MANAWATŪ DISTRICT COUNCIL

Land Transport Network Activity Management Plan

July 2027 to June 2030



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Contents

1.0 Executive Summary i
1.1 Our Story i
1.2 Purpose i
1.3 Our network ii
1.4 The value of our network vi
1.5 Demand vii
1.6 Current concerns viii
1.7 Strategic alignment ix
1.8 The programme x
1.9 Funding xi

2.0 Strategic case 1
2.1 Introduction 1
2.2 Purpose of this plan 2
2.3 Activity management framework 3
2.4 Goals and objectives 3
2.5 Key partners and stakeholders 5
2.6 Policy alignment 6
2.7 Strategic alignment 7
2.8 Relationship with other documents 11
2.9 Network management 11
2.10 Network composition 17
2.11 Expenditure profile 23
2.12 Network demand 28
2.13 Network problems 35
2.14 Network status and evidence 43
2.15 Case for investment 119

3.0 Programme Business Case 122
3.1 Introduction 122
3.2 Programme foundation 123
3.3 Programme development 125
3.4 Funding 128
3.5 Procurement management 130
3.6 Subsidised programme 133
3.7 Non-subsidised programme 158
3.8 Investment summary 161

4.0 Asset Management 163
4.1 Introduction 163
4.2 Goals and objectives of asset ownership 164
4.3 Strategic and corporate goals 166

4.4 Legislative requirements 167
4.5 Levels of service 171
4.6 Demand 183
4.7 Lifecycle management plan 191
4.8 Assets 225
4.9 Financial strategy 290
4.10 Risk management 297
4.11 Monitoring and review 308
4.12 Improvement plan 309

1.0 Executive Summary

A thriving community where wise investment in infrastructure, rich agricultural heritage, and a focus on sustainability come together to create a place where people can grow, belong, and succeed

1.1 Our Story

Welcome to the Manawatū District, where community, nature, and opportunity come together.

With our lush farmland and rugged coastlines, we're proud of our deep agricultural roots. But we're also looking ahead, wisely investing in the services and infrastructure that help our community and economy thrive and make life better for everyone.

By working together, we plan a future that benefits us all, balancing sustainability with fiscal responsibility.

We take pride in delivering excellent services that offer real value to our residents, businesses, and visitors.

Manawatū is a place to call home, where you can grow, succeed, and enjoy the best of both rural life and modern living. It's where community, nature, and smart investments come together for a bright future.

1.2 Purpose

This Activity Management Plan follows a business case approach to deliver what people want in the most cost-effective manner, while demonstrating responsible stewardship for present and future customers.

The Activity Management Plan underpins the Long-Term Plan and processes that have been put in place to engage our community.

The primary purpose of this document is to outline the investment required for the network over the next three years, identifying key risks and determining interventions, performance monitoring, and improvement priorities for the near and far future.

1.3 Our network

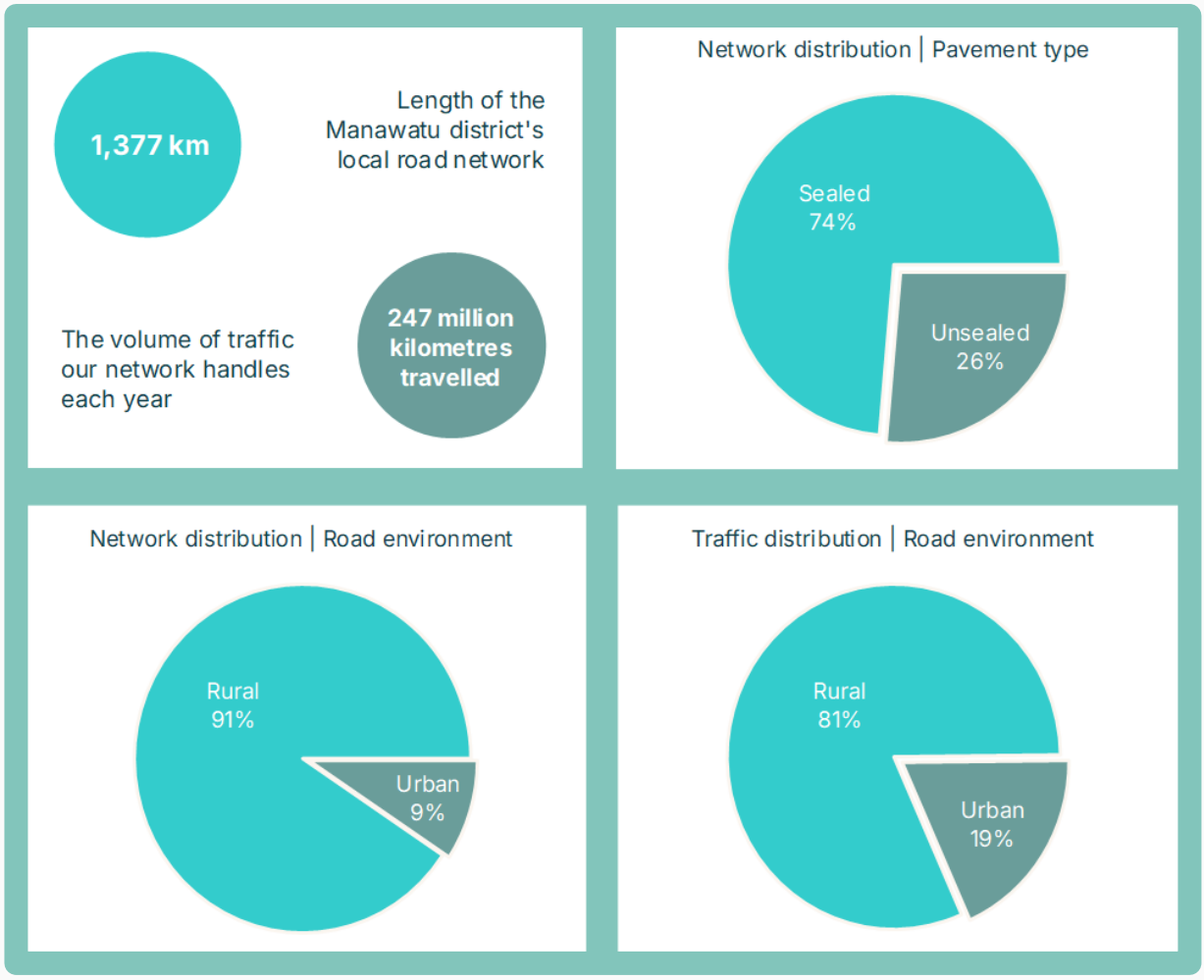


Figure 1 | Manawatū district network composition

Roads

Our district's local road network consists mostly of single lane, two-way roads, totalling 1,377km in length. Around three-quarters of our network is sealed.

A large proportion of the network is made up of rural roads, with the majority of urban roads located to our largest town, Feilding.

Rural roads carry around four-fifths of the traffic on our network, with the remaining fifth travelling in, and through, urban areas. The total distance of vehicle journeys people took on our network last year equates to 247 million kilometres, and continues to increase.

A number of 'rural connector' roads carry the greatest proportion of traffic between Feilding, our villages, and State Highways; around two-thirds in total. **Figure 2** and **Figure 3** detail the current composition of the network and traffic volume.

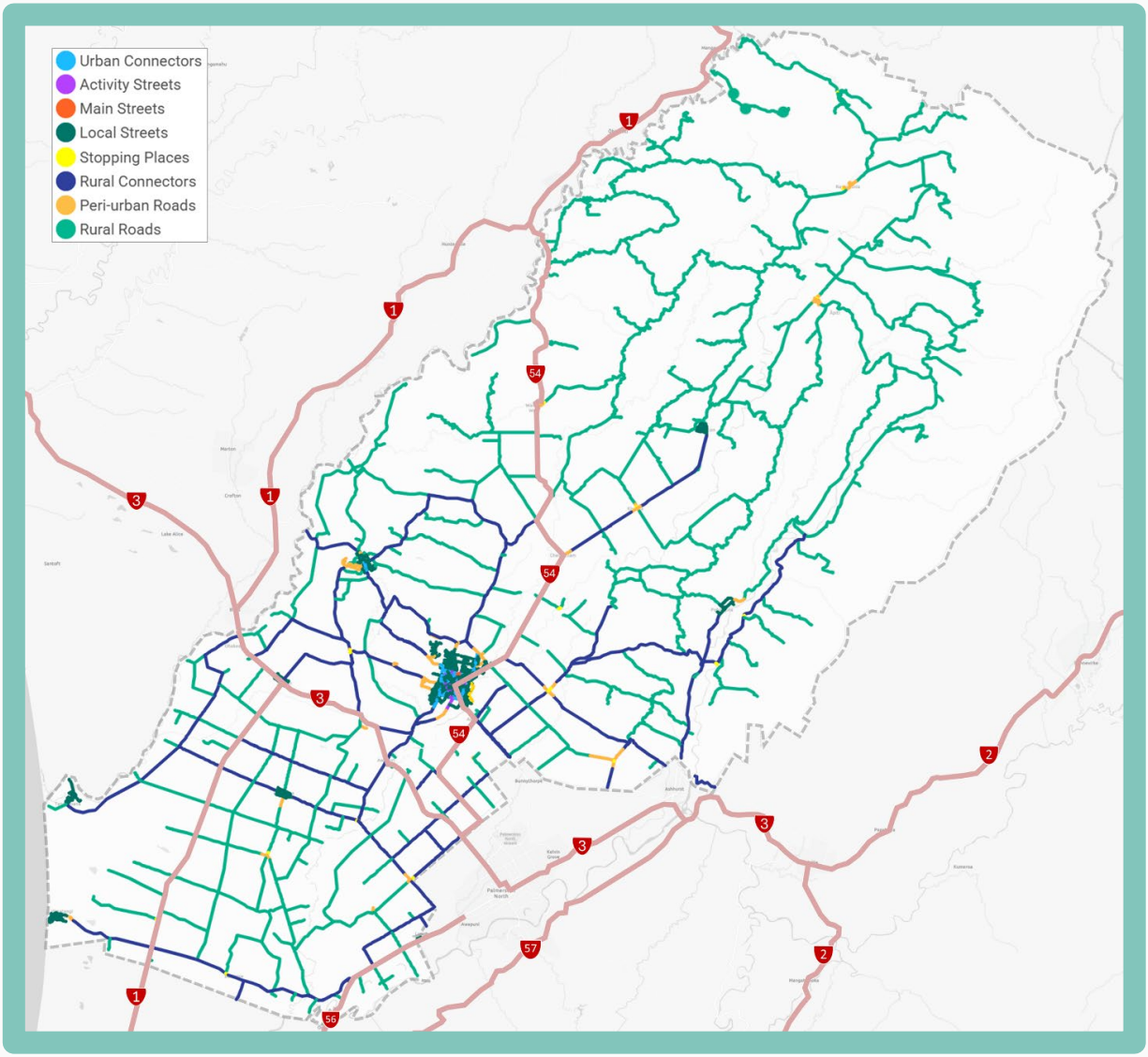


Figure 2 | Manawatū district network by road type

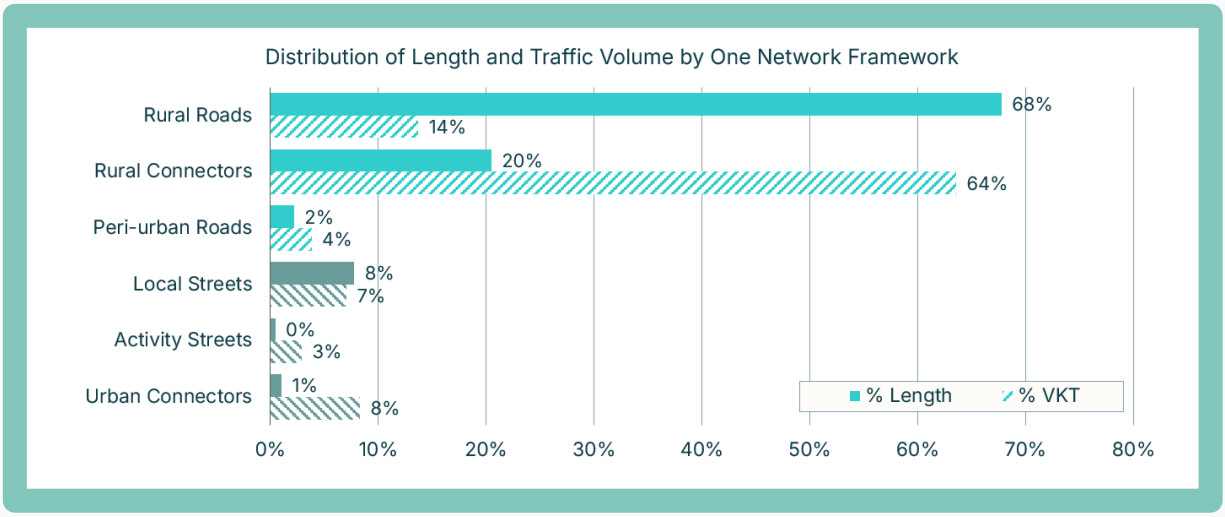


Figure 3 | Distribution of road type and associated traffic volume

Bridges

Key functions

Connectivity | Bridges provide efficient routes over impassable terrain that would otherwise require costly detours

Economic | Bridges enable the transport of goods and services, which is vital for local and regional economies

Safety | Bridges enable safe, efficient passage for vehicles, pedestrians, and cyclists

We own and manage 236 bridge and major culverts, dispersed throughout our district.

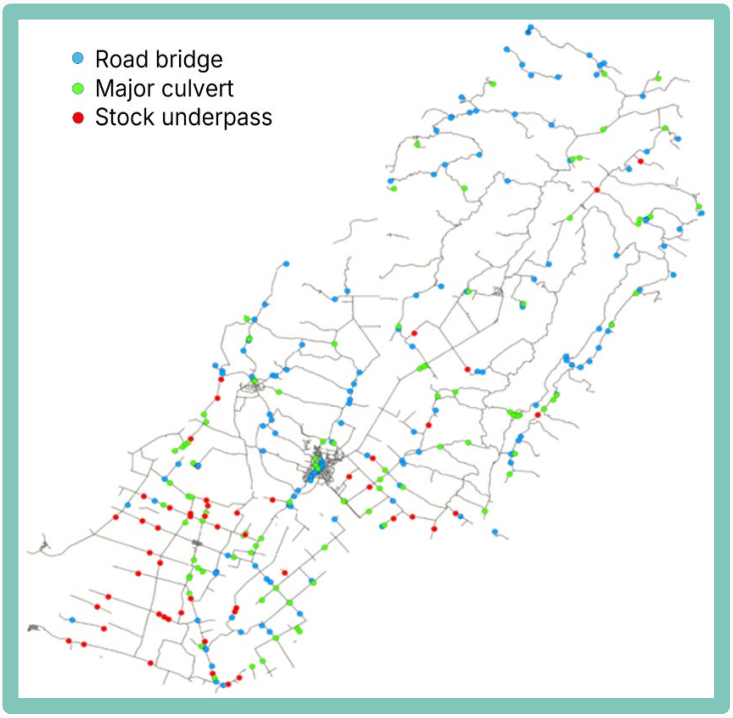


Figure 4 | Bridge locations

These structures range from relatively simple, single spans to large, complex multi-span structures. These bridges and culverts have been constructed over a large period of time, ranging from the early 20th century up to this year.

(Stock underpasses, marked in red, are privately owned, and managed by the owner)

Drainage

Key functions

Stormwater Management | Drainage helps channel stormwater away from road surfaces, preventing pooling, flooding, and washouts

Accessibility | Drainage helps maintain access during and after severe weather by redirecting water safely along, under, and away from roads to prevent road closures

Pavement Life | Drainage helps maintain the integrity of road pavements, reducing premature failure by minimising water-related damage

Our road network utilises various drainage systems to effectively manage stormwater and prevent flooding. These systems are crucial for maintaining road safety and protecting the surrounding environment. The table below shows just how many assets we maintain:

Drainage type	Count	Length (km)
Swale drains	8,392	2,334
Culverts	4,507	58
Kerb and channel	1,979	195
Sumps	1,700	-
Other	209	-
Total	**16,787**	**2,587**

Figure 5 | Drainage asset quantities

Paths

Key functions

Safety | Paths are designed to provide safe routes for pedestrians and mobility aided users, ensuring they can travel without the risk of slipping or tripping

Environmental | Paths can help decrease reliance on motor vehicles, contributing to lower traffic congestion and pollution

Connectivity | Paths facilitate connections between neighbourhoods and services, enhancing community interaction and mobility

We own and maintain nearly 156km of paths on our network, ranging in age from the 1950s to today. You can see that a lot of these paths were constructed in the 1980s.

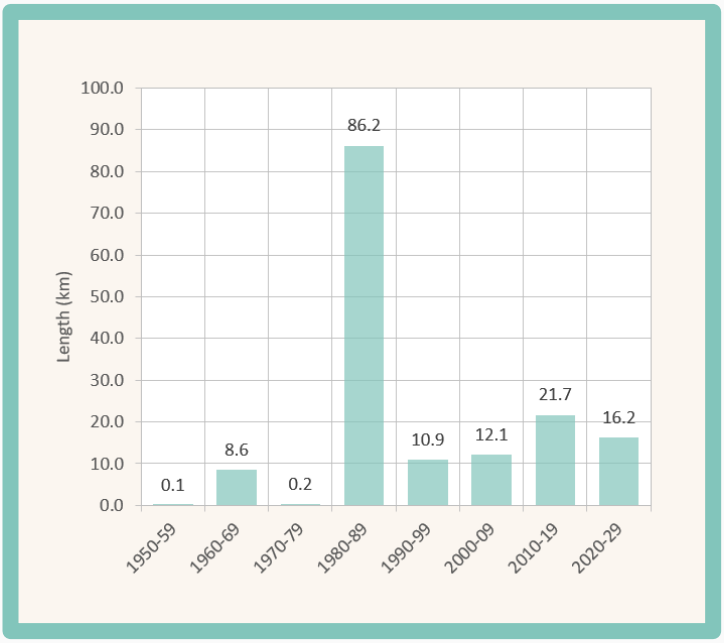


Figure 6 | Path age profile by length

Traffic services

Key functions

Safety | Barriers help protect drivers, pedestrians, and cyclists by guiding traffic and mitigating injury severity in the event of accidents

Visibility | Streetlights and roadmarkings improve visibility for road users, especially during nighttime or adverse weather conditions

Efficiency | Signs assist road users, ensuring that vehicles can navigate the network safely and efficiently

You'll see a lot of traffic related assets that we maintain alongside bridges, drains, roads, and paths as you travel through our network:

Type	Count	Length (km)
Signs	11,092	-
Roadmarking	7,419	861.9
Pavement markers	14,646	135.6
Barriers	350	10.8
Railings	1,454	20.3
Streetlights & poles	2,941	-
Total	**37,902**	**1,028.6**

Figure 7 | Traffic asset quantities

All these assets (and more) make up a significant portfolio that requires investment to maintain, replace, and occasionally add to. The value of our network has consequently become quite substantial.

1.4 The value of our network

The latest valuation of our assets calculates the Optimised Replacement Cost at **$1.36 billion**; the ORC represents the cost of replacing our roading assets today, and demonstrates the importance of managing our existing portfolio effectively.

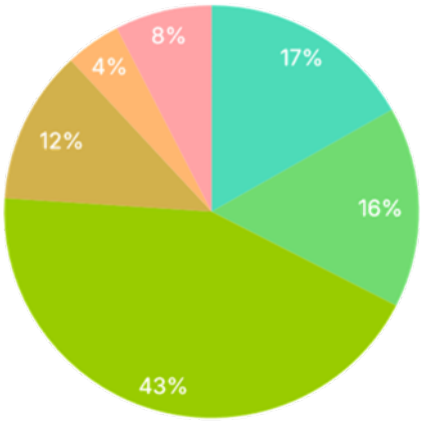
Asset Group Cost Distribution	Asset Group	Original $	% Original	Depreciated $
	Bridges	$227,894,751	17	$90,647,318
	Drainage	$214,021,434	16	$59,039,403
	Pavements	$591,009,435	43	$358,659,547
	Surfaces	$164,200,688	12	$58,289,724
	Retaining walls	$58,812,308	4	$46,161,089
	Other	$102,629,060	8	$53,518,241
	Total	**$1,358,567,677**	**100**	**$666,315,322**

Figure 8 | Asset group distribution and replacement cost

Asset Sustainability Ratio

The Asset Sustainability Ratio (ASR) is a critical measure, highlighting whether an organisation is funding the capital maintenance and renewal of assets it owns to an appropriate, sustainable level of investment.

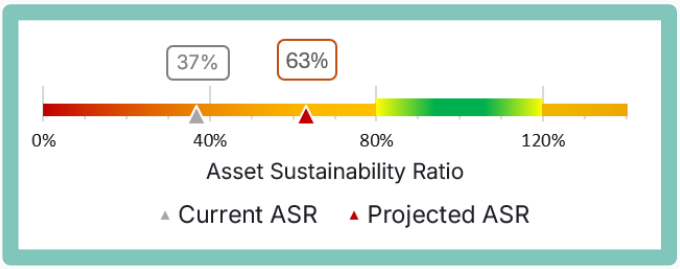


Figure 9 | Current and projected Asset Sustainability Ratio

A target range for appropriate investment level is an ASR between **0.8** and **1.2**. An ASR of **1.0** (i.e., 100%) indicates an optimum level of investment is being undertaken.

Key observation

Our recent level of investment sits **significantly below** the bounds required to sustain its asset portfolio in the long-term.

Delivery of the recommended programme will begin address this, increasing our ASR towards a more appropriate level.

1.5 Demand

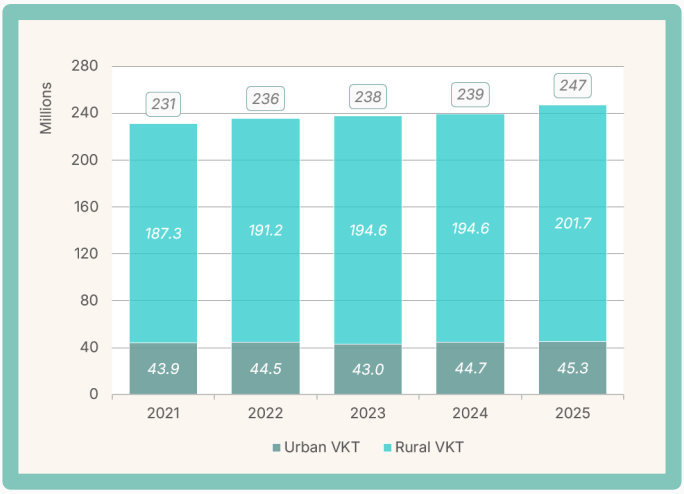


Figure 10 | Traffic volume trend, 2021 to 2025

Overall, our network has seen traffic volumes increase from 231 million to 247 million vehicle kilometres travelled in the last five years, averaging **1.4%** growth per annum.

This is expected to continue with forestry, commercial, industrial, and residential growth progressing within our district.

Forestry

Traffic demand associated with forestry activity is predicted to continue at peak levels until 2030, based on the quantity of wood expected to be harvested in the next three years.

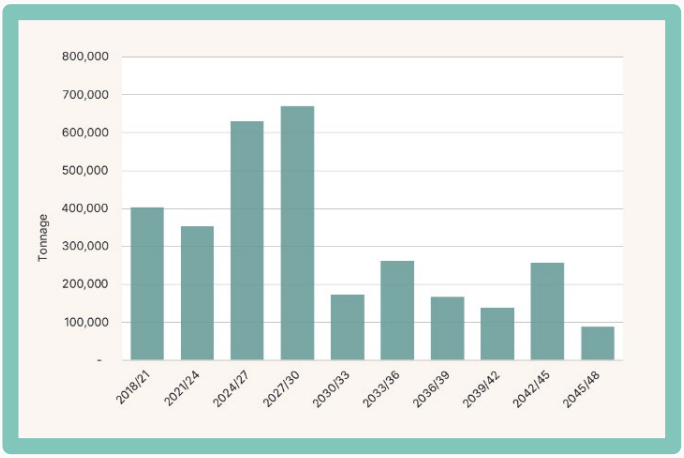


Figure 11 | Forestry forecast for the district, 2018-48

Industrial

Turners Road is being extended and is currently under construction.

The extension of Turners Road will enable the development of 24 hectares of high-quality industrial land, creating a competitive advantage over alternative locations for industrial development across the wider Manawatū Region and drawing significant private investment into the district, along with increasing commercial vehicle movement.

Residential

As subdivisions and other growth infrastructure assets are vested to us, we take on the maintenance and renewal demand on behalf of our customers.

We currently expect **15km** of roads and associated assets to be vested to Council within the next **7-10 years**.

This will generate additional, ongoing maintenance and renewal demand, along with increased light vehicle movement.

Key observation

In order to respond to future traffic demand, Council must maintain condition of the network by concentrating on core corridor related maintenance and renewal activities.

1.6 Current concerns

Problems and objectives

Council have confirmed our key problems in the district, and the investment objectives to address them.

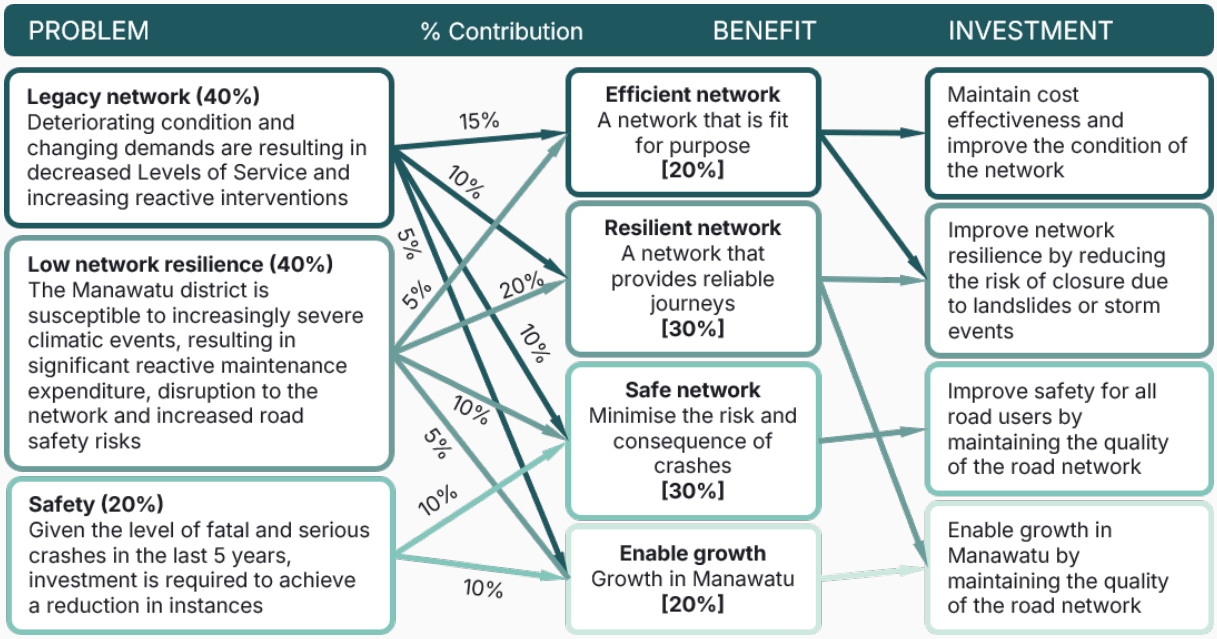


Figure 12 | Investment Logic Map

Measures

The benefits and their Key Performance Indicators (KPIs) have been identified to demonstrate how the outcomes are to be assessed:

Benefit	KPI		Description of successful outcome	Baseline	Target
Efficient Network		Maintenance cost	Cost per lane kilometre remains at or below the median within our 'rural districts' peer group	@ median (2025)	@ median (2029)
		Road condition	Residents are satisfied with the condition of local roads	69% (2026)	-0%, +5% (2029)
Resilient Network		Emergency work	Maintain or reduce expenditure relating to emergency work, as a proportion of overall expenditure over 3 years	27% (2024-2027)	-5%, +0% (2028-2030)
		Network access	The network remains available to traffic (excluding planned closures)	-	≥98% of length (2027-2030)
Safe Network		Crashes	The number of serious & fatal injuries on the local road network trends downward over 5 years	21 per annum (2021 to 2025)	-10%, +0% (2026 to 2030)
Growth Enablement		Freight	Key freight routes maintained to ONF Levels of Service	-	≥90% of length (2030)

Figure 13 | Identified KPIs and outcome objectives

Case for change

Without the appropriate funding, the problems our district faces will become worse, and more difficult for Council to manage or resolve over time. This will have major impacts for the wider community and how it functions.

Furthermore, the impacts due to climate change are exacerbating, highlighting our district's vulnerability to disruption and costs to repair, putting communities at risk of isolation, financial hardship, and injury.

Recent climate change events have also impacted the distribution of limited Council funds, with money originally allocated to maintenance, rehabilitation or reseals being used for emergency work.

Key Finding

Our road network is critical to sustaining the growth and the economy of the district. Without adequate funding for maintenance, renewals, and capital investment, our assets will exponentially deteriorate, negatively impacting access, safety, and experience for our communities.

1.7 Strategic alignment

To verify funding is being allocated appropriately, checks are made to ensure the programme aligns with overarching strategic direction set by Government and high-level transport authorities. We also consider land transport impacted or related programmes being delivered by other organisations, including our neighbouring RCAs.

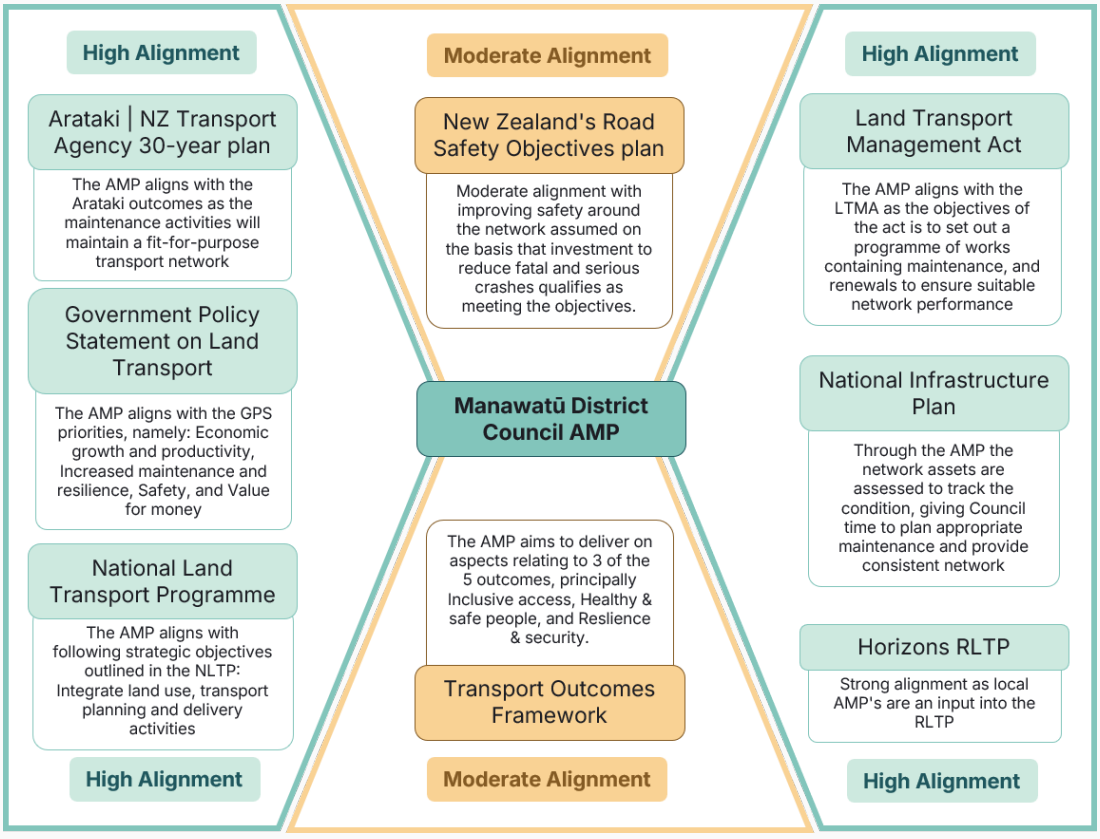


Figure 14 | Strategic alignment

1.8 The programme

The programme is set by the strategic case, and takes into account limitations in budget allocation. This preferred programme focuses on addressing the key findings identified earlier.

Development

Throughout this plan, we aim to maximise the benefits derived from investment in maintaining, operating, and improving our local road network as part of the transport system, and to grow the economy in a safe and sustainable manner.

We will ensure that expenditure to deliver the programme of work fits within our allocated budgets. To do this, we have followed a rigorous programme development process, aimed at extracting the maximum value for money for our efforts.

Delivery and outcomes

We are confident that the programme described in this plan can be delivered, with a proven track record of sound delivery across previous Activity Management Plans, in continuous programmes, and related activities (particularly in terms of timing, alignment, and adaptation).

We also have the capability to deliver this programme, particularly in terms of our internal professional service skillsets, and the availability of external resources throughout our district and the wider region.

1.9 Funding

1.9.1 Subsidised funding

The 2027-30 subsidised programme aims to arrest deterioration of the network core assets, anticipate market rates, and receive 51% financial assistance from the New Zealand Transport Agency.

		2027-30 Block		
Subsidised Roading Budget		**2027-28**	**2028-29**	**2029-30**
	Investment Management			
004	Business Case Development	250,000	0	0
	Sub-total | Investment Management	250,000	0	0
	Local Road Operations			
114	Structures Maintenance	452,574	399,774	398,484
121	Environmental Maintenance	1,734,000	1,768,680	1,804,054
122	Network Service Maintenance	641,769	659,516	673,830
123	Network Operations	16,493	16,823	17,160
131	Level Crossing Warning Devices	30,600	31,212	31,836
140	Minor Events	56,100	57,222	58,366
151	Network & Asset Management	2,023,194	1,995,772	2,044,708
215	Structures Component Replacements	343,740	297,554	249,384
222	Traffic Services Renewals	642,600	655,452	668,561
	Sub-total | Local Road Operations	5,941,070	5,882,006	5,946,382
	Local Road Pothole Prevention			
111	Sealed Pavement Maintenance	1,758,480	1,793,650	1,829,523
112	Unsealed Pavement Maintenance	380,961	388,580	396,352
113	Routine Drainage Maintenance	577,728	595,858	614,482
211	Unsealed Roads Metalling	407,607	415,759	424,075
212	Sealed Roads Resurfacing	1,445,674	4,172,576	4,255,366
213	Drainage Renewals	543,795	559,518	571,816
214	Sealed Road Pavement Rehabilitation	4,349,584	4,014,568	4,371,668
	Sub-total | Local Road Pothole Prevention	9,463,829	11,940,509	12,463,281
	Road Improvements			
216	Bridges & Structures Renewals	550,800	1,165,248	1,804,054
341	Low Cost - Low Risk Programme	815,539	824,727	821,116
	Sub-total | Road Improvements	1,366,339	1,989,975	2,625,170
	Walking and Cycling			
124	Cycle Path Maintenance	1,581	1,613	1,645
125	Footpath Maintenance	35,700	36,414	37,142
225	Footpath Renewals	84,252	85,937	87,656
	Sub-total | Walking and Cycling	121,533	123,964	126,443
	Public transport facilities O & M			
514	Public transport facilities O & M	6,120	6,242	6,367
	Sub-total | Public Transport	6,120	6,242	6,367
Total Subsidised Roading Budget		**17,148,891**	**19,942,696**	**21,167,643**
		2027-30 total		**58,259,230**

1.9.2 Non-subsidised funding

Non-subsidised funding will be allocated to activities unable to qualify for assistance from NZTA. These activities will incorporate maintenance, renewal, and, improvement projects accepted via the Long-term Plan, raised through customer requests, or as defined by Council. They will be prioritised by their economic benefit, social and well-being enhancement, and Council's overarching strategic goals and desires for the district and our communities.

	2027-30 Block		
Non-subsidised Roading Budget	**2027-28**	**2028-29**	**2029-30**
Maintenance and Operations			
Coastal Village Sand Clearance	73,440	74,909	76,407
Street Cleaning (Local Share)	58,044	61,552	65,178
Network and Asset Management	61,200	62,424	63,672
Pavement Maintenance	56,100	57,222	58,366
Recreational Path Maintenance	15,300	15,606	15,918
Network Services Maintenance	5,100	5,202	5,306
Sub-total | Maintenance and Operations	269,184	276,915	284,848
Renewals			
Pavement Renewals	51,000	52,020	53,060
Recreational Path Renewals	10,200	10,404	10,612
Network Services Renewals	15,300	15,606	15,918
Sub-total | Renewals	76,500	78,030	79,591
Road Improvements			
Urban Reconstructions	0	0	0
Improvements	110,594	764,694	15,918
Mitigation sealing	0	0	0
New Roads	0	0	0
Sub-total | Road Improvements	110,594	764,694	15,918
Total Non-subsidised Roading Budget	**456,277**	**1,119,639**	**380,356**
	2027-30 total		**1,956,273**

1.9.3 Total land transport funding

	2027-28	2028-29	2029-30
Total Subsidised Roading Budget	17,148,891	19,942,696	21,167,643
Total Non-subsidised Roading Budget	456,277	1,119,639	380,356
TOTAL TRANSPORTATION ACTIVITY	**17,605,169**	**21,062,335**	**21,548,000**
	2027-30 total		**60,215,503**





Strengthen Manawatū



Thrive Manawatū



Empower Manawatū



Showcase Manawatū



Lead Manawatū

2.0 Strategic case

2.1 Introduction

Manawatū District Council is committed to investing in transport infrastructure based on robust evidence to sustain the network in the long term; by targeting the right treatment, to the right place, at the right time, and for the right cost.

This Activity Management Plan (AMP) has been prepared with regard to transportation assets owned and operated by Council on behalf of its community and ratepayers.

This plan has been produced and reviewed as required by legislation set out in the Local Government Act (LGA) 2002. Under the Act, Council must deliver revised Plans to its community on a three yearly cycle.

It also acts as a road map for the future by providing the context behind how we maintain, operate, renew, and improve Manawatū's land transport network.

Activity management involves the balancing of costs, opportunities, and risks against the desired performance of assets, to achieve the organisations objectives, desired outcomes and benefits for our customers and represent value for money. It is also important that we show how we will meet regulatory requirements and environmental protections.

Activity management also enables Council to examine the need for, and performance of, assets and asset systems at different levels. Additionally, it enables the application of analytical approaches towards managing an asset over the different stages of its lifecycle (from conception of the need for an asset through to disposal at the end of its life) and considers any post-disposal liabilities.

The maintenance strategy and proposed capital projects included in this document have been developed to be consistent with, and to contribute towards, achieving wider national & regional land transport priorities and objectives. These priorities and objectives are guided by the Government Policy Statement on Land Transport (GPS) and will aid the development of the Regional Land Transport Plan (RLTP).

By ensuring alignment with these high-level strategic documents, the Council will not only realise its local strategic vision but will also play its role in achieving a sound regional, and strategically integrated land transport network.

2.2 Purpose of this plan

The primary purpose of this document is to determine the investment required for our network over the next funding period, identify key risks, determine interventions and cashflow, performance monitoring, and improvement priorities for the future.

The key objective of an AMP is to provide desired services in the most cost-effective manner, while demonstrating responsible stewardship for present and future customers.

AMPs are a key component of the strategic planning and management of Council, with links to our 10-Year Plan and service contracts, and underpins the Long-Term Plan (LTP) consultative processes that have been put in place to engage our community.

In order to fulfil community outcomes, vision, goals and objectives, we have adopted a systematic approach to the management of our assets by preparing this AMP.

The AMP delivers a range of benefits to the community through:

- Maintaining, replacing, and developing assets over the long-term to meet required delivery standards and foreseeable future needs at minimal cost
- Continually improving activity management practices and service delivery to our customers
- Complying with statutory requirements

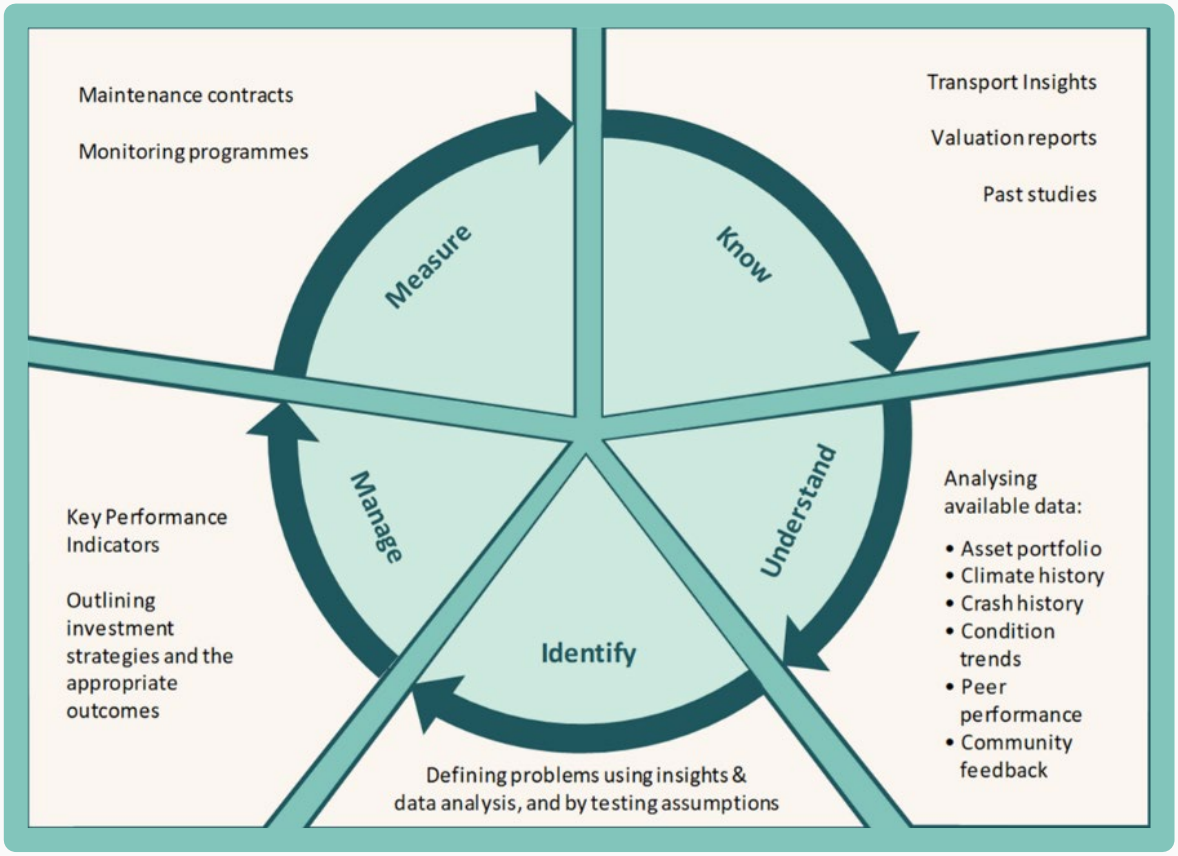


Figure 15 | The activity management process

2.3 Activity management framework

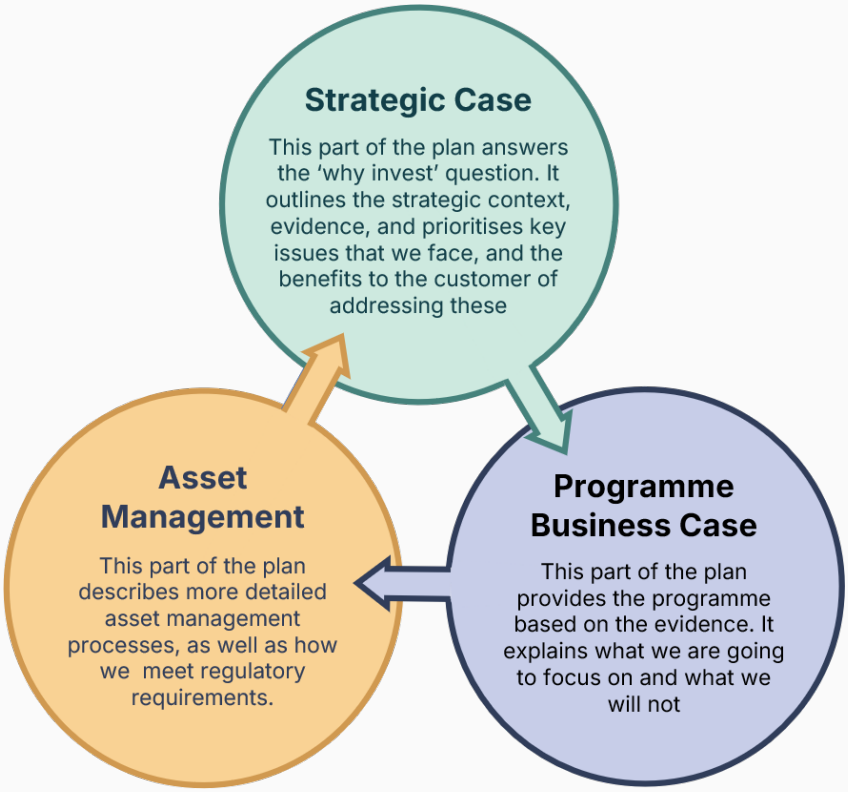


Figure 16 | Activity management plan framework

2.4 Goals and objectives

Council has identified strategic goals to guide investment in land transport initiatives. These goals link the strategic elements with the operational aspects, providing a clear picture of the district's wishes to the New Zealand Transport Agency when it compiles the National Land Transport Programme.

This AMP covers transportation related activities that Council funds, either fully or with assistance from NZTA. It considers how our assets can best be managed to deliver the activities to meet our community's desires, the Transport Outcomes Framework, and the GPS strategic priorities. Council's forthcoming strategy principles are summarised below:



Figure 17 below demonstrates how our transport activities help to deliver this strategy, as well as how they align with the aforementioned GPS strategic priorities, and the Transport Outcomes Framework:

Council strategic priorities	Key services we provide	Current GPS strategic priorities [1]	Transport Outcomes [2]
Strengthen Manawatū	Sealed and unsealed roads Bridges, culverts and drainage Footpaths and transport infrastructure Signs, markings, and other road furniture	Increased maintenance and resilience Value for money Safety	Resilience and security Healthy and safe people Economic prosperity
Thrive Manawatū	Planning, development and management of the transport network to support industry, business, and economic activity Reliable freight and road connections Access to planned growth areas Connections between communities	Economic growth and productivity Increased maintenance and resilience Value for money	Economic prosperity Inclusive access Resilience and security
Empower Manawatū	Footpaths, shared pathways and active mode infrastructure Safe connections to community facilities, services, and employment Road safety improvements	Safety Economic growth and productivity Value for money	Inclusive access Healthy and safe people Economic prosperity
Showcase Manawatū	Management and maintenance of transport corridors, streetscapes and road reserves Footpaths and shared pathways Road signage, markings, and street furniture Attractive and accessible connections through Feilding and the District's villages	Increased maintenance and resilience Economic growth and productivity Safety	Environmental sustainability Inclusive access Economic prosperity
Lead Manawatū	Strategic planning and management of the land transport network Asset management and investment planning Prioritisation of maintenance, renewals and improvements Performance monitoring and continuous improvement Regional partnerships, advocacy and emergency management	Value for money Increased maintenance and resilience Economic growth and productivity	Resilience and security Economic prosperity Environmental sustainability

Figure 17 | Key services & alignment of strategic goals to regional & national objectives

[1] *Government Policy Statement on Land Transport 2024 (www.transport.govt.nz)*
[2] *Transport Outcomes Framework (www.transport.govt.nz)*

2.5 Key partners and stakeholders

Our key partners and stakeholders all have information and knowledge to help us make better decisions. In terms of setting the strategic context and direction for the AMP, our key partners and stakeholders are described below.

2.5.1 Ministry of Cities, Environment, Regions and Transport

The Ministry of Cities, Environment, Regions and Transport (MCERT) is the Government's principal transport adviser, providing policy advice and support to Ministers. By providing advice, MCERT aims to:

- Improve the overall performance of the transport system
- Improve the performance of transport crown entities
- Achieve better value for money for the government from its investment in the transport system

MCERT helps the Government give effect to its policy by supporting the development of legislation, regulations, and rules. It also manages and accounts for funds invested in transport, administered through the New Zealand Transport Agency.

2.5.2 New Zealand Transport Agency

Our Council, together with other approved Road Controlling Authorities (RCAs), has a very important ongoing relationship with the New Zealand Transport Agency (NZTA); a key funding partner to most land transport activities across New Zealand. NZTA ensures that equitable and nationally consistent Levels of Service are achieved over the network, and that this is funded in a long-term, sustainable manner. On average, NZTA currently funds (through subsidies) 53% of the cost of the Land Transport Programme for all RCAs in New Zealand.

2.5.3 Horizons Regional Council

Changes to the Land Transport Management Act (LTMA) 2003 have given a lead role to Regional Councils in regional transport planning. The Regional Land Transport Programme (RLTP) contains all land transport activities of the District Councils in our Region (Whanganui, Manawatū, Rangitīkei, Horowhenua, Ruapehu, and Tararua), Palmerston North City Council, NZTA, and Horizons itself. This sets out the transport activities of the region, for the purposes of obtaining funding from Central Government.

The programme is made up of prioritised activities and encompasses:

- Maintenance and operation of local roads and state highways
- Roading improvements (local roads and state highways)
- Public transport services and infrastructure
- Road safety activities
- Walking and cycling facilities
- Transport planning

The Regional Council also provides the natural resource management functions across the region.

Horizons develops policies to guide the management of the Region's environmental resources - land, air, water, and coast. These

policies set out what needs to be done to achieve the environmental outcomes for the Region. Horizons use both regulatory and non-regulatory methods to meet the objectives in its policies, whereby regulatory management requires users of environmental resources to apply for resource consent and non-regulatory management involves providing advice, information, education, and funding assistance.

Horizons also monitor the effectiveness of these methods and carry out research into existing and emerging environmental issues.

2.5.4 Our neighbours

Rangitīkei District Council, Palmerston North City Council, and Horowhenua District Councils are our neighbouring RCAs.

Agreements exist with these authorities, which outlines specific responsibilities in maintaining assets on various boundary roads. NZTA is responsible for the State Highways 1, 3, 54, and 56 that traverse through the Manawatū District. A memorandum of understanding exists with NZTA over each party's obligations.

2.6 Policy alignment

The LTMA [3] states that Council has a statutory obligation to maintain a roading network within the district. Central Government provides a high level of direction and regulation into the transportation sector through Strategies, Plans, Policy Statements and Legislation.

Many of these documents are delivered through NZTA. Regionally, there is a suite of Plans and Strategies, many of which link with the Horizons Land Transport Strategy. To help fulfil community outcomes, we have adopted a systematic approach to the long-term management of its assets by preparing this AMP. This section describes the objectives and strategic drivers, guided by wider national and regional priorities:

- GPS on Land Transport
- Arataki, NZTAs 30 Year Plan [4]
- National Land Transport Programme [5]
- Horizons RLTP 2027 – 2037
- NZ Government's Road Safety Objectives [6]

[3] *Land Transport Management Act 2003 (www.legislation.govt.nz)*
[4] *Arataki - Our 30-year plan, New Zealand Transport Agency (www.nzta.govt.nz)*
[5] *The National Land Transport Programme (NLTP), New Zealand Transport Agency (www.nzta.govt.nz)*
[6] *New Zealand's road safety objectives, New Zealand Government (www.transport.govt.nz)*

2.7 Strategic alignment

To verify funding is being allocated appropriately, investigations into the network condition and performance are undertaken to ensure that all items of programme development and implementation align with the overarching strategic direction set at the local, regional, and national level.

This desired direction is managed by:

- Setting maintenance intervention criteria for the different road assets, depending on their classification
- Using condition and levels of service to measure performance effectively
- Aligning the preferred programme with the intended strategic outcomes

We will deliver the strategic outcomes by:

- Optimising the intervention options in developing this programme, and
- Selecting the most suitable types of treatments, materials, and construction techniques when implementing the programme

An outline summary, illustrating the alignment, can be seen in **Figure 18** below.

Figure 19 on the following pages detail this strategic alignment more fully against the relevant plans, policies, and strategies highlighted below).

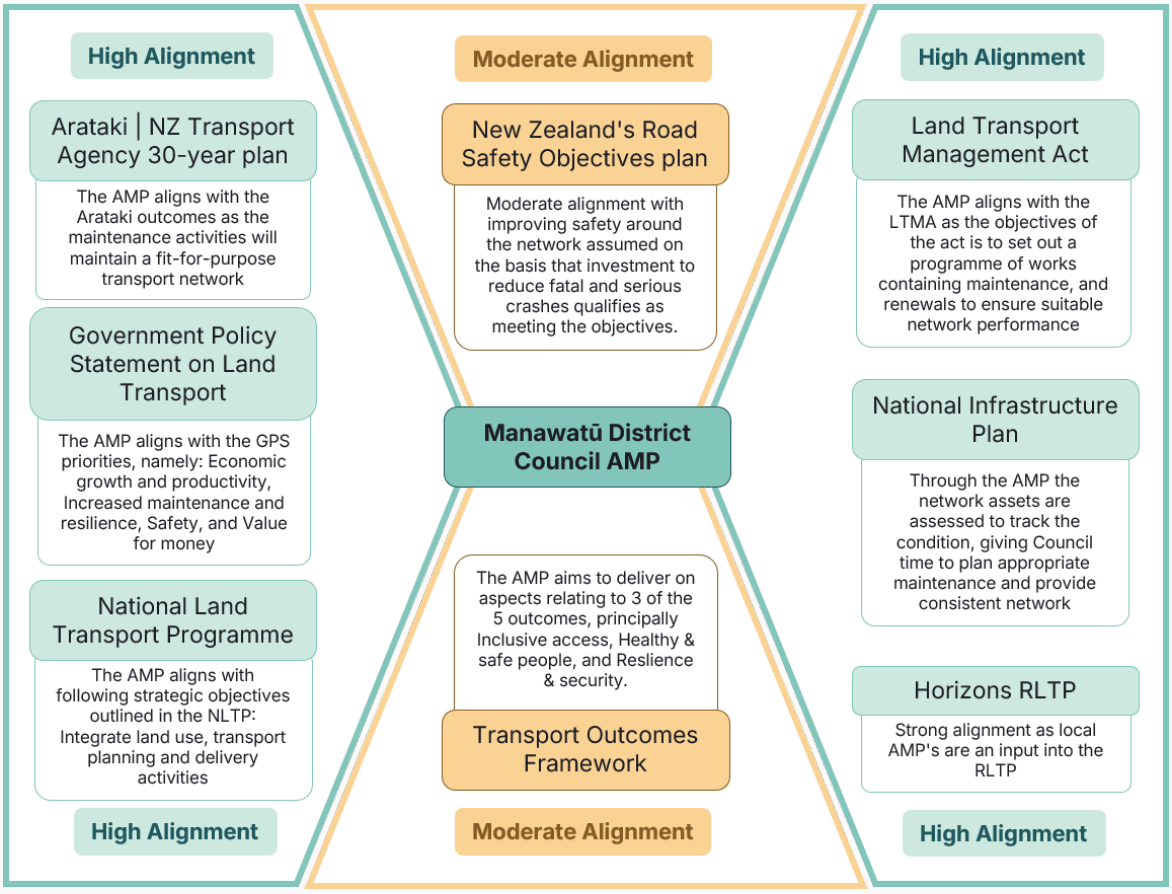


Figure 18 | Strategic alignment

Figure 19 | Strategic policy level alignment

Policy	Guidance and Alignment for this AMP	
Overarching Strategic Drivers, LTMA	The Land Transport Management Act 2003 states that Council has a statutory obligation to maintain a roading network within the district, improve public confidence, and demonstrate greater value from the land transport network. Focus all levels of transport planning and delivery on the goals, strategy and expectations of the GPS and Council. Work collaboratively with other RCAs to build capability, enable innovation, and develop customer-focused systems. Understand Council's contribution to the wider transport system. Collaborate with other RCAs to standardise systems. Understand the importance of Council's role in planning and delivering community outcomes. **Improving investment decision-making** **Customer-focused investment** **Activity Management Excellence** **Evidence-based decision-making** **Data acquisition, analysis, and use** **Service delivery excellence**	
Alignment	The AMP aligns with the LTMA as the objective of the act is to set out a programme of works containing maintenance, rehabilitation, and replacement work, ensuring a suitably performing, well maintained road network that fosters continued confidence from the public.	**High**
GPS on Land Transport, **NZ Government**	The GPS states that '*this Government expects*' the following to be achieved: **Economic growth and increased productivity** - reduced journey times and increased travel time reliability - improved access to markets, employment and areas that contribute to economic growth - more efficient supply chains for freight **Increased maintenance and resilience** - more kilometres of the road network resealed and rehabilitated each year - fewer potholes - a more resilient network **Improved safety** - reduction in deaths and serious injuries **Value for money** - better use of existing capacity - less expenditure on temporary traffic management	
Alignment	The AMP aligns with the all GPS priorities, namely: **Economic growth and productivity, Increased maintenance and resilience, Safety, and Value for money** The condition assessment of the network allows Council to improve performance, focusing on delivering safe, efficient, and resilient infrastructure for all road users.	**High**

Continued on next page...

Policy	Guidance and Alignment for this AMP	
Arataki – Our 30-Year Plan, NZTA	Arataki provides direction at a National, Pan-regional and Regional level to set a cohesive, long-term and proactive programme for the transport sector. The issues and desired outcomes for Manawatū-Whanganui have been summarised in the Regional Summary: *'Network resilience is an issue. Climate change is expected to bring more intense and frequent storms that will impact areas with unstable terrain … The impacts of sea level rise will also increase for low-lying coastal communities.'* *'Te Papa-i-Oea Palmerston North is emerging as the primary distribution centre for the Lower North Island. The development of a high-tech rail hub in the northeast will allow rail to play a greater role in moving freight.'* *'The population of Manawatū–Whanganui is expected to increase from 238,000 to more than 276,000 by 2048, or 2% of the population of Aotearoa New Zealand. Most of this growth is expected in Te Papa-i-Oea, **Aorangi Feilding**, and Taitoko Levin.'* *'There is an opportunity to increase walking and cycling rates in Te Papa-i-Oea, Whanganui, **Aorangi**, and Taitoko, by investing in safe and attractive facilities. Active modes are the best way to reduce vehicle kilometres travelled, along with growing the amount of freight moved by rail and coastal shipping'.* *'Other critical transport challenges facing the region over the next three decades include **safety**, **resilience**, and supporting the transition to a low-carbon economy.'* In line with these statements, it is expected that we should engage in activities that help manage these observations. The scale of effort identified by Arataki to help achieve the Government's desired outcomes are listed below, in order of priority: *Environmental sustainability, **Healthy and safe people**, **Resilience & security**, **Economic prosperity**, and Inclusive access.*	
Alignment	This project aligns with the expectations within Arataki as the maintenance activities and funding will include investment in maintaining a fit-for-purpose transport network, while improving safety and resilience.	**High**
National Land Transport Programme (NLTP)	Following the strategic objectives in the GPS and Arataki, we will be working to: - Apply a value for money approach to transport system investment - Use technology and innovation to achieve improved performance - Integrate land use, transport planning, and delivery activities From Council's investment perspective, key strategic focus is on: - Reducing deaths and serious injuries - An emphasis on transport infrastructure in 'place-making', to support liveable towns - Increased investment in optimising the efficiency of the system across modes - Keeping maintenance and resilience treatments at an optimal level NZTAs Investment Prioritisation Method (IPM) is used to assess and prioritise funding for projects and programmes proposed for inclusion in the NLTP. Council will use this tool to guide investment proposals, once finalised.	
Alignment	The AMP, through investigation of available data, seeks to improve network performance where possible or maintain existing performance where appropriate. By doing this the AMP aligns with the following strategic objectives outlined in the NLTP: Apply a value for money approach to transport system investment From the Council's investment perspective, key strategic shifts are: Reducing deaths and serious injuries, Local road improvements, safety improvements, and keeping maintenance and resilience treatments at an optimal level.	**High**

Continued on next page...

Policy	Guidance and Alignment for this AMP	
National Infrastructure Plan	The National Infrastructure Plan provides the framework for infrastructure development over the next 30 years and is focused on ensuring better use of existing infrastructure and allocating new investment to meet long-term needs.	
Alignment	Through the AMP, network asset condition is frequently assessed, giving us time to plan appropriate maintenance and provide consistent network performance.	**High**
Regional Land Transport Plan 2027-2037, Horizons Regional Council	The RLTP provides the strategic direction and policy framework for developing and investing in the land transport network, setting out how the region proposes to invest to achieve objectives. The project of works improve the regional land transport network is actioned by much of the programmed works contained within local AMP's. Therefore, by achieving the specific projects and objectives in this AMP, this will contribute towards solving the problems and realising the benefits identified in the RLTP. The Region's 30-year vision statement for the next RLTP is: '***A region that connects central New Zealand and provides efficient, resilient, accessible, affordable and safe transport***'. The following five objectives have been developed and are in the process of being endorsed by the Regional Transport Committee (RTC) to deliver on the vision statement above: Connectivity and efficiency, **Network quality and integration**, **Safety**, **Resilience and climate change**, Travel choice	
Alignment	Strong alignment as local AMP's are an input into the RLTP	**High**
New Zealand's Road Safety Objectives, NZ Government	The Government's Road Safety Objectives plan (released in October 2024) expects road safety to improve through key actions, including: Roadside oral fluid drug testing, reviewing penalties for traffic offences, investing in new and safe Roads of National Significance, increasing road policing and enforcement, improving the Graduated Driver Licensing System, and investigating new, targeted safety requirements for vehicles entering the fleet. **There are no outstanding, specified actions or targets for local Road Controlling Authorities to reach regarding the road safety objectives set out in the plan.**	
Alignment	Moderate alignment with improving safety around the network assumed on the basis that investment to reduce fatal & serious crashes meets objectives.	**Moderate**
Transport Outcomes Framework, MCERT	The Transport Outcomes Framework sets a purpose for the transport system, centred around the wellbeing of New Zealanders and the liveability of places. It outlines five outcome areas to contribute to this purpose: **Inclusive access** | enables all people to participate in society through access to social and economic opportunities such as work, education and healthcare. **Healthy & safe people** | protects people from transport-related injuries and harmful pollution, and makes physically active travel an attractive option. **Economic prosperity** | supports economic activity via local, regional and international connections, with efficient movements of people and products. **Environmental sustainability** | transitions to net zero carbon emissions, and maintains or improves biodiversity, water quality and air quality. **Resilience & security** | minimises and manages the risks from natural and human-made hazards. Anticipates and adapts to emerging threats, and recovers effectively from disruptive events.	
Alignment	The AMP aims to deliver on aspects relating to 3 of the 5 outcomes, principally **Inclusive access, Healthy & safe people**, and **Resilience & security**. By maintaining suitable road quality and applying targeted asset investments as a result of funding constraints, the above outcomes can be realised.	**Moderate**

2.8 Relationship with other documents

This AMP is one of a number of key Council strategic documents that detail activities with respect to how Council intends to deliver on the requirements of the LGA. It provides detailed supporting information for the Council's Long-Term Plan.

In addition to the commitment to deliver on the requirements of the LGA, this AMP outlines how we will contribute to the requirements and objectives found in the:

- LTMA 2003, and Amendment Act 2013
- LGA 1974 / 2002, and LGA Amendment Act 2015
- Health and Safety at Work Act 2015
- GPS on Land Transport
- Horizons RLTP
- Government's Road Safety Objectives
- Council transportation strategies, policies, and bylaws

The following documents are periodically published in reference to updated Government strategic direction, priorities and objectives, and consequently influence transportation activity:

- NZTAs Statement of Intent 2024-28 and Statement of Performance Expectations 2024/25 [7]
- NZTAs Rules, Policies and Guidelines
- Transport Insights
- One Network Framework (ONF)
- International Infrastructure Management Manual (IIMM)
- MCERT: New Zealand Rail Plan

2.9 Network management

We undertake management of our network to effectively meet community needs, comply with regulations, enhance infrastructure resilience, and support sustainable transport solutions. Alignment with the expected Levels of Service is crucial for creating a safe and efficient transport system.

2.9.1 Current State

We acknowledge that the One Network Road Classification (ONRC) framework has been substantially enhanced through implementation of its successor, the One Network Framework (ONF).

We had previously embedded ONRC performance measures in assessment, reporting, and setting Levels of Service accordingly.

Whilst our transportation network has been successfully redefined under ONF, a number of performance measures continue to be defined commensurate with underlying classifications,

[7] *Statement of intent 2024-2028 and statement of performance expectations 2024/25 (www.nzta.govt.nz)*

effectively defined as General Traffic (GT) and Freight (F).

2.9.2 Future state

The multi-modal network approach intended for integration into the ONF is still in development.

In particular, the multi-modal network will encapsulate and account for the needs and desires of specific road users above that of the baseline General Traffic and Freight modes, comprising:

- Walking and Cycling, and
- Public Transport

We embrace the use of the ONF to manage and assess network performance and determine appropriate levels of investment to ensure the transport network remains fit for purpose.

2.9.3 One Network Framework

The ONF is a road classification tool which uses place and movement functions to categorise road corridors, with a stronger emphasis on place than previous frameworks have given (see **Figure 20** below). It classifies the network across:

- Rural or urban environments (based on land use, rather than road speed)
- Place value (based on activity and physical form), and
- Movement value (based on traffic volume and vehicle types present)



Figure 20 | Street categories (NZTAs One Network Framework)

As such, a singular stretch of road between - for example, two intersections - can have multiple categories based on place and movement functions. This allows for targeted design, better planning, and delivery of a modern transport system that meets the increasing needs of people, businesses, communities, and our climate at a more granular level. The table below details how the ONF informs our investment decisions:

ONF evidence	What it tells us	How we use it
GT/F classification	Importance of corridor	Determines expected LoS
VKT	Network utilisation	Helps prioritise investment
Current condition	Performance	Identifies intervention need
LoS gap	Customer outcome	Identifies service deficiency
Risk	Consequence of failure	Adjusts priority
Whole-of-life cost	Economic efficiency	Determines treatment/timing

Figure 21 | The ONF influence in investment decisions

2.9.4 Levels of service

NZTA has taken the view that uniformly high operating conditions across all roads in the network are too costly to achieve, and would not present an economic return on investment. On the other hand, it remains impossible to manage an infinite number of standards and performance levels across the network.

For this reason, roads meeting a specific range of functional criteria should achieve a uniform Level of Service, differentiated by each road's hierarchy.

These differential Levels of Service (dLoS) have been developed to help define the required application and performance of particular assets and asset groups.

The ONF classifications and available tools (e.g., Transport Insights) have made it easier for us to compare the performance of our local roads to national and regional networks, as well as peer groups, to understand performance and value of current investment areas. This comparison aids in ensuring our customers get the right level of investment for road infrastructure where it is needed.

Level of Service statements

These have been developed by NZTA to detail what our customers can expect. These expectations are separated by urban or rural environment, detailing the likely form of the corridor, and the anticipated performance.

A summary of service statements for each classification relevant to our district has been recreated on the following page [8].

[8] *The detailed levels of service, form, and operational/maintenance expectations for each classification can be found in section 4.5*

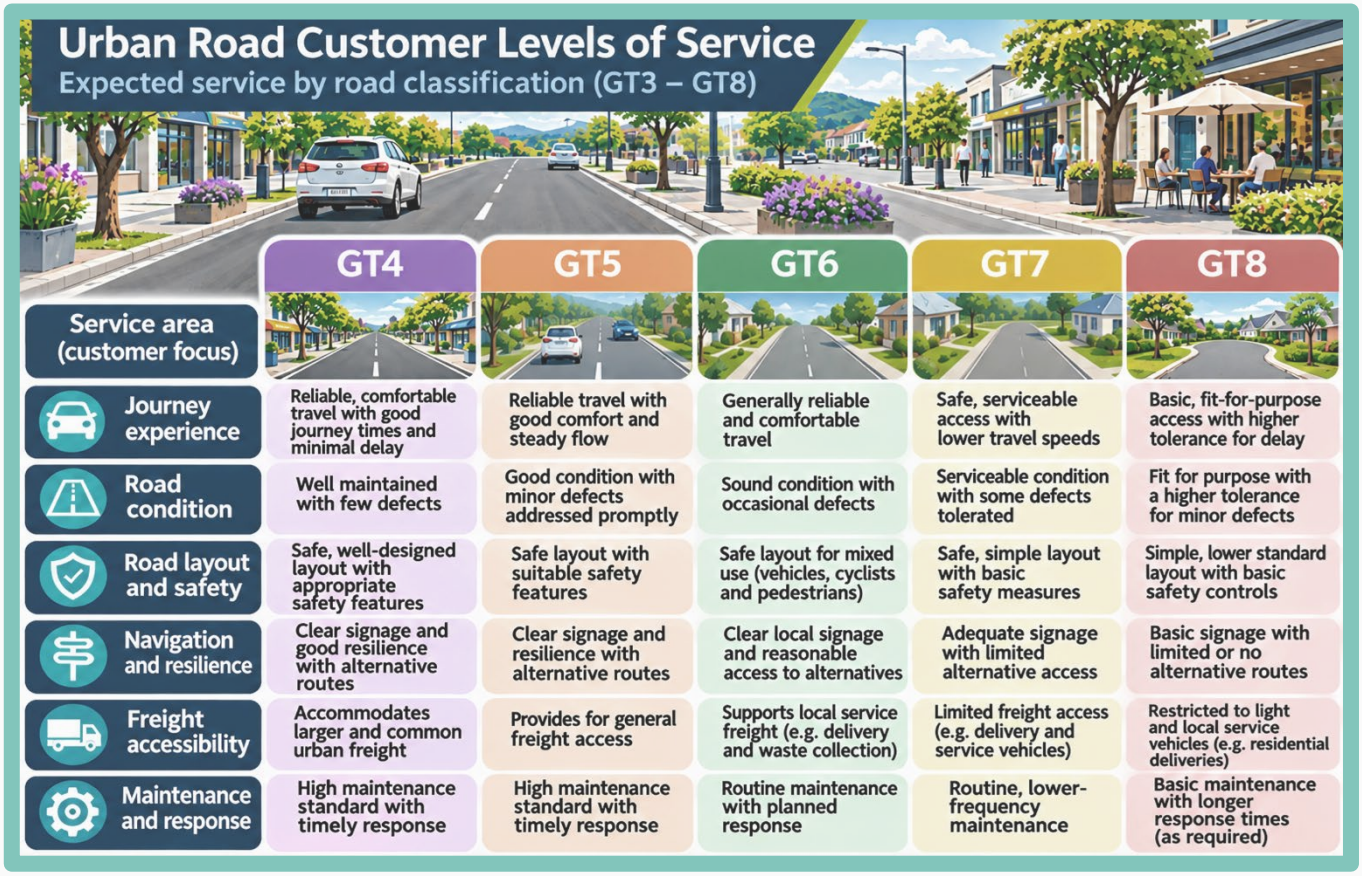


Figure 22 | Service level expectations, urban roads

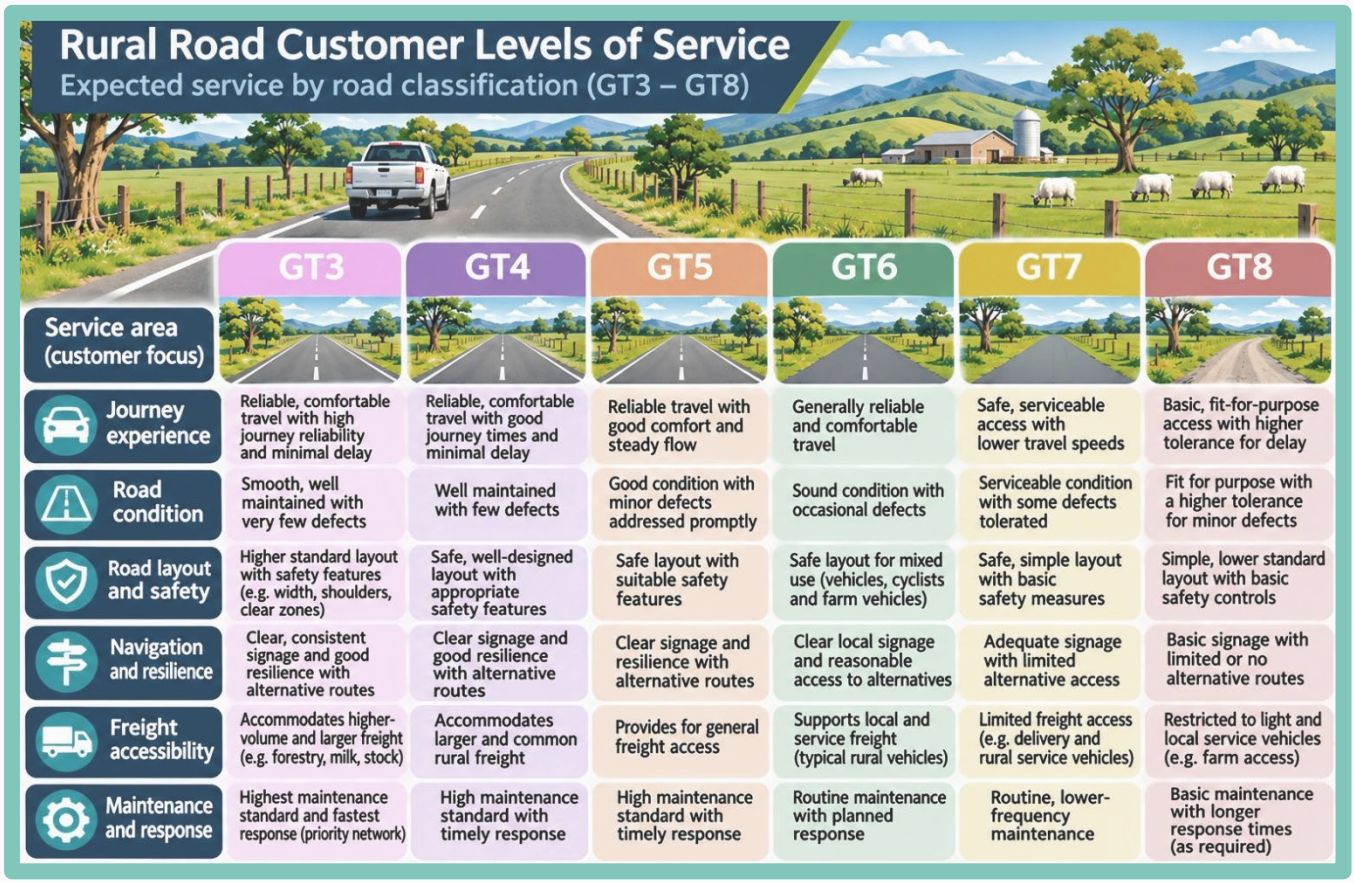


Figure 23 | Service level expectations, rural roads

2.9.5 Service gap identification

We have access to a wide range of data that can be used to provide a baseline assessment of existing problems, and subsequently assist with closing these gaps through policy setting, and suitable investment:

- REG 'Transport Insights' portal
- NZTA Crash Analysis System (CAS)
- NZTA 'MegaMaps' Geographical Information System
- NZTA 'Communities at Risk' register
- Resident satisfaction surveys

Whilst Transport Insights, CAS, and MegaMaps systems are updated reguarly, an annual summary is produced by NZTA for the 'Communities at risk' register.

Likewise, Council produces an annual report regarding the resident satisfaction survey.

These two datasets are discussed below.

2.9.6 Communities at risk

We have summarised the performance for our district relating to each of the metrics assessed by NZTA as part of the 'Communities at risk' register.

The performance is measured using four thresholds:

- Below the mean
- At or above the mean
- At or above half the Standard Devation (0.5 SD)
- At or above the Standard Deviation (1.0 SD)

'Medium concern' is assigned at or above 0.5 SD, and 'High concern' when measured at or above 1.0 SD.

Risk metric	Above Mean	+0.5 SD	+1.0 SD
Urban intersections			•
Rural intersections		•	
Inappropriate speed		•	
Motorcylists		•	
Death/Serious Injury		•	
Alcohol/drugs		•	
Young drivers	•		
Loss of control	•		

Figure 24 | NZTA 'Communities at risk' register summary (metrics scoring 'below mean' excluded)

Key observation

Whilst 'urban instersections' top the table, this measure appears **unduly influenced** by interaction with roads owned or managed by other RCAs.

Of the 'Medium concern' metrics, the area of greatest concern is for '**rural intersections**', currently ranked just below the 'High concern' threshold of **1.0 Standard Deviation**.

2.9.7 Resident satisfaction surveys

Council commissions quarterly surveys as to how our community views, and experiences, the district, summarising findings on an annual basis.

The latest report shows the breakdown of responses for the overall, and individual, measures relating to our roads and pathways, scored out of 10 and ranked from 'poor' to 'excellent'.

Overall roads, footpaths, and cycleways

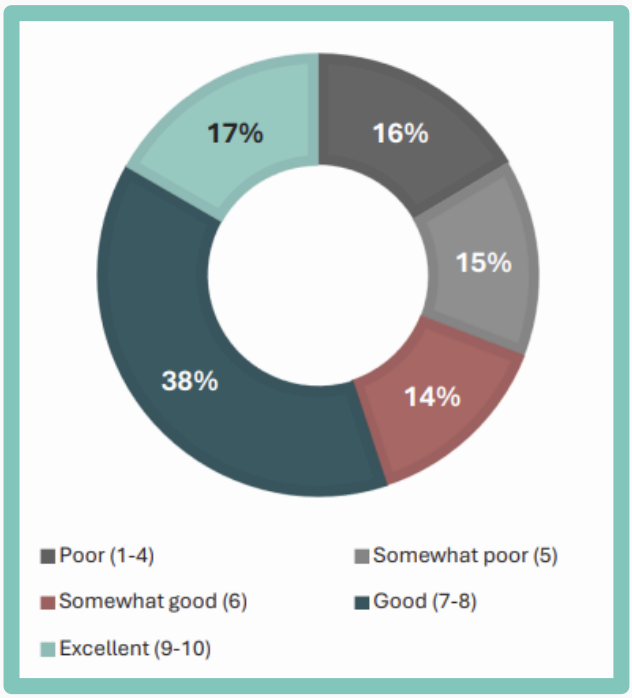


Figure 25 | 2025-26 resident satisfaction, '*Overall roads, footpaths, and cycleways*'

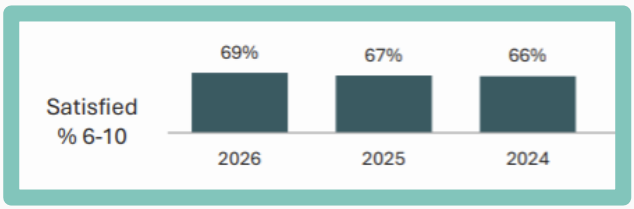


Figure 26 | Resident satisfaction, three year trend, '*Overall roads, footpaths, and cycleways*'

Key observation

A gradual increase in satisfaction with '***Overall roads, footpaths, and cycleways***' has been reported, increasing from 66% to 69% over the last three years

Individual measures

The figure below highlights the individual questions (and satisfaction levels) residents are asked relating to our land transport network:

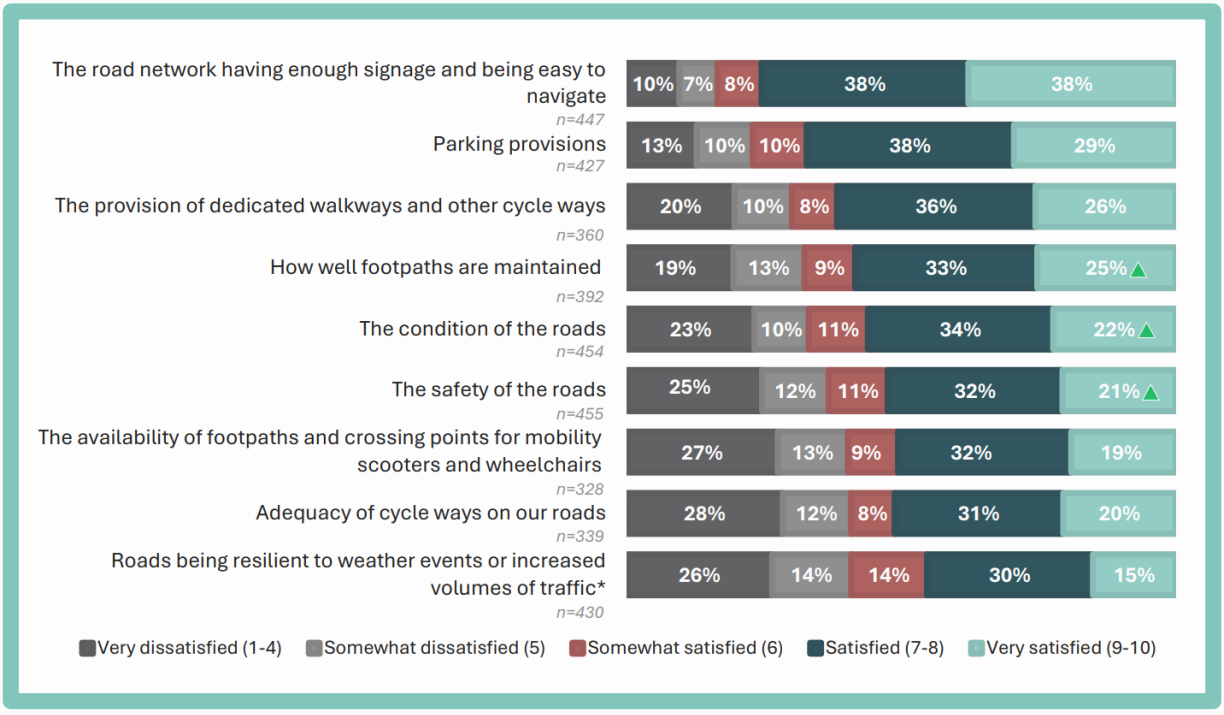


Figure 27 | Extract from 2025-26 MDC resident survey results, individual measures

When registering a dissatisfied score (i.e., five or less), respondents were also asked to provide a reason. The most common reasons stated for dissatisfaction are as follows:

- Tree and shrub maintenance needed
- Upgrades required to intersections
- Poor road maintenance, gravel roads, poor drainage
- Safety, signage, lighting
- Potholes, uneven roading

From these indications, we consider that the following asset groups require management to realise benefits relating to their desires, primarily surrounding amenity and safety:

Environmental

Unsealed road pavements

Network (traffic) services

Streetlighting

Sealed road pavements

2.10 Network composition

Transport assets are an important part of any district and a key component to enable the daily flow of people and commerce across the region. Understanding these assets is vital to determining current and future performance.

2.10.1 Overview

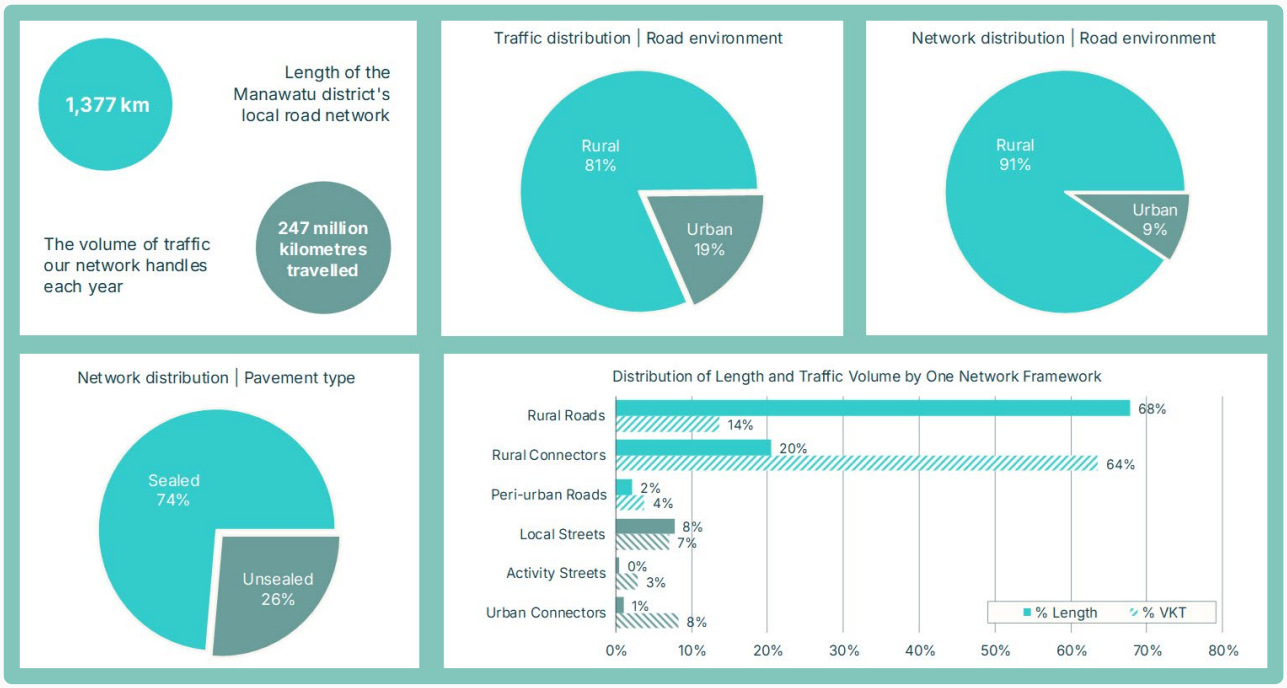


Figure 28 | Network composition

Our district covers a sizeable land mass totalling a little under 260,000 hectares and enjoys a road network reaching 1,377km in length.

Within our road corridors, a broad portfolio of assets can be found; bridging structures, retaining walls, culverts, footpaths, streetlights,

drains, roadmarkings, signs, and safety barriers that directly and indirectly support socio-economic activity within the district, the wider region, and the Country.

Each asset group has its own lifecycle, and is managed through systematic processes detailed throughout this Activity Management Plan.

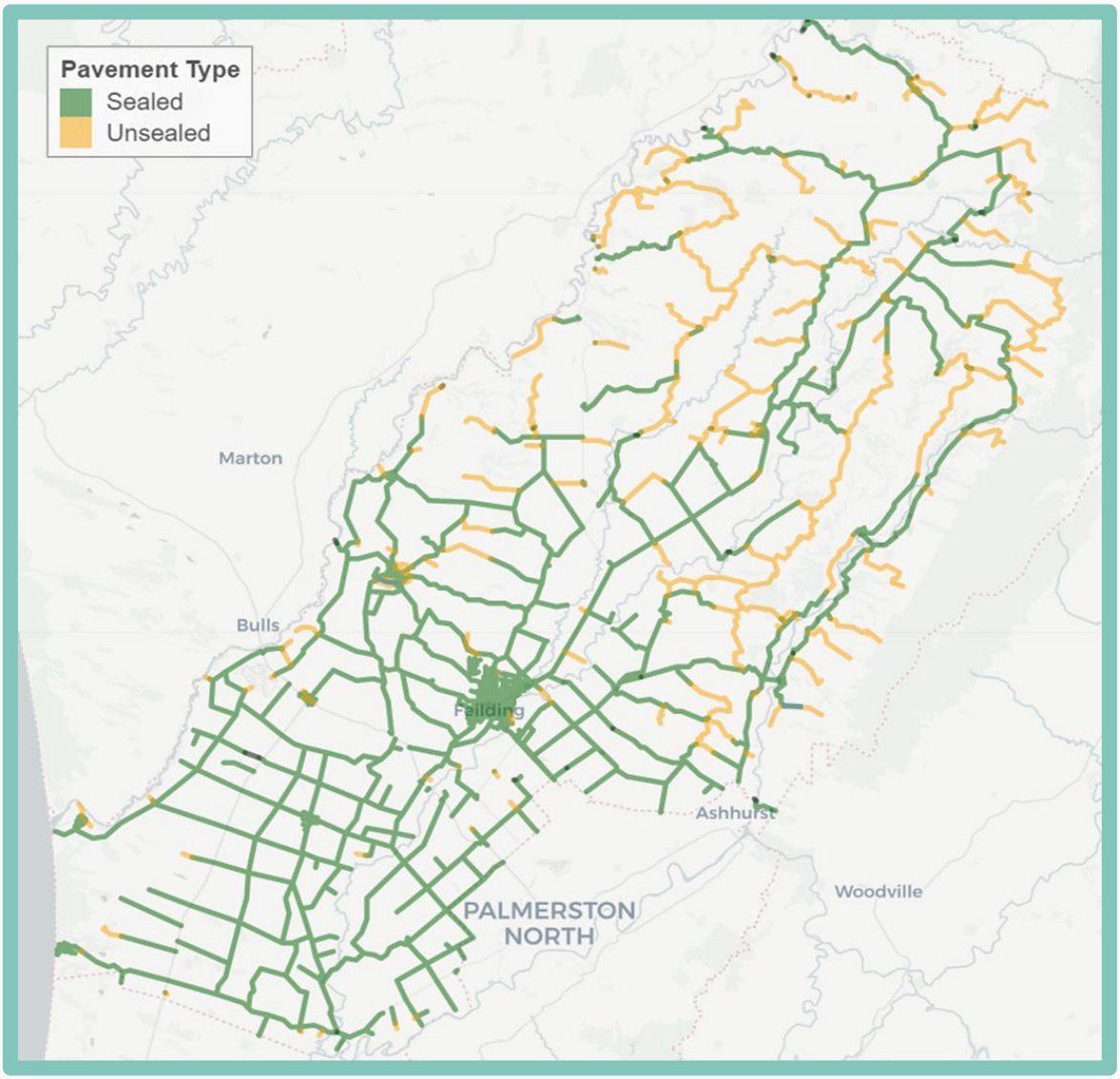


Figure 29 | Manawatū district local road network map by pavement type

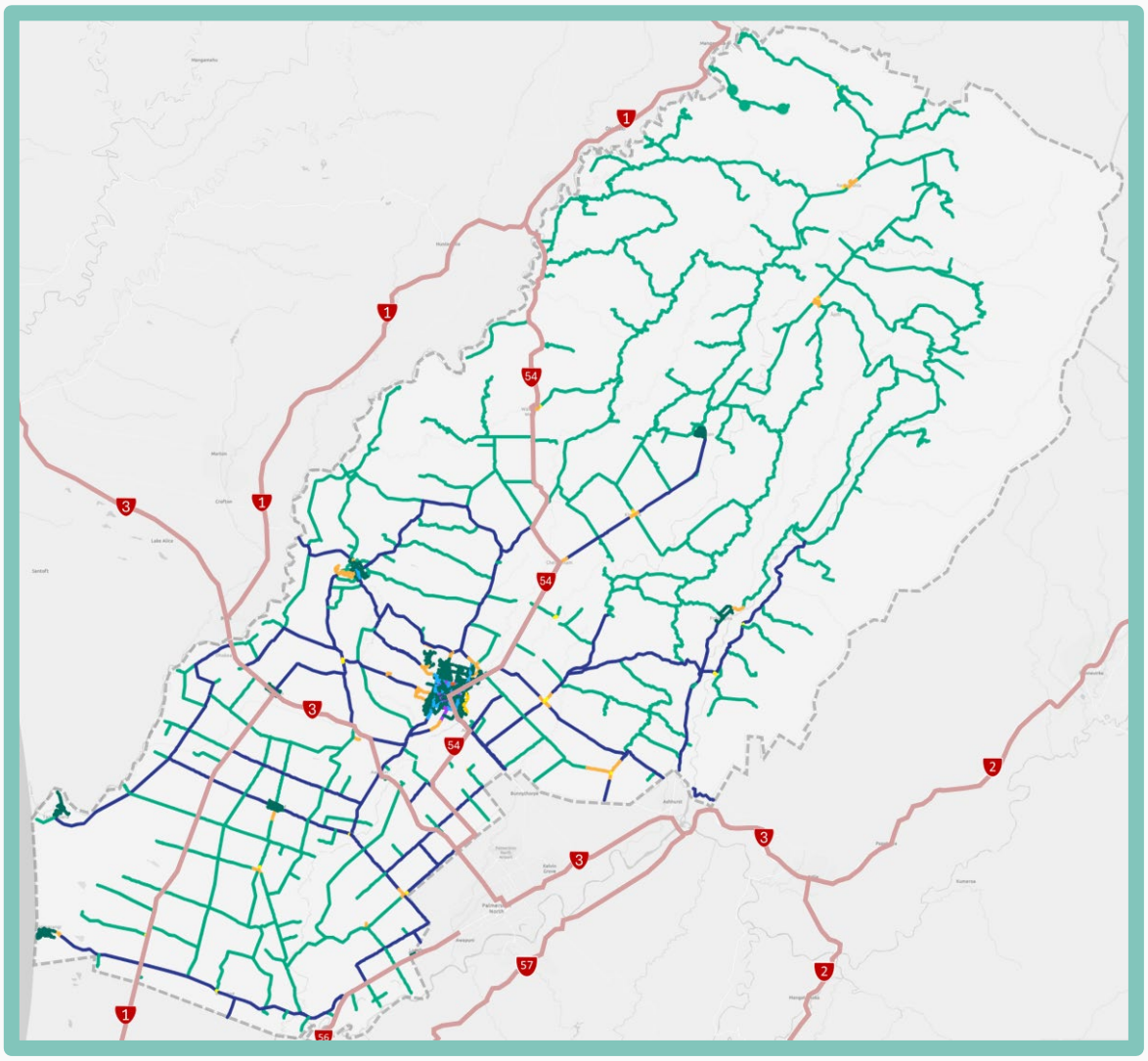
Manawatū's road network is characterised by a mix of sealed and unsealed roads, reflecting varying traffic demands, and environmental conditions, across both urban and rural areas.

Sealed roads (typically chipseal or asphalt) carry the majority of traffic and are critical for economic activity, requiring ongoing maintenance to manage wear.

Unsealed (gravel) roads make up a significant proportion of the network by length, and require frequent intervention to manage surface loss, corrugation, and dust nuisance.

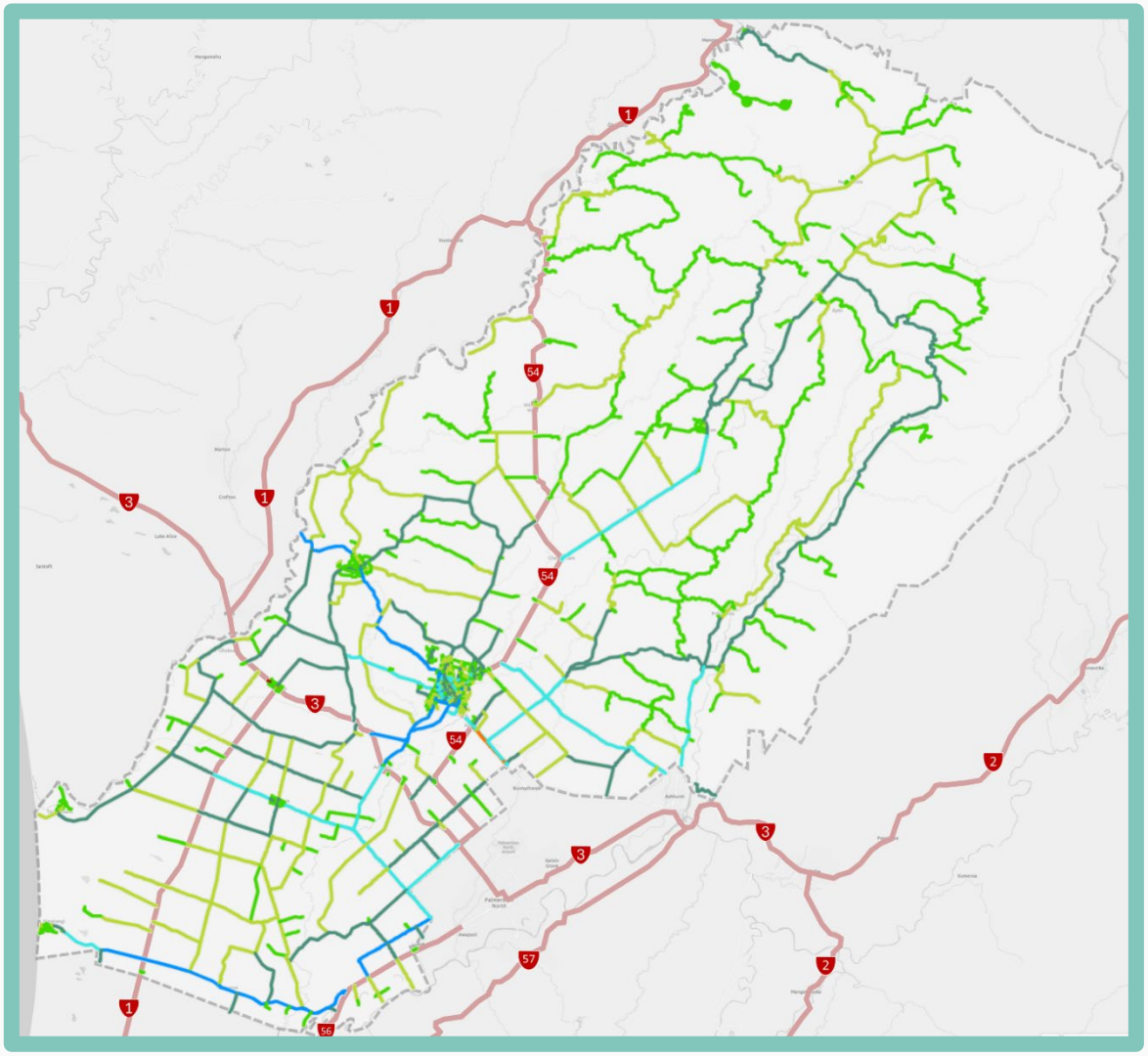
Together, these pavement types present distinct asset management challenges, with sealed roads generally driven by structural and surface performance, while unsealed roads are more sensitive to environmental factors and

maintenance cycles. Understanding the differing deterioration mechanisms and service expectations across both is essential for effective planning, ensuring the network remains safe, resilient, and fit-for-purpose.



One Network Framework Corridor Classification		Length (km)	Length (%)	Urban (km)	Rural (km)	Sealed (km)	Unsealed (km)	Journeys (M VKT)
	Urban Connectors	14	1	14		14	-	20
	Main Streets	<1	<1	<1		<1	-	<1
	Activity Streets	7	<1	7		7	-	7
	Local Streets	107	8	107		100	7	17
	Peri-urban Roads	30	2	-	30	29	1	9
	Rural Connectors	282	20	-	282	282	-	154
	Rural Roads	933	68	-	933	577	355	33
	Stopping Places	3	<1	-	3	3	<1	1
	Total	**1,377**	**100**	**129**	**1,248**	**1,014**	**363**	**241**

Figure 30 | Manawatū district local road network by ONF



One Network Framework GT Classification		Length (km)	Length (%)	Urban (km)	Rural (km)	Sealed (km)	Unsealed (km)	Journeys (M VKT)
	GT3	3	<1	-	3	3	-	8
	GT4	62	5	12	50	62	-	85
	GT5	96	7	11	85	96	-	64
	GT6	294	21	24	270	294	-	54
	GT7	418	30	31	387	385	33	22
	GT8	504	37	64	440	174	330	8
	Total	**1,377**	**100**	**142**	**1,235**	**1,014**	**363**	**241**

Figure 31 | Manawatū district local road network by General Traffic Classification

96.8% of the network has a Freight classification equal to General Traffic, indicating that there is little variance in how to manage the road network against the Levels of Service for each classification identified earlier.

2.10.2 The value of our network

Roading assets are subject to valuation to ensure their reported value reflects current condition, performance, and replacement cost over time. Roading assets continuously deteriorate due to traffic loading, environmental effects, and ageing, while also being renewed and improved through ongoing investment. Regular revaluation captures these changes, ensuring that asset values remain accurate for financial reporting, funding justification, and long-term planning.

Valuations support compliance with accounting standards and audit requirements, providing transparency and consistency in how infrastructure is represented on Council's balance sheets. It enables Council to align financial value with physical reality - linking condition and performance trends to depreciation, renewal demand, and lifecycle management decisions.

Optimised Replacement Cost (ORC)

Optimised Replacement Cost refers to the cost of building the asset today. It is assumed that modern construction techniques, design codes and modern equivalent materials are used but that the physical result replaces the asset as it exists.

Remaining Useful Life (RUL)

Remaining Useful Life is based on the total useful life of the asset less the age.

Optimised Depreciated Replacement Cost (ODRC)

Optimised Depreciated Replacement Cost (ODRC) is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity:

$$ODRC = ORC \times \frac{RUL}{RUL + Age}$$

Annual Depreciation (AD)

Annual Depreciation indicates the quantity of funding that should be set aside each year to cover the cost of renewing our existing assets with an equivalent asset at the end of its useful life. This is generally calculated based on a straight-line method where it is assumed the asset will degrade at the same rate over its life:

$$AD = \frac{ORC}{RUL + Age}$$

The summary costs from this (and the previous AMP's) valuation assessment of our network asset portfolio are shown in **Figure 32** below.

Asset Family	Year	Optimised Replacement Cost ($)	Optimised Depreciated Replacement Cost ($)	Annual Depreciation ($)
Roading	2023	1,157,934,773	620,378,517	15,138,357
	2026	1,358,597,677	666,315,322	19,265,909
Difference (and percentage change)		200,662,904	45,936,805	4,127,552
		(17.3%)	(7.4%)	(27.3%)

Figure 32 | Asset portfolio valuation trend

The network asset Optimised Replacement Cost can also be portrayed by proportionality; asset types have been aggregated to produce an asset group value distribution, displayed in **Figure 33** below:

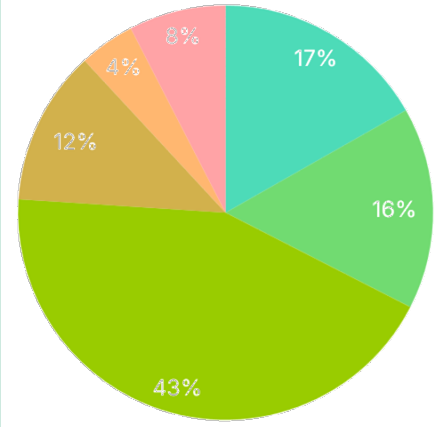
Asset Group Cost Distribution	Asset Group	ORC	% ORC	DRC
	Bridges	$227,894,751	17	$90,647,318
	Drainage	$214,021,434	16	$59,039,403
	Pavements	$591,009,435	43	$358,659,547
	Surfaces	$164,200,688	12	$58,289,724
	Retaining walls	$58,812,308	4	$46,161,089
	Other	$102,629,060	8	$53,518,241
	Total	**$1,358,567,677**	**100**	**$666,315,322**

Figure 33 | Asset group cost distribution

The '*other*' category accounts for asset types that each comprise less than 4% of the ORC. These assets consist of the district's berms, network services (such as signs, road markings, islands, etc), pathways, and streetlights, amounting to 8% of network value.

Elements within each asset group are identified and reported in more detail (see Section 4.9.3).

Asset Sustainability Ratio

The Asset Sustainability Ratio (ASR) is a critical measure, highlighting whether an organisation is funding the capital maintenance and renewal of assets it owns to an appropriate, sustainable level of investment.

A target range for appropriate investment level is an ASR between 0.8 and 1.2. An ASR of 1.0 (i.e., 100%) indicates an optimum level of investment is being undertaken.

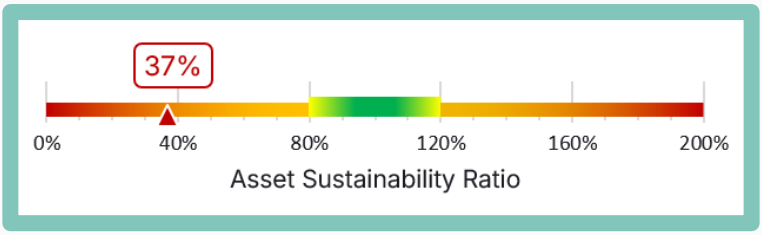


Figure 34 | MDC's Asset Sustainability Ratio, roading asset portfolio

Key observation

Our investment level sits significantly below the bounds required to sustain its asset portfolio in the long-term.

2.11 Expenditure profile

The financial management of our network is assessed by the Road Efficiency Group, a collaboration between Local Government NZ, NZTA, and Local RCAs. It measures the effectiveness, efficiency and value for money achieved across our peer RCAs. Peer RCAs are grouped, based on a combination of urban/rural split and traffic volume in each network.

Expenditure value

Transport Insights measures our land transport related expenditure and achievement using data from the last three years and comparing it to our peers (defined as '*rural districts*'):

Value for Money (Quality / Cost)

This measure compares network roughness to the dollars spent on resealing, road rehabilitations, and kerb & channels.

Efficiency (Quantity / Cost)

This measure compares how much renewal work on resealing, road rehabilitations, and kerb & channels was carried out against dollars spent.

Effectiveness (Quality / Quantity)

This measure compares how good the current network is for the amount of work done.

In summary, our district compares favourably with our peers, currently ranked 4th from 25.

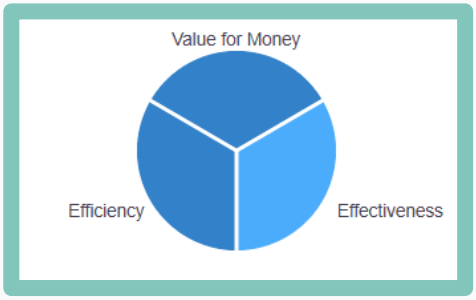




Figure 35 | Value for money, efficiency, and effectiveness benchmarking across peer RCAs

Expenditure distribution

The distribution of expenditure for maintenance, operations, and renewals (MOR) is assessed on a rolling three yearly cycle by, and for, Manawatū District Council. It is assessed against our:

- Peer group '*rural districts*', and
- Neighbouring (local territory) RCAs within the Manawatū-Whanganui region

This assessment is conducted for the latest three yearly average using the following metrics:

- Cost per km of network length, and
- Cost per 100 million Vehicle Kilometres Travelled (VKT)

collating expenditure into the following aggregated groups [9]:

- Network and asset management
- Pavement and surfacing
- Corridor (signs, delineation, etc)
- Environment and drainage
- Structures, and
- Footpaths

Figure 36 on the following page shows the where MDC's mean annual expenditure per km of network over the last three years sits within Manawatū-Whanganui Region.

Key observation

With regard to Emergency Works, it is worth noting that approximately 22% of overall expenditure across our network in the last three years has been as a result of reinstating assets and managing connectivity impacted by severe weather events.

This is expected to rise to 27% by the end of the 2024-27 funding period.

[9] *Two remaining aggregated groups - Cycle facilities and Emergency works - have been excluded when comparing RCA expenditure. This is due to the variability within each RCA of such facilities being present (in the case of cycling), and the volatile and unplanned nature of emergency works.*



Figure 36 | Annual mean cost (over 3 years) per km, for aggregated road maintenance activities

It can be seen that we sit at – or below – the median cost per km of network in all activity groups (excepting structures) when compared to our regional neighbours. Furthermore, our analysis shows that cost effectiveness by network length and by traffic volume on the following page reflects favourably on both our fiscal management and delivery.

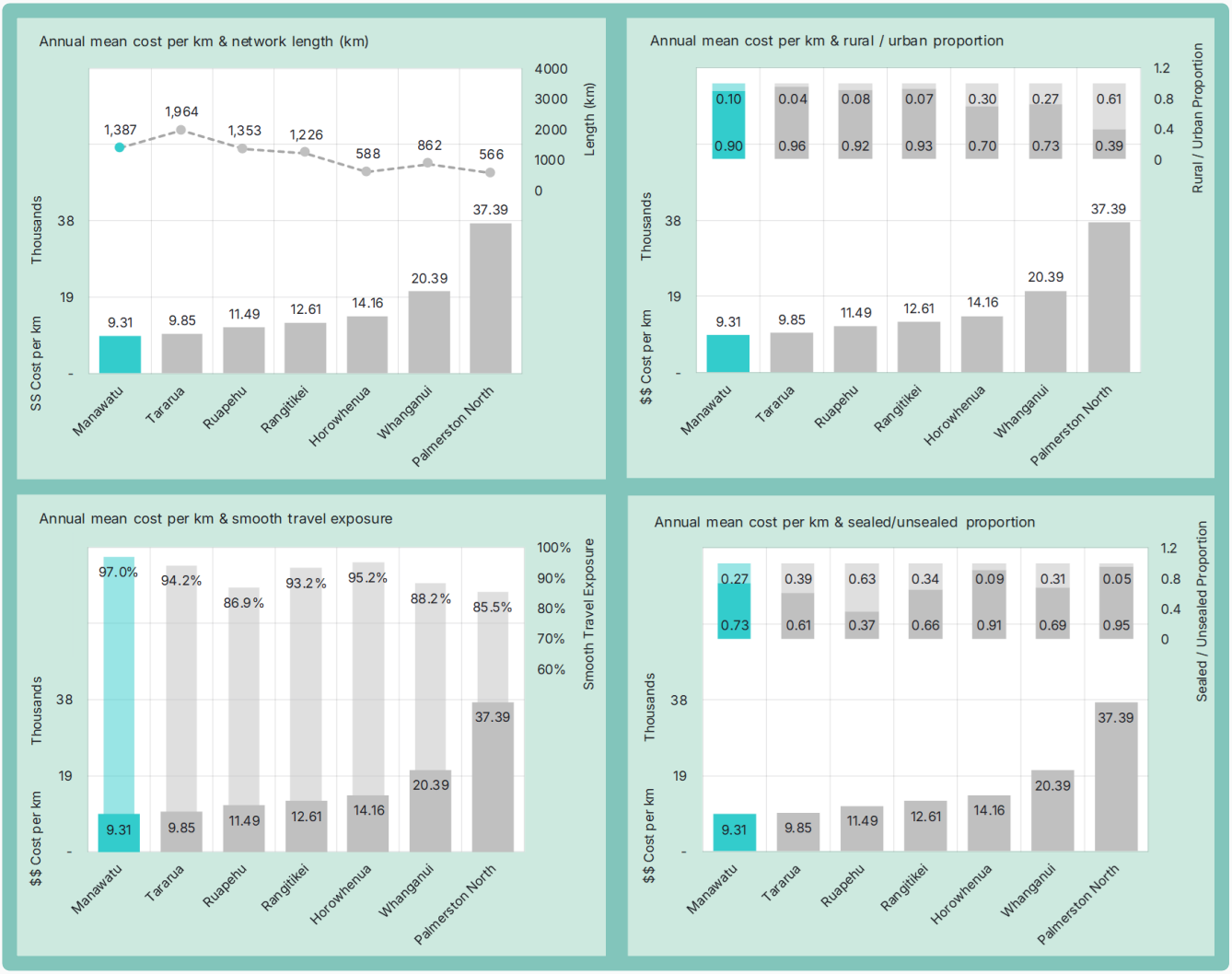


Figure 37 | Annual mean cost (over 3 years) per km, by network composition



Figure 38 | Annual mean cost (over 3 years) per 100 million vehicle kilometres travelled (VKT)

Similarly, for the '*rural districts*' peer group, comparison charts measuring the annual mean cost (over 3 years) per km and by 100 million VKT have been produced below:

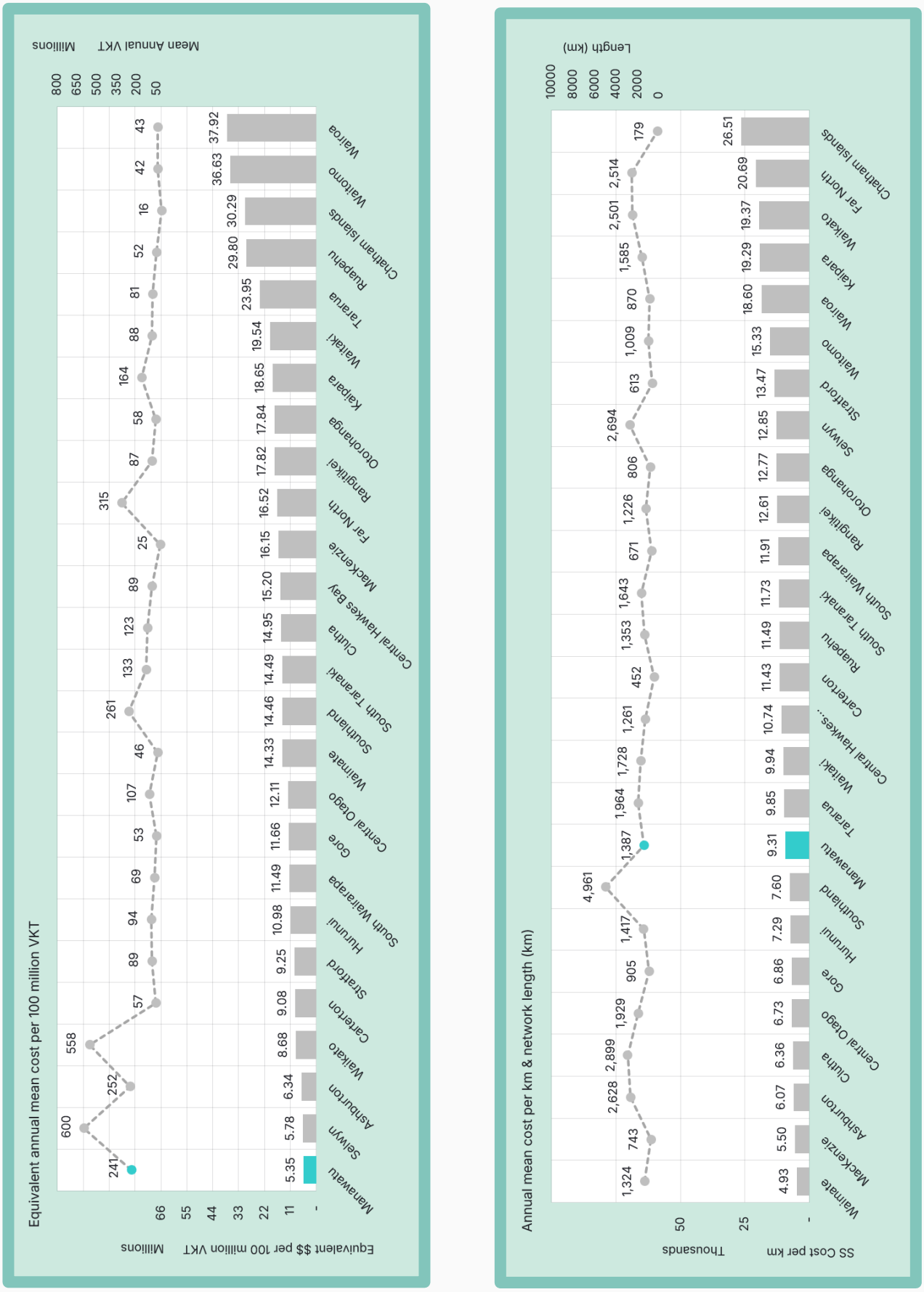


Figure 39 | Cost Effectiveness by traffic volume and network length against peer group RCAs

2.12 Network demand

The land transport network is required to provide safe and efficient movement of people and goods within, across, and beyond our region. Its performance therefore directly influences the economic viability and sustainability of our district, the wider Manawatū-Whanganui region, and indeed New Zealand as a whole.

2.12.1 Context

The road network was instigated many decades ago and has been gradually upgraded to present standard. However, it is evident that community expectations continue to increase, which requires regular reviews of our desired levels of service. This influences our programmes to continually improve and develop our roading network. In general, our network has been coping with the demands placed on it, but this is expected to change.

Parts of our network will need considerable attention over the next decade (and beyond) to meet community and growth expectations.

2.12.2 Drivers

The future demand for services will change over time in response to a wide range of influences, including:

- Location population trends,
- Accuracy of predicted populations,
- Local economic trends and industries,
- Predicted traffic growth,
- Changing technology,
- Changing legislation requirements,
- Changing community requirements,
- Specific trends that have a significant impact on the road asset,
- Climate and climate change, and
- Land use change

All the above factors impact demand and - by extension - the required development of supporting infrastructure (increasing or decreasing asset capacity to cater for forecasted demand).

These factors play a role in the future transport landscape and need to be understood to generate an accurate expectation of demand, which can then be used to inform and develop reasonable infrastructure objectives.

Specific demands influencing the need for change upon the assets or the management of assets within the Manawatū district are briefly described below:

Increasing population

This will result in an increase in traffic on our roads, which can increase travel times, impacting the expected Level of Service provided by each road. Additional traffic will also increase wear on the roads, leading to higher maintenance and renewal costs.

Changes in the way roads are used

Our district is facilitating a number of new urban subdivisions, and the development of new industry. This expansion can - and will - change how the network is used across individual and multiple road corridors. This may mean roads and intersections will need to be amended, upgraded, or transformed to accommodate changing use.

Forestry

Harvesting is a key driver as most of the district's forest estate has, or will, reach harvestable age between 2018 and 2030.

An intensification of heavy vehicle traffic on rural roads continues to be experienced. This intensification requires specific roads to be monitored to handle the increased demand and associated impacts. Due to the nature of the forestry industry usage is highly variable, requiring proactive road maintenance schedules and effective communication between ourselves, forest managers, and public users.

Dairy Conversion

Conversion of land use to dairying is occurring with the effects becoming evident in the Āpiti area. This conversion is producing increased heavy vehicle volumes on rural roads, putting pavement widths, loadings, and safety under pressure.

Agriculture

Farming continues significantly influence the district's economy. One of Council's objectives is to ensure that this industry is not adversely affected by changes in Council policy and planning requirements.

Commercial and Industrial hubs

Attraction and retention of manufacturing and processing plants such as AFFCO and Venison meat packers, facilities such as ProLiant Plasma processing, and nationally recognised commercial business brands is a key component of our district's economic aspirations. This results in impacts from more High Productivity Motor Vehicle (HPMV) movements adding wear and tear to the network.

2.12.3 Forecasting

Traffic movement

Traffic counts are a primary source of information to support our maintenance, renewals, and future capacity planning. We undertake a comprehensive, logical traffic count programme to ensure we know how our network is being used.

Figure 40 shows the steady increase in vehicle journeys observed across our local road network (split between urban and rural roads) over the last 5 years (between 2021 and 2025).

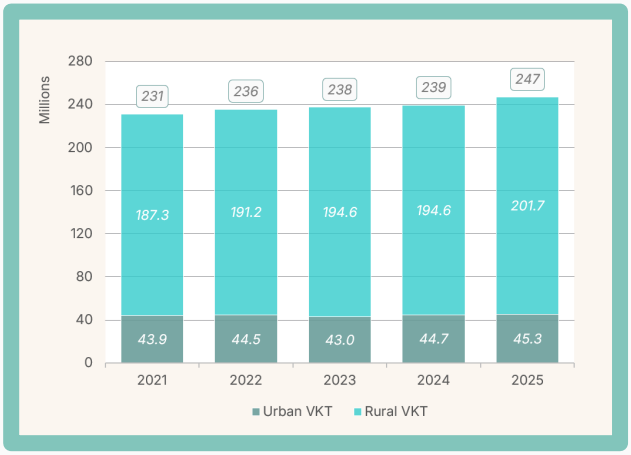


Figure 40 | Local road traffic volume trend, 2021-25

Overall, our network has seen traffic volumes increase from 231 million to 247 million vehicle kilometres travelled, averaging 1.4% growth per annum.

There is, however, an appreciable difference in this growth between the urban and rural portions of the network:

- Urban traffic volume growth between 2021 and 2025 has averaged 0.6% per annum
- Rural traffic volume growth between 2021 and 2025 has averaged 1.5% per annum

Some individual roads or routes within the district are experiencing a higher growth rate due to increased residential or commercial development.

Our main corridors connecting Feilding to Palmerston North also have increasing demand placed upon them, catering for those who wish to live outside the main metropolitan area of Palmerston North, but still rely on daily trips to and from the city for work and recreation.

Traffic volumes are expected to continue to increase for the foreseeable future, taking into account the quantity and location of residential and commercial growth

Industrial and commercial activity

While looking at current traffic demand, it is also important to understand where future funding may be required.

Manawatū is known for its forestry activities which was established in the 1990s. Large-scale harvesting of this resource commenced in 2018, with initial predictions [10] showing a peak between 2024 and 2030.

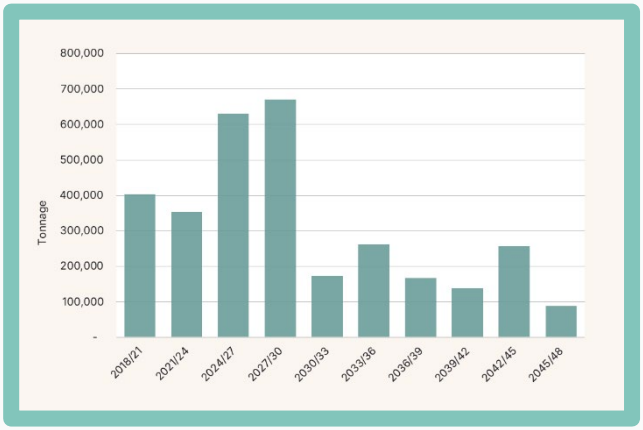


Figure 41 | Initial 30-year wood supply forecast for the district, starting 2018

[10] *'Wood availability and related roading implications on Manawatū District roads 2018-2047; A forecast study prepared for MDC' (Moore and Associates, February 2017)*

Since the initial prediction profile (shown in **Figure 41** on the previous page), tonnage extraction was seen to increase rapidly, primarily from sites not expected to be harvested until the 2027-30 block. This acceleration was due to highly favourable markets, redefining the boundaries of profitability for timber suppliers.

Between 2020 and 2021, a hiatus in logging activity throughout New Zealand was observed; the result of global efforts to prevent the Coronavirus pandemic event from taking hold. Logging operations resumed after this hiatus, trending back towards the originally predicted levels.

To date, the impact of logging trucks has been constrained to a number of routes servicing larger scale harvest operations. Deterioration has been observed to affected pavements and reacted to in an ongoing manner. These reactive works have had moderate success in managing the impact.

However, pavement and surface life has reduced due to accelerated consumption of these assets.

Figure 42 and **Figure 43** show the updated, extraction tonnage and cumulative percentage of yield. The original prediction that 66% of all tonnage will be extracted by 2029-30 stands.

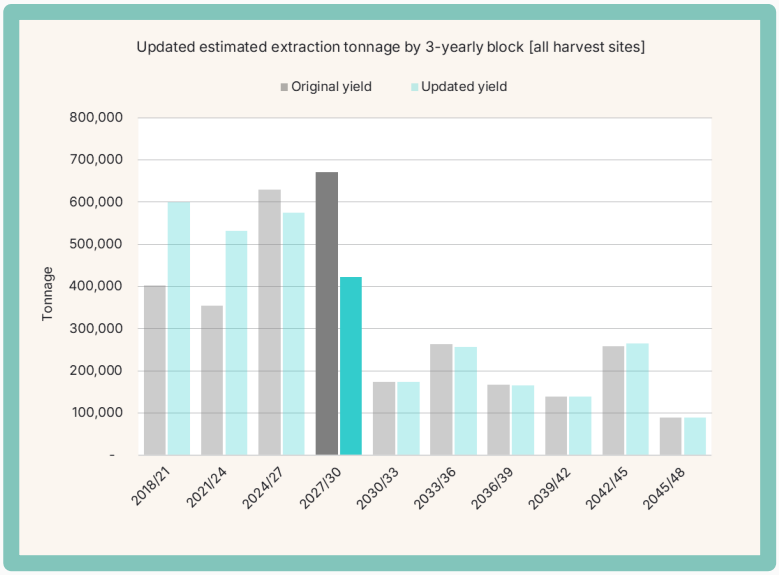


Figure 42 | Tonnage extraction profile for MDC

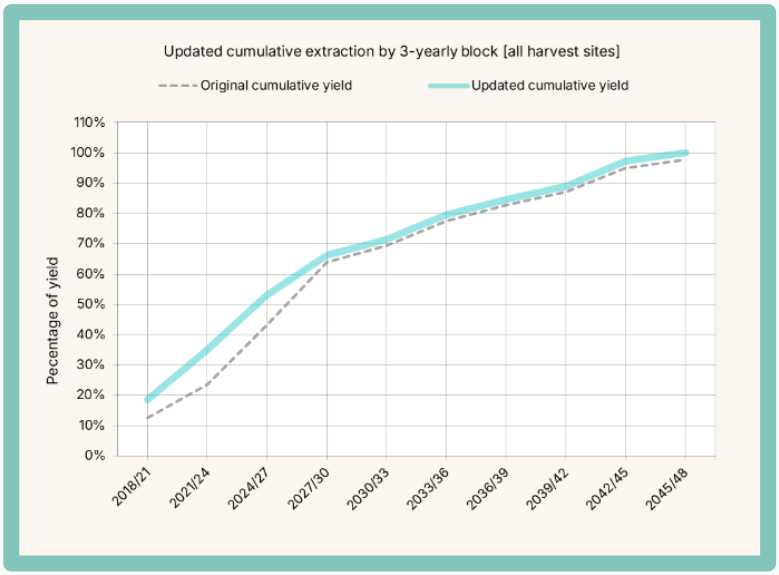
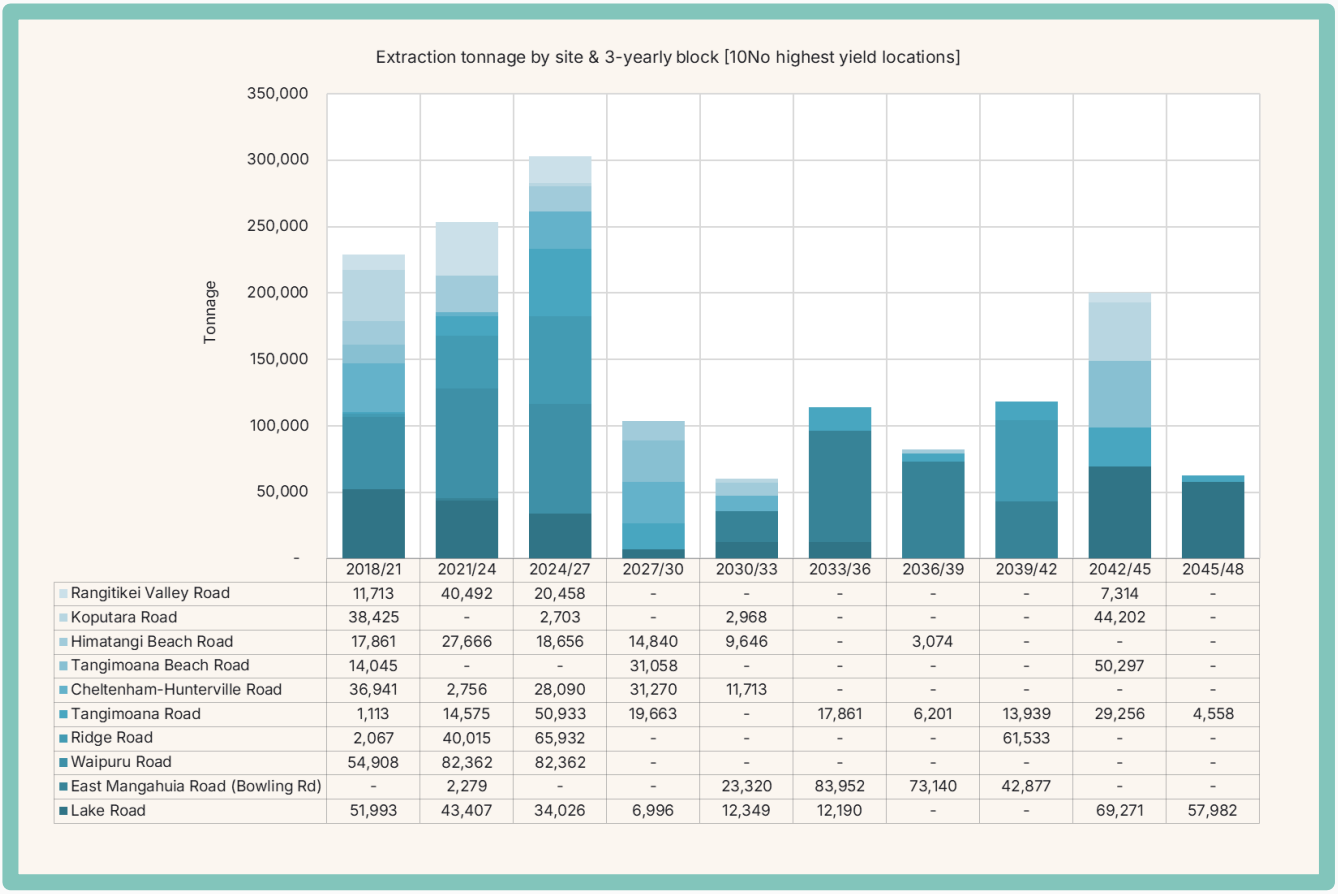


Figure 43 | Cumulative tonnage extraction for MDC

Figure 44 on the following page shows the top 10 harvest sites by yield, amounting to 48% of overall tonnage predicted for extraction within our district up to 2048.



	2018/21	2021/24	2024/27	2027/30	2030/33	2033/36	2036/39	2039/42	2042/45	2045/48
Rangitikei Valley Road	11,713	40,492	20,458	-	-	-	-	-	7,314	-
Koputara Road	38,425	-	2,703	-	2,968	-	-	-	44,202	-
Himatangi Beach Road	17,861	27,666	18,656	14,840	9,646	-	3,074	-	-	-
Tangimoana Beach Road	14,045	-	-	31,058	-	-	-	-	50,297	-
Cheltenham-Hunterville Road	36,941	2,756	28,090	31,270	11,713	-	-	-	-	-
Tangimoana Road	1,113	14,575	50,933	19,663	-	17,861	6,201	13,939	29,256	4,558
Ridge Road	2,067	40,015	65,932	-	-	-	-	61,533	-	-
Waipuru Road	54,908	82,362	82,362	-	-	-	-	-	-	-
East Mangahuia Road (Bowling Rd)	-	2,279	-	-	23,320	83,952	73,140	42,877	-	-
Lake Road	51,993	43,407	34,026	6,996	12,349	12,190	-	-	69,271	57,982

Figure 44 | Extraction tonnage by site and period

Harvest sites have routes associated with the movement of product between Manawatū and the rest of the country. Council has anticipated harvest timeframes, access points, and haul routes from the '*Moore & Associates*' report. Potential (locally operated and maintained) haul roads for sites expected to generate over 20,000 tonnes between 2027 and 2030 are listed below:

Yield Site / Road	Tonnage	Potential haul roads
Tangimoana	50,721	Tangimoana Beach Road Tangimoana Road Rosina Road
Pohangina Road	47,329	Pohangina Road
Finnis / Pollock Road	32,648	Creamery Road Finnis Road Taonui Road Colyton Road
Junction Road	24,327	Makino Road Lethbridge Street Church Street Aorangi Street

Figure 45 | Potential local network haul roads for anticipated harvest sites 2027-30

Demographics and other impacts

Assessing demand to inform future investment decisions carries some inherent risk due to the significant assumptions that need to be made.

Scenario testing assumptions and the alternative outcomes are listed below, together with their relative risk to planned future investment.

Assumption	Alternative	Impact	Likelihood	Risk
Population of the district will increase from 35,140 residents in 2027 to 46,675 in 2057	Population will increase more rapidly than forecasted	Moderate (2)	Possible (3)	Guarded (6)
	Population will increase more slowly than forecasted	Minor (1)	Possible (3)	Guarded (3)
Population distribution across the district will occur forecasted	Population will differ substantially from forecasted distribution	Moderate (2)	Possible (3)	Guarded (6)
Household numbers will increase from 13,596 in 2027 to 18,415 by 2057	Number of households will increase faster than forecasted	Major (4)	Possible (3)	Moderate (12)
	Number of households will increase slower than forecasted	Minor (1)	Possible (3)	Guarded (3)
The proportion of residents aged 60 and over will increase from 27% in 2027 to 32% by 2057	The number of residents aged 60+ years will be significantly more than forecasted	Moderate (2)	Unlikely (2)	Guarded (4)
	The number of residents aged 60+ years will be significantly less than forecasted	Minor (1)	Unlikely (2)	Low (2)
The demographics of the district will follow the Infometrics high growth scenario over 2027 to 2057	The demographics of the district will differ significantly from the Info metrics medium growth scenario	Minor (1)	Possible (3)	Guarded (3)
Current land use will not change significantly over the next 3 years. However, significant land use changes are expected between 2034 and 2054	Current land use in the district will change more rapidly, or in different locations than anticipated	Moderate (2)	Likely (4)	Moderate (8)
	Current land use in the district will develop slower than anticipated	Minor (1)	Unlikely (2)	Low (2)
Intensity and frequency of extreme weather events will increase because of climate change	Extreme weather events are more intense and frequent	Severe (8)	Likely (4)	Extreme (32)
	Extreme weather events are less intense and frequent	Minor (1)	Unlikely (2)	Low (2)
MDC is prepared to respond to emergency events over the life of the 10-year plan; however, a catastrophic event will exceed council's provisions to respond	An emergency event occurs that exceeds councils' financial ability to respond	Worst Case (16)	Possible (3)	Extreme (48)
Council will receive 51% of the cost of roading maintenance and renewal projects from NZTA each financial year from 2027	The total level of NZTA funding for maintenance and renewal of roads is reduced	Severe (8)	Unlikely (2)	High (16)
Council will receive funding from NZTA for the maintenance and renewal of roads	Maintenance and renewal projects will not secure NZTA funding	Severe (8)	Unlikely (2)	High (16)
	There are delays in finalising NZTA funding, impacting delivery of projects	Major (4)	Possible (3)	Moderate (12)

Figure 46 | Demand forecasting

2.12.4 Summary

The main challenges facing our roading network are not just related to traffic growth, since there is spare capacity to cater for additional traffic flows at present. The challenges relate more to:

- A legacy transportation network not envisaged to accommodate the demands of heavy traffic
- The impact of exotic forestry harvesting on remote rural roads
- Long-term funding from NZTA for the current budgeted proportion of maintenance and renewal costs
- Network Frameworks introduced by NZTA have resulted in changes to Levels of Service
- Development of an enduring bridge renewal programme
- Limited Emergency Funding from NZTA

Demand for new or upgraded facilities arises from the needs of the existing population i.e., meeting the Level of Service standards, changing habits, and population growth. This may cause demand for:

- New roads
- Sealing of unsealed roads
- Widening and alignment improvements
- Upgraded intersections
- New and upgraded bridges
- Appropriate urban facilities in closely settled areas, e.g., streetlights, kerb and channel, footpaths

Council intends to maintain its awareness of these issues and plans to provide a roading network which meets our communities expectations.

2.13 Network problems

2.13.1 Investment logic mapping

Utilising the NZTA recommended Investment Logic Map (ILM) framework, the following problems were discussed and agreed by Council in 2023 as part of the previous AMP:

- Legacy network
- Resilience
- Safety

A review of these issues was sought from Council in 2026, testing the relevance and balance of effort for continued focus into this AMP. Based on these discussions, the aforementioned problems remain the primary concern of Council and at the same balance of effort.

The problem statements and objectives have been updated to reflect changes in the frameworks and strategies that land transport activities are now conducted.

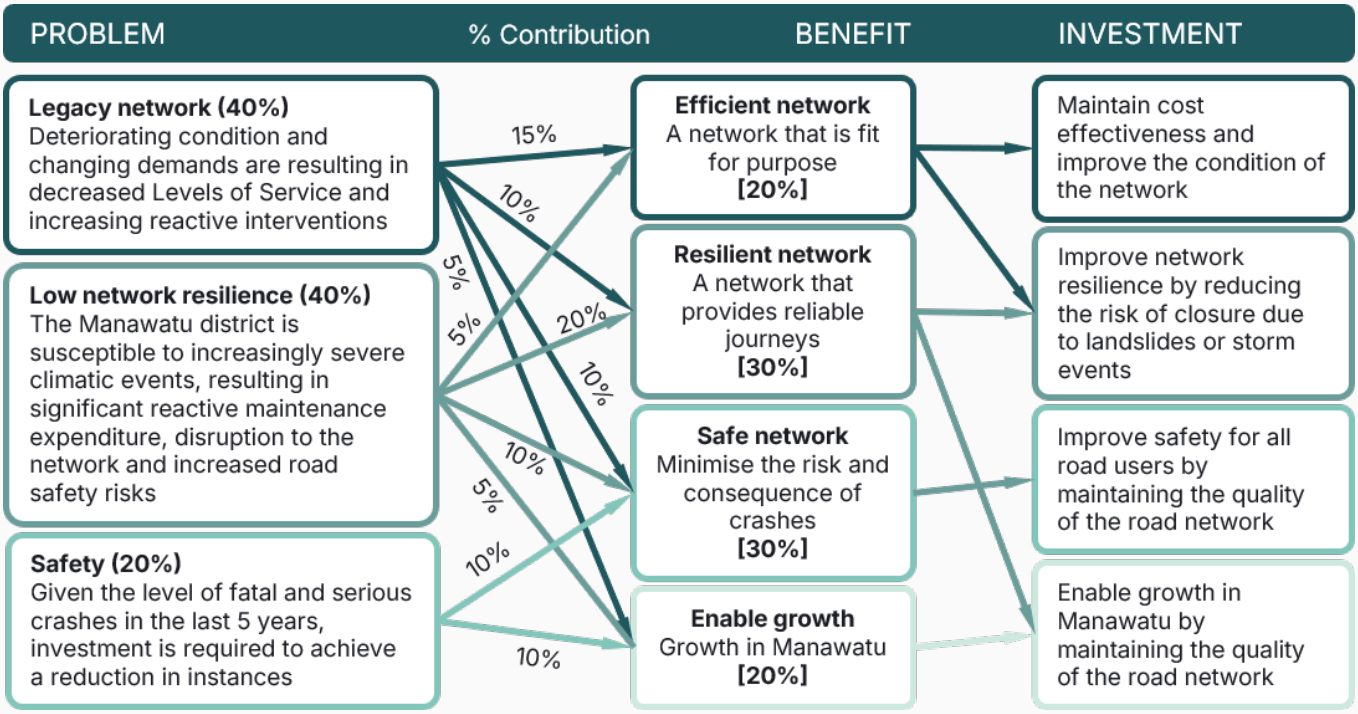


Figure 47 | Investment Logic Map

2.13.2 Key performance indicators and measures

Throughout all stages of the transport planning and project delivery process, it is essential to consider how performance will be measured. In particular, under the business case approach, early identification of measures for the expected benefits is a key step in planning an investment.

The benefits and their Key Performance Indicators (KPIs) have been identified in **Figure 48** on the following page to demonstrate how the outcomes from strategic response(s) to the problems are to be assessed.

Benefit	KPI		Description of successful outcome	Baseline	Target
Efficient Network		Maintenance cost	Cost per lane kilometre remains at or below the median within our 'rural districts' peer group	@ median (2025)	@ median (2029)
		Road condition	Residents are satisfied with the condition of local roads	69% (2026)	-0%, +5% (2029)
Resilient Network		Emergency work	Maintain or reduce expenditure relating to emergency work, as a proportion of overall expenditure over 3 years	27% (2024-2027)	-5%, +0% (2028-2030)
		Network access	The network remains available to traffic (excluding planned closures)	-	≥98% of length (2027-2030)
Safe Network		Crashes	The number of serious & fatal injuries on the local road network trends downward over 5 years	21 per annum (2021 to 2025)	-10%, +0% (2026 to 2030)
Growth Enablement		Freight	Key freight routes maintained to ONF Levels of Service	-	≥90% of length (2030)

Figure 48 | Identified KPIs and outcome objectives

For each asset class/group detailed in sections **2.14.2** to **2.14.9**, a programme option assessment is undertaken, measuring the impact against achieving the above KPIs:

KPI indicator [11]	Programme option	Likely implications	
	**Do Nothing** Doing nothing will result in rapid deterioration of the network. It is also highly inconsistent with customer expectations and statutory obligations.	Infrastructure quality	Rapid degradation
		Level of Service	Rapid degradation
		Cost	Very high cost (future)
		Value for Money	*Not applicable*
	**Reactive** This option limits activity to fixing the most urgent issues only in a reactive manner.	Infrastructure quality	Gradual degradation
		Level of Service	Gradual degradation
		Cost	High variance
		Value for Money	Moderate
	**Evidenced / Optimised** This option takes on board the current status of the asset, and prioritises activities to close performance gaps whilst maintaining everything else.	Infrastructure quality	Gradual improvement
		Level of Service	Gradual improvement
		Cost	Low variance
		Value for Money	High
	**Proactive** This option fixes and improves everything as soon as it triggers the need; the sooner the better.	Infrastructure quality	Rapid improvement
		Level of Service	Gradual improvement
		Cost	High cost (immediate)
		Value for Money	Very low

[11] *The indicators listed above are high-level in nature, and the projected outcomes may vary at the individual activity/project level*

2.13.3 Problem 1 | Legacy network

Deteriorating condition and changing demands on our roads are resulting in decreased Levels of Service and increasing reactive interventions.

Investment benefits

Our road network connects business with customers, suppliers and the workforce, helps people access places of employment and education, and helps move goods from points of production to local, national, and international markets.

There is no single indicator of how roads contribute to economic and social outcomes, however Council considers that the local road network delivers on the priorities defined in the GPS. In addition, this investment will align with achieving the mobility and accessibility Level of Service criteria.

Consequences of misaligned investment

If the investment levels are misaligned, the result would be a more patched and rougher network with increased potholes, rutting, and neglected or improperly performed maintenance, leading to eventual failure from both environmental and vehicle use impacts.

Ongoing road maintenance and renewals are essential in order to preserve our road assets, protect user safety, and provide reliable travel.

Problem	Status	Our response	Why / how	Where we need to focus
Legacy network	Underlying pavement life expiry (increased roughness and rutting), impacting safety, amenity and mobility. Suitability of pavement widths mismatching with expectations from increased usage. % of excessive seal layers, leading to unstable surfaces. Forestry harvest schedules remain at peak activity until 2030.	Increased road rehabilitations	**Improve journey comfort and pavement life by:** Reducing rutting and roughness to strategic road corridors relating to highest volumes of traffic, and key economic/freight routes.	Pavement maintenance Pavement renewals Road resurfacing Structure renewals Drainage maintenance Drainage renewals
		Targeted road resurfacing	**Reduce road surface defects by:** Maintaining waterproofing of underlying pavements.	
		Bridge management	**Maintain network accessibility by:** Keeping bridge and large culvert assets functional.	
		Improved drainage	**Reduce asset damage and travel disruption by:** Mitigating flooding and capacity issues.	

Figure 49 | Strategic response, legacy network

2.13.4 Problem 2 | Low network resilience

The Manawatū District is susceptible to increasingly severe climatic events resulting in significant reactive expenditure, disruption to the network, and increased road safety risks.

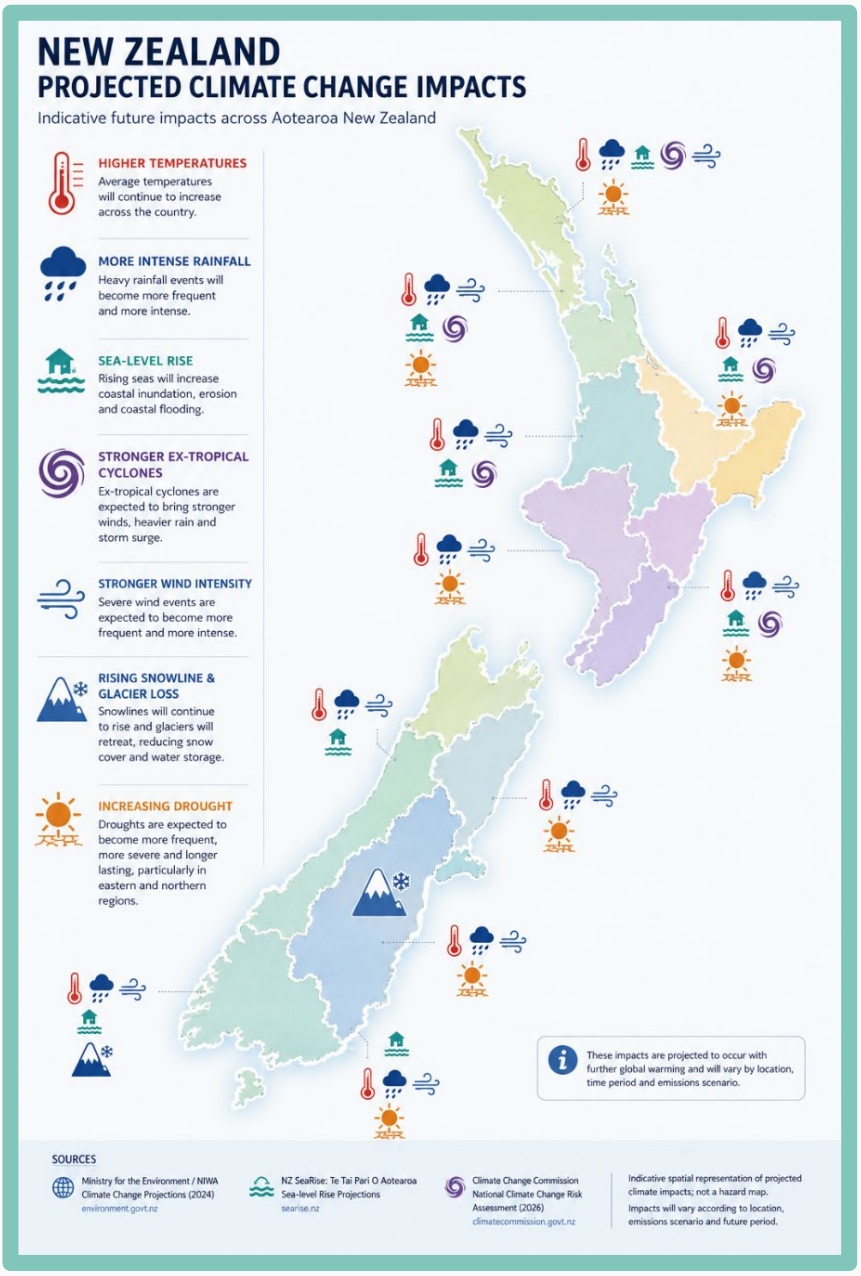


Figure 50 | Climatic impact map of NZ

The primary climatic events for our district to mitigate are:

- increased volume and intensity of precipitation,
- stronger winds,
- increasing temperature highs, and
- more frequent dry soil/land conditions

Impacts

During increasingly frequent storm events in recent years, intense rainfall across the district has caused several rivers to breach their banks and profoundly alter their watercourses.

Both prolonged dry and wet periods have created ground conditions that have become more susceptible to landslips, impacting across and under our road corridors.

Weak ground conditions, in combination with high winds, have also resulted in significant power and travel disruption from tree fall.

These dynamic responses due to the severe weather have resulted in significant damage, highlighted the limitations of our network, and our ability to manage impacts across our:

- bridges,
- roadside drainage,
- culverts, and
- road corridors

$9.8m in the last three years has been required to fund unplanned emergency works in our district.

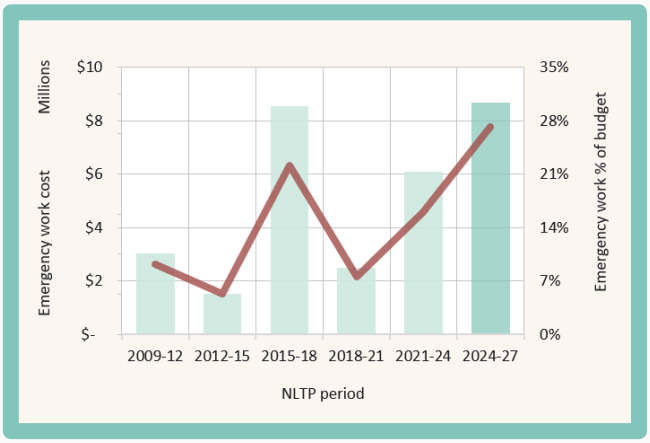


Figure 51 | Emergency work expenditure, previous and current NLTP periods

The line in the chart above indicates the rapid increase in the proportion of unplanned emergency work expenditure, currently peaking at 27% at the end of the 2025/26 year.

Key observation

Outstanding expenditure for the final year of the current NLTP will result in the **proportion of expenditure remaining at 27%**.



Figure 52 | Accessibility impacts during adverse weather events

Investment benefits

Roads and bridges across the Manawatū connect our communities and businesses to the local, national, and international economy. Addressing the identified issues on the network will deliver on the KPIs defined earlier.

Consequence of misaligned investment

Landslips on the network continue to occur and are becoming increasingly debilitating, with communities residing on the more vulnerable roads unable to rely on convenient alternative routes.

With climatic events becoming more frequent, there is increased likelihood of disruption to key routes, particularly with limited alternatives.

The consequence of this is an inconvenience to customers and associated detrimental effect on the economy. These consequences will attract increased complaints from businesses and the community.

Key observation

Investment in activities to mitigate or prevent impacts from climatic events is essential in order to protect accessibility, travel reliability, road user safety, and reduce future costs.

Problem	Status	Our response	Why / how	Where we need to focus
Low network resilience	Excessive slips due to repeated severe weather events, causing route disruption and high maintenance costs. Flooding of roads and tree fall causing power and travel disruption, and public safety. Loss of assets due to weather event damage.	Improving resilience Managing the road corridor environment	**Reduce disruption and emergency / response costs by:** Mitigating and reducing rock falls and slips onto and underneath our roads. Reducing road closures and power outages by managing trees on or near our road network.	Structures maintenance Environmental maintenance Drainage maintenance Drainage renewals
		Improving drainage and waterway capacity	**Reduce disruption and emergency / response costs by:** Protecting our roads and bridges from the effects of scour and debris accumulation. Improving roadside drainage channels and culverts to maximise flow.	

Figure 53 | Strategic response summary, low network resilience

2.13.5 Problem 3 | Safety

Given the trend of crash events on our local roads over the last 10 years, investment is required to realise the Government's strategic priority to reduce fatal and serious injuries on our transport network.

Crash measures

There are two primary measures used across New Zealand when assessing the risk of a particular road network:

Collective risk | A measure of the total number of fatal and serious injury crashes per kilometer of road, highlighting areas with a high number of such incidents, identifying where safety improvements can be most effective.

And:

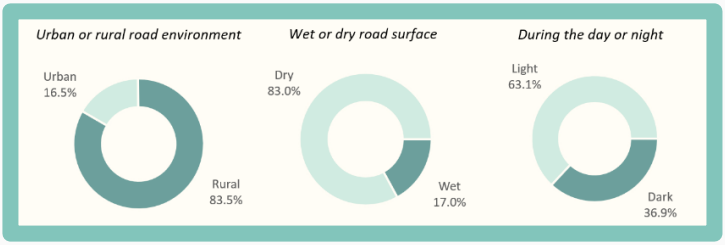
Personal risk | A measure of the likelihood of an individual being involved in a fatal or serious road crash, calculated based on the number of fatal and serious crashes relative to the distance vehicles have travelled.

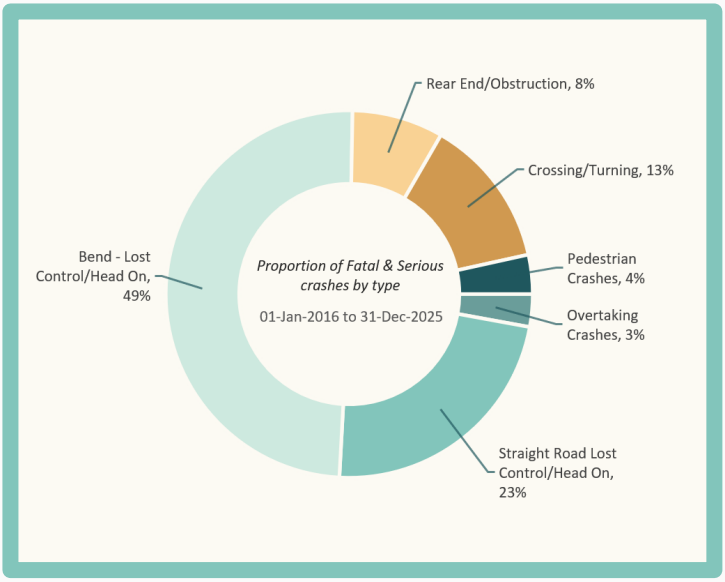


Figure 54 | Collective and personal crash risk trend

It can be seen that, in general, the risk for fatal and serious crashes on the local road network has remained consistently high over the last 10 years.

Crash factors





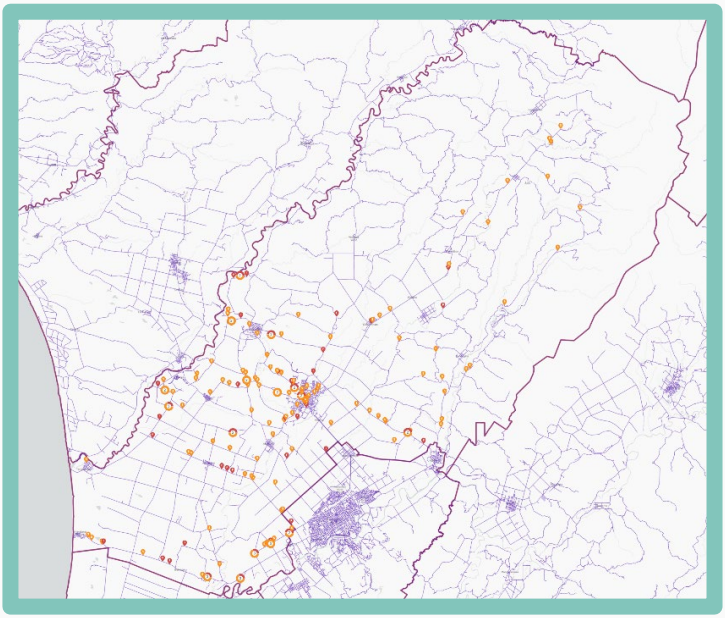


Figure 55 | Fatal and serious crashes by environment, type, and location over the last 10 years

The most common crashes experienced on the local road network are:

- on rural roads, and
- due to losing control on a bend or on a straight [12]

Key observation

Three quarters of fatal and serious crashes are due to loss of control. A significant number of crashes also occur during the hours of darkness.

Causal factors

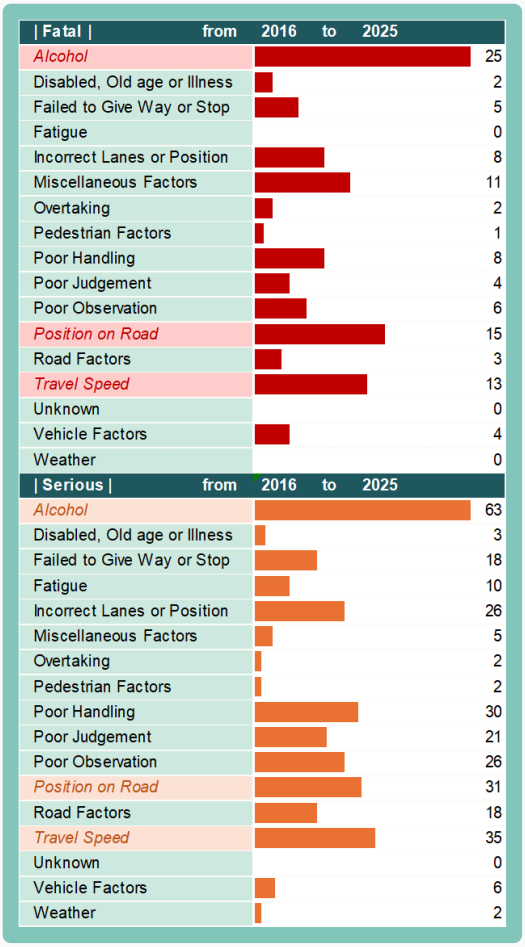


Figure 56 | Causal factors in fatal and serious injury crashes over the last 10 years

[12] *The vast majority of these crashes are single vehicle 'loss of control', rather than 'head-on' collisions*

61% of fatal crashes and **47%** of serious crashes have been reported with driving under the influence of alcohol (or drugs) as a causal factor.

Position on road and **travel speed** are the second and third most common factors noted by crash investigators, attributed to a third of fatal and serious crashes.

Crash and injury trend

	Injuries			Crashes		
Year	Fatal	Serious	5-yr total	Fatal	Serious	5-yr total
2016/17	3	10		3	10	
2017/18	6	21		5	15	
2018/19	3	15	93	3	14	81
2019/20	1	18		1	17	
2020/21	2	14		2	11	
2021/22	7	16		7	14	
2022/23	5	20		5	14	
2023/24	3	15	105	3	13	93
2024/25	4	15		4	13	
2025/26	2	18		2	18	
		Difference	+ 12		Difference	+ 12

Figure 57 | Recorded fatal and serious injuries and crashes by year, aggregated into five year periods.

There has been an increase of crashes and injuries between the previous and latest five year periods.

This reinforces the need to focus on the district's open road environment to realise the most effective crash mitigation interventions.

Investment benefits

Investment in the network will improve safety for users of our road network, reducing severe or fatal crashes.

This will reflect in reduced social harm and economic cost to our communities, and realise benefits in line with local, regional, and national strategic goals.

Consequence of misaligned investment

Limiting safety mitigation activities will fail to reduce the frequency of crashes, potentially leading to increased death and disability, and culminate continued significant social harm.

Problem	Status	Our response	Why / how	What we need to focus on
Safety	Frequency of fatal and serious crashes, resulting in social harm and economic cost to the district and region.	Increased road rehabilitations	**Reduce crash frequency by:** Reducing rutting and roughness	Pavement maintenance Pavement renewals Road resurfacing Structure renewals Drainage maintenance Drainage renewals Low cost, low risk
		Targeted road resurfacing	**Mitigate crash frequency by:** Maintaining skid resistance and texture depth of our road surfaces	
		Improved network services	**Reduce crash severity and frequency by:** Increasing warning signage, roadside barriers, roadmarkings, and other safety systems	
		Improved drainage	**Mitigate crash frequency by:** Managing surface flooding to reduce asset damage	

Figure 58 | Strategic response summary, safety

2.14 Network status and evidence

Effective asset management requires a consistent, shared view of asset classes (e.g. pavements, bridges, drainage, signs), enabling whole-of-life visibility and better investment decisions across the sector.

2.14.1 Network data

High-quality data is fundamental to the effective management of Manawatū's land transport network, particularly in understanding our assets, their current state, and how they have – and will – likely perform over time.

Reliable condition data and performance trends underpin forward works programming, renewals planning, and service level optimisation - allowing practitioners to identify deterioration patterns, prioritise interventions, and target funding where it delivers the greatest value. It also supports benchmarking, forecasting, and system-wide analysis of risks and resilience, including responses to climate and network disruptions.

Accurate, and comprehensive condition data enables transparency, accountability, and the ability to make evidence-based decisions that optimise lifecycle cost, performance, and deliver the desired outcomes.

Data confidence

It is important to note that the underpinning data, used and maintained in available databases, can include degrees of error or uncertainty. This is mostly due to the origin of some data from less robust, often historic data sources. To understand the level of confidence that can be placed on the data used to inform this assessment, nationally consistent data confidence measures have been used.

Data quality

Transport Insights collates and calculates our asset data quality, summarising performance on an annual basis.

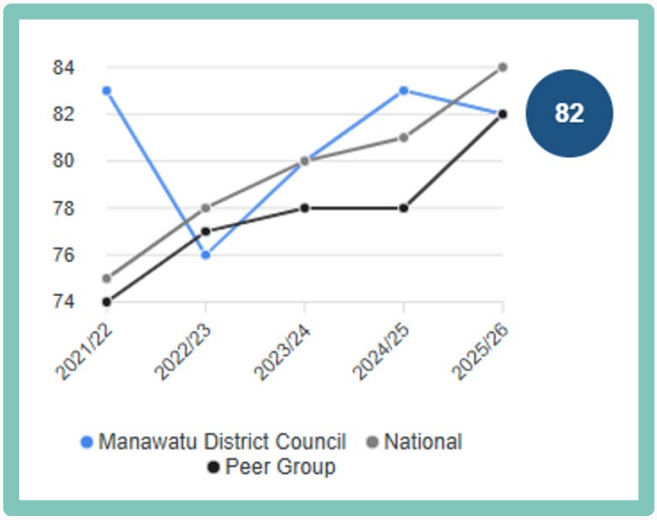


Figure 59 | Data quality score trend

The latest output shows that our data can be used with a moderately high degree of confidence. Further information about data quality measurements can be found on the Transport Insights portal.

An extract of selected metrics from the latest assessment can be seen on the following page (bearing in mind that this information is updated on a regular basis):

Selected data quality measures

Extract from the Transport Insights data quality dashboard for 2025-26, detailing **high importance** metrics measuring the dimensions of **accuracy** and **completeness**:

Category	Ref	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend	This year Last year
Network: **Carriageway**	CWAY7	Sealed/unsealed network correctly defined	**Accuracy**	High	AMENITY, COST EFFICIENCY, SAFETY	✔	98.6	–	95 96 98 100
Network: **Carriageway**	CWAY9a	ONF General Traffic classes are assigned	**Completeness**	High	AMENITY, COST EFFICIENCY, SAFETY		100.0	–	95 96 98 100
Network: **Carriageway**	CWAY9b	ONF Freight classes are assigned	**Completeness**	High	AMENITY, COST EFFICIENCY, SAFETY		98.9	–	95 96 98 100
Network: **Treatment Length**	TREAT1	Treatment Length dimensions match sealed area	**Accuracy**	High	AMENITY		95.9	–	90 95 100
Network: **Treatment Length**	TREAT3	Treatment Lengths match major surfaces	**Accuracy**	High	AMENITY	✔	87.7	–	85 90 95 100
Asset Inventory: **Pavement & Surfacing**	PAVE2	Pavement layer records have valid attribute data	**Accuracy**	High			100.0	–	70 80 90 100
Asset Inventory: **Pavement & Surfacing**	SURF2	Surface records have valid attribute data	**Accuracy**	High			98.6	–	90 95 100
Asset Inventory: **Pavement & Surfacing**	SURF3	Surface records correctly located	**Accuracy**	High		✔	89.9	ℹ	80 85 90 95 100
Asset Inventory: **Pavement & Surfacing**	SURF4	Surface records with Original Cost and Work Category	**Completeness**	High		✔	100.0	ℹ	85 90 95 100
Maintenance Activity: **Maintenance Activity**	MAINT4	Correctly located pavement, surface, shoulder and drainage maintenance activity	**Accuracy**	High	COST EFFICIENCY	✔	100.0	ℹ	50 60 80 100
Maintenance Activity: **Maintenance Activity**	MAINT6	Level of pavement, surfacing, shoulder and drainage maintenance activity known	**Completeness**	High	COST EFFICIENCY		100.0	ℹ	95 96 98 100
Demand/Use: **Traffic Count**	COUNT1	Well targeted traffic count programme	**Completeness**	High	AMENITY, COST EFFICIENCY	✔	72.5	ℹ	30 40 60 75
Demand/Use: **Traffic Count**	COUNT3	Traffic loading understood	**Completeness**	High	AMENITY, COST EFFICIENCY	✔	71.9	ℹ	15 20 40 60 75
Demand/Use: **Traffic Estimates**	ESTIM1	Network has traffic estimates	**Completeness**	High	AMENITY, COST EFFICIENCY	✔	96.4	–	95 96 98 100
Demand/Use: **Traffic Estimates**	ESTIM4	Considered traffic loading	**Completeness**	High	AMENITY, COST EFFICIENCY	✔	99.9	–	95 96 98 100
Demand/Use: **Traffic Estimates**	ESTIM5	Latest estimates align with counts	**Accuracy**	High	AMENITY, COST EFFICIENCY		99.2	ℹ	80 85 90 95 100

Figure 60 | Extract from Transport Insights data quality dashboard (July 2026 upload)

2.14.2 Sealed road pavements

Sealed road pavements serve several essential functions in transportation infrastructure. They are designed to provide durable structures that support a wide variety of traffic types, enabling economic prosperity, accessibility, and comfortable travel across a wide range of environments.

Key functions

Load distribution | Pavements distribute the weight of vehicles evenly to the underlying soil, preventing damage and maintaining integrity

Amenity and mobility | Pavements provide a smooth, stable surface for vehicles, facilitating efficient movement

Safety | Smooth and adequately wide pavements reduce the risk of accidents, contributing to overall road safety

Pavements

Road pavements are typically constructed from multiple layers, comprising a surface course, basecourse, sub-base, and subgrade (compacted natural formation), which is situated upon undisturbed natural ground.

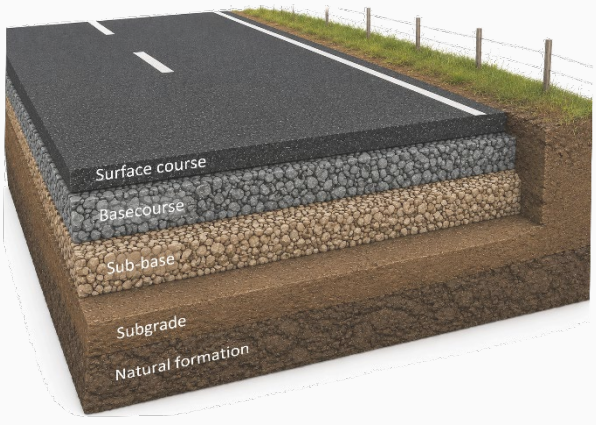


Figure 61 | Typical pavement construction

Pavement condition

Pavement condition is assessed by combining differing pavement defects that have been measured during network inspections, and calculating a Pavement Integrity Index (PII) score out of 100. The higher the score, the fewer the number, or severity, of defects found.



Figure 62 | Network Pavement Integrity Index (PII) trend

Key observation

A step change in pavement condition has been recorded between 2021/22 and 2022/23, subsequently stabilising to date.

This drop in performance is likely due to the accelerated consumption and defect propagation to road pavement assets subjected to increasing vehicular activity, including forestry.

Sealed road pavement defects and management activities

Defects present themselves throughout the life of sealed pavement structures due to usage and the environment. These defects tend to increase in severity over time, impacting on the comfort, travel time reliability, and safety of our road users.

Common defects and consequences are detailed below, along with maintenance, renewal, or improvement options/actions.

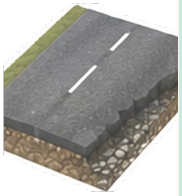
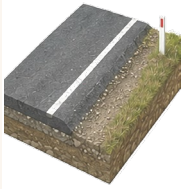
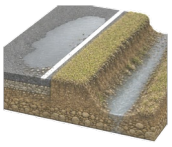
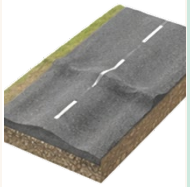
Defect	Indicates	Risk of	Service impact	Costs	Maintain	Renew	Improve
Potholes 	Water ingress, Reduced pavement strength (localised)	Forced vehicle deviation	Reduced journey comfort	Injury, Vehicle damage, Reduced pavement life	Temporary fill, Patch repair	-	-
Edgebreak 	Overstress, Insufficient geometry for demand / use	Forced vehicle deviation	Reduced road width	Injury, Increased travel time	Reinstate	-	Seal widen
Low Shoulder 	Insufficient shoulder strength, Shoulder erosion	Forced vehicle deviation	-	Injury, Increased travel time	Reinstate	-	Seal widen
High lip 	Soil/grass build up to edge of carriageway	Ponding, Aquaplaning	Increased travel time	Injury, Loss of pavement life	High lip removal, reprofile shoulder	-	-
Roughness 	Insufficient layer depths, Failing sub-base	Forced vehicle deviation	Reduced journey comfort	Injury, Increased fuel usage	Patch repair (localised instances)	Rehabilitate	-
Ruts/shoves 	Insufficient pavement strength, Failing sub-base	Forced vehicle deviation, Aquaplaning	Reduced journey comfort	Injury	Patch repair (localised instances)	Rehabilitate	-

Figure 63 | Sealed road pavement defects and management activities

Potholes

A pothole is where an isolated hole in the road surface has developed, exposing the underlying pavement to unwanted water infiltration.

An important measure of the performance of sealed road pavements is the receipt - and response to - customer reports of potholes.

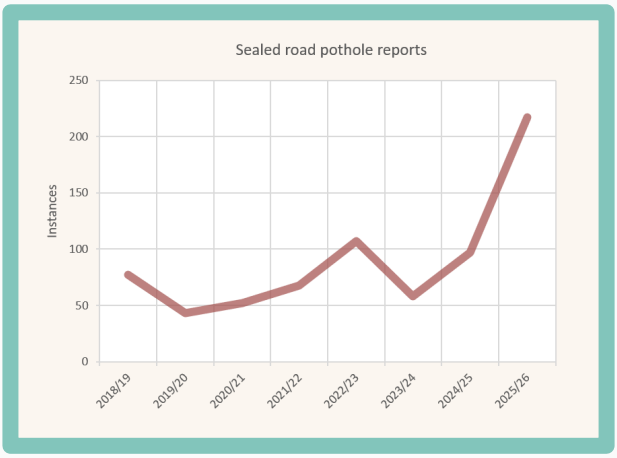


Figure 64 | Trend of pothole defects reported by customers

We have set the following differential Levels of Service when responding to pothole reports within the sealed road network:

ONF GT classification	Response time
GT1 to GT4	1 day
GT5 to GT6	2 days
GT7 to GT8	3 days

Figure 65 | Pothole response LoS

Key observation

Reports show a significant upward trend, indicating that pavements are experiencing increased stress, waterproofing loss and failure. This is leading to negative impacts on safety, journey comfort, and the risk of vehicle damage.

There is some variability in timely response observed, ranging from 63% to 86% across the latest full financial year.

Overall, 76% of potholes are attended to within the Level of Service.

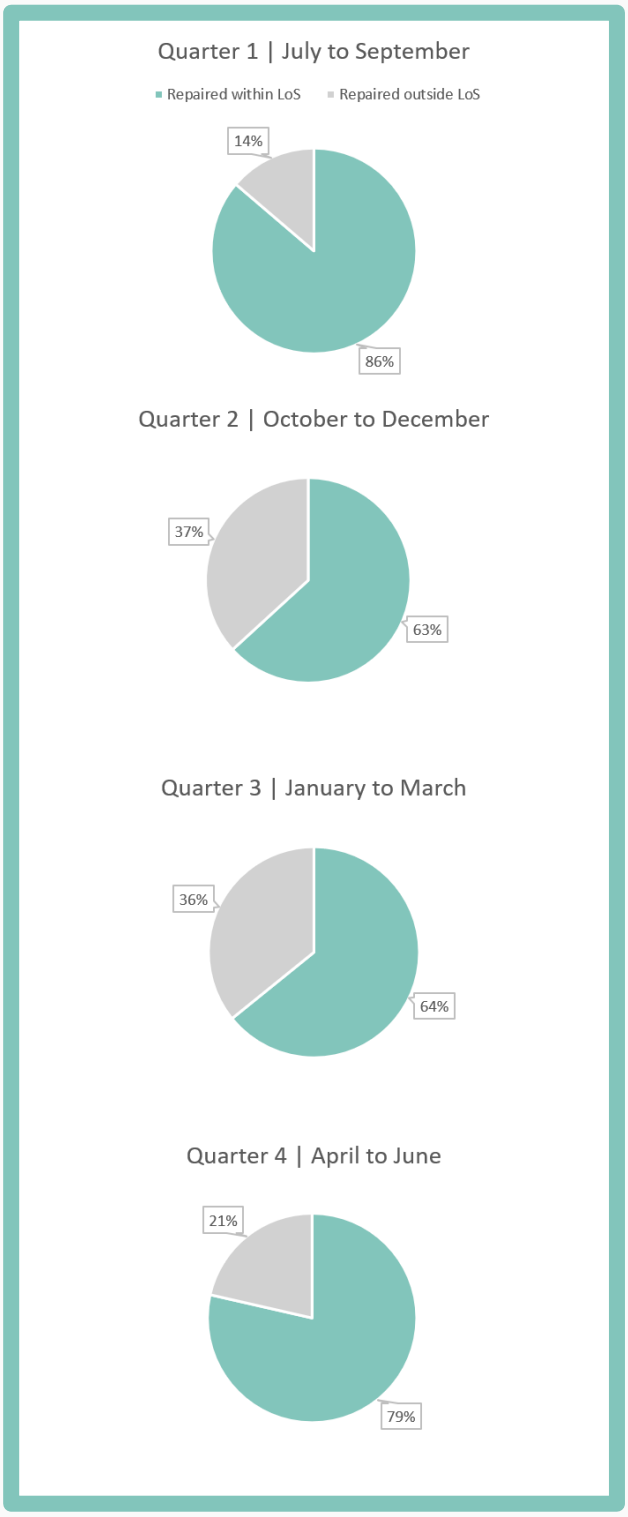


Figure 66 | Pothole response performance

Smooth travel exposure

Smooth travel exposure (STE) provides an indication of ride quality experienced by road users. It calculates the percentage of road length with acceptable roughness, and is weighted by traffic volume. The acceptable level of comfort varies based on General Traffic and/or Freight volumes within each ONF category.

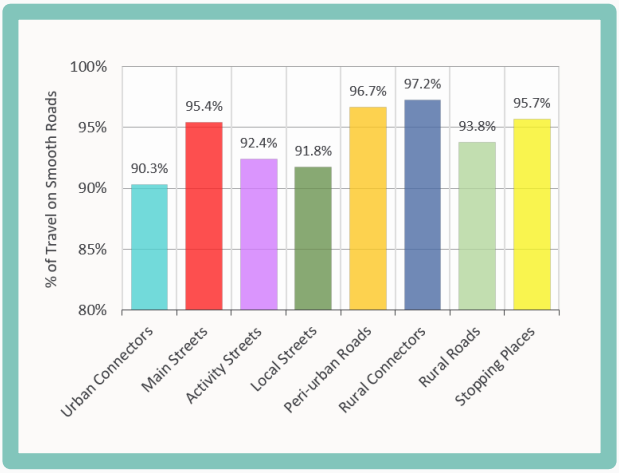


Figure 67 | Current STE measurement by ONF

Smooth travel exposure trend

Smooth travel on each classification of road is reducing slightly year-on-year across most road classifications. In other words, the roads are becoming less comfortable to drive on over time.

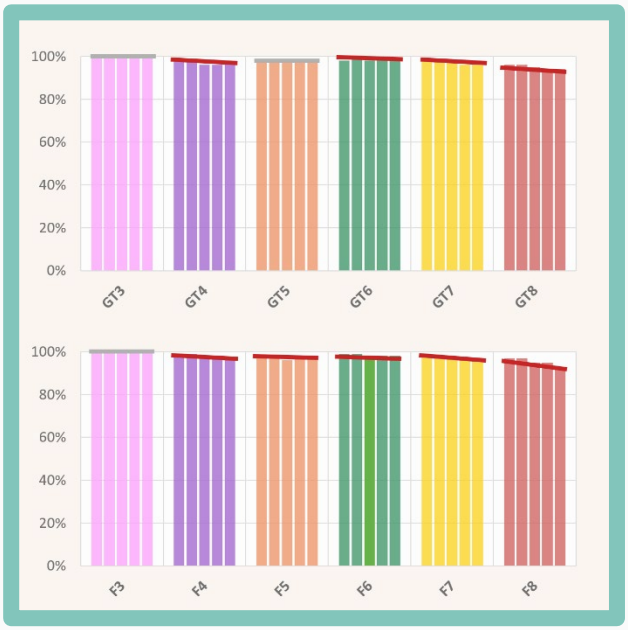


Figure 68 | Trend of travel smoother than threshold by GT and Freight classifications

Roughness

Whilst smoothness provides an indication of travel comfort, the consistency (or distribution) of roughness is also a useful measure. To gain understanding of this, the distribution and 85th percentile of roughness is measured and plotted:

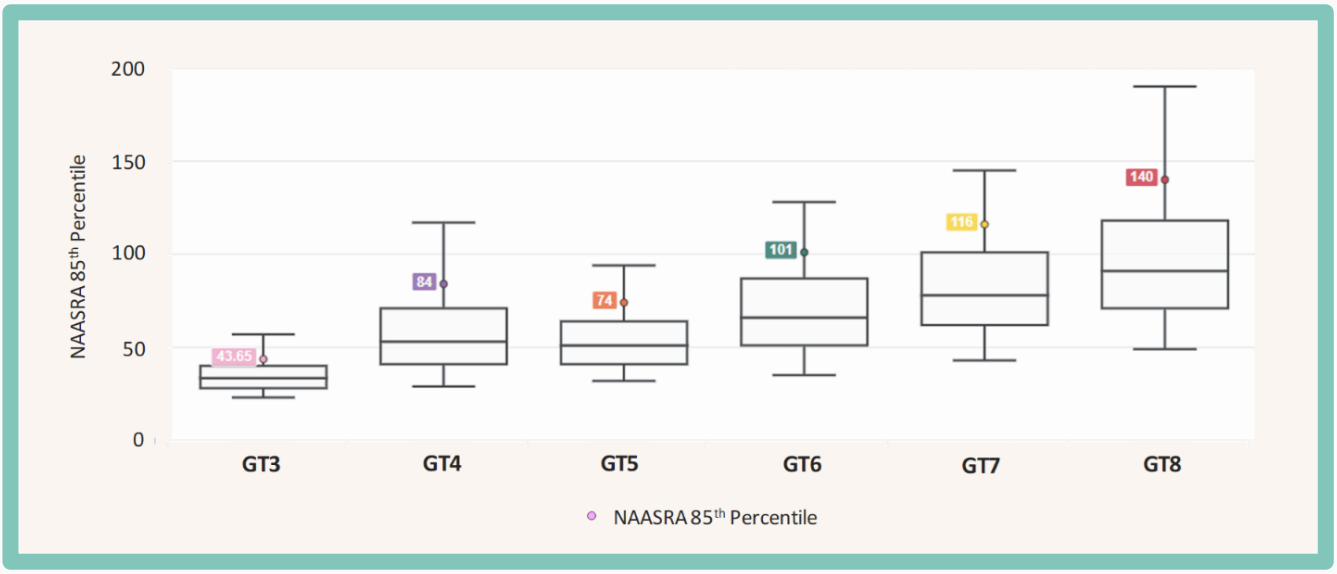


Figure 69 | Roughness distribution across GT classifications

Peak roughness trend

Peak roughness is increasing slightly year-on-year to the highest and lowest classification roads. In other words, the roads are becoming less comfortable to drive on over time.

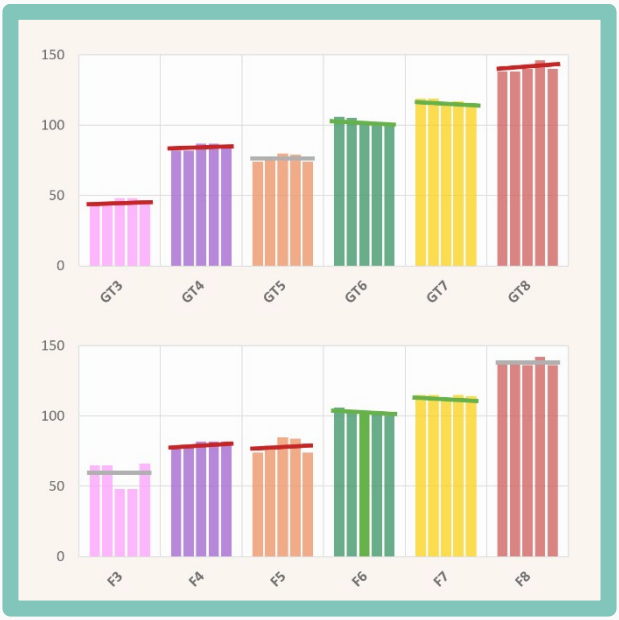


Figure 70 | 85th percentile trend roughness of roads by GT and Freight classifications

Key observation

Roads managing the greatest (and the least) amount of traffic have increased in roughness in the last five years.

Notwithstanding that the network retains a high standard of ride quality, this deterioration has exacerbated the customer's perception of roads that are performing more poorly than in the past.

Thresholds

The severity of roughness can trigger the need to renew a road pavement rather than continue to maintain it.

The roughness threshold varies depending on the road classification, with lesser tolerances set as roads carry greater volumes of traffic. Investigation commences once roughness counts exceed the following thresholds by 5%:

	Roughness (NAASRA)	
ONF GT /F classification	Urban	Rural
GT3 / F3	130	115
GT4 / F4	160	120
GT5 / F5	180	130
GT6 / F6	200	150
GT7 / F7	230	160
GT8 / F8	235	180

Figure 71 | Roughness thresholds by GT classification

Rutting

A separate issue to roughness (or ride quality) is that of rutting, where permanent deformations occur due to weakened pavement layers that are no longer able to resist the loads generated by vehicles.

Our sealed road network is currently experiencing the following quantities of rutting above the 10mm threshold:

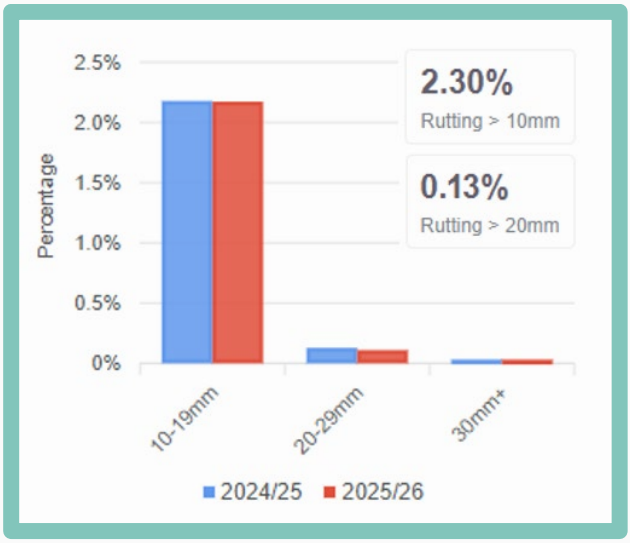


Figure 72 | Network rutting severity

Note: there is no differential LoS across the ONF for rutting, given it's critical safety aspect.

Key observation

Maintaining roads to be free of ruts is crucial for safety and vehicle performance.

Ruts can trap rainwater, leading to steering difficulties, aquaplaning, and can result in forcing a road user off the road or into the path of an oncoming vehicle.

Candidate selection

The Candidate Selection Algorithm (CSA) is utilised as a first pass to collate pavement related defects and assess their severity against trigger thresholds, determining if any particular section of road should be recommended for pavement renewal.

Field validation and local knowledge

Council corroborates initial identification from the CSA by conducting desktop and visual field validations, verifying:

- Severity and frequency of relevant defects, such as roughness and rutting,
- maintenance history, and
- maintenance requirements for defects that have occurred or propagated since inspection

Each traffic lane is assessed individually for roughness and rutting, adding further detail for Council's Engineers, and informing the options to be assessed in managing the performance of the pavement. An exemplar output of our assessment capability can be seen below.

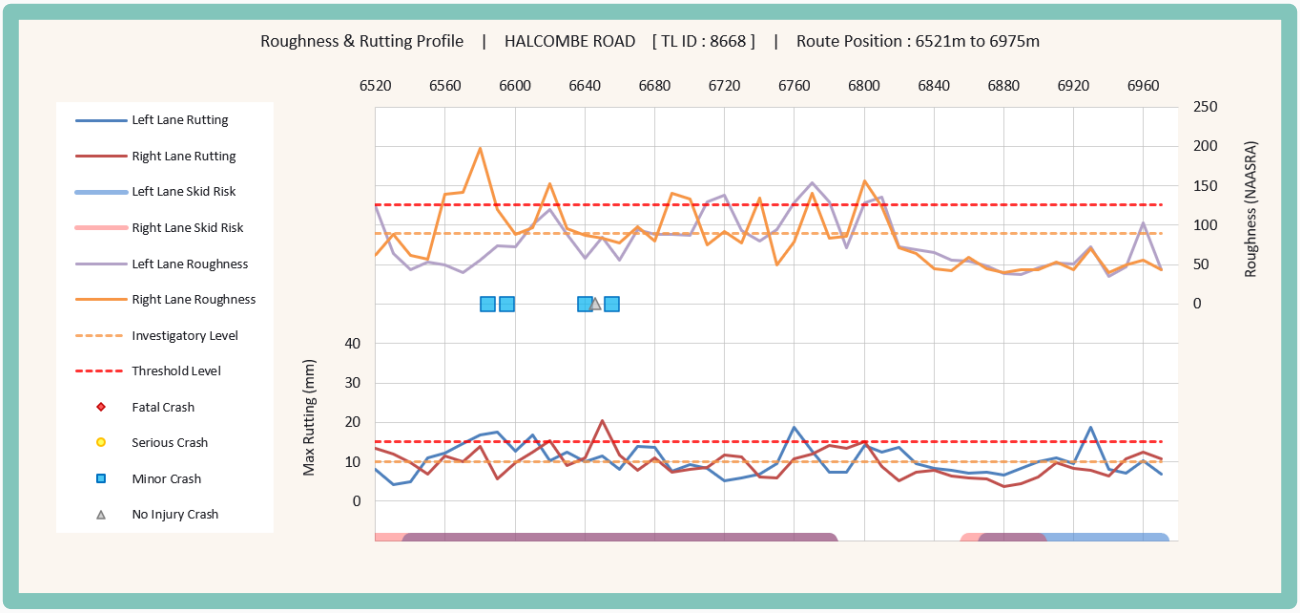


Figure 73 | Exemplar road section assessment, roughness and rutting by lane

A 'Net Present Value' (NPV) analysis is conducted, testing various options that may comprise minimum maintenance, enhanced (heavy) maintenance, and immediate renewal to determine the most economic solution to undertake.

Roughness and rutting

Our initial selection and validation process has highlighted the following quantity of sealed roads where the roughness and rutting has exceeded trigger thresholds:

	Roughness		Rutting		% defect overlap
ONF	Lane km	%	Lane km	%	
GT3	0.0	0.3	0.5	6.9	2.2
GT4	1.9	1.6	3.7	3.0	7.4
GT5	2.1	1.1	2.5	1.3	4.1
GT6	10.5	1.8	12.1	2.1	6.4
GT7	14.9	2.0	16.6	2.2	6.4
GT8	8.2	2.6	8.5	2.7	7.6
Total	**37.8**	**1.9**	**43.9**	**2.2**	

Figure 74 | Quantity of network exhibiting roughness and rutting beyond thresholds, by GT classification

The righthand column (% defect overlap) has been calculated to determine the percentage of road length where both defects are present.

From this column, it can be seen that there is little overlap between roughness and rutting, highlighting distinct failure mechanisms to address.

Key observation

79 lane-km of our road network requires rehabilitation, taking into account overlapping defects.

A **10-year programme** (ranked by a combination of severity and GT classification) is recommended, equating to rehabilitating an average of **4km** (or 0.4% of the sealed network per annum, increasing from the current **1km** (or 0.1% per annum) being achieved.

Pavement width | Rural roads

Over time, some roads have seen increased traffic volumes and/or changes in use (i.e., become a favoured freight or agricultural activity route) far beyond the original intent and arrangement of the road.

This can result in a myriad of issues, ranging across physical damage to the pavement (e.g., edgebreak or low shoulder), increasing travel time or travel time variability, and safety concerns.

An investigation into pavements that fail to reach the desired width **by more than half a metre** has been undertaken:

ONF	Desired width (m)	Affected length (m)	Affected length (%)
GT3	8.1	499	14.5%
GT4	7.7	3,941	7.8%
GT5	7.3	28,274	33.1%
GT6	6.1	32,361	12.1%
GT7	5.5	27,670	7.9%
GT8	5.1	20,832	17.8%
Total		**113,577**	**13.0%**

Figure 75 | Quantity of network exhibiting insufficient pavement width, by GT classification

Under the recommended pavement renewal programme (identified in the previous section), only 6km of roads exhibiting insufficient width will be addressed in the next 10 years.

Key observation

It is recommended roads not included in the anticpated pavement renewal programme be assessed for seal widening, prioritised by road classification and safety record.

Programme | Sealed road pavement investment focus

Given the reducing Pavement Integrity Index, increasing proclivity for potholes, and the quantity of roughness and rutting that exceeds performance thresholds being identified on the sealed road network, associated funding levels should be rebalanced for the 2027-30 funding cycle.

Maintenance

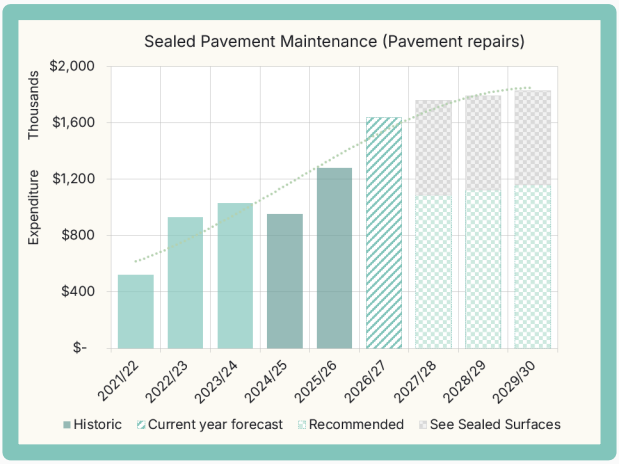


Figure 76 | Historic and recommended expenditure, sealed pavement maintenance [13]

We currently spend **$1,069 per km** on sealed pavement maintenance, whereas our **peer group average spend sits at $2,687 per km**.

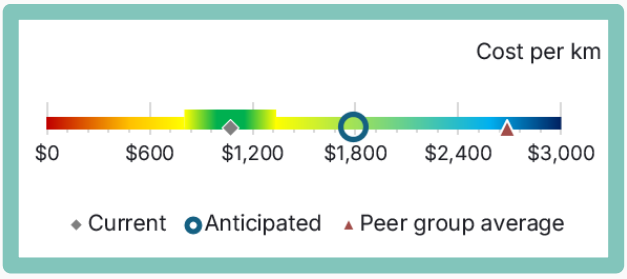


Figure 77 | Projected spend per km, sealed pavement maintenance

Recommended investment brings activity closer to (but lower than) the **current** average expenditure seen across our peer districts.

Renewals

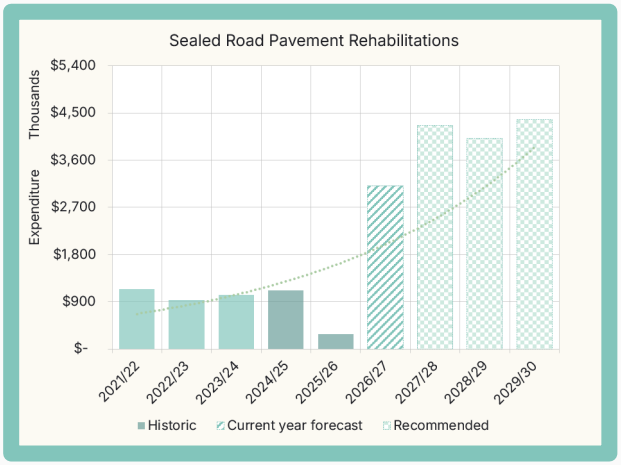


Figure 78 | Historic and recommended expenditure, sealed road pavement rehabilitation

We currently spend **$796 per km** on sealed pavement rehabilitation, whereas our **peer group average spend sits at $1,984 per km**.

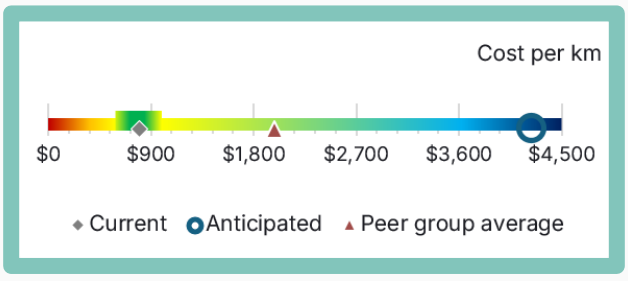


Figure 79 | Projected spend per km, sealed road pavement rehabilitation

Significant investment is recommended for this activity to compensate for historic underspend, return our pavements to suitable condition, and deliver on Central Government's expectations.

[13] *Expenditure in grey is related to treatment of the road surface (flushed or unstable surfaces) identified under sealed road surfaces in section 2.14.3.*

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	Extreme	Rapid decline	-16.11
Minimum	3.85	6.37	-	High	Gradual decline	-5.89
Optimal	3.37	12.74	-	Low-medium	Gradual improvement	0.00
Enhanced	3.37	15.92	-	Low	Rapid improvement	-

Figure 80 | Programme consequence assessment, sealed road pavements

Sealed road pavements		Investment activity option/s			
Benefit	KPI	Defer all maintenance and renewal activities	Maintain and renew only after excessive asset failure/s evident	**Maintenance and renewals, based on validation, +ve NPV's, ONF**	Renew all pavements triggering review
Efficient network	$	Yes	No	Probable	No
		No	Unlikely	Yes	Probable
Resilient network	!	No	No	Probable	Yes
		No	Unlikely	Probable	Yes
Safe network		No	No	Probable	Yes
Growth		No	Unlikely	Probable	Yes
KPI Alignment		!	!		!
Selected Option				▲	

Figure 81 | Performance consequence assessment, sealed road pavements

2.14.3 Sealed road surfaces

Road surfacings serve several critical functions that enhance the performance and safety of our roads. Surfacings are generally made up of chipseal or asphalt, helping to prevent environmental damage, extending the life of our pavements and reducing maintenance cost.

Key functions

Weather resistance | Sealed surfaces protect the underlying pavement from environmental factors like rain, snow, and temperature fluctuations

Safety | Sealed surfaces provide grip for vehicles, reducing the risk of skidding, especially in wet conditions

Amenity | Sealed surfaces contribute to a smoother ride, minimising vibration and discomfort for drivers and passengers

Certain surfaces can also help reduce road noise, contributing to quieter environments

Surface types

A number of surface types are present across our sealed network, primarily consisting of:

Seal type	Length (km)	% Length
Single coat chipseal (1CHIP)	442	44
Racked in chipseal (RACK)	209	21
Two coat chipseal (2CHIP)	335	33
Asphaltic Concrete (AC)	18	2
Other surfaces	10	<1
Total	**1,014**	**100**

Figure 82 | Sealed surface type distribution

Chipseal

Chipseal is the most common surfacing type used on our network, due to it's ability to:

- Protect the underlying pavement from water absorption,
- accommodate flexure in the underlying pavement without cracking, and
- Displace surface water and provide grip

Chipseals comprise approximately 98% of our district's sealed surfaces.

Asphaltic Concrete

AC comprises a small portion of our sealed road network, totalling 1.8%.

It is primarily used in highly stressed areas (e.g., roundabouts, cul-de-sac turning heads, industrial zones, and town centres), but is becoming increasingly popular in urban expansion. Such surfacing is used by developers aiming to maximise investment by providing increased amenity to potential buyers.

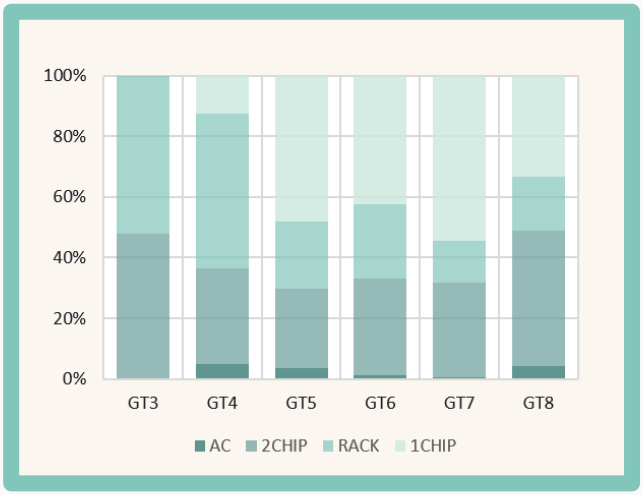


Figure 83 | Seal type distribution by ONF GT classification

Surface condition

Surface condition is assessed by combining differing defects that have occurred, and calculating a Surface Index (SI) score out of 100. The higher the score, the fewer the number, or severity, of defects found during inspections.

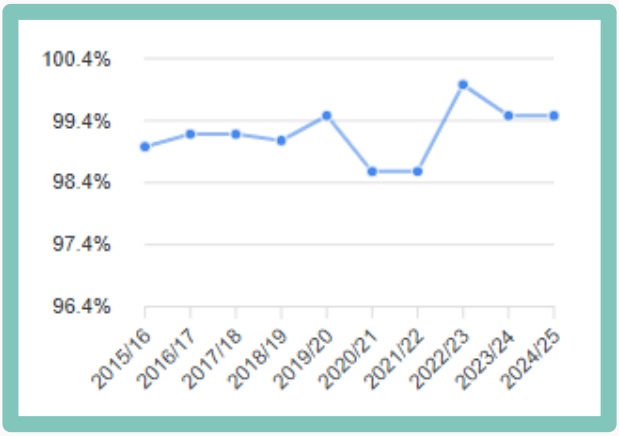


Figure 84 | Network Surface Index (SI) trend

Key observation

It can be seen that the overall Surface Index of our network follows an overall, slight upward trend, remaining stable since 2023/24.

Sealed road surface defects and management activities

Defects present themselves throughout the life of sealed surfaces due to usage and the environment. These defects tend to increase in severity over time, impacting on the comfort, and safety of our road users. Common defects and consequences are detailed below, along with maintenance and renewal options/actions.

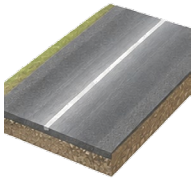
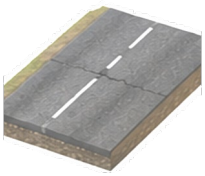
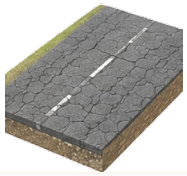
Defect	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Flushing / texture 	Excessive seal layer depth, Excess binder, Aged seal	Aquaplaning Skidding	Bitumen tracking	Property damage, Injury	Patch repair (localised), Watercut or Remake (area wide)	Resurface or Rehabilitate	Upgrade to AC
Stripping / ravelling 	Insufficient binder, Aged seal, Overstress	Forced vehicle deviation	Noise nuisance	Health, Injury	Patch repair (localised)	Resurface	Upgrade to AC
Linear Cracking 	Inflexible seal, Water ingress, Disturbed pavement layers,	Potholes	Reduced journey comfort	Reduced pavement life	Crack seal (localised instances)	Resurface	-
Alligator Cracking 	Water ingress, Insufficient pavement strength	Increased roughness, Potholes	Reduced journey comfort	Reduced pavement life, Injury, Vehicle damage	Crack seal (localised instances) or Patch repair (isolated deformation)	Resurface or Rehabilitate	-

Figure 85 | Sealed road surfacing defects and management activities

Surface stability

Since extensive expansion of the sealed road network (i.e., upgrading of previously unsealed roads) during the mid 20th Century, our chipsealed road surfaces have been habitually renewed by placing a new seal on top of existing layers to:

- maintain pavement integrity,
- provide grip, and
- maximise smooth journey experience

Layering multiple surfaces on top of one another naturally introduces instability, causing early onset of flushing and loss of texture depth. This increases risk of skidding, and vehicles crashing due to lack of grip.

Seal depth	Length (km)	Length (%)
More than 55mm	54.8	5.6
40mm to 55mm	298.3	30.3
Up to 40mm	631.6	64.1
Total	**984.7**	**100.0**

Figure 86 | Sealed surface layer depth distribution

The current distribution of roads with seal layers in excess of 55mm across GT classifications is:

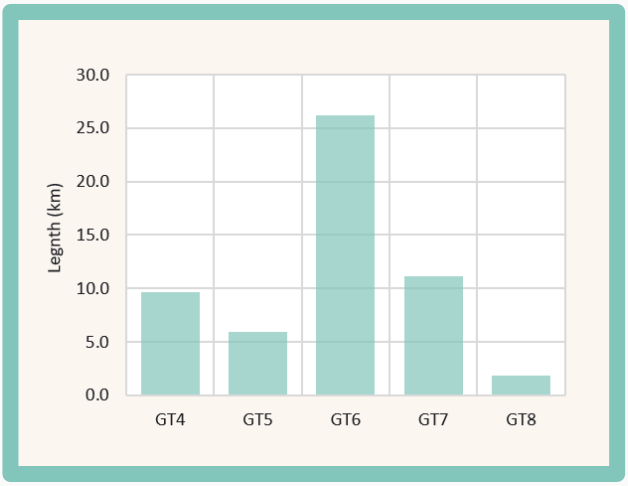


Figure 87 | Excess seal layer depth by GT classification

Key observation

An increasing proportion of the network now exhibits excess seal layer depth. **It is recommended to carry out 'heavy maintenance' to these sections of road by taking up, recompacting and and replacing the surface.**

Candidate selection

The Candidate Selection Algorithm (CSA) is utilised as a first pass to collate surfacing related defects and assess their severity against trigger thresholds, determining if any particular section of road is recommended for treatment.

Activity	Year(s)	Length (km)	Length (%)
Second coat	1	8.7	0.9
Resurface soon	2-3	82.5	8.2
Resurface later	4-6	162.0	16.2
Total		**253.2**	**25.3**

Figure 88 | CSA output, resurfacing

Distributing the sites for renewal across multiple years creates an initial programme:

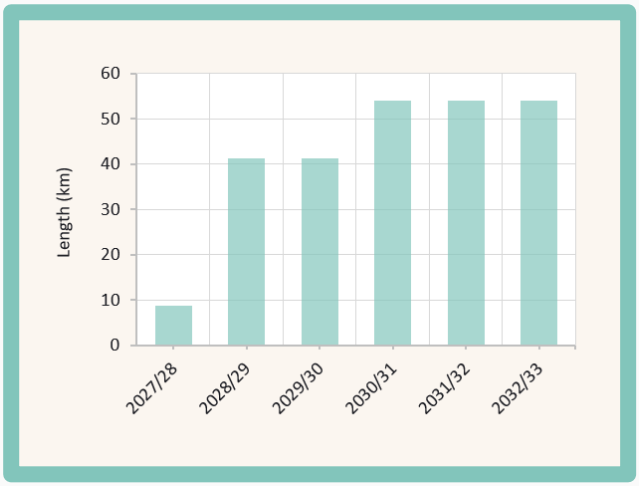


Figure 89 | Initial resurfacing demand, based on CSA output

Field validation and local knowledge

Council enhances this initial identification by obtaining skid resistance data to verify texture sufficiency (or lack thereof), residual skid risk, critical skid locations (such as intersections), and crash records.

Similarly to sealed road pavements, Council has the capability to interrogate the condition of each section of road, with each traffic lane assessed for its texture depth and skid resistance, aiding Council's Engineers in managing performance of the road surface. An exemplar output of our assessment capability can be seen below.

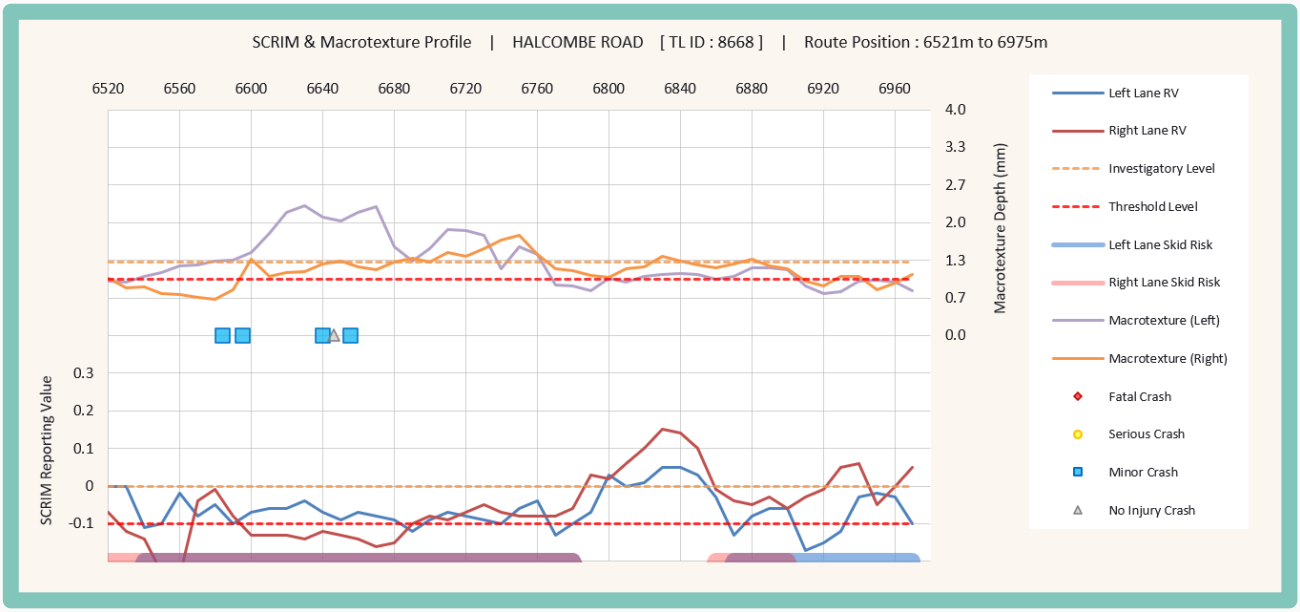


Figure 90 | Exemplar road section assessment, texture depth, and skid resistance

Skid resistance and texture depth

The proportion of network exhibiting deficiency in skid resistance or texture depth is as follows:

	Skid resistance		Texture		% defect overlap
ONF	Lane km	%	Lane km	%	
GT3	0.3	4.5	0.3	5.0	9.7
GT4	5.0	4.0	7.2	5.8	14.3
GT5	1.8	0.9	6.0	3.1	6.6
GT6	5.9	1.0	14.7	2.5	5.1
GT7*	2.4	0.3	1.6	0.2	0.7
GT8*	1.3	0.4	0.1	0.0	0.5
Total	**16.8**	**0.8**	**29.9**	**1.5**	

Figure 91 | Quantity of network exhibiting skid resistance and texture beyond thresholds by General Traffic classification

** Skid resistance and texture is currently obtained to approximately 50% of our sealed surfaces, generally across higher General Traffic classifications, GT6 to GT3.*

Key observation

45 lane-km (or 22.5km) of road requires treatment, taking into account overlapping defects.

Inclusion in the **1-3 year** programme is recommended, equating to resurfacing an average of **7km** (or **0.7%** of the sealed network per annum **in addition to the initial identified programme**.

Skid resistance trend

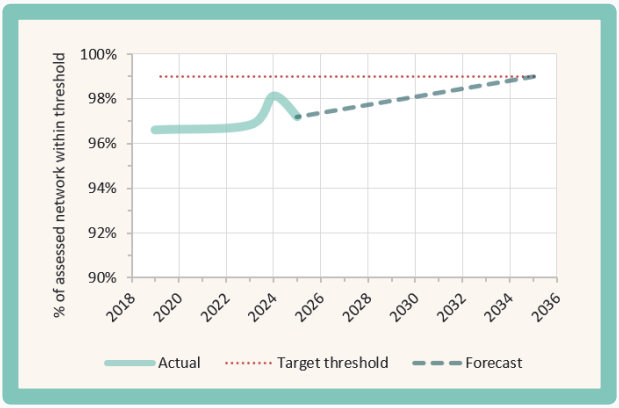


Figure 92 | Skid resistance trend and optimum treatment forecast

Key observation

Our network sits a little below the expected Level of Service, which sets a threshold of:

less than 1% of surfaces with skid resistance below the minimum.

Achieving this LoS by 2036 is anticipated through existing management processes.

Resurfacing

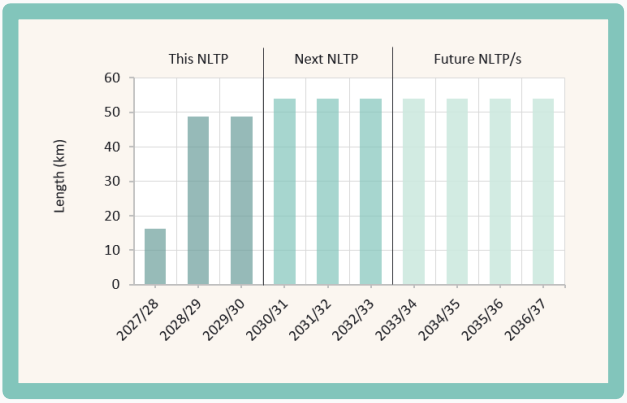


Figure 93 | Anticipated resurfacing demand

Renewal of sealed surfaces constitutes application of a new, uppermost surface layer.

The type of surface selected is assessed against the anticipated:

- General Traffic and Freight volumes
- road widths
- road gradients
- road curvature, ranging from straight to tortuous
- likely turning movements or demand, and
- environmental factors (e.g., shade, altitude, etc)

In rare instances, such factors indicate that the surface should be upgraded from chipseal to AC.

Where this is the case, a 'Net Present Value' (NPV) analysis is is conducted to test the economic viability of this solution over that of alternative treatments.

Key observation

Whilst AC surfaces are better at handling - for example, turning stresses - they are less flexible.

To achieve the expected long(er) life of an AC surface, **the underlying pavement must be much stiffer than for a chipseal surface** in order to resist flexure, prevent cracking, and realise its benefit.

Improvements | Surface upgrading

We do not have a programme of upgrading chipseal surfaces to AC in place, and do not anticipate the need to carry out upgrades at this time. Any locations that we become aware of will be assessed for economic viability via the NPV process described earlier.

Programme | Sealed road surfaces investment focus

Our focus is directed towards treatment of unstable surfaces through watercutting and heavy maintenance.

Programming of reseal sites (excluding second coats and high risk skid locations) in year 2, and beyond, allows the opportunity to complete preseal maintenance in it's entirety a year prior to resurfacing. The evidenced stability of network (through the Surface Index measure) gives confidence that this approach will realise benefits and deliver value for money without compromising performance.

Maintenance

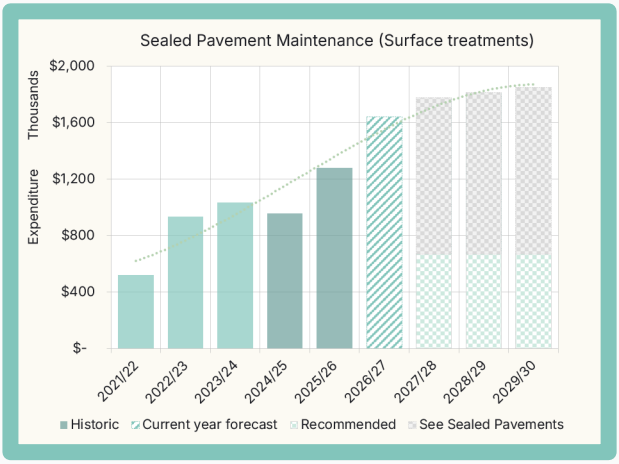


Figure 94 | Historic and recommended expenditure, sealed road pavement maintenance

Figure 76 in Section **2.14.2** (Sealed road pavements), but the expenditure highlighted in green for the next three years is related to treatment of the road surface (flushed or unstable surfaces) rather than deeper pavement related defects.

Renewals

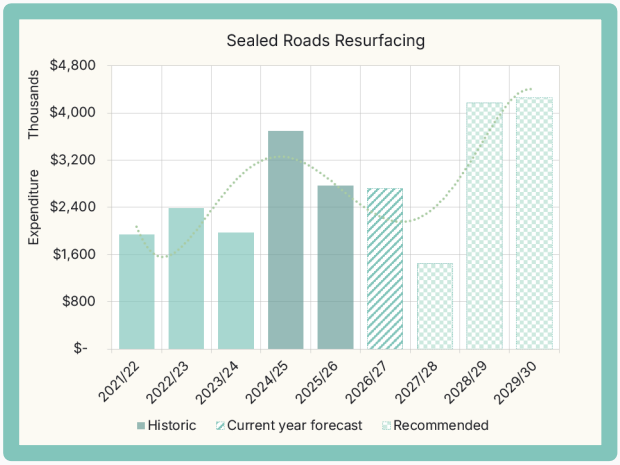


Figure 95 | Historic and recommended expenditure, sealed road resurfacing

We currently spend **$2,760 per km** on sealed road resurfacing, whereas our **peer group average spend sits at $3,389 per km**.

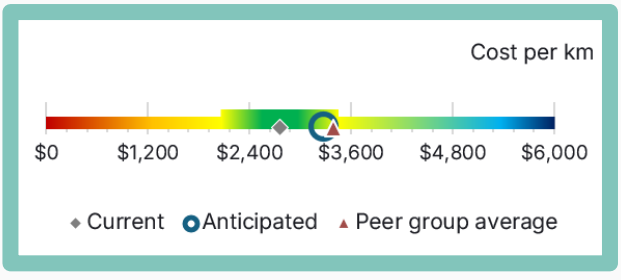


Figure 96 | Projected spend per km, sealed road resurfacing

Recommended investment is similar to the **current** average peer group investment, whilst aiming to maintain our sealed road surface performance.

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	Extreme	Rapid decline	-11.88
Minimum	-	5.92	-	High	Gradual decline	-5.96
Optimal	2.01	9.87	-	Low-medium	Gradual improvement	0.00
Enhanced	2.01	13.82	-	Low	Gradual improvement	-

Figure 97 | Programme consequence assessment, sealed road surfaces

Sealed road surfaces		Investment activity option/s			
Benefit	KPI	Defer all maintenance and renewal activities	Maintain and renew only after excessive asset failure/s evident	**Maintenance and renewals, based on field validation and ONF prioritisation**	Renew all surfaces triggering review
Efficient network	$	Yes	No	Probable	No
		No	Unlikely	Probable	Yes
Resilient network	!	No	Unlikely	Probable	Yes
		-	-	-	-
Safe network		No	Unlikely	Probable	Yes
Growth		No	Unlikely	Probable	Probable
KPI Alignment		!			!
Selected Option				▲	

Figure 98 | Performance consequence assessment, sealed road surfaces

2.14.4 Unsealed roads

Unsealed roads provide essential connectivity in rural and low population areas, which use gravel as a running surface, and offers a cost-effective alternative to sealed roads. Unsealed roads support access for farming, forestry, and residences where sealing is impractical due to low traffic demand or budget constraints.

Key functions

Accessibility | Unsealed pavements distribute the weight of vehicles evenly to the underlying soil, maintaining usability in wet weather conditions

Safety | Unsealed pavement geometries direct water away from the surface, helping to maintain a stable and safer driving environment

Cost effectiveness | Unsealed roads are generally cheaper to maintain and renew compared to sealed roads, making them a practical choice for areas with low traffic volumes

Pavements

Unsealed road pavements are typically constructed from two or three layers, comprising a running course, basecourse, and a possibly compacted natural formation layer (known as subgrade).

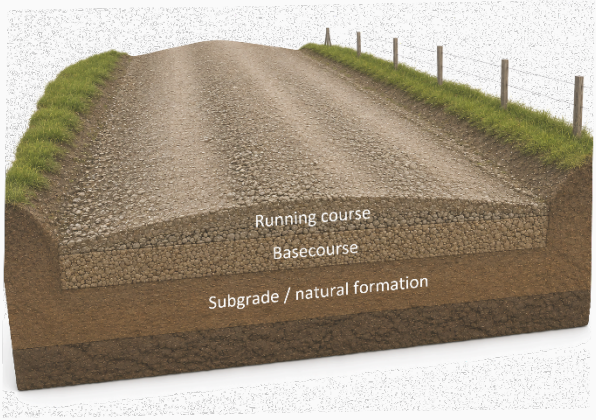


Figure 99 | Typical unsealed pavement construction

Network Classification

The unsealed road network comprises a little over 360km (or a quarter) of our road network, and is classified as follows:

ONF	Length (km)	Area (sq.m)
GT7/F7	34	153,996
GT8/F8	329	1,279,418
Total	**363**	**1,433,414**

Figure 100 | ONF length distribution, unsealed roads

However, the reality of maintenance need within the lowest classification has not been adequately differentiated.

A modification assessment has been undertaken, applying three additional, sub-category classifications under GT8.

Typically, these sub-category roads experience very low demand, are narrower, can be no-exit roads, and service very few properties.

ONF	Primary criteria	Length (km)
GT7	As per ONF	34
GT8	Width 4.8m+	17
GT8a	Width <4.8m, Urban	9
GT8b	Width <4.8m, Rural	159
GT8c	Width <4.8m, No exit roads	144
Total		**363**

Figure 101 | Sub-category criteria for GT8 classification

Roads subject to forestry have been identified by from the '*Moore & Associates*' report referenced

earlier. Where a sub-category road is expected to experience forestry activity within the next funding period, it is reclassified as GT8 to mitigate the increased maintenance regime needed.

ONF	Length (km)	Difference (km)
GT7	34	-
GT8	80	+63
GT8a	9	-
GT8b	125	-34
GT8c	115	-29
Total	363	

Figure 102 | Sub-category length redistribution for unsealed roads between 2027 and 2030

Unsealed road defects and thresholds for service

Defects present themselves throughout the life of unsealed roads due to usage and the environment. These defects tend to increase in severity over time, impacting on the comfort, travel time reliability, and safety of our road users. Common defects are detailed below, along with the thresholds activating maintenance or renewal.

Defect	Indicates	Risk of	Service impacts	Costs	Maintenance threshold	Renewal threshold
Corrugations 	Stressed pavement	Forced vehicle deviation	Journey comfort reduces	Injury, Vehicle damage	25mm depth (peak to trough)	-
Rutting/shoving 	Insufficient pavement depth, Insufficient pavement strength	Forced vehicle deviation	-	Injury	Minor deformation	Substantial deformation
Potholes 	Improper geometry, Insufficient pavement strength	-	Journey comfort reduces	Vehicle damage	3 potholes in any 100m section	-
Scour 	Improper geometry, Insufficient drainage	-	Journey comfort reduces	Vehicle damage	100m along carriageway or 2 instances crossing carriageway	-
Exposed subgrade 	Loss of pavement	Becoming impassable	Loss of access	Detour	-	Engineer's assessment

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Defect	Indicates	Risk of	Service impacts	Costs	Maintenance threshold	Renewal threshold
Soft pavement 	Insufficient drainage, Poor pavement compaction, High fines content	Forced vehicle deviation	-	Injury	20 square metres in any 100m section	50 square metres in any 100m section
Bare surface 	Running course migration	Forced vehicle deviation	Reduced wet weather grip	Injury	Displaced (recoverable from roadside), 50% of area exposed	Lost (non-recoverable from roadside), 50% of area exposed
Dust 	High fines content, Loss of pavement cohesion	Reduced visibility	Air quality	Injury, Health	-	Recurring complaints / observations

Figure 103 | Unsealed road defects and service thresholds

Performance trends

A key measure of the performance of unsealed roads is the receipt - and response to - customer reports of defects, comprising potholes, rutting, requests for grading, dust nuisance, and slippery surfaces.

Council tracks these instances to assist with understanding the demand placed the network beyond feedback from routine patrols and inspections:

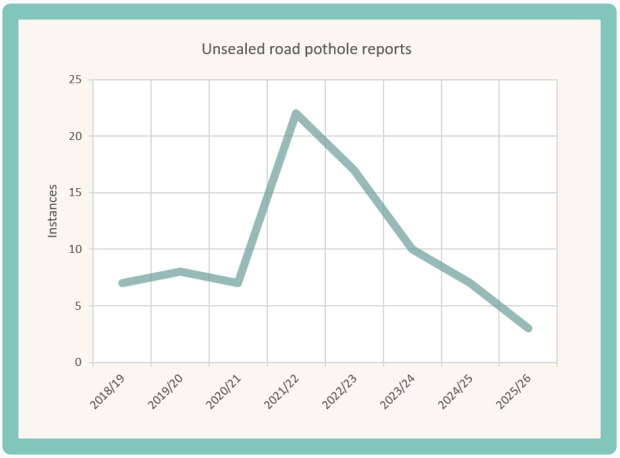


Figure 104 | Trend of customer reports, potholes

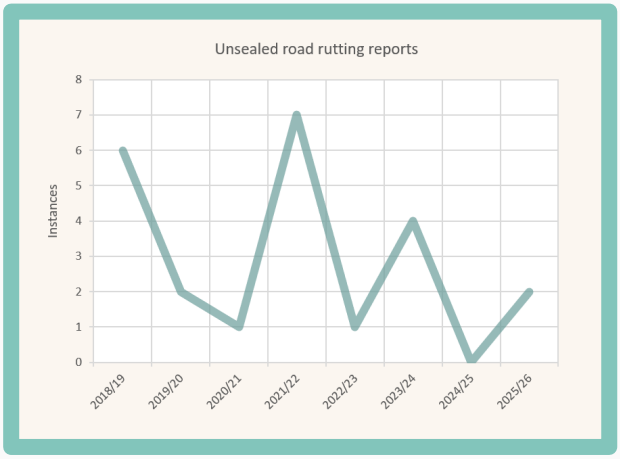


Figure 105 | Trend of customer reports, rutting

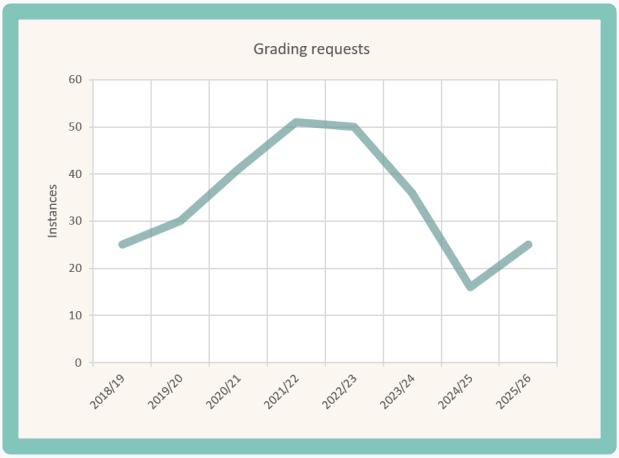


Figure 106 | Trend of customer reports, requests for grading

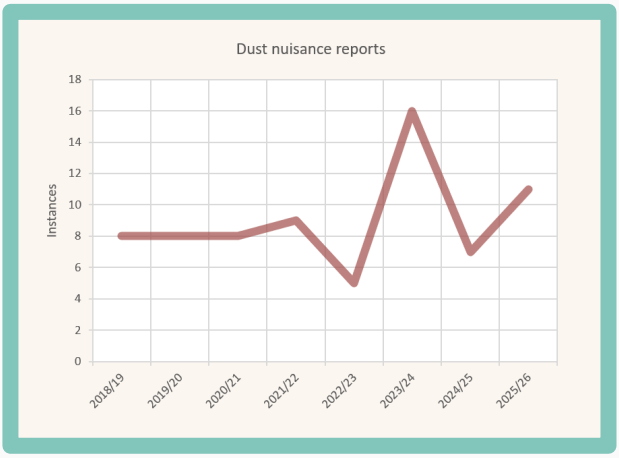


Figure 107 | Trend of customer reports, dust nuisance

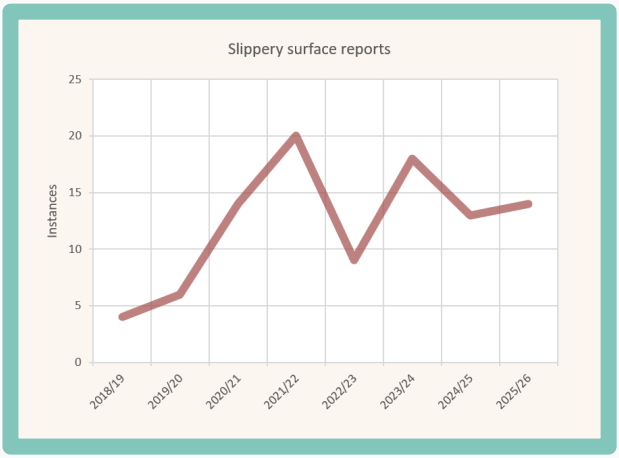


Figure 108 | Trend of customer reports, slippery surfaces

Key observation

Reports of potholes, rutting, and generic grading requests show a downward trend, indicating that efficiencies in the grading schedule can be achieved.

However, increasing reports of slippery surfaces and dust nuisance indicates that increased investment in renewal related activities is needed.

Maintenance | Grading

Aside from requests for service received from our customers, the Contractor is required to patrol and inspect each road 1-2 weeks prior to planned grading. This is to determine the presence and quantity of defects to be addressed, testing the planned timing of intervention. Where roads are found to present an excess – or absence – of defects, the road's classification and/or schedule is realigned.

During periods of lesser rainfall, the moisture content of unsealed roads begins to reduce, solidifying the pavement in the process. Excess grading during this time can damage the pavement and increase costs to remedy.

As such, we have programmed a reduced grading schedule between late October to mid-March (periods 5 to 9).

Preceding the summer period, a heavy grade cycle is undertaken to adequately shape and compact the pavement, and minimise dust nuisance risk, prior to the summer period.

This programme equates to a total frequency and length of grading per annum:

ONF	Grading frequency per annum		Grading km per annum
	Heavy	Light	
GT7	1	7	269
GT8	1	3	320
GT8a	1	2	28
GT8b	1	1	250
GT8c	1 grade, heavy or light as required		115
			982

Figure 109 | Annual grading frequency and length

In comparison to the previous funding cycle, this regular programme equates to **a reduction of 471km** grading length per year, whilst expecting to maintain current Level of Service.

In addition to the regular programme, Council anticipates the need for spot grading in order to mitigate or respond to climatic events, and customer requests for service outside the regular programme.

To this end, two additional light grades to 20% of the unsealed network are required, equating to an additional grading length of 145km per annum.

Renewals | Restoration of pavement depth, strength, and dust mitigation

Gravel loss modelling

An initial 10mm theoretical gravel loss had been assessed as applicable for the Manawatū District's unsealed roads, based on the Paige-Green model, prior to the inception of the ONF.

Further differentiation for the GT8 (and sub-category) classifications have been applied, based on local knowledge and empirical observation. This results in the following annual gravel loss and consequent pavement lives, balanced against the anticipated pavement depth required to accommodate 'business as usual' traffic volumes.

ONF	Road km	Total area (sq.m)	Wearing course depth (mm)	Gravel loss per annum (mm)	Estimated life (yrs)	Application per annum (cu.m)
GT7	34	153,996	200	10	20	1,540
GT8	17	96,848	150	7	21	692
GT8a	9	34,166	100	6	17	201
GT8b	159	625,097	100	5	20	3,125
GT8c	144	523,307	75	4	19	2,066
	363	1,433,414				7,624

Figure 110 | Unsealed road renewal demand per annum

In comparison to the previous funding cycle, this programme equates to **2,124 cu.m (cubic metres) more material** when renewing our unsealed road pavements. This is to combat the increasing instances of slippery surfaces and dust nuisance in a sustainable manner.

Programme | Unsealed roads investment focus

Focus remains on meeting the expectations regarding comfort, safety, and health for our customers who use and reside on our unsealed road network. In particular, attention to dust control, through targeted renewal activities, is a key activity.

This will be achieved through the application of differential Levels of Service, and maximising value for money by incorporating an adaptive monitoring and response system in collaboration with Contractors.

Maintenance

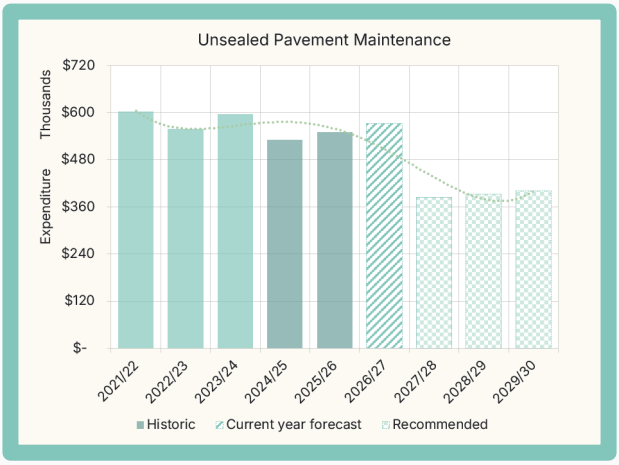


Figure 111 | Historic and recommended expenditure, unsealed pavement maintenance

We currently spend **$1,497 per km** on unsealed pavement maintenance, whereas our **peer group average spend sits at $1,564 per km**.

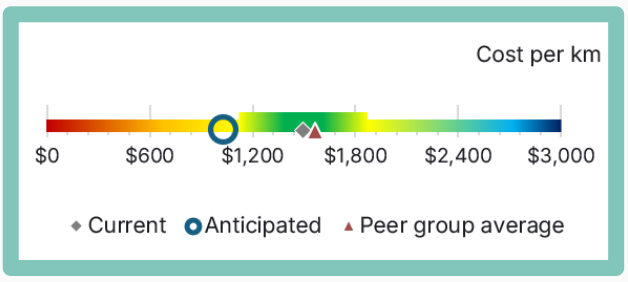


Figure 112 | Projected spend per km, unsealed pavement maintenance

Recommended reduction in investment gains efficiencies whilst maintaining our current unsealed road performance, moving below the **current** peer group average expenditure.

Renewals

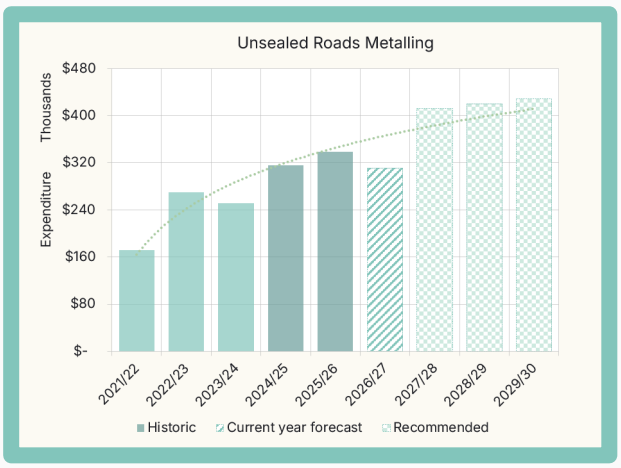


Figure 113 | Historic and recommended expenditure, unsealed road metalling

We currently spend **$807 per km** on unsealed road metalling, whereas our **peer group average spend sits at $1,707 per km**.



Figure 114 | Projected spend per km, unsealed road metalling

Recommended investment brings activity towards (but still lower than) to the **current** average seen across our peer districts, and will deliver on reducing the issue of dust nuisance for our customers.

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	Extreme	Rapid decline	-2.41
Minimum	1.05	0.97	-	Medium-high	Moderate decline	-0.40
Optimal	1.17	1.25	-	Low-medium	Gradual improvement	0.00
Enhanced	2.85	1.37	-	Low-medium	Moderate improvement	-

Figure 115 | Programme consequence assessment, unsealed roads

Unsealed roads		Investment activity option/s			
Benefit	KPI	Defer all maintenance and renewal activities	Maintain and renew only after excessive asset failure/s evident	**Maintenance and renewals, based on field validation and sub-category assessment**	Maintain and renew to high frequency standard
Efficient network	$	Yes	No	Yes	No
		No	Unlikely	Probable	Probable
Resilient network	!	No	Unlikely	Probable	Probable
		No	Unlikely	Probable	Probable
Safe network		-	-	-	-
Growth		-	-	-	-
KPI Alignment		!	!		
Selected Option				▲	

Figure 116 | Performance consequence assessment, unsealed roads

2.14.5 Bridges, major culverts, and structures

There are a wide range of bridge and structure types throughout our network, each differing in construction, materials, spans, and widths. This heterogeneity confers complex demands in both maintenance and renewal management of this asset group.

Key functions

Connectivity | Bridges and structures provide efficient routes over impassable terrain that would otherwise require costly detours

Economic | Bridges and structures enable the transport of goods and services, which is vital for local and regional economies

Safety | Bridges and structures enable safe, efficient passage for vehicles, pedestrians, and cyclists

Our portfolio currently consists of 236 Council owned bridging structures and 52 privately owned stock underpasses situated around the district.

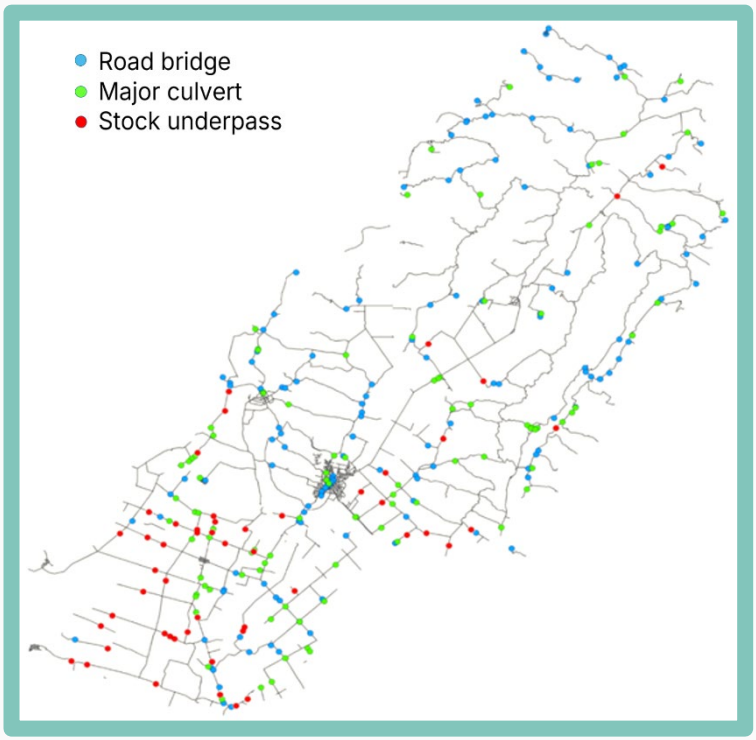


Figure 117 | Bridging structures asset map

Type	Owner	Count
Road Bridge	MDC	139
Major Culvert	MDC	97
Stock Underpass	Private	52
Total		**288**

Figure 118 | Bridging structures portfolio

Stock underpasses

Stock underpasses are included in our portfolio so that our capability to inspect said structures and protect overlying assets is achieved.

The responsibility for maintenance and renewal of stock underpasses remains with each owner.

Asset distribution

The distribution of road bridges and major culverts by General Traffic classification is as follows:

ONF GT	Road bridges	Major culverts	Total
GT3	-	1	1
GT4	13	1	14
GT5	12	17	29
GT6	34	28	62
GT7	40	22	62
GT8	40	28	68
Total	**139**	**97**	**236**

Figure 119 | Bridging structures by GT classification

Road Bridges

We currently manage 139 bridges that carry local vehicular traffic. These assets have been constructed in a variety of ways, from numerous materials, and over a large period of time, ranging from the early 20th Century to within the last year.

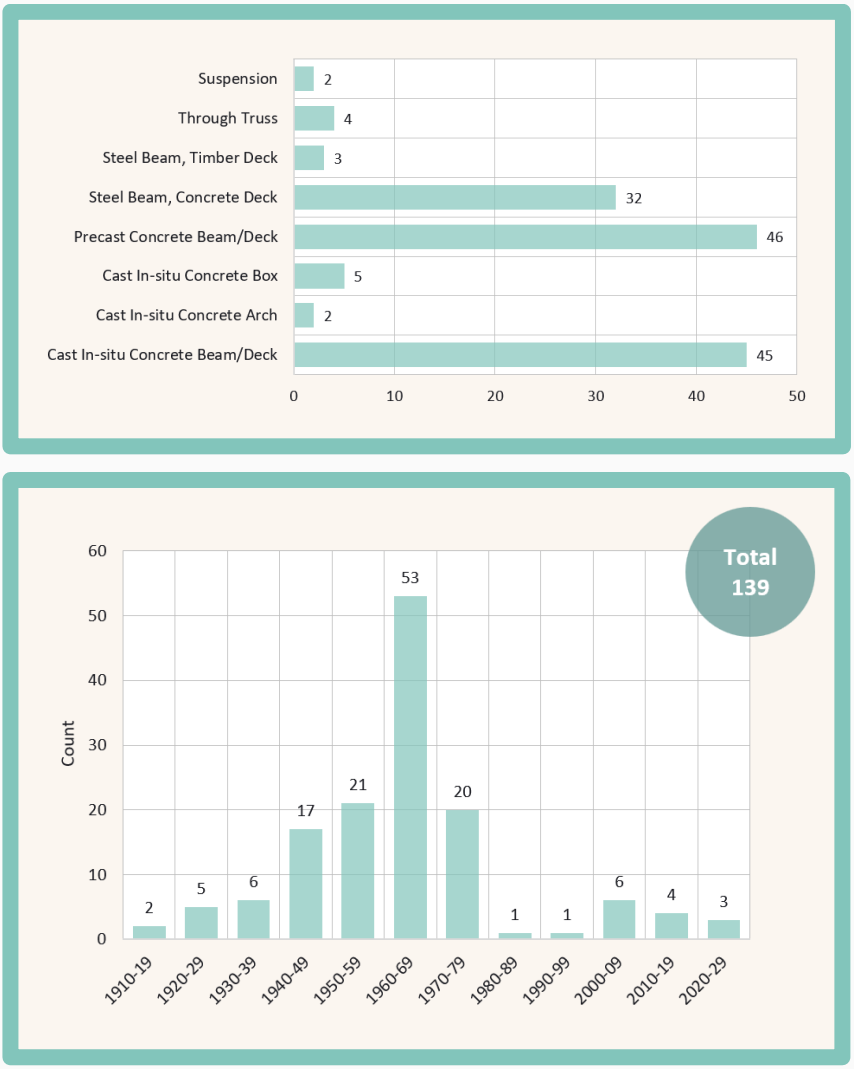


Figure 120 | Road bridges by type and age distribution

Road name	Bridge name	Year built	Shared between
Saddle Rd	Saddle Road Bridge	2006	MDC/PNCC
Otara Rd	Otara Bridge	1962	MDC/RDC
Mangarere Rd	Mangarere Bridge	1966	MDC/RDC
Kawhatau Valley Rd	Powerhouse Bridge	1975	MDC/RDC
Ruahine Rd	Mangaweka Bridge	2023	MDC/RDC
Halcombe Rd	Kakariki Bridge	1968	MDC/RDC

Figure 121 | Shared responsibility bridging structures

The average age of our road bridge stock is 65 years.

With a typical expected service life of 100 years for bridges, this indicates that the bridge stock is aging; increased maintenance and renewals expenditure is required to retain the current Level of Service.

Major Culverts

Major culverts are also considered bridging structures when the cross-sectional area spanned by the culvert exceeds 3.4m^2.

Culverts are less complex and have lesser variability in construction arrangement, size, and material than road bridges.

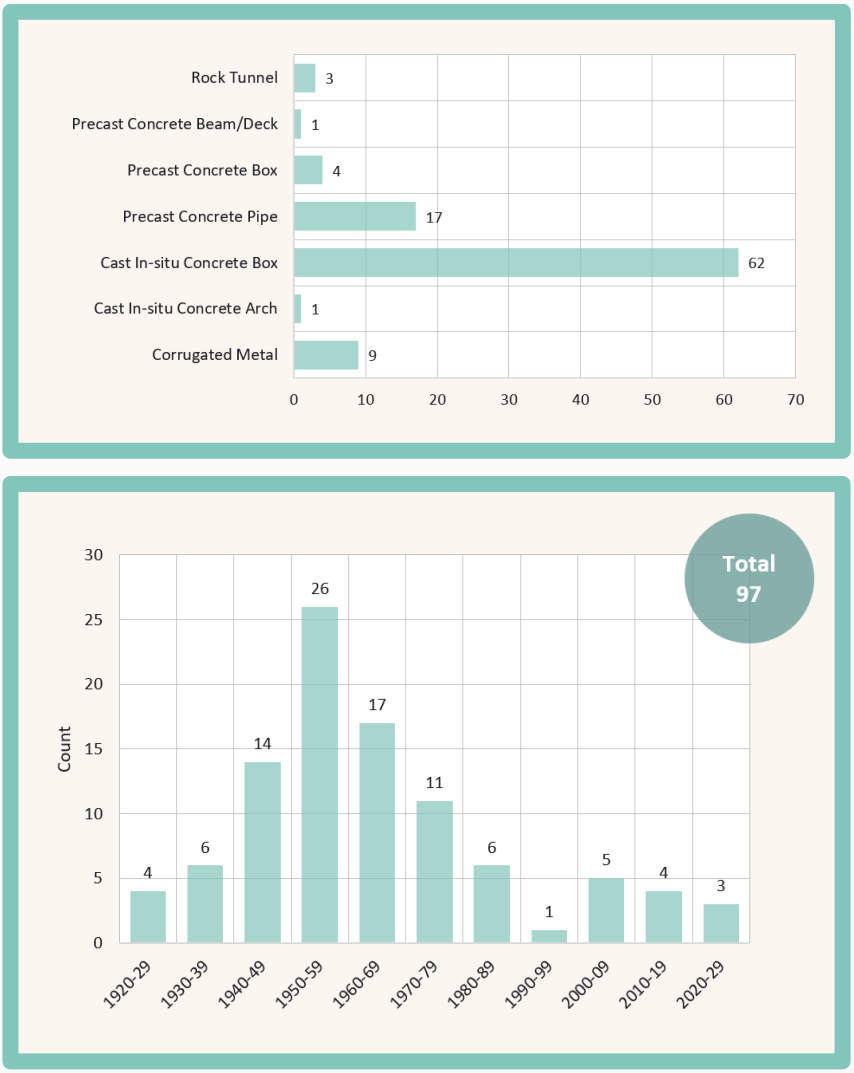


Figure 122 | Major culverts by type and age distribution

There are 85 in-situ or precast concrete structures recorded on our network, comprising 88% of our major culvert assets.

Overall, these tend to be simple, low-risk structures with limited structural maintenance requirements, but there are exceptions considered high risk.

High risk structures

We maintain nine corrugated metal culverts around our network.

Corrugated metal culverts are considered high risk, due to varying performance and longevity. The limited life of these culverts is typically associated with poor construction, detailing, or application in the wrong environment. The current average age for this structure type is 50 years, with an average expected life of only 55 years.

Our portfolio also includes three water drives (unlined, hand dug tunnels through rock).

These present a high risk as they are dependent on the material through which they have been driven, and are subject to geological processes and erosion.

The latest inspection of these structures by an experienced geologist has identified no immediate concerns due to condition or form.

Capacity and Restrictions

Structures are normally designed to accommodate all weight classes of vehicle.

However, there are circumstances where a structure is unable to safely carry certain traffic loads. If a bridge has been assessed as such, it becomes 'posted', and its limitations published. There are currently four posted bridges on our local road network, the details of which are displayed below:

Bridge	Road	ONF GT	Restrictions
S37	Coulter Line	7	44,000kg (Gross)
S173C	Otara Road	7	6,000kg (Axle) 10kph
S142A	Mangarere Road	8	6,500kg (Axle) 34,000kg (Gross) 25kph
S299B	Umutoi North Road	8	6,000kg (Axle)

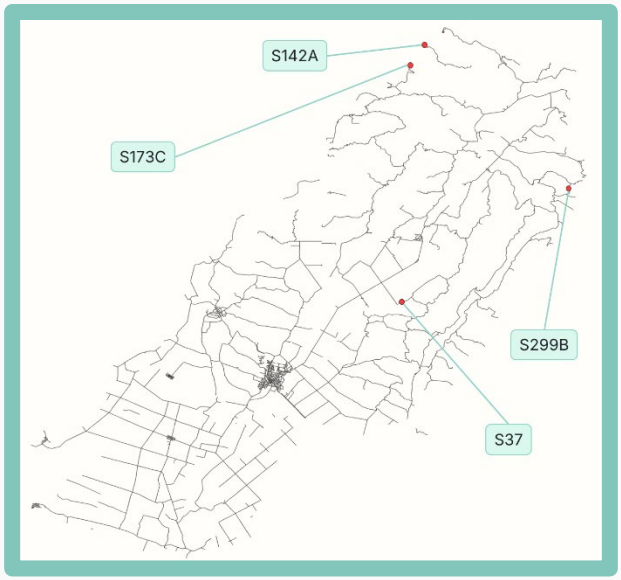


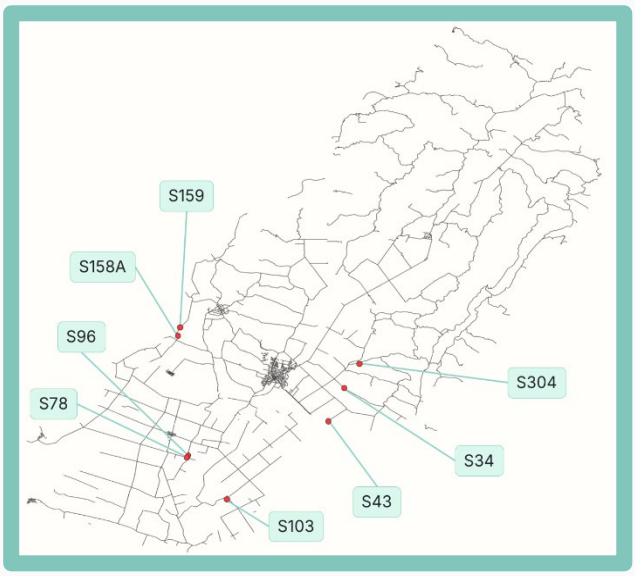
Figure 123 | Posted bridges

One Lane Bridges

One Lane Bridges (OLB's) are relatively common throughout New Zealand, and have been habitually installed on roads with low traffic volumes where the incidence of meeting opposing vehicles is rare.

Some roads have experienced gradual traffic volume growth, increasing the likelihood of a vehicle encountering another travelling in the opposite direction, raising the risk of a collision.

Council has mapped the locations of OLB's on the network where traffic volume exceeds 250 vehicles per day (vpd):



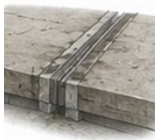
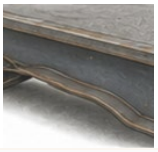
Bridge	Road	ONF GT	vpd	Age
S34	Colyton Road	5	1,298	61
S43	Dixons Line	7	318	66
S78	Kaimatarau Road	7	280	113
S96	Leen Road	7	654	113
S103	Lockwood Road	6	352	25
S158A	Mingaroa Road	6	330	75
S159	Mingaroa Road	6	330	46
S304	Valley Road	6	413	76

Figure 124 | OLB's carrying over 250 vehicles per day

Since the previous assessment in 2023-24, another four roads (with OLB's in place) now experience traffic volumes in excess of 250 vehicles per day.

Bridge and structure defects and management activities

Defects present themselves throughout the life of bridge and structure assets due to usage and the environment. These defects tend to increase in severity over time, impacting on the comfort, travel time reliability, and safety of our road users. Common defects and consequences are detailed below, along with maintenance, renewal, or improvement options.

Defect	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Cracking 	Life expiry, Overstress	Water ingress, Reduced capacity	Loss of access	Reduced asset life, Detour	Crack sealing or waterproofing (isolated instances)	Replace component, Replace structure	-
Spalling 	Water ingress	Loss of section	Loss of access	Reduced asset life, Detour	Concrete repairs	Replace component	-
Expansion joint damage 	Life expiry, Contamination	Water ingress, Ancillary damage	Reduced journey comfort	Reduced asset life	Clean	Replace component	-
Ponding 	Blockages	Ancillary damage, Forced vehicle deviation	Increased travel time	Reduced asset life, Injury	Clean	-	-
Paint loss 	Life expiry	Loss of section	-	Reduced asset life	-	Repaint	-
Corrosion 	Unprotected exposure	Loss of section, Reduced capacity, Collapse	Loss of access	Loss of asset, Detour	Repaint (early onset, Isolated instances)	Replace component, Replace structure	-
Connection loss 	Life expiry, Overstress	Reduced capacity, Collapse	Loss of access	Loss of asset, Detour	-	Replace component	-
Distortion 	Impacts, Overstress	Reduced capacity, Collapse	Loss of access	Loss of asset, Detour	-	Replace component, Replace structure	-

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Defect	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Settlement (differential) 	Foundation movement	Collapse	Reduced journey comfort, Loss of access	Detour	-	Reinstate alignment, Replace structure	-
Settlement (approach) 	Insufficient pavement strength, Failing sub-base, Scour	Forced vehicle deviation	Reduced journey comfort	Injury, Vehicle damage	Repair pavement	-	-
Debris (waterway) 	Inadequate capacity, Substructure impacts	Overtopping, Component loss, Collapse	Loss of access	Loss of asset, Detour	Clean waterway	-	Upgrade substructure protection
Scour 	Dynamic waterway	Undermining, Settlement, Collapse	Loss of access	Loss of asset, Detour	-	-	Upgrade substructure protection
Bearing failure 	Life expiry, Contamination	Reduced capacity, Ancillary component damage	-	Reduced asset life	Clean	Replace	-
Railing / barrier damage 	Vehicle impacts	Reduced containment capability	-	Injury	Clean, Realign, Resecure components	Replace	-
Settlement (differential) 	Foundation movement	Collapse	Reduced journey comfort, Loss of access	Detour	-	Reinstate alignment, Replace structure	-
Damaged / missing delineation 	Life expiry, Lack of maintenance	ineffective driver information, Crashing	-	Injury	Clean	Replace	-

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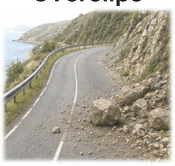
Defect	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Overslips 	Unstable topography	Road closures, Forced vehicle deviation	Loss of access	Detour, Injury	Remove debris	-	Install retaining structure
Underslips 	Unstable topography	Road closures, Forced vehicle deviation	Loss of access	Detour, Injury	-	-	Install retaining structure
Deformation 	Overburden, Insufficient strength, Life expiry	Road closures, Forced vehicle deviation	Loss of access	Detour, Injury	Brace, Remove burden	Replace	-

Figure 125 | Bridge & structure defects and management activities

Maintenance

Maintenance entails managing components of bridges and other structures to attain their expected service life, focusing on repairing identified defects where possible.

Renewals | Component replacements

The components that make up bridges and structures have widely differing service lives. When each component has deteriorated to the extent it cannot be repaired, it is replaced. This generally applies to discrete elements such as - but not limited to - guardrails, bearings, walings, and expansion joints.

Renewals | Bridge renewals

Some components of bridging structures are fundamental to the asset's ability to function (e.g., a deck or abutment), and cannot be replaced without impacting the entire structure. When such critical components can no longer function as designed, the bridge has come to the end of it's life, and requires replacement.

This type of renewal replaces the bridge 'like-for-like', providing the same Level of Service (i.e., an OLB is replaced with another OLB) [14].

The latest LCMP has recommended **two** structures be replaced 'like-for-like' during this this funding cycle (equating to a renewal rate of **0.3%**). Since this recommendation, **recently detected damage to the Otara Road suspension bridge** has raised the necessity for replacement, in order to permanently remove weight restrictions currently in place, retain economic benefits, and travel accessibility.

[14] *'Like-for-like' replacement structures are expected to be constructed to **current design standards** (and not those in place when the original structure was built).*

Improvements | New or upgraded bridges

Council has no plans to provide new or upgraded bridges for the life of this AMP.

Improvements to existing structures are restricted to scour or debris protection that – while associated – are not directly connected and are therefore considered 'resilience improvements'.

Treatment selection

Council engages WSP to conduct a thorough assessment of our bridge data and investment demand, creating the Road Structures **Life Cycle Management Plan (LCMP)**. The latest LCMP was updated in July 2026.

The table below highlights the number of bridging structures identified for maintenance, component renewal, like-for-like replacement, or improvement over the next three years.

ONF GT	Structure portfolio	Maintenance	Component Replacement	Bridge Replacement	Improvement	Total	% of bridge stock managed
GT3	1	-	-	-	-	-	0
GT4	14	8	4	-	-	12	86
GT5	29	10	5	1	-	16	55
GT6	62	36	11	-	-	47	76
GT7	62	29	12	2	-	43	69
GT8	68	33	15	-	-	48	70
Total	236	116	47	3	-	166	70

Figure 126 | Quantity of bridging structures identified for treatment, 2027-30

Improvements | Retaining walls

Council has identified **two** locations where undermining of the road edge due to repeated adverse weather events has presented itself.

If no action is taken to arrest pavement loss, sections of these roads will be reduced in width; firstly to single lane operation, then followed by total loss of access.

Both these locations are situated on the '*Manawatū Scenic Route*', **a formally recognised - and key tourism - route** for our district and the wider region.

Both these roads traverse escarpments, meaning that there is an embankment or cliff above to one side of the road, and below the other. This arrangement precludes the option of 'retreating' (i.e., realigning the road further away from the eroded bank) without incurring significant cost and land purchase(s) to do so.

It is recommended that retaining walls are installed to prevent further erosion, reinstate the road width and improve the resilience of these roads:

Road	GT	Location
Main South Road	7	2.6km North of Table Flat Road
Te Parapara Road	7	3.8km West of Rangiwahia Road

Figure 127 | Proposed retaining wall locations

Programme | Bridges, major culverts, and structures investment focus

Focus remains on meeting the expectations regarding comfort, travel efficiency, and safety for our customers. Keeping our structures operational and capable of handling both increasing traffic demand and severe weather events is our top priority.

Maintenance

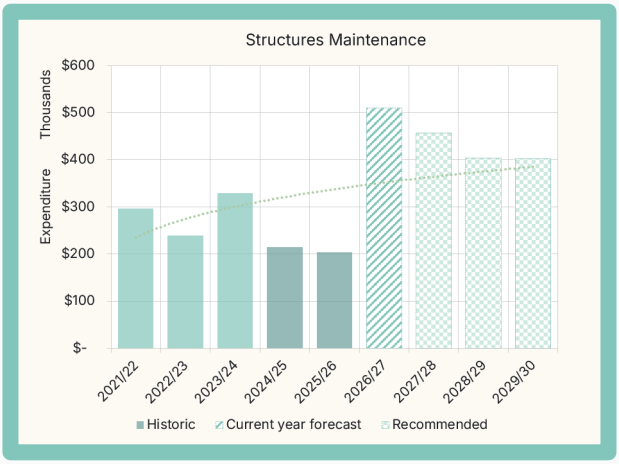


Figure 128 | Historic and recommended expenditure, structures maintenance

We currently spend **$225 per km** on structures maintenance. Given the high variability in the existence of structures between individual RCAs, there is **no peer group average expenditure**.

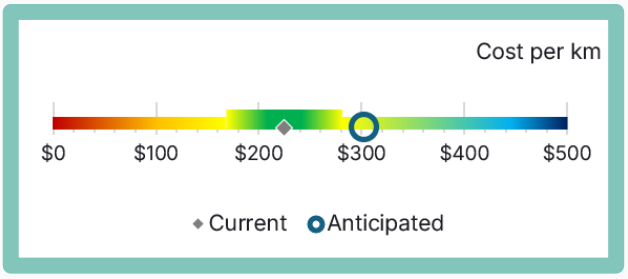


Figure 129 | Projected spend per km, structures maintenance

Recommended investment has increased from historic levels, partly as a result of repairs required to components deteriorating in recent severe weather events, but not qualifying for Emergency works funding.

Renewals | Component replacements

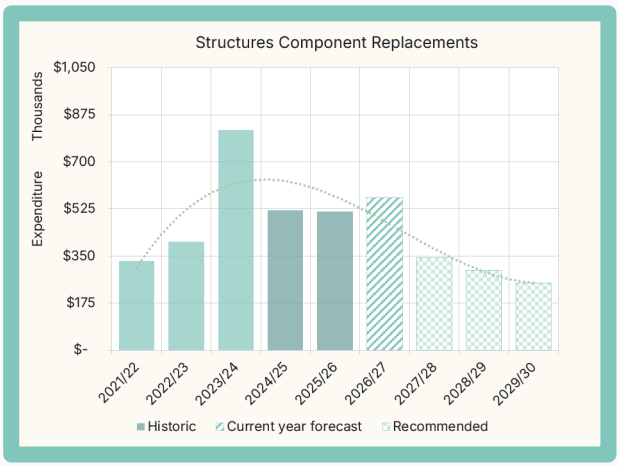


Figure 130 | Historic and recommended expenditure, structures component replacements

We currently spend **$582 per km** on structure components. Given the high variability in the existence of structures between individual RCAs, there is **no peer group average expenditure**.

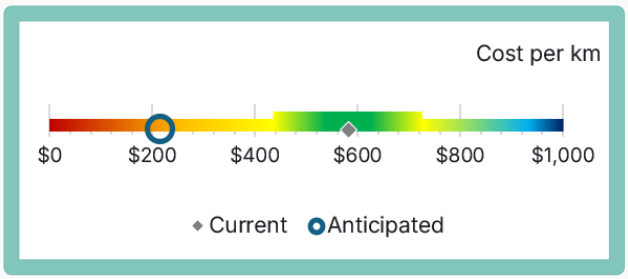


Figure 131 | Projected spend per km, structures component replacements

Recommended investment has reduced from historic levels; Previous programmes have sufficiently managed and reduced demand for this funding period.

Renewals | Bridge and structures renewals

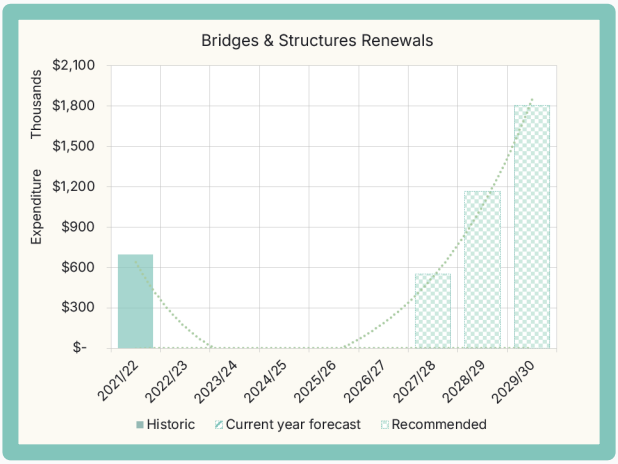


Figure 132 | Historic and recommended expenditure, bridge replacements

Note: Due to the nature and intermittent timing of this activity, bridges & structures renewals are not assessed against peer group RCAs.

Improvements | Low cost, low risk

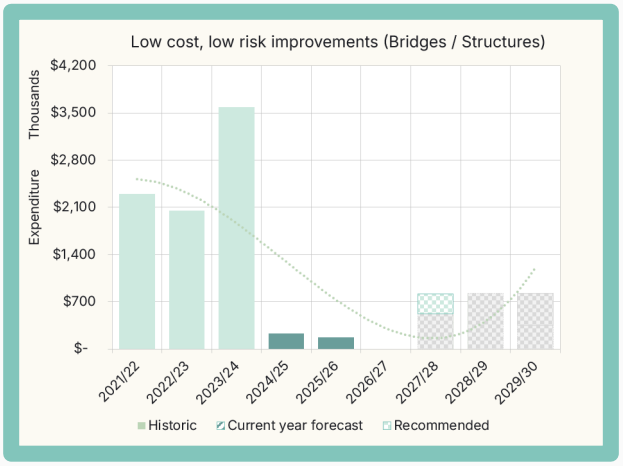


Figure 133 | Historic and recommended expenditure, low cost, low risk improvements [15]

Note: Due to the nature and intermittent timing of this activity, bridges & structures improvements are not assessed against peer group RCAs.

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	Extreme	Moderate decline	-5.06
Minimum	0.93	0.69	-	High	Gradual decline	-3.44
Optimal	1.25	3.52	0.29	Medium	Gradual improvement	0.00
Enhanced	1.25	4.22	0.29	Low	Gradual improvement	-

Figure 134 | Programme consequence assessment, bridges & structures

[15] *Expenditure in grey is related to low cost, low risk network services and resilience improvements, identified under sections 2.14.8 and 2.14.9 respectively.*

Bridges and Major Culverts		Investment activity option/s			
Benefit	KPI	Defer all maintenance and renewal activities	Maintain and renew only after asset failure/s evident	**Maintenance and renewals, based on LCMP recommendations**	Replace and upgrade bridges proactively
Efficient network		-	-	-	-
		No	No	Probable	Probable
Resilient network		No	Unlikely	Probable	Probable
		No	Unlikely	Probable	Yes
Safe network		Unlikely	Unlikely	Unlikely	Probable
Growth		No	No	Unlikely	Yes
KPI Alignment					
Selected Option				▲	

Figure 135 | Performance consequence assessment, bridges and structures

2.14.6 Drainage

We look after numerous drainage assets to manage surface and subsurface water within our road corridors. Drainage assets include roadside open channels, culverts, kerbs, and catchpits, which preserve pavement integrity, improve road safety, and minimise erosion and flooding.

Key functions

Stormwater Management | Drainage assets help channel stormwater away from road surfaces, preventing pooling, flooding, and washouts

Accessibility | Drainage assets help maintain network access during and after severe weather by redirecting water safely along, under, and away from roads to prevent road closures

Pavement Life | Drainage assets help maintain the integrity of road pavements, reducing premature failure by minimising water-related damage

Road related drainage assets

Our road network utilises various drainage systems to effectively manage stormwater and prevent flooding. These systems are crucial for maintaining road safety and protecting the surrounding environment.

Drainage asset type	Count	Length (km)
Open channel	8,392	2,334
Culvert	4,507	58
Kerb and channel	1,979	195
Catchpit	1,700	-
Chamber	209	-
Total	**16,787**	**2,587**

Figure 136 | Drainage asset quantities

Open channel drainage systems

Open channel drains generally comprise shallow, vegetated ditches designed to manage stormwater runoff. These channels are typically constructed from natural earth, and the majority are located to the rural portion of our network.

Asset data | Open channels

Open channels are maintained to retain the desired invert level and grade. In essence, the asset remains in place in perpetuity and its age is not monitored.



Figure 137 | Open channel condition rating

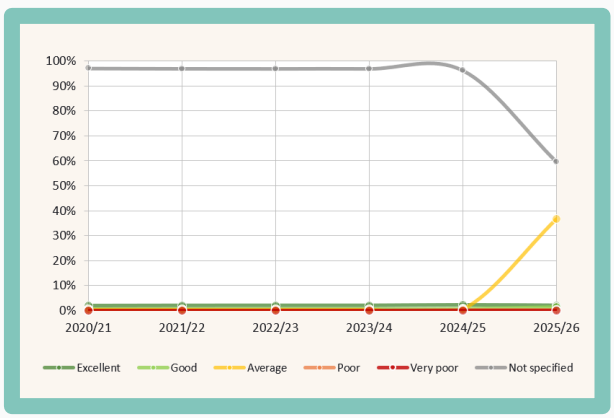


Figure 138 | Open channel condition trend

Culverts

Minor culverts (less than 3.4m^2 in cross-sectional area) generally consist of small-diameter structures designed to channel water under roads and paths, and are essential for maintaining proper drainage in road corridors.

Asset data | Culverts

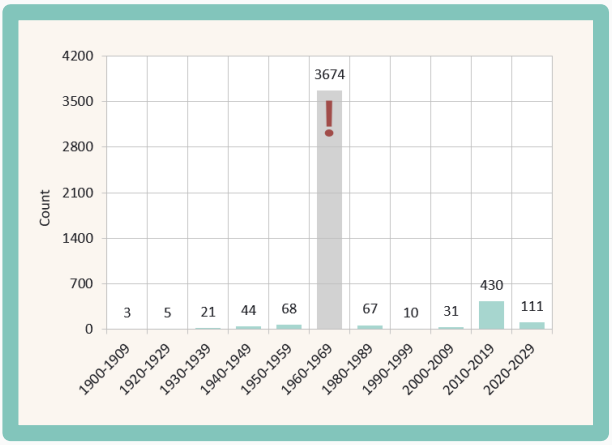


Figure 139 | Culvert asset distribution by age



Figure 140 | Current culvert condition rating

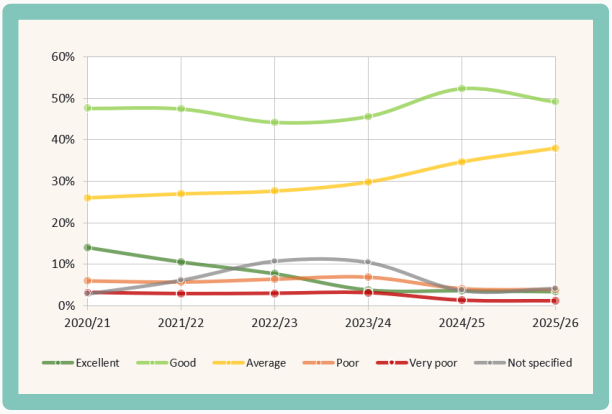


Figure 141 | Culvert condition trend

Kerb and channel

Kerbs and channels are engineered assets (usually constructed from concrete) that are installed along the sides of roads. As well as directing surface water into piped stormwater systems, they also serve as physical separation between the roadway and adjacent areas.

Asset data | Kerb and channel

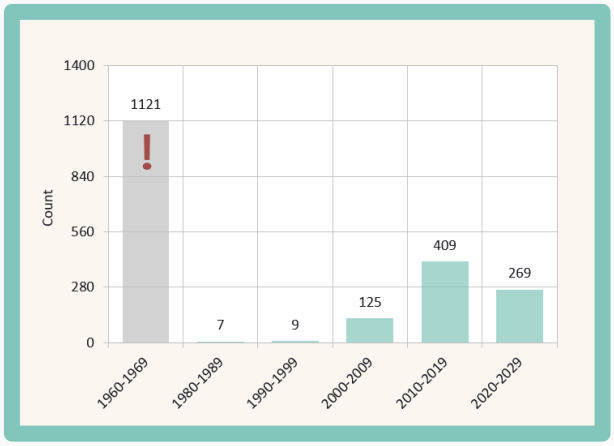


Figure 142 | Kerb and channel distribution by age



Figure 143 | Kerb and channel condition rating

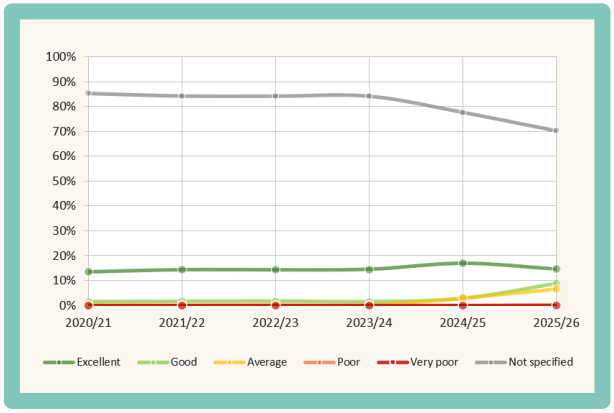


Figure 144 | Kerb and channel condition trend

Catchpits

Catchpits are specialised drainage systems located within road corridors, most commonly connected to the kerb and channel network. They are designed to capture and retain debris from surface water runoff before entering piped stormwater systems that are managed by the water services provider.

Asset data | Catchpits

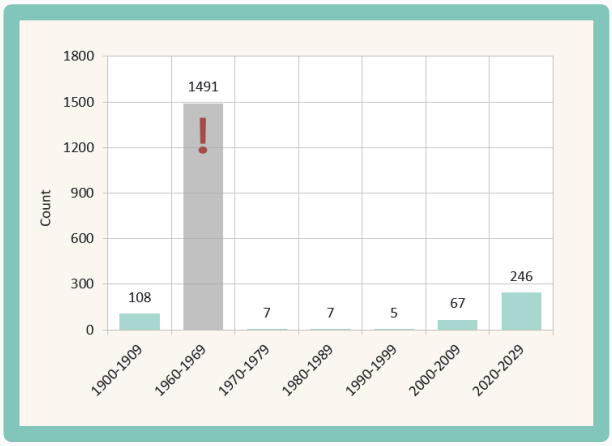


Figure 145 | Catchpit distribution by age



Figure 146 | Catchpit condition rating

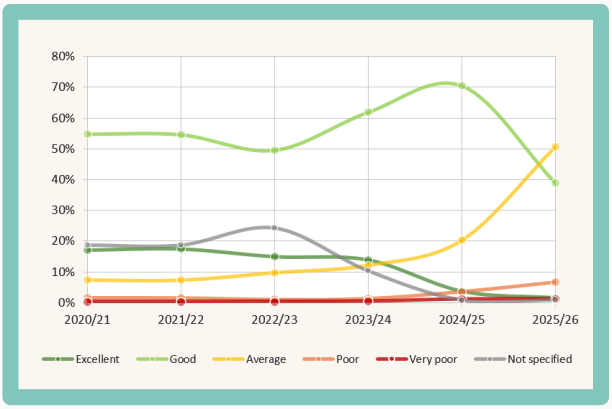


Figure 147 | Catchpit condition trend

Key observations

Open channels | Recent improvement in open channel data collection has been achieved, reducing the unknown condition rating of this asset by 40%; Continuing inspections to complete this work is recommended.

Culverts | A large proportion of assets have been allocated generic installation dates (typically 1965) due to lack of accurate, historic data when the asset database was initially populated. Whilst replacement of these assets will – over time – increase the accuracy of age related data, investigation and updating of this dataset is recommended.

Kerb and channel | Similar to culverts, a large proportion of assets have been allocated generic installation dates. Investigation and updating of this data aspect is recommended. A full condition survey is also recommended in order to develop a sustainable forward work programme in time for the next AMP.

Catchpits | In the same vein as culverts and kerbs, generic installation dates require investigation and updating where possible.

Drainage defects and management activities

Defects present themselves throughout the life of drainage assets due to usage and the environment.

These defects tend to increase in severity over time, impacting on the comfort, travel time reliability, and safety of our road users. Common defects and consequences are detailed below, along with maintenance, renewal, or improvement actions.

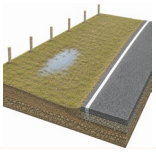
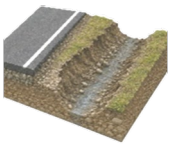
Open channel defects	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Ponding 	Insufficient or misaligned invert grade	Ground water impacting pavement integrity	Reduced journey comfort	Reduced pavement life	Reprofile invert to consistent grade	-	-
Ineffective drain 	Insufficient invert depth	Flooding, Ground water impacting pavement integrity	Reduced journey comfort	Reduced pavement life	-	-	Create new swale
Scour (lateral) 	Soft or insufficiently compacted material	Undermining	Reduced berm width	Injury, Loss of asset	Reprofile and compact swale batter	-	-
Scour (vertical) 	Steep invert grade, High water velocity	Loss of trafficable shoulder	-	Loss of pavement	Reprofile invert	-	Scour protection
Overgrowth 	Reduced capacity	Flooding, Ground water impacting pavement integrity	Reduced visibility	Reduced pavement life	Mowing, Spraying	-	-

Figure 148 | Open channel drainage defects and management activities

Culvert defects	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Displacement 	Insufficient soil compaction, Subgrade scour	Surface cracking, Potholes, Forced vehicle deviation	Reduced journey comfort	Loss of pavement life, Injury, Vehicle damage	Realign	-	-
Deformation 	Insufficient strength, Overstress	Pavement roughness, Forced vehicle deviation	Reduced journey comfort	Injury, Vehicle damage	-	Replace	-
Cracking 	Life expiry, Subgrade scour	Surface cracking, Potholes, Forced vehicle deviation	Reduced journey comfort	Loss of pavement life, Injury, Vehicle damage	Crack seal or sleeve	Replace	-

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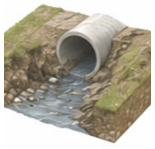
Culvert defects	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Undercapacity 	Insufficient cross-sectional area, Inappropriate catchment	Overtopping, Scour, Forced vehicle deviation	Loss of access	Detour, Loss of pavement, Injury	-	-	Upgrade capacity, install additional culverts
Sediment build up 	Reduced capacity	Overtopping, Scour, Forced vehicle deviation	Loss of access	Detour, Loss of pavement, Injury	Remove material	-	Upgrade capacity
Blockage 	Reduced capacity	Overtopping, Scour, Forced vehicle deviation	Loss of access	Detour, Loss of pavement, Injury	Remove material	-	-
Scour 	Misaligned water flow, Insufficient capacity	Loss of trafficable shoulder, Forced vehicle deviation	Reduced road width	Injury	Reinstate scoured material	-	Install new apron, headwall, wingwall

Figure 149 | Culvert defects and management activities

Kerb & Channel defects	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Cracked/displaced 	Overstress, Poor construction	Water ingress, Tripping	-	Injury, Loss of pavement life	Crack fill (isolated)	Replace	-
Spalled 	Material life expiry, Overstress	Water ingress, Slipping	-	Injury	Repair (isolated instances)	Replace	-
Blocked/debris 	Reduced capacity	Ponding in wet weather	Property flooding		Sweep	-	-
Growth 	Cracked kerb or channel	Ponding in wet weather, water ingress	Property flooding	Loss of pavement life	Spray	-	-

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Kerb & channel defects	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Ponding 	Misaligned grade	Forced vehicle deviation	Property flooding	Injury	-	Replace (at required grade)	-
Eroded 	Material life expiry	Water ingress	-	Loss of asset	-	Replace	-
Grate blockage 	Reduced capacity	Ponding in wet weather, Slipping	Property flooding	Injury	Sweep	-	-
Sump debris 	Reduced capacity	Ponding in wet weather	Property flooding		Remove debris	-	-
Broken grate 	Material life expiry, Overstress	Tripping, Forced vehicle deviation	-	Injury, Vehicle damage	-	Replace	-
Damaged surround 	Material life expiry, Overstress	Forced vehicle deviation	-	Vehicle damage, Loss of asset	Repair (minor damage)	Replace	-

Figure 150 | Kerb and Channel / catchpit defects and management activities

Maintenance | Culverts

Inspections

Culverts are inspected for condition on a 1-in-3 year basis, with visual checks made in-between:

Inspection	Count	Frequency	Per month
Visual	3,005	Annual	250
Condition	1,502	Tri-annual	125
	4,507		**375**

Figure 151 | Culvert inspection frequency

Inlet/outlet clearing

Culvert inlets and outlets are critical locations that need to be maintained in order for the drainage system to function efficiently. Keeping the inlets and outlets clear of debris is a regular, cyclic activity across the 4,490 culverts distributed across our district.

Maintenance | Swale invert profiling

Due to natural hydraulic processes, swale drains naturally erode or scour, often unevenly, over time. Maintaining a steady invert grade between collection and discharge points (i.e., from the road into culverts, waterways, or other drains) ensures that water is conveyed away from the road effectively, maintaining our pavements and maximising their life.

We anticipate **5% length** of our drains require profile treatment each year, equating to **117km**.

Maintenance | Kerb and channel

The majority of kerb and channel assets are situated in our urban locales. There are isolated sections of rural kerb, channel, or bunding, installed to manage surface water where - for example - a steep bank in close proximity to a road edge prevents an adequate swale from being constructed.

Rural kerb sweeping

An annual sweep is expected to ensure any rural kerb, channel or bund remains operational. There are approximately 50 locations around the district, comprising a total of 17km length.

Street sweeping

Keeping channels clear of debris prevents surface water from accumulating on the road and potentially damaging adjacent property.

In addition to the regular programme, Council anticipates the need for spot sweeping to critical channels where the existing stormwater systems suffer from capacity limitations. This is expected during autumn to ensure leaf litter is removed in a timely manner, and before heavy rainfall events.

To this end, two additional sweeps to Feilding's tree lined avenues are anticipated, equating to an additional length of **16km** per annum.

	Length (km)	Frequency	km per annum
Urban	178	4	712
Targeted	8	2	16
Rural	17	1	17
Total	203		**745**

Figure 152 | Annual sweeping length and frequency

In comparison to the previous funding cycle, this regular programme equates to **a reduction of 1,391km** (or **65%**) sweeping length per year, whilst expecting to maintain current Level of Service.

Miscellaneous

Cleaning is also carried out to channels situated to the rear of grassed berms and through vehicle grates. This activity is managed under instruction from our Engineers. Minor repairs to catchpit / chamber surrounds are managed similarly.

Maintenance | Catchpit cleaning

Similar to kerb and channel sweeping, keeping catchpits clear of debris is critical to their continued operation. Catchpits are cleared on an annual basis throughout the district. The majority of assets are located to Feilding:

Locale	Feilding	Wider district	Count
Urban	1,529	86	1,615
Rural	-	85	85
Total	1,529	171	1,700

Figure 153 | Catchpit quantity and distribution

Maintenance | Mowing and spraying

These activities, while maximising the performance of our surface water channel drainage systems, are managed under environmental maintenance. See section **2.14.9**.

Renewals | Asset replacement

Culverts

The latest condition data indicates that **3.9%** of culverts are 'poor' and **1.2%** as 'very poor'.

ONF GT	Poor	Very Poor	Total
GT3	-	-	-
GT4	5	2	7
GT5	10	1	11
GT6	33	7	40
GT7	41	10	51
GT8	83	38	121
Total	172	58	230

Figure 154 | Culverts with poor or very poor condition, by GT classification

Key observation

58 culverts on our road network require replacement in the 1-3 year programme. This equates to **19** asset replacements each year.

A further programme extending from years 4 to 10 is recommended to address culverts identified as being in poor condition, equating to **24** assets being renewed each year.

This recommendation is an increase on the previous five year achievement, which has averaged just **10** asset replacements a year (or **0.2%** per annum).

Kerb and channel

The latest condition data indicates that **<1%** of kerb and channel is in poor condition, but **68%** remains 'unknown'.

ONF GT	Poor (km)	Unknown (km)	Total (km)
GT3	-	<1	<1
GT4	<1	17	17
GT5	-	20	20
GT6	-	28	28
GT7	-	40	40
GT8	-	29	29
Total	<1	134	134

Figure 155 | Kerb and channel with poor or unknown condition, by GT classification

Key observation

It is recommended that **170m** per annum (or **0.1%**) of **poor condition kerb and channel is replaced in the 1-3 year programme**.

The unknown portion of this asset group requires assessment for inclusion in future programmes.

Catchpits and chambers

The latest condition data indicates that **1.3%** of catchpits are in very poor condition, and **6.3%** are in 'poor condition'.

ONF GT	Poor	Very Poor	Total
GT4	21	4	25
GT5	10	3	13
GT6	22	5	27
GT7	33	8	41
GT8	21	2	23
Total	107	22	129

Figure 156 | Catchpits with poor or very poor condition, by GT classification

Key observation

22 catchpits on our road network require replacement in the 1-3 year programme. This equates to **7** asset replacements each year.

A further programme extending from years 4 to 10 is recommended to address catchpits identified as being in poor condition, equating to **15** assets being renewed each year.

This recommendation is an increase on the previous five year achievement, which has averaged just **1** asset replacement a year (or **0.06%** per annum).

Improvements | New or upgraded assets

Construction of new swale drains, new kerb and channel, rock lining of steeper grades, or provision of new culverts is not anticipated for the life of this AMP (excluding assets vested to Council as a result of development activities).

Programme | Drainage investment focus

Keeping our drainage systems operational, capable of handling severe weather events, and maximising the life of our most valuable assets (i.e., our pavements and sealed surfaces) is our top priority.

Maintenance

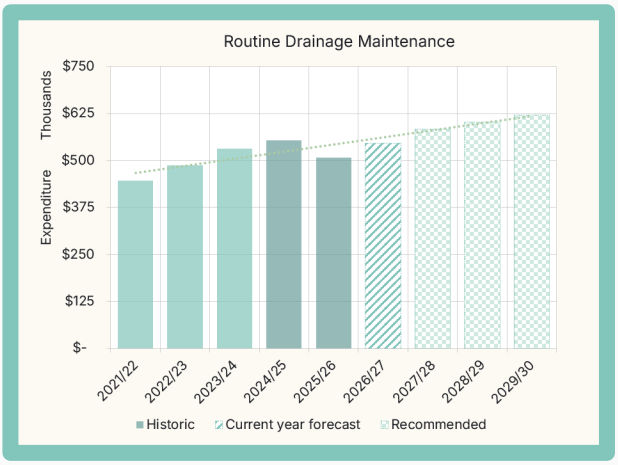


Figure 157 | Historic and recommended expenditure, drainage maintenance

We currently spend **$382 per km** on routine drainage maintenance, whereas our **peer group average spend sits at $601 per km**.

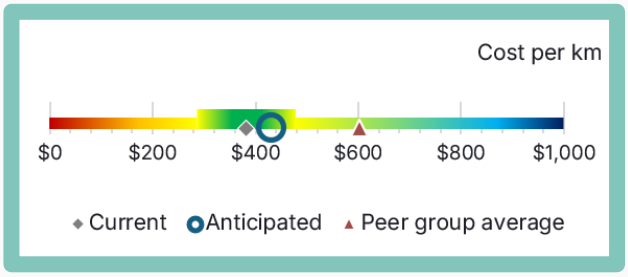


Figure 158 | Projected spend per km, drainage maintenance

Recommended investment remains at a level commensurate with historic expenditure and remains below **current** average peer group investment, whilst aiming to improve our current drainage asset condition data and performance.

Renewals

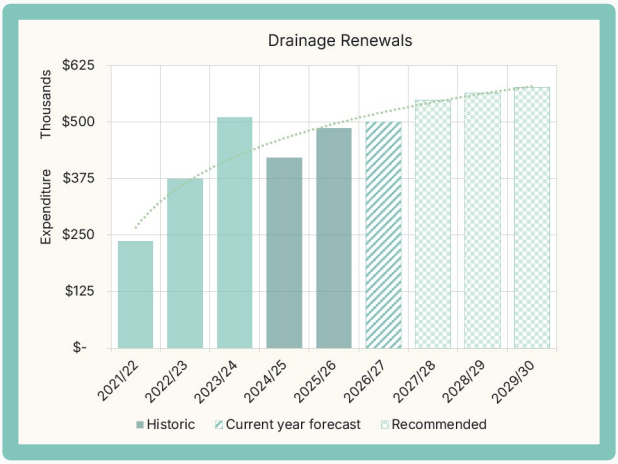


Figure 159 | Historic and recommended expenditure, drainage renewals

We currently spend **$312 per km** on drainage renewals. whereas our **peer group average spend sits at $491 per km.**



Figure 160 | Projected spend per km, drainage renewals

Recommended investment remains at a level commensurate with historic expenditure, and remains below the **current** average for our peer group. This programme will improve our drainage asset portfolio and reduce impacts from future severe weather events.

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	Extreme	Rapid decline	-3.46
Minimum	1.61	0.84	-	High	Moderate decline	-1.02
Optimal	1.79	1.68	-	Medium	Gradual improvement	0.00
Enhanced	2.32	1.95	-	Low	Gradual improvement	-

Figure 161 | Programme consequence assessment, drainage

Drainage		Investment activity option/s			
Benefit	KPI	Defer all maintenance and renewal activities	Maintain and renew only after asset failure/s evident	**Maintenance and renewals, based on available evidence**	Replace and upgrade engineered drainage systems proactively
Efficient network		Yes	Unlikely	Probable	No
		No	No	Unlikely	Yes
Resilient network		No	No	Probable	Yes
		No	Unlikely	Probable	Yes
Safe network		No	Unlikely	Unlikely	Probable
Growth		No	No	Probable	Yes
KPI Alignment					
Selected Option				▲	

Figure 162 | Performance consequence assessment, drainage

2.14.7 Pathways

Pathways serve as designated routes for pedestrians, cyclists, and mobility aided users, providing safe passage away from vehicular traffic. They promote non-vehicular modes of transport, enhance recreational opportunities, and connect communities to essential facilities such as schools, parks, and public transport.

Key functions

Safety | Pathways are designed to provide safe routes for pedestrians and mobility aided users, ensuring they can travel without the risk of slipping or tripping

Environmental | Pathways can help decrease reliance on motor vehicles, contributing to lower traffic congestion and pollution

Connectivity | Pathways facilitate connections between neighbourhoods and services, enhancing community interaction and mobility

Asset Profile

Footpath Type	Area (m^2)	Length (m)	% Length
Tile border AC Panel	1,073	312	<1
Asphaltic Concrete	54,315	20,965	13.4
Concrete	177,671	124,441	79.8
Interlocking block	6,215	1,337	<1
Limestone	5,546	2,213	1.4
Metal	5,605	3,150	2.0
Tiled herringbone	5,294	1,075	<1
Chipseal	5,853	2,460	1.6
Total	**261,570**	**155,953**	100.0

Figure 163 | Pathway type distribution

The majority of the district's paths are constructed from concrete (≈80%), and primarily located throughout our urban locales.

Locale	Footpath length (m)	Shared path length (m)	Total length (m)	% Length
Urban	138,111	333	138,444	88.7
Rural	10,223	7,286	17,509	11.3
Total	**148,334**	**7,619**	**155,953**	**100.0**

Figure 164 | Pathway use distribution

Performance trends

An important measure of the performance of our footpaths is the receipt - and response to - customer reports of pathway defects.

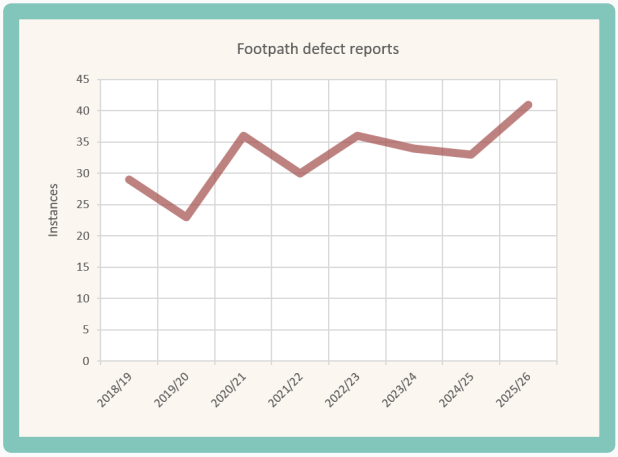


Figure 165 | Trend of path defects reported by customers

Key observation

Reports of path defects show a gradual upward trend, indicating persistent, negative impacts for our customers in safety, journey comfort, and reliability.

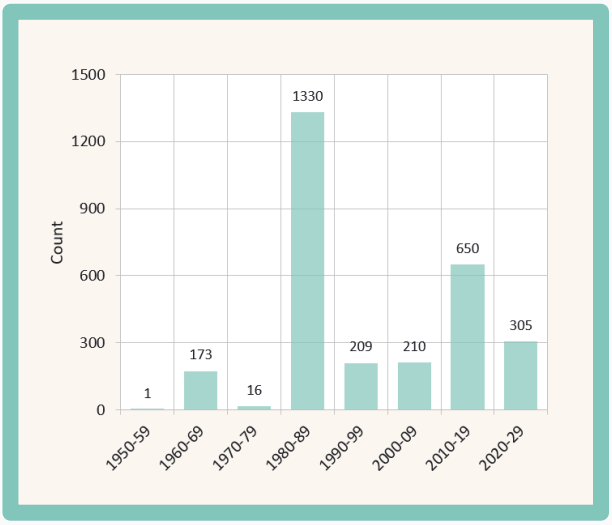


Figure 166 | Pathway asset age profile by count

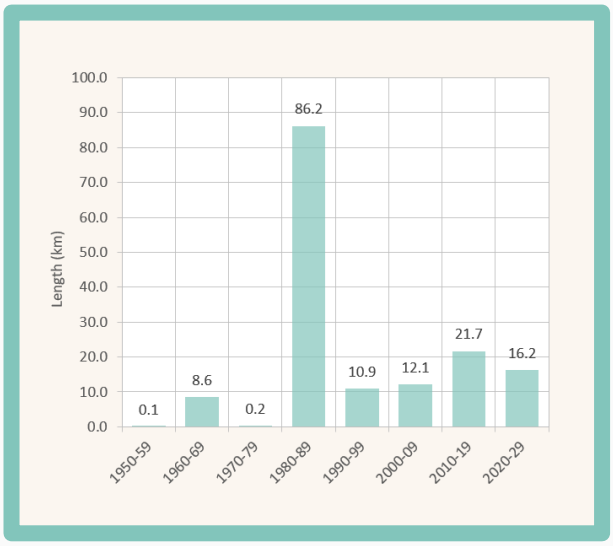


Figure 167 | Pathway asset age profile by length



Figure 168 | Current pathway condition rating

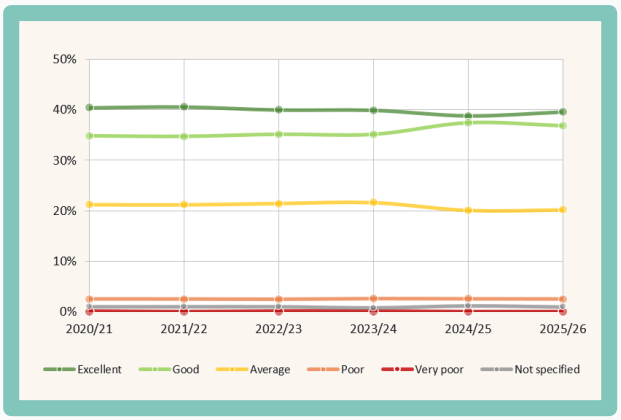


Figure 169 | Pathway condition trend

Note: Condition assessments do not consider fitness-for-purpose, only physical condition.

Key observation

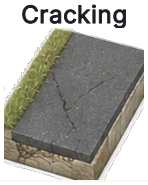
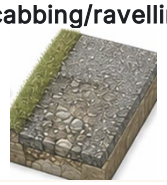
The latest data indicates that **less than 0.1%** of paths have a condition assessed as 'very poor' and **2.5%** as 'poor', equating to **4km** length.

A large proportion of pathway assets, constituting 86km (or **41%** of length), expect to reach the end of their useful life between 2035 and 2045.

In combination with the evidenced condition profile, development of a Forward Work Programme is recommended to smooth out this theoretical peak, reflecting actual asset performance and realistic renewal demand.

Path defects and management activities

Defects present themselves throughout the life of pathway assets due to usage and the environment. Some of these defects tend to increase in severity over time, impacting on the comfort, travel time reliability, and safety or mobility of our customers. Common defects and consequences are detailed on the following pages, along with maintenance, renewal, or improvement actions.

Defect	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Settlement 	Localised basecourse compression, Water ingress	Tripping	-	Injury	Lip grind, Reseat	-	-
Bumpiness 	Poor construction, Heave	Tripping	Reduced journey comfort	Injury	-	Reconstruct, Resurface	-
Depressions 	Poor construction, Water ingress	Tripping	Reduced journey comfort	Injury	Fill, Patch repair	Reconstruct	-
Cracking 	Variable basecourse stiffness, Shrinkage	-	-	Reduced asset life	Crak seal, Patch repair	Reconstruct	-
Root action 	Inappropriate street planting	Tripping	Reduced journey comfort	Injury, Reduced asset life	-	Reconstruct	Reroute, Bridge
Scabbing/ravelling 	Poor construction, Aged material	Slipping	Reduced journey comfort	Injury	Patch repair	Reconstruct, Resurface	-
Potholes 	Water ingress, Reduced basecourse strength (localised)	Tripping	Reduced journey comfort	Injury, Reduced asset life	Fill, Patch repair	-	-
Overgrowth 	Water ingress, Change in use	Slipping, Tripping	Reduced journey comfort	Injury, Reduced asset life	Spray, Mow	-	-
Insufficient width (inherent) 	Substandard design	Forced deviation	Accessibility deterrence	Exclusion	-	-	Widen

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Defect	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Insufficient width (obstruction) 	Substandard design	Forced deviation	Accessibility deterrence	Exclusion	-	-	Reroute, Widen
Variable camber 	Substandard design	Slipping	Accessibility deterrence	Exclusion, Injury	-	Resurface	Realign
Crossing deficiency 	Substandard design, Change in use	Tripping, Slipping, Forced deviation	Accessibility deterrence	Exclusion, Injury	-	Reconstruct (existing asset)	Construct (new asset)

Figure 170 | Pathway defects and management activities

Maintenance | Pathways

Inspections

The path network is inspected as a standalone activity once every three years, given that the primary deterioration process is environmental, rather consumption through use.

Footpath repairs

Condition has remained virtually static between 2020-21 and 2025-26, indicating that historic intervention has been set at a sustainable level.

However, it is recommended that this budget be increased to combat the upward trend in defects being reported by our customers.

Shared path repairs

Our shared paths are predominantly new assets, and have yet to exhibit the defects expected across a more mature network.

It is recommended to retain a nominal budget in anticipation of minor defects beginning to appear through environmental influence.

Maintenance | Mowing and spraying

These activities, while maximising the performance of our pathways, are managed under environmental maintenance. See section **2.14.9**.

Renewals | Pathways

Pathways with a 'poor' or 'very poor' rating total **4km** (or **2.6%**) length. It is recommended that these paths be renewed over a 15-year programme, equating to an average annual achievement of **0.17%** (or **267m** per annum)

This is an increase on the historic five year achievement of **0.06%** (or **93m** per annum).

Programme | Pathways investment focus

A minimal, primarily reactive programme has been developed, continuing from previous funding cycles.

Our focus is to mitigate the gradual upward trend of footpath related defects impacting our customers, and maintain or improve resident satisfaction of the existing pathway network.

Maintenance | Footpaths

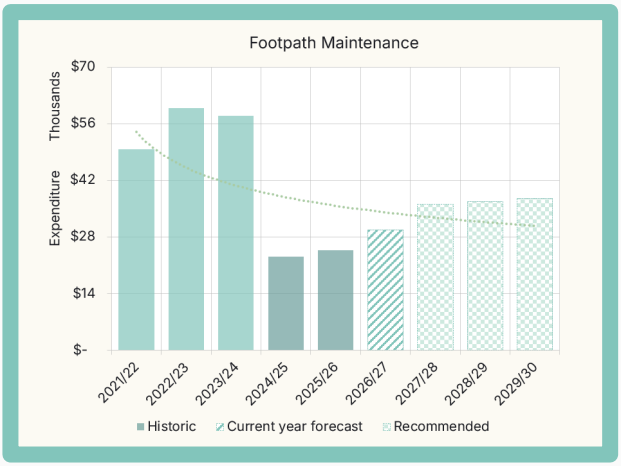

Figure 171 | Historic and recommended expenditure, footpath maintenance

We currently spend **$174 per km** on footpath maintenance. Given the high variability in the existence of footpaths between individual RCAs, there is **no peer group average expenditure**.

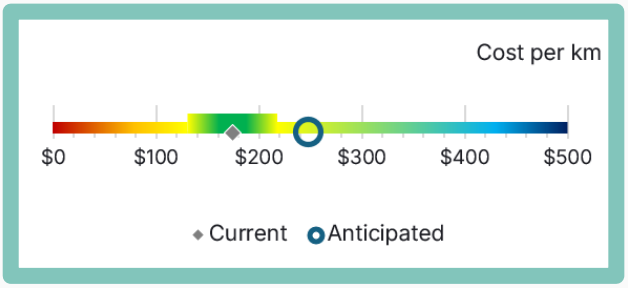

Figure 172 | Projected spend per km, footpath maintenance

Recommended investment has increased slightly compared to the previous funding cycle, but remains well below the preceding period, and aims to improve our customer satisfaction.

Maintenance | Cycle paths

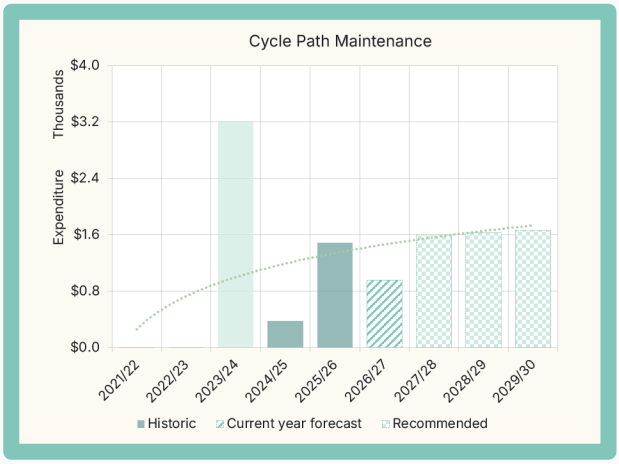

Figure 173 | Historic and recommended expenditure, cycle path maintenance

We currently spend **$125 per km** on cycle path maintenance. Given the high variability in the existence of cycle paths between individual RCAs, there is **no peer group average expenditure**.

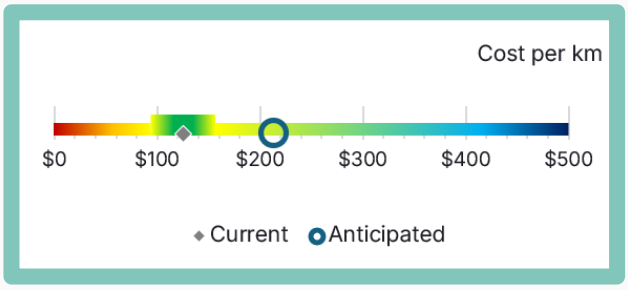

Figure 174 | Projected spend per km, footpath maintenance

It is recommended to increase the investment to facilitate reactive maintenance capability (in a limited capacity) to minor defects that may appear in the next three years.

Renewals | Footpaths

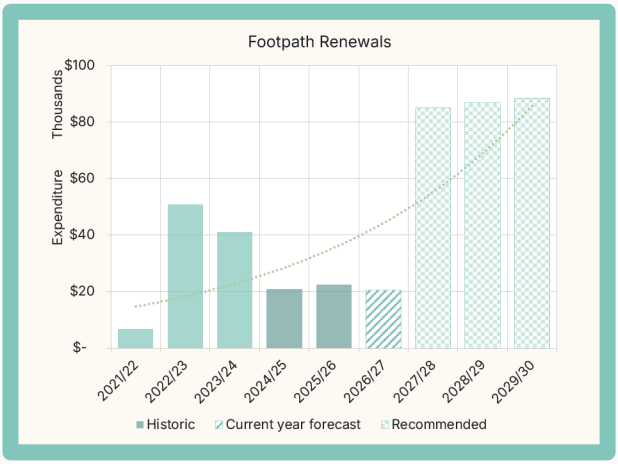

Figure 175 | Historic and recommended expenditure, footpath renewals

We currently spend **$144 per km** on footpath renewals. Given the high variability in the existence of footpaths between individual RCAs, there is **no peer group average expenditure**.

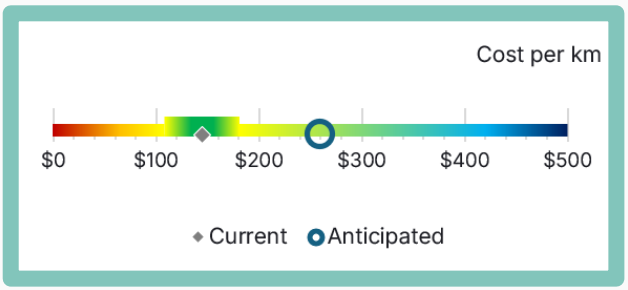

Figure 176 | Projected spend per km, drainage renewals

Increased investment is recommended for this activity to compensate for historic underspend, and improve the quality of our poorest performing sections of the footpath network.

Renewals | Cycle paths

Given the recent inception of paths of this nature on our network, no renewals are anticipated for the life of this, or near future, AMPs.

Improvements | Pathways

Council has identified **one** improvement project for a new footpath to be installed as a result of urban expansion:

- Ranfurly Road, on the outskirts of Feilding

This project is to be funded entirely from Council's **non-subsidised budget**, and does not impact the National Land Transport Fund.

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	High	Moderate decline	-0.53
Minimum	0.11	0.26	-	Medium	Gradual decline	-0.16
Optimal	0.17	0.36	-	Low-medium	Stable	0.00
Enhanced	0.22	0.54	-	Low	Gradual improvement	-

Figure 177 | Programme consequence assessment, pathways



Figure 178 | Performance consequence assessment, pathways

2.14.8 Network services

We manage many assets collectively known as 'network services'. These comprise facilities that help our customers negoiate the network day-to-day, including roadmarkings, pavement and roadside markers, signage, streetlights, roadside barriers, railings, and other devices that contribute to their journey efficiency and safety.

Key functions

Safety | Barriers help protect drivers, pedestrians, and cyclists by guiding traffic and mitigating injury severity in the event of accidents

Visibility | Streetlights and roadmarkings improve visibility for road users, especially during nighttime or adverse weather conditions

Efficiency | Services such as signs assist road users, ensuring that vehicles can navigate the network safely and efficiently

Key observation

Edge Marker Posts (EMPs) are not currently recorded as capitalisable assets and are therefore not managed outside of maintenance activities.

It is recommended that a network assessment be completed to determine the true quantity of EMPs we currently manage, and determine the gaps in our network where future presence of EMPs is required to provide consistent corridor delineation, **as per the recommendation in the latest NZTA technical audit**.

Network services related assets

Our road network utilises a wide array assets that comprise network services. These systems are crucial for maintaining road safety, facilitating efficient travel, and providing comfortable environments for our customers to live and work.

Service asset type	Asset count	Length (km)
Signs	11,092	-
Roadmarking	7,419	861.9
Pavement markers	14,646	135.6
Barriers	350	10.8
Railings	1,454	20.3
Streetlights & poles	2,941	-
Edge Marker Posts	Unknown	Unknown
Total	**37,902**	**1,028.6**

Figure 179 | Network services asset quantities

Performance trends

An important measure of the performance of our network services is the receipt - and response to - customer reports of defects comprising signage, streetlights, and barriers or railings.

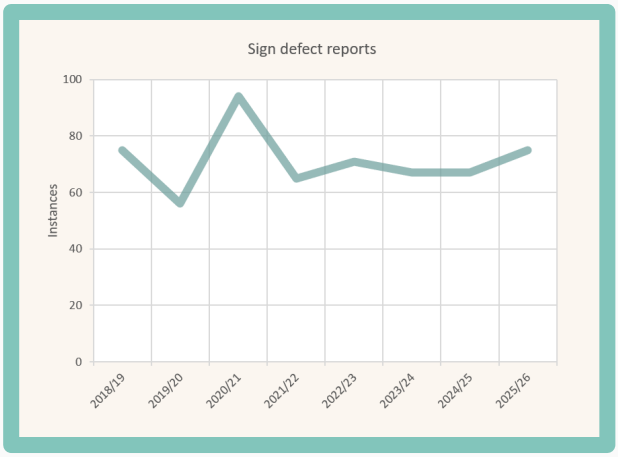

Figure 180 | Trend of signage defects reported by customers



Figure 181 | Trend of streetlight defects reported by customers

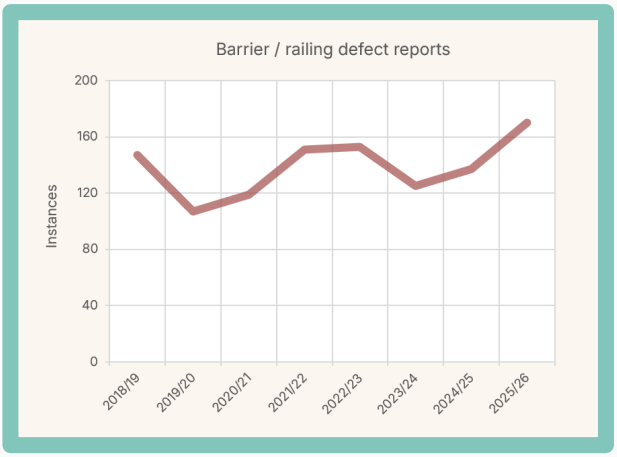

Figure 182 | Trend of barrier / railing defects reported by customers

Key observation

Whilst reports of signage defects are - on the whole - stable, increasing reports of streetlight defects indicate that maintenance and renewal of this asset sub-group should be a focal point.

The increasing trend in barrier and railing defects is less pronounced than streetlights, but also indicates that management of these assets – including investigation into adequacy or effectiveness – should be addressed.

Asset Data | Signage

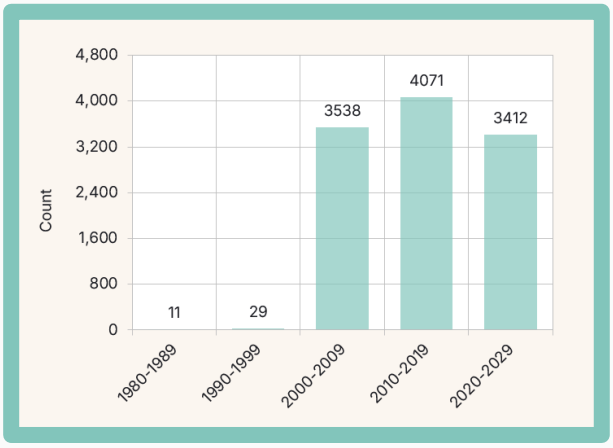

Figure 183 | Signage asset age profile by count



Figure 184 | Current signage condition rating

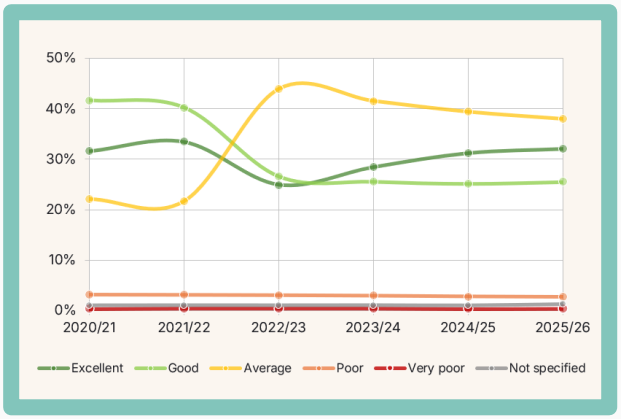

Figure 185 | Signage condition trend

Key observation

The latest data indicates that **0.4%** of signs have a condition assessed as 'very poor' and **2.7%** as 'poor', equating to **347** assets.

Asset data | Streetlights

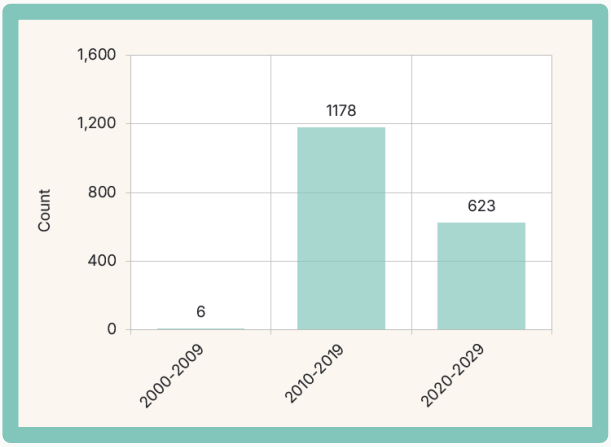

Figure 186 | Luminaire asset age profile by count



Figure 187 | Luminaire condition rating

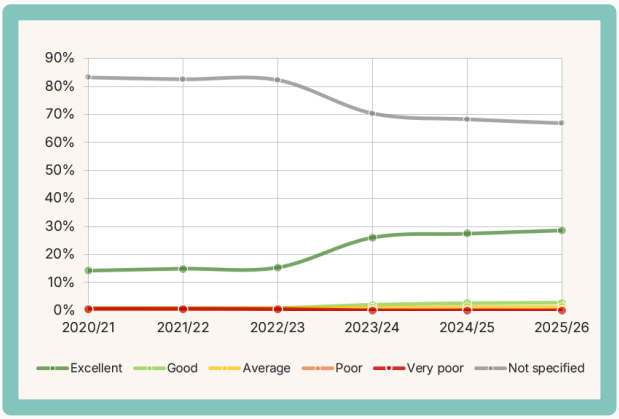

Figure 188 | Luminaire condition trend

Key observation

Recent improvement in luminaire data collection has been achieved, reducing the unknown condition rating of this asset by 16%; Continuing inspections to complete this work is recommended.

Asset data | Light poles

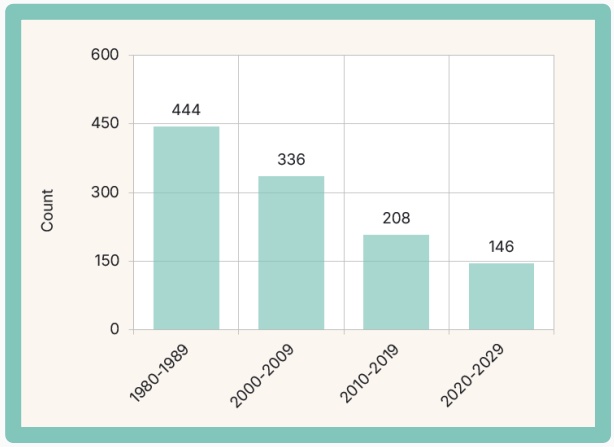

Figure 189 | Light pole asset age profile by count

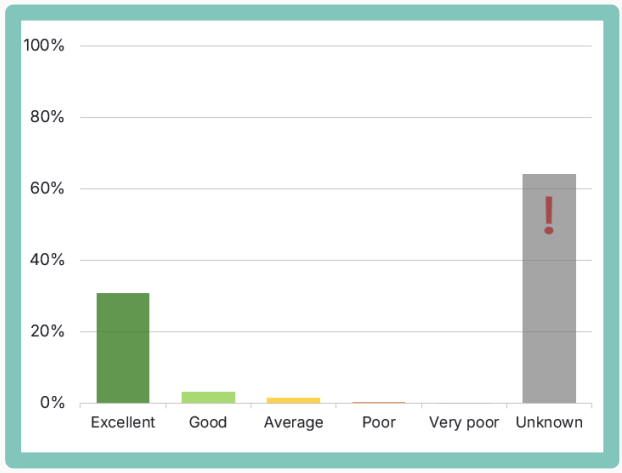

Figure 190 | Current light pole condition rating

Key observation

A full condition survey is recommended in order to develop a sustainable forward work programme in time for the next AMP, particularly given that **39%** of light pole assets will be between **40 & 50 years of age** by 2030.

Asset data | Roadmarking

Roadmarkings are renewed on an annual basis and are therefore not assessed for condition or trend, other than to report defects for remedy.

Asset data | Pavement markers

Raised Reflective Pavement Markers (RRPMs) are assessed during night audits for

effectiveness, with deficient assets identified and replaced immediately afterwards. Otherwise, RRPM's are replaced only at the time of pavement or surfacing renewals.

Asset data | Barriers and railings

Condition surveys are not regularly conducted on these assets; rather, defects noted during driveovers, or otherwise reported, will trigger maintenance or renewal activity on an ad hoc basis.

Network services defects and management activities

Defects present themselves throughout the life of these assets due to use, abuse, and the environment. Some of these defects increase in severity over time, whilst others appear rapidly. These defects impact on the journey efficiency, accessibility, and safety of our customers. Common defects and consequences are detailed on the next pages, along with maintenance, renewal, or improvement actions.

Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Obscured 	Lack of management	Ineffective driver information, Crashing	Reduced visibility	Injury	Mow, Spray	-	-
Dirty 	Lack of management	Ineffective driver information	Route negotiation	Increased travel time, Fines, Reduced asset life	Clean	-	-
Faded 	Environmental degradation, Life expiry	Ineffective driver information	Route negotiation	Increased travel time, Fines	-	Replace	Upgrade
Misaligned 	Poor ground conditions, Vandalism	Falling, Obstructing roadway, Forced vehicle deviation	-	Injury	Realign, Resecure	-	-
Missing 	Theft, Poor installation	Ineffective driver information, Crashing	Loss of route clarity	Injury, Increased travel time, Fines	-	Replace	Install new
Damaged 	Vehicle strike, Vandalism	Loss of asset	-	Injury, Reduced asset life	Reinstate (minor damage)	Replace	-

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Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
No signage 	Not installed	Lack of driver information, Crashing	-	Injury	-	-	Install new
Graffiti 	Criminal activity	Ineffective driver information, Crashing	Route negotiation, Personal safety	Injury, Reduced asset life	Clean	Replace	-

Figure 191 | Signage related defects, issues, and management activities

Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Obscured EMP 	Lack of management	Ineffective driver information, Crashing	Reduced visibility	Injury	Mow, Spray	-	-
Dirty EMP 	Lack of management	Ineffective driver information, Crashing	Loss of route clarity	Injury	Clean	-	-
Faded EMP 	Environmental degradation, Life expiry	Ineffective driver information, Crashing	Loss of route clarity	Injury	-	Replace	-
Misaligned EMP 	Poor ground conditions, Vehicle strike	Ineffective driver information	Loss of route clarity	Injury	Realign, Resecure	-	-
Broken EMP 	Vehicle strike	Instability	Loss of route clarity	Injury, Reduced asset life	-	Replace	-
No EMPs 	Not installed	Lack of driver information, Crashing	-	Injury	-	-	Install new

Table continued on next page...

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Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Worn out RRPM 	Environmental degradation, Life expiry, High use	Ineffective driver information, Crashing	Loss of route clarity	Injury	-	Replace	-
Missing RRPM 	Life expiry, Poor installation	Ineffective driver information, Crashing	Loss of route clarity	Injury	-	Replace	-
No RRPM 	Not installed	Lack of driver information, Crashing	-	Injury	-	-	Install new

Figure 192 | Delineation related defects, issues, and management activities

Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Obscured 	Debris, Spillage	Ineffective driver information	Loss of route clarity	Increased travel time	Sweep, Clear	-	-
Worn out 	Environmental degradation, Life expiry, High use	Ineffective driver information, Crashing	Loss of route clarity	Increased travel time, Fines, Injury	-	Replace	-
No markings 	Not installed	Lack of driver information, Crashing	-	Injury	-	-	Install new

Figure 193 | Roadmarking related defects, issues, and management activities

Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Damaged 	Vehicle strike	Ineffective restraint	-	Injury	-	Replace	-
Misalignment 	Component expiry, Vehicle strike, Poor installation	Ineffective restraint	-	Injury, Reduced asset life	Realign, Resecure components	Replace	-
Obscured 	Lack of management	Ineffective driver information	Reduced visibility	Increased travel time, Reduced asset life	Mow, Spray	-	-
Inappropriate terminals 	Out of date or Substandard design	Ineffective restraint	-	Injury	-	-	Upgrade to standard
No barriers 	Not installed	Lack of road user protection	-	Injury	-	-	Install new

Figure 194 | Barrier system related defects, issues, and management activities

Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Dark spots 	Substandard or out of date installation	Ineffective lighting	Personal safety, Reduced visibility	Criminal activity, Injury	-	-	Upgrade, Install new
Flag-lighting 	Not installed, Substandard installation	Ineffective driver information, Crashing	Reduced visibility	Injury	-	-	Upgrade, Install new
Light failure 	Equipment failure, Life expiry	Ineffective lighting	Personal safety, Reduced visibility	Criminal activity, Injury	Repair	Replace	-

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Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Pole corrosion / spalling 	Life expiry, Lack of protection	Collapse	Personal safety	Reduced asset life, Injury	Clean, Repair, Protect	Replace	-
Misalignment / damage 	Vehicle strike, Component failure	Collapse	Personal safety	Reduced asset life, Injury	Realign, Resecure	Replace	-

Figure 195 | Streetlight related defects, issues, and management activities

Maintenance | Network services

Inspections

Regular daylight inspections are conducted throughout the year to identify defects impacting our network services.

In addition to this inspection schedule, a specific night audit is conducted to assess low-light effectiveness of our signage, roadmarking, and delineation assets.

GT Classification	Regular inspection frequency	Night audit frequency
GT3	Weekly	Annual
GT4		
GT5	2-weekly	
GT6		2-yearly
GT7	Monthly	3-yearly
GT8		

Figure 196 | Network services inspection schedule

Mowing and spraying

These activities, while maximising the performance of our network services, are managed under environmental maintenance. See section **2.14.9**.

Signage, delineators, and barrier systems

Minor defects (graffiti, dirtiness, misalignment, etc) are dealt with during regular inspections, or when reported (whichever is earlier).

Defects requiring asset replacement are logged for instruction by our Engineers.

Streetlights

Defects identified during inspections, or otherwise reported, are logged for instruction by our Engineers on a cyclic basis.

Delineators

Dirty delineators are cleaned during regular inspections. Damaged, missing, and faded delineators are programmed and replaced on a cyclic basis.

Renewals | Network services

Roadmarking

All roadmarking is renewed on an annual basis, irrespective of ONF classification, *given its critical safety aspect*.

Signage

347 'poor' or 'very poor' signage assets on our road network require replacement. This equates to **116** asset replacements each year in the **1-3 year programme**.

In addition, it is anticipated that an additional **1%** of signs will require replacement on an annual basis due to theft, vandalism, or vehicle strike, equating to **111** assets.

This totals **227** signage replacements (or **2%** of assets) each year.

Barriers and railings

It is anticipated that **1%** of our assets require renewal through damage from vehicle strikes or asset life expiry, equating to **4** barrier assets and **14** railing assets per annum.

Streetlights

It is anticipated that **1.5%** of our assets require renewal through damage from vehicle strikes or asset life expiry, equating to **27** luminaires and **17** light pole assets per annum.

Improvements | Network services

Comprehensive analysis of crash events on the local road network is undertaken by ourselves on a continual basis, including mid-block and intersection related crashes, crash type trends, causal factors, and regional comparisons.

The recommended programmes are required to maintain **fit-for-purpose** roadmarking, signage, delineation, roadside safety barriers, and other traffic guidance assets **in accordance with the Road and Traffic Standards (RTS), and Traffic Control Devices (TCD) manuals**.

Roadmarking and pavement markers

Over time, some roads have seen increased traffic volumes and/or changes in use.

An investigation into the expected level of roadmarking and pavement marker application for our rural roads has been undertaken, with a view to their current GT classifications:

	Insufficient roadmarking & pavement marker application (km)			
ONF	Centreline	Edgeline	RRPM	ATP*
GT3	-	-	-	3.5
GT4	-	-	-	-
GT5	-	36.1	12.2	-
GT6	63.7	-	57.4	-
GT7	37.9	-	26.4	-
GT8	-	-	-	-
	101.6	36.1	96.0	3.5

Figure 197 | Quantity of network exhibiting insufficient roadmarking, by GT classification

** ATP | Audio Tactile Pavers*

Audio Tactile Pavers are small ridges applied to the edgeline and/or centreline that make a distinctive rumbling noise when driven on, alerting the driver that they have departed a traffic lane.

It is recommended to install roadmarking and pavement markers to close the gaps identified on our network through application of the TCD manual and expected Levels of Service (as detailed in section **4.5**).

An equivalent urban assessment is recommended to be undertaken to identify corridors inconsistent with the aforementioned manual and expected Levels of Service.

A list of locations prioritised by GT classification from **Figure 197** (then listed in alphabetical order) comprise:

Road	GT	Between
Colyton Road	5	SH54 and Grove Rd (PNCC)
Green Road	5	SH3 and Rongotea Rd
Kairanga Bunnythorpe Road	5	SH3 and Rongotea Rd
Rongotea Road	5	SH1 and No.1 Line Longburn
Sandon Road	5	Ranfurly Rd and Mt Biggs school
Cemetery Road	6	Mt Stewart-Halcombe Rd and Sanson
Makino Road	6	Lethbridge Rd and Stanway Rd
Mt Stewart-Halcombe / Mt Biggs Road	6	SH3 and Halcombe
Rowe / Taipo Road	6	SH1 and Green Rd
Taonui Road	6	Campbell Rd and Finnis Rd

Figure 198 | Proposed roadmarking locations

Signage and barriers

Warning signage and/or barriers are expected to be installed to sections of road corridor, or at intersections, exhibiting **high** or **medium-high** collective risk to reduce crash frequency and severity. A list of locations with such risk ratings currently comprise:

		Identified MegaMaps Risk	
Location	GT	Corridor	Intersection
Halcombe Road (passing lane to Kakariki)	4	**medium-high** to **high**	-
No.1 Line Longburn / Tiakitahuna Road	4	**medium-high**	-
Rangiotu Road / Main Drain Road	4	-	**high**
Halcombe Road Feilding / Hill Farm Road	4	-	**high**

Figure 199 | Proposed safety barrier locations

Delineators

It is recommended that a network assessment be completed to determine the true quantity of EMPs we currently manage, and determine the gaps in our network where future presence of EMPs are required to provide consistent corridor delineation, **as per recommendations in the latest NZTA technical audit**.

Lighting

Urban streetlighting

Assessment of our urban network is underway to determine substandard lighting provision, and identify locations where 'infilling' with additional lighting assets would achieve the Level of

Service for our customers commensurate with current standards.

Council has identified **one** improvement project for new streetlights to be installed as a result of urban expansion:

- Ranfurly Road, on the outskirts of Feilding

This project is to be funded entirely from Council's **non-subsidised budget**, and does not impact the National Land Transport Fund.

Rural flag-lighting

36.9% of fatal and serious injury crashes have occurred in low-light or night-time conditions in the last 10 years.

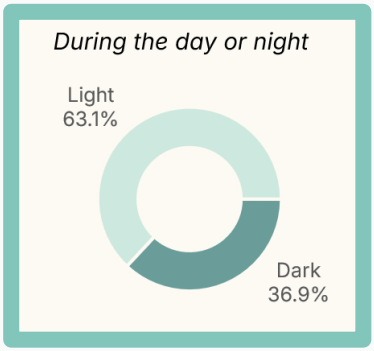

Figure 200 | Proportion of crashes between light and dark conditions, 10 year history

We have identified a number of intersections on our network with a history of crashes in low-light or night-time conditions. Provision of flag-lighting is recommended to alleviate this issue, providing road users with more information and reducing the risk of crashes.

The following locations have been identifed for treatment:

		MegaMaps Risk
Location	GT	Intersection
No.1 Line Longburn / Karere Rd	4	**high**
Mt Stewart-Halcombe Rd / Cemetery Rd	6	**medium-high**
Rongotea Rd / Aranui Rd	5	**medium-high**
Rongotea Rd / Oroua Rd	5	**medium***

Figure 201 | Proposed flag-light locations

** Although lower than medium-high risk, this intersection would become inconsistent with the remainder of the corridor if not addressed.*

Programme | Network services investment focus

A proactive programme has been developed, reinstating our intention to reduce serious and fatal crashes on our network through the maintenance, renewal, and provision of new network services.

Our focus is to ensure that assets remain fit-for-purpose and aligned with the expected standards outlined in NZTAs Traffic Control Devices manuals, the GPS priorities, and design standards.

Maintenance | Network service

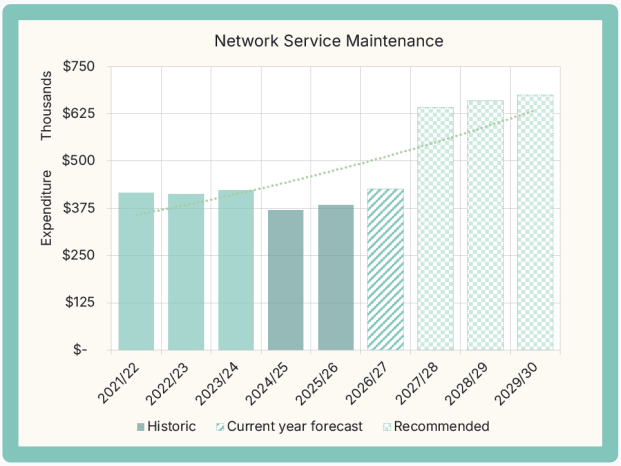

Figure 202 | Historic and recommended expenditure, network service maintenance

We currently spend **$282 per km** on network service maintenance, whereas our **peer group average spend sits at $414 per km**.

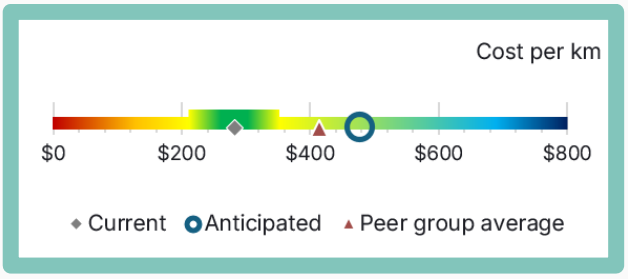

Figure 203 | Projected spend per km, network service maintenance

Recommended investment has increased beyond the **current** peer group average, reflecting the increased consumption of our assets as traffic volumes continue to trend up. This programme aims to improve our customer satisfaction.

Renewals | Traffic services

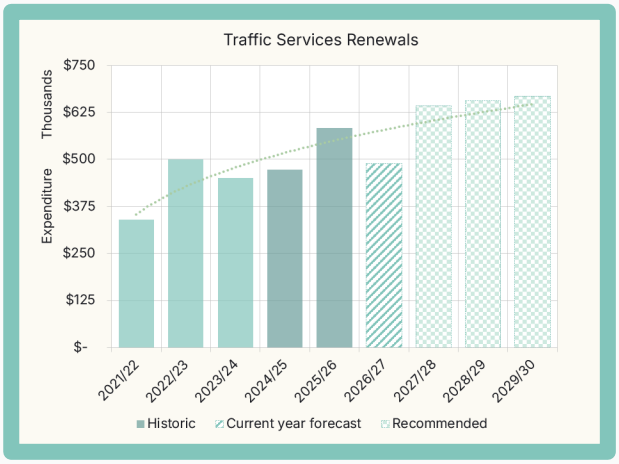

Figure 204 | Historic and recommended expenditure, network services renewals

We currently spend **$360 per km** on traffic services renewals, whereas our **peer group average spend sits at $179 per km**.

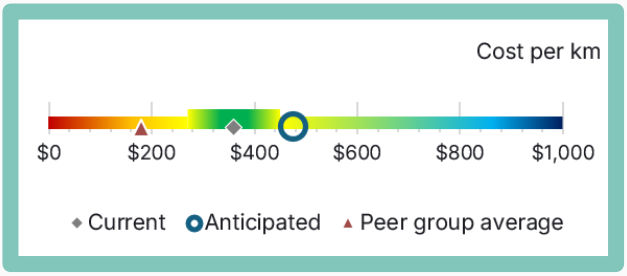

Figure 205 | Projected spend per km, traffic services renewals

Recommended investment has increased from historic levels, primarily aiming to improve our safety performance.

*Note: When considering this measure by VKT rather than km we sit **below** the current average.*

Improvement | Low cost, low risk

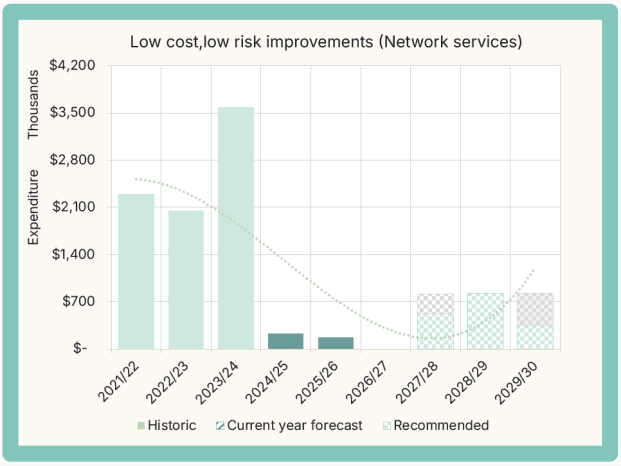

Figure 206 | Historic and recommended expenditure, low cost, low risk improvements [16]

Note: Due to the nature and intermittent timing of this activity, network services improvements are not assessed against peer group RCAs.

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	High	Rapid decline	-5.63
Minimum	1.73	1.54	-	Medium-high	Moderate decline	-2.36
Optimal	1.98	1.97	1.69	Medium	Stable	0.00
Enhanced	2.17	1.97	1.69	Low-medium	Moderate improvement	-

Figure 207 | Programme consequence assessment, network services

[16] *Expenditure in grey is related to low cost, low risk bridge & structure and resilience improvements, identified under sections 2.14.5 and 2.14.9 respectively.*

Network services		Investment activity option/s			
Benefit	KPI	Defer all activities	Reduced Level of Service programme	**Optimal, evidenced maintenance and renewals programme**	Increased Level of Service programme
Efficient network		Yes	Probable	Probable	No
		-	-	-	-
Resilient network		-	-	-	-
		No	No	Probable	Yes
Safe network		No	No	Probable	Yes
Growth		No	Unlikely	Probable	Yes
KPI Alignment					
Selected Option				▲	

Figure 208 | Performance consequence assessment, network services

2.14.9 Environmental

We manage our roadsides to keep roads clear and minimise hazards for our customers, including poor drainage, reduced visibility, fire risk, and slips and trees affecting critical infrastructure. Maintaining our roadside helps ensure effective drainage, reduce flooding, and support a safe and accessible road network.

Key functions

Safety | Managing roadside vegetation and trees ensures visibility for road users is not compromised, decreasing the risk of accidents. It also reduces fire risk, especially during dry conditions

Accessibility | Mowing and spraying helps maintain clear drainage paths, preventing water accumulation that can lead to flooding road closures, and property damage. Tree and slip management maintains an unobstructed corridor for road users.

Economic | Maximising drainage capability helps maintain the integrity of road pavements, reducing premature failure by minimising water-related damage

Roadside shoulders

Shoulders are generally located between the edge of the road and the drainage channel, where there is no kerb constructed.

They are profiled to allow surface water to leave the road and enter the drainage system effectively.

Shoulders are grass covered, which naturally grows throughout the year, and increasingly obscures roadside delineation, signage, and critical locations such as intersections. Excess growth can also increase the risk of fire during prolonged dry periods. Our shoulders are distributed across the network as follows, with the majority located to rural roads:

ONF GT	Rural length (km)	%	Urban length (km)	%	Length (km)
GT3	6.9	100	-	-	6.9
GT4	93.6	90.5	9.8	9.5	103.4
GT5	166.4	98.8	2.1	1.2	168.5
GT6	536.1	96.9	17.1	3.1	553.2
GT7	758.9	97.5	19.1	2.5	778.0
GT8	824.5	92.7	64.5	6.3	889.0
Total	2,386.4	95.5	112.6	4.5	2,499.0

Figure 209 | ONF length distribution, shoulders

Performance trends

An important measure of the performance of our vegetation management & slips or trees causing partial or total blockage of our roads is the receipt - and response to – customer reports.

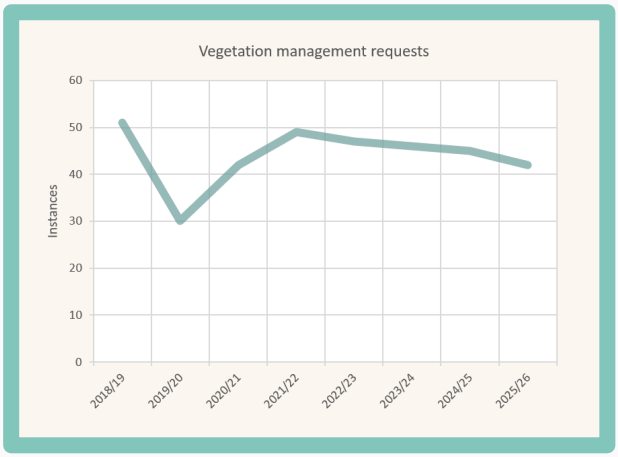

Figure 210 | Trend of vegetation defects reported by customers

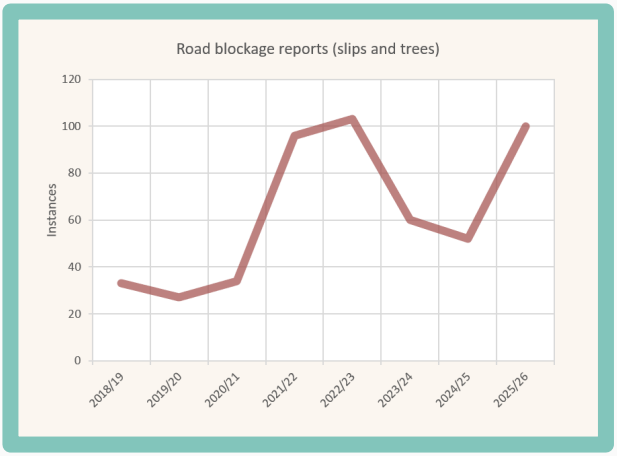

Figure 211 | Trend of slip and tree obstruction defects reported by customers

Key observation

Whilst requests for vegetation management on our network have remained relatively consistent, there have been increasing reports of slips, fallen trees, and overhanging branches impacting our roads.

Trees

Regular driveovers, noting of locations raising concern, reports of issues by our customers, and reactive work to overhanging branches or fallen trees have helped manage this hazard, historically.

It is recommended that locations are identified where prolonged power disruption has been experienced as a result of severe weather events causing trees or branches to fall on power lines.

This intelligence gathering will aid in the development of multi-party (Council, landowner, and power company) opportunities to remove high-risk trees under coordinated and efficient activity, and reduce future disruption.

Slips

Our network has been subject to repeated slip events impacting road access due to numerous adverse weather events. We have 'hot-spotted' the locations most commonly impacted, which indicates the most vulnerable corridors to direct effort.

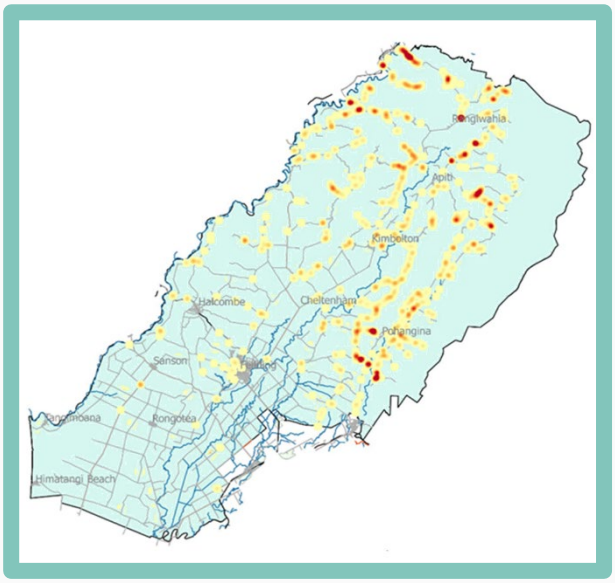

Figure 212 | Historic slip prevalence, Manawatū district

Commonly impacted road corridors include the:

- Pōhangina and Oroua river valleys,
- Ridge & Main South roads, and
- the Ruahine bluffs

Priority routes

Roads travelling through, or bounding, the above corridors have been identified as routes with the highest priority for remedial response and/or recovery activities in restoring Levels of Service, if impacted by an emergency event that would meet the threshold for enhanced funding assistance through the Emergency reinstatement category (WC141).

Environmental issues and management activities

Issues present themselves frequently in the environmental space, due to rapid growth cycles, seasonal variations, and adverse weather events.

Some of these defects increase in severity over time, whilst others appear rapidly. These defects impact on the comfort, accessibility, and safety of our customers. Common defects and consequences are detailed below, along with maintenance, renewal, or improvement actions.

Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Obscured delineation (EMP) 	Lack of management	Ineffective driver information, Crashing	Reduced visibility	Injury	Mow, Spray	-	-
Obscured signage 	Lack of management	Ineffective driver information, Crashing	Reduced visibility	Injury	Mow, Spray	-	-
Envelope infringement 	Unstable or damaged roadside vegetation	Road closures, Forced vehicle deviation, Vehicle strike	Loss of access	Detour, Injury	High reach mowing or trimming, Tree removal	-	-
Overgrowth (roadside drain) 	Reduced capacity	Flooding, Water impacting pavement integrity, Crashing	Reduced visibility	Reduced pavement life, Injury	Mow, Spray	-	-
Overgrowth (channels) 	Cracked kerb or channel	Ponding in wet weather, water ingress	Property flooding	Loss of pavement life	Spray	-	-
Slips 	Unstable topography	Road closures, Forced vehicle deviation, Crashing	Loss of access	Detour, Injury	Remove debris	-	Rockfall prevention / protection

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Defect / issue	Indicates	Risk of	Service impacts	Costs	Maintain	Renew	Improve
Planting 	Inappropriate planting	Seed propagation, Crashing	Reduced visibility	Injury, Pest plant impact	Spray, Remove	-	-
Effluent disposal 	Non-compliance, Under-capacity facility	Contaminant Pollution	Odour nuisance, Public health	Reduced asset life	Clean, Repair	Reconstruct	Construct new
Litter 	Poor behaviour	Ponding, Blockages	Public health	Disposal	Clear	-	-

Figure 213 | Environmental issues and management activities

Maintenance | Mowing

Note: Urban shoulders (berms) are managed by Council's community services team. Roading manages rural shoulder vegetation.

Roadside shoulders

We recognise that seasonal weather conditions impact growth rate and fire risk of grassed shoulders. The programme is designed around maintaining suitable visibility of our traffic services and intersection sightlines.

	Length (km)	Frequency	km per annum
GT3	6.9	4	27.6
GT4	93.6	4	374.4
GT5	166.4	4	665.6
GT6	536.1	4	2,144.4
GT7	758.9	4	3,035.6
GT8	824.5	4	3,298.0
Total	**2,386.4**		**9,545.6**

Figure 214 | Annual mowing length and frequency

Note: we consider that there is no differential LoS across the ONF for mowing, given it's critical safety aspects.

High reach mowing

Note: Urban trees are managed by Council's community services team. Roading manages the rural vegetation subject to high reach mowing.

An annual high reach mowing pass is required to ensure vegetation remains outside the kinetic envelope for our road corridors, retaining visibility and preventing vehicle strike.

It is anticipated that 5% of the rural network requires high reach mowing / trimming per annum, comprising **62km** length.

Maintenance | Spraying

Routine, urban and rural

Similar to mowing of shoulders, spraying of seal edges, traffic services asset surrounds, and surface channel drain inverts is required to maintain safety and maximise pavement life.

In addition, spraying of kerb and channel in urban areas is required to prevent ponding and minimise flooding risk.

	Length (km)	Cycles per annum	km per annum
Kerb and channel	196	4	784
Road edges	1,832	4	7,328
Swale drains	2,334	4	9,336
Total	**4,362**		**17,448**

Figure 215 | Annual spraying length and frequency

Spot spraying

Spot spraying is at the discretion of Council's Engineers in response to reports of pest plants observed on the network.

Maintenance | Slip clearance

Slip clearance occurs when each defect is reported and requires the road corridor and/or roadside drainage to be reinstated to operational status.

Funding for this activity is is dependent on whether it has occurred during an event that would classify as an emergency level event but fails to trigger the threshold for enhanced funding. In this instance, the minor event fund is utilised rather than environmental maintenance.

Maintenance | Rural litter management

Management of litter to our rural roadsides is undertaken to prevent blockages to our roadside drains, and maintain amenity for our customers.

This activity is frequently required to focus on higher incidence locations surrounding urban areas and on our higher volume roads.

		Length (km)
GT3	Waughs Road	3
GT4	Halcombe Road No.1 Line Longburn Tiakitahuna Road Rangiotu Road Awahuri-Feilding Road Stewart Road Kawakawa Road	50
		53

Figure 216 | Higher volume rural roads subject to frequent litter management

Maintenance | Minor events

It is recommended to retain a nominal budget of $55,000 per annum (pre-inflation) to combat environmental impacts from events that would otherwise qualify for enhanced Emergency funding, but fail to meet stipulated thresholds.

Renewal | Environmental

There are no plans to invest in the renewal of environmental assets for the life of this AMP.

Improvements | New assets

Council have identified **one** road corridor with repeated disruption from rock fall, resulting in frequent travel disruption and high risk of injury to Contractors and the public:

- Ruahine Road; the bluffs section towards the Mangaweka bridge

Programme | Environmental investment focus

A combination of proactive and reactive programmes are recommended to manage roadside mowing, spraying, tree, and slip management to maximise continued accessibility and safety for our customers.

This programme also delivers benefits to associated assets, by reducing water related damage, increasing the life of our pavements and reducing future maintenance and renewal cost.

Maintenance | Environmental

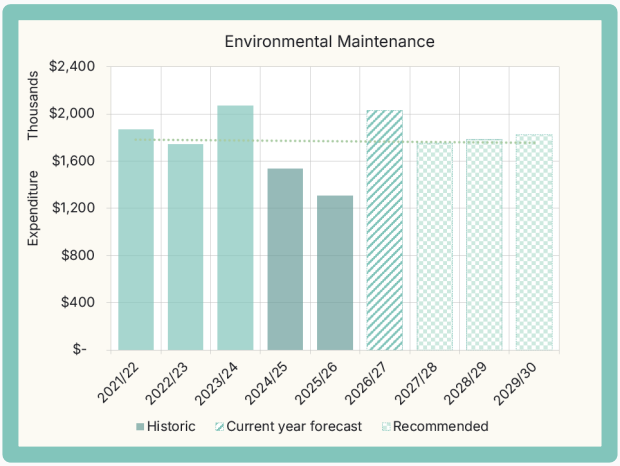


Figure 217 | Historic and recommended expenditure, environmental maintenance

We currently spend **$1,177 per km** on environmental maintenance whereas our **peer group average spend sits at $668 per km**.

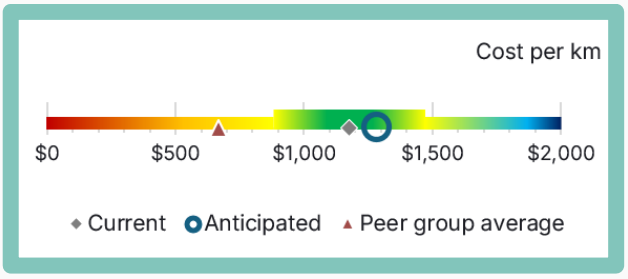


Figure 218 | Projected spend per km, environmental maintenance

Recommended investment has matched our historic commitment, realising a reduction on expenditure in real terms. This level of investment is anticipated to mitigate excess adverse weather impacts, and deliver the expected Level of Service to our customers.

*Note: When considering this measure by VKT rather than km we sit **just above** the current average.*

Improvement | Low cost, low risk

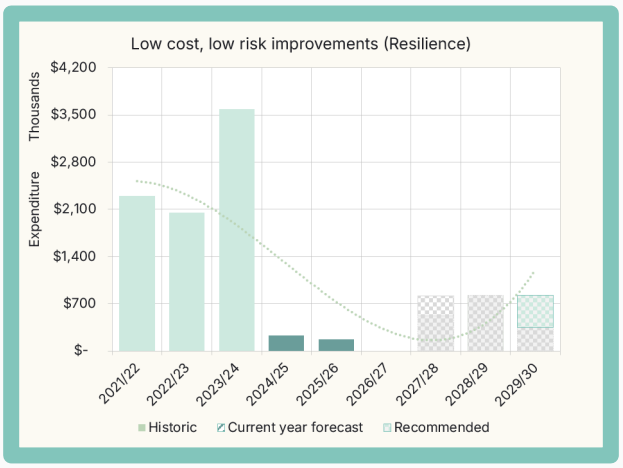


Figure 219 | Historic and recommended expenditure, low cost, low risk improvements [17]

Note: Due to the nature and intermittent timing of this activity, environmental improvements are not assessed against peer group RCAs.

[17] *Expenditure in grey is related to low cost, low risk bridge & structure and network services improvements, identified under sections 2.14.5 and 2.14.8 respectively.*

Activity options and KPI consequence assessment

Scenario	Maintenance $m	Renewal $m	Improvement $m	Risk	Network condition	Deferred need $m
Do nothing	-	-	-	Extreme	Rapid decline	-5.78
Minimum	4.07	-	-	High	Moderate decline	-1.71
Optimal	5.31	-	0.48	Low-medium	Stable	0.00
Enhanced	5.84	-	0.48	Low	Moderate improvement	-

Figure 220 | Programme consequence assessment, environmental

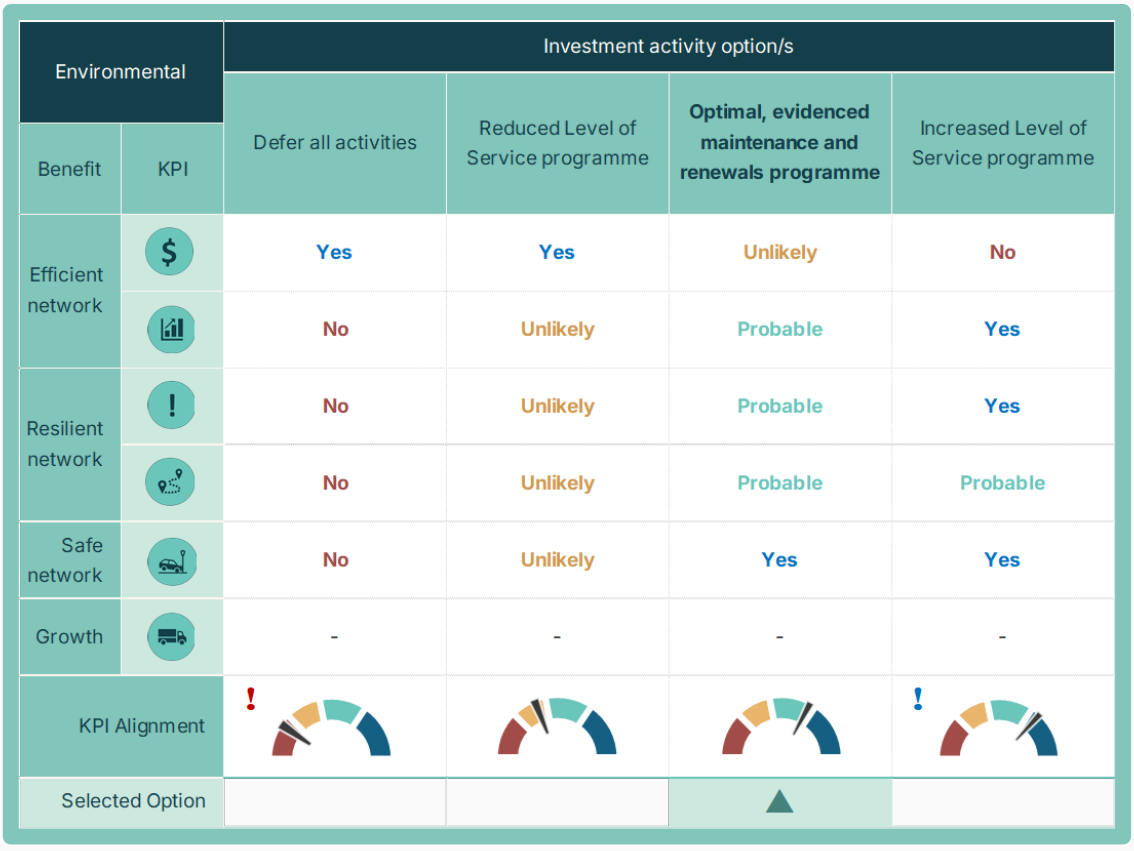


Figure 221 | Performance consequence assessment, environmental

2.14.10 Growth

The Manawatū District is experiencing a period of economic growth, alongside moderate population growth and emerging opportunities through Central Government investment in improving accessibility between the markets of Wellington and the lower and Central North Island. Enabling and managing suitable infrastructure to maximise opportunities for economic development is a fundamental role of our Council.

Urban growth

Urban growth around Feilding has been progressing at a steady pace.

Precinct 4, now known as Maewa, is in the process of being developed, and will deliver the majority of Feilding's residential growth over the next 7-10 years, resulting in approximately 1,600 lots once completed.

Industrial growth

Turners Road is being extended through to Kawakawa Road and is currently under construction. The extension of Turners Road will enable the development of 24ha of high-quality industrial land, creating a competitive advantage over alternative locations for industrial development across the wider Manawatū Region and drawing significant private investment into the district. The creation of jobs and additional local spending, both commercially and from the increased prosperity of residents, will provide significant benefits to local businesses and support the ongoing resilience and prosperity of Manawatū District communities.

Anticipated demand

As subdivisions and other growth infrastructure assets are vested to us, we take on the maintenance and renewal demand on behalf of our customers.

We currently expect **15km** of roads and associated assets to be vested to Council within the next **7-10 years**.

This will generate additional, ongoing maintenance and renewal demand, comprising:

Cyclic and short-term (0-3 years)

- Kerb sweeping
- Catchpit clearing
- Kerb spraying
- Network services maintenance (streetlights, signage)
- Traffic services renewals (roadmarking)

Medium-term (3-50 years)

As above, plus:

- Pavement maintenance
- Footpath maintenance
- Traffic services renewals (streetlignts, signage)
- Resurfacing

Long-term (50+years)

As above, plus:

- Kerb and channel renewals
- Catchpit renewals
- Pavement rehabilitation
- Footpath renewals

2.15 Case for investment

Without the appropriate funding, the problems outlined will compound over time and become more difficult for the Council to manage or resolve. This will have major impacts for the wider community and how it functions.

Climate change is impacting the network with greater intensity, with multiple events causing significant damage in recent months and years. Such events make the network vulnerable to closures and puts communities at risk of isolation and injury; these events are also becoming more frequent and have impacted the distribution of limited Council funds. Money originally allocated to maintenance, rehabilitation or reseals is being increasingly used to fund emergency work activity. NZTAs Emergency Fund process can be a lengthy process, forcing the Council to put planned work on hold, and prioritise remedial work to the network in order to reinstate access for its residents.

Our network is a critical part in sustaining growth of the economy. Forecasts show that over the next three years there will be continued pressure on the forestry routes. Currently, these routes are showing substantial stress, becoming particularly susceptible to further heavy vehicle damage.

Landslides frequently occur in the Manawatū, with some of our more vulnerable roads having no alternative route. This puts Council under significant pressure, as a large portion of the maintenance budget is being reallocated to comparatively few locations across the network. With climate change impacts increasing, road closures are becoming more frequent, leading to implications for our customers and the wider economy, as people may be isolated or delayed.

Without adequate funding for maintenance, road assets will exponentially deteriorate, negatively impacting user access, safety, and experience within the community.

Pavement maintenance and renewals are generally distributed across the network. A focus on key strategic routes is anticipated, given the larger impact that sub-optimal performance of these roads has on our community and the economy.

The overall condition trend of our roads show a gradual deterioration at current investment levels, albeit from a relatively high performance baseline.

Whilst the latest smooth travel data considers our district as having better performance than most networks throughout New Zealand - the proportion of excessive seal layer depths resulting in unstable surfaces atop our pavements is substantial.

This highlights a burgeoning risk to address in order to keep our roads in suitable condition and safe to use by the public.

Substantial under investment in the renewal of existing assets has left Council with an Asset Sustainability Ratio of **37%**; far below the 80%-120% that represents appropriate management of the network.

This programme focusses on 'like-for-like' replacement, prioritising condition over age in line with best practices and recommendations, and will directly aid in mitigating future severe weather event impacts.

Management of the existing network through the main areas of:

- Drainage,
- Pavements & surfacings, and
- Road safety

should be the basis for Council going forward.

Delivery of the recommended programme will also increase our Asset Sustainability Ratio towards a more appropriate level:

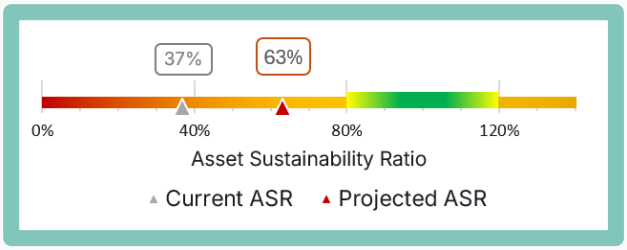


Figure 222 | Projected Asset Sustainability Ratio

Summary of NZTA measures for outcomes

Network status	Limited change
Context	At present, our network appears relatively stable, but service gaps have developed in identification of unstable surfaces, roughness and rutting exceedances, and loss of control DSI's. Targeting poor surfaces and pavements to higher classification rural roads along with targeted network services safety improvements will close these gaps.
Level of Service targets	GT3, 4 and 5 classification roads expect comfortable and reliable travel (aligning with NAASRA and rut thresholds), roadmarking, delineation, safety features, and standard road widths.

Evidence Pack				
Outcomes	**Core measures**	**Source & Granularity**	**Baseline**	**Target/Trajectory**
Cost & activities	Rehabilitations, lane-km	AMP, Transport Insights	2 lane-km	8 lane-km
Condition	Roughness exceedance, Rutting exceedance	CCDC, AWM	Smooth Travel Exposure (STE) 97%, Rut exceedance 2.3%	STE 98%, Rut exceedance <2%
Safety	DSI's	CAS, LTBF [18] #1.1.13	5-year average, 21 per annum (2021 to 2025)	5-year average, 18 per annum (2026-2030)

Programme summary	Concentrated rehabilitations, 8 lane-km per annum for 3 years, GT3, GT4 & GT5 roads, Reduce roughness and rutting exceedances below current level, reduce DSI average by 15% by 2030.
Works triggers	Action pavement treatments due to instability, roughness, or rutting thresholds. Improve safety to high or medium-high risk corridors and intersections.
Benefits and targets	Primary: Safety (LTBF #1.1.3). Monitor through Transport insights, interrogation of CAS

[18] *CAS – Crash Analysis System, LTBF – Land Transport Benefits Framework*





Strengthen Manawatū



Thrive Manawatū



Empower Manawatū



Showcase Manawatū



Lead Manawatū

3.0 Programme Business Case

3.1 Introduction

The Programme sets out the strategic response of the planned future state, and summarises the activities that deliver on the strategic case, with the asset management information identified earlier for maintenance, operations, renewals, and improvement/new works programme.

In order to address the strategic issues and problems stated, the preferred programme aims to address the problems relating to Legacy Network, Resilience, and Safety described in earlier sections.

Funding for Manawatū District Local Roads Network is planned and allocated within three yearly cycles through the National Land Transport Programme (NLTP), allowing medium-term certainty and avoiding costly resource reallocation.

The Government Policy Statement (GPS) - released March 2024 - proposes to focus on the following strategic priorities:

- Economic growth and increased productivity
- Increased maintenance and resilience
- Improved safety
- Value for money

The GPS further states the '*Outcomes the Government expects will be achieved by this GPS*'; some of which include:

- Reduced journey times and increased travel time reliability
- more kilometres of the road network resealed and rehabilitated each year
- fewer potholes
- a more resilient network
- a reduction in deaths and serious injuries
- less expenditure on temporary traffic management

Since the Manawatū is, by nature, a rural district, our proposed investment programme focusses primarily on bullet points 2, 3, 4, and 5 in order to give effect to the GPS.

3.2 Programme foundation

Through this plan, Council aims to maximise the benefit derived from investment in maintaining, operating, and improving the local road network as part of the transport system and growing the regional economy and achieving the right outcomes by targeting the right activity, in the right place, at the right time, and for the right cost.

In developing the 2027-30 AMP, Council ensures that the expenditure associated with the programme of work fits within its allocated budgets. To do this, we have implemented a rigorous programme development process to extract maximum value for money from our operations, maintenance, and improvements programmes.

The process has involved:

- Targeting the most important issues for our customers (Problems identified as part of the Strategic Case)
- Identifying where we can make the greatest difference to improving journeys
- Identifying the best programme of activities we can implement to close Level of Service gaps

3.2.1 Identification of asset requirements

The identification of asset requirements dictates the standards of performance, condition and capacity and the consequential funding requirements. It requires knowledge of existing asset performance and performance targets to identify the gaps in asset performance.

3.2.2 Maintaining a sound network condition

The local road network is generally in acceptable condition. In summary:

- Surface measures are beginning to deteriorate, albeit from a high baseline
- Roughness is considered acceptable on more than 80% of the network
- Rutting is indicating a decrease in performance
- Land instability is increasingly becoming a maintenance issue to parts of the network
- Structures across the network are ageing and reaching the end of their useful life

Council should:

- Continue monitoring and report trends
- Focus investment strategies to minimise the risk of further deterioration of the network
- Implement a continuous programme of bridge and culvert replacements. This replacement programme will prioritise condition over age, in line with the existing recommendations

3.2.3 Working the asset

Having moved to the ONF Levels of Service and - in some parts of the network - replacing assets later in their lifecycle, the local road network has become less frequently renewed. Continuation on this path will result in more patched roads and less smooth journeys for customers. Notwithstanding this, road condition is continually monitored to ensure safety is not compromised.

3.2.4 Condition monitoring

Asset inventory and current condition data is a central aspect of road asset management. Inventory data such as reference number to road segments, road name, road category, road length, lane width and other dimensions, road location, road traffic (lane or overall), pavement age, seal age, shoulder and table drainage are important for locating assets, used for predicting performance over time and determining the cost of closing performance gaps.

Historically, High-Speed Data surveys have been undertaken on a 2-yearly basis, with Council procuring specialist services to collect and supply a range of data, including:

- Skid Resistance,
- Texture,
- Rutting,
- Roughness, and
- Alignment Gradient, Crossfall and curvature

From July 2024, High-Speed Data surveys have been procured and managed by the New Zealand Transport Agency (NZTA) [19], using a regional contractual approach. This data has been uploaded into our asset management database.

It is important to note that whilst this data collection has been centralised externally, skid resistance **is not** part of this arrangement. Council still arranges collection of this metric independently, utilising this data to enhance network management and developing programmes.

Council aims to continue field validation, as well as forecasting remaining lives of other assets on the network. It is planned to do this through Road Maintenance Contracts (RMCs) and other such contracts (i.e., the cyclic structural maintenance contract), together with any other NZTA specified network monitoring.

RMCs stipulate the requirements, specifications and level of monitoring on the network to ensure that adequate condition is maintained, and that repairs are undertaken to a suitable standard. These contracts are the primary mechanism we have for understanding and monitoring road condition.

[19] The Road Efficiency Group (REG) is managing the Consistent Condition Data Collection (CCDC). It enables a consistent approach to collecting pavement condition data for all local authority sealed roads.

3.3 Programme development

Separate funds are allocated to the different programmes including investment, rehabilitation, and periodic maintenance. To ensure efficient utilisation of our resources and funds, the activities under these programmes are coordinated.

The reasons for separating out maintenance are as follows:

- A large proportion of road maintenance work is of a routine and fixed nature and is not subjected to assessment and appraisal
- Periodic activity (e.g., resealing) is usually a case of timing and candidate selection with the aim of minimising the whole of lifecycle costs, including road user costs, for the whole road network
- Major rehabilitation projects are appraised to identify need using whole of lifecycle cost minimisation. For each identified project, Net Present Value (NPV) calculations are carried out to rank selection and timing of treatments
- Growth projects are appraised and developed using the Business Case Approach

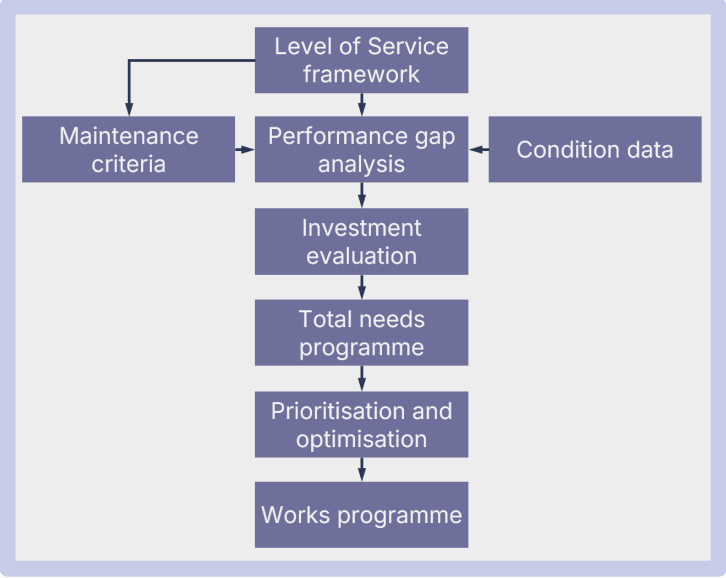


Figure 223 | Process of works programme development at the network level

The needs are evaluated to identify optimal intervention options (maintenance and rehabilitation treatments) to close the asset performance gap and establish budgetary requirements. In a generic sense, the options that minimise Council and road user costs, in a lifecycle cost context, are considered to be optimal. These intervention options comprise the total needs programme.

To ensure an equitable allocation of resources and to achieve Council's desired outcomes, prioritisation and optimisation techniques are used to identify the optimum combination of projects that could be achieved under different funding scenarios. As well as aiming at minimising lifecycle costs, the process of optimising and prioritising includes consideration of strategic network requirements and strategic corridor improvements.

The result of prioritisation and/or optimisation leads to the identification of the works programme. The final works programme includes the funding required for the different maintenance programmes, together with details of the specific works.

The three year rolling programme for road network maintenance management facilitates the preparation of medium-term budgets and the planning of resources and maintenance activities. The three year programme is reviewed annually, considering deferred projects from the previous year's programme, the backlog of needs, and the availability of resources.

3.3.1 Programme optimisation

The programme has been optimised for both the mix and timing of interventions and there is an appropriate procurement approach to deliver value for money in the short, medium, and long term. For the programme optimisation Council chose to use NZTAs framework and guidance to ensure we achieve value for money, while achieving the key outcomes required from our land transport.

3.3.2 NZTA investment decision-making framework

NZTA makes use of various investment assessment tools. Appropriate criteria can be selected on a case-by-case basis, but investment objectives and critical success factors need to be included as part of all assessments. As part of this framework, decision-making criteria include alignment with National Transport Outcomes, including the GPS, which sets out the government's priorities for expenditure over a 10-year period, and practical considerations dictating whether a project can be implemented, including:

Achievability/Feasibility | Potential affordability | Potential value for money | Supplier capacity & capability | Urgency

Opportunities and Impacts

These can include the following effects:

- Environmental
- Social and cultural
- Climate change mitigation or adaption
- Cumulative impacts
- Impacts on Te Ao Māori
- Property Impacts
- Economic Assessment
- Benefit–cost ratio (BCR) or end-of-life net present value (NPV)

3.3.3 Council's project prioritisation criteria

Historically, selection of capital investment projects has been based on a combination of known network issues, community desires, and customer feedback.

A process has been developed, allowing such projects to be assessed for progression or prioritisation by determining impacts against criteria:

Impact	Key Factors Assessed
+ve	Will result in improvement of criteria
Neutral	Criteria will remain unchanged
-ve	Will result in deterioration of criteria

Figure 224 | Criteria marking system

3.3.1 Assessment and scoring

The assessment process is a qualitative analysis using specialist judgement.

Where possible, project outcomes are converted into consequential performance, highlighting the benefits/disbenefits that the project is likely to realise.

This allows for options to be assessed against one another by assessing the following criteria:

Criteria	Questions Answered	Key Factors Assessed
Resilience	How strongly does the programme align with this Council investment objective?	Reliability, the structures durability and resilience against natural disasters
Condition	How strongly does the programme align with this Council investment objective?	The physical condition of the road
Safety	How strongly does the programme align with this Council investment objective?	Impact on road user safety
Customer Satisfaction	Will it contribute to service reliability and meeting customer service level expectations?	Addresses previous issues/concerns raised by the public
Service Delivery	How important is this programme in contributing to the delivery of Council's core activities and services?	Ability of contractor and the construction industry to deliver the resources and material in the current market
Financial Impacts	What is the return on investment or financial benefit? Does the project provide value for money?	Ability of the investment to provide Value for Money i.e., improve overall network performance

Figure 225 | Criteria assessment

3.3.1 Council performance measures

Council identifies the community priorities and direction that it wishes to deliver. In order to deliver these outcomes, it is important that the customer, technical performance measures, and operational & maintenance contracts are clearly linked to achieve this. The following performance measures have historically been adopted by Council as part of the LTP:

Primary Levels of Service	Performance measures
Road Safety	The number of fatalities and serious injury crashes on the local road network is lower than the previous financial year, expressed as a number.
Road Condition	80% of the road is in an acceptable condition - roughness NAASRA less than 150 and rutting less than 15mm
Road Maintenance	5% of the sealed local road network is resurfaced each year.
Response to Service Requests	90% of urgent requests will have service (Council or contractor) on site within three hours of the request being made. If the problem cannot be remedied immediately, the site will be made safe and remedial action carried out as soon as is reasonably practicable. 90% of non-urgent requests for service will result in the contractor on-site (including the repairs) within the three-month rolling programme, or as instructed by the Council's Roading Team

Figure 226 | Historical LTP performance measures

3.4 Funding

The provision of services and projects comes at a cost. Council aims to spend within its means, achieving a balance between meeting the needs of the community with its ability to pay.

The Local Government Act (LGA) 2002 requires Council to prepare a Financial Strategy as part of its Long-Term Plan. This Strategy outlines how the Council intends to manage its finances prudently. This means the Council will act with careful deliberation and will always consider the financial implications of decisions on the community. Council must make adequate and effective provision to meet expenditure needs identified in Annual and Long-Term Plans.

Council's Financial Strategy provides a financial framework for making decisions. Simply, it enables Council to assess proposed spending against rates and borrowing requirements over the ten years of the Long-Term Plan (LTP).

3.4.1 Funding sources

The funding sources for New Zealand's transport infrastructure and services funded through the NLTP are:

- funds from the National Land Transport Fund
- funds managed on behalf of MCERT
- funds from Approved Organisations (the local share)
- funds from supplementary sources (i.e., Development Contributions)

Land transport activities managed or delivered on a regional basis by approved organisations are part-funded from the National Land Transport Fund (NLTF), according to the relevant funding assistance rate. The local share may come from rates or other sources, such as developer contributions, borrowing and investments.

3.4.2 Council contribution

Rates are a property tax set annually by Council. Rates are one source of income the Council uses to fund projects and operating services. Council considers the affordability of the proposed rate requirements both for the Council and ratepayers. When setting rates, Council considers:

- the Levels of Service provided
- intergenerational issues
- other sources of funds
- legislative requirements
- external factors
- what our ratepayers can afford

3.4.3 Supplementary funding sources

Supplementary funding sources for transport activities can include:

- development & financial contributions from land developers, recognising benefits to developments arising from transport infrastructure improvement
- betterment contributions from those who benefit from road improvements
- contributions from approved organisations, community groups or other entities, such as the Accident Compensation Corporation (ACC)
- funds generated from road tolls for new land transport infrastructure

3.4.4 Funding risk

The ultimate limiting factor governing decisions on which projects can be included in Council's Long-Term Plan, the Regional Land Transport Plan (RLTP) and the National Land Transport Programme (NLTP) is the level of available funding. Setting this level of funding is a complex matter requiring numerous iterations of the process. When seeking NZTA subsidies, Council has to ensure that it can meet the local share before submission.

Where activities within Council's proposed Roading Programme are eligible for financial assistance, NZTA provided the lowest rate allowed in the previous AMP, set at 51%. This subsidy is known as the Financial Assistance Rate (FAR). The FAR has been confirmed by NZTA as remaining at 51% for the 2027-30 period.

Historically, Council utilised the Business and Economic Research Ltd (BERL) reports when anticipating cost escalations for the next 10 years, portrayed as a year-on-year percentage increase.

Key observation

Submissions for this AMP have been restricted to using a 2% year-on-year increase to account for inflation, as stipulated by NZTA.

Cost Index fluctuations

Rising bitumen and construction costs have been particularly evident due to market supply pressures, international currency matters, domestic political upheaval, and international conflict affecting energy supply.

Figure 227 and **Figure 228** below show the volatility in cost adjustment for bitumen and construction indices between 2016 and 2026:

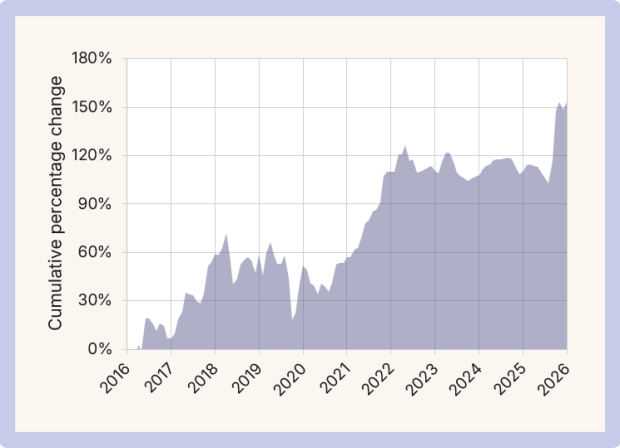


Figure 227 | Cost adjustment trend for bitumen

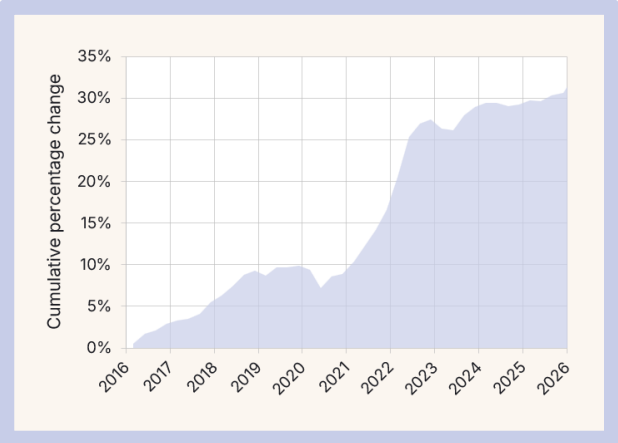


Figure 228 | Construction index trend

Key observation

Of particular note are the bitumen fluctuations. In the **last few months** bitumen has increased by another **50%** alone, having already **doubled since 2016**.

Key funding risks to our programme are:

Council being constrained to **rate capping**, continued volatility in **cost fluctuations** (current programme), and the FAR being **reduced below 51%** and/or the **funding floor reduced below 51%** (future programmes).

3.5 Procurement management

3.5.1 Integration and partnering

Our proposed programme and related activities are considered along with the procurement programmes of other approved organisations and other entities. The three year programmes are routinely coordinated on a regional level through the RLTP. The level of impact neighbouring authorities have on our transport procurement is minimal, but opportunities for packaging or integrating to provide better value for money is constantly discussed.

We share a number of boundary roads with Palmerston North City Council, Rangitīkei, Tararua, and Horowhenua District Councils; a very co-operative relationship exists to deliver appropriate Levels of Service on these roads.

A more significant impact on procurement activities (and budget) is between ourselves and the numerous utility organisations, where coordination of the various programmes and acknowledgement of the commercial imperatives of the utilities can reduce customer and network interruption and disruption.

The newly created 'Manawatū Water' entity (managing water supply, stormwater and wastewater) is a key utility where close cooperation and forward work programme alignment is a strong focus once it commences in July 2027.

Private property development is managed through resource consent and land use regulation processes, and impacts on the transport corridor are managed appropriately. Where there are significant impacts on the network, special conditions or agreements are arranged between the parties.

As with most RCAs, the local road network also interacts with State Highway roads (owned and operated by NZTA). Continuous liaison is undertaken with NZTA to aid coordination of transport related activities.

We have considered our Roading Programme while thinking about ongoing projects, and have adjusted planned interventions to minimise conflicts (e.g., selecting pavement stabilisations where possible, as opposed to overlays, to reduce material demand when carrying out rehabilitations). External activities are continuously monitored and local operations adjusted accordingly.

3.5.2 Procurement capability

Council maintains ownership and responsibility for managing the land transport activity and associated infrastructure.

In order to maximise efficiencies and long-term value for money, we have taken a holistic approach to service delivery. Our approach to the market and contracting align with procurement best practices and demonstrates that we are open, transparent, and accountable.

The Procurement Strategy is reviewed every three years, and lays out the requirements for procurement (at any value) to be made by Council.

Council's procurement policy is based on - and complements - the 'Government Procurement Rules' [20], whilst paying particular attention to NZTAs 'Procurement manual for activities funded through the National Land Transport Programme' [21].

Council has an 'open' supplier selection process as its default position. Direct appointments and 'closed contest' processes may be considered for low value contracts. Council's transportation procurement procedures will be based on a selection of the procedures as documented in the aforementioned NZTA procurement manual.

The aim is to improve road maintenance delivery decisions, affirming value for money and understanding an RCAs ability to procure the services they require in the best possible way.

MDC has conducted the Transport Insights Groups 'Smart Buyer Principles' assessment tool, shown in **Figure 229** on the following page. This indicates that MDC is a 'developing' buyer with good core values and expertise.

[20] *Government Procurement Rules (www.procurement.govt.nz)*
[21] *New Zealand Transport Agency Procurement Manual (www.nzta.govt.nz)*

Assessment statement	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				10	4
Multiplying factor	x1	x2	x3	x4	x5
Total Score in Column				40	20
Total Score	**60**				

- 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.

Figure 229 | REG Smart buyer principles assessment

3.6 Subsidised programme

3.6.1 Activity class | Investment management

Business case development (Work category 004)

This work category provides for funding assistance for the costs of preparing programme business cases under the Business Case Approach, including supporting evidence collection and model application.

	2027-28	2028-29	2029-30
Business Case | SH54 Feilding corridor intersection improvements	250,000	0	0
WC 004 Total	250,000	0	0



3.6.2 Activity class | Local road pothole prevention

Sealed pavement maintenance (Work category 111)

This work category provides for the routine care of sealed pavements to maintain structural integrity and serviceability.

	2027-28	2028-29	2029-30
Pavement repairs	785,400	801,108	817,130
High lip removal	107,100	109,242	111,427
Rip and remake unstable surface layer/s	535,500	546,210	557,134
Watercut flushed surfaces	146,880	149,818	152,814
Contractor database management	183,600	187,272	191,017
WC 111 Total	**1,758,480**	**1,793,650**	**1,829,523**



Unsealed pavement maintenance (Work category 112)

This work category provides for the routine care of unsealed pavements to maintain their structural integrity and serviceability.

	2027-28	2028-29	2029-30
Grading | Routine programme	317,467	323,816	330,293
Grading | Reactive / spot grading	63,494	64,764	66,059
WC 112 Total	**380,961**	**388,580**	**396,352**



Routine drainage maintenance (Work category 113)

This work category provides for the routine care of existing drainage facilities to maintain function [22].

	2027-28	2028-29	2029-30
Routine drain maintenance (reprofile swales, clear inlets / outlets)	244,800	249,696	254,690
Culvert maintenance (realignment, sleeving, marker pegs)	159,120	162,302	165,548
Urban street sweeping	81,600	87,394	93,386
Urban catchpit / sump cleaning	47,328	50,688	54,164
Urban back channel cleaning	12,240	12,485	12,734
Jetting (vehicle grates, pedestrian crossing plates)	16,320	16,646	16,979
Seasonal mitigation sweeping	5,100	5,202	5,306
Miscellaneous repairs (concrete repairs, chamber lids)	11,220	11,444	11,673
WC 113 Total	**577,728**	**595,858**	**614,482**



[22] ***Street cleaning activities*** *- NZTAs policy is that funding assistance will be provided for* ***30%*** *of the RCAs regular financial assistance rate for sweeping and cleaning sumps in urban areas (i.e., 30% of 51%,* ***equating to 15.3% assistance****); this is considered as a commensurate benefit to the road and its users.*

Unsealed road metalling (Work category 211)

This work category provides for the planned periodic renewal of pavement layers, including top surface metal, on unsealed roads.

	2027-28	2028-29	2029-30
Pavement restoration | Remetalling	407,607	415,759	424,075
WC 211 Total	**407,607**	**415,759**	**424,075**



Sealed road resurfacing (Work category 212)

This work category provides for the planned periodic resurfacing of sealed roads.

	Area (sq.m)	Length (m)	% length	Cost ($)
Chipseal	112,554.5	14,127.0	1.41	1,445,674
AC	0.0	0.0	0.00	0
2027-28 Totals	**112,554.5**	**14,127.0**	**1.41**	**1,445,674**

	Area (sq.m)	Length (m)	% length	Cost ($)
Chipseal	314,949.2	51,343.0	5.12	3,937,444
AC	2,781.5	273.0	0.03	235,132
2028-29 Totals		**51,616.0**	**5.15**	**4,172,576**

	Area (sq.m)	Length (m)	% length	Cost ($)
Chipseal	316,399.3	48,764.0	4.86	4,078,259
AC	1,657.5	297.0	0.03	177,107
2029-30 Totals	**318,056.8**	**49,061.0**	**4.89**	**4,255,366**

Sealed road resurfacing	2027-28	2028-29	2029-30
WC 212 Total	1,445,674	4,172,576	4,255,366



Drainage renewals (Work category 213)

This work category provides for the like-for-like replacement of drainage facilities.

	2027-28	2028-29	2029-30
Culvert replacement programme	443,121	456,830	467,075
Kerb and channel replacement programme	64,260	65,545	66,856
Catchpit replacement programme	32,130	32,773	33,428
Component replacements (flumes, socks)	4,284	4,370	4,457
WC 213 Total	**543,795**	**559,518**	**571,816**



Sealed road pavement rehabilitation (Work category 214)

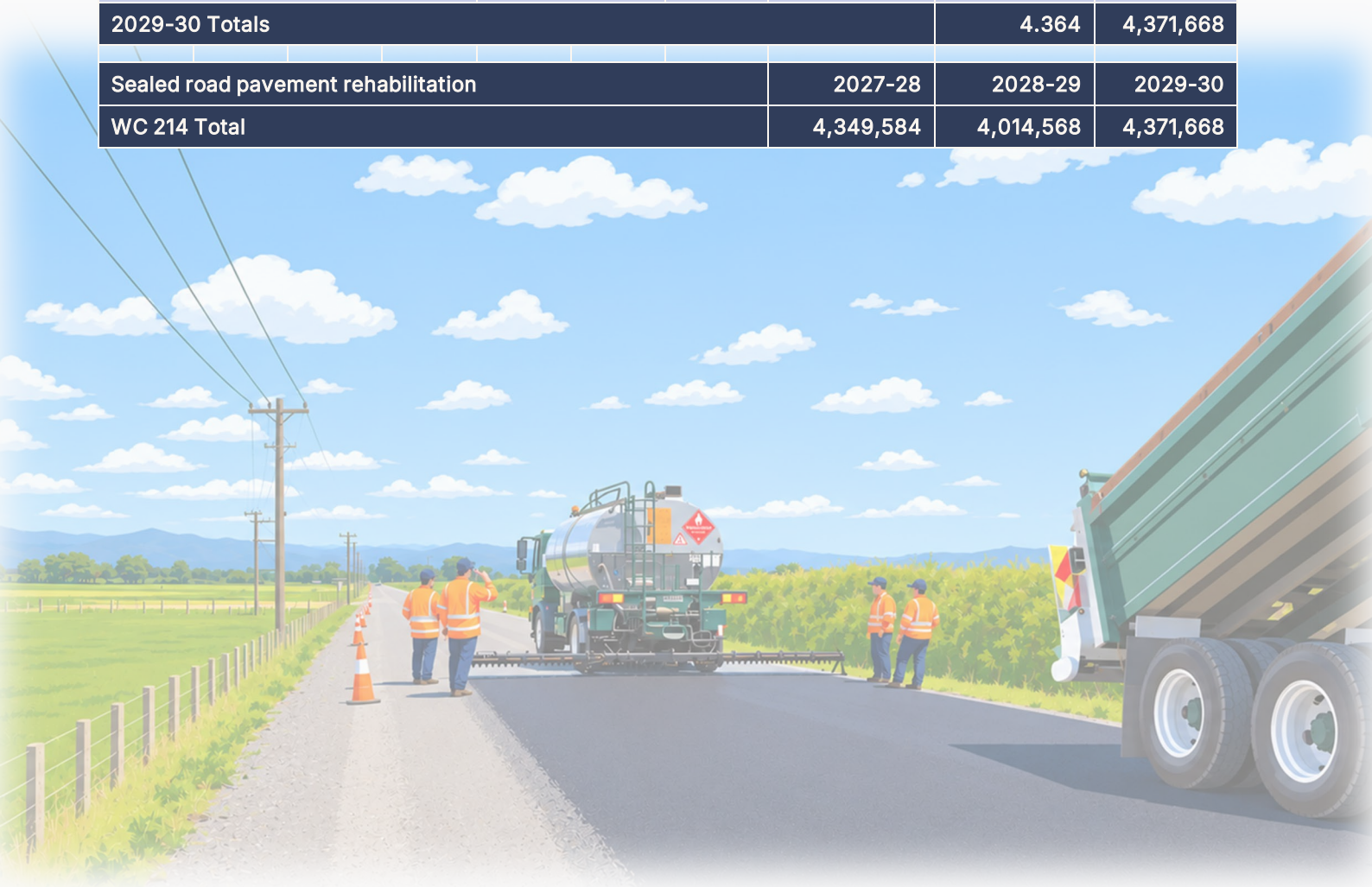
This work category provides for the replacement of, or restoration of strength to, sealed pavements where other forms of maintenance and renewal are no longer economic.

		Route Data (km)			
Location	Economic check	Start	End	Length	Cost ($)
Halcombe Road	Positive NPV	8.080	9.128	1.048	1,230,616
Waughs Road	Positive NPV	1.850	2.690	0.840	1,034,207
Makino Road	Positive NPV	10.096	11.442	1.346	1,145,096
Mt Stewart-Halcombe Road	Positive NPV	3.743	4.727	0.984	939,666
2027-28 Totals				4.218	4,349,584

		Start	End	Length	Cost ($)
Taonui Road	Positive NPV	7.827	11.009	3.182	3,107,158
Tangimoana Road	Positive NPV	6.698	7.602	0.904	907,410
2028-29 Totals				4.086	4,014,568

		Start	End	Length	Cost ($)
Mt Biggs Road	Positive NPV	1.560	2.853	1.293	1,303,382
Mt Stewart-Halcombe Road	Positive NPV	5.682	8.753	3.071	3,068,286
2029-30 Totals				4.364	4,371,668

Sealed road pavement rehabilitation	2027-28	2028-29	2029-30
WC 214 Total	4,349,584	4,014,568	4,371,668



3.6.3 Activity class | Local road operations

Structures maintenance (Work category 114)

This work category provides for the routine work necessary to maintain the functional, structural integrity and appearance of road bridges, retaining structures, guardrails, stock access structures, cattle stops, and footpaths on road structures.

	2027-28	2028-29	2029-30
Barrier Maintenance	32,130	35,166	31,836
Concrete Repairs	72,420	78,030	79,591
Drainage control	33,150	23,669	15,918
Joint Maintenance	38,250	17,167	15,918
Pavement Repairs	41,820	15,606	15,918
Bridge End Marker maintenance	16,932	15,606	15,918
Structure cleaning	23,001	13,005	13,265
Vegetation clearance	50,286	47,546	37,142
Waterway clearance	129,285	122,767	125,223
Miscellaneous maintenance	15,300	31,212	47,754
WC 114 Total	**452,574**	**399,774**	**398,484**



Environmental maintenance (Work category 121)

This work category provides for the routine care and attention of berms, banks, general vegetative matter, trees, and weeds in the road corridor to maintain safety, aesthetic, and environmental standards.

	2027-28	2028-29	2029-30
Routine mowing | Rural corridors	816,000	832,320	848,966
High reach vegetation control	112,200	114,444	116,733
Routine spraying | Urban roads (kerb and channel)	137,700	140,454	143,263
Routine spraying | Rural corridors (seal edge, traffic service, and swale)	387,600	395,352	403,259
Noxious / invasive plant control	20,400	20,808	21,224
High risk roadside tree removal	153,000	156,060	159,181
Slip management (critical road inspections and reactive work)	81,600	83,232	84,897
Litter control (key routes and urban surrounds)	25,500	26,010	26,530
WC 121 Total	**1,734,000**	**1,768,680**	**1,804,054**



Network services maintenance (Work category 122)

This work category provides for the routine care and attention of road features that support the safety performance and functional use of the network including road furniture, pavement markings, and carriageway and pedestrian crossing lighting.

	2027-28	2028-29	2029-30
Routine maintenance (Signs, barriers, EMP's - clean, align, secure)	443,889	457,679	467,955
Contractor database management	42,840	43,697	44,571
Traffic services power supply cost	93,840	95,717	97,631
Streetlight maintenance	61,200	62,424	63,672
WC 122 Total	**641,769**	**659,516**	**673,830**



Network operations (Work category 123)

This work category provides for the operation, maintenance and power costs of traffic signals and other traffic management equipment and facilities, including advanced traffic management systems, variable message signs, area-wide traffic control systems (including update of software) or local area traffic management schemes (including speed control devices).

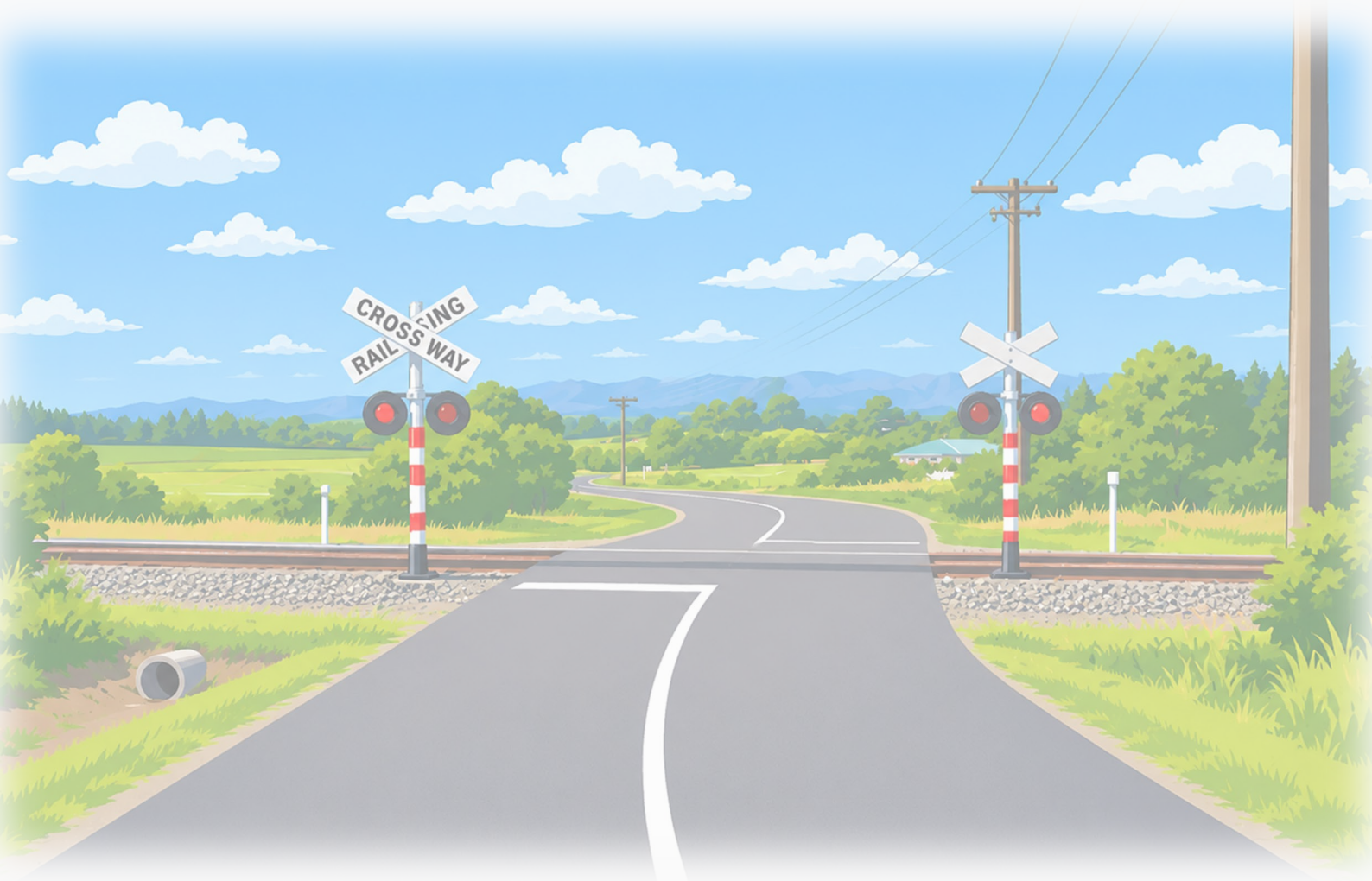
	2027-28	2028-29	2029-30
Electronic / active signage management	16,493	16,823	17,160
WC 123 Total	**16,493**	**16,823**	**17,160**



Rail level crossing warning devices maintenance (Work category 131)

This work category provides for Council to share in costs associated with the maintenance and renewal of rail level crossing warning devices, carried out by the relevant rail track authority where the crossing is part of the road controlling authority's road, cycle or footpath network. This includes public access links to rail stations and interchanges.

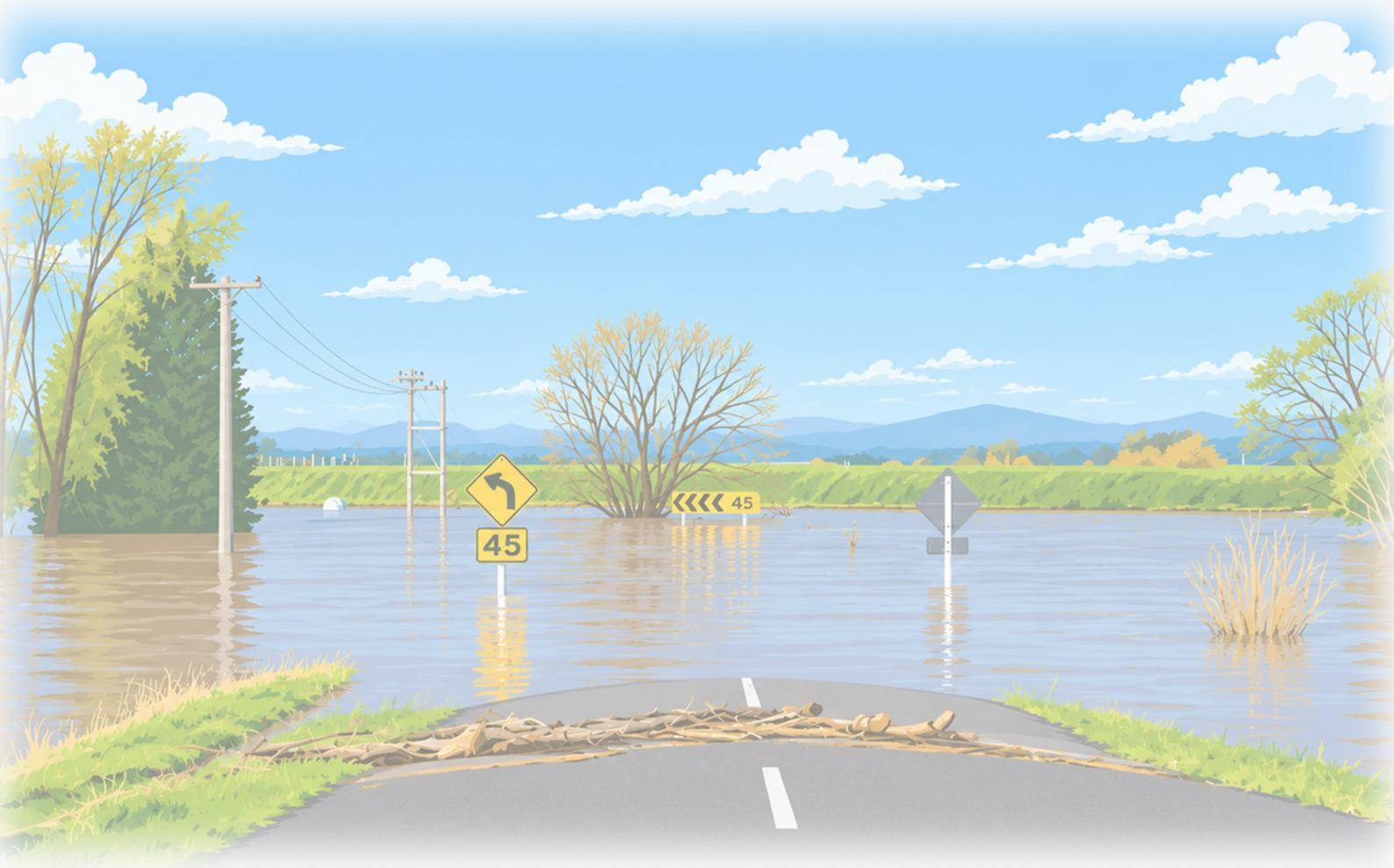
	2027-28	2028-29	2029-30
Rail level crossing warning devices	30,600	31,212	31,836
WC 131 Total	**30,600**	**31,212**	**31,836**



Minor events (Work category 140)

This work category enables funding from the National Land Transport Fund (NLTF) for the response to minor, short duration, sudden events that cause urgent safety and access problems on part(s) of the transport network and that result in unforeseen minor expenditure.

	2027-28	2028-29	2029-30
Minor events	56,100	57,222	58,366
WC 140 Total	**56,100**	**57,222**	**58,366**



Network and asset management (Work category 151)

This work category provides for the general management and control of the road network and management of road infrastructure, including public footpaths and cycleways and associated facilities.

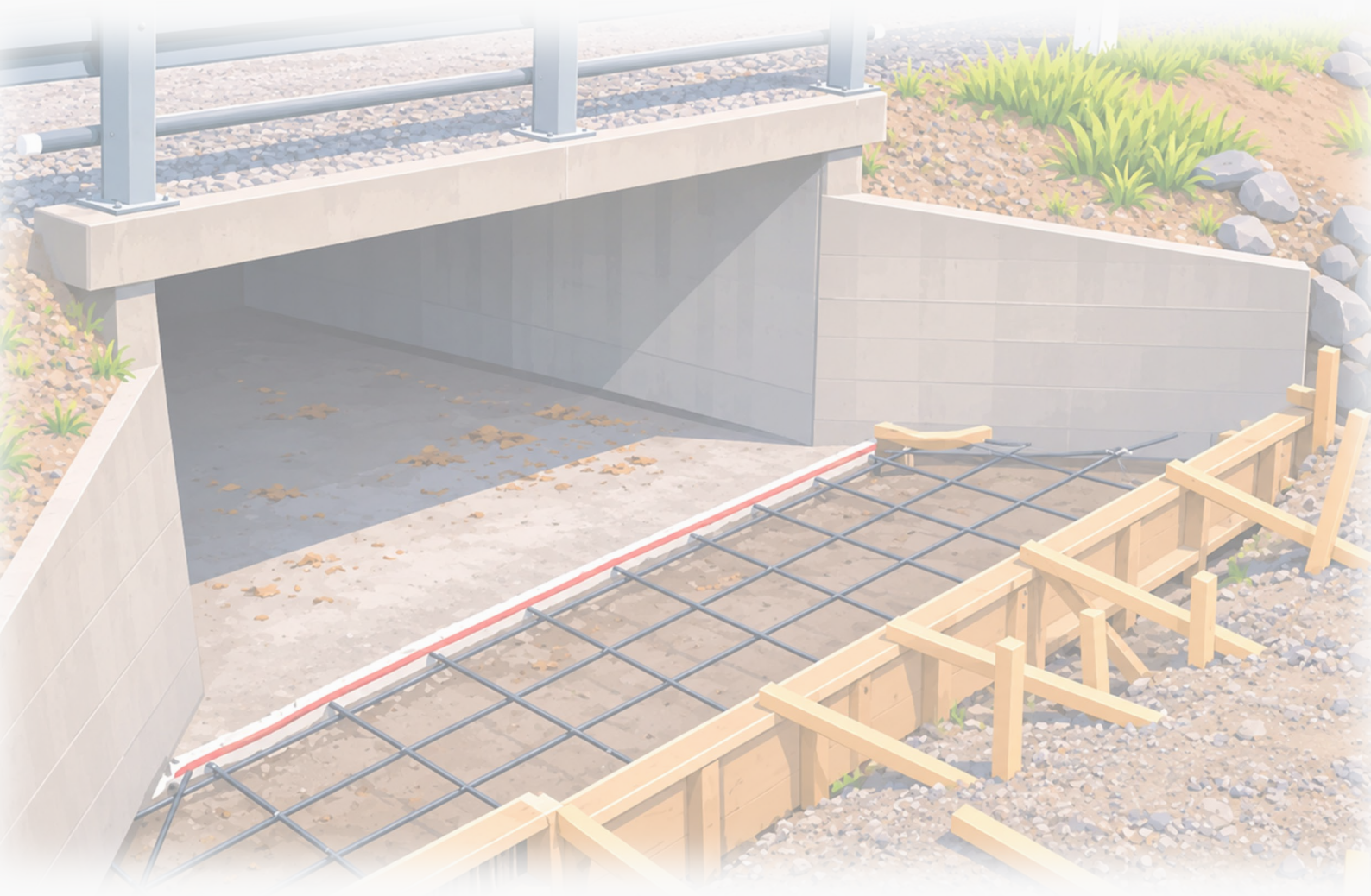
	2027-28	2028-29	2029-30
Internal network and asset management	1,454,289	1,483,375	1,513,043
AWM Database subscription	74,460	75,949	77,468
Skid resistance surveys	40,800	41,616	42,448
Specialist external surveys	76,500	78,030	79,591
Bridges and structures (lifecycle asset management)	248,625	199,237	212,242
Traffic counting programme	115,260	117,565	119,917
Pathway condition inspection (tri-annual assessment)	13,260	0	0
WC 151 Total	**2,023,194**	**1,995,772**	**2,044,708**



Structures component replacements (Work category 215)

This work category provides for the like-for-like replacement renewal of components of road bridges, retaining structures, guardrails, stock access structures / cattle stops, and footpaths (on road structures) & pedestrian overbridges/underpasses.

	2027-28	2028-29	2029-30
Culvert Inverts	40,800	0	212,242
Fish passages	0	0	10,612
Guardrail components	31,620	26,010	26,530
Scour protection	183,600	157,100	0
Steel protection	44,880	27,050	0
Structural steelwork	42,840	87,394	0
WC 215 Total	**343,740**	**297,554**	**249,384**



Traffic services renewals (Work category 222)

This work category provides for the renewal of existing road furniture, lighting, signs and markings, traffic management equipment, and facilities.

	2027-28	2028-29	2029-30
Services renewals (signs, posts/poles, barriers, railings, delineation)	132,600	135,252	137,957
Streetlight renewals	122,400	124,848	127,345
Roadmarking renewals	387,600	395,352	403,259
WC 222 Total	642,600	655,452	668,561

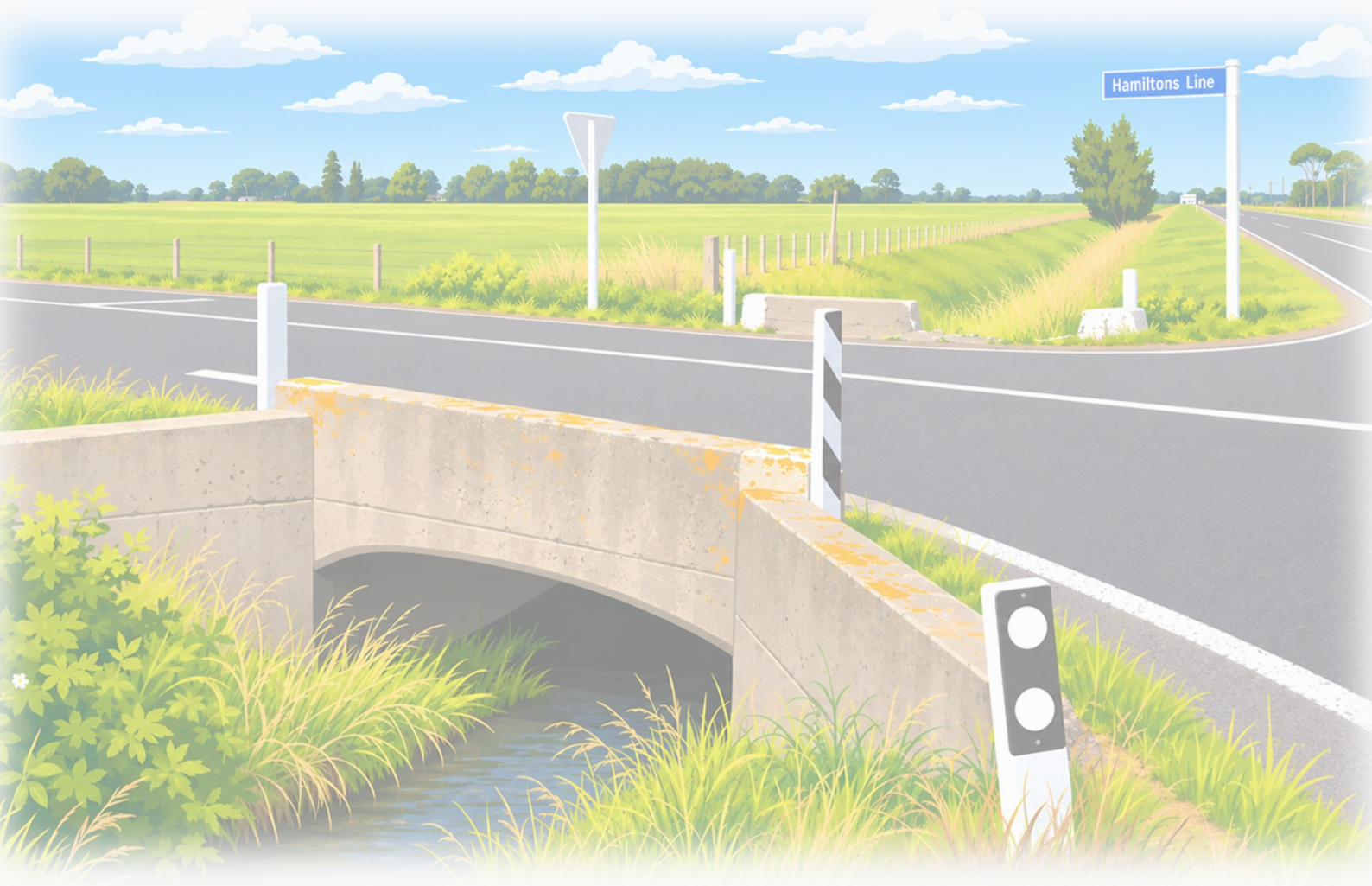


3.6.4 Activity class | Local road improvements

Bridges and structures renewals (Work category 216)

This work category provides for the like-for-like replacement of bridges and structures that are at the end of their serviceable life.

	RP	ID	Structure type	2027-28	2028-29	2029-30
Hamilton Line	0.011	S66	Major culvert	550,800	0	0
Rongotea Road	16.212	S243G	Major culvert	0	1,165,248	0
Otara Road	3.785	S173C	Bridge	0	0	1,804,054
WC 216 Total				**550,800**	**1,165,248**	**1,804,054**



Low cost, low risk roading improvements (Work category 341)

This work category provides for the construction/implementation of low-cost, low-risk improvements to the transport system to a maximum total cost for approval per project, depending on the nature of the improvement. Candidate projects will be advanced if they are affordable and economically justified.

ID / Locale		Project Description	2027-28	2028-29	2029-30
Bridges and Structures Improvements (project value **under $5 million**)					
Te Parapara Road	RP 3.770	Retaining Wall	48,960	0	0
Main South Road	RP 2.600	Retaining Wall	244,800	0	0
		Sub-total	**293,760**	**0**	**0**
Network Services Improvements (project value **under $3 million**)					
Halcombe Road	Corridor	Roadside barrier(s)	357,000	400,554	259,996
Mt Stewart-Halcombe Road / Cemetery Road	Intersection	Flag-lighting	15,300	0	0
No.1 line Longburn / Karere Road	Intersection	Flag-lighting	15,300	0	0
Kairanga Bunnythorpe Road (SH3 to Rongotea Road)	Corridor	Roadmarking upgrade	17,589	0	0
Waitohi Road / Rowe & Taipo Roads	Intersection	Signage upgrade	10,200	0	0
No.1 line Longburn / Tiakitahuna Road	Corridor	Roadside barrier(s)	42,840	0	0
Sandon Road	Corridor	Roadmarking upgrade	36,483	0	0
Mt Stewart-Halcombe Road & Mt Biggs Road	Corridor	Roadmarking upgrade	15,133	0	0
Cemetery Road	Corridor	Roadmarking upgrade	11,934	0	0
Halcombe Road Feilding / Hill Farm Road	Intersection	Roadside barrier(s)	0	54,621	0
Rongotea Road / Aranui Road	Intersection	Flag-lighting	0	15,606	0
Rongotea Road / Oroua & Lockwood Roads	Intersection	Flag-lighting	0	15,606	0
Colyton Road	Corridor	Roadmarking upgrade	0	28,497	0
Makino Road	Corridor	Roadmarking upgrade	0	25,918	0
Taonui Road	Corridor	Roadmarking upgrade	0	23,825	0
Rongotea Road	Corridor	Roadmarking upgrade	0	0	49,342
Rowe & Taipo Road	Corridor	Roadmarking upgrade	0	0	13,541
Green Road	Corridor	Roadmarking upgrade	0	0	20,694
		Sub-total	**521,779**	**564,627**	**343,572**

Resilience Improvements (project value **under $5 million**)					
Ruahine Road (Bluffs)	Corridor	Rockfall mitigation / route accessibility improvement	0	0	477,544
		Sub-total	**0**	**0**	**477,544**
Road Improvements (project value **under $3 million**)					
Rangiotu Road / Main Drain Road	Intersection	Right Turn Bay	0	260,100	0
		Sub-total	**0**	**260,100**	**0**
Walking & Cycling Improvements (project value **under $2 million**)					
None			0	0	0
		Sub-total	**0**	**0**	**0**
WC 341 Total			**815,539**	**824,727**	**821,116**



3.6.5 Activity class | Walking and cycling improvements

Cycle path maintenance (Work category 124)

This work category provides for the operation and maintenance of cycle and shared path facilities, including the operation of associated lighting.

	2027-28	2028-29	2029-30
Cycle path maintenance	1,581	1,613	1,645
WC 124 Total	**1,581**	**1,613**	**1,645**



Footpath maintenance (Work category 125)

This work category provides for the maintenance of public footpaths and facilities associated with public footpaths, such as pedestrian network connections, including stairs, alleyways and off-road connections.

	2027-28	2028-29	2029-30
Footpath maintenance	35,700	36,414	37,142
WC 125 Total	**35,700**	**36,414**	**37,142**



Footpath renewals (Work category 225)

This work category provides for the renewal of public footpaths and facilities associated with public footpaths such as pedestrian network connections, including stairs, alleyways and off-road connections.

	2027-28	2028-29	2029-30
Footpath renewals	84,252	85,937	87,656
WC 125 Total	**84,252**	**85,937**	**87,656**



3.6.6 Activity class | Public transport infrastructure

Public transport facilities operations and maintenance (Work category 514)

This work category rovides for the management, operation and maintenance of off-vehicle facilities and infrastructure associated with the delivery of public transport services.

	2027-28	2028-29	2029-30
Bus shelter cleaning	2,550	2,601	2,653
Bus shelter panel repair/s	3,570	3,641	3,714
WC 514 Total	**6,120**	**6,242**	**6,367**



3.6.7 Subsidised investment summary

	Work Category	2027-28	2028-29	2029-30	NLTP Total
004	Business case development	250,000	0	0	250,000
	Investment Management total	**250,000**	**0**	**0**	**250,000**
114	Structures Maintenance	452,574	399,774	398,484	1,250,831
121	Environmental Maintenance	1,734,000	1,768,680	1,804,054	5,306,734
122	Network Service Maintenance	641,769	659,516	673,830	1,975,114
123	Network Operations	16,493	16,823	17,160	50,476
131	Rail Level Crossing Warning Devices	30,600	31,212	31,836	93,648
140	Minor Events	56,100	57,222	58,366	171,688
151	Network & Asset Management	2,023,194	1,995,772	2,044,708	6,063,675
215	Structures Component Replacements	343,740	297,554	249,384	890,678
222	Traffic Services Renewals	642,600	655,452	668,561	1,966,613
	Local Road Operations total	**5,941,070**	**5,882,006**	**5,946,382**	**17,769,458**
111	Sealed Pavement Maintenance	1,758,480	1,793,650	1,829,523	5,381,652
112	Unsealed Pavement Maintenance	380,961	388,580	396,352	1,165,892
113	Routine Drainage Maintenance	577,728	595,858	614,482	1,788,068
211	Unsealed Roads Metalling	407,607	415,759	424,075	1,247,441
212	Sealed Roads Resurfacing	1,445,674	4,172,576	4,255,366	9,873,616
213	Drainage Renewals	543,795	559,518	571,816	1,675,129
214	Sealed Road Pavement Rehabilitation	4,349,584	4,014,568	4,371,668	12,735,820
	Local Road Pothole Prevention total	**9,463,829**	**11,940,509**	**12,463,281**	**33,867,619**
216	Bridges & Structures Renewals	550,800	1,165,248	1,804,054	3,520,102
341	Low cost, low risk improvements	815,539	824,727	821,116	2,461,382
	Local Road Improvements total	**1,366,339**	**1,989,975**	**2,625,170**	**5,981,484**
124	Cycle Path Maintenance	1,581	1,613	1,645	4,838
125	Footpath Maintenance	35,700	36,414	37,142	109,256
225	Footpath Renewals	84,252	85,937	87,656	257,845
	Walking and Cycling Improvements total	**121,533**	**123,964**	**126,443**	**371,940**
514	Public transport facilities [Ops & Maintenance]	6,120	6,242	6,367	18,730
	Public Transport Facilities O & M total	**6,120**	**6,242**	**6,367**	**18,730**
	Total	**17,148,891**	**19,942,696**	**21,167,643**	**58,259,230**

3.7 Non-subsidised programme

Where Council wishes to invest in activities that do not meet the criteria for funding assistance from the New Zealand Transport Agency,

but sees them as bringing benefit to our customers, local communities, or our district as a whole

a focused investment programme is generated to enable the maintenance, and improvement to, the desired Level(s) of Service.

Maintenance

Non-subsidised activities can include:

Sand and debris clearance | Maintaining access on local roads, and to beaches in Himatangi Beach and Tangimoana

Aesthetic features | Maintenance of berms, shoulders, and traffic islands (behind the kerb), generally in urban areas

Off-street parking areas | Maintaining facilities that are off-road and/or where access is managed

Street sweeping | The additional local share of funds required to compensate for reduced financial assistance

Recreational pathways | Maintenance of pathways not connected to wider public networks, or where access is managed

Network services | Maintenance of signs, delineators, and other services not qualifying for financial assistance

Noxious plants | Control of noxious plants declared in terms of the Biosecurity Act 1993 within the road reserve

Operations

Non-subsidised activities can include:

Network and asset management | Carried out by Council's in-house professional services, including the processing of traffic management for events on public roads

Festive lighting | Lighting for short-term events, or any other lighting not directly related to the operation of a road

Renewals

Non-subsidised renewal activities can include:

Aesthetic features | Replacement of features not qualifying for subsidised funding, or upon Council instruction

Pavements and surfaces | Renewal of pavements, surfaces, or accessways to off-street and/or managed access parking facilities, including roadmarking and other delineation devices

Network services | Replacement of wayfinding, information, and other signage not qualifying for subsidy

Improvements

Upon Council instruction via Long-term planning processes, improvement activities can include:

Seal extensions | The sealing of isolated sections of pavement within the unsealed road network in order to mitigate dust nuisance and/or reduce maintenance costs

Urban reconstructions | The 'rebuild' of all assets within a road corridor, constituting (but not limited to) water and utility infrastructure, pavement, seal, kerbs, channels, sumps, berms, pathways, aesthetic planting, vehicle crossings, roadmarking, and signage

Active/aternative transport facilities | The construction of footpaths, cyclepaths or other transport infrastructure not qualifying for financial assistance

Other improvements | Projects that fail to achieve a high enough score from NZTA's Investment Prioritisation Method (IPM) to obtain funding from the 2027-30 National Land Transport Fund, but Council wishes to implement



3.7.1 Non-subsidised investment summary

Maintenance and operations	2027-28	2028-29	2029-30
Coastal village sand clearance (Himatangi Beach, Tangimoana)	73,440	74,909	76,407
Street cleaning (local share)	58,044	61,552	65,178
Network and asset management (including corridor event management)	61,200	62,424	63,672
Pavement maintenance	56,100	57,222	58,366
Recreational path maintenance	15,300	15,606	15,918
Network services maintenance	5,100	5,202	5,306
Maintenance and operations | Total	**269,184**	**276,915**	**284,848**

Renewals	2027-28	2028-29	2029-30
Pavement renewals	51,000	52,020	53,060
Recreational path renewals	10,200	10,404	10,612
Network services renewals	15,300	15,606	15,918
Renewals | Total	**76,500**	**78,030**	**79,591**

Improvements	2027-28	2028-29	2029-30
Feilding Orbiter PT infrastructure to amended bus route	39,270	0	0
Hobson Street pedestrian crossing (Makino stream bridge to the Hub)	56,024	0	0
Ranfurly Road footpath & streetlighting (Totara Lane to Teitei Avenue)	0	749,088	0
Network services improvements	15,300	15,606	15,918
Improvements | Total	**110,594**	**764,694**	**15,918**

Non-subsidised programme | Total	456,277	1,119,639	380,356

3.8 Investment summary

3.8.1 2027-30 programme

Where activities within our proposed Roading Programme are eligible for financial assistance, NZTA currently provides a subsidy of 51% towards this expenditure, known as the Financial Assistance Rate (FAR). This assistance rate is to remain at 51% throughout the 2027-30 funding period. The table below details the total value of investment, split by eligibility for subsidised funding, summarising the total investment demand for each party over the 2027-30 period.

Funding Stream	2027-28	2028-29	2029-30	Total
Subsidised	17,148,891	19,942,696	21,167,643	**58,259,230**
Non-subsidised	456,277	1,119,639	380,356	**1,956,273**

Proportional Investment	2027-28	2028-29	2029-30	Total
Normal Financial Assistance Rate (FAR)	51%	51%	51%	
New Zealand Transport Agency	8,687,891	10,109,223	10,730,320	**29,527,434**
Approved Organisation	8,917,278	10,953,112	10,817,679	**30,688,069**
Programme Investment	**17,605,169**	**21,062,335**	**21,548,000**	**60,215,503**





Strengthen Manawatū



Thrive Manawatū



Empower Manawatū



Showcase Manawatū



Lead Manawatū

4.0 Asset Management

4.1 Introduction

Asset management is the art and science of making the right decisions and optimising the delivery of value. A common objective is to minimise the whole life cost of assets but there may be other critical factors such as risk or business continuity to be considered objectively in this decision-making.

ISO 55000 defines asset management as the:

coordinated activity of an organisation to realise value from assets

An asset is an item, thing or entity that has potential or actual value to an organisation. Activity management involves the balancing of costs, opportunities and risks against the desired performance of assets, to achieve the organisational objectives. This balancing might need to be considered over different timeframes.

Asset management enables Council to examine the need for, and performance of, assets and asset systems at different levels. Additionally, it enables the application of analytical approaches towards managing an asset over the different stages of its lifecycle (which can start with the conception of the need for the asset, through to its disposal, and includes the managing of any potential post disposal liabilities).

4.2 Goals and objectives of asset ownership

Corporate Goals

Council ensures that all items of programme development and implementation align with the strategic direction by setting maintenance intervention criteria for the different road assets, depending on their classification:

- Using the ONF differential Level of Service (dLoS) performance measures
- Aligning the programme with the strategic direction and dLoS outcomes
- Optimising the intervention options when developing the total needs programme
- Prioritising candidate projects when developing the works programme
- Selecting the types of treatments, materials and construction techniques when implementing the programme
- Ensuring that the activity management plan (AMP) follows the strategic direction

Business frameworks

Council's committee structure is extensive and are established under the LGA 2002. Each township, excluding Feilding, and rural community also has a local Community Committee elected every three years at a specially convened public meeting. The purpose of the committee is to consult with its community and relay local concerns and preferences to the Council. Township services and beautification projects are generally undertaken in conjunction with, or at the behest of, local township committees.

The full list of Community Committees is:

- Āpiti
- Bainesse/Rangiotū
- Beaconsfield
- Cheltenham
- Colyton
- Halcombe
- Hīmatangi Beach
- Hiwinui
- Kimbolton
- Kiwitea
- Pōhangina Valley
- Rangiwāhia
- Rongotea
- Sanson
- Tangimoana
- Waituna West

Organisational culture

An important measure of the quality of Council's activity management is the ability, experience and qualifications of the individuals and companies involved in its preparation. Council employs a limited range of technical staff qualified to carry out the activity management function.

In this context competency refers to applied knowledge, it is not just the knowledge itself. Competencies can be described as: The behaviours that employees must have, or must acquire, to input into a situation in order to achieve high levels of performance.

There are a large number of competencies that the Council requires of its staff to effectively manage its transportation network assets; these are not statements of current individual's skills or

competencies; rather, they are statements of the Council's desired competency in the areas and subjects detailed. Council's People and Culture Group establish the gaps between the competencies of current staff and the competencies required in the organisation. These gaps will be used to guide staff training and development programmes. These inform the recruitment process for staff involved in road activity management when new positions are being filled or replacement staff sought.

Financial sustainability

The LGA 2002 requires Council to prepare a Financial Strategy as part of its Long-Term Plan (LTP). This strategy outlines how the Council intends to manage it's finances prudently. This means the Council will act with careful deliberation and will always consider the financial implications of decisions on the community.

Council must make adequate and effective provision to meet expenditure needs identified in Annual and Long-Term Plans.

The Financial Strategy provides a financial framework for making decisions. Simply, it enables Council to assess proposed spending against rates and borrowing requirements over the whole 10 years of the LTP. It draws together all of the issues in the LTP along with the financial consequences and presents these along with the Council's response. This will:

- Enable the community to readily identify what the financial issues are
- Provide the community with certainty about how expenditure will be met
- The impacts of proposals on Levels of Services, rates, debts and investment
- Enable the community to predict how the Council intends to manage the financial issues in the future
- Provide guidance to decision makers when considering implications of financial issues on communities now and in the future

Council's vision is for:

A thriving community where wise investment in infrastructure, rich agricultural heritage, and a focus on sustainability come together to create a place where people can grow, belong, and succeed.

The services and projects outlined in the LTP will ensure this vision becomes a reality. The provision of services and projects comes at a cost. Council aims to spend within its means, achieving a balance between meeting the needs of the community with its ability to pay.

Asset management

Roading activity management covers a 30-year planning period, in accordance with the International Infrastructure Management Manual (IIMM). It is prepared to meet legislative and user requirements for sustainable service delivery and long term financial planning and reporting. This activity management plan uses a 'bottom up' approach for gathering detailed asset information for individual assets to support the provision of activities and programmes to meet agreed Levels of Service in a financially sustainable manner.

4.3 Strategic and corporate goals

Significance policy

Under the LGA 2002, each Council is required to have a Policy of Significance. The requirements for the policy can be seen as being a means for ensuring that in making decisions that Council is:

- Clear about why it is addressing a matter
- Has evaluated the options and alternatives
- Has information on the community view about the matter and the options for addressing it, and has an understanding of the views and preferences of those persons likely to be affected by - or have an interest in - the matter

A Significant Activity is one that has a high degree of significance in terms of its impact on either:

- The well-being of the people and environment of Manawatū District, and/or
- Persons likely to be affected by or with an interest in that activity, and/or
- Capacity of MDC to provide for the well-being of the district

Transportation is considered as a significant activity and therefore requires consultation.

Our Consultation Policy states that Council will:

- Clarify its expectations through public consultation
- Allow sufficient time for effective response to its proposals
- Report on public proposals and follow up when necessary
- Maintain the consultative process

There are a number of instances where the Council will undertake consultation at a district-wide or comprehensive level. This generally occurs when there is a requirement to use the Special Consultative Procedure as prescribed in the LGA 2002. This occurs when:

- Adopting the annual budget
- Adopting, amending or reviewing a bylaw
- Proposing a change in the way a significant activity is undertaken
- Significant decisions have not already provided for in the community plan
- A service is terminated
- Adopting or amending the community plan

The community plan is reviewed every three years with the annual plan giving effect to that plan in the intervening years. The Council must consult on community outcomes at least every six years.

The Council will decide that some decisions are significant and will therefore require a more rigorous assessment of options and a more robust consultative process. Those decisions are treated as amendments to the Community Plan and can be dealt with separately or as part of the Annual Plan process.

To date, the transportation Levels of Service have been in a process of development and refinement. The One Network Framework (ONF) Levels of Service (LoS) have been established.

The goal of the ONF system is to provide road users, whether they are drivers, users of passenger transport, cyclists, or pedestrians with more consistent LoS across the country.

4.4 Legislative requirements

The NZ Transport Strategy (NZTS) and Long-Term Strategic View (LTSV)

This provides the Government's over-arching strategic vision for transport 'People and freight in New Zealand have access to an affordable, integrated, safe responsive and sustainable transport system'.

It is supported by five principal transport objectives:

- Ensuring environmental sustainability
- Assisting economic development
- Assisting safety and personal security
- Improving access and mobility
- Protecting and promoting public health

To deliver the vision and targets of the Strategy, key components have been identified for government intervention and facilitation by regulation, enforcement, economic incentives, investment, and education as follows:

- Integrated land use and transport planning
- Making best use of existing networks and infrastructure
- Investing in critical infrastructure and the transport sector
- Increasing the availability and use of public transport, cycling, walking and other shared and active modes

Legislation is established by Central Government and must be complied with at Local Government level. Significant legislation and regulations affecting the transportation activities are provided here.

Emergency Management Act 2026

The Council is required to ensure that it can continue to function to the fullest possible extent during and after an emergency, even where services may need to operate at a reduced level.

Council works collaboratively with the regional Emergency Management Committee and other relevant agencies to support emergency preparedness, response and recovery within its district. The land transport network is essential to community connectivity, emergency response and recovery, and the movement of people, goods and essential supplies. Accordingly, transport infrastructure and services are given particular consideration within Council's emergency management planning and operational procedures.

Following an emergency, Council will prioritise the assessment, clearance and restoration of the transport network, seeking to reinstate access as soon as practicable. Where full restoration is not immediately possible, priority will be given to providing safe, limited access to affected communities and essential services, with further restoration undertaken as resources and conditions permit.

Health and Safety at Work Act 2015

New Zealand's key work health and safety legislation is the Health and Safety at Work Act 2015 (HSWA) and regulations made under that Act. All work and workplaces are covered by HSWA unless specifically excluded.

Land Transport Management Act (LTMA) 2003

This document contains particular requirements for content, development of and consultation on the District's Land Transport Programme prior to its adoption by the Council. The original Act was amended in 2008 by the Land Transport Management Amendment Act, which introduced the requirement for a Regional Transport Committee (RTC) to develop a three year Regional Land Transport Programme (RLTP). The Horizons Regional Council is responsible for preparing the Manawatū-Wanganui programme. The programme is required to detail at least the first three financial years' activities, relating to road maintenance, renewals, improvements and public transport services, identified by Approved Organisations/Road Controlling Authorities (RCAs) in the region. The regional programme is then submitted to the New Zealand Transport Agency Waka Kotahi (NZTA) for incorporation into the National Land Transport Programme (NLTP); 10-year forecasts are also required.

Local Government Act (LGA) 2002

Part 6 | Planning, Decision-Making, and Accountability. The consultation and community outcomes sections of this part are particularly relevant. The community outcomes requirements for this Activity management plan are met through the Council's LTP process

Part 7 | Specific Obligations and Restrictions on Local Authorities and Other Persons

Schedule 10 | Council plans and reports on the requirement to consider all options and to assess the benefits and costs of each option

Utilities Access Act 2010

Provides for a coordinated approach to management of the road corridor. The Act requires the Corridor Managers to undertake a planning and access management role, and Utility operators to comply with an approved code of practice.

National planning documents and standards

- Government's Sustainable Development Action Plan
- New Zealand Standard SNZHB 4360:2000 'Risk Management for Local Government'
- The National Land Transport Strategy
- National Energy Efficiency and Conservation Strategy
- The NZTA Maintenance Guidelines for Local Roads
- The New Zealand Coastal Policy Statement 1994
- The (proposed) National Environmental Standard relating to land transport noise from major roads
- NZS 4404:2004 Land Development and Subdivision Engineering
- SNZ HB 2002:2003 Code of Practice for Working in the Road (NZUAG Roadshare)
- National Land Transport Programme
- National Infrastructure Plan 2011
- The Building Regulations 1992
- The Heavy Motor Vehicle Regulations 1974
- Land Transport Rule: Setting of Speed Limits 2022
- Land Transport Rule: Traffic Control Devices 2004

Regional and district level strategies, policies, and plans

Regional council

Section 75 of the LTMA 2003 requires an RTC to produce a Regional Land Transport Strategy (RLTS). The 2027-2057 RLTS is closely aligned with the objectives of the NZTS and LTMA, tailored for the Manawatū region. It includes strategies to accommodate projected growth in the region and the resulting traffic growth or demands for further transport services.

District council strategies

- Sustainability Principal
- District Wide Strategy
- Council Infrastructure Strategy
- Manawatū Walking & Cycling Strategy 2020
- Roading Procurement Strategy

District council documents

- Manawatū District Long-Term Plan
- Manawatū District Plan
- Feilding Urban Growth Framework
- Council Policies
- Council Bylaws

Environmental legislative obligations

There are a number of legislative mechanisms aimed to avoid or mitigate potential adverse environmental effects associated with the management of the Transport network. These are set at national, regional and district level.

The role of Central Government is one of setting policy for activity management across New Zealand. This is achieved through the following:

- Resource Management Act 1991
- Local Government Act 2002
- Land Transport Management Act 2003
- Land Transport (Road Safety and Other Matters) Amendment Act 2011
- Government Policy Statement on Land Transport (GPS) Funding
- Hazardous Substances and New Organisms Act 1996

Resource Management Act plans

The Horizons Regional Council is responsible under the RMA for ensuring that the natural and physical resources of the region (such as the land, air, water and coastal resources) are managed in a sustainable manner.

Horizons regional plan

The Horizons One Plan applies to the management of air, land and water resources in the region including: air, soil, rivers and streams, lakes, groundwater, wetlands and the coast. The One Plan identifies natural values of the regions resources and policies for protecting them. It identifies specific management areas related certain streams, lakes, wetlands, aquifers and air quality areas. It also identifies rules that specify whether an activity is permitted or whether resource consent is needed.

District plan

This provides zoning throughout the district. Certain activities that are permitted in one zone

may not be permitted in another. The different types of resource consents are Land use and subdivision. Activities that need resource consent are classified as controlled restricted discretionary, discretionary and non-complying.

Long-Term Plan

Council has specified 'Environmentally responsible development' in relation to land transport as a community outcome in the LTP.

Horizons Regional Land Transport Strategy (RLTS)

This sets the strategic direction for transport in the Region by describing the vision, objectives and outcomes that will guide the development of the Region's transport network over the next 30-years. The Strategy covers all forms of land transport, including public transport, local roads, state highways, walking and cycling.

Section 175(2)(h) of the Land Transport Act as amended by the LTMA 2011, states that every RLTS must give early and full consideration to land transport options and alternatives in a way that avoids, to the extent reasonable in the circumstances, adverse effects on the environment. It is important to note that the RLTS is a strategic document and does not cover detail at a micro level (i.e., project design). The Strategy, however, provides the strategic direction for future projects.

Resource consents

If the construction of an asset does not meet the development controls outlined in the District Plan or relates to an activity that has the potential to result in adverse effects on the environment, beyond those contemplated by the District Plan provisions, resource consent may be required. An Assessment of Environmental Effects (AEE) is required to support any resource consent applications to the respective Councils when seeking approval to construct, alter or vary the use of a facility or building that is not permitted by the relevant plan.

The AEE process involves the identification and assessment of both the potential and the perceived physical, social and cultural impacts that the proposed works may have on the existing environment, includes the examination and comparison of options and alternatives for mitigating any identified adverse effects, and the confirmation and recommendations on the preferred options and methodology to carry out the works.

The critical environmental factors requiring consideration may include geological and geotechnical effects of land movement (cut and fill), the ecological and biological effects of vegetation removal or earthworks, and the cultural, archaeological and social effects on the environment of the development. These, together with noise, traffic, and visual effects, may require specialist inputs and consultation with the local communities.

4.5 Levels of service

Overarching principles

- Over time all roads in a particular category should offer an increasingly consistent, fit-for-purpose Level of Service for road users
- Value for money and whole-of-life cost will be optimised in the delivery of affordable customer Levels of Service
- The Levels of Service will be delivered in the context of an integrated national network, integrating land-use and transport, including all modes and both rural and urban areas
- The Levels of Service will be delivered in the context of a safe system approach, which aims to create a forgiving road system, where human error and vulnerability do not result in death or serious injury

Non-financial performance measures rules 2013

Pursuant to and in accordance with section 261B of the LGA 2002, the Secretary for Local Government makes the following rules.

These rules are the Non-Financial Performance Measures Rules 2013 (As they apply to the Roading Asset).

Commencement

These Rules come into force on 30 July 2014.

Interpretation

In these rules, unless the context otherwise requires,

Abatement notice means a notice served under section 322 of the Resource Management Act 1991.

Conviction means the conviction of an offence under section 343C of the Resource Management Act 1991.

Enforcement order means an order made under section 319 of the Resource Management Act 1991 for any of the purposes set out in section 314 of that Act; and includes an interim enforcement order made under section 320 of that Act.

Financial year means a period of 12 months ending on 30 June.

Flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.

Flood protection and control works means physical structures owned by local authorities and designed to protect urban and rural areas from flooding from rivers, including ancillary works such as channel realignment or gravel removal.

Footpath means so much of any road as is laid out or constructed by a territorial authority primarily for pedestrians or cyclists; including its edging, kerbing, and channelling, and includes dedicated cycleways.

Infringement notice means a notice issued under section 343C of the Resource Management Act 1991 local authority means a regional council or a territorial authority.

Local authority means a regional council or a territorial authority.

Major flood protection and control works means flood protection and control works that meet two or more of the following criteria:

- Operating expenditure of more than $250,000 in any one year
- Capital expenditure of more than $1m in any one year
- Scheme asset replacement value of more than $10m, or
- directly benefitting a population of at least 5,000 people

Regional Council has the same meaning as in section 5(1) of the Local Government Act 2002.

Road has the same meaning as in section 315 of the Local Government Act 1974.

Sealed local road network means all roads having a sealed or paved surface within a territorial authority's district subject to the exclusions set out in section 317 of the Local Government Act 1974.

Smooth travel exposure means a measure of the percentage of vehicle kilometres travelled on roads that occurs above the targeted conditions for those roads, calculated in accordance with standard industry methodology.

Stormwater system means the pipes and infrastructure (excluding roads) that collect and manage rainwater run-off from the point of connection to the point of discharge.

Territorial Authority means a city council or a district council named in Part 2 of Schedule 2 to the Local Government Act 2002.

Territorial Authority District means a district in respect of which a territorial authority is constituted; and, in relation to land in respect of which the Minister of Local Government is the territorial authority, means that land Measurement Period Any calculation, measure, number or percentage set out in Part 2 of these Rules must be calculated for a financial year (unless otherwise specified in these Rules).

Sub-part 5 | the provision of roads and footpaths

Performance measure 1 (road safety)

The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number.

Performance measure 2 (road condition)

The average quality of ride on a sealed local road network, measured by smooth travel exposure.

Performance measure 3 (road maintenance)

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

Performance measure 4 (footpaths)

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 (such as its annual plan, activity management plan, Activity Management Plan, annual works programme or LTP).

Performance measure 5 (response to service requests)

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

Differential Levels of Service

The ONF is a road classification tool which uses place and movement functions to categorise roads on the network, with a stronger emphasis on place. It classifies the network into rural or urban (based on land use) and assigns place (based on use and physical form) and movement (based on traffic volume) function to the network.

Principles for differential Levels of Service

These statements focus on service levels for General Traffic and Freight modal classes. Service level statements by modal classification for public transport, and walking & cycling are expected to be developed ready for inclusion in 2030.

Level of Service statements are defined by mode (GT and Freight), rather than by the Street Category. While the Street Category indicates the function, the modal classifications that sit under a Street Category can vary significantly (e.g. an Urban Connector can have GT1-4 classifications), making it difficult to ascribe service levels without the underlying modal (and place) context.

These statements are designed to describe what users can expect and are intended to help inform service targets.

Each statement has descriptions that map to service outcomes as well as road condition dimensions.

While customer statements are relatively broad, they do not capture every possible outcome. Further, not all descriptions have a corresponding quantitative measure that is readily available.

General Traffic and Freight service level statements are very similar. In this context, Freight means Heavy Vehicles (>3.5 tonne). This is not intended to indicate that, for example, a GT4 corridor is always an F4 corridor (this will depend on the volumes of each), rather that the description for a GT4 also applies to an F4. The ONF hierarchy bases classification primarily on traffic volume). The following tables detail the classifications relevant to the Manawatū district, and highlights the expected Levels of Service.

Urban Networks

GT / F	4
Volumes	GT 5,000 to 15,000, Freight 300 to 800
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are predictable. Reduced speeds and extra care may be needed during peak flow times or bad weather, and during interactions with other transport modes. Variations in road layout may affect travel comfort and safe speeds. Direct access to nearby areas or facilities is likely. The road is likely to be shared with other transport modes inside or beside the traffic lanes. Extra care, low speeds, and stopping may be required at intersections, crossings, and access points. Parked cars may be present. Signage for key locations and routes will support navigation along the route. Alternative routes and proactive information will be provided during any unplanned disruptions, but roads may be of a lower standard and take longer. **Freight** As above
Corridor form	The road configuration supports comfortable, reliable and safe travel. Designed to maximise safety with speed appropriate road design including smooth, even surfaces to support traffic volume, loading and defined noise requirements. Road lighting provided. Opposing lanes may be separated by a raised median. Can be single or multi laned, with turning lanes at major intersections, or for high volume vehicle access to adjacent land.

	Intersections configured for safe interactions and to support flow for the priority road or users (e.g. roundabouts or signals at major intersections, stop or give way controls on lower priority connecting roads). Parked cars, pedestrian crossings and traffic islands are common. Clear directional signage at intersections with key connecting routes or access points. Designed to support reasonable service life without frequent repair. Key assets accessible for maintenance and emergency crews to mitigate disruptions. Alternative route available. Design usually allows for Heavy Vehicles to pass freely in opposing directions.
Operations and maintenance	Flow along the road is often prioritised at intersections. Proactive maintenance and renewal to maximise safety, reduce hazards, minimise disruption and maintain service. Travel information provided at site and by exception.
GT / F	**5**
Volumes	**GT** 3,000 to 5,000, **Freight** 150 to 300
Customer service statement	**General Traffic** Travel is generally comfortable and reliable, and may require slower speeds. Most travel times are reasonably predictable. Reduced speeds and extra care may be needed during peak flow times, bad weather, and during interactions with other transport modes. Variations in road layout may affect travel comfort and safe speeds. Direct access to nearby areas or facilities is likely. The road is likely to be shared with other modes of transport inside or beside the traffic lanes. Extra care, low speeds, and stopping may be required at intersections, crossings, and access points. Parked cars may be present. Signage for key locations will support navigation. Alternative routes will usually be available during any unplanned disruptions, but drivers may need to navigate these themselves and they may be of a lower standard and take longer. **Freight** All of the above, plus, possible weight, height or length restrictions. Drivers of larger vehicles should Consider this Before using the route.
Corridor form	Road configuration of two lanes allows comfortable, reliable and safe travel. Speed-appropriate road design including smooth, even surfaces to support traffic volume, loading and defined noise requirements. Occasional instances of road surface defects. Road lighting provided. Intersections configured for safe interactions and to support flow for the priority road or users (e.g. roundabouts or signals at major intersections, stop or give way controls on lower priority connecting roads, uncontrolled intersections in lower volume instances). Parked cars, pedestrian crossings, and traffic islands are common. There may be weight, height or length restrictions. Clear directional signage at intersections with key connecting routes or access points. Designed to support reasonable service life without frequent repair. Key assets accessible for maintenance and emergency crews to mitigate disruptions. Alternative route usually available.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network and on priority routes. Maintenance and renewal undertaken to sustain asset life at least cost and where cost-effective to support resilience. Travel information provided at site and by exception.

GT / F	6
Volumes	**GT** 1,000 to 3,000, **Freight** 25 to 150
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are reasonably predictable. Reduced speeds and extra care may be needed on narrow road sections or tight corners, during bad weather, and during interactions with other transport modes. Variations in road layout may affect travel comfort and safe speeds. Direct access to nearby areas or facilities is likely. The road is likely to be shared with other transport modes inside or beside the traffic lanes. Extra care, low speeds, and stopping may be required at intersections, crossings, and access points on the route. Parked cars may be present. You may come across narrow roads, uneven road surfaces, isolated road defects and areas of poor road condition. Signage for key locations will support navigation. Alternative routes may not be available during any unplanned disruptions, so drivers will need to navigate themselves. Any alternate roads are likely to be of a lower standard and take longer. **Freight** All of the above, plus, possible weight, height or length restrictions. Drivers of larger vehicles should consider this before using the route.
Corridor form	Roads configured as two lanes, though in some places may have narrow sections, and be operating as a single lane road due to topography and on street parking. Inconsistent road configuration and design, narrow width, uneven surface and defects. Occasional instances of road surface defects, and patched repairs. Basic delineation such as road markings. No specific provision for vehicles accessing adjacent land. Intersections with higher priority roads and paths often configured with stop or give-way signals. Pedestrian facilities, such as crossings or traffic islands are common. Possible speed management to ensure safe interactions.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network and on priority routes. Medium-priority reactive maintenance, planned renewal and safety and service maintenance across network programme. Maintenance and renewal undertaken to sustain asset life at least cost and where cost-effective to support resilience. Travel information provided at site exception.
GT / F	**7**
Volumes	**GT** 200 to 1,000, **Freight** <25
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are reasonably predictable. Reduced speeds and extra care may be needed on narrow road sections or tight corners, or during bad weather and during interactions with other transport modes. Variations in road layout may affect travel comfort and safe speeds. Direct access to nearby areas or facilities. Extra care, low speeds, and stopping may be required at tight corners, intersections, crossings, and access points on the route. The road will be shared with other transport modes inside or beside the traffic lanes. Parked cars may be present. There may be narrow or single lane sections where you'll need to give way to oncoming traffic. You may come across uneven road surfaces, isolated road defects and areas of poor road condition.

	Signage for key locations will support navigation. Alternative routes may not be available during any unplanned disruptions, so drivers will need to navigate themselves. Any alternate roads are likely to be of a lower standard and take longer. **Freight** All of the above, plus, possible weight, height or length restrictions. Drivers of larger vehicles should consider this before using the route.
Corridor form	Roads are sometimes narrow, with tight corners. May be operating as a single lane road due to topography or parked cars. Inconsistent road configuration and design, narrow width, uneven surface and defects. Inconsistent sight lines. Occasional instances of road surface defects, and patched repairs. Basic delineation such as road markings. No specific provision for vehicles accessing adjacent land. Intersections with higher priority roads and paths often configured with stop or give-way signals. Treatments like traffic islands, pedestrian crossings, and speed management may be present to ensure safe interactions.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network. Lower priority reactive maintenance, planned renewal and safety maintenance across network programme. Instances of road surface defects, and patched repairs. Maintenance and renewal undertaken to achieve minimum standard at least cost. Travel information provided by exception.
GT / F	8
Volumes	**GT** <200, **Freight** <25
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are reasonably predictable. Reduced speeds and extra care may be needed on narrow road sections or tight corners, or during bad weather and when interacting with other transport modes. Variations in road layout may affect travel comfort and safe speeds. Direct access to nearby areas or facilities. The road will be shared with other transport modes inside or beside the traffic lanes. Extra care, low speeds, and stopping may be needed at tight corners, intersections, crossings, and access points on the route. Parked cars may be present. There may be time-based restrictions for vehicles. You are likely to come across narrow roads, uneven road surfaces, isolated road defects and areas of poor road condition. In some narrow sections you will need to give way to oncoming traffic or other modes. Signage for key locations will support navigation. Alternative routes may not be available during any unplanned disruptions, so drivers will need to navigate themselves. Any alternate roads are likely to be of a lower standard and take longer. **Freight** All of the above, plus, possible weight, height or length restrictions. Drivers of larger vehicles should consider this before using the route.
Corridor form	Roads are often narrow, with tight corners and sometimes operating as a single lane road. Inconsistent road configuration and design, narrow width, uneven surface and defects. Inconsistent sight lines. Possible instances of road surface defects, patched repairs, or pedestrian-focused paving. Basic delineation such as road markings.

	Intersections with high priority roads and paths often configured with stop or give-way controls. Treatments like traffic islands, pedestrian crossings, and speed management may be present to ensure safe interactions. No specific provision for vehicles accessing adjacent land.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network. Lowest priority reactive maintenance for general traffic, planned renewal and safety maintenance across network programme. Instances of road surface defects, and patched repairs. Maintenance and renewal undertaken to achieve minimum standard at least cost. Travel information provided by exception.

Figure 230 | Customer Levels of Service expectations by GT classification, urban networks

Rural Networks

GT / F	3
Volumes	GT 10,000 to 15,000, Freight 800 to 1,200
Customer service statement	**General Traffic** Travel is generally comfortable and reliable, with drivers usually able to travel near or up the speed limit. Most travel times are predictable. Reduced speeds and extra care may be needed during peak flow times or bad weather, or to navigate narrow sections of road or tight corners. Variations in road layout, hills, bends, and safe passing opportunities may affect travel comfort and safe speeds. Extra care and stopping may be required at intersections and access points on the route. The road may be shared with other transport modes in some places. Road is well-lit at key points such as major intersections. Access to nearby areas or facilities will normally be provided by connecting roads or through safely designed slip lanes or access points. Easy to navigate to and from connecting roads and access points along the route. Alternative routes and proactive information will be provided during any unplanned disruptions, but roads may be of a lower standard and take longer. **Freight** All of the above, plus, road can accommodate vehicles up to 44 tonne and/or the maximum length for standard vehicles. HPMV access permissible in some cases.
Corridor form	Road configuration mostly supports travelling up to posted speed limits, particularly on the flat. Hilly terrain may require lower speeds. Passing lanes may be provided. Safety features like sealed shoulders, median barriers, roadside barriers at high-risk locations, delineation such as road markings and audio tactile profiled road markings generally provided. Speed appropriate road shape design with sight lines, smooth, quiet surfaces. Regulatory and advisory travel speeds reflect road shape design needs. Infrequent access points to adjacent land, restricted direct access to land across the centreline where the traffic volumes or turning manoeuvres make this unsafe. Good connectivity with other strategic routes. Intersections configured for safe interactions and to support flow on the priority road(s) (e.g. roundabouts or signals at major intersections, turning bays, and stop or give way controls on lower priority connecting roads). Lighting only where there is value, particularly at intersections. Directional signage.

	Designed to maximise service life with inherent resilience, minimal surface water, and easy maintenance access. Design allows for Heavy Vehicles (including HPMVs where access is permissible) to pass freely in opposing directions.
Operations and maintenance	Flow along route is often prioritised at controlled intersections with lower class roads. Prioritised management and restoration of traffic flow following events and incidents. Proactive maintenance and renewal to maximise safety, reduce hazards, minimise disruption and maintain service. Maintenance and renewal undertaken to ensure maximum asset life and resilience, aimed at minimising future disruption. Travel information provided at site and by exception.
GT / F	**4**
Volumes	**GT** 3,000 to 10,000, **Freight** 300 to 800
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are predictable. Reduced speeds and extra care may be needed during peak flow times or bad weather, or to navigate narrow sections of road or tight corners. Variations in road layout, hills, bends, and the number of safe passing opportunities may affect travel comfort and safe speeds. These roads may include direct access to nearby areas or facilities. Extra care and stopping may be required at intersections, crossings, and access points on the route. Easy to navigate to and from connecting roads and access points. The road is likely to be shared with other transport modes, either inside or beside the traffic lanes. Road is well-lit at key points such as major intersections. Alternative routes and proactive information will be provided during any unplanned disruptions, but roads may be of a lower standard and take longer. **Freight** All of the above.
Corridor form	Road layout typically 1+1 with passing lanes or slow vehicle bays. Safety features like signage, sealed shoulders and delineation such as road markings to mitigate known risks. Smooth and even road surface to maximise safety. Surfaces selected to reflect traffic volume, loading and defined noise requirements. Regulatory and advisory travel speeds reflect road shape design needs. Lighting only where there is value, particularly major intersections. Intersections configured for safe interactions and to support flow on the priority road(s) (eg roundabouts at major intersections, turning bays stop or give way controls on lower priority connecting roads). Road shared by all users. Regular directional signage. Key assets accessible for maintenance and emergency crews to mitigate disruptions. Design usually allows for Heavy Vehicles to pass freely in opposing directions.
Operations and maintenance	Flow along route often prioritised at intersections with lower class roads. Prioritised management and restoration of traffic flow following events and incidents. High-priority reactive maintenance, planned renewal and safety and service maintenance across network programme. Maintenance and renewal undertaken to sustain asset life at least lifecycle cost and where cost-effective to enhance resilience. Travel information provided at site and by exception.

GT / F	5
Volumes	**GT** 1,000 to 3,000, **Freight** 150 to 300
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are reasonably predictable. Reduced speeds and extra care may be needed during bad weather, or to navigate narrow sections of road or tight corners. Variations in road layout, hills, bends, and the number of safe passing opportunities may affect travel comfort and safe speeds. May include direct access to nearby areas or facilities. Extra care and stopping may be required at intersections, crossings, and access points on the route. You may come across slow or turning vehicles. The road is likely to be shared with other transport modes, either inside or beside the traffic lanes. Signage for key locations will support navigation. Additional lighting possible at major intersections. Alternative routes will usually be available during any unplanned disruptions, but drivers may need to navigate these themselves and they may be of a lower standard and take longer. **Freight** All of the above, plus, there may be weight limits on bridges. Drivers of heavy vehicles should consider this before using the route.
Corridor form	Road layout: typically two lane undivided, with minimal to no sealed shoulders generally available except at constrictions or across hilly terrain. Few passing lanes. Standard width for traffic volume. Surfaces (sealed or unsealed) selected to reflect traffic volume, loading and defined noise requirements. Delineation generally provided, safety barriers provided at points of greatest risk. Regulatory and advisory travel speeds reflect road shape design needs. Lighting not generally provided but may be provided at major intersections. Occasional instances of road surface defects. Intersections configured for safe interactions and to support flow on the priority road(s) (eg roundabouts at major intersections, stop or give way controls on lower priority connecting roads). Road shared by all users. Surfaces selected to minimise lifecycle cost and minimum safety requirements. Possible surface water during extreme events. Few alternative route options, which may have restrictions on heavy and large vehicles, and may be lengthy. Intermittent directional signage.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network. Maintenance and renewal undertaken to sustain asset life at least cost and where cost-effective to support resilience. Travel information provided at site and by exception.
GT / F	**6**
Volumes	**GT** 200 to 1,000, **Freight** 25 to 150
Customer service statement	**General Traffic** Travel is generally comfortable and reliable. Most travel times are reasonably predictable. Reduced speeds and extra care may be needed during bad weather or to navigate narrow sections of road or tight corners. Variations in road layout, hills, bends, and the number of safe passing opportunities may affect travel comfort and safe speeds. Likely to include direct access to nearby areas or facilities. Extra care and stopping may be required at intersections, crossings, and access points on the route. You may come across slow or turning vehicles.

	The road is likely to be shared with other transport modes, either inside or beside the traffic lanes. Signage for key locations will support navigation. Additional lighting possible at major intersections only. Alternative routes may not be available during any unplanned disruptions, so drivers will need to navigate themselves. Any alternate roads are likely to be of a lower standard and take longer. **Freight** All of the above, plus, there may be weight limits on bridges. Drivers of heavy vehicles should consider this before using the route.
Corridor form	Configured as two lanes, with shoulders generally available except at constrictions or across hilly terrain. Few passing lanes. Standard width for traffic volume. Surfaces (sealed or unsealed) selected to reflect traffic volume, loading and defined noise requirements. Delineation generally provided, safety barriers provided at points of greatest risk. Regulatory and advisory travel speeds reflect road shape design needs. Occasional instances of road surface defects. Lighting not generally provided but may be provided at major intersections. Intersections with high priority roads often configured with stop or give-way signals. Road shared by all users. Surfaces selected to minimise lifecycle cost and minimum safety requirements. Possible surface water and slips during extreme events. Intermittent directional signage. Few alternative route options, which may have restrictions on heavy and large vehicles, and may be lengthy.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network. Medium-priority reactive maintenance, planned renewal and safety and service maintenance across network programme. Maintenance and renewal undertaken to sustain asset life at least cost and where cost-effective to support resilience. Travel information provided at site and by exception.
GT / F	**7**
Volumes	**GT** 200 to 1,000, **Freight** <25
Customer service statement	**General Traffic** Travel is generally comfortable and most travel times are reasonably predictable. Reduced speeds and extra care may be needed at times. Variations in road layout, hills, bends, road width, road surface, and the number of safe passing opportunities will affect travel comfort and safe speeds. There may be narrow sections of road and narrow bridges, sometimes requiring vehicles to give-way to oncoming traffic. Likely to include direct access to nearby areas or facilities. Extra care and stopping may be required at intersections, crossings, and access points on the route. You may come across slow or turning vehicles. You may come across uneven road surfaces, isolated road defects and areas of poor road condition. The road is likely to be shared with other transport modes, either inside or beside the traffic lanes. Signage will likely be limited to street names and key locations nearby. Additional lighting possible at major intersections only.

	Alternative routes may not be available during any unplanned disruptions, so drivers will need to navigate themselves. Any alternate roads are likely to be of a lower standard and take longer. **Freight** All of the above, plus, possible weight limits on bridges. Drivers of heavy or wide vehicles should consider restrictions before using the route.
Corridor form	Inconsistent road configuration and design, narrow width, uneven surface and defects, often unsealed surfaces. Often narrow with no shoulders, with constrictions and narrow bridges that are effectively one way. Minimal delineation provided such as road markings and edge marker posts. Inconsistent sight lines. Occasional instances of road surface defects, and patched repairs. Intersections typically at-grade either priority or uncontrolled T- or X-junctions. Road shared by all users. Unlit. Likely surface water during extreme events. Prone to failure during extreme events. Generally no alternative route.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network. Low-priority reactive maintenance, planned renewal and safety maintenance across network programme. Maintenance and renewal undertaken to achieve minimum standard at least cost. Travel information provided by exception.
GT / F	8
Volumes	**GT** <200, **Freight** <25
Customer service statement	**General Traffic** Travel is generally comfortable and most travel times are reasonably predictable. Reduced speeds and extra care may be needed at times. Variations in road layout, hills, bends, road width, road surface, and the number of safe passing opportunities will affect travel comfort and safe speeds. There may be long sections of narrow of road and narrow bridges, sometimes requiring vehicles to give-way to oncoming traffic. Likely to include direct access to nearby areas or facilities. Extra care and stopping may be required at intersections, crossings, and access points on the route. You may come across slow or turning vehicles. You are likely to come across uneven road surfaces, isolated road defects and areas of poor road condition. The road is likely to be shared with other transport modes inside or beside the traffic lanes. Signage will likely be limited to street names. Additional lighting not provided. Alternative routes will generally not be available during any unplanned disruptions, so drivers will need to navigate themselves. **Freight** Possible weight limits on bridges. Drivers of heavy or wide vehicles should consider restrictions before using the route.
Corridor form	Inconsistent road configuration and design, narrow width, uneven surface and defects, often unsealed surfaces. Generally narrow with no shoulders, with constrictions and narrow bridges that are effectively one way.

	Minimal safety features and delineation such as road markings. Inconsistent sight lines. Instances of road surface defects, and patched repairs. Unlit. Intersections typically at-grade either priority or uncontrolled T- or X-junctions. Road shared by all users. Likely surface water during extreme events. Prone to failure during extreme events. No alternate route. Information provided only as available.
Operations and maintenance	Response to events and incidents prioritised by severity of impact and restoration dependent on extent of impact across the network. Lowest-priority reactive maintenance, planned renewal and safety maintenance across network programme. Maintenance and renewal undertaken to achieve minimum standard at least cost. Travel information provided by exception.

Figure 231 | Customer Levels of Service expectations by GT classification, rural networks

4.6 Demand

Asset impact

Asset context and achievements to date

The district's land transport network is a core strategic facility and is maintained (excluding state highways) by the Council to assist it in meeting its Community Outcomes. It provides particularly strong inputs into the achievement of Community Outcomes.

New infrastructure has been continually added to the network - primarily from new urban subdivisions - since the District was established in 1989, reflecting the high population growth rates over that period. The majority of new urban infrastructure is vested at no initial cost to Council by private developers. However, Council is then responsible for the ongoing maintenance and renewal of this infrastructure in perpetuity.

Changes in the strategic management of the assets

The Council's policies and management strategies are continual evolve to keep pace with the changing needs of the community, statutory requirements, funding organisations and central government's requirements. Changes to policies and management strategies can also have a significant effect on how assets are managed.

The directions of future land use changes and their effects on the roading network are always difficult to determine with accuracy, but it is important that the roads likely to be affected are identified and prepared in readiness for these changes at the appropriate times. More importance is being placed on the integration of land use and transportation systems to provide long-term sustainable solutions. The Council is actively involved in regional strategic planning initiatives to help it assess and plan for the demands of further growth in a sustainable way, across all its assets and responsibilities, including the transportation network.

Demand for new or upgraded facilities arises from the needs of the existing population i.e., meeting the Level of Service standards, changing habits, and population growth. This demand manifests itself in the need for:

- New roads
- Sealing of unsealed roads
- Widening and alignment improvements
- Upgraded intersections
- New and upgraded bridges
- Appropriate urban facilities in closely settled areas, e.g., streetlights, kerb and channel, footpaths
- New cycleways and walkways

The Council intends to maintain its awareness of these issues and plans to provide a transportation network that meets the communities' expectations. This may involve implementing improvement projects, walking and cycling lanes, seal widening and selected public transport infrastructure facilities in conjunction with routine maintenance and renewal of its roading network.

The funding of all these works has been recognised in the financial forecasts in this Plan and will be utilised in the formulation of Manawatū's LTP.

Significant land use changes

Council periodically undertakes a review of the District Plan. One of the key parts of the review involves consideration of urban growth requirements around Feilding. A total of four residential growth precincts and one industrial growth precinct are currently identified in the District Plan.

To date Precincts 1 (one), 2 and 3 from the framework plan have been through the public plan change process under the Resource Management Act (1991). These areas are located to the west of Feilding, and detailed structure plans have been prepared. The combined total yield of three precincts is 1,860 new residential lots at minimum lot sizes between 800m^2 and 2,000m^2. The expected yield will result from some rezoning completed immediately, and from areas identified for deferred zoning that will remain rural and be rezoned to residential as demand requires.

Precinct 4 (now known as Maewa) - located around Pharazyn Street/Reids Line - and the industrial growth at Turners Road (Precinct 5) are being developed at the time of this plan. These areas will provide an additional yield of 1,600 residential lots and an additional 97ha for future industrial land use.

Planned upgrades

For roading the large majority of expenditure is on planned renewals and maintenance. The largest single project capital costs are to replace the bridge structures across the district as they reach the end of their useful lives. These renewals are programmed in over the next 30-years and beyond.

This strategy reflects the current upgrade programme in the short to medium-term. As these infrastructure assets are long-term investments the majority of investment required in the long term will be plant and pipe renewals, and forecast work required to lift standards in response to the renewal of resource consents.

Council also has a focus on economic development, and on ensuring the associated infrastructure capacity is available for commercial/industrial land and residential growth in Feilding.

Management planning

Plan changes

These provide for the strategic residential growth of the Northeastern, Western, and Southwestern areas of Feilding, with the Southern area identified for industrial growth.

The broad objective and policy framework put in place by plan changes will manage business as well as residential growth. Development plans have been established for inclusion in the District Plan as part of the plan change process. These seek from the outset to achieve good urban design and sustainable outcomes, by establishing how each block will spatially develop across all infrastructural assets, and how these developments will link to existing and other new areas. Some of the key elements required to be shown are roading, walking and cycling routes and networks.

Subdivision planning

The nature of subdivision developments, and the corresponding need for subdivision commitment expenditure, can be difficult to define and predict

over a 10-year programme period. This also comes about from the large differences in lead times between receipt of proposals for major developments and their practical completion.

Subdivision commitments can only be determined on a case-by-case basis once applications are lodged and approved. Consent conditions, under the Resource Management Act 1991, requiring financial contributions for roading upgrades can be contested by the developer. The time taken to work through these processes can present a problem in forecasting the work and finance required to meet them. The approach taken in this Plan to address this problem is to:

- Programme specific works when they are confirmed and quantified
- Programme indicative finance where specific works or projects are not yet identified or quantified
- Base financial projections on constant-dollar historical expenditures on subdivision commitment works, tempered by consideration of the Council's accepted growth predictions for the various towns and localities within the district

While predicted growth discussed above refers to people, it is expected that the average dwelling occupancy rate will continue to decline over time, resulting in the numbers of dwellings increasing at a slightly faster rate than the residential population over the period.

Trip generation is typically modelled on the number of trips generated per household, which for assessment purposes currently ranges between 6 and 10 trips per day. Another recent influence is that most households in the district now have more than one vehicle. Therefore, trip generation or traffic growth is expected to increase faster than the population. An aim of initiatives like Travel Demand Management (TDM) is to manage the increase in trips by facilitating non-car based solutions such as walking, cycling, and public transport.

Assumptions

It is reasonable to assume that the Council will need to fund a share of subdivision works related to development at about the same proportion as present. However, despite the uncertainty surrounding prediction of subdivision commitments discussed above, some of the commitments in the immediate years (years 1 to 2 and possibly 3) of the programme are known, because of the lead-times between receipt of proposals for major developments and their practical completion. These known projects will be programmed as specific items in the forward programme.

The demographic changes around dwelling occupancy will have only a very small effect on the total number of dwellings required in the short to medium-term; and as far as the forecasting of subdivision commitment funding is concerned, they can reasonably be ignored.

Development contributions

Development contributions are contributions required from developers to help offset the effects of growth they have induced on the network. They are levied under the LGA 2002 and Council's Development Contribution Policy.

Financial contributions are amounts or works required of developers to avoid, remedy or

mitigate the adverse effects of their developments on the environment, built or natural. They are levied under the Resource Management Act 1991. Works that include a growth component can be considered for a development contribution; based on the cost of providing additional capacity for growth. Providing additional capacity for an enhanced Level of Service as well may still attract a growth component, but it will be of a lesser proportion.

Financial Contributions are levied for specific works that need to be carried out on roads adjacent to new developments, where the standard of the road is inadequate for the development. The costs of these works are shared with the Council, based on projected traffic volumes.

Subdivision approvals and commitments

Roads, because of their fundamental role in providing access to and from, and often within, properties, are directly affected by changes in land use and subdivisions. Some of these effects may be very minor and some can be significant, either locally or at a network level.

Subdivisions reflect the underlying land use zoning. If the zoning status of land changes, through the Manawatū District Plan or private plan changes, this can result in areas being subdivided and developed for residential, rural residential, business/commercial and industrial purposes. This can drive the requirement for existing roads and streets to be upgraded and new infrastructure to be constructed and vested in the Council.

Developers usually pay the full cost of roading and development works within new subdivisions. However, when the Council anticipates that a proposed local road will have wider use in network, such as a collector or arterial road, it will contribute towards the incremental cost of any additional width.

New roading assets are vested in the Council upon completion of the subdivision and the issuing of titles to the new lots. The Council, as ultimate owner and operator of these assets, specifies minimum design criteria and checks construction at critical stages.

This process requires developers to obtain engineering approval for the proposed works from Council staff prior to construction. This includes providing fully detailed plans and specifications for approval. Until approval is obtained, physical construction work, including roading, streetlighting, and utilities installation and construction, cannot proceed.

The Developer must have all completed works inspected and approved by the Council before a Section 224(c) Certificate is issued. When the certificate is issued the new assets are vested in Council.

New roads and other associated infrastructure like footpaths, streetlights, etc are recorded and added to the Asset and Work Manager (AWM) network inventory upon receipt of the assets from the developer.

Where a new development fronts an existing legal road, improvements will often be needed to be made to it; sometimes improvements are required to other parts of the wider network, separate from the subdivision. These improvements can include footpaths, kerb and channel, access improvements, increased seal width, and improved sight lines and improvements to adjacent intersections.

For each development, the Council considers the need for roading improvements directly associated with the subdivision and, where

improvements are justified; engineering staff seek to have appropriate conditions inserted in the relevant consents. These can be established and applied through either the Resource Management Act 1991 (to avoid, remedy or mitigate the adverse effects of a particular development), or as Financial Contributions.

The Council prefers to utilise its development contribution policy for establishing upgrading contributions for any improvements remote from the subdivision.

Under the provisions of these Acts, and case law, the Council is often not able to require a developer to pay the full cost of an upgrade to an existing road and is required to share the cost of the works. In some cases, the Council will apportion costs on the basis of contributing traffic, however generally a minimum 50% contribution is sought as it would be inappropriate for the Council to commit itself to significant expenditure on the basis of a low contribution.

Existing roads are upgraded as a result of new subdivisions or changes in land use if the additional traffic generated is significant enough to warrant a contribution being imposed on the developer to mitigate its adverse effects on the network.

Until recently, the nature of subdivision development was that the Council had little, if any, control over the timing or implementation of any project. Recent strategic planning initiatives are attempting to control the amount, and staging of, growth to ensure the supply of supporting infrastructure is sustainable and achievable.

The development of Structure Plans have provided greater certainty in the urban form likely to develop and deemed appropriate. This enables coordinated planning to occur and opportunities for lead infrastructure to be provided by Council and funded by development contributions.

Improvement funding

The funding of larger scale improvements is catered for in the subsidised National Land Transport Programme, and can be allocated to NZTA Work Categories 216, 322 to 325, and 357, enabling substantial projects such as new bridges and roads. Individual projects generally have to meet assessment criteria under NZTAs Cost Benefit Manual(s) to be eligible for funding.

Smaller scale improvements access funding through Work Category 341. Depending on their nature, projects below, or within, $2m to $5m can be funded from this category. Historically, Council would anticipate availability of funding commensurate to 5% of the value of its Maintenance and Renewal Programme. This equated to approximately $500,000 per annum. Since 2021, Council must discuss with - and have approved - all Road Safety projects by NZTA, reporting delivery status on a frequent basis.

Wherever possible, the Council utilises subsidised funding sources to carry out major works. If major transportation projects are not eligible for subsidised funding, Council may then consider fully funding them to achieve their goals.

Improvement planning

The LTP process stipulated by the LGA 2002 requires the Council to plan and forecast its activities for long periods into the future, and to publish and consult on its intentions at three yearly intervals. In the periods between LTPs, it is required to follow a simpler Annual Plan

procedure. There is little scope under this system for making significant changes to major LTP programmes at Annual Plan time, unless there are exceptional circumstances.

The Land Transport Management Amendment Act 2008 introduced a requirement for RCAs to prepare three yearly Land Transport Programmes. However, the requirement for territorial local authorities to do so is only an indirect one, in that major projects need to be prioritised and coordinated on regional basis in order to obtain funding from the NLTP and a Regional Land Transport Programme (RLTP) is required as an input to the NLTP. The RTC performs this prioritisation task, and achieves the regional consensus necessary to develop and confirm the RLTP.

The Council oconsiders potential, individual improvement projects from sources such as community committees, staff, and councillors. These requests may also arise from public enquiries and projects not usually expected to be contained in other forward more formal programmes (e.g., seal extensions and seal widening programmes). Typically, these requests are associated with township renewal and improvement works such as footpath extensions, new kerb and channel, individual streetlights and street upgrades. Renewal recommendations are not part of this process, other than their interaction with street upgrading in some instances.

Local priorities

As part of the development of LTP, the District's communities, via their respective Community Committees, are provided the opportunity to rank proposed improvement projects in order of their preferences. These preferences are then considered by the Council in the preparation of the LTP and Annual Budgets. Usually, these proposals include mainly minor improvement works, like footpath extensions and new streetlights; however, other works such as street upgrades, that strictly speaking are renewal works, are included to simplify the consultation and consideration processes and to ensure that the communities are fully informed.

Where roading projects are likely to be approved as part of the NLTP, they are incorporated into the Council's Land Transport Programme.

There is also a need to be financially prudent on what funding can be provided to the programme to ensure future rates movement is minimised. The simplest way to minimise rates increase is to minimise the capital spend on items that are discretionary in nature.

Accordingly, there is no discretionary funding included in the LTP. Once it is known what the core general rates/funds are, Council may be able to provide some form of discretionary project funding.

Changes in the Level of Service demanded by the road users

Over time, communities tend to expect improving service from their assets. Agreed Levels of Service for roads, and the activities involved in managing the roads, will help to control this tendency but Level of Service may nevertheless need to be improved to satisfy these future needs. The trend to more lifestyle blocks in the countryside has also changed the expectation of the travelling public in rural areas where rural roads are no longer used only by local farmers, but now carry a much wider range of people and vehicle types. This has resulted in factors such as smoothness of ride, loose metal, dust and

higher speeds becoming more important to more road users.

Similarly, more people wish to cycle, and to have safe alternatives to cycling, on the district's typically narrow rural roads. These people seek wider carriageways, cycle lanes and off-road pathways to address their needs.

Increasing fuel costs will continue to put pressure on the Council to provide or facilitate more affordable and sustainable transport solutions for the district's residents. This may require additional public transport services, and an investment in walking and cycling infrastructure to cater for both short trips and longer commuter travel to and from Palmerston North. However, there are disconnections between what can be realistically provided in the district's urban and rural areas and in the nearby areas of Palmerston North City.

Requests for service

To assist reactive maintenance, Council deploys a customer service system via a proprietary software provider. Requests for service are received through Council's contact centre during business hours and the Palmerston North City Council after hours service centre. Requests are recorded and forwarded to the appropriate council staff or maintenance contractor for action. The requests are recorded with the appropriate details (name, location, issue, priority etc) to enable tracking for resolution.

The receiving officer/maintenance contractor is required to action the enquiry within specified periods. Once the issue is resolved to council's requirement the details are updated with completion details and any issues outstanding.

Also of significant value to Council is regular meeting minutes with various Community Committees throughout the district which provide wide ranging information and highlight any particular issues to be addressed. This information complements the regular network inspections undertaken by - or for - Council.

Customer surveys

Council undertakes both customer surveys and assessments of the complaints service request records to obtain information on the delivery of Levels of Service to customers. This research identifies areas that are performing well, those that require improvment or intervention.

Level of Service improvements

From time to time significant safety problems arise at particular points on the network. For example, the severity or number of crashes at a particular intersection might increase to the extent that a major improvement project is necessary and justified.

On existing roads these types of interventions are generally not considered improvement backlogs; rather, they are usually newly justified improvement works. However, they could form part of a backlog if they have been identified for longer than it would usually take to programme and fund a new project and remain programmed. As discussed, eligible projects costing below, or within, $2m to $5m can be funded through the low cost, low risk category in the Council's subsidised Land Transport Programme.

Programming Level of Service improvements

The new improvement programmes reflect a balance between what is affordable and what is

achievable with the funding currently, or expected to be, available.

Most road network Level of Service gaps are known and are relatively small in the context of the whole network. These are compensated for in the day-to-day administration of the asset. When this cannot occur, additional funding is sought to address the gap. This normally occurs when the Council's Land Transport Programmes is compiled and submitted to NZTA for approval. However, NZTA usually requires any such requests to be 'evidence based' before approving additional funding.

The Improvement Plan includes a number of individual tasks over sub-asset groups to review and identify any potential Level of Service backlogs that are outside normally acceptable time variances/lead times.

Summary

Council has the following long-term strategy:

- Ensure rural townships are vibrant and thriving by providing affordable infrastructure with some spare capacity that meets current relevant mandatory and resource consent standards for quality and security of supply
- Maintain the existing roading network to current Levels of Service, including renewing bridges and other roading assets
- Gradually upgrade the quality of urban streets that need major renewals
- Meet new resource consent standards for Feilding and meet Manawatū River Accord commitments for all urban areas
- Ensure capacity is available to support the development of the wider Manawatū as Food HQ for New Zealand, and specifically food innovation and processing in the district
- Plan for the renewal of all assets as set out in the AMPs
- The current upgrade programme and the identified Feilding growth precincts will cater for forecast growth over the next 30 plus years
- Funding for the forecast expenditure and loans will fit within the Financial Strategy rating and debt limits for the first 10 years and will be consistent with the Financial Strategy funding strategies for years 11 to 30.

4.7 Lifecycle management plan

Programme prioritisation and optimisation

Prioritisation is a method of putting proposals on a priority list indicating which are to be funded first.

Optimisation allocates resources to gain the most benefit or return possible in the given context. It focusses on evaluating what are considered to be the most important aspects of asset management. These aspects relate to minimising total lifecycle costs while meeting community and broader social expectations.

Aims of prioritisation and optimisation

In a generic economic sense, the option that minimises Council and road user costs, in a lifecycle context, is considered to be optimal. An optimisation and/or prioritisation model is required to aid in the ranking of capital and maintenance projects to enable the optimum allocation of resources. In reality, this model will be indicative only and a number of iterations through the model may be required to achieve the final funding scenarios.

As well as minimising lifecycle costs, the process of optimising and prioritising includes consideration of strategic network requirements and the accumulation of benefits from strategic corridor improvements. Prioritisation and various funding scenarios act interdependently through the planning and evaluation and the previous phases. The prioritisation and funding scenarios identify the forward works programme. The prioritisation and optimisation process is difficult when prioritising involves political decision-making where questions such as those below must be answered:

Should higher priorities be given to the roads that contribute directly to the Region/District's economy? If benefits can be clearly demonstrated and quantified, the priorities of projects may be resolved by using Whole-of-Lifecycle-Cost (WOLC). However, this may not always be the case because it is not possible to quantify some community benefits

Should funding priorities be directed toward remote areas recognising the equity issues in transport? The concern is that the ONF dLoS and Performance Measures for lesser classification roads commit Council funding levels that may be politically unacceptable

Is it desirable to allow road conditions to deteriorate to meet ONF dLoS and Performance Measures? In the short term it may be acceptable to allow deterioration provided the general road condition does not fall below the assigned LoS. Some business rules may need to be developed to allow relatively small sections of these roads to exceed the assigned LoS for short periods.

Decision support systems

Council uses a variety of Decision Support Systems (DSS) which include:

- Gap analysis tools
- Economic evaluation tools
- Prioritisation and optimisation tools to assist in the development of the funding scenario and works programme
- Performance management tools
- Various levels of reporting requirements

Decision support levels

DSS helps decision-making at a number of levels of the activity management hierarchy. These levels are referred to as strategic, programme, and project management levels. The activities and analysis involved in each of these levels are highlighted below.

Strategic level (NZTA)

- Policy analyses e.g., ONF
- Setting standards
- Budget allocations
- Constrained 'top-down' network analyses
- Determine funding to meet policy and standards
- Receive budget requests, compare with funding
- Allocation of budgets

Programme level (Council)

- Gap analyses
- Identify pre-selected works
- Unconstrained 'bottom-up' sub-network analyses
- Prioritised and costed wish-list of works
- Budget request
- Formal submission of budget request to NZTA
- Receipt of budget allocation and condition standards
- Budget allocation by Work Category
- Divide allocated budget by Work Category
- Works programming by Work Category
- Constrained 'top-down' sub-network analyses

Project level (Council)

- Selection of treatment options, e.g., detailed economic lifecycle cost analyses.

Identification of asset requirements

The identification of asset requirements dictates the standards of performance, condition and capacity and the consequential funding requirements. It requires knowledge of existing asset performance and performance targets to identify the gaps in asset performance.

Performance measures of road assets are aligned with the ONF classification to deliver consistent community outcomes. Identified asset requirements must therefore correspond to the prescribed dLoS hierarchy taking into account community requirements and the existing network usage, configuration and condition. This involves collecting current condition/performance data and setting network performance targets/intervention criteria for each dLoS class so that performance gaps can be identified and rectified.

Asset performance measures

Target road asset conditions (roughness, rutting, etc) and road configuration parameters (width, lanes, etc) have been defined for each road classification. Performance measures are measurable targets with which current asset condition and configuration are objectively compared to determine road asset requirements. They are used to identify gaps in asset performance, which identify maintenance and/or capacity improvement activities.

Performance measures are defined using physical and dimensional parameters that reflect the operational and structural capacity of the asset. The configuration parameter targets represent the minimum acceptable levels. Condition parameters represent the health and condition state of the asset. The condition parameter performance targets represent the maximum acceptable levels, above which remedial actions are considered.

Targets for other aspects such as delineation, safety, availability, accessibility, reliability of travel times, congestion and environmental performance are aligned with a range of ONF Performance Measures.

The Performance Measures have been developed in conjunction with the ONF and associated LoS outcomes for each category of road the minimum (or maximum) acceptable configuration and condition parameters have been set.

Performance measures have also been set for an asset network as a whole. They are used to compare the network performance over a defined period, e.g., from year to year, and thus assess the effectiveness of the adopted activity management practices.

Community consultation

Implementing the ONF, associated LoS and Performance Measures as the basis for identifying asset requirements incorporates the informed view of the stakeholders and the rest of the community.

Council consultation with stakeholders and the community is a requirement of the LGA 2002 and is an essential part of the planning and policy development of the whole road system. Community consultation continues throughout the whole Integrated Activity management process. Formal community consultation is conducted in accordance with Sections 82 and 83 of the LGA 2002.

When conducting community consultation to determine acceptable intervention criteria for condition parameters, it is important to consider the distinction between the perceived condition of the asset as 'seen' by the users and the condition of the asset as determined by measurement and the analysis of condition data, particularly the structural condition of the asset.

Setting performance targets/intervention criteria

Council's performance targets/intervention criteria are set by legislative requirements, Council's investment objectives the ONF, associated LoS and Performance Measures, road user requirements, engineering and safety standards, economic analysis, existing road standards, historical performance trends, and budgetary limitations.

As a consequence, Council has developed strategies and makes policy choices regarding the degree to which an equity objective should be pursued to complement an economic objective when defining road outcomes.

Maintenance intervention criteria

These are based on features that are measured in an objective and repeatable manner. Further, as the intervention criteria apply across the entire network, they must be affordable from a network funding level perspective. Setting of affordable intervention criteria for a 30-year time horizon for a network can be difficult given future funding uncertainties. Therefore, different

funding scenarios with different sets of intervention criteria have been developed.

Routine maintenance

intervention criteria are more specific than the approach taken in developing infrastructure preservation programmes. Setting routine maintenance intervention criteria involves establishing, for different classes of asset (roads, structures, roadsides, traffic signals and on-road electrical assets), the maximum acceptable routine maintenance inspection periods, severity and extent (intervention levels) of condition parameters that can be tolerated and times within which condition parameters are to be repaired (response times).

Intervention levels are specified in Council's Road Maintenance Contract(s) and define the value (extent and severity) of a condition parameter, which triggers either maintenance investigation or maintenance activity. An intervention level will identify a defect as either acceptable or unacceptable. The latter will require further consideration of the defect in relation to its location with respect to the asset, safety issues, the possibility of continuing deterioration and increased repair cost and the economics of not undertaking repairs.

Response times are specified in the Road Maintenance Contract stating the maximum period between the time the defect/condition parameter was detected and the maintenance action was undertaken. Response times are based on the severity and extent of the defect/condition parameter and the level of asset usage.

Periodic maintenance and rehabilitation

Intervention levels are established for combinations of condition parameters to trigger investigation into major infrastructure preservation activities. For example, intervention levels are set for road surface roughness to trigger investigation into pavement rehabilitation. The optimum intervention level for road roughness is determined using a WOLC analysis which includes ONF Performance Measures.

On the other hand, pavement resealing operations are usually triggered using a number of criteria/condition parameters, which may include, seal age, extent of surface distress (cracking and patching), rutting and roughness.

Approaches to setting maintenance intervention criteria

Risk assessment

Maintenance intervention criteria and asset performance targets, particularly those related to reactive maintenance activities, are established using a risk management approach to best meet reasonable community expectations within the available budget. Maintenance intervention levels and response times vary across the road network in line with relevant risk factors such as the nature and volume of traffic using the road, operating speed, the susceptibility of assets to deterioration, the cost effectiveness of repairs and the competing priorities for funding.

Risk assessment, combined with engineering judgement and community input, is the most common process used by Council in establishing intervention criteria for most condition parameters of road assets. The NZTA Z/44 risk management methodology is used to determine the likelihood of an incident or failure and its

consequences in order to establish the overall risk assessment. The risks considered are related to user safety, asset integrity, damage to other assets, utilisation of assets and environmental risks.

Economic analysis

Council invests in a wide range of activities that help to achieve land transport outcomes and deliver value for money. Council does this by using the resources made available through the Financial Assistance Rate provided from the National Land Transport Fund (NLTF) and the revenue it gathers through rates.

NZTAs Monetised and Non-monetised Benefit and Cost Manuals provide procedures to evaluate the economic efficiency of Council's investment proposals in line with the Agency's Assessment Framework. These procedures sit within the investment policy framework set out in the Agency's Knowledge Base.

The Monetised and Non-monetised Benefit and Cost Manuals employ a WOLC analysis procedure to compare competing investment options over a given time period, and identify the option that results in the minimum total lifecycle cost. Since Council aims at minimising the cost of maintaining its assets over their whole lifecycle, it uses these manuals, where possible, to set the optimum intervention criteria that achieves the minimum total lifecycle cost. The Monetised and Non-monetised Benefit and Cost Manuals consider benefits and costs expressed in quantitative money values.

The analysis to set intervention criteria is limited to preservation and rehabilitation works of road pavements. This limitation is due to a lack of reliable lifecycle deterioration and works effects prediction models for the other assets. In practice, however, the final selection is based on available funds, equity considerations, community expectations in terms of LoS and engineering judgement regarding the reliability and accuracy of the prediction models for road deterioration and works effects.

Road asset condition monitoring

Asset inventory and current condition data is a central aspect of road asset management. Inventory data such as reference number to road segments, road name, road category, road length, lane width and other dimensions, road location, road traffic (lane or overall), pavement age, seal age, shoulder and table drainage, are important for locating the asset and are used for predicting the asset performance over time and determining the cost of closing performance gaps.

The condition of the asset is described by a set of attributes. The quality of these attributes changes over the lifetime of the asset. Sound decisions about interventions and investments rely to a large degree on knowledge of the current condition and the rate of change in the condition of the asset.

Condition monitoring is the continuous periodic quantitative assessments of the actual physical condition measurements of all asset classes (e.g., pavement roughness, bridge strength, signage reflectivity). The set of condition parameters to be measured and assessed describe the long-term performance of each type of asset. The performance of a road asset is assessed in terms of its function (safety, serviceability, physical appearance, quality of service) and structural condition (load-carrying capacity, structural integrity, durability). Pavement roughness, for example, is a functional

performance measure and an indicator of structural condition while skid resistance is a measure of the safety function.

Interpreting Performance Measures results requires a good understanding of the asset's failure modes, the timing, consequences and associated risks of the failure and an understanding of how the condition of the asset affects the quality of services it is intended to provide and the perceptions of the users. The parameters selected must be able to be assessed or measured in an objective, accurate, verifiable and affordable manner used selectively for modelling to forecast deterioration and estimate future condition.

Condition monitoring processes provide relevant information at an affordable price. They include a number of methods including measurement of specific parameters (e.g., rut depth) or visual examination by qualified staff.

Network segmentation and data aggregation

Network segmentation and data aggregation are used to characterise the road network for the various possible forms of analysis. The input data is representative of the network and appropriate to the level of analysis being undertaken. The analysis varies from a strategic level to the development of project level recommendations on individual road segments.

The two key interrelated steps are road network segmentation and data aggregation:

Road network segmentation subdivides the road network into manageable and homogeneous lengths.

Data aggregation is the aggregation of the road inventory and condition information into the defined segments in order to adequately reflect the characteristics of the road segment.

The above two processes are inter-dependent. Further data aggregation is then conducted by transforming the road inventory and condition data into uniform segments that were defined during segmentation.

The segmentation of road networks can be rigorous and repeatable, based on either engineering judgement, or the use of a fixed pre-determined length. Segmentation of pavement lengths is based on homogeneity where at least some of the relevant condition and use parameters are relatively constant and statistically representative values of the relevant condition and use parameters. A combination of the two approaches is used as a practical means to gain representative segments.

Performance gap analysis

Analysis is carried out to reveal performance deficiencies or gaps in the network where the asset is below the ONF dLoS and Performance Measures.

This facilitates the preparation of long-term budgets and the planning of resources and maintenance activities. These long-term programmes are reviewed annually giving consideration to projects deferred from the first year's programme, the backlog of needs and the availability of resources.

Gap analysis is performed considering asset ONF dLoS and Performance Measures in terms of configuration, condition, and operational performance.

Gap analysis establishes the required investment plan by projecting the road asset parameters to determine the required ONF dLoS and

Performance Measures to estimate future needs. The processes of gap analysis and investment planning and evaluation is not carried out in isolation, they interact and the output from one process is used as input into the other.

General aspects of investment planning and evaluation

Investment planning and evaluation identifies where and when to invest resources in the most cost-effective manner on the road network for the road users. This is undertaken in the context of the following:

- The Strategic Assessment which covers initiatives such as, sustainability, a growing economy, etc
- The Strategic Priorities that define what needs to be done
- Key Results Areas (KRAs) statements that quantify progress in meeting Strategic Priorities.
- Performance Measures are identified in response to the goals and objectives and indicate the condition state of the network and form a reference for future network condition states
- Technical tools and data allow objective evaluation and optimisation to select the appropriate strategy from various alternatives to maintenance and/or improve road network performance
- Monitoring and feedback is needed to assess the impact of past and present investments on the road network.

The last activity above is an essential input to the performance gap analysis.

Formulation of total needs programme

This step identifies intervention options to close the asset performance gaps. These intervention options comprise the total needs programme. It is expected that owing to resource constraints, only a portion of the total needs programme will receive funding. To ensure an equitable allocation of resources and to achieve Council's objectives, the total needs programme is prioritised.

The formulation of the total needs programme involved the following process for each asset performance gap.

Investment planning

This investigates intervention options including engineering and management solutions such as road use policy initiatives, preventive or periodic maintenance, rehabilitation, reconstruction, construction, education, incentives, or penalties. During this process maintenance works are integrated with capital upgrades to ensure efficient and sufficient investment of funds.

Investment evaluation

This defines and broadly costs phases of potential projects and identifies the optimal intervention option to close the gap. Evaluation is applied to all programmes including the routine maintenance programme. Coordination of these programmes takes into consideration that if rehabilitation, reconstruction or replacement is due then routine maintenance for the same segment could be excluded. The total needs programme is the final list of projects created from the above process.

Budget scenarios define for the activity management model the amount of money that

can be spent in any particular year of the analysis. The model uses the allocated money to optimise the network. That is, a single strategy is selected for each of the analysis sections based on the overall benefit to the network as a whole and on the available funds. The result of prioritisation and/or optimisation and funding scenarios lead to the identification of the works programme.

Maintenance treatments and strategies

Maintenance treatments

These are actions Council takes on a given asset to either reduce the deterioration rate or to repair the effects of deterioration. A set of generic maintenance treatments are used for network level analysis to determine the optimum options for each performance gap and the required budget for keeping the network at the defined ONF dLoS and meet the Performance Measures. These treatments are selected and programmed based on common intervention practice by Council.

Depending on the purpose of treatment selection, the approach to carrying it out varies. The two main approaches considered are as follows:

- Network level approach: Used for planning and priority programming, including selecting network investment strategies and screening to identify major defective sections of the network
- Project level approach: Used for treatment selection and/or design and evaluation of maintenance effectiveness.

Within these two approaches, two different types of treatment selection processes are used:

- Scheduled: That is, a fixed amount of a given maintenance type per year or a given maintenance type at fixed intervals of time
- Condition-responsive: That is, maintenance intervention when the asset condition is predicted to reach a specified intervention level

Scheduled maintenance tends to be undertaken for the more unpredictable works such as environmental maintenance, e.g., drain clearing, or where the cycle of deterioration is relatively rapid (vegetation growth, unsealed road grading, etc.). Condition responsive methods are used in most other situations.

Maintenance strategies

Maintenance strategy or treatment intervention strategy is where a major treatment occurs in a particular year, during the lifecycle of the asset, possibly combined with a secondary treatment in a later year which can also be combined with ongoing preventive maintenance and reactive maintenance treatments. Each strategy has an associated present value cost and a present value benefit. The benefit is measured by the impact of each of the treatments contained in the strategy on the performance.

The application of the treatment or treatments are specified by time or condition level (intervention level or criteria). A set of maintenance strategies (treatment types and timing) for each asset for use at network level analysis has been developed for different ONF

categories and associated LoS, together with relevant treatment intervention criteria.

A WOLC analysis is used to determine the strategies that achieve minimisation of total lifecycle costs at network level. The selection of the optimum maintenance strategy for each ONF category and associated LoS is based on economic criteria and/or multi-criteria.

Determining the optimum set of maintenance strategies requires performing a number of analyses using Council and NZTA business rules for maintenance management. This process involves reviewing historical records on expenditure, maintenance practice and effects of past and current strategies on budget and asset performance.

For each gap, the optimum maintenance strategy applicable to the ONF category and associated LoS is applied and related costs are determined. The intervention options are then listed and ranked considering using economic criterion. The maintenance interventions defined by Council and NZTA are used to select appropriate treatments to meet Performance Measures.

Approaches to prioritisation

The road network components of most interest, and of high priority, are:

- those that are the most expensive (in terms of lifecycle costs)
- those that are key contributors to performance (to satisfy stakeholder needs)
- those that are the most prone to deterioration or need ongoing maintenance investment

The components of the highest priority include road formations (cuttings, embankments and the sub-grade), drainage, pavements (the road surfacing and structural layers that support the traffic loading), safety, and bridges.

Council's approach to prioritisation is based on asset preservation. The process utilises the Pavement Integrity Index (PII), a numerical index between 0 and 100 which indicates the general condition of a pavement. PII is a function of strength, roughness, rutting and the consequences of routine maintenance application.

New capital works are often initially prioritised in terms of Benefit Cost Ratio (BCR) but a final decision on which projects will be funded follows the Business Case Approach.

Optimisation techniques

The optimisation employs optimum intervention standards, which take into account whole of lifecycle costs. The intervention standards identify projects which are inspected and listed in the expenditure scheduling system for the total needs programme 'the long list'. The funds for these projects are then allocated on priority.

The approach for prioritising projects is transparent and objective. Not all externalities and possibilities are taken into account in this model, but it does serve as a guide to project suitability and provides an objective indication of the benefits gained or forgone by including alternate programmes. To achieve the true benefits of Integrated activity management both capital and maintenance works are considered together in a transparent process.

Council takes a top-down approach to optimisation. The top-down approach first determines the desired goals (ONF dLoS,

intervention levels, capacity, etc.) for the entire network then selects the individual projects based on those goals. The top-down approach is considered to be the most expeditious because the individual projects are determined after the network goals are set.

Funding policy

The ultimate limiting factor governing decisions on which projects can be included in Council's LTP, the RLTP, and the National Roading Programme is the level of available funding. Setting this level of funding is a complex matter requiring numerous iterations of the process. When seeking NZTA subsidies Council has to ensure that it can meet the local share before submission.

Council's Financial Strategy guides decision-making from the outset and provides guidance for resolving the complex issues that need to be addressed during preparation of the roading infrastructure programme.

Backlog of needs

The change in the backlog of needs presents the impact of funding decisions. Backlogged needs are defined as the management sections or items to which maintenance and rehabilitation should have been applied, but which were not funded. This is presented by the amount or percent of asset area or number of items backlogged. This amount is calculated by subtracting the quantity of assets selected for funding in the optimisation process from the quantity of assets identified as needing work in the needs analysis.

Deferred funding needs

Deferred funding shows the amount of money that was needed for maintenance and rehabilitation but was not available, resulting in the funding being deferred until some later time. The deferred amount is calculated by subtracting the funds allocated in the optimisation process from the amount of funds estimated to undertake the work identified in the needs analysis process.

Stop-gap maintenance

The amount of stop-gap maintenance is another measure that can be used to demonstrate the impact of different funding scenarios. Stop-gap maintenance is used to describe maintenance and some rehabilitation treatments that are applied to keep a pavement section in serviceable condition until the funding required to correct the underlying problem is available.

These treatments are applied to backlogged pavement sections that are in such a poor condition that they cannot tolerate any further funding deferral and need some money spent on them to keep them serviceable. These sections can be described either in terms of the amount or percent of asset area to which stop-gap maintenance is applied or in terms of the additional funds needed.

Maintenance planning

Introduction

Council ensures that all items of programme development and implementation align with the strategic direction by:

- setting maintenance intervention criteria for the different road assets depending on their classification
- using the relevant Level of Service (LoS) Performance Measures
- aligning the programme with the strategic direction and LoS Outcomes
- optimising the intervention options when developing the total needs programme
- prioritising candidate projects when developing the works programme
- selecting the types of treatments, materials and construction techniques when implementing the programme
- ensuring that the Activity Management Plan (AMP) follows the strategic direction

The activity management process is intended to deliver agreed Levels of Service in the most cost effective manner to present and future customers. Managing the transportation network infrastructure is simply one of the inputs to this process.

At the highest level, the services to be delivered and standards to be achieved are those that contribute towards the achievement of the community outcomes in Council's LTP.

Gaps between required standards and services and the ability of the network to deliver them are identified and processes are put in place to manage these gaps within acceptable margins. In managing these gaps, both asset solutions (such as new or enlarged asset elements) and non-asset solutions (such as use reduction programmes) are considered. Decisions on the option to be followed in any particular instance are based on a range of factors such as risk assessments, legal requirements, through life costs, customer approval ratings and the ability of the community to pay for system improvements.

The detailed considerations behind these decisions are not made or detailed in this AMP; rather, they occur during the early stages of the projects' development as determined by the complexity, scale and potential effects of the problem / issues and the options available to address them.

Objectives and intervention levels

In order to fulfil Community Outcomes, Vision, Goals and Objectives, Council have adopted a systematic approach to the long-term management of its assets by preparing this Activity Management Plan.

The key objective of AMP is to provide a desired Level of Service in the most cost effective manner while demonstrating responsible stewardship for present and future customers. Activity Management Plans are a key component of the strategic planning and management of Council, with links to the LTP and service contracts.

The AMP underpins the LTP and consultative processes that have been put in place to engage the community. The AMP delivers a range of benefits to the community as well as to the provider of the services, the main ones being to:

- Maintain, replace and develop assets over the long-term to meet required delivery standards and foreseeable future needs at minimal cost
- Continually improve activity management practices and service delivery to the customers, and
- Comply with Statutory Requirements

Developing maintenance plans and procedures | Activity management systems

The primary activity management system in use is AWM (Asset & Work Manager), which is the main repository for all of the Council's roading asset inventory and condition rating information. AWM software has been developed over a number of years and is used by most RCAs in New Zealand to manage their roading assets.

This system, combined with modelling functions and asset valuation modules, provides the asset information to produce this plan, and operate and manage the network.

Quality assurance

Council actively monitors the performance of the contractors, internal professional services unit, and consultants to ensure that the performance standards defined in contracts are continually achieved.

All main contractors, stipulated as part of any contract, are required to submit for approval their Quality Assurance Plan prior to the commencement of the contract, that establishes standard and specific quality procedures relevant to the work being conducted. This is particularly relevant for the main ongoing road maintenance, roadmarking and streetlighting contracts. For term period contracts, the Quality Assurance Plan(s) are reviewed updated each year of the term of the contract.

Supervision

The Council roading team audits contractors performance by measurement and inspection of work, and of the roading assets.

The Council roading team has Engineers who are dedicated to the operations and performance of the road network maintenance contract. They provide an important conduit between the contractor and the Engineer to Contract in the identification and resolution of any problems or issues as they occur.

The Council's roading team have daily contact with the contractors to:

- Keep informed of where the work is being done
- Inspect work on a daily basis resolving any issues on site
- Report to the Engineer on the work being done
- Approve work to the Contractor
- Clarify contract issues
- Have a crucial role in developing and maintaining the partnering approach and relationships essential to the successful management of long term contracts, e.g., the road maintenance contract

Process plans

Categories of road maintenance programmes

The main objective for Council is to maintain its assets at appropriate LoS and structural integrity at the lowest possible cost (Council and user costs) without creating any significant adverse impacts on the environment, user safety and community activities.

The programme development process involves identifying infrastructure needs, determining the maintenance works programme and funding needs to ensure adequate performance of

existing assets. Council's maintenance programmes fall under four categories, namely:

- Emergency and Resilience,
- Routine Maintenance,
- Renewals, and
- Improvements.

Emergency and resilience

The response to a defined, major, short-duration natural event that has reduced - or will reduce - customer levels of transport service significantly below those that existed prior to the event and results in unforeseen, significant expenditure. Resilience activities are non-routine work required to protect assets from damage, and to minimise the threat of road closures arising from natural phenomena.

Routine maintenance

This comprises activities for which deferment is not an option, with public safety identified as the highest priority. These activities include Sealed pavement maintenance, Unsealed pavement maintenance, Routine drainage maintenance, Structures maintenance, Environmental maintenance, Network service maintenance, Foot & Cycle path maintenance, Level crossing warning devices, and Network and asset management.

Renewals

This comprises activities which are required to improve/preserve asset functional integrity to meet road infrastructure performance targets and reduce future deterioration. These activities are designed to reduce future deterioration by timely interventions that limit the need for more expensive remedies, while also ensuring that general safety levels are maintained. They include Unsealed road metalling, Sealed road resurfacing, Drainage renewals, Sealed road pavement rehabilitation, Structures component replacements, and Traffic services renewals.

Improvements

These activities provide for the implementation of low cost, low risk improvements to the transport system to a maximum total cost per project not exceeding $2m (walking and cycling), $3m (network services, road improvements), or $5m (resilience, bridges and structures).

Outline of programme development process

Separate funds are allocated to the different programmes including investment, rehabilitation and periodic maintenance. To ensure efficient utilisation of Council's resources and funds, the activities under these programmes are coordinated. The reasons for separating them out are as follows:

- A large proportion of road maintenance work is of a routine and fixed nature and is not subjected to assessment and appraisal

- Periodic maintenance, e.g., resealing, is usually a case of timing and treatment selection with the aim of minimising the whole of lifecycle costs, including road user costs, for the whole road network

- Major rehabilitation projects are appraised to identify the rehabilitation needs using a WOLC minimisation. For each identified maintenance project, Net Present Value (NPV) calculations are carried out to rank the selection and timing of rehabilitation treatments

- Growth projects are appraised and developed using the Business Case Approach

To ensure an equitable allocation of resources and to achieve Council's desired outcomes, prioritisation and optimisation techniques are used to identify the optimum combination of projects that could be achieved under different funding scenarios. As well as aiming at minimising lifecycle costs, the process of optimising and prioritising includes consideration of strategic network requirements and strategic corridor improvements.

The result of prioritisation and/or optimisation leads to the identification of the works programme. The final works programme includes the funding required for the different maintenance programmes, together with details of the specific works.

The three year rolling programme for road network maintenance management facilitates the preparation of medium-term budgets and the planning of resources and maintenance activities. The three year programme is reviewed regularly giving consideration to any deferred projects from an earlier year's programme, the backlog of needs and the availability of resources.

Network level management

Network level management decisions affect the maintenance programmes for the entire system. The management system considers the needs of the network as a whole and provides information for a districtwide programme of new construction, maintenance, and rehabilitation. The goal of this level is to optimise the use of funds over the entire system.

Project level management

Project level management is where specific maintenance treatment alternatives are examined on a technical and economic basis in order to make decisions about which specific will be used for each project. At this level, detailed consideration is given to the alternative design, construction, maintenance, and rehabilitation activities for specific projects.

For maintenance and rehabilitation, this is accomplished by comparing the NPVs of several alternatives with their associated lifecycle activities and selecting the alternative that provides the highest net benefits for the least net total cost over the projected life of the project.

For low cost, low risk improvements, the primary, most cost effective sites are identified and ranked in order of importance against the rest of the network.

The development of capital projects will follow the business case approach.

Linkage between programme development and annual planning cycle

The strategic planning process is conducted on a cyclic basis, linked to Council's planning and funding cycles. The linkage occurs as follows:

The annual planning process commences with an asset performance gap analysis. During this stage, the set of committed projects is restated, while infrastructure needs are identified. These investment needs result in the total needs programme. All necessary overhead costs are included as part of the investment.

Optimisation and/or prioritisation of investment options results in the identification of revenue requirements. Such requirements are presented to the funding providers (Council and NZTA) and a process of negotiation takes place. Depending on the outcome of the negotiations and various funding scenarios, investment options and prioritisation may be reviewed.

When Council is satisfied with the revenue requirements for the funding scenarios, the requirements become the works programme that is submitted to NZTA. Following budget submission, the next annual cycle commences. The actual funding allocation process typically spreads over a few months.

Programme development

The decision-making process for road activity management is a combination of bottom-up and top-down approaches. It is bottom-up in the sense that needs are generated from the component level, and it is top-down in the sense that budgets are dictated by NZTAs requirements and Council as part of the political process.

Council has adopted a combination of these approaches in developing the maintenance works programme. The programme is developed at the district level by Council staff based on guidelines prepared by the NZTA. NZTA considers the Council's submissions and makes funding allocations, as appropriate, under each work category to the district. On receipt of allocations, Council reviews priorities and determines the works that should proceed determined through economic and business case analysis.

Accounting/financial systems

All expenditure on infrastructure assets falls into one of three categories:

- Operations and maintenance
- Renewals
- New improvement works and disposals

Financial management system

All Council activities are required to have their financial results reported externally in a way that complies with generally accepted accounting practice (GAAP) in New Zealand. The Finance Team ensures that GAAP is complied with by regular updates to the Council's Accounting processes, and the ongoing formal and informal training and education of staff in departments throughout the Council.

The activity relies on the Council's core financial systems which include proprietary software systems encompassing accounts payable, time entry, purchase orders, general ledger, accounts receivable, cash receipting, bank management and rates, plus inputs from other Local Government regulatory systems such as Person/Property, Infringements, Licensing, and Consents.

Information management systems

Current Council information systems are outlined on the following page.

Information Management Systems	
System	Current Business Practice
Asset Registers	AWM, Reliable asset registers available for most assets
Financial System	Job costing system available, via general ledger system Costs allocated at activity level only, Inflation adjustment application Asset valuation generated in AWM formulated from the database inventory
Maintenance Management	Maintenance records held in AWM, direct entry by Contractors
Contract Management	Maintenance standards specified in maintenance contracts AWM and manual works order systems for unscheduled or out of contract work
Condition/Performance Monitoring	Good performance and condition information for major asset groups, i.e., pavements, bridges
Customer Enquiries	Customer service system in place
Work Planning	Transport Insights candidate selection algorithm analysis undertaken Bridge repairs identified and programmed Minor asset groups defect analysis less developed
Risk Management	No corporate risk management strategy in place AM plan to include risk register and analysis
Optimised Renewal Strategy	Effective lives assigned to all asset groups
Forward Works Programme	Forward programmes developed for major road improvement projects, seal extensions, seal widening and bridge renewals. Development based on a good assessment of needs confirmed under consultative processes
Integration of Systems	Extensive use of AWM throughout planning and operations Databases have GIS type interfaces or functionality
Plans and Records	Hard copy plans held for most major project and improvement works. (Availability reduces as further back in time) All new plans/as-builts on digital systems, and on consents information system
GIS	GIS used for spatial representation of assets

Figure 232 | Information management systems

AWM software

Council's prime inventory system for its roading assets is the AWM database. The system is web-based and is available simultaneously to Council staff, Contractors, and Consultants.

This software is used by Council to manage road inventory assets and condition for our Network. AWM is the complete package for asset maintenance, valuation, assessment, Forward Work Planning as well as inventory-based asset management. It also includes a range of report and analysis applications which complement the management functions.

AWM is a tool for organising all the activities that go into providing and operating assets, ranging from the collection, processing, and analysis of data, the identification of current and future

needs, and the development of rehabilitation and maintenance programmes.

Road hierarchy classification systems and associated Performance Measures help to improve efficiency of decision-making, provide feedback regarding the consequences of decisions and allow the testing and optimisation of different budgets.

The database is updated constantly following maintenance and renewal work activities this enables forward work programmes to be developed, for both the short and long-term. These programmes provide analysis, prediction and costing of major pavement renewal works such as reseals and sealed road pavement rehabilitations, in addition to other works such as kerb and channel, and footpath renewals.

Road network maintenance data is entered directly by the contractor and used for activity management and contract management purposes. The Council also uses the system to undertake valuation, using the Asset Valuation Module.

Data quality

The current completeness of Council's assets can be found on the Transport Insights website, which details multiple aspects of asset data, including completeness, accuracy, and timeliness

AWM has connectivity with other Council information databases so that information can be easily transferred. GIS enables identification and an asset from the office or the field as well as facilitating the scheduling, reporting and coordination of maintenance activities.

Geographical information systems

Council uses LocalMaps for its GIS requirements. The GIS systems have some linkages with the AWM system to enable public access to some data. Further AWM data is made available to all Council Staff via LocalMaps and used extensively through all Council's activities.

Activity management system

AWM is divided into information management systems and decision support systems that can be viewed as an overarching Activity Management System (AMS). It is not critical that the AMS is fully integrated, provided the different modules are interfaced appropriately. The elements incorporated into the AMS are dependent on Council's needs. Selecting the most appropriate combination of AMS elements for Council involves considering a number of conditions including district size, organisational structure, past management and decision-making practices, stability, planning horizons, resources and fixed investments. Council also estimates the quantity of resources it needs when implementing an AMS.

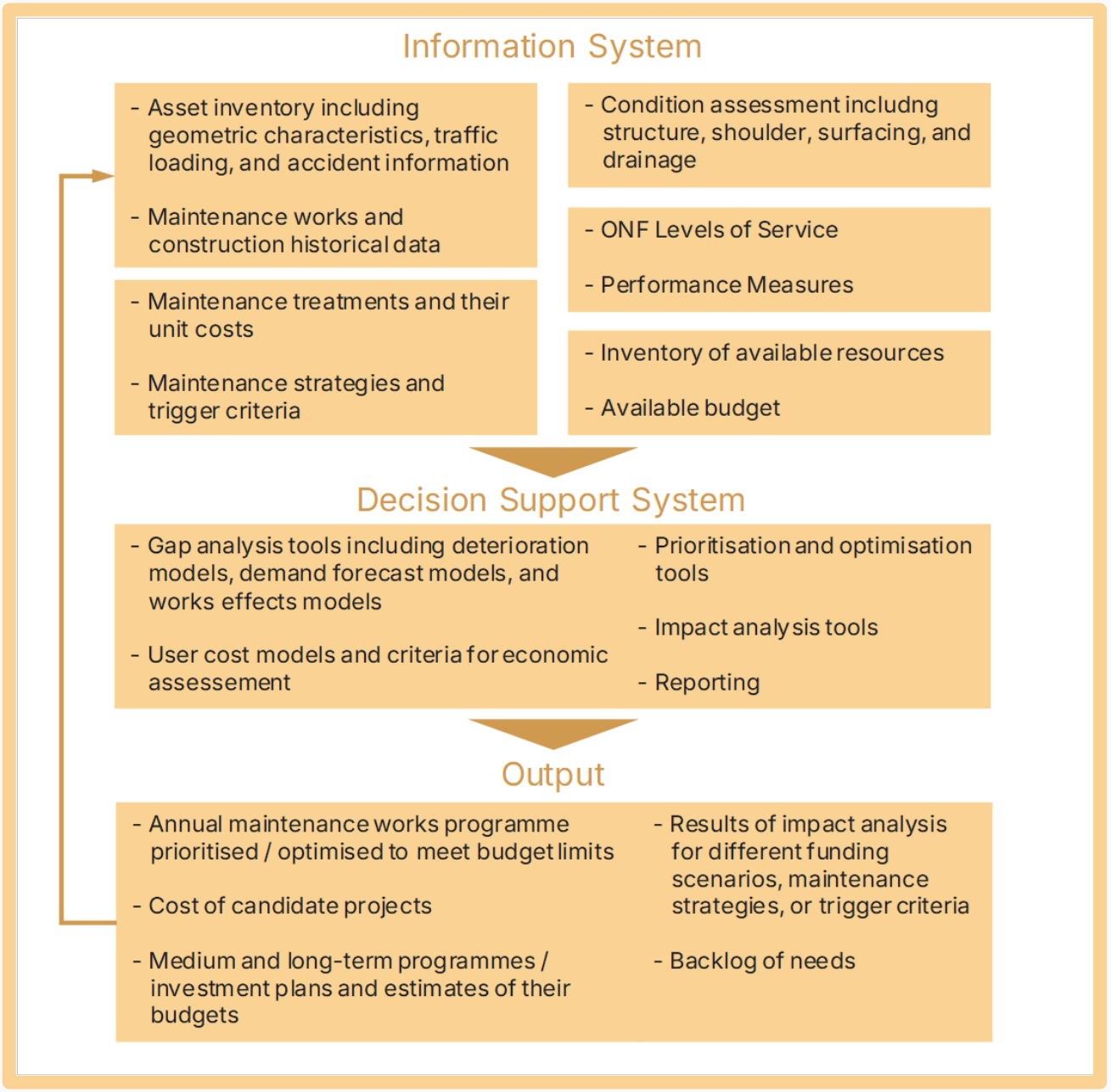


Figure 233 | Activity Management System process

Operational structures and support operations

Asset operations are activities that do not have a direct physical effect on asset condition but are necessary to keep the asset appropriately utilised by the timely and professional input of engineering knowledge and the use of activity management systems. This activity distinguishes it from maintenance activities, which directly affect asset condition and performance. Costs such as power supply to streetlights and professional services are often defined as operational costs.

Professional services

Professional services for most renewal and new improvement works are regarded as project related and form part of the overall cost of those projects.

The current structure of the infrastructure services originated from a review undertaken by

Morrison Low and associates in 2002. This review recommended the creation of the in-house professional services unit, and this was established in 2003. Roading professional services were the primary driver, but the utility groups of water, wastewater and stormwater were also incorporated. The strategic activity management functions are a separate function operating in the infrastructure group. A further revision of this structure, in 2009, saw the development of a shared services function that provided infrastructure activity management and professional services provided for the Rangitīkei District Council (RDC).

In 2024, the agreement with Rangitikei District Council was rescinded with regard to shared infrastructure services. Our internal professional team now delivers services for MDC alone, only liaising with other Councils when discharging duties across shared assets.

In addition, the utilities team has now transferred to Manawatū Water, the 'Local Water Done Well' entity set up as a separate Council Controlled Organisation.

The strategic activity management unit is responsible for providing strategic long-term planning functions, such as the preparation of Activity Management Plans, input into the Long-Term Plan, and the Infrastructure Strategy.

Generally, professional services provide for the service fees relating to maintenance and operations. Operational fees include the professional services necessary to:

- Manage the roading network, including all maintenance activities
- Prepare contracts for the works and services needed to deliver the agreed Levels of Service
- Legalise existing road reserves
- Produce project feasibility report (PFRs) for capital projects
- Investigate rehabilitations
- Manage preventative maintenance

NZTA Work Category 151: Network and activity management under the Council's subsidised Land Transport Programme is where funding is sourced for professional services for Maintenance and Operations of Local Roads. This category does not include emergency reinstatements.

For the other main activity classes associated with the Council's subsidised Land Transport Programme Renewal of Local Roads, and New and improved Infrastructure for Local Roads, professional services costs form part of the individual work category budgets that fall under these categories.

Professional services costs are incurred by the Council's strategic activity management unit, and any external consultants the Council engages. These activities are all subsidisable provided the works themselves are subsidisable.

Professional services costs for non-subsidised activities are fully funded by the Council, including professional services and system costs for all unsubsidised maintenance, renewal or improvement works.

Staff structure

Council's transportation assets are managed by the Roading Manager who works with the Roading Operations Manager, Roading Programme Manager, and other roading staff to discharge all their responsibilities for operational, daily, short-term, medium-term and strategic planning of the road network and its maintenance. Professional services are largely delivered by in-house staff, who are accountable to the Roading Manager.

There are a number of cross-departmental links that are important to the correct functioning of the roading team and management of the roading network. The most significant of these are with the Financial and Administration Services staff.

Staff competencies

An important measure of the quality of Council's activity management is the ability, experience and qualifications of the individuals and companies involved in its preparation. Council employs a limited range of technical staff qualified to carry out the activity management function.

In this context, competency refers to applied knowledge and can be described as:

> **the behaviours that employees must have, or must acquire, to input into a situation in order to achieve high levels of performance**

There are a large number of competencies that the Council requires of its staff to effectively manage its transportation network assets; these are not statements of current individual's skills or competencies; rather, they are statements of the Council's desired competency in the areas and subjects detailed and will:

- Establish the gaps between the competencies of current staff and the competencies required in the organisation. These gaps will be used to guide staff training and development programmes.
- Inform the recruitment process for staff involved in road activity management when new positions are being filled or replacement staff sought.

Audits

To establish and ensure the ongoing improvement of Council's systems, audits of financial, technical and performance systems are routinely implemented by NZTA, Audit New Zealand and Vertitek (streetlight inventory audit on behalf of the electricity retailer).

Financial audits

The LGA requires that independent annual financial audits be undertaken on the operations of Council – such audits may include all significant activities such as Activity Management Planning. The auditor's opinions are included in the Annual Report.

Information system audits

System audits are undertaken at regular intervals to access the appropriateness and performance of activity management systems, data and processes. Audits should identify the current status of activity management processes, systems and data and produce targets for

Activity management practices to be achieved in following years.

Technical audits

Technical audits (peer reviews) are undertaken by NZTA at regular intervals to assess and identify compliance with statutory requirements.

Performance audits

Performance audits will establish whether the stated objectives for the operation of the asset have been achieved. Measurement of the success of the operation of the asset will be assessed using the results of:

- Customer satisfaction surveys
- Key service criteria objectives compliance
- Benchmarking surveys

These measurements will determine the public view of how well the Levels of Service have been achieved, an objective measure against stated key service criteria and national measures of relative performance. The performance audits will also be used in ongoing customer consultation regarding future standards and requirements in the provision of service.

The collation of this data is often undertaken as part of NZTAs national role in monitoring performance of transportation agencies.

Operational improvements

When a non-conformity or incident occurs in assets, activity management or activity management system Council will:

- React to the non-conformity or incident as applicable, take action to control and correct it and deal with the consequences
- Evaluate the need for action to eliminate the causes of non-conformity or incident by:
- Reviewing the non-conformity or incident
- Determine causes of non-conformity or incident
- Determine if similar non-conformities exist, or could potentially occur
- Implement any action needed

Root Cause Analysis is a technique that examines why the problem occurred in the first place. It seeks to identify the origin of a problem using a specific set of steps, with associated tools, to find the primary cause of the problem, to determine:

- What happened
- Why it happened
- What can be done to reduce the likelihood that it will happen again

Identifying Systemic Issues highlights problems or changes in Council/NZTA policy or practice that affects, or has the potential to affect, a number of customers. It may be caused by, but not limited to, the following:

- a system change
- an alteration in performance levels (e.g., quality of supply, access to call centre)
- a policy or procedure change
- a lack of policy or procedure

- a lack of clear regulatory guidelines
- regulatory non-compliance
- the conduct of an energy or water provider's employee, agent, servant, officer or contractor
- the action of a stakeholder (e.g., legislative or regulatory change leading to misunderstanding or misapplication of the change)

If any systemic problems are identified, a plan is implemented to correct the potential faults before failure occurs.

Continuous improvement is a method for identifying opportunities for streamlining work and reducing waste. It can be viewed as a formal practice or an informal set of guidelines that has the following principles:

- Improvements are based on small changes, not major paradigm shifts or new inventions
- Ideas come from Council and Contractor's employees
- Incremental improvements are typically inexpensive to implement
- Council and Contractor's employees take ownership and are accountable for improvement
- Improvement is reflective
- Improvement is measurable and potentially repeatable

Developing renewal programmes

Road improvements

Road improvements include activities that target a specific increase in Levels of Service in part of a roading network.

The road improvements activity classes include Local Road Improvements under the following work categories:

- Work category 216: Bridges and structures renewals
- Work category 321: New traffic management facilities
- Work category 322: Replacement of bridges and structures
- Work category 323: New roads
- Work category 324: Road improvements
- Work category 325: Seal extension
- Work category 332: Property purchase – local roads
- Work category 333: Advance property purchase - local roads
- Work category 341: Low cost, low risk improvements
- Work category 357: Resilience improvements

The required benefit and cost appraisal methodology for road improvements is benefit-cost analysis and the required measure is the benefit-cost ratio (BCR). NZTA requires Council to use the Monetised and Non-monetised Benefit and Cost Manual procedures and templates to determine the BCR for road improvement activities.

Capital investment planning

Council uses NZTAs Business Case Approach (BCA) to guide its planning, investment and project development processes. The BCA is used to develop business cases for investment through the NLTP. The BCA provides flexible building blocks which can be adapted to particular situations and proposed investments.

NZTA assesses investment proposals in the 2027-30 NLTP using the information contained in the business cases and supporting information submitted in Transport Investment Online (TIO). After the business case has been assessed and passed, the information is then distilled down to two ranking factors,

- **Results Alignment** | The alignment of the proposal's key transport issues with the GPS, and
- **Cost Benefit Appraisal** | How efficient resources are used to deliver benefits from the proposed solution

The information relating to developing assessment profiles is organised by activity class groupings. NZTA provides guidance on each of the two factors within the groupings.

Identifying and scoping capital projects

NZTA assesses business cases at the end of the strategic case, programme business case and single-stage business cases phases (or after both the indicative and detailed business case, if they are done separately). This assessment uses the business case investment questions and the Investment Prioritisation Method (IPM). The investment questions ensure that the business case will be effective and the IPM checks alignment to the strategic priorities outlined in the GPS.

Developing new build programmes

The business case is developed by answering the questions in the table on the following page. They don't all need to be answered at each phase, but the more advanced the business case is the more questions need to be answered (for the most up-to-date Business Case Approach guidance, visit NZTAs website).

Problem	Benefits	Strategic response	Solution
Is it clear what the problem is that needs to be addressed (both the cause and the effect)?	Have the benefits that will result from fixing the problem been adequately defined?	Have a sufficient range of strategic alternatives and options been explored (demand, productivity and supply)?	Consistent with the strategic alternatives and options, have a reasonable range of project options been analysed?
Is there evidence to confirm the cause and effect of the problem?	Are the benefits of high value to the organisation(s) (furthering its (their) objectives)?	Is it clear what strategic alternatives and options are proposed and the rationale for their selection?	Is the proposed solution specified clearly and fully (all business changes and any assets)?
Does the problem need to be assessed at this time?	Will the KPIs that have been specified provide reasonable evidence that the benefits have been delivered?	Are the proposed alternatives and options the most effective response to the problem (comprehensive and balanced)?	Is the proposed solution the best way to respond to the problem and deliver the expected benefits?
Is the problem specific to this investment (or should a broader perspective be taken)?	Are the KPIs both measurable and totally attributable to this investment?	Are the proposed alternatives and options feasible?	Can the solution really be delivered (costs, risks, timeframes, governance, etc)?

Figure 234 | The business case process

Compiling the capital investment strategy

The strategic case phase is about defining and understanding the problem or opportunity, and showing there will be substantial enough benefits to justify investment to investigate the problem further. Essentially, it asks 'Is there a case for change?'

The main purpose of the strategic case is to confirm whether:

- there is a compelling case for change to investigate further; that is, there is evidence that suggests there is a problem, and indicates the scale of the problem
- key stakeholders are aligned and behind the need to address an agreed problem
- agreement is forming on what a good outcome looks like and what benefits could be gained before effort is expended on investigating solutions

Strategic cases avoid wasted effort where agreement is not reached, or where stakeholders agree that the problem is not significant enough to proceed. This decision can be made at any point during development of the strategic case.

Strategic cases should clearly answer the following questions:

- What is the problem?
- Do the benefits of addressing the problem justify further investigation?
- How big is the problem? Examine existing evidence and information
- Is the issue important to Council and its stakeholders (alignment with goals, policies, strategies, etc)?

It is essential that the strategic case is crafted carefully so that it is clear and concise. The desire to tell a compelling story that will convince investors to commit limited public funds must be balanced against the need to be objective and maintain the integrity of the business case.

It is also important to put the investment story in a national context. The strategic case will be assessed along with many others seeking investment from a contestable national fund that has a finite amount of money.

Net present value analysis

The present value of future costs of options are determined and compared to identify the long term least cost option.

The method is recommended to determine if renewal is more cost effective than ongoing maintenance. Where the future costs of 'do-minimum' exceeds the costs of replacement, then the net present value of the option can be assessed as the best approach. In certain cases, the use of benefit streams rather than future costs may be more appropriate.

Benefit cost evaluation methods | Approaches to investment evaluation

NZTAs Monetised and Non-monetised Benefit and Cost Manuals are the industry's standard for the economic evaluation of land transport activities for New Zealand. These manuals set out economic evaluation procedures and values used in calculating benefits and costs, necessary for applications seeking investment where a benefit cost appraisal from NZTA is mandatory.

Decision-making at the strategic, programme and project level operates with different degrees of sophistication as follows:

- **Current status** | Condition is the driver in decisions, and is often associated with a worst first approach to investment
- **Whole of lifecycle costing** | Future performance is the main driver, and requires condition prediction modelling over the whole of life analysis period
- **Risk analysis** | Involves consideration of multi-criteria; options are evaluated using a risk assessment method

Business case approach

NZTA requires Council to use a business case approach to guide its planning, investment and project development processes. It is a principles-based approach that clearly links Council's strategy to outcomes and defines problems and their consequences thoroughly before solutions are considered. This approach ensures a shared view of problems and benefits early in the transport planning process without requiring that the work has to be done in a particular way.

A business case approach encourages early engagement with stakeholders to confirm:

- The fit with strategy and need to invest
- The way forward with short-listed options
- That the best value option is affordable and deliverable and that the risks are acceptable

New programmes/activities in the NLTP are required to follow the business case approach.

A project's business case is built progressively; starting with a strategic case, then a programme business case, progressing to an indicative business case and finally a detailed business case, with decision points along the way that determine whether the investment is worthwhile in relation to the desired outcome. And at every step of the way, there's a strong connection between strategy and outcomes, whereby a:

Strategic Case sets the strategic context and presents a shared understanding of the scale and significance of problems, the outcomes sought, and the benefits desired. This stage is a central pillar to subsequent business case stages and enables NZTA to provide early investment signals to our partners. Investment logic mapping (ILM) is at the heart of this stage.

Programme Business Case identifies an optimal mix of alternatives and options but doesn't look at detailed solutions at this stage. The preferred programme could include a broad mix of activities that might be delivered by multiple parties over a period of time. This business case will receive official NZTA support, including assessment of strategic fit. An anticipated effectiveness and efficiency assessment is also undertaken at a programme level.

Indicative Business Case further develops specific activities. It provides a long list to short list of options, and it recommends a preferred way forward as part of the short-listed alternatives. An indicative business case receives official NZTA support, including assessment of strategic fit and effectiveness, with anticipated efficiency assessment.

Detailed Business Case confirms an activity that comes from the detailed programme (previously called 'package') of activities and confirms the overall assessment profile. It includes a more detailed reporting of economic, financial and commercial aspects of the activity.

Multi-criteria analysis (MCA)

Asset optimisation and prioritisation framework

Decision-making by Council entails identifying and assessing options with quantified and unquantified impacts, in a context of multiple objectives, constraints and uncertainty. Inevitably, a high level of subjectivity and judgment is involved, no system of decision-making can change this. However, the Programme Business Case approach provides a structured framework which breaks the decision-making process into stages and makes good use of data and analysis. This reduces complexity, adds consistency, rigour and transparency, and ensures that the best use is made of information.

There are a number of steps between performing the gap analysis and finalising the works programme. The 'best' option for each gap is chosen after an analysis of different funding options and scenarios. This analysis of scenarios considers asset optimisation and prioritisation or a combination of both.

Asset optimisation aims to maximise asset life and benefits (economic, social, safety, environmental or otherwise) while minimising the lifecycle costs. Optimisation affects decision-making throughout the life of the asset from planning to renewal or disposal. Asset optimisation also takes into account the road use and infrastructure strategy, demand management and sustainability.

The WOLC evaluates the total costs to be expended on an asset over its entire life span, expected life or service potential. The WOLC economic analysis tool considers the costs, in present day value (PV), to NZTA, Council and the community throughout the life of the assets. The costs include annual maintenance costs, the timing and cost of future investments, such as rehabilitation, reconstruction and construction for additional capacity, and community costs such as road user costs. WOLC compares alternative options with different economic lives. WOLC is used to establish intervention levels for each ONRC category of road, taking into account traffic levels and geographical differences.

- The framework is simple and transparent, minimising both the level of information required and the necessary computation so that auditing and ease of use are maximised
- The framework is used for initial optimisation/prioritisation of a number of projects
- The results of the optimisation / prioritisation process are used to rank projects

The results of the outcomes developed from the framework are considered carefully for their credibility and whether there are other possible outcomes that are not provided by the framework. The long-term programme is developed by expanding this process to include previous years' gaps that have not been filled due to insufficient funding and ongoing committed projects are also taken into consideration.

Risk-based decision-making considerations

Risk-based decision-making involves a series of basic steps. The steps can be used at different levels of detail and with varying degrees of formality, depending on the situation. The key to using the process is in completing each step in the most simple, practical way to provide the information the decision maker needs. Some situations are so complex that detailed risk assessments are needed, but most can be addressed with more simple risk assessments. It is a process that organises information about the possibility for one or more unwanted outcomes into a broad, orderly structure that helps decision makers make more informed management choices.

Risk-based decision-making is made up of five major components, shown below.

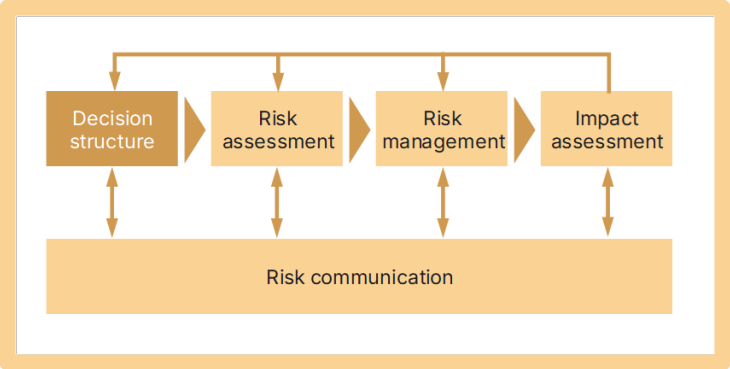


Figure 235 | The risk based decision-making process

Other decision-making considerations

The forward works programme

The final works programme shows the funding available for routine, preventative, and periodic maintenance, as well as funding for rehabilitation and construction, including details of specific works for funding. As a final step in the programme development process the ranking list is reviewed to ensure that the high level policy decisions are reflected in the projects chosen for funding.

Renewal forecasts

Council prepares forward programmes for the resurfacing of sealed roads annually from information from AWM.

Unsealed roads are monitored continually, and work programmes are revised throughout the year in response to changes in need exhibited by the road surface, especially through the winter.

Specific forecasting assumptions

Initially, the need for renewal works may not be so obvious compared to those associated with maintenance but the consequences of not recognising, planning and forecasting for the appropriate interventions can create a significant and expensive long term problem.

- The Council's policy is all new developmental roading shall be sealed. This affects expected future renewal costs
- Annual sealed road renewal costs will increase proportionately, and annual metal road renewal costs will decrease proportionately, with the length of seal extension completed in the previous financial year
- There will be no growth in unsealed road length. This is a reasonable assumption, as the Council's policy is all new developmental roading shall be sealed

Traffic capacity

As a whole, the network is not stressed in terms of its ability to cope with present and foreseen demands. However, there are sections where its capacity is under pressure. This is evident from the following:

- Inadequate seal width for current traffic volumes and types of traffic evidenced by the increased need to repair the edges of some roads (e.g., edge break, edge rutting repairs), by an increase in concerns over safety of passing of heavy vehicles and an inability to pull onto the shoulder on some roads
- Lack of safe travelling-space for both cyclists and motor vehicles on some routes
- Concerns over the inability of opposing vehicles to pass safely on some unsealed roads and the lack of visibility for following vehicles on these roads

A 'Whole of Life' approach with a 30-year horizon has been taken to capture a representative portion of pavements that will reach the end of their lifecycle. This approach is consistent with the legislative requirements for Infrastructure Strategies which require (as a minimum) 30-year forecasts and is also consistent with the role of the AMP. The decision-making is evidence based, and an optimised programme of works has been developed that represents best value for money.

The Programme Optimisation process selects the right things to do at an appropriate level of investment (i.e., not over capitalising or over investing in treatments for the Level of Service or economicsocial value of a road, then implements them in the right way, at the right time and for the right price.

The Programme Optimisation process

- Addresses the Strategic Key Results Areas, Operational Measures and Performance Measures
- Sustains the network i.e., the major spend items are appropriate and tally with AWM data
- Provides an appropriate level of treatment
- Ensures costs are reasonable (compared to other RCAs with similar mixes of roads)
- Meets business case requirements
- Demonstrates how the ONF is implemented
- Identifies a long list of possible alternatives and options
- Develops a range of possible programmes, their benefits, consequences and potential costs
- Identifies a preferred programme of activities to progress

Planning for emergencies, crises, and incidents

Climate change

New Zealand's climate varies significantly from year to year and from decade to decade. Human-induced long term trends will be superimposed on these natural variations, and it is this combination that will provide the future climate extremes to which New Zealand society will be exposed.

The Ministry of Cities, Environment, Regions and Transport (MCERT) has produced a document

entitled 'Climate Change and Long Term Planning' which advises that, projections of New Zealand's future climate indicate:

- Temperatures increase on average by 1ºC by 2040 and 2ºC by 2090
- Rainfall has a pattern of increases in the west (up to 5% by 2040 and 10% by 2090) and decreases in the east and north (exceeding 5% in places by 2090). There is marked seasonality in the rainfall distribution pattern changes
- Sea levels will rise
- Decreased frosts
- Increased frequency of high temperatures
- Increased frequency of extreme daily rainfalls
- Higher snow lines and possible reduced snow coverage
- Possible increase in strong winds
- Wetter in the west and south, drier in the north and east

The document also states 'Key principles for responding to climate change'; local government is required to operate under a range of principles that are set out in law or have evolved through good practice and case law. The principles should also be kept in mind when adapting to the effects of climate change. The key principles are:

- Sustainability
- Consideration of the foreseeable needs of future generations
- Avoidance, remedy or mitigation of adverse effects
- Adoption of a precautionary approach
- The ethic of stewardship/Kaitiakitanga
- Consultation and participation
- Financial responsibility
- Liability
- Resilient communities
- Spill

The following mitigation measures may be considered when taking into account climate change:

- Have regard to projections during planning phases
- Cognisance of areas located as being potential hazard zones
- Specialist advice

Natural hazard management

The term 'natural hazards' covers situations where water, air and ground movement have the potential to adversely affect human life and property. They can also have adverse effects upon structural assets and the natural values of areas. The hazards most relevant to the Manawatū District are flooding, earthquakes, land slips, coastal erosion/deposition and tsunamis. Events such as storms, tornadoes, and volcanic ash showers may also happen, but land use planning could do little to reduce their effects. The first way of reducing adverse effects on people, property and natural values from hazard events is to reduce the severity of the event itself, for example by planting stream catchments to reduce the speed of water runoff. The second is to avoid damage by keeping residents and development away from the hazard. The third method is to try and modify the effects of the hazard, e.g., by constructing stop banks to confine floodwaters.

When it comes to hazard avoidance, the level of risk determines the amount of development which is 'acceptable'. For example, most people would agree that houses should not be built in places which flood every year, but the risk may be acceptable on a property which could be flooded by a 200-year magnitude event.

The Manawatū District and surrounding regions are exposed to a number of natural hazards. From an activity point of view hazards have the potential to cause major disruption and need to be taken into account.

Information on the risk posed by natural hazards is sparse for the Manawatū District. In conjunction with the Horizon Regional Council the Council has developed a database of natural hazards.

Horizon Regional Council's One Plan sets outs responsibilities for natural hazard management relevant to the Manawatū District. The plan to minimise risks of natural hazards through:

- Raising public awareness of the risks of natural hazards through education, including information about what natural hazards exist in the Region, what people can do to minimise their own level of risk, and what help is available
- Making territorial authorities responsible for developing objectives, policies, and methods (including rules) for the control of the use of land to avoid or mitigate natural hazards in all areas, for all activities (except land-use activities) in the coastal marine area, erosion protection works that cross or adjoin mean high water spring, and land-use activities in the beds of rivers and lakes for the purpose of avoiding or mitigating natural hazards

The plan also identifies:

- Flood ways and other areas known to be inundated by a 0.5% annual exceedance probability flood event in District Plans and controlling land-use activities in these areas.

Natural hazards in the Manawatū district

The hazards most relevant to the Manawatū District are flooding, earthquakes, land slippage, coastal erosion/deposition and tsunamis. These may result in natural hazards occurring at two levels:

- **District wide** | Large-scale natural hazards which affect all or large parts of the district, e.g., a major earthquake
- **Localised** | Natural hazards which affect a smaller area of the district, e.g., flooding in a township or a landslip

Flooding is a commonly occurring major natural hazard that results when the natural and modified drainage systems fail in a particular rainfall event. The risk of flooding is influenced by a number of factors such as:

- Weather systems
- Hydrological factors (catchment size, rainfall intensity and infiltration)
- Hydraulic factors
- Soil type
- Land use
- Ground saturation

Storm events and the resulting flooding can result in significant adverse effects on both

residents and the environment. These effects may include:

- Personal injury or loss of life, property and possessions or livelihood
- Disruption of utilities and transportation networks
- Impacts on the environment (vegetation/habitat loss, erosionsedimentation in waterways, soil/water contamination)

Flooding hazards within the Manawatū District have principally occurred within the Feilding and Southern areas of the district. Horizon Regional Council is also modelling the flood risks for Feilding.

Flood Prone Areas

Flooding can be caused from stormwater ponding in low-lying areas; or waterbodies overflowing their normal channel in high rainfall events. Townships known to experience localised flooding include:

- **Feilding** | overflow of the Makino Stream, Ōroua River and the Kiwitea Stream
- **Rongotea** | School drain and stormwater ponding
- **Kairanga/Bainesse** | Taonui Flood Basin stormwater ponding
- **Tangimoana** | stormwater ponding

The Manawatū District is bounded by two major rivers: the Rangitīkei (to the North and West), and the Manawatū (to the South). The Ōroua & Pōhangina Rivers (and the Kiwitea, Makino & Waituna streams) traverse through the district as well. All these rivers and streams can, and have, broken out of their channels during major flood events. Horizons Regional Council has done considerable work modelling likely outbreak point(s) to understand flood impacts from a number of these watercourses:

Flood action plans, prepared by Horizons Regional Council, outline a management of spillway operations into defined areas of high flow river levels of the Ōroua River and the Makino Stream.

Low-lying townships in southern Manawatū may also be vulnerable to flooding from tsunamis. Historically, tsunamis that affect New Zealand's coastline are triggered by earthquakes off the coast of South America or Japan. Horizons Regional Council has also modelled the Southern Areas of Tangimoana and Hīmatangi Beach to assess the risks associated with varying tsunami events. The modelled effects would comprise sea water encroachment into the settlements, and for water to travel up the mouths of rivers such as the Rangitīkei River and the Kaikokopu stream.

However, although the probability is low for any particular location, other parts of the Pacific rim frequently experience more destructive tsunamis. In 2012/13, two warnings were issued for coastal environments due to earthquakes off South America and the Solomon Islands. Although no effects were noted, the probability exists of further activity affecting NZ.

Landslides

Landslides are generally caused by slope saturation and can include mudslides, debris flow or avalanches, rock falls and rockslides. Increased ground saturation can be caused by intense rainfall, changes in groundwater and water level changes in rivers, earth dams, lake banks and the coastline. Generally flooding and

landslide events are closely linked as they both result from heavy rainfall, stormwater runoff and ground saturation.

The risk of landslide is influenced by a number of factors such as:

- Underlying geology
- Proximity to rivers, lakes and the coast
- Past and present land use including vegetation changes
- Infrastructure development

Landslides can result in significant adverse effects on the road network including blocking roads by material dropping onto the road or loss of the road because the supporting country and the road slip away.

Earthquakes

New Zealand is considered amongst the most seismically active places on earth, as it is located on an active boundary of two tectonic plates.

Active faults

In central NZ, motion of the Pacific Plate relative to the Australia Plate occurs at approximately 40mm/year, in the direction of approximately 260°. The forces involved in plate movement are immense and cause rock of the Earth's crust to buckle (fold) and fracture (fault) in the general vicinity of the boundary between the plates. There are five known active faults in the vicinity of the Manawatū Region, and all have the potential to cause strong shaking.

These active faults are:

- Wellington Fault, laying 27km southeast of Feilding
- Ruahine Fault, laying 24km southeast of Feilding
- Northern Ohariu Fault, laying 28km southwest of Feilding
- Mt Stewart-Halcombe Fault, laying 4km to the south of Feilding
- Rauoterangi Fault, traversing through the Western side of Feilding

A seismic earthquake risk assessment was included as part of the Manawatū-Whanganui Lifelines project. The assessment considered major lifeline services and the effects of Natural Hazards on them.

Volcanic activity

Ruapehu is one of New Zealand's most active volcanoes, with ten eruptions since 1861. The eruptions aren't the only threat; there is a more serious threat from the volcanic mudflow called a 'Lahar'; in between eruptions, a lake forms in the volcano's caldera from melting snow. If a previous eruption has deposited a dam of ash, rocks and mud in the lake's natural overflow point, then the lake becomes dangerously full, held back only by the temporary dam.

Mount Ruapehu has erupted at least 10 times since 1861 (produced numerous lahars); the most recent of which occurred on 25 September 2007 [23].

Volcanos and volcanic eruptions

The New Zealand region is characterised by both a high density of active volcanoes and a high frequency of eruptions. Volcanic activity in New

[23] https://www.geonet.org.nz/about/volcano/ruapehu

Zealand occurs in six areas, five in the North Island and 1 (one) offshore to the northeast in the Kermadec Islands. The volcanos of note to the Manawatū District are the cone volcanos of Mt Ruapehu, Mt Tongariro, Mt Ngauruhoe, Mt Egmont/Taranaki, and the caldera volcano of Lake Taupo. Typically, a number of types of hazards will result from a volcanic eruption. Each hazard poses different risks affecting different areas. This is the key difference between eruptions and the other principal natural hazards, floods and earthquakes. The most threatening hazards include pyroclastic falls, pyroclastic flows and surges, lava extrusions (flows and domes), lahars, debris avalanches and volcanic gases.

Pyroclastic fall deposits consist of material which rains out from an eruption column. Large fragments (blocks and bombs) follow ballistic trajectories and are highly damaging. These fragments rarely land more than two kilometres from the vent. Finer material (ash and lapilli) is convected upwards in the eruption column before settling out downwind to form pyroclastic fall deposits. Fine ash can be deposited hundreds - to thousands - of kilometres from source, and volcanic ash is the product most likely to affect the largest area and the most people during an eruption. These particles commonly have sharp broken edges and volcanic ash is therefore highly abrasive. Volcanic ash clouds will block out sunlight and total darkness may result where moderate to heavy falls of ash occur. A community's infrastructure provides the services and linkages which allow society to function.

Essential infrastructure such as electricity, water, sewerage, and roads are vulnerable to damage from ash falls. Falls of volcanic ash, for example, have the potential to disrupt electricity supply. Loss of supply commonly occurs when ash is wet, as a result of rain during or immediately after the ash fall.

Contamination of open water supplies occurs, even in relatively small ash falls. Both turbidity (suspended material) and acidity are the most common problems affecting water supplies, but they will usually return to normal levels within a few hours or days unless ash falls are prolonged. Hazardous chemicals from ash can mix with small volumes of water such as roof-fed water tanks, stock water troughs and shallow surface water bodies, causing chemical contamination above safe guidelines for drinking water. Volcanic ash falls can cause severe damage to sewage and stormwater systems. Ash is easily washed off impervious surfaces, such as roads, carparks and buildings, into these systems.

Volcanic ash falling on roads is extremely disruptive to transportation, reducing visibility. The ash is easily raised in clouds by passing vehicles and this presents an ongoing visibility hazard.

Wet ash can turn into mud, causing further problems with vehicle traction. Fine ash causes clogging of air filters resulting in cars overheating. Vehicle brakes are susceptible to damage and ash may also enter the engine causing wear on moving parts, which reduces vehicle life. Even minor ash fall (<1mm) will close airports. Ash has damaging effects on other electrical or mechanical systems.

A Volcanic risk assessment was included as part of the Manawatū-Wanganui Lifelines project and included in the table following. The assessment considered major lifeline services and the effects of Natural Hazards on them.

Essential infrastructure

Essential infrastructure consists of assets and networks that support life and business in our community. Increased awareness and plan development aims to minimise the impact of natural hazards on essential infrastructure, and reduce the time that such networks are out of service. Events considered as a risk to essential infrastructure comprise:

- Earthquakes
- Meteorological events
- Mass land movement
- Coastal hazards
- Climate change

Business continuity

Business Continuity is a progression of disaster recovery, aimed at allowing an organisation to continue functioning during and after a disaster, rather than simply being able to recover afterwards. The following plan(s) have been developed to ensure business continuity:

- Effects and Responsibilities Plan; Effects and Intervention for Transportation
- Transportation Lifelines Response plan

The principal objectives are to:

- Possess a management tool that identifies relevant natural hazards t
- Identify the consequences of the natural hazards
- Identify immediate remedial actions
- Define restoration levels, priorities and issues
- Identify long-term risk management issues

Emergency management

The Emergency Management Act 2026 requires Local Authorities to coordinate Plans, Programmes and Activities across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups.

A Lifelines Response Plan has been prepared for key Council services including Transportation. The Plan considers natural hazard events including earthquake, flooding, volcanic and mass movement (land slip).

Emergency works

Under the road maintenance contract, the Contractor is required to attend to all emergency work as soon as existing sites can be made safe and may be required to establish emergency patrols during periods of expected damage to facilities.

Emergency works may arise from adverse weather events like storms that result in wind damage, flooding, slips and snow. Work associated with these events is generally completed, even if this 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 are needed to restore and reopen roads.

The Council applies to NZTA for additional funding for emergency and permanent reinstatement work resulting from weather events under Work Category 141: Emergency Reinstatement. This funding allows the Council to repair carriageway and structural damage caused by severe weather to at least as good a standard as previously existed before the weather event.

4.8 Assets

The following sections discuss the assets with detail around their specific lifecycle management requirements. The level of detail required for this plan varies as some asset groups have expansive technical requirements based on large amounts of data while others have minimal requirements with relatively low levels of management intervention required by the council.

The asset groups and their principal components are:

Road pavements

- **Formation** | the existing / modified material supporting the sub-base and basecourse layers
- **Sub-base** | the lower structural layer between the formation and basecourse
- **Basecourse** | the top structural layer of the pavement
- **Shoulders** | grass and metal between seal edge and drainage features
- **Top surface** | the bitumen bound chip seal or asphaltic concrete surface

Drainage

- **Culverts** | piped systems under roads conveying stormwater run-off
- **Kerb and channel** | concrete lined channels on streets / roads to control runoff
- **Sumps and soak holes** | collection structures to control discharge of run-off
- **Surface water channels** | earthen formed 'v' profile drains, predominantly beside rural roads

Bridges

- **Abutments** | fixed platform to support deck ends
- **Piers** | mid-point columns to support decking
- **Deck spans** | the trafficable platform atop the abutment and piers
- **Large culverts** | pipes or box channels with a cross-sectional area greater than 3.4m^2

Retaining walls

- Carriageway formation, support and protection structures

Network services

- **Signs** | the message board to convey safety and directional information
- **Posts** | wooden or steel posts or poles supporting signage
- **Markings** | painted lines on the road surface
- **Islands** | traffic control structures at intersections
- **Rails** | roadside site visibility aids
- **Barriers** | Safety protection systems reducing the severity of vehicle crashes

Streetlighting

- **Luminaires** | light fitting, including control gear and lamp
- **Poles** | concrete or steel columns supporting luminaires
- **Brackets** | supporting the luminaire atop the pole

Pathways

- Concrete, paved, asphaltic, and unsealed pedestrian pathways

Environmental

- **Vegetation Control** | control or grass and noxious plants
- **Emergency Works** | snow clearing, flood damage reinstatement, or other natural response
- **Stock Underpasses** | below ground structures to enable stock to pass under the road
- **Street Cleaning** | Detritus removal

Operation and asset management

- **Activity management** | strategic management of the roading network
- **Systems** | AWM database to manage roading inventory
- **Road closure** | Council approved activities for community or sport events
- **Traffic Management** | function of operating on legal roads safely
- **Corridor Access** | permit approval system to operate on public roads

Lifecycle management plans for each asset group detail the methods and actions planned to deliver the agreed Levels of Service while optimising lifecycle costs.

The lifecycle management plans cover asset information identifying:

- The scope and nature of assets
- The current condition of assets
- The current capacity and performance of asset relative to the Level of Service
- Demand projections and risk
- Management of, and standards for, all asset lifecycle work activity – operations, maintenance, renewals, new improvements and disposals
- Costs and timing of identified work and forecast needs for all asset lifecycle work activities (maintenance, renewal, development and disposal) required to action the adopted lifecycle activity management strategies

4.8.1 Berms

The Berm is the grass area between the kerb edge and the property boundary in urban areas. Berms are identified by the type of plant cover. For the majority of Berms, the plant cover is grass but there are some areas planted with shrubs or flowers.

Overview

Modern subdivision construction methods normally allow for an area of grassed berm either side of the footpath, but there are many other combinations depending on the position of the footpath and drainage channels.

Berms are formed when the road is constructed or reconstructed, and their renewal is normally included in these programmes.

There is an expectation that residents will maintain berms outside their properties so there is little ongoing maintenance required by the Council.

4.8.2 Bridges

The purpose of road bridges is to provide continuous all weather access over rivers, streams and uneven terrain, and grade separation over railway lines and other roads.

NZTAs definition of bridge includes structures such as major culverts if they have a waterway area greater than 3.4m^2, for a round pipe this is equivalent to the pipe having a diameter greater than 2.08m (or 82 inches).

Overview

The Council maintains bridging structures ranging in size from 2.1m diameter culverts to bridges spanning 140m+ in length.

There are 9 bridges that straddle the district's boundaries. Three are State Highway bridges which the Council has no responsibility for. Responsibility for the remaining 6 boundary bridges are shared with neighbouring RCAs.

Some significant bridges provide access for agricultural transport while others provide for tourism and recreational activities. Bridges range in age from those constructed in the last decade to those constructed in the early 20th Century. Many original bridges over the larger rivers were replaced with modern concrete and steel structures in the latter 30 to 40 years of the 20th Century, however some older timber deck bridges remain in service.

Major culverts generally serve smaller water courses and are of concrete construction and varying in quality depending on their age. Much of the district's major culvert stock was constructed between 1930 and 1979.

Bridges are constructed from various materials; timber was used on older structures with concrete and steel being used as time progressed.

Typically, timber was used for decks and steel for the superstructure, whilst piles utilised either material. This has created some difficulty with the long-term maintenance of bridge structures, as the different materials age and deteriorate at different rates.

Nearly all bridges are now constructed from concrete, utilising high quality precast components. Smaller timber bridges are being replaced with precast box culverts that can be quickly put into position.

Timber, including Australian hardwood that was the early material of choice for most bridges, is the least durable of all the materials available and is prone to rot, insect attack and natural defects such as cracking, splitting and in the case of timber decks, surface abrasion. Steel is more durable but is subject to rust and consequently must be well protected by surface coatings to prevent deterioration.

Concrete structures, while potentially the most durable, can suffer from carbonation and chloride attack which can allow internal reinforcing steel to rust or concrete to degrade. Poor or inappropriate structural detailing and construction of concrete structures can significantly influence their longevity and the potential for expensive rehabilitation work during the life of the structure.

This is more prevalent in older structures where these types of defects have become evident by the passage of time. Key issues relating to the management of road bridges are:

- Older timber bridges reaching the ends of their practical and serviceable life spans
- Higher demands on older bridges from heavier and more traffic than originally anticipated when built (e.g., forestry, dairy, stock transport at 44t and 50t gross compared with 16t to 20t 40 years ago)
- Maintenance liabilities with some types of older bridges from poor detailing and construction methods
- Increasing awareness of safety related issues with older bridges (e.g., single lane, inadequate approaches, substandard guardrails)
- Striking the correct engineering and social balance between an appropriate Level of Service and cost, e.g., bridge replacements or refurbishments
- Obtaining financial assistance (subsidy) for replacements or new bridges
- Obtaining resource consent for major works in, or adjacent to, watercourses
- Operational and Maintenance Processes
- Asset Performance Data

The correlation between current condition and remaining useful life could be more closely aligned.

Currently the remaining useful life is assigned when assets are valued using a standard table relating to construction dates and type of construction. Improvement could be made in this data, so it is more aligned with condition rather than the construction date.

Maintenance Strategy

The objective of the works programme is to identify maintenance projects consistent with the overall Activity Management Plan.

It is important that the developed works programme and bridge strategy are consistent and realistic in terms of the overarching policy, goals and timeframes established by Council in this overall AMP.

In the context of bridge activity management, the optimisation of works programme is aimed at ensuring that the available budget is used in the best way to ensure that the risk and the possible consequence of any reduction in the Level of Service due to structure performance is minimised.

The ‘best way’ is identified by assessing the merit of various possible sets of maintenance projects proposed for the programme against the policy, aims and objectives of the road authority. Optimisation of the works programme is therefore achieved by identification and selection of the set of projects accorded the most merit.

At the strategic level the key objectives/goals for bridge activity management are:

- Plan and develop an integrated, safe, responsive, and sustainable bridge system
- The Activity Management Plan establishes the need for sound activity management planning, with a focus on long-term asset sustainability
- Maintain, operate and protect the road bridge system

Each of the elements shown below are inputs to the works programme that may be individually analysed and optimised to provide an overall benefit greater than the sum of the parts. The optimisation of the works programme is necessarily one of iteration and feedback in the quest for the best practical, economic, and sustainable solution to many competing needs and objectives. As a consequence, the factors to be considered are many and varied and dependent on business practice.

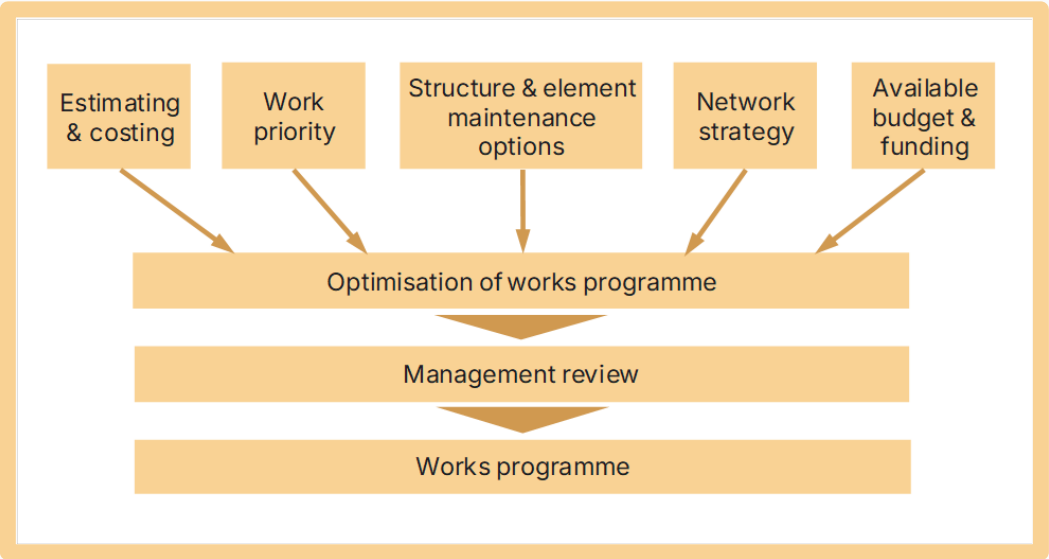


Figure 236 | Elements in the development of the bridges work programme

Factors to be considered include:

- Levels of Service
- Standards
- Priority projects with ranked under budget constraints
- Determining the necessary programme to meet performance objectives
- Economic feasibility of alternatives

Other factors to be considered include:

- costs for the agency and user
- bridge condition
- deterioration prediction
- funding constraints and minimum conditions
- feasible actions

The database contains information derived from the following activities:

- inventory
- inspection
- maintenance
- construction
- traffic surveys
- accident reporting
- cost accounting

The structure of Council's Bridge Management System is shown on the following page.

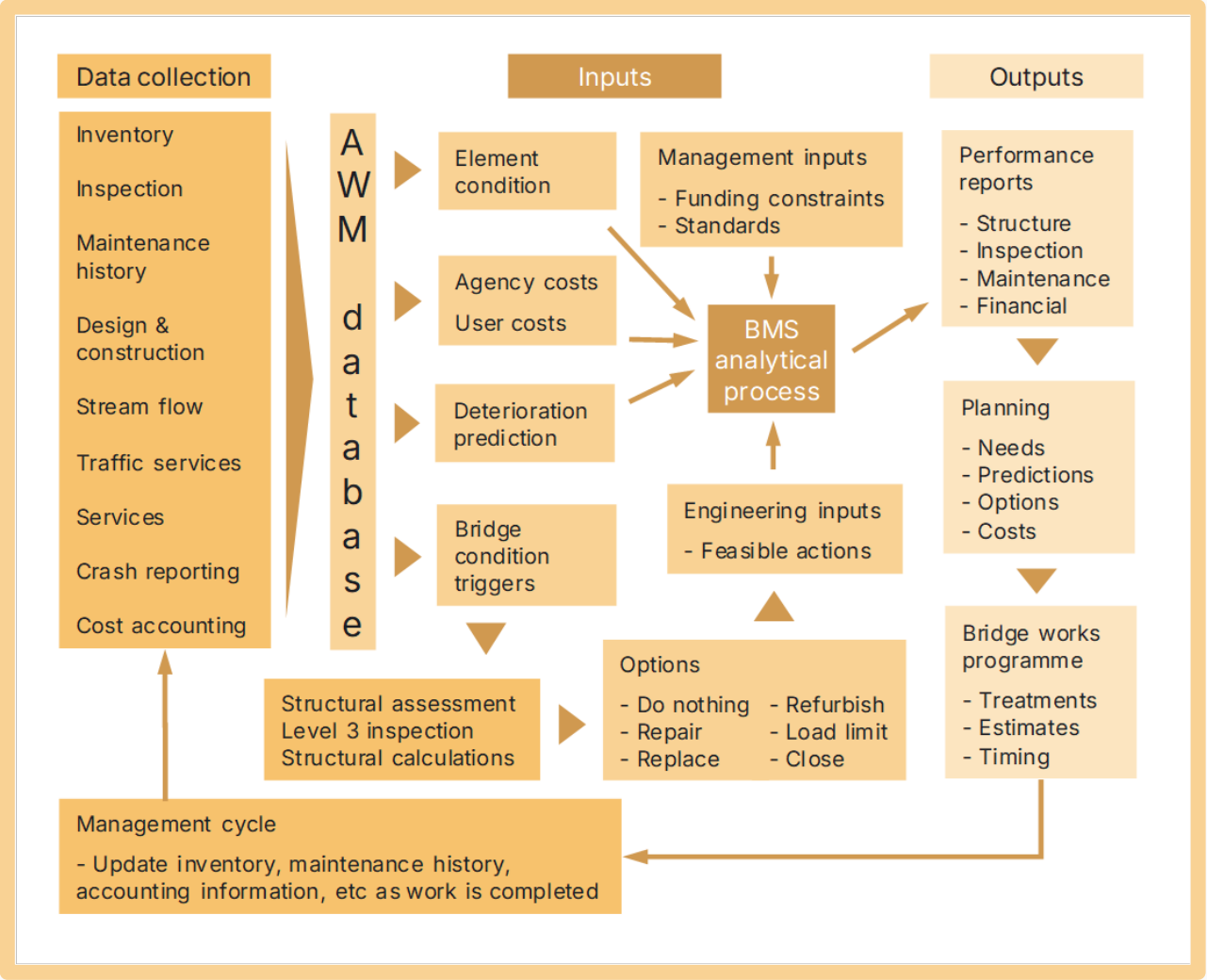


Figure 237 | the Bridge Management System

Programme Optimisation

The bridge works programme is developed in a systematic way. In general terms this is achieved through the application of a Bridge Management System (BMS).

The BMS is a tool that assists with information collection, storage and analysis. It is designed to support decision-making about optimal use of resources for bridge asset management. The BMS should provide reports that support the choice of the most beneficial set of bridge works for the works programme.

Optimisation determines the most beneficial strategy for bridge elements using lifecycle cost analysis or an equivalent procedure. Operated under various budget constraints, the system provides an indication of the effect of delayed maintenance on future element conditions and budget needs.

Optimisation may be either a top-down or a bottom-up approach. Each approach has its advantages and drawbacks.

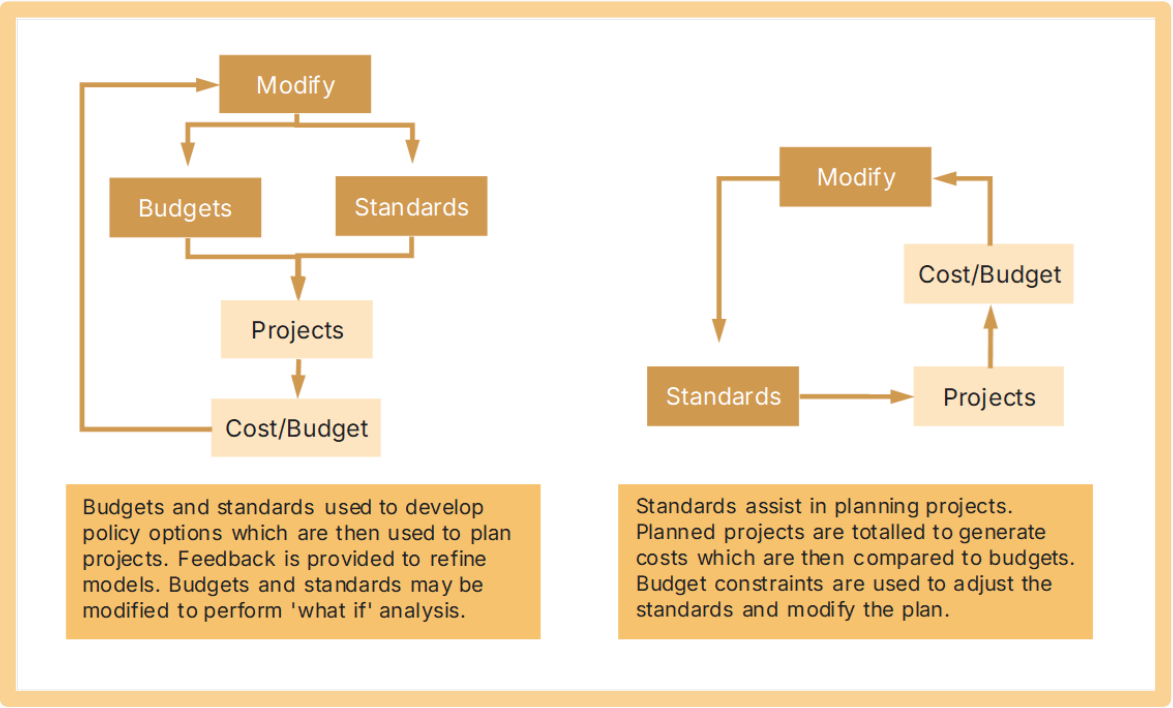


Figure 238 | Differing optimisation processes

NZTA Work Categories

General Bridge Maintenance and Renewal activities are included in the Structures group and are managed under NZTA Work Category 114: Structures maintenance and 216: Bridge and structures renewals.

Large scale renewals or upgrades are included in Work Category 322: Replacement of Bridges and Structures.

Inspection Programme

Scheduled bridge inspections are undertaken in accordance with NZTA requirements, this is done under contract by specialist bridge inspectors. Bridge inspection staff undergo structured training to ensure consistent results are reported. The inspection cycle is bi-annual for general inspections and on a six-year cycle for detailed structural inspections. The reports supplied include recommendations for any required maintenance or structural repairs.

Routine visual inspections are undertaken by the Road Maintenance Contractor under the relevant contract, and occur as part of the general network inspection cycle. Inspections are also undertaken during and after events that might threaten the safety or performance of bridges, such as floods, earthquakes or overloading. The bridge inspection report includes recommended repair options, which are then prioritised.

Council engineering staff assess the report findings, and the required work is either given to the road maintenance contractor to programme, price and action once approved by the Engineer, or contracts are let for more specialist structural repairs to be undertaken.

The Engineer is in the position of being able to coordinate the amount, type and cost of more complex and expensive work over the whole asset.

Maintenance programmes are developed from the schedules of defects identified during the inspections by both the Contractor and the Engineer. Repair treatments and priorities are determined by considering the impact on:

- Public safety (top priority)
- 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. From an activity management perspective, the additional criteria are also required, and are applied to:

- 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 discussed 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

Deferred maintenance

The impact of deferred maintenance is:

- The inability to carry the design flows with a corresponding decrease in Levels of Service with respect to stormwater control, or
- The inability to carry normal traffic loads

The results of the current detailed structural inspection to be undertaken will determine with improved certainty the extent of any possible deferred maintenance.

Maintenance Standards

- NZTA Bridge Inspection and Maintenance Manual
- Relevant New Zealand and other standards for design, construction and workmanship

Bridge Expected Condition

Further work is required to produce a more accurate correlation between condition rating data and remaining useful life. One option for doing this is to structure Council requirements for information collected whilst carrying out inspections so that asset related data is checked and updated along with the collection of condition related data which may correspond to amendment of the remaining useful life of the bridge.

Weight Capacity

In 2010 the Vehicle Dimension Mass (VDM) Rule was introduced to allow the freight industry to move freight safely, on fewer vehicles, within an appropriately regulated and permitted environment. This was proposed as part of Central Government's direction to make the freight industry more efficient, free up capital for increased economic productivity and create

more jobs. An increase of maximum vehicle loading from 44-tonne to 50-tonne was approved under the new rule.

A review is underway to determine the possibility of increasing the VDM thresholds. **This may have significant impacts on the capability and longevity of this asset group if progressed**.

The imposition of weight and/or speed restrictions extends the remaining life until renewal or replacement is possible. It should not be expected that restricted bridges would be replaced just because a restriction has been imposed. For some bridges, other solutions may be appropriate because replacement may be uneconomic or unnecessary, especially if they provide access to a single property or very few private properties.

Traffic Capacity

Most bridges on major roads are of sufficient size to accommodate anticipated traffic growth rates. The majority of these bridges are relatively modern and have two lanes.

Most single lane bridges are on low volume rural roads, have less traffic volume capacity and provide a lower Level of Service than bridges with two lanes. However, not all single lane bridges are deficient in terms of the Level of Service they provide; on many roads a single lane bridge is all that is required.

The increasing emphasis being placed on providing for other modes of transport, such as walking and cycling, is highlighting potential safety problems with some bridges. These typically arise on longer bridges on rural roads (or road bridges on popular recreational routes) when the bridges are not wide enough to enable pedestrians/cyclists to safely traverse them in conjunction with other traffic.

In some instances, the design of replacement bridges needs to consider whether any additional width is warranted to allow for the passage of over width farm machinery in remote areas where there is no practical detour. To avoid safety problems care is required in these circumstances to ensure that the replacement bridge is clearly either single or dual lane.

Smaller bridges in rural areas are susceptible to increased traffic volumes and weights from the developments in these areas e.g., forestry and dairy farming. This could potentially have a flow through effect when forests reach maturity and are logged.

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 consideration only when these bridges are replaced at the end of their serviceable lives.

In the hill country areas, river channels are well contained in gullies and other natural low points. However, 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 and abutments, which can result in damage or losses. The unstable nature of silty soil types found in the northern parts of the district also has an impact on the bridge structures located in those areas during severe weather events.

In the southern low lying parts of the district low grades dictate meandering rivers and streams which are susceptible to flooding after high rainfall in the northern catchment areas.

Bridge Replacements

Bridge replacements are assessed on a 'case by case' basis. Council is aware that ratepayers do not appreciate a bridge not being replaced, as it is deemed an unacceptable reduction in Level of Service. In rural areas, bridges in more remote areas are used for moving stock and farm machinery along public roads and are seen as vital for this purpose. In the case of moving stock, the use of fords or long detours is usually not an acceptable alternative.

Bridge Renewal/Replacement Plan

Asset renewal is undertaken when a bridge, or a significant component of a bridge, has reached the end of its economic life. This is measured by either its condition or performance.

The types of renewal work undertaken include:

- Replacement of an entire bridge
- Replacement of individual major bridge components e.g., deck beams, piers
- Rehabilitation of bridge components that restores the structural integrity of components, e.g., reinforcing repairs

Renewals are undertaken for the following reasons:

- The entire bridge has deteriorated to the extent that it no longer has the strength to carry its design loads (normal traffic) safely. (As all bridges were built to carry the normal maximum legal load that prevailed at the time, current lack of capacity is generally the result of deterioration or government imposed increases in axle and vehicle weight limits)
- Major components have worn or decayed to the extent that they are preventing the bridge carrying its design loads
- The waterway's characteristics have altered to the extent that the bridge can no longer pass the design flood flows
- Flood or earthquake damage has displaced or irrevocably damaged the bridge
- Major vehicle impact damage

When a bridge is replaced with a significantly wider or stronger structure the portion of work that is effectively increasing the Level of Service is classified as an improvement work.

Renewal and replacement needs are identified, and renewal priorities allocated, from inspections and in particular 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.

NZTA have recognised the problem of the increasing amount of deferred bridge renewals and developed evaluation criteria relating to 'Bridge Replacements on Low Volume Roads' allowing easier and simpler funding justification of individual bridge replacements. These requirements are detailed in SP2 of the NZTA Monetised and Non-monetised Benefits Manual. This procedure now allows funding of the Council's individual bridge replacements, to a value of $200,000, to be more easily justified. Despite this some bridge replacements may not be justified, for example if a detour less than 5km long is available.

Bridge renewal costs include the cost of the consents required for the bridge's construction.

Uneconomic Bridges

NZTA, in addition to the criteria allowing funding of bridge replacements on low volume roads, also has a general policy regarding uneconomic bridge renewals. A bridge is considered uneconomic by the NZTA 'where the ratio of the total cost of the work to be undertaken per AADT is greater than or equal to $8,000 per vehicle'. However, under this policy financial assistance will be provided for the most cost effective maintenance option.

Economic assessment of bridge renewals also requires the corresponding portion of road serving the bridge to be considered. The NZTA policy goes on to state: 'On application, the [NZTA] will consider the eligibility of non-maintenance activities on uneconomic roading facilities for financial assistance on a case by case basis.'

Bridge Renewal Forecast

The assessment of long-term renewal needs requires an understanding of the performance and condition of each of the bridges, especially those of the larger and more complex structures.

Bridge Renewal is budgeted under NZTA Work Category 216: Bridges and structure renewals. Council's bridge renewal strategy has prioritised 28 bridge renewals over the next 30-year timeframe; all structures identified are closely monitored under the bridge inspection programme.

The assessment of long-term renewal needs is based on the currently assessed expected useful life, however, these may alter depending on how the structure is managed long-term. For example, a renewal of a particular component of the bridge may extend its effective life beyond that assessed at this time.

As the replacement cost of bridges and large culverts is significant, it is important that future financial forecasts for their replacements are as accurate as practicable.

Bridge New Improvements

The background influences and methodologies applying to bridge new improvements are essentially the same as those detailed for pavements.

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. These are normally fully funded by the site developer.

Development Strategy

Council will only consider constructing a significant new bridge if the project is subsidised by NZTA.

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 the NZTAs Monetised and Non-monetised Benefit and Cost Manuals. If prioritisation is required, it will normally be by ranking projects in terms of the NZTAs funding criteria.

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.

4.8.3 Crossings

Crossings are the vehicle or pedestrian access ways between the road edge and property boundary; pedestrian pram crossings are also included in this data set but are managed under pathways.

Overview

Vehicle crossings that provide access to private properties are installed to Council specifications by approved contractors when properties are developed or subdivided.

The cost of the crossing is borne by the property owner or developer and the completed crossing is vested to the Council. The exception to this is where the Council undertakes an urban street upgrade which includes new or replacement footpaths and vehicle crossings.

4.8.4 Drainage

The purpose of drainage assets is to contain and then convey surface water away from the carriageway keeping the road sub-surface dry to minimise water damage. Waterlogged pavements deteriorate rapidly so good drainage is necessary to minimise premature pavement failure and the associated maintenance costs.

Overview

Good drainage performance generally requires:

- **Catchment coverage** | In urban areas surface water channels should have kerb and channel and piped stormwater systems installed. Kerb and channel at the edge of the carriageway protects and defines the seal edge as well as collecting stormwater
- **Stormwater carrying capacity** | Capacity of the kerb and channel is not a problem as long as sufficient sumps and outlets are installed. This is one of the reasons low profile kerbs can be used as the standard profile unless a specific stormwater design requires the use of a standard high profile channel
- **Water tightness** | Channels need to be able to carry the water to the sumps and outlets. Old or damaged channels allow water to get into the subgrade, and over time cause failures to the adjacent pavement, these channels need to be repaired or replaced before serious pavement damage occurs
- **Conformity with current standards** | Deep channels cause safety problems in urban areas as they are not easily negotiated by pedestrians or mobility aided users (e.g., wheelchair users)

- **Ease of cleaning** | Channel covers used for crossings over deep kerb and dish channel can cause problems when cleaning as debris can be caught underneath the covers. Dish channel and non-standard channels also cause problems when cleaning with mechanical cleaners
- **Ease of crossing installation** | Non-standard profiles cause problems with crossings. The shape of the channel is often such that a cut down cannot be used, or standard sump-covers do not fit. As a result, special covers need to be made or standard covers are installed with the approaches modified to allow their use, in both these cases costs increase.

In urban areas drainage assets are generally constructed of concrete and convey surface water to reticulated storm water systems. Surface water channels, catchpits, culverts and sump leads are deemed roading assets up to the point where the flow of water joins the reticulated storm water system.

In rural areas drainage assets are designed to convey water to the nearest natural or formed water course via roadside drains and culverts where it is necessary to direct water under the road or driveway entrances.

Horizons One Plan | Stormwater Discharge

With respect to the management of stormwater runoff from the roading activity, the Horizons One Plan defines the activity to be in accordance with the discharge of stormwater into surface water pursuant to s15(1) RMA or onto or into land pursuant to ss15(1) or 15(2A) RMA, and any ancillary takes or diversions of stormwater pursuant to s14(2) RMA forming part of the stormwater system. All activities are monitored to ensure that no new, or existing discharge activities are adversely affecting, or causing affect to the quality of the receiving environment.

Distinction between Roading and Utilities

Urban

Council has made a clear distinction between the stormwater collection, treatment and disposal requirements of the Utility Networks and Transportation Networks assets in urban areas.

Roading drainage assets

These are the initial carriageway collection facilities within road reserve associated with catering for drainage from the carriageway that deliver the stormwater to a point of mains reticulation, treatment and/or disposal, they can also carry stormwater from roofs in some urban areas. These assets include:

- Kerb and channel*
- Surface Water Channels (mostly rural drains)*
- Culverts*
- Catchpits (sumps)*
- Bubble up sumps*
- Piped connections between the above

*NOTE: Assets marked * are currently recorded in AWM and are considered to be roading assets.*

Utility stormwater assets

These are the reticulation, treatment and disposal facilities both inside and outside road reserves and include:

- House lot laterals (reticulation)
- Manholes (reticulation)
- Main disposal pipe work (reticulation)
- Formed swales or drains (treatment)
- Soak holes (disposal)
- Interceptors (treatment)
- Wetlands, retention ponds (treatment)
- Discharge from wetlands, retention ponds etc. (disposal)

Most facilities located beyond the boundary of the legal road reserve in urban areas are assumed either to be Utility stormwater assets or owned privately, for example systems within private rights of way. However, compliant discharges from these systems are accepted into road drainage collection systems.

Rural

In rural areas carriageway drainage is purely a transportation/roading responsibility as there is little threat to subsurface water quality from any carriageway runoff due to the inherent treatment systems that occur with the side swales and open drains that are commonly present. The exception is any rural or rural-residential subdivisions where a specifically consented stormwater system occupies legal road reserve.

Operations and Maintenance Plan

NZTA Work Category

Drainage Maintenance and Renewal activities are funded under NZTA Work Categories 113: Drainage maintenance and 213: Drainage renewals.

Service Delivery and Rationale

Routine Works include:

- Cleaning of culverts, including inlets and outlets, slot drains, subsoil drains, shoulder cut-outs (or placing as required), flumes, sock drains, and roadside drains other than water channels
- Cleaning of minor blockages in water channels that can be accomplished (in the opinion of the Engineer) with hand tools
- Cleaning of vehicular access culverts
- Cleaning of grates and sump tops
- Cleaning of sumps, manholes, cesspits, and catchpitssoakpits
- Cleaning/replacement of culvert markers including placement of the relevant culvert number

The following sections discuss Culverts, Catchpits, Kerb and Channel, and Surface Water Channels which are sub asset groups of the drainage asset base.

Drainage | Culverts

The purpose of culverts is to convey natural watercourses or stormwater across the road without adversely affecting the pavement or surface of the road or disrupting its use. They are distinguished from bridges by having formed bases in place of the stream bed (water flowing under bridges flows in a natural bed).

Overview

Culverts have a waterway area less than or equal to 3.4m^2 or 2.08m diameter. Culverts larger than this are classified as bridges and are often referred to ‘major culverts’.

Culverts are generally long-life assets that show little sign of deterioration until failure if they have been correctly installed. The exceptions can be:

- Armco (galvanised steel) culverts carrying peaty or swampy water, which is often quite acidic. In these circumstances, the acidity attacks the galvanising and removes it over a decade or so, leaving an unprotected steel surface thus shortening the culvert's life
- Older butt jointed concrete culverts that do not have the modern spigot and socket rubber-ring sealing system between the pipes. Butt jointed pipes can allow water to escape, eroding the surrounding pavement formation, which can, in turn, create subsidence of the carriageway or can contribute significant land slope failures causing sections of road to drop out on hillsides

Service Delivery and Rationale

Operations and Maintenance Plan

Culvert maintenance is the work necessary to keep the waterway clear of debris throughout the length of the culvert, its approach and discharge channels.

Council takes a proactive approach to culvert maintenance, through regular inspections and appropriate maintenance.

The requirement for culvert replacement and renewal is often identified from failure, creating the need for reactive maintenance.

Maintenance Inspections

The contractor is required to inspect all culverts as required to maintain the agreed Level of Service noted above. The inspections identify when maintenance cleaning is required and also replacement from failure which causes blockages that are identified when the culverts cannot deliver the Level of Service. Occasionally the Engineer may direct a culvert replacement as part of an upgrade of a stormwater drain or water race system.

The maintenance contractor is required to confirm culvert details in the asset register and update the location and condition rating data held. This information is to be used to create an inspection programme for high-risk culverts and to provide the structure for future condition ratings and inspections.

The results of the condition rating have provided a list of culverts that are in very poor condition and require programmed replacement and is detailed in the strategic case.

Culverts are cleaned where possible in conjunction with each inspection. Debris, including all litter, rubbish, detritus, flotsam and vegetation is removed from culverts so that normal water flow is maintained, and care is taken so that the culverts are not damaged during cleaning operations. Culvert inlet and outlet structures and the areas immediately adjacent to these are also cleaned.

Unplanned Maintenance: The road contractor is required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken as soon as possible after notification.

Planned Maintenance: Damaged and malfunctioning assets identified by Council staff, contractor reports or the public are programmed for repair according to the following criteria:

- Public safety
- Accelerated deterioration of the adjacent pavement is occurring, or is likely to occur
- Inconvenience occurring to road users, pedestrians and/or property owners
- Untidy appearance
- Optimisation of complementary work scheduling

Culverts that cross private entranceways, or side culverts, are the responsibility of the property owner, however, these are maintained at council discretion if blockage poses a threat to the carriageway.

Deferred Maintenance: The impact of deferred maintenance is accelerated deterioration of culverts, which can affect the structural integrity of the road pavements.

Blockages in culverts can create a build-up of water, which can flow over carriageways creating a safety hazard and potentially damaging the carriageway.

Maintenance Standards: Currently there are no specified maintenance standards for culvert maintenance outside the maintenance contract. Work is carried out in accordance with good work practice using materials and profiles that conform to the adjacent sections of channel but also comply with the relevant current standards and specifications.

Renewal/Replacement Plan

Culverts are renewed when they are unable to perform their functions safely and satisfactorily to the agreed Level of Service. This can occur through breakage, corrosion, blockage, change in run-off characteristics requiring a greater waterway capacity, and lack of length (often caused by end breakage over the years).

The need for replacement is determined by inspection and the monitoring of performance during periods of heavy rainfall.

As a subsurface asset, problems are often not apparent until these manifest themselves indirectly. For example, a breakage under the carriageway may result in localised settlement or slumping of the road surface. Usually when this occurs, it is evidence of a fault or defect that has been developing over some time. Problems are aggravated and failure rates increase when traffic loadings increase.

Asset Performance: Performance issues for culverts relate to:

- Pipe capacity
- Variable performance caused blockages
- Downstream channels being impeded by fences and debris build up beyond the road reserve
- The adequacy of supporting stormwater collection and disposal systems
- The types of pipes and jointing systems used
- Increasing heavy traffic volumes are contributing to early failures, e.g., dairy tankers in rural areas where older culverts may have been installed to a lower specification that would normally occur now

In addition, there can be safety issues around the lack of adequate barrel length restricting the flow of traffic by narrowing the carriageway.

Expected Lives: Drainage assets have default service lives of 80 years; this default value is applied for valuation purposes and does not

factor variables like differing standards of construction and operating conditions which dictate service life and often premature failures. For example, an older type of culvert installed under a carriageway with high volumes of heavy traffic movement would likely fail earlier than the same type of culvert installed where there is no heavy traffic.

The expected life calculation is reliant on an accurate construction date for each asset so its end of life can be assumed. Most Council culvert data lacks accurate construction dates so this assumption cannot be made with certainty. An arbitrary date is added to assets with no construction date for valuation purposes, but as this is added across the board, there is little confidence in the valuation data for these assets. An item is included in the improvement plan to construe construction dates from known information for other assets in similar locations.

Renewal Plans: Renewals are based on the results of the current and future condition rating inspections.

Failed culverts will be replaced as needed and with adjustments to the budget made at the time. Expenditure forecasts prepared subsequent to such renewals will consider their effects.

Asset Improvement and Development Plan: New culverts required by developments are included in their pavements. These may be required to connect between sumps and stormwater treatment facilities. However, there is a difference between what is defined as a roading asset and that defined as utility stormwater asset.

The need for other new culverts generally arises from the need to improve or resolve identified drainage issues or as part of street upgrade and area wide pavement rehabilitation projects.

There is no formally identified need for new culverts that might be required to maintain the current Levels of Service.

Drainage | Sumps and catchpits

Sumps and catchpits are used to remove stormwater from kerb and channel or other surface water channels when there is no suitable open watercourse available.

Overview

Sumps by definition connect to a pipe and usually contain a silt trap. Sumps are also referred to as ‘catchpits’ as a generalised description. Where there are no reticulated stormwater systems or natural flow paths stormwater is sometimes disposed of through soak holes. In urban areas ‘bubble up’ sumps may be used to transfer water from a private property to the kerb and channel if there is no reticulated storm water system available, these systems use water pressure to force the storm water up through the sump to the kerb and channel.

The operation and maintenance of soak holes in urban areas is now seen as part of the Utility Stormwater asset because of the specific operational and maintenance requirements to maintain water quality standards. In rural areas, carriageway drainage is purely a roading responsibility as there is little threat to subsurface water quality from any carriageway runoff, due to the inherent treatment systems that occur with the side swales and open drains that are commonly present.

The design of urban sumps has changed in recent times, to improve the trapping of sediments and contaminants. This has required

the use of submerged outlets and other techniques before discharging to other treatment and disposal systems like swales, soakage basins and wetlands alongside the carriageway.

Service Delivery and Rationale

Operations and Maintenance Plan: Maintenance requirements are easily accommodated under the road maintenance contract and respective street cleaning operations; therefore it is sensible to have these retained and managed as roading assets.

Deferred Maintenance: The impact of deferred maintenance is the inability to carry the design flows with a corresponding decrease in Levels of Service with respect to stormwater control.

The maintenance contract is structured to ensure the Level of Service is maintained, there is currently no deferred maintenance.

Maintenance Costs: Street Cleaning activities are only partially funded under NZTA Work Category 113: Routine Drainage in the Council's Land Transport Programme. Only 30% of the total expenditure of street cleaning within 2m of the edge of carriageway is eligible for funding. The remaining 70% has to be fully funded by the Council. This is included in the financial forecasts.

Renewal/Replacement Plan

Occasionally the need for replacement is determined by inspection and the monitoring of drainage performance during periods of heavy rainfall, however, sumps are normally renewed when the kerb and channel they serve is renewed. Parts of the original sumps may be reused, e.g., the piped outlets, this is done on a case-by-case basis and generally for practical rather than cost reasons.

The primary reason for renewing sumps is usually a consequence of street upgrade projects. Sumps are unlikely to be replaced in their existing positions when kerb and channel are realigned, and it could be argued that - in this circumstance – use of an improvement works category is most appropriate. However, as the capability to receive stormwater is retained in the approximate location being renewed, it is more appropriate to consider this work renewal.

Asset Performance Data: There are no performance issues with sumps as long as they regularly cleaned. The greatest issue is build-up of leaf debris on their grates occurring in autumn. This can be a particular problem when strong winds and heavy rain coincide. This is a maintenance issue and is resolved through additional maintenance at the appropriate times.

More regular cleaning is also resulting from their increasing function to entrap sediments and contaminants as part of a consented stormwater treatment and disposal system in urban areas.

Expected Lives: As detailed above the replacement of sumps and catchpits is normally dependent on when the associated kerb and channel is renewed. The expected life of sumps and catchpits is aligned with kerb and channel and is set at 80 years.

The expected life calculation is reliant on an accurate construction date for each asset so its end of life can be assumed. Historical sump and catchpit data lacks accurate construction dates so this assumption cannot be made with certainty. An arbitrary date is added to assets with no construction date for valuation purposes, but as this is added across the board, there is little confidence in the valuation data for these assets. An item is included in the improvement plan to construe construction dates for kerb and channel assets, once this information is obtained

construction dates for the associated sumps and catchpits will also be added.

New Sumps

New sumps required to service new kerb and channel in new developments are included in the costs of those works. These initial costs are borne by the developer with ongoing maintenance costs becoming councils responsibility once the assets are vested to council.

Drainage | Kerb and channel

Kerb and channel is a specific type of surface water channel. Its purposes are to provide a path for stormwater runoff from the carriageway, footpaths, berms and adjacent properties, protecting the pavement from water ingress, and consequential structural deterioration, allow the convenient and safe movement of pedestrian and vehicular traffic, and enhance the convenient and safe movement of pedestrians and traffic by separating these two streams of road users.

Overview

Kerb and channels also have an important secondary purpose; the use of concrete kerb and channel, as opposed to earthen surface water channels (also referred to as swales) is a recognised and accepted sign of urban development. With the flat profile of the district's towns, ponding can occur if well-formed channels are not used. Apart from its functional role, kerb and channel also protects the carriageway seal edge from the higher exposure to traffic within the urban area. It is a requirement of the District Plan that all new urban subdivisions have formed kerb and channel. In some of the smaller and more rural orientated townships kerb and channel may be seen as unnecessary, or not be wanted by the residents.

Kerbing is also installed at some rural intersections, bends and corners in conjunction with other road improvement works, such as minor improvements at intersections, seal extensions and seal widening. Kerbing in these situations protects the edge of seal from edge break problems in these high-wear areas while also providing positive drainage of stormwater runoff. In addition, kerbs delineate corners of an intersection to a higher degree than a plain seal edge.

All new kerb and channel is either standard profile kerb and channel, or mountable kerb and channel and is generally slip formed in-situ. Mountable kerb and channel is used in the majority of situations, although it does not have the carrying capacity of standard kerb and channel, this is not considered to be a problem as suitability assessment is carried out during the design phase of construction.

Standard profile kerb and channel is used if there is a wish to match it with existing installations or if there is a requirement to have a higher stormwater capacity.

The mountable kerb and channel profile channel is less obtrusive than standard kerb and channel and allows normal residential vehicle access without the need to cut the kerb and install a dedicated vehicle crossing. It is the Council’s policy to provide kerb cut downs on the low profile kerb and channel in specific situations, such as crossing points for pedestrians, rights of way and commercial entranceways where there is a large amount of traffic, e.g., shopping malls and warehouses.

Kerb and dish channels are difficult for pedestrians, especially the elderly and mobility

impaired to cross, as it can trap cycles and car tyres, is difficult to clean, and are sources of ponding during heavy rain. Nevertheless, Council regards it as filling a function and its policy is to replace it only when condition dictates, or as part of a street upgrade project.

The key issues relating to kerb and channel are:

- Implementation of a kerb and channel extension strategy that identifies missing sections or sections that need to be provided
- Determination of the amount of deferred maintenance and renewals of kerbs and channels
- Provision of appropriate stormwater collection, treatment and discharge facilities where necessary
- Compliance with Resource Consent conditions, imposed when maintaining, renewing and providing stormwater facilities
- Resource Consent conditions imposed on developers that will become the Council's responsibility when the assets themselves are vested in the Council by the developers and any resource consents transferred to it
- Asset data integrity (e.g., lack of accurate construction dates)

Service Delivery and Rationale

Operations and Maintenance Plan

Clean, hard-surfaced channels carry stormwater more efficiently. Kerb and channel cleaning is therefore an important activity and is not just done for aesthetic reasons i.e., to make the channels look tidier. This work is carried out as part of the overall roading maintenance contract, which specifies the frequency and standard of cleaning.

There are periodic maintenance requirements that are not extensive enough to be classed as renewals, in particular, it is often necessary to repair stormwater outlets and occasionally to repair short lengths of broken or failed kerb and channel. These works are identified by the contractor, condition rating inspections, Council staff, or from ratepayer concerns or complaints. The work is carried out under the Road Maintenance Contract.

Condition Inspections: The Council's staff and the road maintenance contractor report any defects observed in day-to-day road maintenance activity. There is currently a lack of condition data available in the AWM database. An item is included in the improvement plan to construe condition data for kerb and channel assets.

Unplanned Maintenance: The road contractor is required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken as soon as possible after notification.

Planned Maintenance: Damaged and malfunctioning assets identified by Council staff, contractor reports or ratepayers are programmed for repair according to the following criteria:

- Public safety
- Accelerated deterioration of the adjacent pavement is occurring, or is likely to occur
- Inconvenience occurring to road users, pedestrians and/or property owners
- Untidy appearance
- Optimisation of complementary work scheduling

Deferred Maintenance: The impact of deferred maintenance is an accelerated deterioration of kerbs, channels and pavements with a corresponding low Level of Service with respect to appearance and stormwater control. They also become difficult to clean and can attribute to pavement deterioration.

Maintenance Forecast: The forecast cost of maintaining kerb and channel is largely derived from past experience.

Renewal/Replacement Plan

Replacing isolated sections of kerb and channel can be impractical, as it is likely also require the partial reinstatement of the adjoining footpath and pavements, and it is therefore best performed as part of an integrated programme. Kerb and channel renewals therefore usually take place in conjunction with the upgrading or reconstruction of the adjacent pavement sections, footpaths and berms, usually as part of street upgrade projects.

Strategy and Funding Mechanism: An appropriate renewal programme will be funded as maintenance costs will increase if renewals are deferred. Maintenance costs will also increase in proportion to the increase in kerb and channel length.

Renewal Strategies: Street upgrade projects are usually seen as township projects, and as such become part of the identification and prioritisation processes that the Council engages in with Township Committees when it prepares its forward programmes. However, there are usually good engineering reasons supporting such programmes, often related to the state of the kerb and channel, and that can be significant contributors to the prioritisation process.

Renewal Standards: While much of the old channel is located at 3 metres from the road boundary, its replacement is optimised to meet current engineering and planning standards. This can require the width of the adjoining carriageway to be reduced from its original 14m or so to 11m or less, in accordance with the road's hierarchy and the corresponding standards.

Older streets also often have an area of metal or grassed shoulder between the edge of the formed carriageway and the old channel. In these circumstances the replacement kerb and channel is likely to be positioned at the immediate edge of the carriageway and a new berm and footpath created behind it. This has lower through life costs and is also more practical and aesthetically pleasing.

Replacement kerb and channel is installed to the same standards as new, using appropriate engineering standards and the same cross sectional profiles.

Renewal Programme: To establish a renewal programme there is a need to undertake specific inspections of the worst channels. The economics of renewing these lengths should then be reviewed and the renewals programmed appropriately. Renewal of kerb and channel is justified when more than 30% of the length of the channel is broken or damaged beyond practical, repair or there is extensive damage to the adjacent carriageway.

There is also a need to validate existing construction date data to enable renewal forecasting. Under the current NZTA criteria, renewals can only generally be considered for funding if the condition of the kerb and channel is contributing to the deterioration of the adjoining pavement formations and the work will reduce future maintenance costs. On these

bases there currently are few renewals that can be justified for funding.

A renewal programme is to be developed as described above and will be deliverable once items relating to asset data are addressed in the improvement plan.

Renewal Plans: Current condition rating data shows that 510m of kerb and channel is due for replacement as it is in very poor condition. As this length is represented as a percentage of broken channel per length surveyed the actual length that is replaced may vary due to site specific requirements. For example, if it is more sensible to replace an adjoining length in poor condition or to extend the replaced length for growth or aesthetic reasons.

Asset Condition: The extent of deterioration of kerb and channel depends on age, method of construction, the quality of materials and location (damage can be caused by heavy traffic driving over kerb, tree roots etc). The main factor causing deterioration is age, with the bottom of the channel failing (in particular in the older dish channels), allowing water to soak into the subgrade and the adjacent basecourse of the pavement.

Expected Condition: To forecast expected condition accurate construction dates are required, as this information is not currently available these forecasts cannot be made.

Asset Performance: For kerb and channel assets, this relates to:

- The profile of the channel; older dish channels have more capacity but are more prone to disintegration and blockage
- Variable performance caused by different and substandard vehicle crossings on older styles, e.g., blockages and breakages
- The integrity of the channel, which is dependent on standard and quality of construction. Older types are more likely to be substandard
- The effects of impact damage associated with vehicles at entranceways, and heavy vehicles elsewhere
- Poor gradient or other alignment problems
- Blockages from debris build up
- The adequacy of supporting stormwater collection and disposal systems, e.g., sumps and pipe reticulation

A more proactive approach to identifying and replacing sections of substandard kerb and channel is needed. Substandard sections need to be accessed for repair or reconstruction, together with pathway works, to complement adjoining work. Kerb and channel condition and pathway condition are major factors in the consideration of street upgrade projects. Renewal of both of these assets is considered complementary work, and there are practical and economic advantages in renewing both at the same time and in conjunction with street upgrading works whenever it is reasonable to do so.

Expected Lives: When new kerb and channel is constructed, the associated AWM record is assigned a default service life of 80 years.

Older assets do not have accurate construction dates so forecast based on age is not possible. An item has been added to the improvement plan

to estimate construction dates for older assets based on other known construction dates for assets in the same area.

New Kerb and Channel

New sections of kerb and channel are acquired when:

- New sections of kerb and channel are constructed in townships by the Council where there was no kerb and channel previously (kerb and channel extension)
- New kerb and channel constructed by the Council as part of rural intersection improvements (quadrant kerbing)
- New kerb and channel is vested in the Council after it has been constructed in new subdivisions by private developers

Development Strategy: Criteria used for justifying new kerb and channel include:

- Evidence of ponding/flooding
- Incompatibility with agreed urban standards
- High cost of maintaining existing stormwater control
- The need for carriageway edge definition and/or separation of footpath/pedestrian areas from a carriageway

Priorities are allocated following evaluation of pedestrian usage, safety issues, stormwater control needs and the number of residential properties to be served. However, Township Committees play a significant role in determining relative priorities when township improvement projects are considered.

Kerb and channel extension can be combined with new path extensions, and associated berm improvements, to provide an integrated and comprehensive upgrade to a section of berm. This type of work mostly comes about where roading upgrade contributions have been applied on consented subdivision developments.

Development Programme: The timing of new subdivisions, and the amount of kerb and channel that is constructed in them, is dictated by respective private property developers and is strongly influenced by market forces. This work is not funded by Council unless a roading upgrade contribution has been sought as part of a consented subdivision or a Council activity or project eventuates from the consent.

Apart from those works associated with street upgrades, other opportunities to provide new kerb and channel include improvements to the carriageway such as seal widening in urban areas, area wide pavement rehabilitation projects and as part of subdivision commitments.

Deep and shallow surface water channels

The primary purpose of all surface water channels is to provide a path for stormwater runoff from the carriageway, footpaths, berms, and sometimes the adjacent properties, to protect the pavement from water ingress, and consequent structural deterioration, and to allow the convenient and safe movement of pedestrian and vehicular traffic.

Overview

Deep and shallow channels are generally unlined except in very exceptional circumstances where there is a requirement to prevent sub-surface water infiltration/ exfiltration or erosion of the channel.

The Council's AWM database records information on shallow and deep surface water channels.

Shallow surface water channels are shallow trafficable depressions formed with the invert 2.0m to 3.0m from the carriageway edge and 150mm to 300mm below the edge of the carriageway. Their sides are tapered back to the existing berm with a target slope of around 1:10. These types of channels are referred to as swales.

Deep surface water channels are often referred to as drains. Both types of surface water channel are predominately found in rural areas with the use of swales and drains being common in the outlying urban settlements.

Land drains are part of a wider public drainage network. Their primary function is to drain private land and to convey drainage water and stormwater to receiving water bodies. The proportion of stormwater originating from roads and ending up in land drains is very low.

Operations and Maintenance Plan

Maintaining surface water channels is an important part of rural road maintenance, poor surface water drainage can contribute to premature pavement failure and ponding of excess water can cause safety hazards.

Condition Inspections: The Council's engineering staff and the road maintenance contractor report any defects observed in day-to-day road maintenance activity. This includes whether high shoulders are present, which provides a good indication of the current effectiveness of the corresponding surface drainage systems.

Unplanned Maintenance: The road contractor is required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken as soon as possible after notification.

Planned Maintenance: Damaged and malfunctioning assets identified by MDC staff, contractor reports or the public are programmed for repair according to the following criteria:

- Public safety
- Accelerated deterioration of the adjacent pavement is occurring, or is likely to occur
- Inconvenience occurring to road users, pedestrians and/or property owners
- Untidy appearance
- Optimisation of complementary work scheduling

Shallow SWC | Swales

To address the performance issues, high shoulders on the carriageway sides of swales are periodically removed. This is done on a cyclic basis in conjunction with pre-reseal repairs on sealed roads and remetalling, grading and other pavement renewal works on unsealed roads. The swales themselves may also be reformed and improved as part of this work.

Currently high shoulder removal work and swale reformation is classified as maintenance. However, because of its longer-term cyclic nature it can also be considered a renewal.

Deep SWC | Drains

Adequate maintenance will keep these channels functioning indefinitely. They are cleaned by mechanical excavation when the build-up of detritus is sufficient to impair their performance. Some drains are also sprayed to control vegetation, especially woody type weeds.

Cut-Outs

Cut outs are channels cut through sections of high shoulder to allow water to drain off the carriageway. These are in place on sections of road that require shoulder removal but have not yet had the work approved but are usually on unsealed roads. The cut outs should be shaped so that vehicles are able to drive through them if necessary. This is usually done by the grader while maintenance grading in the area.

Operational and Maintenance Processes

Maintenance Forecast: The maintenance of unlined surface water channels is budgeted under NZTA Work Category 113: Routine Drainage Maintenance in the Council's Land Transport Programme.

Deferred Maintenance: The impact of deferred maintenance is accelerated deterioration of unlined surface water channels and the adjacent pavements, with a corresponding lower Level of Service with respect to ride and stormwater control. It can also be a safety issue if water is sufficiently widespread and deep to cause vehicles to aquaplane and lose control.

Condition, Performance and Capacity

Shallow SWC | Swales

Swales generally maintain their shape reasonably well. However, there is a gradual deterioration over time because of the build-up of vegetation, soil, and sometimes road metal, along the edge of the carriageway. This occurs on both rural sealed and unsealed roads but is more rapid on the latter where it is exacerbated by normal maintenance grading.

The effect of grading is to build up the edge of the berm, which then retains a proportion of the stormwater on the road surface for longer than would otherwise occur. This allows a greater opportunity for water to seep into the pavements' structural layers, and on metal roads it combines with passing traffic to develop large potholes rapidly.

Vegetation in the invert of the swale has little direct effect on a channel's performance. As long as the channel is not clogged, vegetation has a positive effect as it can filter out contaminants and improve water quality before it goes sub surface either naturally or via soak holes.

Deep SWC | Drains

Deep drains within the road reserve can serve one of the following functions. They can be:

- **Road drains** | built to carry large volumes of water running off the road or to protect the road from high ground-water levels
- **Land drains** | draining adjacent land but not serving any additional road function
- **Shared drains** | as the name implies the benefits are shared between the property owner and the road. Maintenance is a matter of negotiation

Drains generally deteriorate slowly. The major issue they face is slow accumulation of sediment as material is precipitated from stormwater and loss of capacity through growth of vegetation. Both of these problems are controlled by routine maintenance.

Asset Performance Data: Performance issues for swales and similar earthen surface water channel assets relate to:

- The effects of impact damage associated with vehicles at entranceways
- Substandard culverts, built with or without the proper authority from the Council
- Blockages from debris build up
- The adequacy of the receiving stormwater collection and disposal systems, e.g., soak holes, culverts, drains and streams

Renewals Plans

There is currently no renewal plan for swales and drains as this has been considered as a maintenance activity.

New Unlined SWC

There is little requirement for new road drains (deep SWCs) given the maturity of our network. New swales are formed if the adjacent section of rural carriageway:

- Is showing deterioration from ingress of water to the pavement structure
- Is subject to ponding caused by the inability of stormwater to flow off the surface onto the adjacent berm
- Is scoured by stormwater
- Has high shoulders removed

Otherwise, they are provided as part of cyclic maintenance work in advance of reseals and unsealed road remetalling and pavement during renewal work.

Development Strategy

Priorities are allocated following consideration of costs, effects on pavement life, other programmed works, safety issues, and stormwater control needs. Because the work is so intimately bound with other maintenance activities, it has traditionally been regarded as a maintenance activity.

Development Standards: The location of new swales in the carriageway cross section is determined largely by the road's hierarchy and the associated width standards.

The procedure employed where the existing roadside is maintained to a high standard by the adjacent property owner, is to reinstate the trimmed area to a condition that allows it to be mown to the previous standard once vegetation re-establishes. Rural roadsides are not re-sown with grass after high shoulder removal. However, the removal of high shoulders and the formation of any swales in these situations still needs to accomplish a continuous well-draining profile to ensure good drainage along the whole section of the road.

Roadside berms, when disturbed by roading activities are generally left in a condition that allows mowing with a tractor mounted mower.

Development Programme: The timing of new rural subdivisions, and thus the swales they contain, is under control of the respective property developers and is strongly influenced by market forces. This work is not funded by the Council and is not programmed in this, or any other Council plan.

4.8.6 Features

Features are generally structures which have been installed in the road reserve to enhance the aesthetic appeal of the area

Overview

An example of a feature are stone features installed by developers at the entrance to subdivisions. Once the subdivisions are vested to Council, ownership these assets fall under its control, and they form part of the transportation asset base.

There is little requirement for ongoing management of features assets. The following table summarises the information held for Features:

Feature	Total Features
Fence - Hardwood and Wrought Iron	2
Stone Wall Feature at Entrance - Large	5
Stone Wall Feature at Entrance - Small	4
Tree Planter (CBD)	4

4.8.7 Pathways

Pathways are provided for pedestrians, cyclists, and other non-vehicluar road users to connect to society and access local facilities

Overview

The majority of paths are constructed of concrete. Other materials include asphalt, paving stones, chipseal and metal.

Service Delivery and Rationale

The maintenance contract includes all path maintenance work including safety repairs or other minor ordered repairs as required. Ordered work includes:

- Pothole repair
- Replacing footpath battens
- Grass edge trimming
- Weed control
- Cleaning (removal of moss/lichen)
- Repair of surface defects prior to footpath resurfacing
- Filling depressions and slumps, and the reinstatement of utility trenches

Fault information is gathered for each section of footpath with the number of faults recorded in the AWM database, using the following:

- Settlement
- Bumps
- Depressions
- Crack
- Scabbing
- Pothole

NZTA Work Category

Footpaths are managed under NZTA Work Categories 124: Cycle path maintenance, 125: Footpath maintenance, 224: Cycle path renewals, and 225: Footpath renewals.

Maintenance Strategy

Maintenance needs are mainly identified during contractor and MDC staff inspections. Other sources are also used, such as AWM rating surveys, public and community committee requests.

The consequences of inadequate maintenance are:

- Reduced safety
- Accelerated footpath deterioration and additional consequential costs; and/ or
- Lower Level of Service (ease of use, appearance)

Path maintenance is prioritised using the following criteria:

- Available budget
- Optimisation of complementary work scheduling
- Safety of users
- State of surface affects ease of use e.g., rough surface, potholes
- Likelihood that the area of distress may expand and require more expensive intervention
- Aesthetics (e.g., minor water ponding/untidy appearance)

Maintenance Plans

Once faults are identified they are included in work programmes. The amount of work carried out on path maintenance is based on physical need and the Council's approved budgets. The quantity of work carried out is based on prioritising the worse sections and working within the available annual budgets.

Renewal/Replacement Plan

Renewals are carried out to:

- Return paths to their original condition
- Provide for safe passage and ease of use for use, as appropriate to the facility
- Provide a surface that requires minimal lifecycle maintenance.

Renewal is required when a path has deteriorated to the extent that:

- The required Level of Service is not being delivered
- Continued maintenance is not economical

Justification of renewal work is also influenced by:

- The condition of the kerb and channel adjoining the path - Replacement of substandard kerb and channel will also require the reinstatement of the path, generally to an extent consistent with full reconstruction
- The advantages of co-ordinating with other nearby works, such as street upgrading, urban road reconstruction or renewal of other utility services

The types of renewal work undertaken to renew these facilities include resurfacing, where the existing formation is sound, to provide a smooth, waterproof, surface by:

- Overlaying with asphaltic concrete on existing surface
- Resealing with bitumen and chip or slurry on existing chip seal
- Resurfacing with asphaltic concrete on existing chip seal
- Removing the existing surface and laying new surface over existing Base-course
- Reconstructing substandard sections of path, where the existing formation is unsound, by replacing any timber battens, Base-course and surfacing

Work needs are identified following identification of work. Priorities are based on:

- Level of Service deficiencies/path performance, including safety issues – differential settlement, cracks, potholes etc
- Physical condition
- Coordination with other works, such as kerb and channel replacement, installation of underground wiring by utility companies, underground utility renewal, and street upgrading
- Likelihood of accelerated deterioration

Asset Condition: The extent of deterioration of paths depend on age, method of construction, the quality of materials and location (damage can be caused by heavy traffic driving over paths, tree roots etc). The main factor causing deterioration is age, with the path exhibiting failure through cracking and displacement.

Physical inspections of footpaths are undertaken at regular intervals and a rating system is used to quantify defects. Each footpath is given a condition rating from 'Excellent' to 'Very Poor'.

Defects found during the most recent rating survey summarise the length of defects found totaling 4km; approximately 2.5% of all path assets. Overall, 97% of paths are assessed as average or better condition.

Asset Capacity: Expansion of the path network requires a deeper understanding of user movement, according to how the towns are changing, and how people are using retail areas, businesses and community services.

As the extent of the asset increases and other influences change with time, it is likely that it will be necessary to revise the current approach to prioritising this work. In particular, a combination of the present system inspections and the use of rating data collected for AWM on footpaths is more likely to indicate the expected condition of footpaths. It will provide a better indication of the need to increase expenditure on maintenance and renewals.

Renewal Standards: Renewal works comply with the standards for new works as detailed in Council's standard specification for path construction.

Generally, sections of footpath are renewed on a like-for-like basis; however consideration is given to change the type of material used if the change will better suit the site.

Renewal Programme: The required level of renewal varies depending on the:

- Levels of Service provided by the paths
- Condition profile
- Age profile
- Proximity of trees
- Level of ongoing maintenance required
- Economic lives of the materials used
- Effects of underground wiring

Renewal Forecast: To enable long-term renewal forecasting an accurate construction date is required. This information has been incomplete in the past; to address this, Council has conducted an assessment of its assets and determined actual (or likely) time of construction. These findings have been implemented into Council's AWM database and now provides a baseline for an initial renewal forecast. This data now needs to be aligned with condition (past and current) to confirm expected useful lives of Council's varying footpath types.

Asset improvement and Development Plan

Council's Walking & Cycling Strategy is the most significant driver of new footpath and cycleway improvement projects.

In general, other new paths are acquired through:

- New paths being constructed by Council where no path previously existed
- New footpaths vested to council in new subdivisions

Development Strategy: The footpath and cycleway development strategy is to:

- Carry out the projects required to implement the Walking & Cycling Strategy
- Develop other new footpaths where there is a clear community need and strong community support for them
- Provide footpaths and cycleway linkages that have been identified through Council initiatives, such as township structure plans, neighbourhood accessibility plans and new urban subdivisions
- Promote and encourage third party initiatives to establish formed walking and cycling pathways for both commuter and recreational purposes
- Ensure opportunities are taken to establish walking and cycling facilities when upgrading existing or planning new roading infrastructure projects

The criteria used for advancing and prioritising footpath and cycleway development projects are:

- Achievement of Council's Walking & Cycling Strategy's goals and objectives
- Pedestrian and cyclist safety
- The locality, proximity and suitability of alternative paths
- The vehicle operating speed on adjacent carriageways
- Providing and enhancing connectivity e.g., between new urban subdivisions
- Township and Community Board committee priorities (within their jurisdictions only)
- The ability to coordinate with other works to provide a package of complementary works to meet demand e.g., roads, walking, cycling, public transport etc
- Promotion of sustainable transport options

Development Programme: The timing of new subdivisions, and thus the paths they contain, is under control of the respective property developers and is strongly influenced by market forces. This work is not funded by the Council and is not programmed in this, or any other, Council plan. Where possible, funding for projects will be sought through the NZTA subsidised Work Categories 451 and 452, Pedestrian Facilities and Cycle (Shared Path) Facilities respectively.

The funding eligibility criteria generally excludes projects that are purely for recreational purposes, and those that have no other benefits such as the promotion of sustainable transport options. As another of the criteria for eligibility, projects should achieve an economic benefit cost ratio of 1 or above.

Management Programme Maintenance Standards: Technical and materials standards are generally those specified for on-carriageway works. However, care is required to avoid making new tripping hazards, to avoid creating nuisances caused by 'wet tar' that can track into shops and homes, and avoidance of loose chip on paths with smooth surfaces such as concrete or asphaltic concrete.

Deferred Maintenance: There is no intentionally deferred maintenance; once the improvement task of better utilising condition rating data is achieved, maintenance may be deferred based on priority and available budget.

4.8.8 Islands

Traffic Islands are painted areas or raised concrete delineation devices, generally at intersections or in the centre of wide carriageways.

Overview

Islands can be painted directly onto the road surface or can be constructed of entirely of concrete, concrete edged pavers or concrete edged landscaped areas.

If the island uses painted road markings only, without raised kerbs or other physical obstructions, it is called a painted island. When traffic islands are painted for longer lengths, they are referred to as traffic medians, shown as a strip in the middle of a road acting as a divider between lanes over a much longer distance. When making a right turn out of a junction, drivers will often drive into painted median refuge and wait for space before entering traffic, as a way of crossing one lane of traffic at a time. Some traffic islands may also serve as refuge islands for pedestrians wishing to cross a road or State Highway.

Painted Islands are managed and recorded along with other Painted Road Markings.

Areas of grass and gardens inside some Islands are maintained by the Council's Parks and Property contractor.

Service Delivery and Rationale

Islands have reflective white painted surfaces on the borders; for safety considerations these surfaces need to be repainted on a regular basis so are included in the annual Pavement Marking Contract which encompasses all Pavement Markings throughout the district.

The condition of traffic islands are assessed during routine inspections undertaken by the Contractor, with the results reported to Council. There is no formal condition rating system for this asset; condition is assessed both visually, and in accordance with the appropriate key performance indicators.

NZTA Work Category

Islands are included in the Network services group and are managed under NZTA Work Categories 122: Network service maintenance and 222: traffic services renewals.

4.8.9 Markings

Painted pavement markings are provided throughout the district to identify road features, hazards, and to provide general information to road users.

Overview

Marking assets comprise:

- Road centrelines, lane lines, no overtaking lines, and no stopping lines
- Edge lines and shoulder markings
- Median markings, cycle lanes, parking areas, and bus stops
- Traffic Islands, intersection markings
- Messages, symbols, and direction aids
- Pedestrian crossings
- Fire hydrants
- Raised reflective pavement markers (RRPM)
- Audio Tactile Pavement (ATP) Markings

Roadmarking data is held in the AWM database. Where amendments, removals, or additions are made, the changes are recorded by the contractor in spreadsheet form, rather than directly through AWM. Council staff periodically update the database from the spreadsheet, so detail of any changes are captured.

Service Delivery and Rationale

Painted pavement markings are re-marked annually with this task being treated as a renewal item. The use of a separate contract reflects this asset's more specialised needs in terms of plant, materials and required operator skills.

The key issues relating to markings are:

- The quality of road marking materials and application
- Establishing relevant customer Levels of Service for road markings
- Establishing economic and meaningful performance measures for signs and markings
- Problems with markings adhering to fouled surfaces
- Maintaining road markings in areas of high wear
- Providing a consistent appropriate standard of road marking on all roads in the district, relative to their hierarchy and use

NZTA Work Category

Islands are included in the Network service group and are managed under NZTA Work Categories 122: Network service maintenance and 222: Traffic services renewals.

Strategy

Maintenance needs are identified through inspections of the roading network by the contractor and Council staff. Maintenance activities are also carried out as a result of other pavement maintenance operations (e.g., roadmarking following surface patching after a pavement repair).

Operational and Maintenance Processes

The majority of this work is carried out under a separate renewals contract. However, other contracts may specify whether the relevant contractor is responsible to reinstate any required pavement marking.

Renewal/Replacement Plans

Repainting of all marking is carried out on a cyclic basis over a 12 month period using the NZTA P/12 method based specification. This work is treated as renewals with the asset having a 12 month effective life.

The standard of roadmarking in the performance specification is based on five criteria:

- Colour (daytime and night-time)
- Daytime Visibility
- Night-time Visibility (dry and wet)
- Skid Resistance
- Durability

The measurement of each of these criteria is set out in the specification, along with the values to be achieved. The contractor is required to carry out regular inspections and measurements to ensure that the roadmarking meets the standard set in the specification. If it does not meet the standard, then the marking is repainted.

4.8.10 Railings

Railings and barriers provide visual cues to the road user and/or help prevent serious injury (or worse) in the event of a vehicle losing control and departing the road.

Overview

Sightrails

A sightrail is one or more timber boards, secured by posts driven into the ground and positioned approximately 500mm – 1,000mm above the ground. They are most common along the edge of a carriageway bend or to indicate thepresence of a deep drain or stock underpass.

They act as a visual aid to road users, defining the edge of carriageway around an approaching bend or a section of road with limited shoulder width. As with roadmarking, sightrails are also painted white.

Unlike barrier systems, sightrails have no real structural ability, and the posts will only provide a minimum amount of restraint under a vehicle collision.

Sightrails are routinely inspected to ensure cleanliness, clarity and to note damage. Sightrails are routinely painted by the contractor and reported accordingly. Occasionally, repair work may be required due to a road traffic collision which may include replacement of timber boards or posts.

Barrier systems

Barriers, also known as guardrails, are most commonly lightweight steel systems built along the edge of a carriageway to act as a vehicle restraint. They are generally selected for construction in areas with a greater risk of an incident occurring, such as a bend with a significant speed reduction or steep drop.

If a vehicle travelling around the bend loses control for any reason, crosses the edge of carriageway and strikes the barrier, the steel will deflect, and the vehicle impact energy is dissipated. As a result, the vehicle will be pushed back towards the road, which greatly reduces occupant risk. The lightweight posts used are designed to provide a forgiving impact and minimise vehicle damage where possible. Barrier installations have differing types of end terminal systems which are designed to minimise damage and subsequent injury from impact with the start or end of the barrier. Some terminal systems are designed to collapse on impact while others are designed to deflect the vehicle.

Service Delivery and Rationale

The routine maintenance involved with barrier systems is minimal for the contractor; however, renewal work can be very time consuming and expensive. The barrier sections are designed to act as a single system, therefore damage to one section can mean several sections need to be replaced in order for the barrier to function correctly.

NZTA Work Category

Railings are included in the Network services group and are managed under NZTA Work Categories 122: Network services maintenance and 222: Traffic services renewals.

4.8.11 Retaining walls

Retaining walls provide structural support and lateral restraint to the carriageway and/or to the land adjacent/above the carriageway, preventing material slipping down and blocking the drainage channel or road.

Overview

If the land directly above a road carriageway collapses due to bad weather or a serious weather event, the slip material is cleared away and the adjacent bank reshaped at an appropriate gradient to prevent further collapse. This is known as a road retreat. In certain circumstances, such as a confined road width on a hillside, a retreat is not possible, and a retaining wall may be constructed to either prevent material from further collapse or support the road from collapsing to a lower level. This is more common in the northern parts of the district where the terrain is often unstable and susceptible to land slips.

Emergency response and reinstatement work such as this is normally managed separately as it qualifies for a higher subsidy rate than general maintenance. Most retaining wall installations form part of an emergency reinstatement programme created after a serious weather event.

Construction of a new retaining wall follows the following process:

- **Identification of the site** | normally from inspection by council staff or the maintenance contractor
- **Design** | this usually involves appointment of a structural engineer and sometimes geo technical reports on land stability
- **Compliance** | resource consent applications are lodged if required
- **Tender** | following a weather event where multiple walls are required, council will release tenders for individual sites or bundled work as is seen fit at the time. Contracts for individual or smaller value walls may be given to preferred contractors by direct appointment
- **Construction** | contractors are supervised by MDC staff during the construction phase

Council holds some data for retaining walls in AWM. Differing methods of design and construction are adopted for new retaining walls depending on the requirements for the site.

Information held for retaining walls dates back to 1990; there are retaining walls that were installed before this time, but Council does not hold any data for these assets. Existing retaining walls, constructed before accurate activity management was adopted, become increasingly difficult to identify and maintain due to vegetation growth and further minor land slippage.

MDC plans to validate our existing data and, as part of this process, some older retaining walls may be discovered. However, due to the difficulties in locating old sites this is not a specific task identified in the improvement plan.

Key issues relating to retaining walls are:

- **Carriageway drainage** | poor drainage is a major factor in destabilisation of the land supporting the carriageway, or the land above the carriageway
- **Emergency response** | generally when a severe weather event occurs there are many sites where new retaining walls are required, this involves a coordinated approach for emergency and long-term reinstatement
- **Construction time** | new walls need to be designed by structural engineers and the time between the need arising and a new wall being completed can be lengthy. Temporary reinstatement can be costly and disruptive to road users
- **Resource consent** | often retaining walls are required in riverbeds and their installation can affect waterways. Resource consent requirements and applications can cause further delays to construction
- **Maintenance of unknown walls** | old walls can be difficult to locate when no data is held, as these walls are not included in any inspection programme, their maintenance or renewal requirements are unknown
- **Unstable terrain** | the nature of the terrain in the northern part of the district causes an ongoing need for walls in some areas

Occasionally a new retaining wall needs to be built on land outside the council owned road reserve. Generally, landowners are cooperative and allow the construction, however, land can be acquired under the Public Works Act 1981.

Operations and Maintenance Plan

Once retaining walls are established, they generally require little maintenance. As retaining walls are constructed to stabilise land, the nature of the stability of land surrounding them is inherently poor. Therefore, visual inspections are occasionally carried out by the road maintenance contractor however, a more thorough inspection may be performed by a road engineer if any subsidence or movement is noted.

Currently there is no specific inspection regime in place, however, the maintenance contractor inspects the entire network regularly and this identifies any retaining wall failures. If any significant structural maintenance is required, this will be tendered to, and undertaken by, a contractor who specialises in structural repair work.

The road maintenance contractor is required to undertake regular inspections of the entire road network. Slips and dropout sites (where the land supporting the carriageway slips away) are identified from these inspections.

After assessment, reinstatement of a site identified from these inspections may require design and construction a new retaining wall.

NZTA Work Category

Retaining Walls are included in the Structures group and are maintained under NZTA Work Categories 114: Structures maintenance, 215: Structures component replacements and 216: Bridges and structures renewals.

Strategy

Maintenance needs are normally identified by contractor inspections or by MDC staff who actively monitor performance of existing retaining walls during their own network inspections.

Retaining wall maintenance is tied closely to drainage maintenance, as poor drainage contributes to erosion and undermining of the carriageway structure. Drainage requirements are assessed for each retaining wall during the design phase, and this must be monitored to ensure further damage does not occur. Good drainage can prevent slips and dropouts and the need for reinstatement with retaining walls.

Emergency Response

During a severe weather event, Council staff monitor rainfall and rising river levels, particularly in the northern catchment areas and tributaries of the Ōroua River, Pōhangina River and the Makino Stream. Engineers will accompany the maintenance contractor on a thorough inspection of the entire road network during and after these events. This will ensure any sections of road that have become blocked, due to the ground material directly adjacent to the carriageway slipping onto the carriageway, are identified and cleared as quickly as is practicable.

Renewal/Replacement Plan

No replacements are anticipated based on current knowledge.

Asset Condition: As noted previously, little to no information is recorded in AWM for retaining walls prior to 1990. The condition of the recorded retaining walls is very good; however, the accuracy of this information may be subject to scrutiny and not a completely clear representation of the entire asset base due to the possible condition of unrecorded retaining walls. Visual inspections of the road network are carried out with the intention of locating and recording any existing retaining walls within the road network, not currently entered into AWM.

Renewal Standards: Renewal work is extremely unlikely with retaining walls, as a loading safety factor is incorporated into the design process to ensure the wall will act correctly even under conditions more extreme than it was originally envisioned.

In the unlikely event that a wall begins to develop horizontal movement, a full inspection of the wall will be carried out to determine if movement or failure is occurring. The inspection may conclude that movement or minor damage is within acceptable limits and further monitoring is required. If not, an individual component or member can be selected for replacement by a specialist contractor.

Expected Lives: All retaining walls, regardless of construction method or material, have a default useful life of 80 years. This default life is used for forecasting, valuation and depreciation purposes. In reality, once a retaining wall has stood the test of time it is unlikely to be replaced unless there is further land movement at the location, or other works dictate its replacement.

Renewal Plans: There are currently no renewal plans in place.

4.8.12 Shoulders

The shoulder is the trafficable surface between the edge of seal and the feather edge of the carriageway.

Overview

Shoulder data applies to rural areas only. Generally, shoulders are unsealed.

Operations and Maintenance Plan

Shoulder maintenance and renewal work is generally undertaken in conjunction with other work on the adjacent drainage channels or road

pavement. Complementing work activities include:

- Pavement rehabilitation
- Surface resealing
- Remetalling and shape correction (unsealed roads)
- Drainage channel maintenance or renewal
- Sealed pavement maintenance (e.g., edge break repairs or pre-reseal repairs)

NZTA Work Category

Shoulder maintenance and renewal is generally included with the parent activity Work Categories.

4.8.13 Signs

The purpose of road signage is to contribute significantly to a safer road network. The use and design of signage is controlled by statute, currently the Land Transport Rule: Traffic Control Devices 2004, Rule 54002/7.

Overview

Most of the signs used New Zealand roads are based on international symbolic signs. Symbolic signs are used because they are quick to read and easy for all drivers to understand. Road signs are generally made of reflective material, making them easier to read at night. The key issues relating to signs are:

- Providing a consistent appropriate standard of signage on all roads in the district, relative to hierarchy and use
- Damage caused to signs by vandalism and traffic accidents

Road signs are installed across the district in a consistent manner with the following main purposes:

- To summarise regulatory instructions that road users are required to obey e.g., speed limits and controls at intersections:
- Chevrons to indicate abrupt changes in road direction
- Warning of temporary or permanent hazards that may not be self-evident
- Indicating directions and distances to destinations
- Indicating road user services and tourist features/establishments
- Indicating other information of general interest to road users

Signs are recorded with posts as components of the parent sign; a single sign can have multiple posts but can also share a post with other signs (e.g., where multiple signs are installed on the same post).

Operations and Maintenance Plan

Maintenance and inspection duties for the Network services assets described in this section are carried out by the appointed contractor. On this basis, the service delivery and renewal sections normally expected for a sub asset have been combined in this instance.

The contract specifies:

- Minimum maintenance standards
- Frequency of routine inspections
- Response times to correct defects

NZTA Work Category

Signs are included in the Network services group and are managed under NZTA Work Categories 122: Network service maintenance and 222: Traffic services renewals.

Operational and Maintenance Processes

The Contractor is required to maintain an effective level of preparedness including temporary traffic signs to ensure emergency signage works can be undertaken to comply with the Levels of Service stated in the maintenance contract.

The scope of routine works within the road maintenance contract has separate requirements for the different asset groups described in this section.

Council carries out regular audits to ensure the contractor is correctly carrying out their routine works. The request for service system is used by the public to report a problem with a road sign, which is directly sent to the maintenance contractor.

Signs deteriorate through weathering, which causes both loss of reflectivity and fading of sign colours. However, most signs are replaced because of damage resulting from vandalism and vehicle accidents.

Warning, regulatory and information signs are generally in good condition because the majority of the signs are relatively new as a result of previous upgrade programmes. The large number of new signs that eventuated came about because of the lack of signs prior to this and because of the replacement of non-conforming or substandard existing signs.

Under the maintenance contract, the contractor is required to carry out a detailed condition rating and inspection on Council road signs.

Renewal/Replacement Plan

Since 2014, MDC has undertaken periodic Traffic Safety Reviews of a number of high use rural roads. The reviews identified a number of deficiencies and recommended areas for improvement to bring the standard of signage and delineation to the level of current standards. The recommendations are being progressively implemented.

All new signs are installed or painted in accordance with the Traffic Control Devices (TCD) manual, which in turn, complies with the requirements of the Traffic Control Devices Rule.

Asset Performance Data: Performance issues for signs relate to coverage, accuracy of placement, visibility, reflectivity and conformity with standards.

Upgrading of the asset over time has reflected the importance placed on road safety and the higher Levels of Service expected by the travelling public.

Obsolete, damaged, sub-standard and non-conforming traffic signs assets identified during inspections are programmed for replacement subject to funding provisions in the following priority order:

- Public safety
- Traffic volumes
- Convenience of road users

Deferred Maintenance and Renewals: The impacts of deferred maintenance and renewals may lead to loss of legibility/definition of the sign or marking. In the case of missing or removed signs, information provided by the road sign is not provided. All of these circumstances lead to a decrease in the levels of safety provided by the

network. There are no deferred maintenance or renewal issues at present.

Upgrade Process: New signs are installed to provide information and improve road safety. Problem sites are continually surveyed, and appropriate signage installed, with priorities being broadly assigned in accordance with road category.

New signs and markings are often vested in the Council from new urban subdivisions undertaken by private developers.

4.8.14 Streetlights

The purpose of streetlighting is to ensure the council's street lighting and amenity installation continues to operate safely, efficiently and effectively over its economic life with minimum failures and outages.

Overview

The first streetlights were installed in the district around 60 years ago on a relatively small scale and only in town centres. Since that time, advancements in technology along with increasing ratepayer expectation and implementation of lighting standards has driven continuous improvement and expansion of the asset base.

Streetlights are provided for a variety of reasons, ranging from lighting at specific rural intersections to improve traffic safety, lighting of high traffic volume areas, lighting residential and rural streets and roads and lighting of amenity areas such as pedestrian pathways and parks.

Historically streetlights have been mounted on other utility poles like telecom and electricity network poles. Over the past 40 years new urban subdivisions have utilised underground power and telecommunications services, requiring streetlights to be mounted stand-alone lighting poles. The developers who construct these subdivisions often utilise decorative light fittings and poles to enhance the streetscape. The installations that are then subsequently vested to Council can have higher maintenance and renewal needs and demands. As part of the subdivision approval process the developer must submit the proposed compliant lighting design and gain council approval before installation of the lighting assets to be vested, this gives Council control over the quality and type of assets it will inherit.

The key issues relating to the management of streetlighting are:

- Specialist industry, most local authorities have limited in house knowledge forcing reliance on consultants and contractors
- Changing technology means identifying opportunities for optimising street lighting power consumption and maintenance requirements
- Reliance on the electricity network owner to maintain the street lighting power supply cables, network outages impact on council Levels of Service
- Lighting standards that reflect the intended use and road hierarchy
- The need for a development of a street lighting upgrade and renewal programme
- The impacts of any future overhead wiring undergrounding programmes
- The effect of decorative urban streetlights vested in the Council, by urban subdivision developers, on renewals and maintenance budgets

As the District's communities have become more concerned about personal safety and property protection, there has been an increase in public interest regarding the standard of lighting provided throughout the district.

Council follows NZTAs M30 Specification and AS/NZS 1158 Street Lighting series of standards. These set out recommendations for lighting systems for roads and other outdoor public areas, primarily to provide a safe and comfortable visual environment for both vehicular and pedestrian movement at night.

Urban streetlights installed under the AS/NZS 1158 standard have differing purpose. On higher volume roads, or V Category roads, the road user is the main consideration, and the design is based around lighting the road. On residential streets with lower traffic volume, or P Category roads, there is more emphasis placed on security and pedestrian safety, so lighting the whole road reserve is considered.

The asset base also includes some lighting in reserves and other amenity areas. Although costs for these lights are administered by different council departments the maintenance and management is undertaken under the same contract as for all other MDC streetlighting.

Rural lights are primarily for flag-lighting at road intersections and other significant locations such as rural halls and schools. In some cases, residents of the smaller more rural townships in the district prefer to have little to no street lighting, which is more in keeping with the rural environment.

Streetlights are componentised to three asset sub types these are the pole, bracket and light:

- **Pole** | this can be a utility network owned pole or a standalone street light pole
- **Bracket** | the steel arm mounted to the pole to support the luminaire, in the case of steel standalone poles the bracket is an integral part of the pole, but it is still identified as a separate component
- **Light** | lighting unit which comprises of control gear and lamp. There are two types of light currently in use, High Pressure Sodium (HPS) and Light Emitting Diode (LED). HPS are older technology lights which were used from the 1990's until LED technology became affordable in around 2017. LED streetlights have many advantages over HPS, the primary one being lower energy use

Ownership

Council owns the majority of the dedicated stand-alone street light poles; others are owned by NZTA, and some are some privately owned. Where a streetlight is supported by a utility company's pole or by another other structure not owned by Council, the light and its bracket are included in the asset register, but not the pole or building. However, in these cases the nature of the support and its owner are noted.

Brackets and Luminaires are predominantly owned by Council and NZTA with some privately owned streetlights identified.

Many privately owned streetlights were installed before Council took ownership of the asset base, when consideration of long-term maintenance and power costs were not a factor. An example would be a streetlight installed at the end of a private right of way, which may serve only two or three properties. These streetlights are generally

connected to the same electrical circuit as Council and NZTA assets, but as they are identified by owner, they are excluded from any Council funded maintenance and energy cost payments.

The street light inventory is maintained in the AWM database. This allows continual updating of asset information as maintenance and renewals are undertaken and provides accurate information to predict future maintenance and renewal requirements.

Asset ownership is identified in the database so costs associated other party streetlights can be separated, and so owners of other assets which are not maintained by Council, are easily identified.

Operations and Maintenance Plan

The streetlight maintenance contractor is required to:

- Provide an immediate response to hazards
- Undertake monthly inspections of the entire network at night, to ensure all luminaries are operating, undertake necessary repairs to non-functioning lights
- Develop maintenance programmes from the schedules of defects identified during the inspections
- Monitor asset condition by undertaking planned daytime inspections, action routine maintenance and report on any unexpected maintenance requirements
- Undertake routine shear base pole maintenance to ensure correct security of mounting bolts
- Ensure no lights malfunction continuously and that there are no areas where continual intervention is necessary
- Repair, on demand and within the specified response timeframes, faulty, accident damaged or vandalised lanterns, lamps, control gear, columns (poles) and associated equipment

Repair options and priorities are determined by considering the impact on:

- Public safety (top priority)
- Traffic movement
- Future costs if the work is not done

When streetlighting assets are renewed, any components that can be used as spare parts are retained in storage. Other surplus assets generally have no commercial value and are disposed of by the contractor.

NZTA Work Category

Streetlights are included in the Traffic Services group and are managed under NZTA Work Categories 122: Network service maintenance and 222: Traffic services renewal.

Operational and Maintenance Processes

The maintenance requirements for the MDC streetlight network have greatly reduced since the phasing out of the majority of older technology High Pressure Sodium Streetlights (HPS) which have been replaced with more efficient LED technology. This is discussed in more detail under the Accelerated LED Replacement Programme.

With the reduced need for monthly maintenance MDC has not needed a formal streetlight

maintenance contract which has traditionally been in place for periods of up to five years.

To undertake the required maintenance, MDC engages an approved contractor on an as needed basis for general repairs, scheduled maintenance, inspections and minor renewal work.

Renewal/Replacement Plan

Asset renewal is undertaken when a streetlight or a significant component of a light has reached the end of its economic life. Renewal requires replacement of either the complete installation or individual components of the installation e.g., luminaire, bracket or pole. Renewals are generally programmed to coincide with street upgrades.

Strategy and Funding Mechanism

Renewal Strategy: There are no legislative requirements for manufacturers to supply spare parts for the lanterns beyond any given period. The Council will attempt to account for this in their design review, to ensure products are of suitable quality and that they are sourced from reputable suppliers.

The selection of protective coating on steel poles can be galvanised or painted. With painted poles, the paint is applied over an already galvanised surface. Although paint deterioration is not detrimental to the life of the pole, painting is carried out to maintain the aesthetic look of the pole, as most are decorative.

Pole life expectancy is also influenced in part by the soil conditions. Acidity and water in particular can reduce pole life significantly; the resulting underground corrosion can go unnoticed if not checked by excavation around the pole base. As part of Council's streetlight maintenance strategy all steel poles fitting the criteria will be inspected for condition.

New poles have a thick enamel type coating covering the entire ground planted section of the pole. This is a significant improvement over previous pole coatings. The manufacturer supplies a limited replacement guarantee period of 20-years for the pole coating system that pushes the expected life of these poles out from 30 to 50 years.

Renewal needs of other components are identified from the planned inspection programme. The strategy for renewal of streetlight assets, or components of those assets, is to:

- Renew faulty or damaged assets when renewal is more economic than repair. This includes unavailability of spare parts
- Renew faulty or damaged lanterns that are of technically obsolescent types
- Renew faulty or damaged assets that do not meet current designsafety standards

Work is prioritised according to public safety, coordination with other works, eliminating obsolesce, improved light outputs and cost savings such as reduced energy consumption.

The amount of streetlighting renewal work depends on:

- Their age profiles
- Their condition profiles
- The level of ongoing maintenance
- The economic lives of the materials and components used
- The availability of replacement parts

Accelerated LED Replacement Programme: Enhanced NZTA funding assistance for the replacement of older technology streetlights with

LED streetlights was made available mid-way through the 2015-2018 NLTP and for the duration of the 2018-2021 NLTP.

MDC tool full advantage of this assistance and renewed majority of Council (Roading) owned streetlight luminaries with modern LED type luminaires.

This bulk renewal will cause a funding spike when these lights reach the end of their economic life. However, the enhanced NZTA funding assistance outweighs this with payback on Council investment in less than three years.

Asset Condition: The overall assessment of asset condition is undertaken using the following condition grading criteria:

Rating value	Approximate remaining life
Excellent	20 – 30 years
Good	15 – 20 years
Satisfactory	10 – 15 years
Poor	1 – 10 years
Very poor	0 -1 year

Information on condition is limited at present. An item is included in the improvement plan to clarify/obtain up to date condition for these assets.

The main cause of deterioration of streetlights is related to age, which in turn is related to exposure to the elements. For example, moisture causes the breakdown of electrical connections and components, and acidic or wet ground conditions can accelerate corrosion of steel poles.

Light output of HPS lamps depletes over the life span of the lamp which ranges from approximately three to five years. Once light output deteriorates most luminaires can be returned to their optimal or as new condition by installation of a new lamp and diffuser. In some cases, internal electrical components may also be needed, generally as a result of damage through moisture ingress. Most HPS type streetlights have been phased out.

LED streetlights are not expected to suffer any noticeable level of deterioration with the only maintenance required between installation and renewal being the cleaning of the LED lens on the underside of the luminaire. The frequency of the cleaning cycle is dependent on the environment where the streetlight is installed. The Council expects the frequency of the cleaning cycle to be in excess of seven years.

Brackets and poles suffer from corrosion problems and are also subject to vehicle collision damage. The deterioration of painted surfaces on decorative poles can lead to unsightliness.

Asset Capacity/Performance Data: Streetlight capacity and performance issues relate to light intensity, colour, reliability, safety and the areas of the townships covered.

Performance of streetlights can be a simple go/no-go test, i.e., the light either works or it does not. As the majority of luminaires are less than five years old it can be assumed that the luminaires are operating to their optimum performance level unless other factors impede function, vandalism for example. However, this approach only considers the function of individual lights and does not consider areas which may be under-lit due to wide spacing of luminaires.

This is a common issue where streetlights are mounted on power poles, as the common spacing between power poles less than the optimum for most streetlights. Design criteria varies between sites but to illustrate this issue an average optimum spacing between luminaires

may be 60m where power pole spacing is normally around 40m. In urban areas streetlights are often installed on every second pole at spacing of around 80m.

The installation of lights onto existing utility poles is no longer an option; increased investment is likely to be needed where 'infilling' (to eliminate 'dark spots') is identified.

It is acknowledged that the majority of the older street light installations do not perform to the current lighting standard. All new installations, undertaken by Council and those vested to Council by private developers, are required to meet current standards. The standards are considered for renewal work, where the existing pole is utilised to mount a replacement luminaire, but in most cases the lighting level required is not achievable due to the pole spacings.

Deficient installations will be progressively phased out as part of wider integrated works such as street upgrades when existing overhead services are placed underground, or when outdated lights are replaced along a street.

The Council accepts that unless large gains can be made lighting installations will remain as they exist.

Renewal Standards: When a number of adjacent lights are renewed at the same time, the lighting standards appropriate for that road are considered. Generally, the standard will not be met without the installation of new poles to enable luminaires to be spaced accordingly. Council does not require adherence to the lighting design criteria set out in the standards for renewal of lights fitted to existing poles.

When individual light fittings are renewed, the new fitting is generally the most appropriate modern engineering equivalent of the failed fitting. Replacement poles will generally be lightweight galvanised sectional-steel poles of appropriate height. Exceptions to both of these practices occur when the adjacent poles are of a decorative type, in which case appropriate decorative poles and luminaries are used.

NZTA Work Category

Renewal of streetlights is budgeted under NZTA Work Category 222: Traffic services renewals in the Council's Land Transport Programme.

Expected Lives: The expected lives of components are as follows:

- **Luminaire** | 20 years
- **HPS Lamp** | 4 – 5 years
- **Galvanised pole and bracket** | 30 years
- **Tough Coat galvanised pole** | 50 years
- **Concrete pole** | 70 years

Deferred Renewals: There are currently no deferred renewals for street lighting assets.

Asset Improvement and Development Plan: Streetlights are acquired or upgraded in the following circumstances:

- When new lights are provided by the Council where no streetlights previously existed
- When the Council streetlights are installed and vested in the Council as part of a new urban subdivision

Through work to improve the Level of Service arising from:

- Improvements in association with the street upgrading programme
- Minor safety improvements

- Improvements in association with undergrounding of overhead utility reticulation
- Recommendations from township committees
- Public requests on the discretionary street lighting funds

The undergrounding of existing overhead wiring is an important issue that can have a significant effect on the development of the streetlighting asset. Utility companies rarely remove overhead wiring in the townships of their own accord. Instead, this is usually a result of the Council wanting to upgrade a street and improve its overall amenity by the removal of overhead wiring and associated utility poles.

When Council undertakes a project where new underground street light cables are installed the cost is borne by Council but on completion, the cables are vested to the power company who agree to maintain the cables for the rest of their economic lives.

LED Technology: The use of Light Emitting Diodes (LEDs) has become the standard for new street lighting installations in New Zealand. Their use in residential streets and open spaces is proving to be a very cost effective option due to decreased energy and maintenance costs.

In most cases LED luminaires consume at least two thirds less energy than equivalent HPS luminaries. There are also significant savings made through reduced maintenance as the only planned maintenance the LED fittings require is occasional cleaning of the luminaire optical surface.

Development Strategy: The street lighting development strategy is to:

- Install lighting to improve road safety where a lighting problem is identified
- Specify installation of LED luminaires as a retrofit option in place of existing HPS luminaires
- To upgrade the lighting in residential streets to current standards when carrying out street improvements (where appropriate)
- To upgrade lighting in residential streets to current standards where possible when renewing obsolete fittings. (Often the existing obsolescent lights will be too far apart, even for more efficient modern fittings, and in these circumstances some new lights and sometimes new poles are required)
- To light rural intersections, where justified by safety concerns
- Upgrade urban lighting to meet current Levels of Service, especially where there are concerns about public safety

Development Standards: Light colour is an important consideration in selecting light fittings. The figure on the following page shows the Kelvin Scale (k) which grades colour ‘temperature’ and is used as performance criteria for light output.

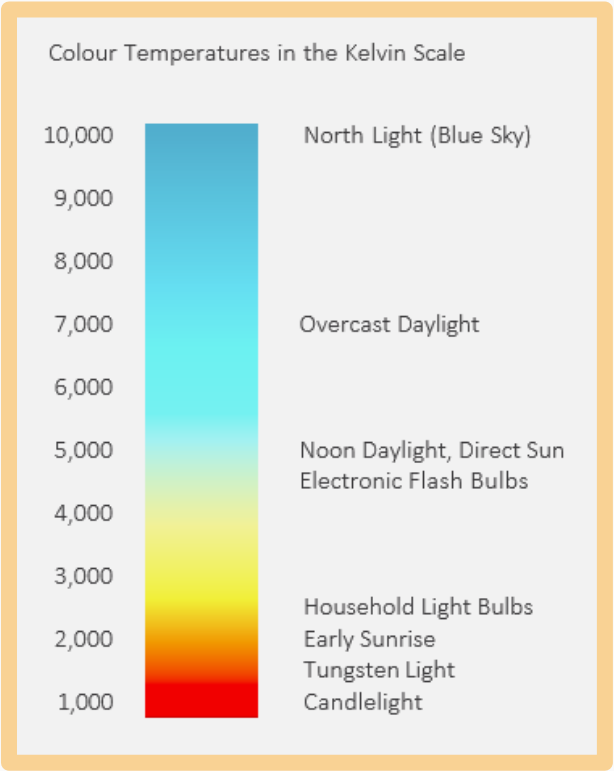


Figure 239 | Lighting temperature scale

The LED streetlights throughout the district are rated at 4,000k, which is a crisp white light that allows better perception of colour at night in comparison to HPS streetlights. HPS lamps emit light at 2,700k which is a more orange light that does not render colours as well, making recognition of objects harder or slower in comparison to 4,000k light.

Consideration of light colour temperature was when specifying the replacement LED streetlights, lights that produce white light to enhance safety for both motorists and pedestrians was preferred.

The following standards are applicable to the renewal of existing streetlights and new streetlights and installations:

- Current version of AS/NZS 1158 (excluding lighting design criteria for luminaire renewals)
- NZTA M30 Specification and Guidelines for Road Lighting Design
- All new installations, upgrades and maintenance must comply with the Electricity Act 1993 and Electricity Regulations 1993 and subsequent revisions
- Pole selection based on location, frangible in urban areas, shear base where appropriate in areas with speed limits above 70kph
- Lighting Design and Intensity
- LED technology is to be specified for all new installations
- Street lighting design shall be in accordance with AS/NZS 1158 Street Lighting series of standards. These set out requirements for lighting systems for roads and other outdoor public areas, primarily to provide a safe and comfortable visual environment for both vehicular and pedestrian movement at night
- Where lighting is provided for off-road walkways in townships, lighting shall be to the appropriate standard while not being over intrusive on neighbouring properties. This may require fittings different from those on trafficable roads

Management Programme: All lights, brackets and poles are maintained by an external contractor.

Power for street lighting is based on the rated consumption of each light and the hours the lights are operating for. This information is

supplied under an agreement with the Energy provider and paid directly by the Council.

4.8.15 Traffic facilities

Traffic Facility assets are predominately edge Marker Posts although the AWM Traffic Facility table also houses some data on different traffic delineation devices such as bollards and speed deterrents.

Service Delivery and Rationale

Edge Marker Posts are replaced by the maintenance contractor when needed generally following damage from road users or the mowing activity. Damaged or non-reflective Edge Marker Posts are identified during the contractors regular network fault inspections and remedial action is taken in line with the requirements of the Maintenance Contract.

Asset details are not currently recorded in AWM.

Other Traffic Facility assets such as traffic calming speed humps are generally only installed following concern from residents or road users around motorist behaviour.

NZTA Work Category

Traffic Facilities are included in the Traffic Services group and are manage under NZTA Work Categories 122: Network service maintenance and 222: Traffic services renewals.

4.8.16 Treatment lengths (pavement layers and surfaces)

Roads are segmented into treatment lengths which are continuous sections of road which have the same dimensions, construction characteristics, and environmental exposure.

This segmentation allows for efficient activity management as treatment lengths can be likened to individual assets even though they form part of the entire road network.

Overview

Changes in the top surface and pavement construction characteristics are the most frequently used method of segmenting road lengths into manageable treatment lengths. As condition deteriorates treatment lengths are further segmented to allow separation of sections that need intervention.

Each treatment length has a set of the following components which make up physical construction of the road:

- **Surface structure** | the current top surface of sealed roads
- **Pavement (unsealed)** | the metal running course surface on unsealed roads
- **Pavement layer (first coat)** | the lowest layer of chip seal on sealed roads. This layer of chip seal is applied to seal the pavement when roads are built or reconstructed
- **Pavement layers** | the compacted layers of metal that give the road structural strength
- **Formation** | the levelled base of the road on which the pavement layers are placed

Nearly all new pavements that have been added to the network in recent times have come about from new roads and streets vested to Council by private developers undertaking new subdivisions.

Surface Structure | Sealed Roads: The prime purpose of the top surface is to shed water, preventing it entering the structural layers

underneath. The top surface also protects the top structural layer (basecourse) from the abrasive effects of traffic and provides the frictional properties required for safe vehicle use. There are two types of road surfaces in the district, thin bitumen surfaces (sealed surfaces) and metal surfaces (unsealed).

All of the district's rural sealed roads have chipsealed surfaces with a very small number having thin asphaltic concrete surfaces; both these surfaces are classified as thin surfaced flexible pavements; there are no structural asphaltic concrete, or other structural pavements. Often sealed roads were sealed by 'dressing up' and sealing the previously unsealed road. This can lead to some of these roads deteriorating more quickly when they are subject to rapid changes in vehicle loading; for example, when a beef or sheep farm is converted to dairying, the advent of tanker-traffic increases the quantity and weight of vehicles on the road network.

The most common surfacing used is a chipseal, which comprises stone chips embedded in bitumen sprayed onto the basecourse. This surfacing provides the most cost effective and best performing surfacing for thin flexible pavements in the district (i.e., thin pavement layers over subgrades of a moderate to high strength). It is a very cost effective surfacing due to the availability of stone that can be extracted from local rivers or pits and crushed to the appropriate size.

When the pavement basecourse is new or reconstructed a first coat seal is applied, this has a relatively short design life due to the thickness of seal (remembering that the sealed surface's main purpose is to protect the pavement). A second coat seal is then applied which has a longer life; following that, the surface is resealed at longer regular intervals. All seal design lives are dependent on by traffic volume and the seal design characteristics.

Asphaltic Concrete road surfacing comprises an approximately 30mm thick dense layer of mixed bitumen and small stone aggregate applied to the basecourse surfacing. It is known for its smooth black finish and is used predominately in new urban subdivisions for its aesthetic properties. It is also used in high wear and high traffic areas because of its durability.

Pavement | Unsealed Roads: Unsealed roads are quite dynamic in their performance and, on occasion, can have higher maintenance costs than sealed roads. This is because they require more regular intervention to maintain their surfaces and shapes because of the influences of weather and traffic. Unsealed roads have poorer riding characteristics than sealed roads and can create dust nuisances.

The principal maintenance activities on unsealed roads are application of a running course of AP20 metal and periodic grading to maintain an even running surface for vehicles to travel on. The rate of metal loss can vary between 5 to 10mm per annum depending on the use and location of the road and climatic conditions.

A typical problem with running course is that as a loose metal that can quickly migrate from the wheel paths, where it is needed the most, to the side of the carriageway under the action of vehicle wheels. While grading does reposition the metal this, constant intervention can become inefficient.

Pavement Layers: Pavements are the structural and wearing course layers of a road. They are regarded as the core components of the roading network's trafficable carriageways. A major

failure of a section of pavement can result in the road becoming dangerous and/or impassable.

Current practice is to provide additional strength to a road when it is sealed and to design the pavement for a standard 25-year life, however, the variability of conditions throughout the district prevents a blanket approach being taken to the structural design of roads.

The purpose of each road pavement is to provide an element of the network that has:

- a suitable all-weather surface that is appropriate to location and function in terms of skid resistance, noise reduction and smoothness
- a structure suitable to carry legal weight, and overweight, traffic

Pavement Layers consist of the following principal components,

- **Subbase** | is a structural metal course laid and compacted on excavated and prepared subgrade, devoid of any organic matter or materials that could consolidate or settle. The subbase is usually a coarser type of graded gravel, or metal. Typically, it is a pit run material no larger than 65mm in diameter in layers 250mm thick. The subgrade and subbase layers are identified in the asset valuation table by Subgrade Formation
- **Basecourse** | is laid and compacted over the subbase but to a higher standard. It is the main load-carrying component of the pavement. It also provides the final alignment and shape of the pavement and accepts the surfacing.
- **Basecoure (continued)** | The base is made of crushed rock that conforms to a 'grading envelope'. The size grading allows it to be placed and compacted to higher tolerances than the subbase. In practice, it is placed in a layer 100mm to 150mm thick, or thicker when high loadings are expected. It is usually specified as M4 AP40, the M4 designation referring to the NZTA specification of that name and the AP40 designation to a material that will pass through a 40mm aperture sieve. The basecourse layer is identified in the asset valuation table by Pavement Formation
- **Pavement first coat** | is the first layer of seal applied over the finished basecourse, this and the subsequent second coat seal and reseals become part of the pavement structure when they are no longer the top surface
- **Formation** | consists of the bulk earthworks required to provide the shape and a firm platform for the structural components of the road to be built on and, for the purposes of this section of the Plan, the land on which the carriageway is built, and land held for future road construction.

Strategy Operations and Maintenance Goals

General maintenance work is classed as priority work where:

- The safety of road users may be compromised
- The required Level of Service has fallen below the prevailing level for the adjacent parts of that section of road
- It is likely that the area of distress may expand so that the road is incapable of providing the required Level of Service and a renewal or upgrade will then be required
- The scope of repair work would change to be become significantly more expensive, if left to deteriorate further.

Subsequent maintenance, renewal, or new improvement work depends on the completion of the planned maintenance repair

A suitable level of preparedness for prompt and effective response to asset failures and emergencies is maintained by ensuring the availability of suitably trained and equipped staff and service delivery contractors. This is provided through specific requirements detailed in maintenance and other roading contracts.

The initial, practical, and objective response to asset failures is to restore service as quickly as possible by the most economic method available. This may mean having to make temporary repairs to maintain a Level of Service if the repairs or renewals are time consuming to complete.

The Council's operations and maintenance strategy is to implement the most cost effective maintenance options through:

- Adequate monitoring the condition and performance of assets
- Investigation of any system deficiencies which are outside the parameters of the target Level of Service
- Identification of the most appropriate work required to correct defects

To achieve this, assets are monitored through routine proactive inspections, testing, and analysis of customer complaints and condition reports. Service levels are managed by assessing the consequences of asset failure and assessing the levels of customer expectation. Asset ownership costs are minimised by identifying, evaluating and introducing new technologies and equipment that may improve operational and management efficiencies.

Exposure to risk is managed by maintaining up to date fault detection systems and providing a prompt and effective response to system failures. This exposure is also minimised by maintaining insurance on key insurable assets, undertaking structural checks of key assets and controlling environmental impacts.

A partnering approach is sought and encouraged between the Council's staff, consultants and contractors; its aim is to make effective use of resources, systems and procedures by taking collective ownership of these matters and transportation network.

NZTA Work Category

Treatment Length assets are included in the following NZTA Work Categories for Maintenance and Renewal activities:

- WC111: Sealed pavement maintenance
- WC112: Unsealed pavement maintenance
- WC211: Unsealed metalling (renewal)
- WC212: Sealed road resurfacing
- WC214: Sealed road pavement rehabilitation

Pavement Maintenance Plan

The Council's contract specifications establish the adopted technical Levels of Service, which in turn deliver the agreed customer Levels of Service, thus applying the Long-Term Plan's Community Outcomes to transportation.

Roading work is required to conform to a number of funding guidelines, which are set out in an annual Land Transport Programme Relationship Protocol between the Council and NZTA.

Council staff and contractors work to ensure that the road network is maintained to the specified standards while staying within the approved budgets. Individual carriageways may be below the specified standard for short periods, but this is only permitted if the road user is not unduly affected.

For example, minor patching work may be undertaken to hold over a pavement until the full repair is done. If the work is urgent, it will be done, even if this means that there is expenditure over the budget or other less important work has to be deferred to keep overall expenditure under budget. Safety related work always takes priority.

Generally, the budgets have been based on historical and predicted trends and set at levels that permit the maintenance work necessary during the year to be done.

Agreement is established around three sets of maintenance guidelines, achievement of which is measured against:

- Safety
- Asset preservation
- Road user satisfaction

These measures, and progress towards these achievements, are reported to NZTA at regular intervals by the Council.

Routine Maintenance: The majority of maintenance work carried out by the maintenance contractor is self-identified. Roads included for reseal have all maintenance work identified and carried out prior to reseal. This is to ensure the pavement is in its best condition to receive the new surface.

A schedule of proposed reseals is given to the Contractor and inspections made to identify repair work necessary to prepare the carriageway for the reseal. Pre-reseal repairs can cost up to one third of the total value of the reseals carried out that year.

Seasonal conditions and the need to coordinate routine and planned works may mean a carriageway is below the specified standard for a time. However, this is only accepted or tolerated if the road user is not unduly or adversely affected. For example, some minor patching may be held over until a full repair is done, or grading of a metal road may be deferred due to adverse weather conditions (either wet or dry). Generally, the budgets are set at a level that permits the maintenance work necessary during the financial year.

The Contractor also identifies maintenance work such as digout repairs, edge breaks, culvert, renewals, minor bridge repairs and shoulder

removal during the routine course of activities and network inspections. A schedule of work is submitted for approval to the Engineer, then once approved, it is programmed and completed by the contractor.

Maintenance Programme: The nature and frequency of the work is consistent with the maintenance strategies outlined above and the age, condition and performance of the roading asset. The majority of maintenance work carried out by the Contractor is routine and can be undertaken within predefined discretionary limits without initial approval of the Engineer. There are exceptions to this general rule with some maintenance activities requiring pre-approval.

Forward work programmes are developed and maintained so the scope of up and coming work is known and quantified. The work is identified from AWM data, the Engineer, and the Contractor. These programmes are used to track progress and the costs of work in relation to the budgets available. The forward works programmes are updated regularly due to reprioritisation as other work is identified, arising from more recent network inspections or public service requests.

Deferred Maintenance: On a network basis there is generally no significant backlog of routine maintenance.

The aspect of pavement maintenance that typically has the highest levels of perceived deferred maintenance is that associated with the maintenance metalling of unsealed roads; however, this is not necessarily seen as deferred work, rather it is most commonly a difference in Level of Service expectations.

Adverse climatic conditions such as a wet winter or a storm event can create additional pressures that mean that scheduled maintenance metalling work may need to be deferred to address the more urgent problems that arise from these types of events. If an event is serious enough, and creates repair and reinstatement that cannot be sensibly met from normal funding allocations, RCAs can apply additional funding from NZTA under Work Category 141: Emergency reinstatement.

Prioritising Work: As the contractor's general staff cover most roads in the district at far more frequent intervals than those stipulated as part of the day to day management of the contract, there is the expectation that the contractor will capitalise on this opportunity to enable work to be identified, carried out or reported for back for approval and prioritisation.

Maintenance work identified by the Contractor is either:

- Prioritised as immediate, in which case it is programmed and completed by the Contractor forthwith. This includes routine work such as pothole repairs, short sections of edge break, small areas of surface levelling, and removal of surface detritus; or
- Scheduled as part of identified work submitted to the Council's Engineer for approval monthly. Once approved by the Engineer it is included in the schedule of all approved work. A three-month forward work programme is maintained by the contractor and updated monthly. The month the work is programmed is also noted in the schedule of approved work

Work is generally programmed in accordance with the following priorities, but may be scheduled differently if requested by the

Engineer to meet non-roading priorities, e.g., utility services installation or repairs:

- The safety of road users or adjacent property owners is, or is likely to be, compromised
- The structure or integrity of the road or road component is or is likely to be compromised
- The areas of distress may expand or the method of repair change, such that the cost of any repair may increase significantly
- Other programmed work depends upon the completion of the work in question
- The order in which it was approved approval

At times there is a greater value of work approved than budgets will allow to be done. The Engineer keeps the Contractor informed monthly on how the expenditure relates to the budget and will request certain types of maintenance work to be put on hold if expenditure is close to the budget. Generally, this applies to the work types with the larger budgets such as maintenance metalling, digout repairs and drainage.

Calls from ratepayers, road users and the Council's staff are another, less formal, form of network surveillance and a gauge on contractor performance. These calls are logged into the Council's service request system with relevant items passed onto the Contractor (with instructions where necessary) for assessment and/or remedy. Other defects or works required are noted as part of any additional inspections following service request enquiries.

Cost increases caused by inflationary pressures such as oil price increases can affect the ability to carry out all necessary work and stay within budget. Cost increases resulting from inflation cannot be economically written out of contracts and all the Council's period contracts therefore include them. Cost escalation adjustments are regularly applied to contract rates and prices.

The maintenance budgets for each year are adjusted to reflect the previous year's inflation in that particular part of the industry. This is done using standard construction cost indices compiled by the NZTA. Failure to increase annual budgets to match the costs of inflation over the previous period will usually result in failure to achieve the agreed Levels of Service, and a loss of service potential.

Urgent work is generally completed even if this means that there is expenditure over the budget or other work has to be deferred to keep overall expenditure within budget. This is particularly relevant to safety related works and other works that are needed to restore roads affected by adverse weather events like storms that result in wind damage, flooding, slips and snow. As discussed in Emergency Works, if the extent of this becomes too severe the Council can apply for NZTA Funding for additional funding.

General Maintenance | Sealed Pavements

Sealed road pavement maintenance includes:

- Pothole repairs
- Digout repairs
- Surface levelling
- Repairs to seal edges (edge break and shoulder wear)
- Trimming of high shoulders to ensure drainage off the carriageway

Details of the various types of defects and the method of repair are in detailed in the Road Maintenance Contract specifications. In general,

small repairs such as potholes, short sections of edge break and small areas of surface levelling, are completed by patching trucks as part of their routine circulation around the district. Other routine maintenance activities are carried out as needed by the Contractor.

The maintenance of private entranceways within the road reserve is carried out as part of the carriageway maintenance. This is subject to the entranceway being previously formed and sealed to match the carriageway. Unsealed entranceways are only maintained at the seal edge, unless there is significant damage to the seal edge in which case the entranceway will be sealed to 1.5m from the carriageway edge in conjunction with the roading work, this is to ensure that the edge of the sealed carriageway is kept intact.

Pre-reseal Repairs: Pre-reseal repair work is carried out under the road maintenance contract. The purpose of this work is to ensure that all defects are repaired prior to the reseal. It includes high-shoulder removal, which consists of the trimming of the existing shoulder and berm to remove the build-up of soil, vegetation and chip at the edge of the carriageway. The formation of shallow drainage swales to move runoff away from the pavement formations is also done at this time.

The coordination of shoulder maintenance and reseals ensures that over time the entire network will have improved drainage that is regularly attended to, as part of the reseal cycle. This work also helps to prevent or minimise damage to the carriageway that can occur from remedial shoulder maintenance works.

The majority of the shoulder removal and digout repair budget is spent on the roads being resealed. By doing this as pre-reseal work the entire network will get shoulders trimmed and the failed area of pavement dug out during the reseal cycle.

General Maintenance | Unsealed Road Pavements

Maintenance of unsealed roads consists of the routine work such as grading, pothole patching, isolated gravelling, the removal of high shoulders, reprofiling of the basecourse, and placement of running course.

Grading and Pothole Repairs: Grading is undertaken at set frequencies for each road section. Additional grading is carried out, outside the set frequencies, if the condition of the road falls below the stipulated performance standards.

The programmed grading frequency is based on that historically needed to maintain the carriageway to the required standard. This is based on information obtained from long-serving staff, observation of the roads, and from the contractor who also recommends changes to the frequency if necessary, and are routinely reviewed.

Corrugations are cut out as part of routine grading. The specification requires corrugations greater than 25mm high (trough to crest) to be cut out. Some corrugations shallower than this can still cause concern to road users and the contractor is usually asked to cut these out as part of the next grade.

Drainage work to reduce surface water on or at the edge of sealed and unsealed carriageways is carried out following identification and approval.

Pothole patching and isolated gravelling are done by the contractor where needed and generally to coincide with the grading cycle, with repairs being done prior to the grading. This is done to maintain a carriageway that is becoming worn but does not yet need major renewal.

Renewal and/or restoration of pavement strength: Carriageways that cannot be maintained to the required standard through regular grading and patching are scheduled for approval of the work necessary to overcome the problem.

This may include replacement or reformation of all or part of the basecourse and running course.

The four main types of renewal activity are:

- Stabilising existing pavement layers
- Strengthening sub-base layers
- Reshaping existing surface layers
- Placing new running course (remetalling)

Remetalling

Remetalling demand is based on a theoretical gravel loss prediction model. This aims to provide consistent protection to the base formation of the unsealed road, manage pavement deterioration, and provide a quality material suitable for ongoing grading and compaction.

Amendments to the programme are based on regular performance management evaluations, undertaken by Council engineers and inspectors.

Isolated remetalling is also carried out as needed. The roads in need of upgrading are identified by the Contractor and by the Engineer by observation or following complaints from ratepayers and road users. These roads are listed and prioritised by the Engineer and programmed in accordance with the most effective use of the available funds.

The remetalling list is reviewed regularly to reflect changing circumstances. The contractor, following the identification of sections of road in need of upgrading and approval of the proposed work carries out placement of new metal courses when approved by the Engineer.

Response Times: Response times are set in the maintenance contracts, and the actual performance of customer-raised queries is recorded through the Council's service request system.

The contractor receives requests for service through this system, and notifies of the completion of a request utilising the same system. Regular audits are undertaken to identify any outstanding issues and to ensure that the work has been done as required and that it meets specification.

Reactive Maintenance and Response: A suitable level of preparedness is maintained allowing prompt and effective unscheduled responses to emergencies and asset failures. This is achieved by ensuring the availability of suitably trained and equipped staff and service delivery contractors.

The initial response to asset failures is to restore service as quickly as possible using the most practical and economic method available. Temporary repairs will only be made if major repairs or renewals are time consuming to complete. Response requirements for routine maintenance activities and emergency events are listed in specific maintenance contracts.

Renewal/Replacement Plan

Renewal Goals: The overall objective for rehabilitating and renewing pavements and pavement surfaces is to apply the correct treatments at the optimum times so that the required Level of Service is delivered, and total lifecycle costs minimised. The required level of renewal will vary depending on:

- The age profile of carriageway surfacing and structure
- The condition profile of carriageway
- The level of ongoing maintenance demand
- The differing economic lives of the materials used
- Traffic growth

Pavement Capacity: The bulk of the network is coping well with the current traffic volumes and loadings. It only requires routine maintenance and scheduled end-of life renewals like resurfacing, for it to deliver the agreed Levels of Service.

Pavement strength is rarely a problem on sealed roads carrying low volumes of heavy vehicles on good subgrades.

Old, sealed pavements that have had no previous rehabilitation were generally built on existing unsealed formations with no specific subbase and a minimum of basecourse (often about 100mm). They are generally coping with current volumes of light traffic, however these roads do not perform well with higher volumes of heavy vehicle use (log extraction, for example).

Sealed pavements in the district usually fail for one of the following reasons:

- They have an old seal with poorer quality pavement metal than normal
- They are higher volume arterial roads, particularly in urban areas
- They are on rural roads that were seal widened 20 or more years ago when the additional width was often constructed to a lower standard than the existing sealed surface

Failure of these sections can be a driver for renewal of rural carriageway sections.

Unsealed roads usually require pavement renewal for one of two reasons:

- Failure of the pavement structure, this is similar to that occurring on sealed pavements
- Insufficient renewal of the metal surface, resulting in traffic running on the pavement structural layers, eroding and damaging them

Unsealed roads pavement renewals are identified through inspection, network knowledge and maintenance issues, as discussed previously.

Rehabilitation usually consists of a granular overlay on rural road roads, or a reconstruction on urban roads where the additional depth of metal cannot be accommodated within the existing levels established by the kerb and channel.

Identification of Work Pavement Structural Layers: Candidate sites and forward work programmes for sealed roads are identified through analysis of road inventory and condition information held in the AWM System. The information is provided through the Consistent Condition Data Collection programme, operated centrally across New Zealand for all RCAs by the Road Efficiency Group.

Candidate Selection: Transport Insights has the ability to interrogate condition data and highlight candidate sites for treatment, based on analysis of lifecycle data, traffic volumes and pavement condition. This is known as the Candidate Selection Algorithm (CSA).

It provides a list over a two-year period for short term planning processes. Council staff use this tool as a 'first pass' to investigate candidate sites, then developing the work programme with supplementary local knowledge, Contractor feedback, and field validations.

Sealed Surfacings: Council had historically operated a rolling forward works programme based on the expected life of the surface to identify reseal sites. From 2014, AWM and inputs from condition surveys have been used to assess the surface condition and then generate the forward works programmes based on these results and field validation by council staff.

The strategy adopted for renewing sealed surfaces is to reseal pavements as close to the possible to the end of each seal coat's economic life. This is determined by the condition of the pavement and demonstrated by factors such as:

- Crack initiation because of brittle binder
- Loss of binder adhesion and stone loss
- Lack of water proofing resulting in potholes and other failures
- Loss of macro texture resulting in loss of skid resistance
- Loss of surface integrity, especially if the existing seal has been subject to potholing, trenching, edge break and digout repairs

The following factors affect material selection:

- Traffic volume, percentage of heavy vehicles, and road geometry, and adjacent land use zoning
- The flexibility of the existing road formation, e.g., thick asphalt is a semi-rigid material and requires special design if laid on a flexible foundation, or on a pavement formation of insufficient strength to accommodate vehicle loading stresses
- The proximity of dwellings to the carriageway and potential for noise nuisance
- Road pavements that are structurally sound, but have unacceptably rough surfaces, can be rehabilitated by the application of a levelling coat of asphalt
- A trend towards increased use of thin asphaltic concrete surfacing on main roads in townships to reduce surface roughness, traffic noise and bitumen tracking to improve street amenity value

Nevertheless, after consideration of all these factors, chipseals remain the predominant sealed surfacing on urban and rural roads in the district. Use of asphaltic concrete surfacing is increasing in urban areas. It is expected that there will be a steady increase in the length of urban roads with this surfacing because of its popularity with developers and ratepayers and increasing scuffing problems in high-wear areas, attributable to larger trucks.

Roads for resealing are identified and short listed according to:

- Second coat seal requirements (i.e., the need to reseal over first coat seals resulting from seal extensions, and seal widening projects, reconstruction and rehabilitation works)

- Transport Insights Candidate Selection Algorithm output
- Seal lifecycles
- Individual road section maintenance histories
- Coordination with other works such as utilities maintenance and renewal work, i.e., the reseal is delayed to incorporate any first coat seals that result from these works

All short listed sites are inspected by suitably qualified and experienced staff and the priorities suggested from the preceding steps adjusted as appropriate.

Renewal Practices: Pavement renewal on sealed roads is often carried out because of failure of the pavement resulting in a rough surface and poor ride. Roughness and other pavement condition factors are used to assist assessment of sites requiring pavement renewal. Roughness counts high enough to cause sufficient discomfort, increased road user costs, or introduce a safety concern can qualify for pavement renewal. Renewals are also likely to result from an inherent structural failure of the pavement.

Rutting of sealed surfaces is a better indication of pavement life, and that the onset of rapid rutting is a reliable indicator of the end of a pavement's life.

Council is often unable to obtain sufficiently high benefits to justify pavement rehabilitation on a Benefit-Cost-Ratio (BCR) basis. However, the roads that will require renewal works typically have high maintenance costs, and rehabilitation of these sections is usually justified using least-cost analysis techniques. Similar problems are not encountered with obtaining financial support for resealing. The types of renewal work undertaken are discussed below.

Reseals: As seals become old, they become more brittle and tend to fracture under traffic loadings, this allows the ingress of water and leads to the formation of potholes, and in the worst cases, to failure of the pavement structure.

The predominant resealing technique used is chipsealing. It is used predominately on rural roads. Asphaltic concrete (AC) (hotmix) is used as a more resilient surface where there are high turning stresses, e.g., at cul-de-sac heads, intersections, retail, commercial and industrial areas. They are also chosen for use in urban areas from both an aesthetic perspective, to reduce road noise to adjoining properties, and address the issue of tracking bitumen in hot weather which can cause damage to floor coverings when it is carried into buildings on the soles of footwear in retail areas.

Granular Overlay/Rehabilitation: These techniques are used where only parts of the pavement are exhibiting distress and it is more cost effective to repair only these areas. The life of a sealed pavement is extended by construction of an additional layer of base-course finished with a sealed surface. This technique is generally referred to as an 'Area Wide Pavement Treatment' and is used predominately on roads without kerb and channel.

This technique can be unsuitable where there is existing kerb and channel, such as in urban areas, as it builds up the crown of the road or street so that the resulting cross-fall becomes too steep preventing residents' vehicles from accessing their properties without 'bottoming out'. In these circumstances it is usually more efficient to carry out a full reconstruction as described below and replace the pavement, and

often the kerb and channel, to the appropriate levels.

Full Reconstruction: This is the removal of the existing basecourse and/or subbase and its replacement with new metal courses and a new sealed surface. This is the most likely technique used on urban streets and generally involves renewal of kerb and channel, and in some cases catchpits and pipes to stormwater mains, footpaths and berms.

If a full reconstruction is carried out this is often undertaken in conjunction with replacement of other utility services such as storm water and sewer mains.

Renovation: This increases the strength of existing basecoursesubbase materials by chemical stabilisation such as adding a stabiliser (hydrated lime or cement) and recompacting. This involves the pavement being ripped in-situ and relaid in place by heavy plant. This technique can incorporate blending in of new materials and stabilisation measures. This is used when the existing pavement formations can be reused in a reconstituted manner.

Smoothing: Irregularities in the road surface, where the structural condition of the carriageway is sound, are smoothed by placing additional (thick) surfacing on an existing sealed surface to smooth out irregularities. The materials used depend on traffic volumes/road geometry and road condition. The most commonly used materials are cold emulsion mix and asphaltic concrete (hotmix). NZTA Work Category 214: Sealed road pavement rehabilitation and 324: Road improvements are the specific categories that encompass these types of work. They have previously been generally referred to, and categorised, as Shape Corrections.

Standards and Specifications: The Council's standards and specifications for renewals reflect the best and most appropriate use of current technologies, in accordance with national standards and legislative requirements as detailed previously in conjunction with maintenance and operational activities.

Prioritising Renewals: In addition to the pavements condition and likely remaining useful life, i.e., its ability to deliver the agreed Level of Service, consideration is also given to the needs of other adjacent assets that may require attention soon. For example:

If a road is getting near the end of its life and the sewer running below it is due to be replaced in two years requiring extensive works in the road, then the road renewal works would be programmed to coincide with the sewer works. Alternatively, if the road works were more urgent the sewer works could be brought forward

During upgrading of older urban streets, the opportunity is usually taken to combine the renewal of all the urban roading asset components such as footpaths, kerb and channel, streetlights and the pavement. This has proven to be an economic and practical approach, and is commonly referred to as a 'street upgrade'.

The district's roads and streets are important corridors for the location of non-roading services and they need to be considered when planning pavement and street renewal works, in urban areas the street take on even greater significance for these services, which can include:

- Sewers
- Water supply reticulation
- Stormwater drainage networks
- Electricity, telephone and street light poles and associated cables (overhead and underground)
- Water races

For the purpose of allocation of available funds, a broad renewal priority order has been adopted. This is a guide only, and is varied as circumstances warrant. The priority order reflects the goals of safety and road efficiency.

- Resealing
- Bridge replacement
- Area wide treatment, road rehabilitation and reconstruction
- Footpaths reconstruction and resurfacing
- Road signs, markings and control structures
- Car park resealing and other works
- Pavement renewal programme

Reseals: The process used to identify sites for annual resealing programmes is to:

- Identify the candidate sections of carriageway from the CSA and knowledge of the network
- Examine forward works programmes, including those of other network utilities such as water and sewer, for clashes or other factors that may influence the decision to reseal
- Confirm and prioritise sites following site inspections and inter-programme coordination
- In selecting the most suitable surfacing material for each category of road the impact of that material on the total pavement life and the lifecycle cost are considered

The length of sealed roads continues to increase because of new subdivision roads.

Rehabilitation and Reconstruction: The quantity of historical and projected pavement renewals is much lower than the theoretical annual renewal length. The current approach to selecting pavement rehabilitation sites is as follows:

- Identification of carriageway sections based on the CSA recommendations
- Local knowledge
- Field validation

Larger sections, and those requiring funding outside normal allocations, require justification under NZTAs project evaluation criteria, which generally require a project to obtain a BCR greater than 3 to be considered eligible. With the network's low roughness counts, even on pavements that are at the end of their lives, it has historically been difficult to obtain the required 'benefit' to justify the work.

Rehabilitation and reconstruction work is therefore often justified by showing that it is the least cost option for the Council and the NZTA (this approach differs from BCR in that road user benefits and costs are not considered)

The type of treatment, its need and priority identified are confirmed through a physical inspection of all candidate sites, good knowledge

of overall network condition, and technical assessment by experienced staff, and where required consultants, using sound engineering principles.

Any works failing to attract NZTA financial assistance for specific funding are be considered for an alternative strategy of 'heavy maintenance repairs' or other repair strategies to improve the pavement before resealing.

A rural roadside drainage programme has been established to improve drainage and reduce the risk of pavement structure failure due to moisture ingress. This involves a cycle of reshaping surface water channelsswales.

4.8.17 Environmental management

Stock crossing/droving

Stock droving is permitted on roads within the district, but it must comply with the requirements of the Council's Traffic Safety and Road Use Bylaw 2023, Part Five: Stock on Roads. Alongside this bylaw sits the Road Controlling Authorities, Best Practice Guidelines for Stock Crossings 2014 and the NZTA New Zealand Guide to Temporary Traffic Management.

Farmers must obtain the appropriate consent in advance of when the droving or crossing activity will occur, where it exceeds normally accepted standard conditions, practices and expectations detailed in the bylaw.

The current bylaw reflects the Councils current responsibilities towards the control of the activity. It balances the needs of farmers to use public roads for moving stock against the rights of other road users, primarily from a road safety perspective, and in a fair manner. In addition, with the increase in rural residential subdivisions that have occurred in the district, the resulting new property owners are much less tolerant to rural farm practices, such as stock and effluent on rural roads, than the original farming communities. Again, Council has had to balance the needs and rights of the respective road users in a fair manner.

Maintenance: The consents for the regular droving of dairy cows directly across roads requires the farmers to take all reasonable and practicable steps to clean, scrape or sweep the road, conditions may be imposed to implement methods to minimise fouling of the road surface.

Underpasses: There are 52 stock underpasses in the district; these are constructed to an agreed standard, and each required a building consent. Upon completion of an underpass's construction, it is inspected by a Council Engineer who must approve the structure before the Code of Compliance Certificate is issued. Councils policy for stock underpasses contains specific details regarding construction and maintenance requirements of stock underpasses.

Surface detritus, litter, roadside rubbish, and street cleaning

Surface Detritus is defined as:

- Any collection of fragments and/or material on sealed surfaces and in drainage channels, including loose sealing chip and aggregate
- Any material that impedes the efficient operation of existing drainage
- Frettings from cuttings
- Deposits of windblown sand, grit, loose aggregates, or fallen leaves
- The result of build-up of minor spillages from traffic or climatic conditions
- Broken glass
- Silt and weed growth in lined channels

Locations of sealed surfaces include all of the following:

- Road carriageways over their full width, including sealed shoulders, shoulder zones where cyclists ride, designated cycle zones/lanes, and intersections
- Central median islands, splitter lands, threshold islands, roundabouts, and central medians
- Footpath surfaces
- Driveway and accessway entrance surfaces between the sealed carriageway and property boundaries
- Lined and unlined drainage channels

Litter is defined as:

- Any single item with a dimension greater than 75mm in any direction and is visible from a vehicle traveling at 70kph
- Items such as tyre fragments, car parts, scrap steel, metal, timber, concrete, large stones, bricks, paper, cardboard packaging, refuse, rubbish, garbage, broken glass (see exclusion below), glass bottles and containers, plastic bottles, plastic bags, plastic sheeting, metal cans, plant debris including fruit fallen from trees, inorganic waste matter, or any other material of like nature weighing **less than** 40 kg

Roadside Rubbish (over 40kg) deposited on roadsides, referred to as fly tipping, comes under the responsibility of Council's solid waste management contract. Generally, the location of sites where rubbish has been dumped is notified to Council by contractors, council staff, ratepayers or road users.

Due to the road maintenance contractors coverage of the network, it is more cost effective for the council to utilise their services to collect and dispose of roadside rubbish rather than to send the solid waste contractor to clean up sites, which are often remote locations. At the time of the contractors payment claim, the cost of collecting and disposing of this type of rubbish is transferred to the Council's Solid Waste Management budget.

Any incriminating content in the rubbish is collected by the contractor and handed to Council's compliance and monitoring team so they can pursue infringement of the person responsible if possible.

Street Cleaning activity covers the inspection, reporting, programming, and cleaning of urban kerbs and channels, sump tops, property access culverts and slot crossings, and adjacent road surfaces. Street cleaning is defined as the removal of all debris (including loose aggregate, litter, sand, grit, leaves, bottles, cans, cigarette butts, graffiti, and other unsightly or deleterious material) and detritus up to a maximum of 40 kg per individual item.

The area defined for street cleaning is the area from the kerb face to a distance of 2m into the road carriageway. Cleaning is carried out to maintain the Level of Service defined in the relevant contract. Additional cleaning is also carried out on new subdivision roads to remove debris tracked out onto the carriageway from construction vehicles accessing muddy building sites. This has become more important as stormwater systems have become more complex and sensitive, to avoid them from becoming clogged or rendered ineffective and/or in breach of specific resource consent conditions relating to their operation.

Cleaning is done by mechanical sweeping where this can achieve the standard of cleaning, but hand cleaning is done in conjunction with this on dish channels, channels with non-standard shapes, or those that have berms and trees in front of the channel, and those that have channel covers or slotted channels at entranceways.

A proportion of funding for this work is budgeted under the NZTA Work Category 113: Routine drainage maintenance. Current NZTA rules for the funding of street cleaning mean that only 30% of the total cost is subsidised. The remaining 70% is required to be funded by Council.

The details include the funding necessary for street cleaning in both the subsidised and non-subsidised portions of the financial forecasts.

The cost of street cleaning undertaken on State Highways in townships is recovered from NZTA – State Highways Group.

Abandoned vehicles

Abandoned Vehicles are the responsibility of Council's environmental services department. Identification, removal and disposal of abandoned vehicles is undertaken by the Council's Animal Control Officers (ACO's), who have the necessary dual purpose vehicles, trailers and storage areas to remove and store vehicles. The processes pertaining to abandoned vehicles are contained in Section 356 of the LGA 1974, Removal of Abandoned Vehicles from Roads. This details, amongst other things, the Council's responsibility to identify the owner of the vehicle before sale or disposal. The funding for this activity is not included in this Plan.

Vegetation control

Vegetation Control applies to grass, plant pests, shrubbery, exotic seedlings, trees, and any other plant growth within the legal road reserve.

Exotic seedlings are plants up to 2.5m in height and include:

- Poplars
- Wattles
- Pinus radiata
- Macrocarpa
- Lupin
- Pinus pinaster
- Gums
- Flame Trees
- Willows
- Pampas

All plant pests are described in the Horizons Regional Council's Regional Plant Pest Management Strategy, including Horsetail.

The Contractor is to ensure that the work carried out on legal roads reserves is such that:

- At all times the area from boundary to boundary is free of exotic seedlings and plant pests
- At all times the area remains free of all vegetation encroaching within the 'control envelope'
- At all times the vegetation on unsealed shoulders and other nominated areas is maintained to the specified heights

Sealed and Unsealed Shoulders: Vegetation height is maintained in accordance with the contract specifications for the category of road.

Edge Marker and Signposts: The area surrounding edge marker posts and signposts,

including culvert marker posts, is to be treated to provide vegetation control. Vegetation shall not exceed 150mm in height in the control area.

Bridge End Markers: The area surrounding bridge end markers at bridge abutments is to be treated to ensure clear driver visibility of the markers.

Barriers, Sightrails and Culvert Headwalls: The area surrounding barriers, sightrails and culvert headwalls is to be treated to provide vegetation control. Vegetation shall not exceed 150mm in height in the control area.

Surface Water Channels, Side Drains and Culvert Waterways: All surface water channels, side drains, cut-out drains, and culvert waterways are to be treated to ensure the free flow of water, with growth height not exceeding 150mm. All culvert inlet and outlet drains are to be treated to the adjacent fence line or to a minimum of five metres from the culvert, whichever is the lesser.

Kerb and Channel, Road Furniture, Fence lines, Paths and Paved Areas: Any vegetation encroaching on, over, or around the kerb face, street and road furniture, or along unmaintained fence lines, or appearing in construction and defect cracks between kerb, pavement, path, edge strip, barrier,or within the pavement, path or paved surface, or any other concrete structure, shall be removed.

Visibility and Road Hazards: Roadside vegetation which encroaches into the vegetation envelope or vegetation control area, as detailed in the contract, shall be within the tolerances described.

Any other vegetation which presents a safety hazard to road users or operators of all vehicle types, by restricting visibility are to be removed.

Special width cut areas may be required for safety visibility on vertical and horizontal curves, intersections, railway crossings and at private vehicle crossings, where cut areas may extend to the legal boundary.

The contract specifies the type of herbicides permitted along with restrictions and exclusions relating to their use. Control of vegetation by the use of chemicals is carried out in accordance with all relevant Acts, regulations and Bylaws.

Berm Mowing: The mowing and trimming of berm areas, embankments and amenity areas is to conform to the standards detailed in the contract specifications.

It is expected that property owners will mow berms in urban areas (typically roads with a speed limit up to 70kph). These zones are excluded in the maintenance contract.

Vegetation Hazards: The Council's request for service system records sites where there are observed problems on the road network, such as a fallen tree or slip blocking the road. If clearance is more of a major undertaking, the road is made practicable then permanent repairs or reinstatement is prioritised in the Councils forward works or rolling maintenance programmes. Vegetation control is budgeted under NZTA Work Category 121: Environmental maintenance in Council's programme.

Trees planted in the berm areas of urban streets are covered under the Parks and Reserves Maintenance Contract, administered by Council's community facilities group. The removal of trees for safety is considered on a case by case basis based upon input from:

- The road maintenance contractor
- Council staff
- Community committees

4.8.18 Disposals

This section describes how to identify and actively manage assets, which are no longer fit for purpose, and then to programme the most cost effective disposal of those assets.

Disposal activities are associated with the removal from service of a redundant or surplus asset. Assets may become surplus due to:

- Under-utilisation
- Obsolescence
- Provision exceeds Level of Service
- Uneconomic to upgrade or operate
- Policy change
- Service provided by other means (e.g., private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social, vandalism)
- Advancements in technology which provide more cost-effective options

Item	Mitigation	Relevant Standards
Disposal of Roads	**The Council is not free to dispose of roading assets as it wishes**. The principal controls on its ability to do so are: Section 342 of the Local Government Act 1974. This gives The Council authority to remove a road from the network and for title to it to be granted to the Council. The Council may then retain or dispose of the title. If a road is diverted or realigned, rather than being removed from the network, the provisions around road stopping may not apply.	Council Policy Road Stopping – Disposal of Surplus, which outlines the Council's minimum requirements for consideration of a request to stop a road.
Uneconomic Roads	**Unformed legal roads are not maintained by the Council for roading purposes.** Some roads have been classified as limited maintenance roads, and therefore receive only sufficient maintenance to provide a minimal Level of Service. The Council may agree on a case-by-case basis to maintain a road if it has been upgraded to a suitable standard by others at their cost, **with its prior permission.**	NZTA Planning, Programme and Funding Manual determines the provision of financial support for 'uneconomic roading facilities'.
Surplus Land	Land is usually declared surplus when: It has been purchased under the Public Works Act for future road development. Land designated as legal road is not required for roading purposes now or in the future. When this process is requested, a case-by-case evaluation determines if there is strategic value in keeping the land for another transport purpose	
Disposal of Bridges	No decisions have been made on disposal of bridges. These will be considered when the need arises for substantial renewal works or replacement, considering all which are defined as 'uneconomic' bridges as discussed earlier.	These sale processes must comply with the Local Government Act 1974.
Disposal of Paths	Before committing to the removal of any of path the Council will: Consult the people in the affected street or streets, Consult the relevant communities, and consider the recommendations of the relevant township committees. There are no current plans to dispose of any paths.	

Figure 240 | Disposal mitigation

4.9 Financial strategy

4.9.1 Identifying and categorising lifecycle costs

Council makes decisions on the acquisition and ongoing use of many different assets. The initial capital outlay cost is usually clearly defined and is often a key factor influencing the choice of asset given a number of alternatives from which to select.

The initial capital outlay cost is, however, only a portion of the costs over an asset's lifecycle that needs to be considered in making the right choice for asset investment. The process of identifying and documenting all the costs involved over the life of an asset is known as lifecycle costing.

The total cost of ownership of an asset is often far greater than the initial capital outlay cost and can vary significantly between different alternative solutions to a given operational need. Consideration of the costs over the whole life of an asset provides a sound basis for decision-making. With this information, it is possible to:

- Assess future resource requirements (through projection of projected itemised line item costs for relevant assets)
- Assess comparative costs of potential acquisitions (investment evaluation or appraisal)
- Decide between sources of supply (source selection)
- Account for resources used now or in the past (reporting and auditing)
- Improve system design (through improved understanding of input trends such as manpower and utilities over the expected lifecycle)
- Optimise operational and maintenance support (through more detailed understanding of input requirements over the expected lifecycle)
- Assess when assets reach the end of their economic life and if renewal is required.

The lifecycle costing process can be as simple as a table of expected annual costs or it can be a complex (computerised) model that allows for the creation of scenarios based on assumptions about future cost drivers. The scope and complexity of the lifecycle cost analysis generally reflects the complexity of the assets under investigation, the ability to predict future costs and the significance of the future costs to the decision being made by Council.

A lifecycle cost analysis involves the analysis of the costs of a system or a component over its entire life span. Typical costs for a system may include:

- Acquisition Costs (or design and development costs)
- Operating costs
- Cost of failures
- Cost of repairs
- Cost for replacement
- Maintenance costs
- Cost of corrective maintenance
- Cost of preventive maintenance
- Cost for predictive maintenance

Developing long term financial forecasts

Long-term financial planning combines financial forecasting with strategising. It is a highly collaborative process that considers future scenarios and helps governments navigate challenges. Long-term financial planning works best as part of an overall strategic plan.

Financial forecasting is the process of projecting revenues and expenditures over a long-term period, using assumptions about economic conditions, future spending scenarios, and other salient variables.

Long-term financial planning is the process of aligning financial capacity with long-term service objectives.

Financial planning uses forecasts to provide insight into future financial capacity so that strategies can be developed to achieve long-term sustainability in light of the government's service objectives and financial challenges.

Council has a comprehensive long-term financial planning process because it stimulates discussion and engenders a long-range perspective for decision makers. It can be used as a tool to prevent financial challenges; it stimulates long-term and strategic thinking; it can give consensus on long-term financial direction; and it is useful for communications with internal and external stakeholders.

Council's long-term financial plan includes these elements.

Time Horizon: The plan looks at 30 years into the future.

Scope: The plan considers all appropriated funds, but especially those funds that are used to account for the issues of top concern to elected officials and the community.

Frequency: Council updates long-term planning activities as needed in order to provide direction to the budget process, though not every element of the long-range plan is repeated.

Content: The plan includes an analysis of the financial environment, revenue and expenditure forecasts, debt position and affordability analysis, strategies for achieving and maintaining financial balance, and plan monitoring mechanisms, such as scorecard of key indicators of financial health.

The public and elected officials are able to easily learn about the long-term financial prospects of Council and strategies for financial balance. Hence, Council has an effective means for communicating this information, through separate plan documents and by integrating it with existing communication devices.

Disposal costs: A complete lifecycle cost projection analysis may also include other costs, as well as other accounting/financial elements (such as, interest rates, depreciation, present value of money/discount rates, etc).

Developing funding plans

Balancing the Budget: Council is required by legislation and for prudent financial management to balance its budget. This means that operating expenses must be covered by operating revenues unless specific exemptions are detailed in this Financial Strategy. During the preparation of the Long-Term Plan the balancing of the budget is done at an activity level. In the Financial Strategy Council has identified a number of circumstances where it is appropriate not to balance the budget.

Unfunded depreciation: Council uses depreciation to fund the renewal or replacement of assets. Council currently funds 49% of the depreciation on roading because the renewal or replacement of the majority of our roading assets

are funded through subsidy from NZTA. Roading is a strategic asset of Council and results in a significant depreciation charge.

Revenue for capital purposes: The operating surplus in the Statement of Comprehensive Revenue and Expense includes revenue to fund capital expenditure. Through the life of the plan this type of revenue includes subsidy from NZTA for roading capital expenditure, development contributions received to cover growth related capital expenditure and contributions from ratepayer to fund the connection to Council infrastructures.

Funding from future development contributions for growth related capital expenditure: In determining our development contributions, a 50 year programme has been developed and development contributions were calculated over this time. Often, Council is required to put the infrastructure in place to ensure we have the capacity to accommodate growth in advance of the development. In these instances, loans are taken out to fund this expenditure. The servicing of these loans (both interest and principal repayments) is to be funded by future development contributions.

Funding From Prior or Future Years Surpluses: There are a small number of circumstances where it is considered prudent to fund operational expenditure from prior or future years' surplus.

Intergenerational Issues: Council manages many different assets. Roads, paths, pipes, drains, parks and reserves all require careful management to provide services to the community now and in the future.

Some assets are useful for a long time and provide service to more than one generation. For example, pipes and bridges often have an estimated life of 60 to 100 years.

When making financial decisions about how to fund assets, Council takes into account how today's decision will impact on current and future generations. Council considers that it is fair to expect those people who benefit from the service should pay for it. This principle assists Council to decide how to fund the costs of replacing existing assets and to build new assets. For example, long life assets may be partly funded by a loan. Loans spread the cost of the asset across current and future generations.

Funding Sources: Rates are a property tax set annually by Council. Rates are one source of income the Council uses to fund projects and operating services.

Council considers the affordability of the proposed rate requirements both for the Council and ratepayers. When setting rates Council considers:

- the Levels of Service provided
- intergenerational issues
- other sources of funds
- legislative requirements
- external factors
- what our ratepayers can afford

A minimal amount of investment income is generated by Council's investment in forestry assets, and this is used to offset general rates.

Borrowing: Council utilises external borrowing to fund the acquisition of assets. Council's Liability Management Policy governs the borrowing mechanisms and current limits.

Internal Borrowing: This is a mechanism available to manage both the level of funds available and external debt. This facility enables an activity to borrow from the Council treasury function as

opposed to borrowing externally, with an appropriate interest rate charged.

Utilising internal borrowing enables Council to manage its cash/investment portfolio to take advantage of the moving margins between interest rate receivable and interest rates payable. Internal borrowing is used when external borrowing costs are higher than allowed investment returns.

Security for Borrowing: Many of Council's assets are not readily saleable so are less attractive as security items. Council will secure borrowings by a charge over our rating revenue either directly or through a debenture trust deed. Council will not secure other assets unless circumstances show it to be appropriate (e.g., leased assets).

Investments: Council is a risk-averse entity. Council will not undertake transactions where the level of return or benefit is dependent on an unacceptable level of risk. The Investment Policy expressly forbids any form of purely speculative activity.

Adequate liquid funds are to be kept to allow all expected payments to be made on the due date. Investment levels should ensure adequate funds are maintained so special funds and reserves are backed by suitable investments.

Expenditure Classifications: To assist in identifying the reason for expenditure and finding the most appropriate funding source, Council has four expenditure classifications. Classification reflects good practice and new legislative requirements for financial reporting.

Type of Expenditure	Description
Operational expenditure	Operating expenditure is the day-to-day costs associated with providing a service. It includes expenditure not linked to an asset. It includes work required to keep an asset operating at the required level
Capital | renewal expenditure	Renewal work is expenditure required to replace or refurbish an existing asset that will bring the asset back to the original service potential
Capital | new works to improve the service level	In meeting desired Council outcomes and working to achieve its vision, Council may invest in additional facilities and/or upgrade existing assets. There will be changing service level requirements because of new technology, changing legislative requirements and resource consent requirements
Capital | new works to accommodate growth	Capital expenditure to accommodate growth in resident population and business activity

Asset Management: Roading is funded through a partnership with Central Government through NZTA. Historically most standards were set by the Council within broad NZTA guidelines. A new system now sets national standards (the One Network Framework) for each type of road. This may impact on the affordability of maintaining existing Levels of Service.

This strategy is not a completely new process for Council. Previous LTP processes and adopted LTP's have included infrastructure programmes that were forecast out to 10 years. These were based on the Activity Management Plans that Council continually revised and improved in response to Council decisions, imposed standards and resource consent conditions,

technology and demand changes, and condition assessments / maintenance work.

Funding of Capital Expenditure: Capital works expenditure can be funded from NZTA, targeted rates, subsidies, reserves (for example a depreciation reserve), borrowing, and development contributions. Where possible, the first source of funding for non-subsidised capital expenditure will be third party sources i.e., development contributions.

4.9.2 Asset Valuation

Valuation approaches

Road assets are infrastructure assets, defined as infrastructural systems that provide a continuing service to the community and are generally not regarded as tradable.

The valuations are based on accurate and substantially complete asset registers (see improvement plan) and appropriate replacement costs and effective lives. The prime asset register is the AWM database. The asset registers record data to a sufficient component level to allow assets of different base lives to be valued separately. The database includes assets owned by other entities; these are identified by '*Asset Owner*' and are excluded from Council's asset valuation calculations.

Statutory financial reporting standards require MDC to revalue its plant, property and equipment where there has been a significant change in values, or at a maximum interval of three years. However, MDC chooses to value its assets on an annual basis regardless of the significance of changing values. This allows the council to better forecast increases in annual depreciation and helps to ensure there is an understanding of any significant changes resulting from changes to the asset stock or contractor rates. Significant changes in input parameters, that may have a material effect, may result in an earlier revaluation of assets.

- Asset valuation reports are externally peer reviewed on a 3-yearly cycle.
- Road assets are valued by Council staff and specialist consultants in accordance with the following standards: PBE IPSAS 17 Property Plant and Equipment International Accounting Standards.
- NAMS Infrastructure Asset Valuation and Depreciation Guidelines, Edition 2, 2006. In addition, the guidelines provided in the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines Edition 2.0 2006 are followed.
- The valuation is subject to Audit. Asset quantities used for valuations are those detailed in the Council's asset registers and databases.

The annual valuations calculate the following financial information at component level, summarised by asset type as:

- Optimised Replacement Cost (ORC)
- Optimised Depreciated Replacement cost (ODRC)
- Annual Depreciation (AD)

Council has adopted the depreciation method of calculating the change of service potential as:

- Change service potential = Renewal expenditure - Annual depreciation
- Cumulative change in service potential 03/04 = change SP 02/03 + change SP03/04.

NOTE: The value of new improvements is not added into the equations in the years in which they are built, rather, their depreciation and ultimate renewal are considered in all subsequent years.

Calculating depreciated replacement cost

Most assets lose their value over time (i.e., depreciate), and must be replaced once the end of their useful life is reached. Depreciation is a method of allocating the cost of an asset over its useful life. For example, as a bridge ages and comes to the end of its useful life it is worth less than when new.

Depreciation represents the charge to the current ratepayers for the use of the asset during each year. If operating costs, including depreciation, are not covered by operating revenues, it can be argued the current users of the service are not paying for the benefits they are receiving. Depreciation will be charged on all assets by allocating the cost/or valuation of the asset over the estimated remaining useful life of the asset.

Assets are regularly revalued (operational assets at least every three years and infrastructural assets annually) with the depreciation expense based on the revalued amount. This ensures the amount of depreciation reflects current market values.

As depreciation is a charge for the use of the asset by current users, Council has elected not to create individual depreciation reserves.

There are some assets depreciated in the balance sheet, but their depreciation is not included in the calculation of rates.

The proportion of depreciation on roading assets funded by the NZTA subsidy is also removed from the rating calculation. Currently Council receives 51% of the maintenance and renewal expenses on the majority of roading assets. Including this in our rating calculation would be funding the expense twice.

4.9.3 Valuation Summary

MDC has valued its transportation assets at component level, as they are populated in the AWM database as of 30 June 2026. This table has been provided on the next page.

Asset Type	Component	ORC Value	ODRC Value	Annual Depreciation
Berm	-	$11,509,471	$11,509,471	$0
Bridge	Bridges and major culverts	$227,894,751	$90,647,318	$2,278,948
Drainage	Chambers	$8,437,689	$3,489,339	$105,577
	Channels	$59,108,275	$11,957,490	$883,324
	Headwalls	$632,780	$409,902	$10,527
	Pipes	$145,815,386	$43,168,295	$1,821,316
	Water structures	$27,305	$14,376	$911
Miscellaneous	-	$649,594	$594,538	$10,832
Pathway	Layers	$395,610	$365,803	$5,737
	Surfaces	$47,480,816	$23,574,288	$938,995
Pavement	Formation	$309,100,621	$309,100,621	$0
	Shoulder	$72,763,856	$6,344,058	1086167.687
	Layers	$209,144,958	$43,214,868	$3,121,567
Surfaces	Top surface	$85,505,405	$29,605,507	$6,070,490
	1st coats	$78,695,283	$28,684,217	979038.7724
Pole	Support structures	$7,955,577	$3,743,071	$179,169
Sign	Electronic	$992,505	$695,213	$66,167
	Static	$4,934,524	$1,451,506	324808.0006
Streetlight	Luminaires	$2,176,154	$1,506,370	$91,880
	Outreachs	$1,822,214	$379,354	$36,444
Traffic service	Bollards	$11,775	$8,459	$785
	Barriers	$5,843,937	$3,670,936	$116,879
	Rails	$2,822,248	$1,111,495	$57,433
	Delineators	$23,791	$13,555	$1,586
	Kerb crossings	$10,893,630	$2,411,127	$145,799
	Markings	$484,407	$0	$121,102
	Planting structures	$33,885	$28,501	$452
	Road humps	$101,272	$70,874	$6,606
	Traffic islands	$4,497,649	$2,383,679	67129.09334
Wall	Other	$94,412	$59,777	$1,468
	Retaining walls	$58,717,896	$46,101,312	$734,772
Total		**$1,358,567,677**	**$666,315,322**	**$19,265,909**

Figure 241 | MDC Roading assets valuation table, 30 June 2026

4.10 Risk management

4.10.1 Introduction

Council is confident that the programme can be delivered, and risks managed. Council has a proven track record of sound delivery with previous investment in the continuous programme and related activities (particularly in terms of timing, alignment, and management of the funding allocation). Council has the capability and the capacity to deliver and manage the future programme and related activities, particularly in terms of adequacy of resourcing and skillsets available.

Council has identified its key risks for the type / complexity of the network (and/or related activities) and has a sound risk mitigation strategy in place.

4.10.2 Context

The Council is exposed to a number of risks arising from the operation of the road network. A Risk Register and Treatment Plan has been developed in alignment with AS/NZS ISO 31000:2009 Risk Management, Council's Corporate Risk Policy, and the RIMS Best Practice Guideline for Risk Management on Road Networks.

The figure below summarises the key steps of the risk management process specified in AS/NZS ISO 31000:2009 and as applied within its contracts. This process is a systematic approach applicable to all aspects of Council's Roading Activity delivery, from governance to task level activity.

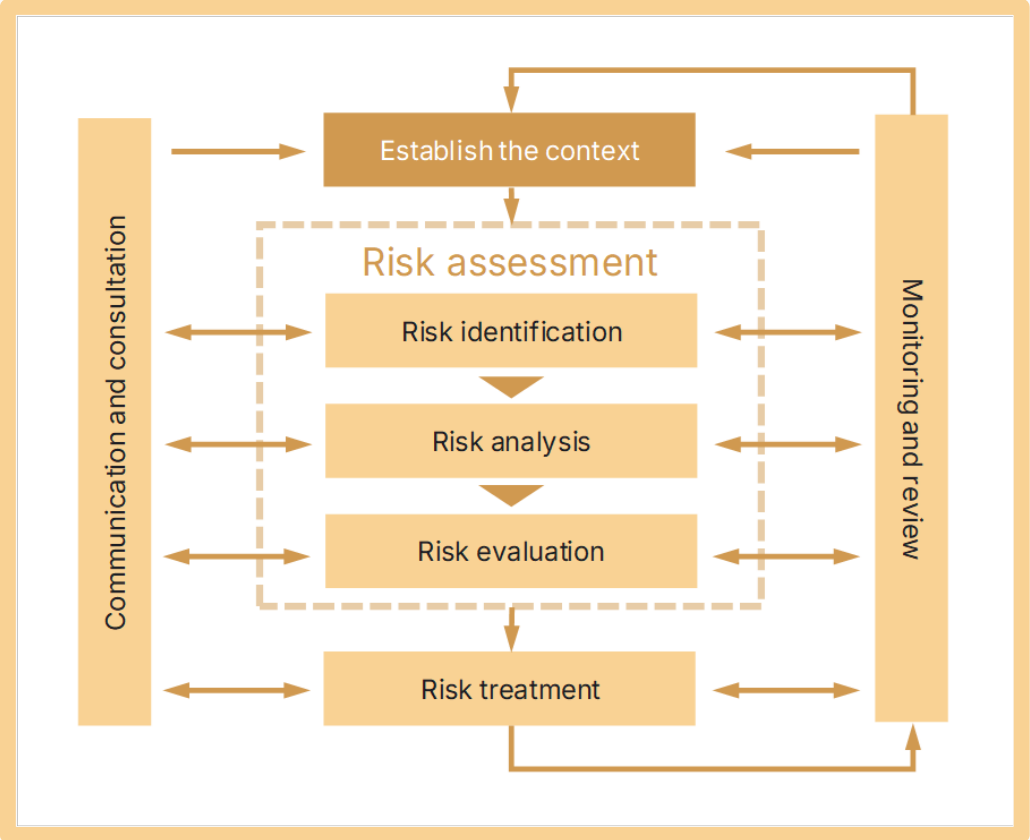


Figure 242 | The risk management process

Establishing the context for risk management is fundamental to its effective management. The context against which risks may be identified is likely to exist in the following:

- Political, economic, social, technological, legal and environmental change
- Client/contract objectives
- Client or supplier-initiated contract change
- Delivery programme
- Potential for failure to achieve Performance Indicators (PI's)
- Estimating assumptions or uncertainties
- Business, process, design or construction change
- Design outputs and assumptions
- Construction working methods
- Outputs from review/audit

4.10.3 Identification

The following risk identification techniques are utilised:

- **Checklists** | review of generic and/or activity specific risk themes
- **Workshops/reviews** | formal multi-disciplinary forums that take the form of either 'blue sky' thinking or focused review of existing data. Participants are selected based on attendance requirements relative to maximising outcomes from the degree of involvement and time spent
- **Interviews** | used on a selective basis to elicit information from specialist personnel
- **Experience-based reviews** | review of previous projects and/or contracts undertaken
- **Ad-hoc** | delivery team identification of risks during contract execution

The framework for transportation risk management considers the risk topics shown below.

Planning Risks

- Strategic planning
- Activity management planning
- Levels of service
- Natural event and environmental

Management Risks

- Systems/information
- People
- Financial

Delivery Risks

- Procurement
- Project management
- Contract management
- Communication

Physical Asset Risks

- Risks common to all assets
- Risks associated with specific asset types

Level of investment/programming of work

The programme optimisation process selects the right things to do at an appropriate level of investment i.e., not over capitalising or over

investing in treatments for the Level of Service or economicsocial value of a road. It is important to note that the programme chosen tries to balance risk, condition and cost/outcomes. If investment is reduced, Council will assume a higher risk for assets on the network. The identified programme is then implemented in the right way, at the right time, and for the right price.

Demand forecasts

Growth and demand forecasting is inherently uncertain and involves many assumptions. The Manawatū District is expected to continue to experience high growth between now and 2057. However, the forecasts for households, residential development, community demographics, and land use changes will vary if the growth that occurs is different to the forecast, as will the impact assumed based on these forecasts.

Council regularly reviews demographic and development trends as part of their 10-Year Plan process, through regular monitoring and reporting, as well as using various resources including data from Statistics NZ. Major projects and significant changes to Levels of Service are assessed against affordability annually through the Annual Plan process. Specifically for land use, the zoning of land and the activities permitted on land is managed through the District Plan Review, informed by expert advice and investigations.

The above processes will enable Council to respond to changes in the demographic characteristics and development of the district over time, including the prioritisation of projects and service delivery to meet the needs of the community.

Climate change and emergency events

For this AMP, it is assumed that the intensity and frequency of extreme weather events, such as flooding, drought or heavy snowfall, will increase as a result of climate change, in line with projections released by Earth Sciences New Zealand (encompassing the entity formerly known as NIWA).

Future climate change is unpredictable as the factors that influence the climate are highly complex and only partially understood. It is difficult to make a definitive prediction on what the future climate will look like. It is possible that climatic changes in the Manawatū District are more extreme than predicted.

The financial impacts of more extreme climate change will be mitigated by ensuring adequate insurance cover and undertaking appropriate maintenance as a preventative measure. The Regional Council has undertaken major flood protection works (stop banks) for the lower Manawatū, the Kiwitea Stream and Ōroua River flood control scheme. These stop banks are designed to withstand the current 1% Annual Exceedance Probability (AEP) flood event, i.e., a 1 in 100-year flood. Further, technology is always changing, and it is likely that new and cost-effective plant and materials will be available to meet some of the challenges in the future.

Emergency funding

Numerous ex-tropical cyclones have caused significant damage in recent years within the district. Such events make the network vulnerable to closures and put communities at risk of isolation and injury. Due to the impact these unpredictable events have on the community, immediate action is required by Council. Council is responsible for emergency work and must reprioritise pre-allocated asset

management funding to execute this emergency work. If council maintenance or renewal budgets are continuously spent on emergency works the existing infrastructure is at risk of deteriorating below the acceptable Level of Service, increasing risk to the community and the Council.

It is acknowledged that NZTA has an Emergency Fund which councils can apply for in an emergency event however,emergency funding applications to NZTA can take months, and in some cases years, to be paid.

It is also worth noting that the current Financial Assistance Rate (FAR) Policy for Work Category 141: Emergency reinstatement is expected to be reviewed during the 2027-30 NLTP, which may result in lesser funding rate(s) and/or higher event severity thresholds to be met in order to qualify for enhanced financial assistance.

Forecast assumptions

Cost increases caused by inflationary pressures such as oil price increases can affect the ability to carry out all necessary work and stay within budget. Cost increases resulting from inflation cannot be written out of contracts, so all the Council's period contracts include them. Cost escalation adjustments are regularly applied to contract rates and prices.

NZTA co-investment

Council assumes that it will receive 51% of the cost of roading maintenance and renewal projects from NZTA over the 10-Year Plan, with the exception of Emergency works, which may attract a higher subsidy dependent on qualifying criteria.

State Highway street cleaning and some components of the urban drainage maintenance programme, which are subsidised at a co-investment rate of 30% of the total expenditure of street cleaning within 2m of the edge of carriageway is eligible for funding. The remaining 70% has to be fully funded by the Council. This is included in the financial forecasts.

The programme of work and the financial plan to fund this work have been prepared based on the current 2024 Government Policy Statement. This recognises that NZTA is operating in a constrained funding environment. The maintenance and renewals programmes have been held at minimum levels and linked to the ONF Levels of Service to reduce the risk of work not being funded by NZTA.

Asset data knowledge

It is important to note that the underpinning data, used and maintained in available databases, can include degrees of error or uncertainty. This is mostly due to the origin of some data from less robust, often historic data sources. The Data Quality assessment obtained from the Transport Insights website shows that the data captured for MDC can be used with a moderately high degree of confidence, as shown in section 2.14.1 in the Strategic Case.

However, there are gaps and lower levels of confidence within Council's asset register (AWM) for roading assets which could influence financial forecasts. These gaps have also been identified, including recommendations to improve these. This increases the risk over/under budgeting for the funding period as accurate information about the MDC assets are unknown.

Asset life

Assumptions have been made regarding the expected life of the assets.

Currently the remaining useful life is assigned when assets are valued using a standard table relating to construction dates and type of construction. Specifically, remaining useful life (RUL) is based on the total useful life of the asset less the age. Improvement has been identified (particularly with regard to MDC's structures portfolio), so it is more aligned with condition rather than the construction date which is susceptible to inaccuracies. If improvement is deferred, the risk of over/under budgeting for each funding period increases where less accurate information about MDC assets are unknown.

Identifying critical assets

Risk management provides the foundation for critical infrastructure protection. The ability to effectively identify critical assets is a crucial first step to any risk management process. Ensuring that a critical infrastructure asset identification methodology is complete, reproducible, documented, and defensible it is essential to enable cross-sector comparisons. The scope, approach and evaluation method are variables that can contribute to meeting these requirements. While several methodologies have been proposed in literature, no current methodology meets all the requirements. An MCA decision-making model that combines the strengths of existing methodologies is a promising approach as it can provide systematic solutions that address the gaps and challenges associated with critical infrastructure asset identification.

4.10.4 Evaluation

Risk evaluation is the process of comparing the results of the risk analysis with the risk criteria to determine whether the risk and/or magnitude is acceptable or tolerable. The Council will draw on the best practice principles outlined by NZTA to identify, analyse, evaluate, and treat risks. The Risk Management Process will develop a Risk Matrix of Likelihood (L) versus Consequence (C) which will allow the prioritisation of identified risk.

Likelihood scale

The likelihood (L) scale describes how likely or often an event is expected to occur. For physical assets, the likelihood of some events can be estimated by condition assessments. For other events such as natural disasters or political risks the likelihood of occurrence is more difficult to determine and probably even more difficult for non-technical people to understand e.g., a 1-in-100 year flood event.

The likelihood of occurrence and severity of consequences should be based on as much real data as possible; for example, local knowledge or recorded events such as maintenance records, weather events, etc. Some analysis may be required for verification.

The prime objective of this process is to apply a set of likelihood criteria which are also reasonable within the context of land transport activities. The likelihood scales help identify how often a particular event is expected to occur.

The descriptors shown below are provided as a guide to help rank the likelihood of occurrence of each risk.

Score	Likelihood	Descriptor
5	Highly Probable	The event is expected to occur e.g., 80% chance within the next 12 months
4	Probable	The event will probably occur e.g., 25% chance within the next 12 months or once in 4 years
3	Possible	The event might occur e.g., 10% chance within the next 12 months or once in 10 years
2	Unlikely	The event will probably not occur e.g., 4% chance within the next 12 months or once in 25 years
1	Rare	The event is not expected to occur e.g., 1-2% chance within the next 12 months or once in 50+ years

Figure 243 | Likelihood scale

Consequence scale

Consequences of an event are the impacts that it has on the social, environmental, or economic wellbeing of the community or Council. The consequence (C) scale is focused on a quantitative approach. Each of these risk areas are then assessed using the standard consequence levels, ranging from negligible to catastrophic.

The figure below shows a series of qualitative descriptors for levels of consequence for the key areas. They are not exhaustive but will help when considering the correct level with the view that Council is the Risk Owner.

Score	Consequence	Descriptor
5	Severe	Death and/or catastrophic effect on environment that may take longer than a year to restore and cost more than $1m. Regulator notification mandatory.
4	Significant	Life threatening injury or multiple injuries requiring admission to hospital and/or significant effect on environment that may take up to a year to restore and cost up to $1m. Regulator notification mandatory.
3	Moderate	Injury requiring admission to hospital and/or effect on environment that may take 1-2 months to restore and cost up to $20,000. Regulator notification mandatory.
2	Minor	Minor illness or injury requiring medical treatment (e.g., first aid) and/or minor effect on environment that can be cleaned up. Any potential damage remediation likely to cost less than $5,000. Regulator notification unlikely to be required.
1	Negligible	Illness or injury that doesn't require medical attention. No adverse effect on environment. Regulator notification not required.

Figure 244 | Consequence Scale

Risk matrix

After the likelihood and consequence factors have been determined, the level of risk is calculated by multiplying the Likelihood of Occurrence and Consequence Rating together.

$$Risk = Likelihood \times Consequence$$

The seriousness of risk is best categorised as a function of Consequence and Likelihood and involves selecting the most appropriate combination determined using the most current information. Risk categories from Low to Extreme are shown using a 'traffic light' system on the next page.

Council's risk management process requires an initial and revised risk assessment to determine the risk rating. The matrix on the next page shows how the Likelihood and Consequence scores are combined to yield a total risk score for an event.



Figure 245 | Risk Rating Matrix

When the assessment of risk is done without regard for any current risk mitigation or control method it produces the raw, untreated, or gross risk.

Once the gross risk has been established an assessment of the risk is completed to understand the existing mitigation / control methods. The risk is then re-assessed for likelihood and consequence, taking the current mitigation / control methods into account. This helps quantify the effectiveness of the controls and provide a residual risk rating.

4.10.5 Risk register

The Council is exposed to a number of risks arising from the operation of the road network. A Risk Register and Treatment Plan has been developed in alignment with AS/NZS ISO 31000:2009 Risk Management, Council's Corporate Risk Policy, and the RIMS Best Practice Guideline for Risk Management on Road Networks. The risks identified are shown in the table on the following pages.

Risk with current Controls												
Ref	**Risk Category**	**Risk**	**Source**	**Expected Consequences**	**Risk Area**	**(L)**	**(C)**	**Rating**	**Controls**	**(L)**	**(C)**	**Rating**
R1	Planning	Observed population growth is slower than demand forecasts predicted	Demand forecast based on inaccurate assumptions	Impact on financial ability to maintain infrastructure. Lower population will increase cost per property of delivering LOS.	Service Delivery Financial Decision Making	3	2	M	Council regularly reviews census data and monitor population growth, adjust investment accordingly. Develop a spatial plan to map population growth.	2	1	L
R2	Planning	Observed population growth is more rapid than forecasts predicted	Demand forecast based on inaccurate assumptions	Reduced LOS as additional demand is placed on infrastructure. Increased funding to service excess capacity	Financial Decision Making Service Delivery	3	3	M	Council regularly reviews census data and monitor population growth, adjust investment accordingly. Develop a spatial plan to map population growth.	2	1	L
R3	Planning	The impact of climate change will be more severe than predicted	Climatic changes in the Manawatū District are more extreme than predicted	Increased Infrastructure repair costs. Decreased LOS and safety. Impact on wellbeing and satisfaction of the community.	Financial Decision Making Health and Safety	4	4	M-H	Ensuring adequate insurance cover. Identify and mitigate high risk areas. Undertaking appropriate maintenance as a preventative measure.	2	4	M
R4	Management	The council will not receive emergency fund in a timely manner causing council to reprioritize	Recently requests to NZTA for emergency funds are taking months, even years to be paid.	Without timely processing of emergency event funding, council will be required to reprioritize budget at the cost of maintenance which will result in a drop of LOS. Reduced safety due to declining asset conditions.	Financial Decision Making Service Delivery	4	4	M-H	Anticipate extreme weather events and therefore request increased overall funding to provide a safeguard.	3	3	M

Risk with current controls												
Ref	**Risk Category**	**Risk**	**Source**	**Expected Consequences**	**Risk Area**	**(L)**	**(C)**	**Rating**	**Controls**	**(L)**	**(C)**	**Rating**
R5	Management	Cost escalations affecting affordability of necessary work.	Inflationary pressures such as material (steel, aggregate, etc) can affect the price of work	Increased cost to Councils. Unable to complete all necessary maintenance, renewals or rehabilitations in the FWP. Decreasing LOS. Increasing safety concerns.	Financial Decision Making Service Delivery	3	4	M-H	Budget monitoring and regular reporting. Careful contract (project) planning.	2	3	M
R6	Management	The total level of NZTA funding is reduced.	Changes to the NZTA funding model	Reduction in the level of funding will have a major impact on the council budgets and thus affordability of required maintenance and LOS. Decreasing ability to maintain and renew assets on the network will increase risk to Council. Increased customer dissatisfaction.	Financial Decision Making Service Delivery	2	5	M-H	The Council intends to maintain its awareness of any issues that impact on the level of NZTA funding. Funding for the changing needs and expectations of the community has been recognized in the 10-year plan.	1	5	M
R7	Physical Assets	Remaining useful life.	Due to limited data - useful life of an asset is more closely related to construction date rather than condition	Increased risk of over/under budgeting for the funding period as remaining useful life is unknown. Assets with declining LOS. Reprioritising funding to undertake unforeseen rehab/maintenance leaving less funding for FWP.	Asset & Project Management Service Delivery	4	4	M-H	Include condition assessments as the key indicator of remaining useful life where possible.	2	4	M

Risk with current Controls												
Ref	**Risk Category**	**Risk**	**Source**	**Expected Consequences**	**Risk Area**	**(L)**	**(C)**	**Rating**	**Controls**	**(L)**	**(C)**	**Rating**
R8	Management	General labour shortage, maintaining skills and abilities, maintaining local knowledge	Difficulty in attracting, remunerating and retaining key staff	Cost Impact. Impact on continuity of planning decision-making.	Service Delivery	3	4	M-H	Monitor labour market and work to maintain or enhance the working environment at MDC.	3	4	M-H
R9	Management	Managing Cash Flow	Not spending when budgeted causing cash flow issues	Increase costs.	Financial Decision Making Leadership and Governance including Reputation	3	4	M-H	Budget monitoring and regular reporting.	2	4	M
R10	Planning	Road closure due to incidents	Climate change events Accidents	Delays in planned projects. Costs to emergency fund. Environmental damage. Economic impact. Social Impact. Increase in safety risks. Disruption to journeys. Community Dissatisfaction.	Environment Asset & Project Management Service Delivery Management Leadership and Governance Reputation	4	5	H	Biennial review of agreed detours. Identify key routes, roads and areas prone to slips. Emergency response plans and process in place with contractors so community impact is reduced. Work with NZTA on accident hot spots. Improvements take into account modern safe road design. Safety through maintenance and renewals.	2	5	M-H

Risk with current Controls												
Ref	**Risk Category**	**Risk**	**Source**	**Expected Consequences**	**Risk Area**	**(L)**	**(C)**	**Rating**	**Controls**	**(L)**	**(C)**	**Rating**
R11	Planning	Not replacing depreciating assets	Funding	Reduction in asset value. Reduction in condition of asset. Reduction in service levels.	Asset & Project Management Financial Decision Making	3	5	M-H	Monitor impact on road roughness and condition. Investigate other external funding sources. Budget for condition assessments. Plan and undertake renewals.	2	5	M-H
R12	Operational	Changing vehicle needs	Increased usage of VDAM, 50 Max and HPM vehicles	Impact on bridges and road use and loads. Cost of upgrading bridges and key roads.	Asset & Project Management Service Delivery Financial Decision Making	3	4	M-H	Monitor changing requirements of SH. Regulate permitting through NZTA. Consolidate HV traffic to key routes.	2	4	M

4.11 Monitoring and review

The activity management team will monitor contract delivery and the identified risks on the register (in accordance with NZTAs minimum standard Z/44 – Risk management, Table 3.2). Risk owners will be responsible for ongoing monitoring and review of risks, the conduct and effectiveness of associated treatments and currency of related data. Council will be responsible for monitoring the content of the risk register to ensure currency of data and the identification and notification of risk owners needing to update data. Contract risk reviews will be conducted to ensure the ongoing validity of risks identified, exposure levels, and progress and effect of associated treatment actions. Risk reviews will be attended by members of the delivery team deemed appropriate by the activity management team to maximise outcomes.

4.11.1 Developing effective performance measures

Council addresses their Customer Levels of Service using ONF Performance Measures.

The focus shifts from technical solutions to customer outcomes, and because of this the performance measures do not prescribe specific operational tasks. Overall, they can measure Council's efficiency and effectiveness at meeting the Levels of Service. The Performance Measures are a key tool for Council when building its business cases for national funding.

Transport Insights specifically reports on the ONF measures, and is useful by Council to view its performance and compare with other Approved Organisations.

NZTAs transport data website publishes a range of financial and non-financial information related to the performance of its transport investments. This data is collected as part of a statutory annual achievement return process and is published as part of the agency's commitment to open government data. These tools were developed several years ago and are currently maintained with data updates only. NZTA keeps them under review and will remove any tools if they are no longer required. Most of the metrics reported are independent of ONF measures.

Whilst NZTA supplied data is not specific to the ONF measures, it has proven to be a useful information source over many years for roading Engineers in particular.

The team responsible for transport data is involved in Transport Insights decision-making and its future management and governance through REG. As a result, the agency is well placed to understand if or when opportunities will arise for reducing the apparent duplication in systems and tools referred to.

To fully replace the transport data tools would require a significant expansion of the scope of Transport Insights. It is likely that the tools will be viewed as complementary to each other for the foreseeable future.

4.11.2 Evaluating options and setting performance targets

As the evidence base grows, the ONF and its performance measures enable us to benchmark the performance of each RCAs network. Council is able to easily identify varying levels of outcome across the country, and inconsistency of costs.

The ONF was designed to standardise the performance of our roads throughout New

Zealand, aiming to address historical inconsistencies, and promote economic growth.

This can only be achieved if all RCAs are monitoring and measuring their roads with the same tools and standards consistently over time. These performance measures support that consistency and have been developed by subject experts from REG, a collaboration between Local Government New Zealand (LGNZ) and NZTA. When used with Transport Insights, they are a significant resource to help asset managers better understand their network and tell their investment story.

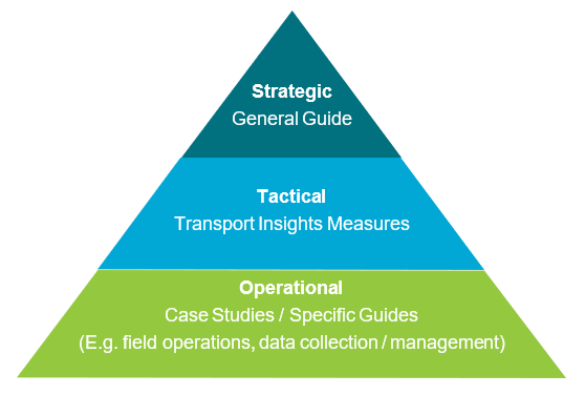


Figure 246 | Strategic, tactical & operational context

Council uses the performance measures when developing its business cases. When using the performance measures, it is important to remember that while there is an element of compliance, they are intended to form the backbone of a thinking process. The measures complement and interact with each other.

Council's investment story is derived by considering the data across the network and in the national context, rather than focusing on individual performance measures in isolation.

4.12 Improvement plan

Improvement items are identified as general deficiencies that arise during the course of Asset Management and Contract Management activities. Other items can be determined through attendance at REG workshops, which identify regional and national improvement opportunities.

REG also provides a framework around Activity Management Improvement Planning, and has been developed using the following six pillars:



The table on the following pages lists the improvement projects and service or data gaps, allocated to each relevant pillar:

SYSTEMS				
	Title	**Activity**	**Current status & priority**	
S1	ONF Differential Level of Service (dLoS)	Incorporate the dLoS to improve national alignment and value for money linked to business systems.	Interim dLoS for GT and Freight classifications incorporated into AMP. Multi-modal (PT, walking & cycling) dLoS under development.	Medium
			Future status, identified improvements & timeframe	
			Business / AMP systems fully integrated with dLoS definitions and use of performance measures.	Dec-2029
			Improvement approach & resources (lead in bold)	
			Work collaboratively with other RCAs and NZTA. Review data sources to determine when information related to dLoS is available.	**Roading Programme Manager**, Asset Coordinator
EVIDENCE				
	Title	**Activity**	**Current status & priority**	
E1	Asset condition status	Improve asset data knowledge for drainage assets	Accurate age or condition data is variable or limited for particular types of drainage assets.	High
			Futures status, identified improvements & timeframe	
			Completeness and accuracy of asset data obtained, allowing development of a robust drainage maintenance / renewal programmes.	Jun-2028
			Improvement approach & resources (lead in bold)	
			Manage, gather and adapt asset information to provide total network coverage. Engage external resource if necessary.	**Roading Manager**, Roading Programme Manager, Operations Manager, Asset Coordinator
	Title	**Activity**	**Current status & priority**	
E2	Asset condition status	Improve asset data knowledge for network services assets	Accurate condition data is variable or limited for particular types of network services assets.	High
			Futures status, identified improvements & timeframe	
			Completeness and accuracy of asset data obtained, allowing development of a robust streetlight maintenance / renewal programmes.	Jun-2028
			Improvement approach & resources (lead in bold)	
			Manage, gather and adapt asset information to provide total network coverage. Engage external resource if necessary.	**Roading Manager**, Roading Programme Manager, Operations Manager, Asset Coordinator

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SERVICE DELIVERY				
	Title	**Activity**	**Current status & priority**	
SD1	Maintenance contract	Rollover of, or procurement of new, transport / roading contract(s).	Current contract period ends in June 2027	High
			Future status, identified improvements & timeframe	
			Rollover confirmed or new contract(s) to be procured for the next funding period (2027-2030) and beyond. Clear expectations of Contractor in maintaining the network at an appropriate Level of Service.	Apr-2027
			Improvement approach & resources (lead in bold)	
			Integrate Levels of Service for road classifications between AMP and Road Maintenance Contract. Obtain internal approvals and develop productive working relationships.	**Roading Manager** Roading team, ELT, Elected members
PEOPLE / CULTURE				
	Title	**Activity**	**Current status & priority**	
P1	Team restructure, enhanced internal capacity	Reallocation of staff duties, recruitment of additional resource to reduce external reliance	Preliminary framework visualised.	Medium
			Future status, identified improvements & timeframe	
			Realigned team in place.	Jun-2027
			Improvement approach & resources (lead in bold)	
			Individual capability and core competencies developed. Gaps identified and resource obtained.	**Roading Manager** HR department, Roading team

Figure 247 | Improvement Plan


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