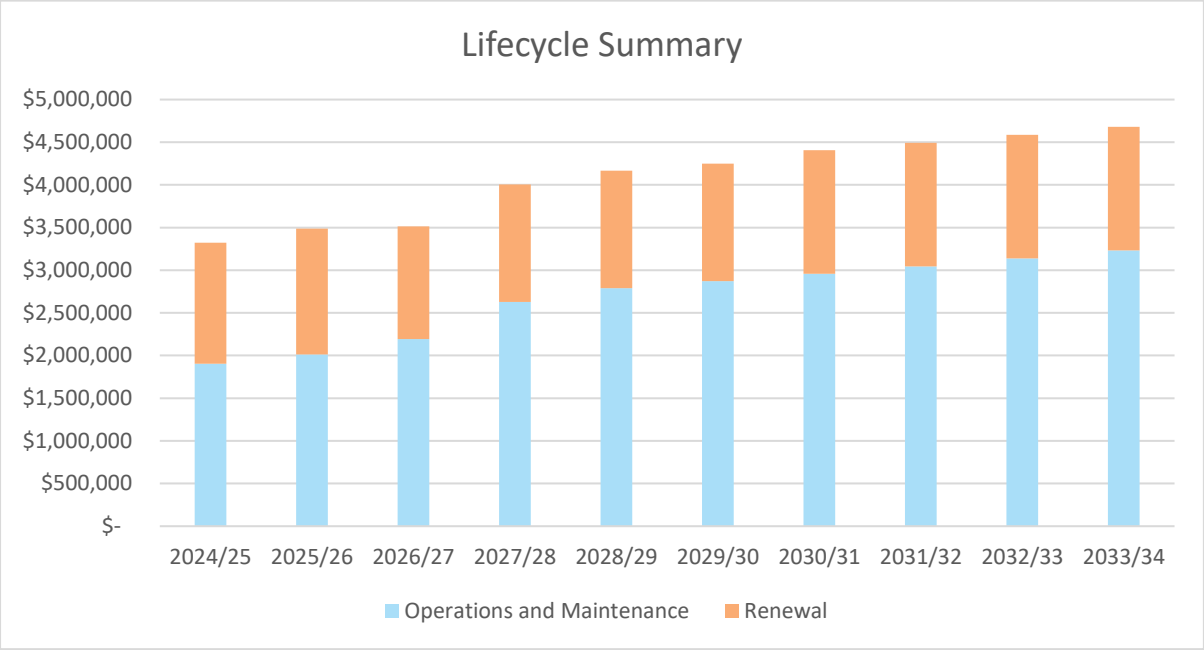
When an entity commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the entity. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown below.

The council is typically vested around 5 roads per year from subdivisions which includes a range of traffic service assets. These assets are vested in near new condition so are expected to have very minimal maintenance costs and the only renewals expected will be road markings. Costs associated with maintenance and renewals are already considered in the maintenance, operations and renewals costs although this is negligible.

6.6.5 Lifecycle

The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.



The consequence of not funding traffic services maintenance and renewals in roading can have several negative impacts on traffic management, public safety, and transportation efficiency. Some of the potential consequences include:

- Traffic congestion: Insufficient funding for traffic services maintenance and renewals can lead to the degradation or malfunctioning of traffic management systems, such as traffic signals, signage, and intelligent transportation systems. This can result in increased traffic congestion, as the ability to effectively control and regulate traffic flow is compromised. Congestion leads to longer travel times, reduced efficiency, increased fuel consumption, and economic costs for both individuals and businesses.
- Decreased roadway safety: Traffic services play a critical role in maintaining roadway safety by providing clear guidance, warnings, and information to drivers. Without adequate funding for maintenance and renewals, traffic signs may become faded, damaged, or obscured, impairing their visibility and effectiveness. Malfunctioning or outdated traffic signals can lead to confusion and potential conflicts, increasing the risk of accidents and injuries.
- Impaired traffic flow and capacity: Traffic services, including traffic signal timing, lane markings, and signage, are designed to optimize traffic flow and capacity. Without proper maintenance and renewal, these elements may not be adjusted or upgraded to accommodate changing traffic patterns and demands. This can result in reduced roadway capacity, inefficient traffic flow, and increased bottlenecks, exacerbating congestion and reducing overall transportation efficiency.
- Compromised pedestrian and cyclist safety: Traffic services also play a crucial role in ensuring the safety of pedestrians and cyclists. Inadequate funding for maintenance and renewals can lead to worn-out or poorly marked crosswalks, faded pavement markings, and inadequate signage for pedestrians and cyclists. This can increase the risk of accidents and conflicts between different road user groups, diminishing the overall safety and accessibility of non-motorized transportation modes.
- Limited effectiveness of traffic management strategies: Effective traffic management requires continuous monitoring, evaluation, and adjustment of strategies and systems. Insufficient funding can hinder the implementation of advanced traffic management technologies, data collection, and analysis systems, and the training of traffic management personnel. This can limit the ability to respond to changing traffic conditions, optimize signal timing, and implement intelligent transportation solutions that improve overall system efficiency.
- Inefficient use of transportation infrastructure: Traffic services maintenance and renewals are essential for maximizing the capacity and efficiency of transportation infrastructure. Without adequate funding, the potential of existing infrastructure may not be fully utilized, leading to suboptimal traffic flow, wasted resources, and the need for additional infrastructure investments to compensate for deficiencies.
- Public dissatisfaction and loss of trust: When traffic services are not adequately maintained or renewed, it can lead to public frustration, dissatisfaction, and a loss of trust in transportation authorities. Road users may experience inconvenience, delays, and safety concerns, perceiving a lack of investment in essential services that affect their daily lives. This can erode public confidence in transportation agencies and their ability to provide efficient and safe travel experiences.

To mitigate these consequences, it is crucial to allocate sufficient funding for traffic services maintenance and renewals in roading. This includes regular inspections, timely repairs, upgrading outdated infrastructure, implementing advanced traffic management technologies, and investing in

training and capacity-building for traffic management personnel. By prioritizing traffic services, we can enhance traffic flow, improve safety, and optimize the use of transportation infrastructure to benefit both individuals and the overall community.

6.6.6. Disposal Plan

Assets identified for possible decommissioning and disposal are shown in the table below. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in the table below. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Asset	Reason for disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
NPDC has no assets due for disposal				

6.7. Footpaths and Cycleways

The purpose of footpaths is to provide a safe and effective network, catering for the transportation and recreation purposes of pedestrians (and associated contrivances which are not vehicles).

Pedestrian access ways provide a safe, convenient and defined means for pedestrian movement alongside and linking roadways. The key issues related to footpaths and pedestrian access ways are:

- Safety of pedestrians
- Identifying and prioritising routes for accessibility
- Urban character and streetscape design
- Increased public expectations over time creating greater demand for network extension and higher quality footpaths. The aging population is a factor in this.
- Potential improvements in levels of service as a direct result of the Integrated Transport Strategy
- Direct relationship with New Plymouth being one of Waka Kotahi's two model walking and cycling communities in New Zealand.

The purpose of cycleways is to provide an efficient and safe network of cycle lanes and facilities to encourage the use of cycles as a viable mode of transport within the road corridor.

In 2000, the New Plymouth Cycle Facilities Review, led to adoption on the initial Cycle Strategy in 2003, which was updated in 2007. This has since been superseded by the Model Communities for Walking and Cycling project (Let's Go). In 2019 NPDC engaged consultants to undertake a review of the local cycling network. This has outlined recommendations for improvements for New Plymouth, Bell Block, Waitara and Inglewood. An integrated transport strategy is also underway which will build on the existing work that has been completed to date – this will also consider the One Network Framework to provide future guidance in the development of our walking and cycling network.

Key issues relating to cycleways are:

- Continuity of cycle lanes throughout the cycleways network as they are quite disjointed near intersections and carriageway pinch points.
- Cycleways being obstructed by planter boxes, kerb extensions and vehicles.
- Development of off-road cycleways as part of network
- Provision of appropriate space on specific rural cycling routes
- Clearing of detritus from cycleways
- Cycling promotion and education including travel planning and skills training

Urban road berms provide a buffer space between carriageway, drainage, footpaths and property for safety, amenity and drainage. This space is also used for installing utilities and street furniture. Typically, rural road berms provide a buffer space between the carriageway shoulder and the property boundary for drainage and enable vehicles to stop safely off the road in emergencies.

Historically concrete footpaths constructed were between 50mm and 75mm thick – current requirements are that footpaths are constructed to be 100mm thick and 1.5m wide with a 2% cross-fall. In general, footpaths in residential areas are constructed from concrete while those in commercial areas are constructed from asphalt.

Vehicle Crossings

Urban vehicle crossings are installed at the cost of the property owner and may only be installed by an approved contractor. An urban crossing from the roadway to the property boundary will be approved if it allows good vehicle access without detrimentally affecting the road, drainage or footpath.

Cycleways and Pedestrian Access Ways

The Council promotes cycling, walking and public transport as alternative modes of transport in the district to optimise the network and support sustainability, reducing reliance on fossil fuels and limiting carbon emissions. This is coupled with wanting to improve public spaces, where the urban built environment is focused on people rather than motor vehicles. To support this, the Council is developing a comprehensive path / cycleway network within and between urban settlements in the district.

Currently, the relative mass difference is weighted in favour of motor vehicles, with cyclists and pedestrians disadvantaged when competing for the same commute space. To alleviate this conflict, the Council foresees some key components of the ultimate network eventually becoming off road, either as separate cycleways within the road reserve, or as paths / walkways within reserves.

Most designated cycleways are currently in the New Plymouth urban boundary and are demarcated on road carriageways. In some instances, the footpath is designated for shared use with cycles (outside New Plymouth Girls High School and the Shared Pathway network). The Shared Pathway Network is managed by the Parks and Open Spaces Team.

Footpath and Cycleway Maintenance

The overall maintenance strategy for footpaths and cycleways is to retain their integrity and to promptly repair defects that are hazardous. For example, the Council may replace, relay, or repair sections to prevent the defect from tripping a pedestrian.

Service delivery is performed under the Term Services Contract. The major work activities are:

- General maintenance – retain the integrity of the footpath by carrying out repairs such as patching of failed areas, levelling, tree root damage, sunken trenches, cracked areas etc.
- Damage repairs – carry out footpath repairs where the damage is attributed to others and can be recovered (e.g., building contractors)
- Pre-seal patching – pre-sealing maintenance work on sealed footpaths, including patching and smoothing, typically on a 16–17-year cycle to match resealing operation.

Note: The operation and maintenance of cycle lanes forming part of the pavement assets is included in the Pavements section of this AMP.

The council has installed several combined walk / cycle paths and facilities as part of the 'Let's Go' programme that now require operation, maintenance and minor components of renewal.

Maintenance Standards:

Technical and material standards for maintenance works generally align with pavements works. Care is required to avoid creating issues caused by tracking of bituminous products or loose chip on footpaths and cycleways. To overcome these issues, concrete or asphaltic concrete is the preferred option.

Renewals Works Plan

Whilst on a purely financial basis the use of concrete is the most cost effective on a whole-of-life basis, in some circumstances there are other non-financial drivers. Other factors to consider include the level of desired amenity and appearance, and the location and growth of tree roots. Footpath renewals are specified on the following basis:

- High amenity areas such as CBDs – Bluestone, Clay pavers or concrete with 4% of black oxide and exposed aggregate
- Areas around trees where future growth could displace footpath construction – asphalt.
- All other areas – concrete with a broom finish

All renewals will be in line with NZS4404:2010. The work activities for concrete and sealed footpaths are:

- Footpath renewals – replace the footpath including excavation and renewal of the footpath structure itself.

The council develops the renewals programme using the data obtained from a three yearly network wide survey completed by an external contractor. This survey highlights the footpaths that are in poor and very poor condition which drives the three-year renewal plan and highlights faults that can also be picked up as programmed maintenance.

Renewal of footpath vehicle crossings is included as part of the footpath renewals programme. While vehicle crossings technically belong to the property owner they serve, it is often very difficult or impossible to get the owner to fund the crossing during renewal of the adjacent footpath. Failing to renew the vehicle crossing could have a detrimental effect on the newly formed footpath or create a low amenity match if the vehicle crossing is in a poor condition or non-matching material. Therefore, a provision in the renewal strategy has been included to renew vehicle crossings when renewing footpaths.

Capital Works Plan

The most significant drivers to the acquisition of new footpath and cycleway assets include:

- Council shared pathway strategies (cycling and walking)
- New paths being constructed by the council where no pathway previously existed.
- New footpaths being vested with the council from new urban subdivisions by private developers.
- Upgrading to improve Level of Service, particularly in relation to special or superior treatment from that which previously existed prior to the upgrade.

As previously noted, new assets installed by developers to serve new domestic and non-domestic developments are usually vested in the Council. Assets are built to the NZS4404:2010 – Land Development and Subdivision Standard. NPDC's specific requirements are defined in the NPDC, SDC and STDC adopted standard for Land Development and Subdivision Infrastructure, which is based on NZS4404:2010 with local amendments. NPDC assumes full responsibility for any assets vested with the Council and includes them in operations, maintenance and future renewal plans.

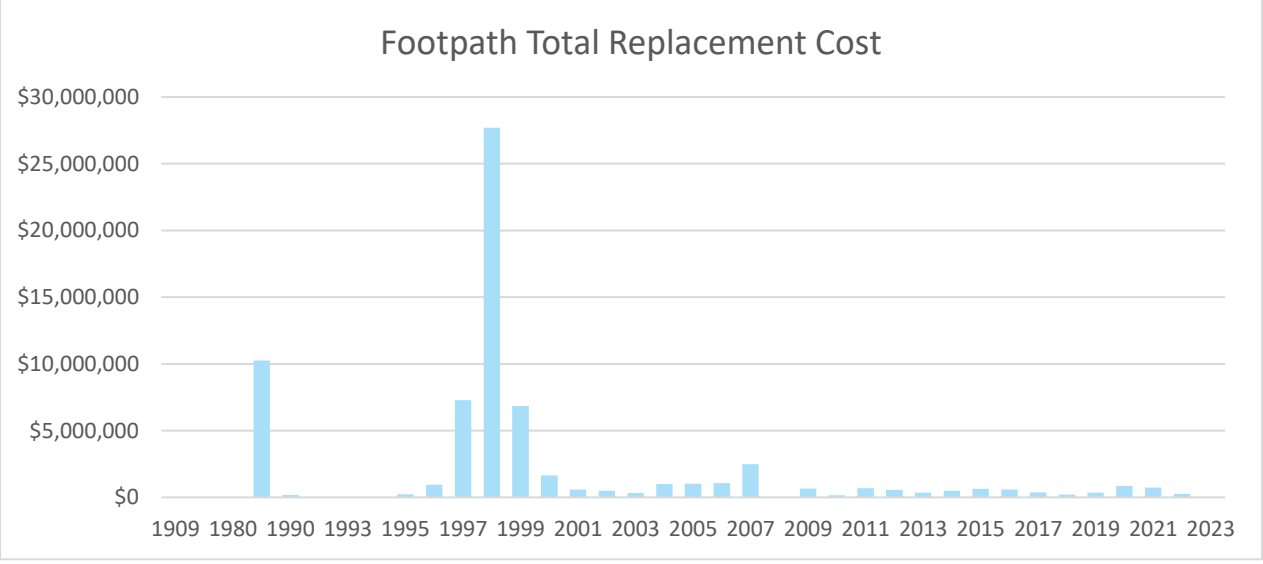
6.7.1 Background Data

Physical parameters

The assets covered by this AMP are shown in the table below.

Asset Category	Dimension	Replacement Value
Berm	2134	$12,848,209
Crossing	2685	$18,152,533
Footpaths	881,719.3 m^2	$68,485,918
Total		**$99,486,660**

The age profile of the assets is shown below.



All figures are shown in current day dollars.

There are a few large peaks in 1985, 1997, 1998 and 1999 that suggest we have large bow waves of renewals coming; however, this is likely a data error in construction date. Footpath condition is usually the key trigger for renewals rather than age, so this is not considered to be an issue.

Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in the table below:

Location	Service Deficiency
New Plymouth	4,647m (70.8%) in Poor Condition 6,784m (68.9%) in Very Poor Condition
Waitara	1,442m (22.0%) in Poor Condition 2,313m (23.5%) in Very Poor Condition
Inglewood	324m (4.9%) in Poor Condition 534m (5.4%) in Very Poor Condition

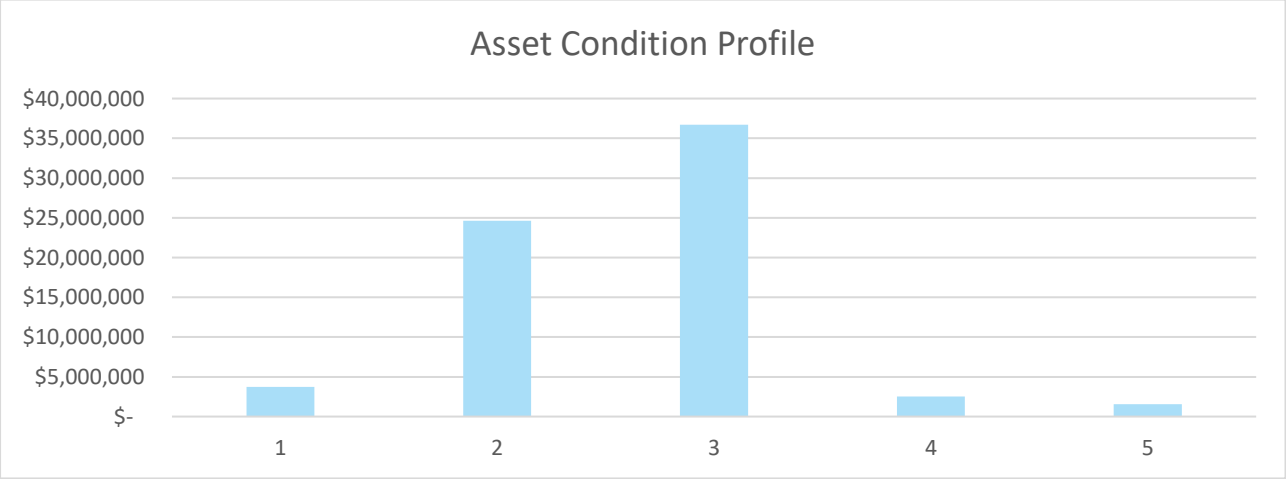
New Plymouth (which contains over 80% of the network length) has a fault density of 28.5m of grade 4 and 5 footpath faults per 1km of surveyed footpath. Of this 23m is cracking. It is noted that while Uruti has a high fault density its total length of footpath is less than 17m and has 6m of cracking on it.

The above service deficiencies were identified from the 2022 NPDC Footpath Condition Rating Report.

Asset Condition

Footpath condition data is collected on a 3 yearly basis. Faults identified by inspectors and customer service requests are also added to our open dispatch table in RAMM and then programmed based on priority and ONF.

The condition profile of our assets is shown below:



The above condition profile shows we have $4.1 million of assets in Poor or Very Poor condition. We also have $36.7 million in fair condition which without preventative maintenance could lead us to an even greater number of assets in poor or very poor condition in the future. Assets that have been highlighted as a risk of failing quickly include footpaths made of seal/slurry seal. We currently have 59km of seal/slurry seal in fair condition that is quickly deteriorating.

6.7.2 Operations and Maintenance Plan

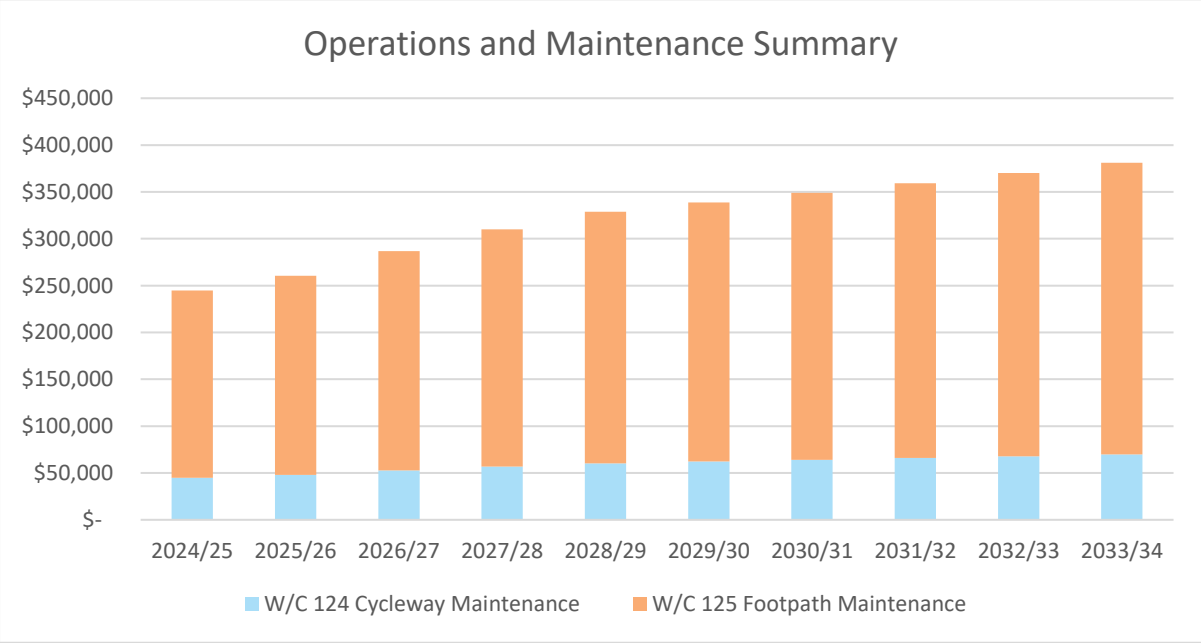
The trend in maintenance budgets is shown in the table below:

Year	Maintenance Budget $
2021/22	$332,000
2022/23	$339,000
2023/24	$347,000

The acquisition of the Coastal Walkway, fast deteriorating rate of seal/slurry seals and increasing cost to deliver the same level of service (increase in materials and labour) means the once appropriate maintenance budget is no longer appropriate and a decreased level of service is expected.

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.



All figures above include predicted inflation.

6.7.3 Renewal Plan

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in the table below. Asset useful lives were last review on 15th July 2022.

Asset (Sub) Category	Useful Life
Berm	999 years
Crossing	80 years
Footpath - Asphalt	50 years
Footpath – Blue Stone	100 years
Footpath – Clay Paver	80 years
Footpath - Concrete	80 years
Footpath - Grass	80 years
Footpath – Interlocking blocks	50 years
Footpath - Seal	25 years
Footpath – Slurry seal	40 years

The estimates for renewals of footpaths are based on Asset Register data.

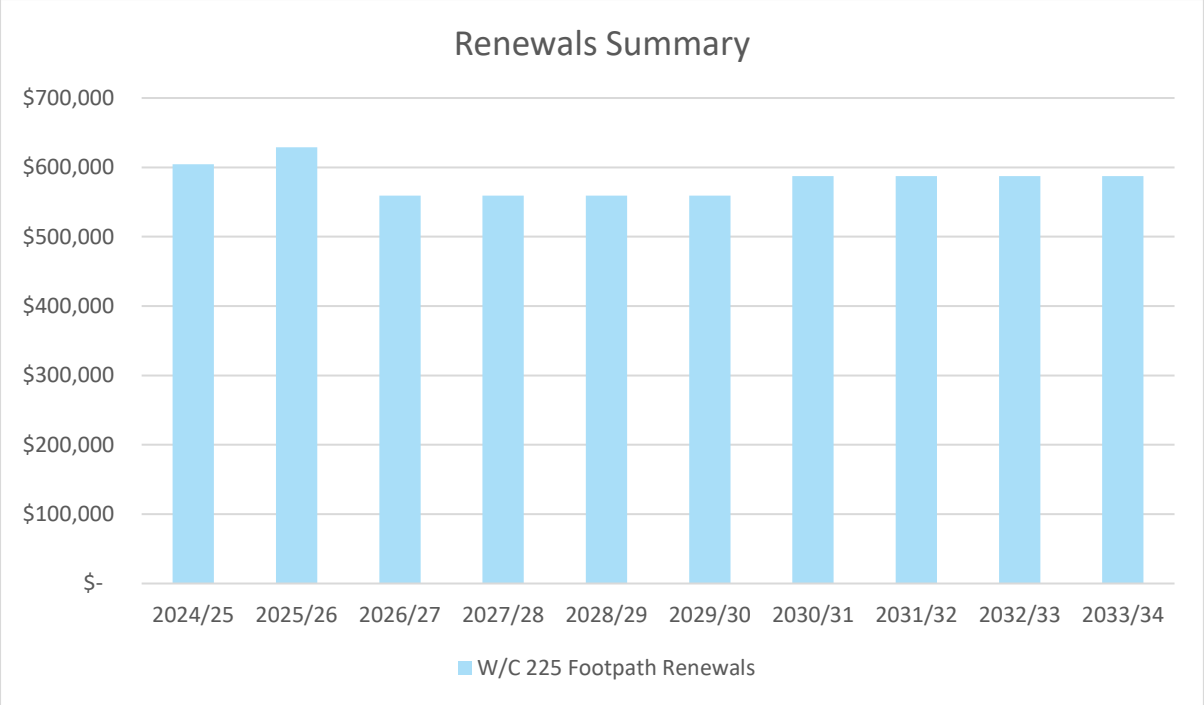
Renewal ranking criteria.

The ranking criteria used to determine priority of identified renewal proposals is detailed in the table below:

Criteria	Weighting
Condition	80%
Hierarchy (ONF)	10%
Safety	10%
Total	**100%**

Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.



All figures above include predicted inflation.

6.7.4 Acquisition Plan

Selection criteria

The priority ranking criteria is detailed in the table below:

Criteria	Weighting
Overarching Strategies	30%
Roading Hierarchy (ONF Gap Analysis)	30%
Safety Assessment	30%
Risk	10%
Total	**100%**

Summary of future asset acquisition costs

When an entity commits to new assets, they must be prepared to fund future operations, maintenance, and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the entity. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown below.

Expenditure on new assets and services in the capital works program will be accommodated in the long-term financial plan, but only to the extent that there is available funding.

The council is typically vested around 5 roads per year from subdivisions which includes footpaths. These assets are vested in near new condition so are expected to have very minimal maintenance costs and should not have any renewals in the next 10 years. Costs associated with maintenance and renewals are already considered in the maintenance, operations, and renewals costs although this is negligible.

Other assets that have been identified for acquisition include the Coastal Walkway Extension from Bell Block to Waitara. This will extend the current walkway by approximately 10km at a width of around 2.6m, giving a total length of around 23km.

This project will be built in stages, starting late 2023 and finishing in 2027:

- Stage 1 – From Waitara to the intersection of Brown and Tate roads (2023 – July 2024)
- Stage 2 – Bell Block to New Plymouth Airport (July 2024 – end of 2025)
- Stage 3 – From the intersection of Brown and Tate roads to New Plymouth Airport (end of 2025 – end of 2027).

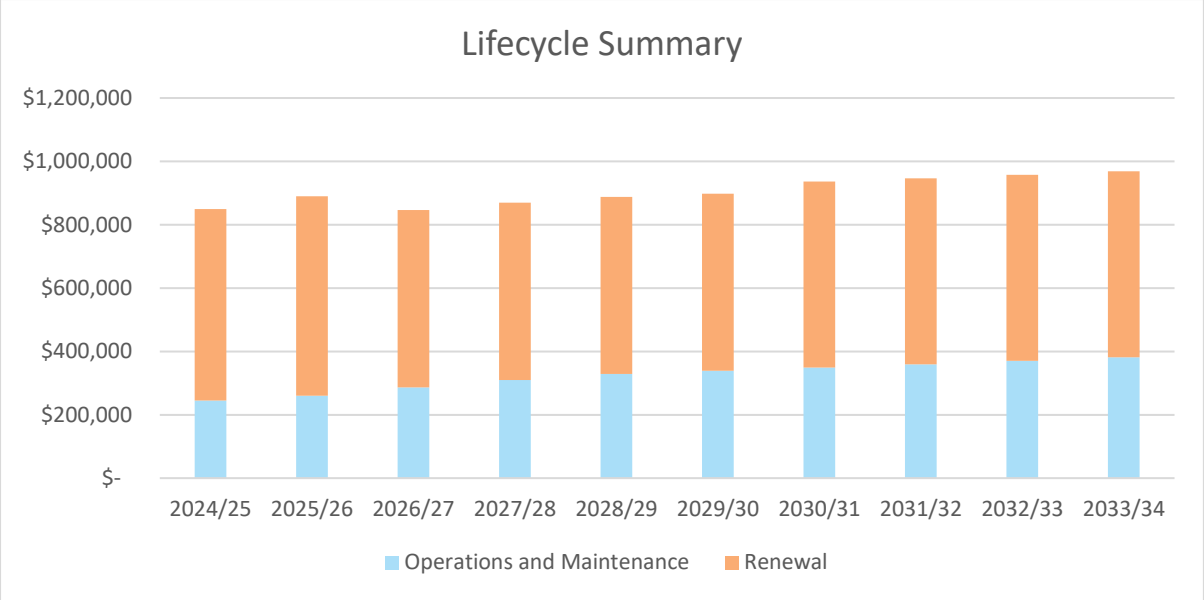
The expected assets and value are shown below.

Stage	Material	Width (m)	Length (m)	Estimate
1	Asphalt Path	2.6	3,202	$771,000
1	Shell Path	1.2	461	$179,000
1	Grassed Path	2.6	656	$144,000
1	Vehicle Crossings			$22,000
2	Asphalt Path	2.6	2,835	$650,000
3	Asphalt Path	2.6	3,638	$996,000
Total			**10,792**	**$2,762,000**

6.7.5 Lifecycle

The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.



The consequence of not funding footpath and cycleway renewals and maintenance can have several negative impacts on pedestrian and cyclist safety, community well-being, and transportation infrastructure. Here are some potential consequences:

- Safety hazards: Neglected footpaths and cycleways can pose safety hazards to pedestrians and cyclists. Cracks, potholes, and uneven surfaces can lead to trips, slips, and falls, causing injuries. Lack of proper signage, markings, and lighting can also increase the risk of accidents, especially during low-light conditions. Insufficient maintenance can also result in obstacles such as overgrown vegetation or debris obstructing the paths, further endangering users.
- Decreased accessibility: Footpaths and cycleways provide important routes for pedestrians and cyclists, promoting active transportation and connectivity within communities. If these paths are not properly maintained, they may become impassable or unsafe, limiting accessibility for individuals who rely on walking or cycling as their primary mode of transportation. This can negatively impact mobility and independence, particularly for the elderly, people with disabilities, and those without access to motorized vehicles.
- Deterioration of infrastructure: Without regular funding for renewals and maintenance, footpaths and cycleways will deteriorate over time. Cracked and broken surfaces, faded markings, and damaged infrastructure (e.g., benches, bike racks) will reduce the usability and overall quality of the paths. This deterioration not only affects the safety and comfort of users but also diminishes the aesthetic appeal and attractiveness of the community.
- Detriment to public health: Footpaths and cycleways play a vital role in promoting physical activity and public health. When these paths are neglected, people may be less inclined to walk or cycle due to safety concerns or poor conditions. This can contribute to a sedentary lifestyle, reducing opportunities for exercise and negatively impacting public health outcomes, such as increased rates of obesity and related health issues.
- Alternative transportation challenges: Inadequate footpath and cycleway maintenance may discourage individuals from using active transportation options and push them towards less

sustainable modes, such as private vehicles. This can lead to increased traffic congestion, environmental pollution, and higher demand for parking infrastructure, exacerbating transportation challenges in urban areas.

- Community dissatisfaction: Neglected footpaths and cycleways can result in community dissatisfaction and frustration. Residents and visitors may perceive it as a lack of investment in public infrastructure and a disregard for pedestrian and cyclist safety. This can lead to a decline in community well-being, diminished trust in local authorities, and a negative perception of the overall liveability of the area.

  To avoid these consequences, it is essential to allocate adequate funding for footpath and cycleway renewals and maintenance. Regular inspections, repairs, surface improvements, and ensuring proper signage and lighting are crucial to promoting pedestrian and cyclist safety, accessibility, and community well-being.

6.7.6 Disposal Plan

Assets identified for possible decommissioning and disposal are shown in the table below. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in the table below. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Asset	Reason for disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
NPDC has no assets due for disposal				

6.8. Environmental and Emergency Works

Environmental Maintenance

Environmental maintenance is defined as those activities that provide for the routine care and attention of the road corridor to maintain safety, aesthetic and environmental standards.

Examples of activities currently undertaken by the Term Services Contract include:

- Vegetation control (spraying, roadside mowing and general vegetation control)
- Removal of minor slips, litter and other loose debris accumulating on roads
- Clearing vehicle accident debris and spillages
- Road sweeping/cleaning
- Fish passages maintenance/installation
- Rip rap maintenance/installation

One of the key issues related to environmental (and emergency) works is related to the lack of data, specifically around fish passages and rip rap sites. Further information for some of these activities is provided below.

Slip and Debris Removal

The northern and eastern areas of the New Plymouth rural road network is constructed in high relief topography which passes through steep sided cuttings commonly affected by high rainfall. The combination of steep topography and high rainfall can at times lead to many under slips / over slips which heavily influences the high rural maintenance cost. Localised high intensity rainfall events can also cause waterways to rise rapidly. An example of this being Okau Road in the Clifton Ward, where the river causes significant damage to existing infrastructure during flood events. This is evidenced by the high maintenance cost of this road. Harvesting of trees for forestry operations can often lead to unstable hillsides which contribute to slips and accumulation of debris in drainage assets. The expense generated in maintaining safe travel for road users and ensuring drainage structures and water table drains are clear is significant and difficult to forecast from one year to the next. This is a critical preventative activity that can greatly reduce the cost of repairs to other transportation assets such as pavements, retaining walls or bridges.

Spraying

Spraying roadside vegetation is undertaken on sealed and unsealed roads and specifically at inverts of roadside drains, bridges, culvert headwalls, sight rails, EMPs, kerb and channel and traffic signs. The vegetation is sprayed using approved chemicals where it is:

- Obscuring abutments, headwalls, signs etc.
- Affecting the functioning of the kerb and channel and sumps etc.
- Affecting the aesthetics of the streetscape

If a member of the public does not wish to have the outside of their property sprayed, they can be added to a no spray list which is recorded in the RAMM.

Pest plants on the network are routinely identified and programmed for spraying I the appropriate season, examples include Gorse, Agapanthus, and self-seeded pine trees.

Yellow Bristle Grass (YBG) is becoming an increasing problem on the transportation network and various trials are being undertaken and planned to ensure it is managed during its growth periods. YBGs currently not listed as a pest plant by TRC, but work is underway across the region to coordinate a regional approach. The onset of YBG has led to an increase in drainage maintenance expenditure as disposal sites for roadside vegetation accumulation are becoming more difficult to locate, leading to longer cartage times.

Any growth noted during the inspection cycles is programmed for spraying and completed by the contractor., although programmed cyclic spraying of the network generally maintains vegetation within the relevant specification. (Note: Specifications and performance criteria are detailed in the relevant sections of the contract documentation pertaining to this activity.

Roadside Mowing

Mowing is carried out on both the rural and urban transportation network; however, most of the mowing occurs on the rural network as residents in urban areas typically take responsibility for

berms outside of their properties. The main purpose for mowing is the safety aspect as it provides a line of sight and reduces fire hazards.

Roadside mowing is typically done three times per year on the network.

Vegetation Control

The requirements for the control of overhanging vegetation are that no foliage shall encroach outside the specified vegetation envelope such that the passage of traffic is impeded, causes visibility issues or otherwise interferes with the safe use of the road.

Emergency Works and Minor Events

Emergency Works

Emergency works normally arise from adverse weather events like storms that result in wind damage, flooding and slips. Work associated with these events is generally completed, even if it means that there is expenditure over the budget or other routine work is deferred to keep overall expenditure within budget. This is particularly relevant for safety related works and works that is needed to restore and reopen a road. If the extent of an event becomes too severe, or the effects too significant, the Council can apply to Waka Kotahi for additional funding under WC 141 – Emergency Works, under the categories of immediate response and permanent reinstatement.

Initial Response

An immediate response covers the work necessary to open a road, where practicable, to at least a single lane facility for safe use by traffic or to minimise risk of further damage. This work may include:

- Slip clearance and removal of carriageway obstructions.
- Construction of temporary detours
- Temporary reinstatement
- Restoration of roadside drainage
- Patrols during and/or after storm events
- Clearing and controlling spillages to minimise environmental impacts.
- Frost, ice gritting and snow clearance on Egmont Road, leading to Mount Taranaki

Under the Term Services Contract, roving patrol crews respond to emergency situations while these are in progress, patrolling, and erecting signage to warn motorists of potential hazards on the roads and where possible preventing damage to transportation assets, facilities and private property. The follow up tasks of restoring assets to full or part service potential are completed under the initial response activity.

Permanent Reinstatement

Permanent reinstatement involves work that is required to restore the road to its former or similar condition. As the work is of a long-term nature, it generally involves an engineering appraisal of

options and may require design input. Permanent reinstatement works have included the design and construction of retaining structures, road retreats and realignment and culvert replacements. These features are added to the RAMM asset inventory upon completion and capitalised where appropriate.

Minor Events

The minor event WC is funded from the Local roads maintenance activity and applies to any works that would otherwise qualify as emergency works except that the total cost of the works is less than $100,000 per event. This WC was introduced for the 2015-18 NLTP and applies to the following:

- Removal of rocks and slip material from roads and cycleways.
- Repairs to road and cycleway surfaces
- Reinstatement of network facilities damages as a result of a minor event.

6.8.1 Operations and Maintenance Plan

The trend in maintenance budgets is shown in the table below:

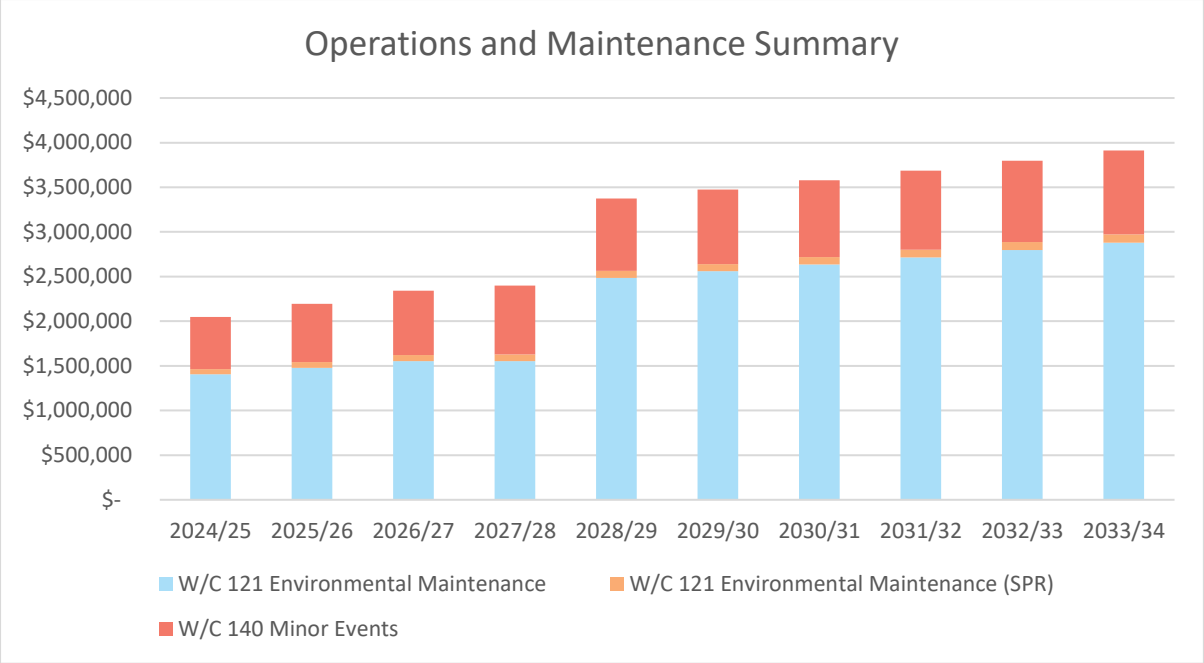
Year	Maintenance Budget $
2021/22	$1,365,000
2022/23	$1,382,500
2023/24	$1,400,000

There are many trees in our roading corridor that pose a risk to people and their assets. Previous maintenance budget did not allow for the removal of these trees. A dangerous trees register has been added to RAMM to help prioritise this work to mitigate the risk.

With the increasing number of weather events due to climate change, further budget is also required to continue to respond to slips, under slips, tree fall and flooding.

Summary of forecast operations and maintenance

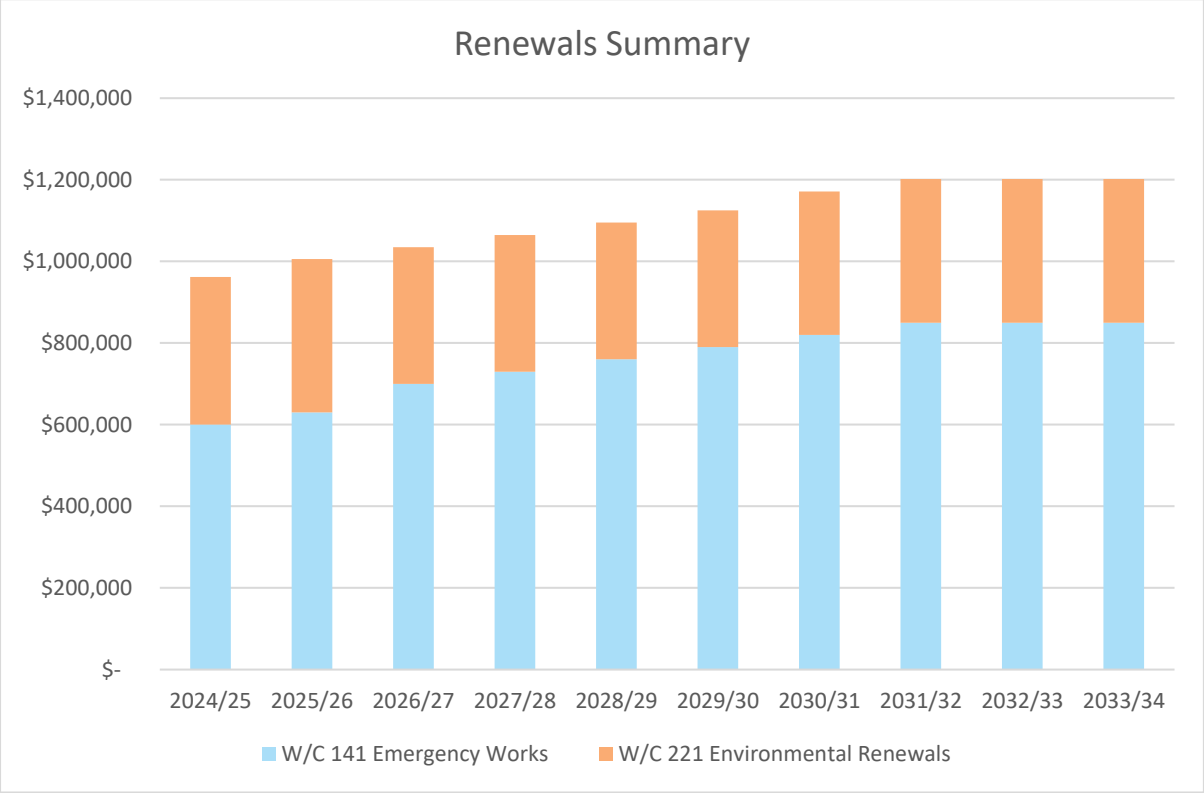
The figure below shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.



All figures above include predicted inflation.

6.8.2 Renewal Plan

The forecast costs associated with renewals are shown relative to the proposed renewal budget in the figure below.

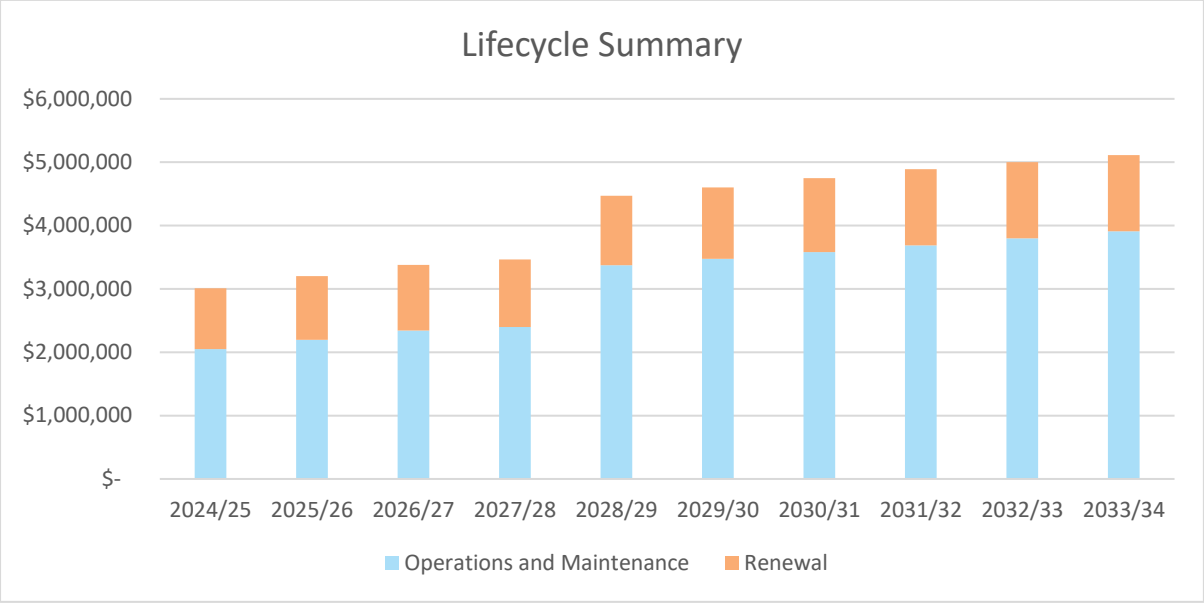


All figures above include predicted inflation.

6.8.3 Lifecycle

The financial projections from this asset plan are shown in the figure below. These projections include forecast costs for operation, maintenance and renewal. All figures below include predicted inflation.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.



The consequence of not funding environmental maintenance and renewals in roading can have several negative impacts on the environment, public health, and sustainable development. Some of the consequences include:

- Water pollution: Roads and transportation infrastructure can contribute to water pollution through stormwater runoff. Without proper funding for environmental renewals, measures such as sediment control devices, retention ponds, and filtration systems may not be installed or maintained adequately. As a result, pollutants such as sediment, oils, heavy metals, and chemicals can enter nearby water bodies, harming aquatic ecosystems and compromising water quality.
- Habitat fragmentation and biodiversity loss: Road construction and maintenance can fragment natural habitats, leading to the loss of wildlife corridors and biodiversity. Without appropriate funding for environmental renewals, mitigation measures like wildlife crossings or habitat restoration may be neglected. This can disrupt the movement of wildlife, increase the risk of wildlife-vehicle collisions, and contribute to the decline of native species.

- Soil erosion and degradation: Road construction and maintenance activities can disturb soil, leading to erosion and degradation. Adequate funding for environmental renewals can support erosion control measures such as retaining walls, revegetation, and sedimentation ponds. Without these measures, soil erosion can occur, leading to the loss of fertile topsoil, reduced vegetation cover, and increased sedimentation in water bodies.
- Impacts on ecosystems and ecosystem services: Roads can disrupt ecosystems and their associated services. Insufficient funding for environmental renewals can result in the loss of ecosystem services such as carbon sequestration, water regulation, and natural flood control. This can have implications for climate change mitigation, water resource management, and overall ecosystem health and resilience.

To mitigate these consequences, it is essential to allocate sufficient funding for environmental renewals in roading. This includes implementing and maintaining measures to mitigate water pollution, habitat fragmentation, soil erosion, and the preservation of ecosystem services. By prioritizing environmental sustainability in roading projects, we can minimize the negative impacts on the environment and promote sustainable development.

The consequence of not funding emergency response in roading can have significant impacts on public safety, transportation efficiency, and the ability to effectively respond to emergencies and natural disasters. Some of the consequences include:

- Delayed emergency response: Insufficient funding for emergency response in roading can lead to delays in addressing emergencies and natural disasters, such as accidents, road closures, or infrastructure damage caused by severe weather events. This delay can hinder emergency services, including police, fire departments, and medical personnel, from reaching affected areas promptly. It can also impede the timely evacuation of residents in high-risk areas.
- Increased risk to public safety: Without proper funding for emergency response in roading, there may be a lack of resources, equipment, and personnel necessary to quickly address safety hazards on roads. This can increase the risk of accidents, injuries, and fatalities for both motorists and pedestrians. Inadequate emergency response measures can also lead to traffic congestion and delays, further compromising public safety.
- Limited access for emergency vehicles: In emergency situations, it is crucial to ensure unobstructed access for emergency vehicles to reach affected areas swiftly. Insufficient funding for emergency response in roading can result in poorly maintained or inadequate emergency access routes, hindering the movement of emergency vehicles and potentially delaying critical medical assistance or fire response.
- Reduced transportation infrastructure resilience: Funding for emergency response in roading is essential for maintaining and strengthening transportation infrastructure resilience. Without adequate investment, roads, bridges, and other transportation assets may not receive necessary maintenance or upgrades to withstand natural disasters or severe weather events. This can result in infrastructure failures, including bridge collapses or road washouts, further impeding emergency response efforts.
- Economic impact: Inadequate emergency response in roading can have economic implications at both the local and regional levels. Disruptions caused by accidents, road closures, or

infrastructure damage can impact transportation networks, logistics, and the movement of goods and services. This can lead to increased costs for businesses, reduced productivity, and potential economic losses for affected communities.

- Public dissatisfaction and loss of trust: When emergency response in roading is insufficient, it can result in public dissatisfaction and a loss of trust in government agencies responsible for emergency management. The perception that emergency needs are not being adequately addressed can erode confidence in the ability to effectively respond to emergencies, undermining public trust and cooperation during future crises.

To mitigate these consequences, it is essential to allocate sufficient funding for emergency response in roading. This includes investment in infrastructure maintenance, preparedness planning, training for emergency personnel, and the implementation of effective communication systems. By prioritizing emergency response in roading, we can enhance public safety, improve transportation resilience, and ensure a timely and effective response to emergencies and natural disasters.

7. Financial Forecasts

Contents

7.1. Financial Forecasts

Asset management planning translates the physical aspects of planned operational, maintenance, renewal and new works into financial terms. Management and maintenance of the transportation network is funded from local funding and financial assistance received from Waka Kotahi from dedicated transport funding.

Local funding is obtained through a transportation rate as part of general rates and is a uniform annual charge. It is also funded through the road user revenue. For capital improvements the local funding is loan-funded while the renewal and replacement of assets comes from financial assistance and renewal reserves.

Co-investment Funding Assistance Rate (FAR) received from Waka Kotahi for the 2021-24 financial period has been 51% of the cost for maintaining operations and renewals of the transportation network and 51% of the cost for transportation capital improvements. The 51% FAR is expected to continue over the 2024-27 period and it is also assumed to continue over the 10-year LTP period and 30-year infrastructure strategic period.

7.2. Expenditure Categories

Expenditure on transportation assets can be categories into four main areas:

- Operating expenses
- Maintenance
- Capital works, including:
    - Capital renewals.
    - Capital augmentation.

7.3. Operating Expenses

Operating expenditures are those costs where the benefits are used within one year. Operating expenditure can be funded by grants and subsidies, interest income and user charges. If these sources of revenue are unavailable or if they are insufficient, then the default funding source for operating expenditure is rates.

7.4. Maintenance

Maintenance costs are generally subdivided into three groups:

- Routine maintenance – Day to day maintenance that is required on an ongoing basis and is budgeted for.
- Proactive / planned maintenance – non-day-to-day maintenance that is identified in advance and is incorporated into a maintenance budget for a required period.
- Reactive Maintenance – Maintenance that is unexpected and necessary to be attended to immediately continue operational services.

7.5. Capital Works

CAPEX arises when the benefits derived are for longer than the current year. People in future years will continue to receive the benefit of the expenditure and should pay towards that cost. This is achieved through capitalising the cost and therefore recognising it as an asset. The cost is then

charged to current and future users through a depreciation charge. CAPEX is divided into augmentation and renewal expenditure as detailed below.

7.5.1 Capital Renewals

Renewal expenditure includes rehabilitation and replacement of assets to restore an asset to its original Level of Service, i.e., capacity or the required condition. Renewals expenditure forecasts cover the cost of asset renewal through its whole lifecycle through to disposal of the asset. Renewal CAPEX is funded from rate funds or loans with an annual interest charge allocated to operating expenditure.

7.5.2 Capital Augmentation

Capital augmentation involves the creation of new assets (acquisition) or (improvement) works that upgrade or improve an existing asset beyond its current capacity or performance in response to changes in usage or customer expectations. These can be either to improve Level of Service deficiencies or to improve current Levels of Service. New CAPEX is funded by loans and an annual interest charge is allocated to operating expenditure.

7.6. Asset Management Assumptions

Schedule 10 (section 11) of the LGA contains provisions relating to 'significant forecasting assumptions'. The LGA requires the Council to identify the significant forecasting assumptions and risks underlying the financial estimates. The following asset management assumptions and risks have been made in preparing the 10-year expenditure forecasts:

- The base financial assistance rate used by Waka Kotahi will remain at 51% for both road maintenance and improvements.
- It is anticipated that the funding criteria and policy used by Waka Kotahi will remain relatively unchanged from 2024/25
- The rate of deterioration of road pavements will increase because of increased demand, particularly urban Arterial routes, which are rapidly deteriorating (due to poor historic investment in their upkeep)
- Forestry harvesting will have a major impact on road pavements.
- Extremely high rate (34/100,000 population) of fatal and serious injury crashes on Local roads requires investment in safety related (improvements and education) project to achieve the 'Road to Zero' goals of the GPSLT.
- Changes in the management, programming and scheduling of work activities are to align with the ONRC Levels of Service and the new ONF.
- Walking and cycling improvement of key transport nodes will continue in order to enable users to have sustainable alternatives option choices as per the goals of the GPSLT.

7.7. Asset Valuation

Statutory financial reporting requires the Council to revalue its fixed assets at least every five years. An asset valuation is used for asset management (calculating long term asset renewal projections), identifying loss of service potential (depreciation) and for financial reporting purposes. Transportation assets are revalued every year.

7.8. Accounting Standards

The NZ International Financial Reporting Standard (NZIAS16) applies to all transportation assets considered in the scope of this valuation for the general purpose of financial reports.

7.9. Asset Valuation Summary 2022

The latest valuation of transportation assets was undertaken in 2022 and accounts for inflation. The replacement value of roads assets is approximately $1,149 million as detailed in the table below.

Asset	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Formation	$227,351,761	$227,351,761	$0
Subbase	$254,759,398	$224,028,482	$639,793
Basecourse and First Coat	$203,891,302	$76,099,335	$2,548,641
Surface	$63,118,127	$24,689,162	$3,977,465
Berm	$12,848,209	$12,848,209	$0
Bridges	$139,977,959	$42,061,113	$1,537,831
Crossings	$18,152,533	$8,456,769	$226,907
Drainage	$30,467,902	$15,822,195	$420,643
Features	$402,196	$167,515	$14,376
Footpaths	$68,485,918	$45,093,006	$1,017,446
Islands	$7,016,957	$4,465,745	$156,234
Markings	$402,873	$346,516	$5,679
Minor Structures	$3,384,499	$2,382,277	$89,143
Railings	$3,712,286	$1,954,497	$83,617
Retaining Walls	$24,972,987	$16,959,237	$366,542
Signs and Posts	$4,945,664	$683,393	$280,893
Street Lights	$18,884,738	$10,602,793	$759,479
Surface Water Channel	$66,484,026	$35,254,982	$831,138
Traffic Signals	$614,564	$284,509	$25,127
TOTAL	**$1,149,873,900**	**$749,551,495**	**$12,980,953**

A carrying value assessment was then completed in April 2023 to assess the suitability of using the 31 March 2022 valuation for financial reporting in the 30 June 2023 year. This saw an increase from $1,149 million to $1,279 million. It was deemed a full revaluation was not required.

It is also noted that there has been a transfer of assets from Parks to Transportation after the 2022 Valuation occurred. $21,542,194 was transferred which consists of structures, pathways and lighting. This is an amendment as the assets should have been with Transportation after construction as Waka Kotahi was one of our funding partners.

The percentage of replacement cost spent on maintenance and operations for roading assets can vary, but a common benchmark is to keep the maintenance cost percentage at around 2-4% of the replacement asset value (RAV) annually. This range helps ensure that the assets are well-maintained without overspending.

The annual depreciation (Renewals) is $14,422,511 and 2% of the RAV (Maintenance and Operations) is $25,594,489, therefore the target MOR budget to ensure our assets are well maintained is $40,017,000 per year, or $120,051,000 per three years (LTP cycle).

7.10. Transportation Asset Financial Forecasts

Table 1 provides the financial forecast for maintenance, operations and renewals and Table 2 provides the financial forecast for augmentation.

TABLE 0-1: MAINTENANCE, OPERATIONS AND RENEWALS FINANCIAL FORECAST

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
111	Sealed pavement maintenance	Maintenance	2,623,829	2,761,925	2,900,021	3,600,000	3,700,000	3,800,000	4,679,118	4,819,492	4,964,077	5,112,999
	Sealed pavement maintenance (SPR)	Maintenance	12,350	13,140	14,454	16,452	17,454	17,978	18,517	19,073	19,645	20,234
112	Unsealed pavement maintenance	Maintenance	215,650	229,452	252,397	287,271	304,776	313,920	323,337	333,037	343,029	353,319
113	Routine drainage maintenance	Maintenance	1,695,477	1,883,863	1,978,056	2,496,219	2,648,333	2,727,783	2,809,616	2,893,905	2,980,722	3,070,143
	Street Cleaning and Sump Clearing	Maintenance	664,430	706,954	777,649	885,098	939,034	967,205	996,221	1,026,107	1,056,891	1,088,597
	Routine drainage maintenance (SH)	Maintenance	50,000	50,000	50,000	159,581	169,305	174,384	179,616	185,004	190,555	196,271
	Routine drainage maintenance (SPR)	Maintenance	6,500	6,916	7,608	8,226	8,727	8,989	9,259	9,536	9,822	10,117
114	Structures maintenance	Maintenance	806,400	877,162	964,878	1,063,029	1,127,807	1,161,641	1,239,222	1,276,399	1,314,691	1,400,826
124	Cyclepath maintenance	Maintenance	44,935	47,811	52,592	56,866	60,331	62,141	64,005	65,925	67,903	69,940
125	Footpath maintenance	Maintenance	200,000	212,800	234,080	253,102	268,525	276,581	284,879	293,425	302,228	311,295
140	Minor events	Maintenance	585,000	655,200	720,720	771,170	809,729	834,021	859,041	884,813	911,357	938,698
141	Emergency works	Renewals	600,000	630,000	700,000	730,000	760,000	790,000	820,000	850,000	850,000	850,000
121	Environmental maintenance	Operations	1,405,267	1,479,229	1,553,190	1,553,190	2,485,203	2,559,759	2,636,552	2,715,649	2,797,118	2,881,032

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
	Environmental maintenance (SPR)	Operations	58,500	62,244	68,468	74,032	78,544	80,900	83,327	85,827	88,402	91,054
122	Traffic services maintenance	Operations	1,340,902	1,426,720	1,569,392	1,696,925	1,800,332	1,854,342	1,909,972	1,967,271	2,026,290	2,087,078
	Traffic services maintenance (SH)	Operations	200,000	200,000	200,000	471,813	500,564	515,581	531,049	546,980	563,389	580,291
123	Operational traffic maintenance	Operations	96,200	102,357	112,593	121,742	129,161	133,035	137,027	141,138	145,372	149,733
	Operational traffic maintenance (SH)	Operations	219,700	233,761	257,137	278,033	294,975	303,825	312,939	322,327	331,997	341,957
131	Level Crossing warning devices	Operations	46,800	49,795	54,775	59,226	62,835	64,720	66,662	68,661	70,721	72,843
151	Network and Asset Management	Operations	3,741,905	4,052,245	4,037,250	4,197,479	4,488,242	4,416,612	4,580,103	4,699,973	4,696,983	4,835,096
211	Unsealed Road Metalling	Renewals	1,030,248	1,082,707	1,010,516	1,010,516	1,010,516	1,010,516	1,061,042	1,061,042	1,061,042	1,061,042
212	Sealed road resurfacing	Renewals	4,200,000	4,300,000	4,500,000	4,500,000	4,500,000	4,500,000	4,725,000	5,200,000	5,500,000	5,500,000
	Sealed road resurfacing (SPR)	Renewals	42,189	44,889	49,378	53,390	53,390	53,390	56,060	56,060	56,060	56,060
213	Drainage Renewals	Renewals	1,029,338	1,081,750	1,009,623	1,009,623	1,009,623	1,009,623	1,060,104	1,060,104	1,060,104	1,060,104
214	Sealed road pavement rehabilitation	Renewals	3,600,000	3,800,000	4,000,000	3,200,000	3,200,000	3,200,000	4,600,000	5,500,000	7,000,000	10,000,000
215	Structures component replacements	Renewals	878,922	1,094,950	867,544	867,544	867,544	867,544	910,921	910,921	910,921	910,921
216	Bridges and structures renewals	Renewals	1,874,772	4,573,492	2,175,861	618,375	618,375	618,375	649,294	1,000,000	1,000,000	1,000,000

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
221	Environmental renewals	Renewals	361,611	375,963	334,946	334,946	334,946	334,946	351,693	351,693	351,693	351,693
222	Traffic services renewals	Renewals	1,370,184	1,424,566	1,269,146	1,269,146	1,269,146	1,269,146	1,332,603	1,332,603	1,332,603	1,332,603
	Traffic services renewals (SH)	Renewals	50,000	50,000	50,000	109,232	109,232	109,232	114,694	114,694	114,694	114,694
225	Footpath renewals	Renewals	604,490	629,109	559,424	559,424	559,424	559,424	587,395	587,395	587,395	587,395
432	Road safety promotion – Roadsafe Taranaki	Operations	373,500	380,970	388,589	396,361	404,288	412,374	420,622	429,034	437,615	446,367
	Education & Encouragement – Let's Go Programme	Operations	923,500	1,060,250	1,013,500	1,033,770	1,054,445	1,075,534	1,097,045	1,118,986	1,141,366	1,164,193
514	PT Operations and Maintenance (TRC)	Operations	200,000	200,000	200,000	220,000	220,000	220,000	230,000	230,000	230,000	230,000
532	Bus Shelter Improvements (TRC)	Augmentation	150,000	150,000	150,000	155,000	155,000	155,000	160,000	160,000	160,000	160,000
N/A	Unsubsidised Maintenance	Maintenance	1,235,970	1,256,723	1,283,145	1,103,458	1,121,347	1,140,217	1,164,682	1,187,976	1,211,736	1,235,969
	Unsubsidised Operations	Operations	536,895	541,780	546,761	553,429	567,190	581,245	595,602	608,733	622,068	632,609
	Unsubsidised Renewals	Renewals	147,603	149,999	153,628	321,493	327,305	333,213	339,217	346,200	357,250	360,600
	Unsubsidised Augmentation – Coastal Pathway Extension (Bell Block to Waitara)	Augmentation	1,158,289	1,237,628	637,645	800,000						

TABLE 0-2: AUGMENTATION FINANCIAL FORECAST

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
322	Airport Dr/Parklands RAB	Augmentation	1,175,199			50,000	1,000,000	1,100,000				
322	Waiwhakaiho River Second Viaduct (Burgess Park Area)	Augmentation								150,000		350,000
322	Waiwhakaiho Road extension (to Smart Road) aka NP Eastern Ring-Road	Augmentation										100,000
323	Bishop Road extension (Egmont-Henwood)	Augmentation					350,000			500,000	1,900,000	4,200,000
323	Colson Road Extension (Smart Rd – Egmont Rd)	Augmentation				300,000	1,000,000	2,000,000	5,200,000	3,300,000		
323	Parklands Ave extension (Waitaha Bridge – Airport Drive)	Augmentation	50,000	250,000		600,000	2,000,000	2,000,000	5,000,000	1,000,000		
323	Roads Land Purchase - NP Western Ring-Road	Augmentation					375,000			2,250,000		2,250,000
323	Roads Land purchase as per DP & rural widening	Augmentation	500,000	500,000	500,000	500,000	500,000	750,000	1,106,000	1,106,000	1,106,000	1,106,000
323	Transport Services for Subdivisions in Unserviced Areas.	Augmentation	318,000	318,000	318,000	344,500	347,100	354,900	392,000	392,000	392,000	392,000
341	LRI Bell Block Court Village Placemaking	Augmentation							150,000	1,000,000		
341	LRI Bridge Barrier Upgrade Programme	Augmentation	269,684			400,000	400,000	400,000				
341	LRI Camera Installation on Intersections	Augmentation				155,000						

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
341	LRI Carrington Road (Peri-Urban) Widening	Augmentation							65,000	450,000		
341	LRI Delineation Upgrade to RTS5 standard	Augmentation	117,028									
341	LRI Egmont Road Maunga Park'n'Ride	Augmentation	150,000	1,800,000								
341	LRI Henwood Road Widening	Augmentation				400,000		400,000		400,000		
341	LRI Huatoki/Carrington Vogeltown IS	Augmentation	260,000									
341	LRI Inglewood CBD Placemaking	Augmentation				75,000	200,000	200,000	1,525,000			
341	LRI Inglewood CBD Upgrade	Augmentation						20,000	80,000	400,000		
341	LRI Junction Rd Endowment fund	Augmentation	350,000	350,000	350,000	350,000	350,000	350,000	350,000	350,000	350,000	350,000
341	LRI Ocean View Pd Street Lighting	Augmentation							400,000			
341	LRI Otaraoa Road Geometric Improvements	Augmentation				105,000	715,000					
341	LRI Patterson Road Widening	Augmentation	222,500									
341	LRI Raleigh St and Tate Rd IS Improvements	Augmentation	35,000	300,000								
341	LRI Seal Widening	Augmentation				350,000	350,000	350,000				
341	LRI SH3 Henwood Road Bridge Signalisation	Augmentation				650,000						
341	LRI SH3 Pohutukawa Place Off-Ramp	Augmentation						200,000	1,500,000			
341	LRI Smart Road Widening	Augmentation				50,000	250,000	250,000	250,000	250,000	250,000	

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
341	LRI Upland Road Geometric Improvements	Augmentation				150,000	1,000,000					
341	LRI Upper Carrington Road Widening	Augmentation				150,000	500,000	500,000				
341	LRI Uruti Road Geometric Improvements	Augmentation							515,000	600,000		
341	LRI Visibility Improvements (Resilience project)	Augmentation				200,000	200,000	200,000				
341	LRI Westown Village Placemaking	Augmentation							20,000	80,000	200,000	1,500,000
341	LRI Wills Road Widening	Augmentation	45,000	100,000	1,000,000							
341	NP Central City PT Trial	Augmentation	200,000	408,000	408,000							
341	Pukekura Green Link and Gover St Programme	Augmentation				300,000	600,000		3,700,000	3,100,000	2,400,000	8,400,000
341	R2Z Belair Ave (SH45 South Rd-Omata Rd)	Augmentation	437,104			450,000						
341	R2Z Brookland/Hori/Upjohn IS	Augmentation				150,000	700,000	1,050,000				
341	R2Z Carrington/Huatoki/Hori IS	Augmentation				220,000		1,200,000				
341	R2Z Coronation/Upjohn/Tarahua IS	Augmentation									80,000	500,000
341	R2Z Devon East/Mangorei Rd IS (Traffic Signals)	Augmentation				100,000	500,000					
341	R2Z Gover Street Traffic Calming	Augmentation							500,000	500,000		
341	R2Z Nugent/Pohutukawa/Bell Block Court IS	Augmentation				130,000	850,000					
341	R2Z Parklands/Nugent Corridor	Augmentation						100,000	450,000			

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
341	R2Z Parklands/Nugent RAB	Augmentation						165,000	750,000			
341	R2Z SH3 Cameron St IS Closure	Augmentation			250,000							
341	R2Z SH3 Coronation/Cumberland (Traffic Signals)	Augmentation				760,000						
341	R2Z SH3 Coronation/Rogan (Traffic Signals)	Augmentation	240,000		1,600,000							
341	R2Z SH45 Morley/Vivian (Traffic Signals)	Augmentation				90,000	590,000					
341	R2Z Speed Management Programme	Augmentation	429,010			750,000	750,000					
341	R2Z Strandon Village Place Making	Augmentation				135,000	1,300,000					
341	R2Z Tukapa St Corridor	Augmentation				250,000	250,000	250,000	1,000,000	1,000,000	1,000,000	
341	R2Z Tukapa/Clawton Intersection	Augmentation				50,000		300,000				
341	R2Z Tukapa/Saunders Intersection (Traffic Signals)	Augmentation				150,000		600,000				
341	SPR Maunga PT Trial	Augmentation	300,000	300,000	300,000							
341	W&C Beach St Pathway Improvements	Augmentation	150,000	150,000	1,800,000							
341	W&C Bulkeley Tce Railway Crossing Pedestrian SI	Augmentation				250,000						
341	W&C Calvert Rd (St Joseph's School) SI	Augmentation							260,000			
341	W&C CBC Tactile Pavers Upgrade	Augmentation				25,000	25,000	25,000	25,000	25,000	25,000	25,000

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
341	W&C Coastal Pathway extension (Pioneer Rd – Paritutu)	Augmentation							130,000	640,000		
341	W&C Endeavor St (Marfell School) SI	Augmentation							300,000			
341	W&C Harris St Huatoki Pathway	Augmentation								25,000	250,000	
341	W&C Pedestrian Crossing Lighting Upgrades	Augmentation	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
341	W&C Pohutukawa Place (Links to Jersey)	Augmentation				500,000						
341	W&C Pukaka Green Link	Augmentation				300,000	600,000		1,000,000	1,200,000		
341	W&C Queen St Cenotaph Pedestrianisation	Augmentation		300,000			1,750,000					
341	W&C Raiomiti St Improvements	Augmentation					75,000	500,000				
341	W&C Raised Pedestrian Crossings	Augmentation	250,000			250,000	250,000	250,000				
341	W&C Record St Pedestrianisation (Barriball-Princes)	Augmentation				25,000	175,000					
341	W&C Rifle Range Rd Shared Pathway (Constance-Vickers)	Augmentation					30,000	65,000	355,000			
341	W&C School Infrastructure Projects	Augmentation				122,000	122,000	122,000				
341	W&C SH45 Wairau Road Walking/Cycling underpass	Augmentation									150,000	1,000,000
341	W&C Sisson Tce (Lepperton) Widening	Augmentation				220,000						

WC	Description	Service Level Driver	2024/25 ($)	2025/26 ($)	2026/27 ($)	2027/28 ($)	2028/29 ($)	2029/30 ($)	2030/31 ($)	2031/32 ($)	2032/33 ($)	2033/34 ($)
341	W&C Sutherland Park Cycle/Walkway link	Augmentation	130,000									
341	W&C Tukapa St (Frankley School) SI	Augmentation					75,000					
341	W&C Waireka Road West to East Walking and Cycling Connection	Augmentation							150,000			
341	W&C Waitaha Stream Bridge & Underpass	Augmentation				10,000	190,000	1,800,000				
341	W&C Waitaha Stream SH3 Underpass	Augmentation					10,000	80,000	270,000	1,600,000		
341	W&C Waitaha Stream Shared Pathway	Augmentation				40,000	130,000	400,000	600,000			
341	W&C Waiwhakaiho River Walking/Cycling Bridge	Augmentation				150,000	1,250,000	500,000				
341	W&C Windsor Walkway	Augmentation	1,000,000									
421	Let's Go Travel Demand Management	Augmentation	683,000	683,000	683,000							
452	Coastal Pathway Extension Waitara-MaNgāti	Augmentation	5,343,265	13,353,543	9,111,465	8,466,600						
PBC	NP East-West Ring Road Study (including second river crossing)	Augmentation	408,000	408,000	408,000							

8. Business Processes and Risk Management

Contents

8.1. Business Processes

The Council's transportation asset management system is a combination of processes, data and software applied to provide the essential outputs for effective asset management. The transportation activity utilises a number of these aspects for the effective management of transportation assets.

This section provides information regarding the Council's systems, procedures, strategies, and processes. Information obtained from public consultation on Levels of Service, updated construction rates and data reflecting the changing of condition or performance will be used to keep this AMP current.

8.2. Health and Safety

NPDC cares for the wellbeing of the district's people, community and the environment people live and work in. The Council is committed to continuously learning and improving its Health, Safety and Environment (HSE) performance. The Council welcomes and encourages feedback and involvement, acknowledging that it can always do better.

Through its Pinnacle Health, Safety and Environment Management system, the Council provides several guidelines to ensure that staff are provided with the tools and processes to support the implementation and delivery of its HSE policies.

While Health and Safety is primarily the responsibility of the Employer, it is also the responsibility of every individual. Managers remain responsible for ensuring that management practices regarding Health and Safety are both put in place and undertaken.

8.3. New Plymouth District Council Financial Strategy

The Council's Financial Strategy aids in delivering a financially sustainable district in the long term, one in which its citizens can afford to live in the near future, but also in 50 and 100 years from now. It is intended to guide decisions made now and, in the future, to ensure they contribute to the Council's vision and goals identified in Section 2: Strategic Case of this AMP.

The Council's Financial Strategy applies the following principles:

- Fairness and equity (intergenerational equity, balanced budget, borrowings funding, distribution of benefits, development contributions, market neutrality)
- Willingness to pay.
- Value for money
- Risk management and assessment
- Good financial governance and stewardship

Being fair to ratepayers and customers means that transportation activities are cost-effective and necessary for the community's current and future needs. It means that rates and charges are allocated to those who benefit and to those who have a negative impact on (or exacerbate)

community wellbeing; that costs are spread across todays and tomorrow's users (inter-generational equity) to match when benefits arise; and being aware of not excessively burdening today's users with the impact of yesterday's users not having contributed enough.

The Council's AMPs are renewed regularly and inform a 30-year Infrastructure Strategy. Every three years the Council prepares a 10 Year Plan. Every year the Council prepares a detailed Annual Plan. The Council consults the community on what is proposed and at the end of every year it reports back to the community on how well it has done against the plans.

8.4. Road Assessment and Maintenance Management

The Council uses the RAMM system to obtain information about assets. The RAMM system contains a schedule of all roads in the network and information on carriageway widths, surfacing types and ages, pavement composition, traffic volumes and loadings and road condition data. Information on structures such as drainage facilities, footpaths, bridges, streetlights, and signs are also stored on the RAMM system.

Information contained in this AMP will be used in the preparation of the LTP and subsequent Annual Plans, as well as in the preparation of insurance schedules. The Council will move to use the RAMM valuations module by the next AMP (2027).

Advanced asset management techniques such as optimised decision making, will be further integrated into the system as asset management as the transportation activity evolves. Further details for RAMM are in Sections 8.3.1 and 8.3.2 and other sections below (where relevant).

8.5. Accounting and Financial Systems

The Council's financial accounting system is delivered via a software package entitled TechnologyOne.

Accounts are compiled in accordance with Generally Accepted Accounting Principles (GAAP) standards to meet LGA regulations. The RAMM database (detailed above) holds all pertinent financial information relating to an asset on an asset-by-asset basis. Financial information includes purchase or commissioning date, asset value, and depreciation charged. The financial information held in the register allows financial transactions such as depreciation to be calculated. The register also reflects changes to existing assets that occur over their life, such as revaluations and disposals. The register also holds non-financial information for the management of the assets.

8.6. New Plymouth District Council Procurement Strategy

The Council maintains ownership and responsibility for managing the transportation activity and associated infrastructure. To maximise efficiencies and long-term value for money, the transportation network is managed with a holistic asset management focus. This means that all procurement is linked operationally and strategically where the maintenance management system, the intervention strategy and the 10-year programme is linked.

The Infrastructure Procurement Strategy (reference: ECM#7758249) was updated in July 2018 and outlines “how NPDC will apply the rules and processes of our procurement manuals and policies in order to maximise the long-term value when procuring infrastructure services”. This strategy supports NPDC’s Infrastructure team in the position of Supply Chain Leader.

The road maintenance and capital works contracts form the largest component of NPDC’s procurement of transportation services. For maximum effectiveness the whole NPDC road corridor maintenance contract is carried out by a single entity. The Alliance model exploits the local knowledge from the team, determining what works and what does not work. Decisions are made by people who actively plan and manage the transportation network with full knowledge of the strategic outcomes.

The Term Services Contract helps achieve the Council’s vision by:

- Providing a line of sight between the Councils objectives and goals
- Making a long-term investment in people, plant, and materials
- Improving safety by investment in the right equipment and people
- Reducing tendering costs over the life of the Term Services Contract
- Increasing synergy between various work activities and asset groups
- Maximising contract management efficiency
- Obtaining value for money
- Increasing asset lives
- Parties working collaboratively.

To achieve this vision, it is vital to have the right team on board. The make-up of the New Plymouth Alliance team and how it operates is summarised in the figures below:

FIGURE 0-1: THE MAKE-UP OF THE NEW PLYMOUTH ALLIANCE TEAM

FIGURE 0-2: HOW THE NEW PLYMOUTH ALLIANCE OPERATE AS A TEAM.

8.7. Supplier Capacity and Capability to deliver the Asset Management Plan

To establish Optimal Value for Money, NPDC is working on becoming a Supply Chain Leader rather than just a conventional client. This will assist risk management across whole supply chains and ensure a coordinated and cohesive understanding of contractual interdependencies and relationships amongst all parties in the supply chain. Target unit rates in the AMP and programme business cases reflect some of the potential savings that the Council believes are achievable.

NPDC will develop a new procurement strategy to take advantage of the identified opportunities. This will include all parties involved in the supply chain in capacity and capability planning to deliver the activities included in the AMP. This will allow longer term partnerships with contractors to be formed and improved term contracts to be developed, to the mutual benefit of all parties in the supply chain.

8.8. Term Service Contract

Delivering the 'activities' of the AMP falls to the supply chain, who carry out the maintenance and renewal physical works. The Council manages these through an NEC4 Term Service Contract and CEMAR is the administrative tool used by the parties involved.

NEC4 is a collaborative contract and CEMAR achieves true collaboration, drives consistency, and frees teams from administration, through a cloud-based contract management system. CEMAR focuses on the user experience and allows engineers, supervisors, managers, and consultants to spend their time on their profession instead of administration.

Key features enable participants to:

- Keep in line with contract compliance, through a simple register of events.
- Stay up to date with action reminders, with party-sensitive reminders and email alerts.
- Audit, archive and remain in control, through permissions, user threshold settings and internal approval workflows.
- Unlock valuable overview and insights with real time reporting.

8.9. New Plymouth District Council as a "Smart Buyer"

In 2011 the Government established the Road Maintenance Task Force to identify opportunities to increase the effectiveness of road maintenance. In particular, they reviewed the areas of asset management, risk management and procurement methods. In the 2012 review report, the Task Force listed the characteristics that would be exhibited by an RCA that has the capability and the capacity to be a "Smart Buyer".

Te Ringa Maimoa, a collaborative project between local government and Waka Kotahi has subsequently developed a Self-Assessment form for RCAs to assess their own performance in this area. Figure 100 indicates NPDC's assessment. The score of 57 is interpreted as "Our organisation has embraced Smart Buyer principles but can still improve".

FIGURE 0-3: NPDC SMART BUYER SELF-ASSESSMENT

REG THE ROAD EFFICIENCY GROUP — We are. LGNZ. — WAKA KOTAHI NZ TRANSPORT AGENCY

Smart Buyer Principles Assessment Tool

This assessment is based on the Smart Buyer Principles identified in the Road Maintenance Task Force Report. That statement of principles is included at the end of this document. Score the following by ticking the appropriate box - (1) Disagree to (5) Strongly Agree

Whenever you score yourself "4 or 5" think of an example you can use to justify your score to an independent auditor

Assessment statement Our Organisation	Score 1	2	3	4	5
1. Fully understands the different contracting models available				✓	
2. Holds meetings that updates the contracting industry on the forward works programme and any changes it is taking in approach and proactively engages with the contracting industry to ensure that gains optimal value out of any changes being implemented				✓	
3. Has sufficient robust data (or is in the process of gathering robust data) on our networks that enables optimal integrated decision-making				✓	
4. Has access to expertise that fully enables best use of the data available				✓	
5. Is open to alternative solutions to those proposed in the contract documents				✓	
6. Understands risk and how to allocate and manage it				✓	
7. Has a Council that is prepared to pay more now to achieve a lower whole of life cost					✓
8. Actively pursues value for money & does not always award contracts to the lowest price					✓
9. Is able to manage supplier relationships / contracts to ensure that expenditure is optimal and sustains infrastructural assets at appropriate levels of service				✓	
10. Supports ongoing skill and competency training and development for its staff				✓	
11. Actively participates in gatherings to share and gain knowledge within the sector				✓	
12. Is effective in keeping up with best practice in procurement including best practice RFP / contract documentation			✓		
13. Regularly seeks and receives candid feedback from suppliers on its own performance as a client and consistently looks to improve its performance				✓	
14. Explores opportunities for collaboration by either sharing in-house resources with neighbours, or by procuring together or tendering together. That exploration could be through an LGA s17A evaluation of transport function delivery options.				✓	
Number of ticks in each column			1	11	2
Multiplying factor	x1	x2	x3	x4	x5
Total Score in Column			3	44	10
Total Score	57				

Score:	Interpretation
65 to 70:	A smart buyer: Our organisation is a smart buyer. We help to minimise rate increases by maximising the value created for our community
55 to 64:	Developing: Our organisation has embraced the principles of being a smart buyer but can still create further improved value for our communities
30 to 54:	Limited: Our organisation currently has limited capability to maximise the value created from being a smart buyer
0 to 29:	Basic Our organisation is focused on tender process and compliance. We have not developed the capability to realise any of the value created for our community from being a smart buyer

8.10. Asset Data

8.10.1. Asset Data Accuracy

Throughout the AMP the accuracy / confidence grade of the data presented on the quantity, type (material), age, value, expected life, RUL and performance is assessed and indicated in accordance with the table below. This table is based on IIMM Section 2.4.5 on Maintaining and Improving Data Confidence.

TABLE 0-1: ASSET DATA ACCURACY/CONFIDENCE GRADES

Accuracy/Confidence	Description
A – Highly Reliable	Data based on sound records, procedures, inspections. Data recorded in well maintained system. Estimated accuracy ± 2%.
B – Reliable	Data based on sound records, procedures, inspections. A few records questionable or missing or extrapolated. Estimated accuracy ± 10%.
C – Uncertain	Data based on sound records, procedures, inspections which is incomplete. Some records questionable or missing with up to 50% extrapolated. Estimated accuracy ± 25%.
D – Very Uncertain	Data based on unconfirmed verbal reports or cursory inspections. Most data estimated or extrapolated. Estimated accuracy ± 40%.
E - Unknown	None or very little data held.

8.10.2. Asset Criticality Ratings

Throughout the AMP the condition assessment for the assets has been summarised in accordance with the table below, which is based on guidance in IIMM Section 3.2.4 on Identifying Critical Assets.

Criticality Rating	Description
1	Non-critical
2	Moderate
3	Important
4	Critical
5	Non-Applicable
6	To be Determined

8.10.3. All Faults Network Condition

Over / above the previously mentioned condition grading and criticality ratings, the Council also identifies and captures all unsealed and sealed network faults (hence called All Faults), which can be used to provide real time indicators to inform programming of routine forward works. This enhanced visual condition rating system is roughly aligned to the NAMS lifecycle rating (1 to 5), where 1 is a

pavement asset in new condition and 5 is at the end of its serviceable life and has been summarised in accordingly in the table below.

A key feature of this system is that it considers the asset condition in terms of the health and safety the hazard to poses to users of the network.

All Faults Rating	Description
1	New asset condition
2	Low priority fault identified, for monitoring
3	Medium priority fault identified, for action in a three-month programme
4	Intervention required for hazardous identified fault, for repair action
5	Out of specification, levels of service and hazardous fault, for immediate repair action.

8.10.4. Asset Data Types

Information on age, condition, risk factors, material, cost, and location are captured within the RAMM system for all assets. The NAMS guidelines, Rawlinson's construction cost manual and manufacturers specifications, and maintenance schedules are utilised for asset management decision making. Spatial representation of the transportation network is located within the Council's GIS system, which allows for spatial analysis.

Since the 1990's RAMM has provided a uniform national inventory system and is also used by Waka Kotahi to obtain consistent data and condition reporting over the country's transportation network.

Streetlight data is held within RAMM in the SLIM database.

8.10.5. Asset Data Quality

Information quality forms a cornerstone of effective asset management. Confidence in the accuracy and completeness of asset information impacts the degree of which that information contributes as an enabler for fact-based decision making. To that end the Council produced a transportation 'Data Quality Management Plan' (in 2020) setting out the Council's data collection requirements, frequency, and data standards for managing the transportation network in a manner that meets its goals. This document is to be used in conjunction with the Contractor's Data Quality Plan.

Frequency and method of inspections and data to be collected is related to the service being provided by the particular asset. The aim is to ensure data is used to determine need and timing of some preventative or remedial action to maintain the desired Level of Service.

The criticality of the asset, or the skill set required to assess the asset, determines whether the inspections are carried out in-house or via an external contractor or consultant. There are two Network Inspectors; one to service the rural network and one to service the urban network. Between the two inspectors, they assess the asset conditions of pavements, footpaths, cycleways, stormwater drainage, traffic services and street furniture. The remaining surveys / inspections are undertaken by external contractors.

The asset management system uses the following asset information data:

- Asset Inventory – Physical parameters (asset type, age, size, material, and location)
- Asset Location – Linear (km post or reference point) and spatial (GPS coordinates)
- Asset Condition – Condition assessment (manual condition and high-speed survey)
- Traffic Volume – Traffic count and traffic estimation
- Data Collection Level – Network level and project level
- Standard and Policies – Waka Kotahi data requirements and Council policies
- Budget – Annual/ multiyear budget by each asset type

8.11. Asset Management Improvement Programme

A multi-disciplinary Asset Management Steering Committee was formed in mid-2016, tasked with the delivery of the Asset Management Policy Statement: "The Council's asset management practices ensure the prudent stewardship and the efficient and effective use of its resources in the interests of the district, including planning effectively for the future management of its assets".

8.11.1. Asset Management Maturity

The Asset & Data Management Office (ADMO) sitting within Downer Group Strategy, Growth and Innovation has developed an Asset Management Maturity Assessment (AMMA) with alignment to ISO 55000.

The New Plymouth District Council (NPDC) contract was independently assessed as 'Proficient'.

The key areas assessed are shown below:

Key Area	Description
Business Alignment	Alignment to business objectives, stakeholder engagement and scope of the asset management system.
Leadership	Policy awareness and commitment to asset management by the business.
Planning	Based on the business objectives, is risk managed in the planning to achieve objectives?
Support	Resourcing, Awareness, Competence, Engagement and Documentation and Data.
Operation	Operational planning and control change management and outsourcing.
Performance Monitoring	Monitoring, measuring, analysis, and evaluation of asset and system data.
Improvement	Continual Improvement, preventive action, and non-conformance.

The Asset Management Maturity Scale is shown below:

Maturity	Scale
Advanced	>81%

Proficient	61-80%
Competent	51-60%
Aware	41-50%
Immature	<40%

The table below shows historic trends:

Key Area	2021	2022
Business Alignment	71.4%	68.6%
Improvement, NCR, and Preventative Action	56.0%	64.0%
Leadership	70.0%	60.0%
Operation	80.0%	88.0%
Performance Monitoring	71.4%	74.3%
Planning	60.0%	62.5%
Support	78.0%	74.0%

8.11.2. MAX.quality

MAX.quality is an automated RAMM setup developed by GHD to help the road management industry to improve their data quality and to support the management of their various business activities, which are supported by the RAMM system.

MAX.quality tests data for correctness based on a mixture of logic (locations of assets not within the carriageway where they should not be, for example) and testing fields that lookup tables such as materials or type for missing data or selected values (custom to an individual database) which are considered to be incorrect.

The table below shows a vast improvement in the last three years – NPDC have reduced the number of errors by 90%. This provides a lot more confidence in data decision making. Further work is required around condition and dimensions, with the main issue being drainage assets. This should be the primary focus over the next three years.

Area of Issues	Total Errors (2020)	Total Errors (2023)	Notes
Age/life	24,286	459	Date of construction, expected life, etc.,

Classification	715	37	Specific type of asset, definition of the network, etc.,
Condition	10,837	4570	Does it have a condition rating?
Details	10,255	83	Catch all, includes such items as material, colour, etc,
Dimensions	20,270	5351	Length, height, width, depth, shape, etc,
Location	15,129	0	Route position, side, offset, etc,
Missing Activity	3,764	835	An activity such as condition rating, traffic estimates that has not occurred within an expected timeframe
Missing Assets	80	13	Locations where an asset would be expected yet there is no asset
Ownership	30,856	14	Missing or incorrect ownership
Value	202	0	Value of assets or maintenance cost values
Total	**116,494**	**11,397**	

8.11.3. Pavement Deterioration Modelling

The council utilises JunoViewer by Lonrix for all our deterioration modelling needs. Deterioration modelling is a core feature of the framework and facilitates budget and treatment optimisation using established approaches such as the HDM models or later, more innovative approaches such as those based on Heuristics and Big Data analysis techniques.

Some of the key features include:

Feature	Summary
Modelling engine provides segment or segment group-based optimisation and ranking capability	Innovative group-based optimisation and ranking engine is ideal for networks with multi-lane highways where lanes or sections need to be treated as a group (same time, different treatments)
User-definable benefit/ranking indexes and modelling parameters	Users can design and implement their own model parameters and benefit functions
User-definable deterioration models/equations	HDM models or more locally developed models can be defined by the user. Any number of model parameters can be defined
Treatment or Strategy based optimisation using Heuristics and/or Cost-Benefit Analysis Indicators	Requires some customisation and setup to suit client-specific needs
Flexible, user-defined Treatment Selection Algorithm	Users can define rules and rules sets for Treatment Selection. A unique feature is the optional use of a user-defined Pavement Design Catalogue
Budget scenario analysis features	Users can define budgets and analyse future network condition over different budget scenarios to identify and optional budget

8.11.4. RAMM Asset Valuation

As noted in Section 8.3, the Council will be gearing up to use the Asset Valuation Module in RAMM to calculate the replacement cost, depreciated replacement cost and annual depreciation costs of its transportation assets, by the next 10 Year Plan (2027). The Council will need to update/collect vital information which is currently missing on key asset types.

8.12. Traffic Data Collection

An annual traffic counting programme is in place to monitor traffic volumes on the network and to ensure that the information held on the RAMM database is accurate.

The Council operates 20 traffic counters with priority given to the counts being undertaken on proposed resurfacing and pavement rehabilitation sites in the first instance and other roads requiring updated traffic composition for reporting and analysis purposes. The Council also operates a cycling counter, which is used when needed.

Classified traffic counts also identify the composition of the traffic carried, which is necessary for pavement and resurfacing design purposes. These counts are also used to monitor the speed of vehicles.

NPDC also conducts an annual cordon survey to capture all transport movements into and out of the central city. This has recently been improved to remove 'holes from the cordon' to improve accuracy.

8.13. Business Systems

The Council has systems to support a management decision making structure with accurate information. The information systems necessary to support this type of program are often based around IT systems. The resources required include project management, implementation and ongoing support staff, software, hardware, data collection, and system operation and maintenance. The cost can represent a substantial business investment, and this warrants a dedicated project management team to ensure satisfactory implementation and completion.

The Council has developed its Information Services for infrastructure around several key products that provide a platform for all IT applications. Over / above the systems already mentioned, these include:

- Microsoft – Word processing, spreadsheets, emails, project, etc.,
- TechnologyOne – Ci Anywhere extension for records management
- Miles – Esri powered GIS mapping.
- SmartTrack – vehicle fleet management\
- Ochre – Human Resources system
- Affinity – Clever timesheets and payroll system

8.14. NPIP Emergency Preparedness Plan

The purpose of this plan is to ensure the NPIP team are prepared for foreseeable Emergency Events. This plan identifies key tasks and responsibilities which need to be completed before and during an emergency event to ensure preparedness. These tasks include:

- Preparation
- Event Declaration and Communication
- Hub Setup
- Roles/Responsibilities

If an emergency event occurs the priorities must be:

1. The safety of all persons on site (Including visitors and contractors)

2. The safety of nearby residents.

3. Minimum impact on the environment.

Normal business operations are returned to normal as soon possible.

8.15. Waka Kotahi

As part of Waka Kotahi's quality processes, they carry out several audits within NZ across all RCAs. These audits are intended to check compliance with Waka Kotahi's procedures and policies. They also check processes systems and personnel are in place to support analysis and good asset management decision making. These audits form a significant part of the business processes that determine how well the Council's assets are performing and how well they are being managed, maintained, and renewed.

8.15.1. Procedural Audits

Procedural audits are carried out in terms of section 69(1) (k) of the LTMA. A procedural audit of each RCA is carried out every two to four years. The objectives of the procedural audits are generally as follows:

- To review any issues arising from previous procedural audit(s)
- To review final claims for the period being audited
- To assess the audit trail of transactions for financially assisted works
- To assess compliance with Waka Kotahi's approved procurement procedures
- To review contract management procedures
- To review the Councils professional services provider/network manager/business unit for compliance with Waka Kotahi's requirements
- To recommend measures for improved practice if appropriate.

8.15.2. Technical Audits

Technical audits are carried out on at least a four-year cycle. Factors that determine the frequency include the value of the financial investment, the complexity of each RCAs programme, network condition (pavement and safety) and the outcome of previous audits. Each RCA will be advised at least a month in advance of the audit commencing. The objectives of the technical audits are generally as follows:

- To review any issues arising from previous technical audit(s)
- To assess whether the level and quality of transportation maintenance being carried out by the Council is realistic and acceptable.
- To determine the extent to which the Councils structural and corridor maintenance programme is meeting (not exceeding) maintenance needs.
- To determine the extent to which the Council's RAMM database can provide reliable reports and treatment selections.

8.15.3. To determine considering the answers to above, that there is progress towards achieving a last cost, long term, maintenance programme] Reporting Tools

Te Ringa Maimoa publishes a range of financial and non-financial information related to the performance of its transport investments on Transport Insights. This data is collected as part of a statutory annual achievement return process and is published as part of the Waka Kotahi's commitment to open Government data. These tools were developed several years ago and are currently maintained with data updates only. Waka Kotahi keeps them under review and will remove any tools if they are no longer required. Most of the metrics reported are not the same as the ONRC measures.

Transport Insights reports on ONRC measures and some ONF reporting. This tool is useful for the RCA to view performance and compare performance against other RCAs.

The ONF is a new framework that extends he ONRC to the next level and provides a common language for all disciplines, including urban and rural planners, urban designers, land use planners, traffic engineers, journey managers, network and asset managers, construction designers and landscape architects. Further information for the ONF is provided in Section2: Strategic Case of this AMP.

8.15.4. Road Infrastructure Safety Assessment

The Road Infrastructure Safety Assessment (RISA) is a safety focused technical review of several sample sections of a road network to identify areas that could be improved.

The RISA is based on international best practice guidelines. The safety audit is carried out in advance of a technical review and the results are included in the technical review report. The recommendations are typically used to prioritise safety improvements, which RCAs can then include in their next NLTP.

8.16. Risk Management Planning

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk'[9].

An assessment of risks10 associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

Risk assessments are conducted, recorded, managed, escalated, and monitored in accordance with the Corporate Risk Management Framework: Policy and Process (reference: ECM#1479536). A summary of how the policy and process operate and a list of the current key risks that are relevant

to all asset groups and those particular to transportation assets is included in the Strategic Asset Management Plan. The consequence descriptors in the table below indicate the level of possible consequences for a financial risk at the organisation level.

Consequence rating:

Consequence rating	Factor: Financial
Catastrophic	Loss of over $10m
Major	Loss of between $5m and $10m
Moderate	Loss of between $1m and $5m
Minor	Loss of between $100k and $1m
Low	Loss of less than $100k

Knowledge of the frequency with which risks occurred in the past should inform, but not determine, the likelihood rating given. This is because the past is not always an accurate predictor of the future.

Likelihood rating	Probability of the risk occurring
Almost certain	Expected to occur more than once I the next year. Likely to occur multiple times during a project. Over 90% probability.
Likely	Expected to occur once in the next year. Has occurred in similar projects. Between 75-90% probability.
Moderate	Could occur at least once I the next two years. Has occurred in a small number of similar projects. Between 25-75% probability.
Possible	Could occur at least once in the next three to five years. Could occur but has not in similar projects. Between 1-25% probability.
Unlikely	Unlikely to occur in the next five years or during the project. Less than 1% probability.

After consequence and likelihood have been determined, the level of risk is evaluated by referring to the matrix shown below:

Catastrophic	H	H	H	E	E
Major	M	M	H	H	E
Moderate	L	M	M	H	H
Minor	I	L	M	M	M
Low	I	I	L	L	L
	Unlikely	Possible	Moderate	Likely	Almost Certain

Once the impact has been assessed according to the relative risk level is poses, it is then possible to target the treatment of the risk exposure, by beginning with the highest-level risks (high and extreme risks, and then those with a catastrophic consequence) and identifying the potential mitigation measures.

Rating		Action needed
E	Extreme	The risk owner immediately escalates new extreme risks to the Executive Leadership Team, and considers escalating it to the Finance, Audit and risk Committee. These risks are to be monitored weekly.
H	High	The risk owner immediately escalates new high risks to the Group Manager, and to the Executive Leadership Team as applicable. These risks are to be monitored monthly.
M	Medium	Bi-monthly the risk owner monitors and reviews the effectiveness of treatments and whether the risk rating has changed.
L	Low	Six-monthly the risk owner monitors and reviews the effectiveness of treatments and whether the risk rating has changed.
I	Insignificant	Annually the risk owner reviews if the controls are necessary or could be reduced.

8.17. Critical Assets

Critical assets are defined as assets that are significant in providing essential services to our community, and which may also be important in emergency situations. These assets have high consequences of failure, and as such require a higher level of proactive maintenance and management. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 9.1. Failure modes may include physical failure, collapse or essential service interruption.

TABLE 0-2 - CRITICAL ASSETS

Critical Asset(s)	Failure Mode	Impact
Roads (with no viable detour)	Flooding/Washout	Closed Roads – Loss of service
Tunnels	Collapse	Closed Roads – Loss of service
Bridges/Large Diameter Culverts	Collapse/Washout	Closed Roads – Loss of service
Retaining Structures	Collapse/Washout	Closed Roads – Loss of service

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

8.18. Risk Assessment

The risk management process used is shown in Figure 0-4 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

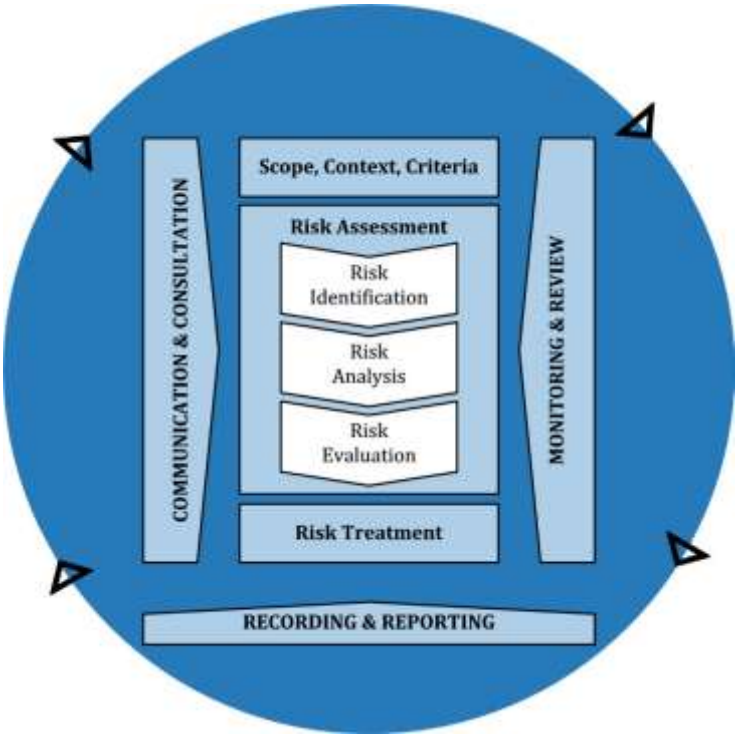


FIGURE 0-4 - RISK MANAGEMENT PROCESS – ABRIDGES

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks[11] associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action), and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 9.2. It is essential that these critical risks and costs are reported to management and the elected members.

Sources of Risk

NPDC is exposed to many and varied sources of risk. As a framework for risk identification and analysis, there are nine identified sources of risk that are relevant to all Council activities, as identified below:

8.18.1. People and knowledge:

- Inability to attract and retain skilled staff.
- Ineffective employment relations
- Poor staff knowledge, skills, engagement
- Inadequate human resource planning

8.18.2. Health and Safety:

- Failure to provide a safe work environment.
- Non- reporting of incidents/accidents, and/or not identifying trends from those reported.
- Inadequate focus on Health and Safety, especially at high-risk workplaces

8.18.3. Governance, reputation, legislative compliance, and control:

- Ineffective relationship the community (with reputational risk being a contributor)
- Ineffective relationship with and between elected members
- Implications of the election cycle e.g., the learning curve for new members as they become familiar with the functions and requirements of local government.
- Failure to comply with legislative requirements.
- Lack of internal control

8.18.4. Planning and strategy:

- Inadequate business improvement planning
- Inadequate planning to meet future requirements (growth, renewals, changing Levels of Service) as documented in the LTP, Annual Plan and Annual Report
- Inadequate emergency response/business continuity planning

8.18.5. Financial:

- Fraud (misappropriation of Council funds)
- Inability to secure funding or credit
- Inappropriate or inadequate procurement practices
- Lack of internal control

8.18.6. Information Management:

- Inadequate management of technology and systems
- Poor staff knowledge of systems
- Viruses, hacking, unauthorised access, inappropriate use of IT systems

8.18.7. Property and assets:

- Facilities do not meet requirements.

- Failure to deliver on key projects.
- Inadequate asset information and management
- Inadequate insurance cover
- Poor safety and security at public facilities: accidents, criminal activity, unacceptable behaviours, abuse

8.18.8. Environment:

- Natural hazards
- Security
- Hazardous and toxic materials
- Public health – disease outbreak
- Emergency/disaster management
- Waste and refuse

8.18.9. Operations and service delivery:

- Poor operations or customer service (including poor contractor management and performance)

The table below includes an extract from the register of risks relevant to transportation assets.

TABLE 8.2: RISKS AND TREATMENT PLANS

Risk Type	Description	Inherent Consequence	Inherent Likelihood	Inherent Risk Rating	Treatment	Residual Consequence	Residual Likelihood	Residual Risk Rating	Treatment Cost
Financial	Increased community expectations over time require levels of service above those in the LTP, resulting in unplanned increases in cost and reprioritisation of resource allocation	Major	Almost certain	Extreme	Any new service level request now needs to be justified with a Business Case. Document systems and guidelines re current Levels of Service, including in the RAMP, for the use of staff/consultants/contractors covering the full range of transportation activities.	Minor	Likely	Medium	Already covered by overheads
Operations and service delivery	We are unable to meet planned Levels of Service because of increasing costs and budgetary constraints, resulting in community discontent and the potential for service disruption if key assets fail	Major	Almost certain	Extreme	Ensure that the discussion with the community during the LTP and Annual Plan processes clearly outlines the relationship between budgets (and rate increases) and Levels of Service	Minor	Likely	Medium	Non-applicable
Financial	Financial pressure on our transport activities increases because of legislative change e.g., with increase vehicle dimension or mass limits, resulting in new compliance costs	Catastrophic	Possible	High	Expectation that any significant change would provide sufficient lead in time to allow financial preparations to be made. Also look at innovative ways to achieve compliance at the least possible cost. Accept corporate/reputational risk with having a reactive rather than a pro-active management approach.	Minor	Possible	Low	Non-applicable
Financial	We are found liable for an event that causes damage to property or serious harm/death to individuals because of our design of new network assets or	Catastrophic	Possible	High	Best practice regarding design, supported by inspections of the network to identify deficiencies and remedy them, along with a rapid response to calls from the	Major	Unlikely	Medium	Non-applicable

Risk Type	Description	Inherent Consequence	Inherent Likelihood	Inherent Risk Rating	Treatment	Residual Consequence	Residual Likelihood	Residual Risk Rating	Treatment Cost
	the failure of existing ones, resulting in financial loss.				public logging issues with the network.				
Financial	There is unbudgeted expenditure because of ongoing repairs of damage to the transport network due to a natural catastrophe, resulting in a need to revisit future year budgets.	Catastrophic	Moderate	High	Identify alternative funding from a reserve to assist with financial impact.	Moderate	Moderate	Medium	Non-applicable
Financial	Waka Kotahi withdraws or reduces its subsidies for roading maintenance and other initiatives because of factors including: The ONF system and Waka Kotahi's Investment Framework, resulting in the council needing to allocate more funding to transportation than planned.	Catastrophic	Possible	High	Internal processes, and ensuring they follow Waka Kotahi's requirements for business cases (ONF). Supported by ongoing relationship management and communication, and an expectation that Waka Kotahi will signal early on any significant changes to its funding models that will have financial implications for local government,	Major	Possible	Medium	Non-applicable
Health and Safety	A member of the public has an accident on our roading network because of a deficiency in our infrastructure, resulting in serious harm of death. Examples of deficiencies are things that do not meet current design standards or Levels of Service e.g., sharp corners with no signage or barriers, and a chipseal with insufficient skid resistance.	Major	Likely	High	Reduce the likelihood and severity of crashes with the Minor Improvement Programme, speed controls, monitoring of crash data and behaviour change programmes.	Major	Possible	Medium	Utilises W/C341
Operations and	Small talent pool in supply chain	Major	Likely	High	Creating a talent pipeline to create more interest in civil	Minor	Possible	Low	Already in existence

Risk Type	Description	Inherent Consequence	Inherent Likelihood	Inherent Risk Rating	Treatment	Residual Consequence	Residual Likelihood	Residual Risk Rating	Treatment Cost
Service Delivery					sector (digger, roller, grader operators crucial to pavement renewals/maintenance				
Operations and Service Delivery	Large number of estimated pavement thicknesses skewing modelling results	Major	Likely	High	Collect MSD data network wide to back calculate pavement thickness	Minor	Possible	Low	W/C 151: $90,000 (every 5 years)
Operations and Service Delivery	Climate change causing more frequent failures due to more extreme weather events	Catastrophic	Likely	Extreme	Adopt adaptation plan.	Moderate	Moderate	Medium	TBD
Operations and Service Delivery	Historically low budgets and high inflation rates has resulted in decreased level of service (increase in peak and average road roughness on Arterial network)	Major	Likely	High	Increase budget to bring roughness back to appropriate level of service	Moderate	Moderate	Medium	W/C 214: $1,000,000
Operations and Service Delivery	There are currently just under 1100 concrete/spun concrete light poles that need to be replaced. Need to increase budget to ensure we are replacing 300 per year – they are deteriorating faster than the remaining useful life states. A special inspection should be planned to help prioritise the renewal of these poles.	Moderate	Likely	High	Replacement of 300 concrete light poles per year for four years would significantly reduce the risk to public and their assets.	Minor	Possible	Low	W/C 222: $585,000
Operations and Service Delivery	New Plymouth has several trees in the roading corridor that pose a risk to the public and need to be removed. Removing trees while they are smaller is more cost effective, the consequence of not being proactive in this	Moderate	Likely	High	There is currently no additional budget to remove hazardous trees. We currently have 40 trees listed in our Hazardous Tree register in RAMM, but this list is expected to grow. Removing these trees will	Minor	Unlikely	Insignificant	W/C 121: $300,000

Risk Type	Description	Inherent Consequence	Inherent Likelihood	Inherent Risk Rating	Treatment	Residual Consequence	Residual Likelihood	Residual Risk Rating	Treatment Cost
	space could mean a tree that costs $2000 could become $10,000. The risk of falling over also increases over time exponentially.				reduce the risk to members of the public and their assets				
Operations and Service Delivery	New Plymouth has approximately 300 lane kilometres of seal past design life. There is a large risk that if the seals start to fail, we will see a large increase in more expensive pavement faults.	Major	Likely	High	Increase reseal programme to bring % of network resurfaced each year to 6%.	Minor	Possible	Low	W/C 212: $1,000,000
Operations and Service Delivery	New Plymouth has many assets with unknown condition ratings or condition ratings greater than 3 years which poses a large risk. Having assets with unknown condition affects maintenance, safety, regulatory compliance and financial forecasting.	Catastrophic	Likely	Extreme	Further work should be completed so that the Council has up to date condition data for all assets, this will help inform the 2027-30 AMP.	Minor	Possible	Low	W/C 151: $100,000
Operations and Service Delivery	Current drainage maintenance budget only allows for surface water channel maintenance and high shoulder maintenance of reseal sites. This does not allow for any other drainage work on the network.	Major	Likely	High	Increase drainage maintenance to reduce whole of life cost of pavement and likelihood of over slips and under slips.	Minor	Possible	Low	W/C 113: $1,100,000

8.19. Service and Risk Trade-Offs

The decisions made in adopting this AMP are based on the objective to achieve the optimum benefits from the available resources.

8.19.1. Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition, or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Increased number of roading defects
- Slower response times for repairing defects.
- Delayed work leading to higher lifecycle costs of assets.
- Decrease in customer satisfaction.
- Increase in crashes.

8.19.2. Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- Increased risk of traffic accidents and vehicle damage
- Increased number of customer complaints
- Reputational risk to the New Plymouth District Council and Supply Chain

These actions and expenditures are considered and included in the forecast costs, and where developed, the Risk Management Plan.

8.20. Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience recovery planning, financial capacity, climate change risk assessment and crisis leadership.

Our current measure of resilience is shown in Table 9.3 which includes the type of threats and hazards and the current measures that the organisation takes to ensure service delivery resilience.

TABLE 0-3 - RESILIENCE ASSESSMENT

Threat/Hazard	Assessment Method	Current Resilience Approach
Weather events	Regular inspections and appropriate maintenance of drainage	Medium
Traffic Crashes	Adequate emergency response levels	High

Contents

9.1. Status of Asset Management Practices

9.1.1. Accounting and financial data sources

This Asset Management Plan utilises accounting and financial data. The source of the data is from the 2022 New Plymouth District Council Road Asset Valuation

9.1.2. Asset management data sources

This Asset Management Plan also utilises asset management data. The source of the data is from the RAMM and JunoViewer software.

9.1.3. Continuous Improvement

NPDC is adopting a strategic management approach to improvement planning and implementing improvement processes and practices. This Improvement Plan is integral to that approach, quantifying current business practice and measuring progress toward an identified future position.

9.1.4. Improvement Cycle

The purpose of the Improvement Plan is to identify, prioritise and implement specific projects and tasks which will increase the level of maturity over time.

9.1.5. Current Practice Assessment

The first step of asset management improvement planning is to understand the current and future "appropriate practices". To do this is a systematic way the following elements will be assessed, being:

- Asset Management Policy Development
- Levels of Service and Performance Management
- Demand Forecasting
- Asset Register Data
- Asset Condition
- Risk Management
- Decision Making
- Operational Planning
- Maintenance Planning
- Capital Works Planning
- Financial and Funding Strategies
- Asset Management Teams
- AMPs
- Information Systems
- Service Delivery Mechanisms
- Quality Management
- Improvement Planning

These key elements are critical to achieving sustained performance of the organisation at the lowest lifecycle cost and to form a clear picture of how well it is performing in each of these elements and where the weaknesses lie. Each of the elements “adds value” to the raw business processes which leads to good asset management practice.

9.1.6. Identify Improvement Actions

A clear understanding of the gap between current and appropriate practice will help drive identification of improvement actions. However, identifying improvements should also be an ongoing activity not just a “one-off” gap assessment process.

Improvement actions need to be clearly scoped and defined. Failure to recognise the full costs associated with improvements may see the projects inadequately resourced and potentially not meeting the desired outcomes.

9.1.7. Develop Improvement Plan and Prioritise Actions

The Improvement Plan will be developed to identify the high priorities requiring action to focus the organisation on the most important areas. Utilising a simple improvement framework that has clear relationship to the assessment elements will help people understand how the actions relate to the appropriate level of asset management required.

Plan, do, check, act is an iterative four-step management method used in business for the control and continuous improvement of processes and products. It is also known as the Deming circle or Shewhart cycle and is illustrated in the figure below.

Plan

Establish objectives and processes required to deliver the desired result.

Do

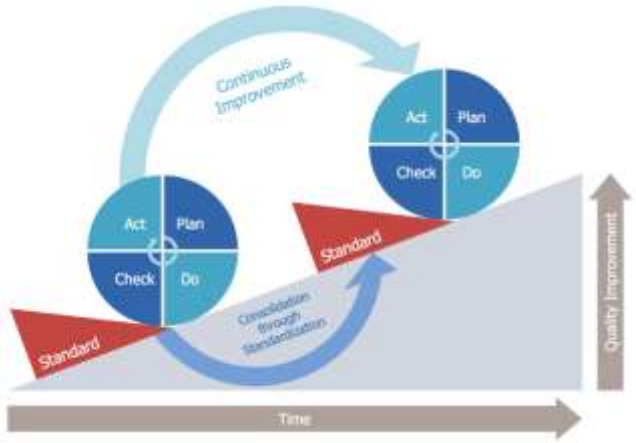
Carry out the objectives from the previous step.

Check

During the check phase, the data and results gathered from the do phase are evaluated.

Act

Also called the “adjust”, this act phase is where process is improved.



9.1.8. Deliver the Improvement Plan

The Improvement Plan needs to be strongly led, properly resourced and regularly monitored and reported by a steering group. Clear targets must be well defined with specified deliverables that help focus on what is required.

9.1.9. Monitor the Outcomes

Organisations are under pressure to show the quantifiable benefits from improving asset management outcomes and this is a real challenge across local government. Regular asset management assessments using the frameworks in this section are currently the best way to demonstrate ongoing improvement to asset management practices. Assessments should be undertaken over several years to track progress.

9.1.10. Current Practice Assessment

As part of the improvement planning process, NPDC assessed the current maturity for the transport activity across 16 key asset management elements. The framework used to assess the maturity levels of each asset management element is from the IIMM. These elements have also been utilised to develop strategies for improving asset management practices for the next NLTP. The results of NPDC's Transport Activity Asset Management Maturity Current Assessment and Gaps are contained in Section 8 of the AMP.

9.1.11. Strategies for improving Asset Management

Setting Priorities

A thorough asset management review process will often identify more improvements than an organisation is able to realistically deliver in a short timeframe. As such, there is a need to prioritise these actions, so they are realistic and affordable. NPDC sets priorities on programme business cases based on a 1-4 scale as demonstrated in the figure below. This has also been utilised for prioritising improvements.

It is important to record priority 4 s as this shows that the improvement has been considered and can avoid rework in the future. Options can also change importance and urgency over time.

The symbols below represent the progress for the Improvement Plan Item:

Symbol	Status
	Improvement is completed
	Improvement is in progress
	Improvement is not yet started

9.2. Improvement Plan

It is important that an entity recognise areas of their Asset Management Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this Asset Management Plan is shown in the table below.

Activity	Improvement	Priority	Accountable	Details	Responsible	Resources Required	Timeline/ Progress
Pavement Deterioration Modelling	Currently there are no tools for network pavement deterioration to drive decisions on pavement rehabilitation.	1	Rui Leitao	Utilise a deterioration modelling tool to drive pavement rehabilitation decision making.	Kris Butterworth	N/A	
Condition Ratings	There are many assets that do not have a condition rating, or the condition rating is older than 3 years. Further work is required to understand the condition of our network and help inform the next AMP.	1	Rui Leitao	Ensure there is adequate resource and a planned 3-year inspection plan, so all asset classes are captured.	Kris Butterworth	Utilise current resource.	2024-2027 
Street Lighting	Concrete light columns and associated underground cable joints are coming to the end of their design lives and cables are prone to damage through strikes.	1	Rui Leitao	Undertake a programme of works to replace concrete poles with modern poles with the cable joints in the bases	Rui Leitao	W/C 222: $585,000/ year for 3 years	2024-2027 
Environmental Renewals	An increase in regulations set by TRC could lead to abatement notices should we keep under spending in this area	1	Rui Leitao	Increase in environmental renewal expenditure	Rui Leitao	W/C 221: $200,000/ year	2024-34 
Suspension Bridge Specific Management Plan	Develop specific asset management plan for the Historic Bertrand Road suspension bridge and the O'Sullivans bridge in Tongaporutu	2	Rui Leitao	Develop and adopt plans	Rui Leitao	W/C 151: $50,000/ Two plans	2024-2025 

Activity	Improvement	Priority	Accountable	Details	Responsible	Resources Required	Timeline/ Progress
Permanent hazards and delineation	Permanent hazards and delineation not consistent across network.	3	Rui Leitao	Council to comply with national standards	Rui Leitao	W/C 222: $50,000/ First year	2024/25 
Chipseal programme	The council has 300 lane kilometres of seal that is past design life. Further investment is required to reduce this backlog.	1	Rui Leitao	Complete more lane kilometres of reseals each year	Rui Leitao	W/C 212: $1,000,000/ year	2024-2034 
MSD Data Collection	Undertake MSD testing on Regional, Arterial, Primary Collector, Secondary Collector and Forestry Routes to understand remaining useful life of pavement. This is imperative to accurate deterioration modelling for future forecasting.	2	Rui Leitao	Collect MSD data	Rui Leitao	W/C 151: $90,000/ Once every NLTP	2024-2027 
Drainage maintenance	Current expenditure only allows the council to complete water tabling and high shoulder once every 15 years on each road.	1	Rui Leitao	Complete more high shoulder and water tabling maintenance and clearing of vegetation/debris around culverts.	Rui Leitao	W/C 113: $1,000,000	2024-2034 
Emulsion Stabilisation	Currently 100% of our stabilisations use cement. If we switch to emulsion, we can reduce our carbon footprint along with additional waterproofing benefits compared with cement. The cost difference is approximately a third more	3	Rui Leitao	Utilise emulsion stabilisation.	Rui Leitao	W/C 111: $500,000	2024-2034 
Unsealed Road Modelling	Carrying out an unsealed pavement model will provide a 10-year programme for unsealed pavement maintenance and maintenance metalling. We already have a JunoViewer	4	Rui Leitao	Model the unsealed network using JunoViewer	Rui Leitao	W/C 151: $5,000	2024/25

Activity	Improvement	Priority	Accountable	Details	Responsible	Resources Required	Timeline/ Progress
	License and inspectors, so the only cost is inferencing and storage fee of GoPro videos by Lonrix.						
Uneconomic roads	Remove uneconomic roads and roads that act as private driveways so the money can be diverted back to roads with higher usage.	2	Rui Leitao	Further analysis and buy in from ELT and elected members required	Rui Leitao	W/C 151: $20,000	2024-27 
Camera installation	By installing cameras at intersections, operators can update phase change in real time to improve efficiency of the network – especially during events or crashes	4	Rui Leitao	Install cameras at signalised intersections.	Rui Leitao	W/C 341: $155,000	2024 
Footpath Renewal	Currently there is 3% (16.4km) of our footpath network in poor or very poor condition. Further investment is required to bring our network back in line with our DIA target of less than 1%.	1	Rui Leitao	Increase footpath renewal or footpaths in poor and very poor condition to meet DIA requirement.	Rui Leitao	W/C 225: $800,000/ Next 3 years then re-assess	2024-2027 
Cycleway Maintenance	Increasing the frequency of cycleway sweeping will improve the slow build-up of chip and debris, however a lot of the time cycleways need sweeping are due to reactive needs i.e., a recent storm, recent reseal or littering/smashing glass. – Sweep Arterials monthly in line with current carriageway sweeping frequency.	4	Rui Leitao	Increase sweeping frequency of Arterial cycleways	Rui Leitao	W/C 124: $10,000/ year	2024-34 
Tree removal	There is currently no additional budget to remove hazardous trees. We currently have 40	1	Rui Leitao	Remove hazardous trees from the network.	Rui Leitao	W/C 121:	2024-34

Activity	Improvement	Priority	Accountable	Details	Responsible	Resources Required	Timeline/ Progress
	trees listed in our Hazardous Tree register in RAMM, but this list is expected to grow. Removing these trees will reduce the risk to members of the public and their assets.					$300,000/ year	
Environmental Maintenance	Increased pressures from the community and TRC has led to a need to increase maintenance for the following activities: vegetation in urban areas, addressing the increase in noxious weeds, and increasing mowing and spraying rounds.	2	Rui Leitao	Increased maintenance programme	Matt Richardson	W/C 121: $420,000	2024-27 
Asset criticality	The development and implementation of an asset criticality tool that objectively identifies critical assets, in order to improve the decision-making confidence with our capital and operational infrastructure investment decisions, to best serve the needs of our communities (or words to that effect).	2	Rui Leitao	Develop asset criticality tool	Mike Coronno	W/C 151: $10,000	2024-27 
Catchment Analysis	Complete a network wide catchment analysis to understand level of investment required to bring stormwater network in line with annual exceedance probability (AEP) of 2%.	2	Rui Leitao	Complete catchment analysis	Rui Leitao	W/C 151: $50,000	2024 
Use of non-M4 aggregate	Utilize non-M/4 aggregate on low-risk sites as the material can be 15-20% cheaper than M/4.	4	Rui Leitao	Work with Downer on implementation	Rui Leitao	N/A	2024 

Activity	Improvement	Priority	Accountable	Details	Responsible	Resources Required	Timeline/ Progress
Increase in short overlays	In areas with a high density of pavement faults, it is often more economical to complete a short overlay. This will also build up the pavement, improving the pavements whole of life cost.	4	Rui Leitao	Work with Downer on implementation	Rui Leitao	N/A	2024 
Return sealed roads to unsealed	Some of the logging routes require a large amount of pavement rehabilitation to maintain an acceptable level of service – turning some of our sealed roads into unsealed during the harvesting period would make it cheaper to maintain these routes.	2	Rui Leitao	Collect evidence on failing roads to present to ELT and elected members.	Kris Butterworth	N/A	2024-27 
Sharing Downer Resources	Downer currently holds the NPDC and TNOC contract. By sharing crews and resources, we can save on establishment fees of crew, plant, materials and traffic management.	3	Rui Leitao	Work with the renewals and maintenance mangers to identify shared opportunities.	Matt Richardson	N/A	Ongoing 
Specialist Structures Inspections	Undertake specialist inspections of structural steelwork protective coating systems, buried corrugated metal culverts, unlined water drives structures, unlined road tunnels, specific condition related inspections.	2	Rui Leitao	Develop inspection plan for high-risk structures.	Matt Richardson	W/C 151: $50,000	Ongoing 
Fish Passage Review	Undertake network review for structures likely to impede fish passages.	4	Rui Leitao	Complete fish passage inspection using NIWA app on all structures	Matt Richardson	W/C 151: $10,000	2024 
Posting, HPMV and Rating Assessment	Completing Posting, HPMV and Rating Assessment of 4 structures currently restricting network access: • Kent Road Bridge No.96	3	Rui Leitao	Engage consultant to inspect 4 structures limiting access on network.	Matt Richardson	W/C 151: $20,000	2024-27 

Activity	Improvement	Priority	Accountable	Details	Responsible	Resources Required	Timeline/ Progress
	• Makara Road Bridge No. 300 • Mangatete Road Bridge No.99 • Old Mountain Road Bridge No.103						
Inspect Sump Leads	Sump Leads have previously been looked after by the 3 Waters team, however, with the reform, they will become Transports Assets and further work is required to understand the networks condition.	3	Rui Leitao	Develop inspection regime for inspecting sump leads	Kris Butterworth	W/C113: $100,000/ year	Ongoing 
Pedestrian Crossing Lighting	Some crossings on our network have poor lighting or no lighting which is outside the pedestrian crossing specification (Waka Kotahi)	2	Rui Leitao	Roll out consistent lighting of pedestrian crossings.	Kevin Munisamy	W/C 341: $100,000/ year	2024-27 

9.3. Monitoring and Review Procedures

This Asset Management Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The Asset Management Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The Asset Management Plan has a maximum life of 3 years and is due for complete revision and updating within 2 years of each board election.

9.4. Performance Measures

The effectiveness of this AMP can be measured in the following ways:

- The degree to which the required forecast costs identified in this AMP are incorporated into the long-term financial plan,
- The degree to which the 1–5-year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AMP,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%).

Te Kaunihera-ā-Rohe o Ngāmotu
New Plymouth District Council

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REVISIONS

Version	Description	Written by	Revision date	Peer Reviewer(s)	Approver	Approval Date	Issue date
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