KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Supplementary items to the following meeting:

Meeting	Kaipara District Council
Date	Wednesday 28 February 2018
Time	9.00am
Venue	Northern Wairoa War Memorial Hall (Dargaville Town Hall), 37 Hokianga Road, Dargaville

Open Agenda: Supplementary Items

Volume 3

Linda Osborne
Administration Manager

Membership

Chair:	Mayor Jason Smith
Members:	Deputy Mayor Peter Wethey
	Councillor Anna Curnow
	Councillor Victoria del la Varis-Woodcock
	Councillor Julie Geange
	Councillor Libby Jones
	Councillor Karen Joyce-Paki
	Councillor Jonathan Larsen
	Councillor Andrew Wade

KAIPARA DISTRICT COUNCIL

Kaipara District Council

Asset Management Plan 2018/2048

The Provision of Roads and Footpaths

January 2018

Status: Draft

Kaipara te Oranganui

KAIPARA DISTRICT

Two Oceans Two Harbours

QUALITY STATEMENT

Project Manager	Project Technical Lead	
Garry McGraw	Garry McGraw	
Prepared By		
Garry McGraw	…….....	31/08/2017
Checked By		
Reviewed By		
	…….....	……/……/……
Approved For Issue By		
	…….....	……/……/……

42 Hokianga Road
Private Bag 1001
Dargaville 0340
New Zealand

Telephone: 64 9 439 3123

FAX +64 9 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name			
			Prepared by	Checked by	Reviewed by	Approved by
1	31/08/2017	Draft for loading to NZTA TIO	GJMcGraw	OPUS		
1a	13/09/2017	Revision(a) incorporating all sections	GJMcGraw			
1b	11/10/2017	Revision to Section 5 adding in issues and problem table. Revision to Section 2.4 Work category summary costs. Included Safety item 18 into AMP Improvement Plan.	GJMcGraw			
1c	14/10/2017	Added in Section 6.7 Asset Management, Section 6.8 on Low cost Low risk, Safety, and Section 6.9 Education	GJMcGraw			
1d	19/10/2017	Added Appendix E Communities at Risk Road Crashes and Appendix F First Coat Seals register. Section 1 added customer value statement.	GJMcGraw			
1e	21/10/2017	Added pages 48-51 under Procurement Strategy to update new contract philosophy.	GJMcGraw			

Contents

List of Tables

Table of Figures

1 Executive summary

1.1 Introduction

The purpose of this Asset Management Plan (AMP) is to:

Provide Kaipara District Council (KDC) a strategic and long term management approach for the provision, maintenance, renewal and construction of its Transport assets.

The purpose of the transport network is to:

'Improving our customers' journey experience requires an understanding of their needs as our customers' needs are different depending on their mode of travel. We have identified the key aspects of our modal customers' journeys that they value most. These values are most likely to encourage our customers to shift to a certain mode of travel or use that mode of travel more often. Regardless of the mode of travel, our customers share similar objectives in terms of safe, direct and timely journeys with minimum disruption. At times, however, our customers compete for the same road space which results in conflict with each other, particularly where our roads and streets are narrow, crowded or congested.'

The AMP provides the linkage to the key elements of Council's transport network assets. This includes the legislative framework, links to Community Outcomes, Policies and Strategy, the Levels of Service (LOS) and performance measures from both the community measures and the One Network Road Classification (ONRC) measures along with growth demand. These are then reflected in the Operations and Maintenance contracts to allow the outcomes to be met and realised.

Asset performance, condition, consumption rates and value are examined from a business case and value for money (VfM) philosophy. The Financial and Lifecycle Strategy is presented to define the investment planned to ensure that a continuous service is provided to customers now and into the future at the agreed LoS. This is supported by the newly developed Sealed Road Maintenance Management Plan, Unsealed Road Strategy, the Forestry Harvest Impact Statement and the Maintenance Intervention Strategy along with other strategic documents.

This Asset Management Plan (AMP) focuses upon the next 10 years in detail, to facilitate and demonstrate alignment with the Long Term Plan, but also has a longer term 30 year focus on asset management planning.

The AMP has now embedded the processes and concepts from the ONRC introduction being Business Case Approach (BCA), Investment Logic Mapping (ILM), and Critical Thinking along with the National standard Hierarchy for classifying the Road Networks in preparation for the 2018/2021 National Land Transport Programme (NLTP).

1.2 Key investment risks and management measures

Risk	Management measure
Road safety – safer journeys development and how this will affect the network.	Develop a "Safety in Design" approach to allow incremental safety improvements to the network through the programme renewals and through the Minor Safety improvements.
Asset data – Increased data collection to improve understanding and knowledge of the network to give more accurate assessments of renewals and maintenance programmes.	Collect and analyse network behaviour and condition data that will underpin greater knowledge and understanding to provide for smarter decision making processes in the Forward Planning.
Distance from aggregate sources – the availability of the right quality of material within a reasonable distance affects the ability to minimise the cost of efficiently managing the unsealed network.	Council is undertaking Aggregate Blend trials to understand if there is an opportunity to improve the wearing ability and therefore lifecycle of the unsealed pavement surface. If successful this will reduce the reliance annually on large amounts of aggregate and also reduce the cost.
Funding Assistance Rates (FAR) review – Clarity around the future trends of Government funding of local roads and how the distribution may impact on local share costs to manage the network.	Develop and foster a close working relationship with the Procurement and Investment (P&I) local and regional representatives to develop a transparent partnership. Include the GPS VfM statements to drive innovation and delivery of the right product, at the right time, at the right place and at the right "price".
Community's ability to fund the "local Share" through the rating process.	Council needs to have a matrix that will effectively manage the increasing LoS demands against the ONRC LoS and against the funding available. Also look for new technologies, initiatives and opportunities that will mean that the $ will go further.
The inclusion of the ONRC Customer Outcomes may reduce current LoS on low volume roads.	Develop through the Operations and maintenance contract an agreed set of performance indicators based on the ONRC hierarchy and communicate this to the users.

1.3 History

A number of the initiatives that were identified and highlighted in Council's Long Term Plan 2015/2025 and the NZ Transport Agency (NZTA) Investment Performance Audit completed 23-26 February 2016 have been triggered with progress as below:

Initiative	Progress
Review the activities we deliver and LoS.	This commenced with the development of Activity Plans for all Council's activity areas.
Review the way in which we deliver our services through the Service Delivery and Capability Review.	The first phase of this review has been completed and is progressively being implemented. The incorporation of Kaipara's Transport Team into the Northland Transportation Alliance (NTA) has been a major change for the Council delivery of transport activities. This has given the opportunity to tap into a wider range of skillsets and resources.
Reviews of our AMPs.	The development of this AMP is in response to the review of AMPs by NZTA under their Audit process and the requirements under the ONRC transition plan. Also the need to build the justification and improved understanding of the level of investment in community infrastructure for the 2018-2021 NZTA co-funding application.
Review of our investments.	Preliminary work has been completed. Further work is required to better understand actual costs down to a per road detail compared to an agreed LoS. This will give us a broader strategic picture of providing the network at the current costs and be able to analyse the VfM statements.

1.4 Key levels of service (LOS)

- Number of serious and fatal accidents caused by either road design or condition factors;
- Road condition (smoothness): measure by NASSRA and based on ONRC Hierarchy;
- Road condition (Pavement Integrity Index) PII: Measured by PII and based on ONRC Hierarchy;
- % of sealed network that has been resurfaced (Annual) now a redundant measure as resurfacing is based on need;
- Length of Unsealed Network that has been graded annually: (SC): 140km, (A): 1200km, (LVA): 750km;
- Footpath condition: resident satisfaction survey, 73% satisfied; and
- Service request response Compliance: 90% complete within timeframe.

1.5 Future demand and the impact of the change in demand

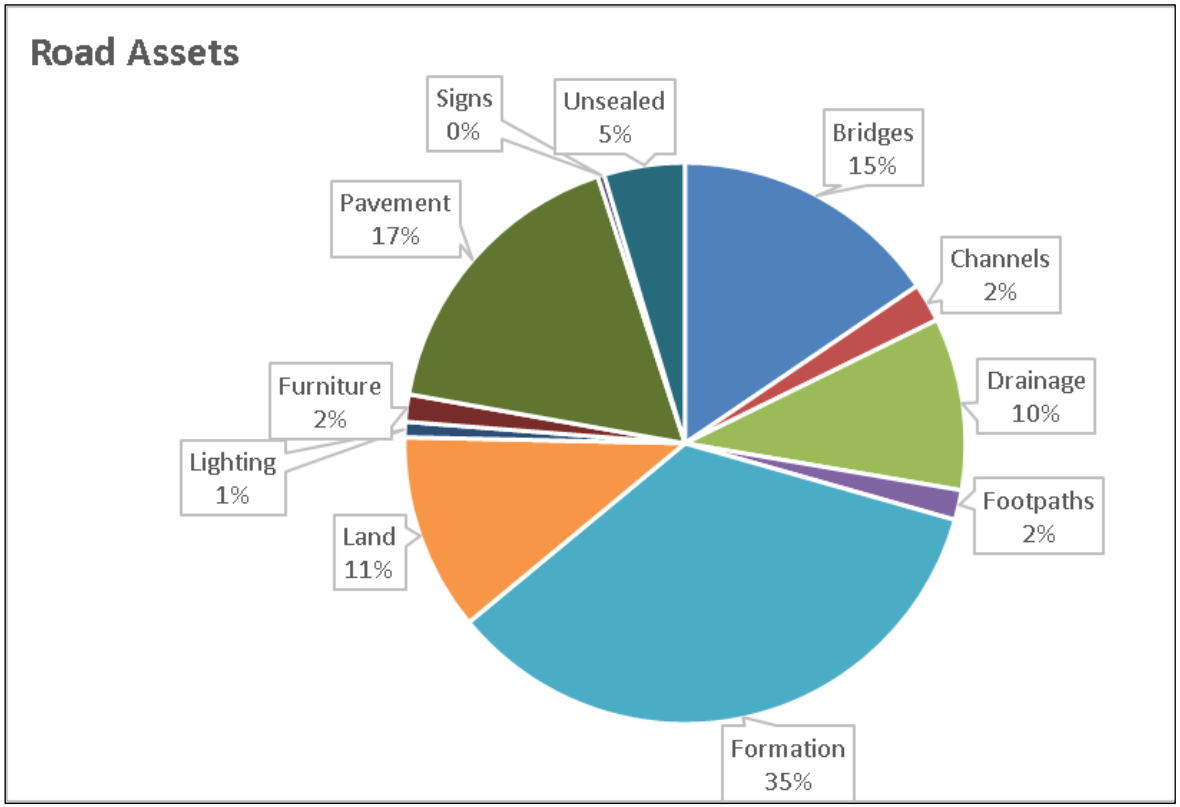
Demand	Impact
Increased tourism traffic. The "Twin Coast Discovery route" has changed the focus from A to B point travel to the travel being an enjoyable part of the journey.	Increased need for rest pull-off sites, photograph opportunity sites, higher level of destination and route signing (wayfinding).
Increased demand for tourist cycling options within the existing road network and also off-road network.	Increase in carriageway width where possible and also an increase in shared pathway facilities.
6-10 year continuation of exotic forest harvesting creating high volumes of 50MAX and High Capacity Vehicles (HCV) on the low volume network.	The effect of this use is an unprecedented increase in the consumption of the road surface reducing the presumptive lives.
Increase in development and construction in the east coast settlements is resulting in an increase of heavy vehicles carting construction material beyond what was predicted.	This activity is increasing the consumption on the networks highest capacity roads significantly.
Increased accessibility for 50MAX and High Productivity Motor Vehicles (HPMV) to more of the network as a Government efficiency measure for the freight industry.	The impact on the local government network is to require upgrades to a number of bridges and structures which has a high cost involved along with low volume narrow road re-alignment and sight line improvements.

1.6 Asset Group and Classes

The Provision of Roads and Footpaths AMP includes the following asset groups:

- Bridges, large culverts, retaining walls and other structures;
- Sealed pavements;
- Unsealed pavements;
- Drainage facilities;
- Corridor facilities (streetlights, guard rails, sight rails, carparks);
- Footpaths / walkways, cycling facilities;
- Traffic Services (signs, delineation and roadmarkings, edge marker posts, RPM's); and
- Land.

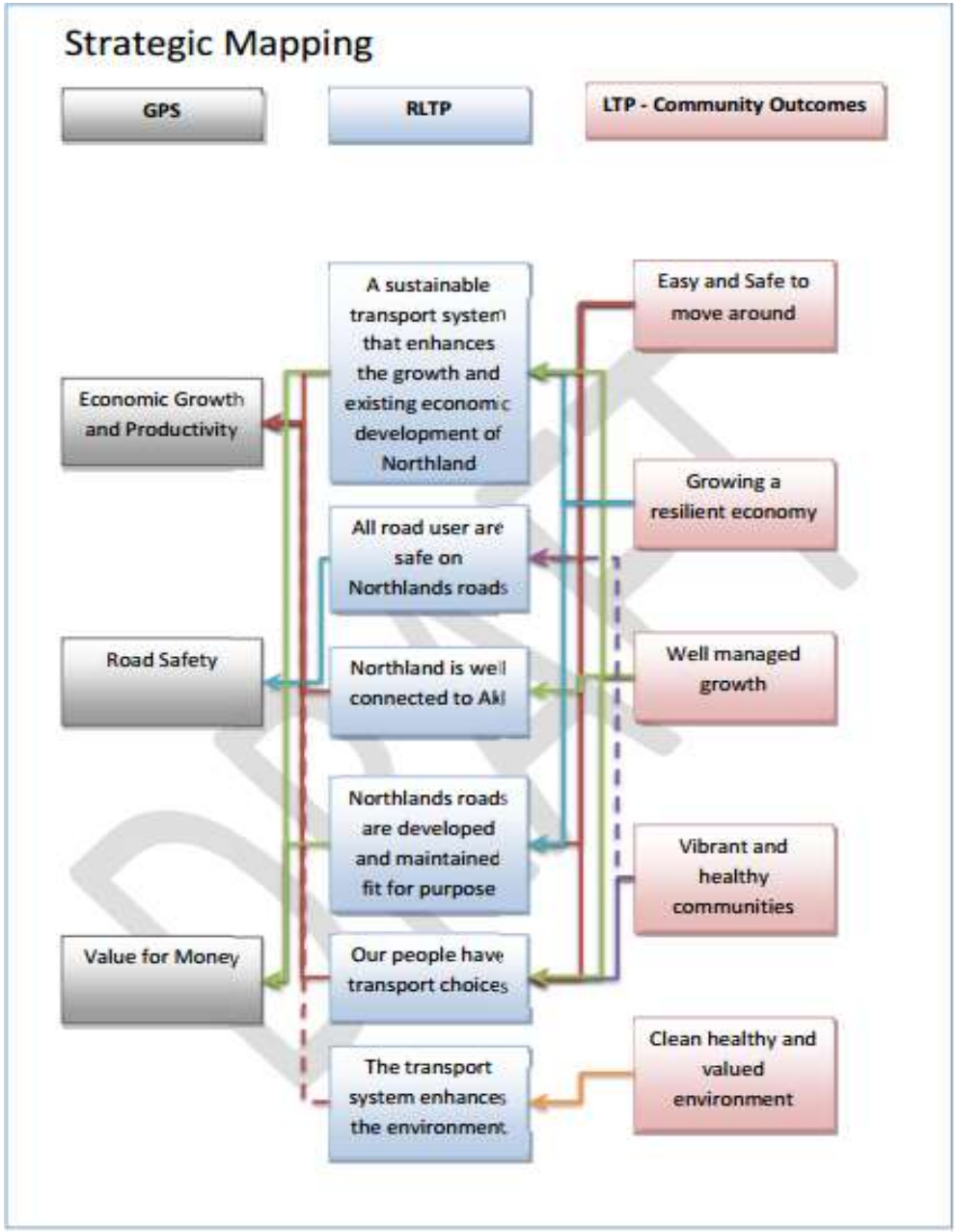
Further details are as on the following page.



Asset	Quantity	Replacement Cost
Bridges (Nº)	348	$91,800,044
Channels	1,845 km	$13,250,800
Drainage	139 km	$58,748,155
Drainage Structures (Nº)	14,462	
Footpaths	91 km	$10,190,923
Land	3,234 ha	$67,155,752
Lighting (Nº)	1,184	$5,250,095
Furniture (Nº)	railings, retaining walls, traffic facilities	$9,289,211
Signs (Nº)	9,459	$2,232,010
Pavement	448 km	$101,571,436
Unsealed	1,125 km	$27,573,035
Formation	1,573 km	$204,776,973
		$591,838,434

1.7 Strategic Environment

This section includes the extent of each asset; its age, capacity, criticality, condition, demand, performance, history, planned maintenance and renewals along with any improvements proposed. The detail that each asset is examined in is determined from its criticality to the community and Council. Assets such as sealed, unsealed pavements and bridges make up the bulk of the road network assets by replacement value and criticality, therefore attracting the highest level of analysis. Currently the Kaipara road network has a very high percentage of unsealed road (72%) and a very high percentage of Low Volume/Access roads (79%). This is a trigger to manage and minimise the investment on these roads so that they attract the appropriate co-funding from the Government that give our more remote communities confidence that the road network is resilient and available but are not overly invested in.


Strategic Mapping
GPS
RLTP
LTP - Community Outcomes
Economic Growth and Productivity
Road Safety
Value for Money
A sustainable transport system that enhances the growth and existing economic development of Northland
All road user are safe on Northlands roads
Northland is well connected to Akl
Northlands roads are developed and maintained fit for purpose
Our people have transport choices
The transport system enhances the environment
Easy and Safe to move around
Growing a resilient economy
Well managed growth
Vibrant and healthy communities
Clean healthy and valued environment

1.8 The Services We Provide

The key drivers of asset management planning include legislative requirements and customer demands. The Local Government Act 2002 (sub part 1) states that the purpose of local government is:

- to enable democratic local decision-making and action by, and on behalf of, communities; and
- to meet the current and future needs of communities for good quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.

In the Act, good quality, in relation to local infrastructure, local public services and performance of regulatory functions, means infrastructure, services and performances that are:

- efficient;
- effective; and
- appropriate to present and anticipated future changes.

The Local Government Act 2002 (11A) requires the following core services to be considered in performing its role. In performing its role, a local authority must have particular regard to the contribution that the following core services make to its communities:

- network infrastructure;
- public transport services;
- solid waste collection and disposal;
- the avoidance or mitigation of natural hazards; and
- libraries, museums, reserves, recreational facilities, and other community infrastructure.

1.9 Activity Management Practices

The asset management activity is divided into a number of common areas, being:

- Redevelopment of current AMP, taking into consideration the business case approach, VfM statement and investment logic mapping. This will drive best practice decision-making and fit-for-purpose programmes;
- Development and implementation of the lifecycle management plans for the major assets;

- Development of the operational management plans;
- Delivering the condition assessments of major assets and the long-term analysis of this data;
- The management of Council's "RAMM" database which holds all the current and historic data in regards to the road network (One place of the Truth) and building the 10 year renewal programme from this information. The types of data and systems include physical field condition assessments (bridges, culverts, retaining structures, guard rails etcetera), traffic studies and counts, high speed data collection on the sealed network of all potholes, cracking, rutting, road deformation, surface texture and full video. The unsealed network has a continual SCALA penetrometer survey completed which will eventually cover the whole unsealed network giving the current depth of running course metal, current depth of structural formation and an indicator of current strength. The detailed assessments of the data is completed by using such tools as JUNO FIT, dTIMS, RAMM, spreadsheet analysis etc. through the NTA based in Kaipara;
- Corridor management such as road opening notices, road closures for events, traffic management plans, corridor access requests, overweight and over-dimension permits is also managed through the NTA; and
- The operational management plans incorporates:
  - the Sealed Road Maintenance Management Plan (2017);
  - the Unsealed Road Strategy (underway) 2017;
  - the Maintenance Intervention Strategy; and
  - bridge and major culvert renewals and component replacement programme.

1.10 Financial Management

The road and footpath activity is funded through subsidies provided by NZTA, Council's general rates and fees, charges and targeted rates (forestry). Summarised below are the main categories of expenditure. Figures provided from the NCS Performance module.

WC	Activities/Programmes	2017/2018 Budget	NZTA Share	Council Share
Local Road Maintenance				
111	Sealed pavement maintenance	$1,212,311	$739,510	$472,801
112	Unsealed pavement maintenance	$2,454,000	$1,496,940	$957,060
113	Routine drainage maintenance	$521,457	$318,089	$203,368
114	Structures maintenance	$265,850	$162,169	$103,682

WC	Activities/Programmes	2017/2018 Budget	NZTA Share	Council Share
121	Environmental maintenance	$516,516	$315,075	$201,441
122	Traffic services maintenance	$746,425	$455,319	$291,106
131	Level crossing warning devices	$10,225	$6,237	$3,988
151	Network and asset management	$1,462,175	$891,927	$570,248
211	Unsealed road metalling	$2,124,510	$1,295,951	$828,559
212	Sealed road resurfacing	$1,164,253	$710,194	$454,059
213	Drainage renewals	$409,852	$250,010	$159,842
214	Sealed road pavement rehabilitation	$2,898,090	$1,767,835	$1,130,255
215	Structures component replacements	$836,267	$510,123	$326,144
222	Traffic services renewals	$189,572	$115,639	$73,933
	Subtotal	**$14,811,503**	**$9,035,018**	**$5,776,486**
Investment Management (including Transport Planning)				
3	Activity Management Plan	$50,000	$30,500	$19,500
Road Safety Promotion				
432	2015/2018 High Strategic Fit	$105,000	$64,050	$40,950
432	2015/2018 Medium Strategic Fit	$20,000	$12,200	$7,800
	Subtotal	**$125,000**	**$76,250**	**$48,750**
Local Road Improvements				
341	Minor improvements 2015/2018 (includes LED conversion)	$4,761,408	$2,904,459	$1,856,949
357	Resilience Improvement 2015/2018	$820,000	$500,200	$319,800
	Subtotal	**$5,581,408**	**$3,404,659**	**$2,176,749**
	Grand Total	**$20,567,911**	**$12,546,426**	**$8,021,485**
Unsubsidised Works				
	Footpath Maintenance	$91,000	$0	$91,000

2 Introduction

2.1 Purpose of the Plan

This AMP sets out how Kaipara District Council (KDC) provides the community and other users with the transport infrastructure required and agreed to meet the community objectives in the Long Term Plan, meet the requirements under the Local Government Act to provide core services. Also set out in this Plan is how we will measure our success, quality and cost of these services are provided by KDC. This depends on the LoS determined by the community and NZTA through the ONRC system.

Key stakeholders in the Plan

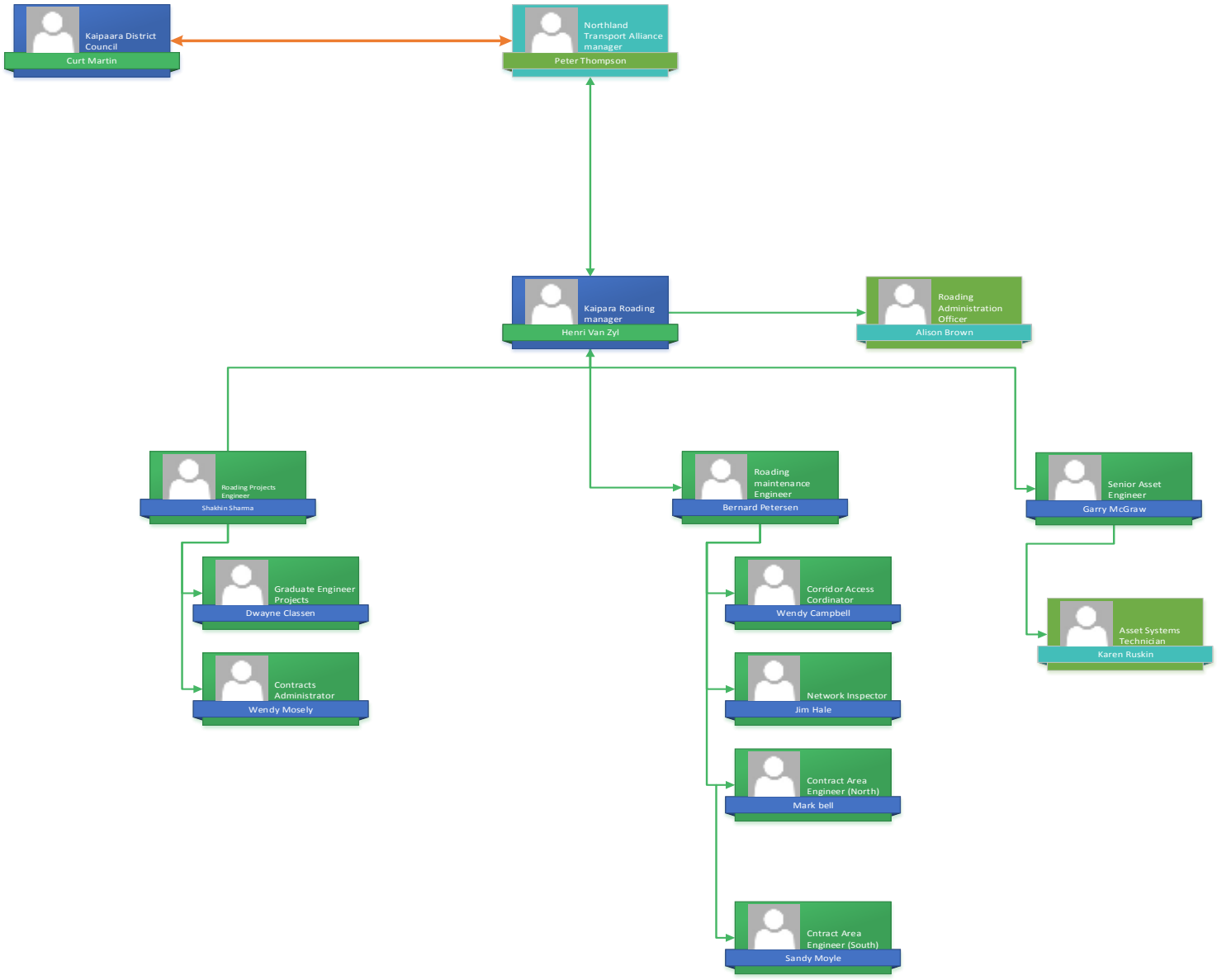
- NZTA (Investor) 61%;
- Ratepayers (Investor) 39%;
- Office of the Auditor-General (Government Auditor); and
- New Zealand Government (Ministry of Transport, Ministry of Business and Innovation and Ministry of Local Government).

Key Customers of the Service

The key customers/clients, who are the direct users of the district's roads, footpaths, cycleways, bridges, are KDC ratepayers, residents, domestic and international tourists, public transport, school bus services, freight industry, Police, fire authorities, ambulance, motorsport industry, community events, road cyclists, farming community, sporting clubs, community groups.

The transport assets are strategically managed by KDC in-house technical staff supported by professional service providers when required for specialist activities. The physical operations of the network is managed in-house and carried out through a series of Contracts. These are designed to deliver the LoS agreed.

Organisation structure:



2.2 Plan Framework

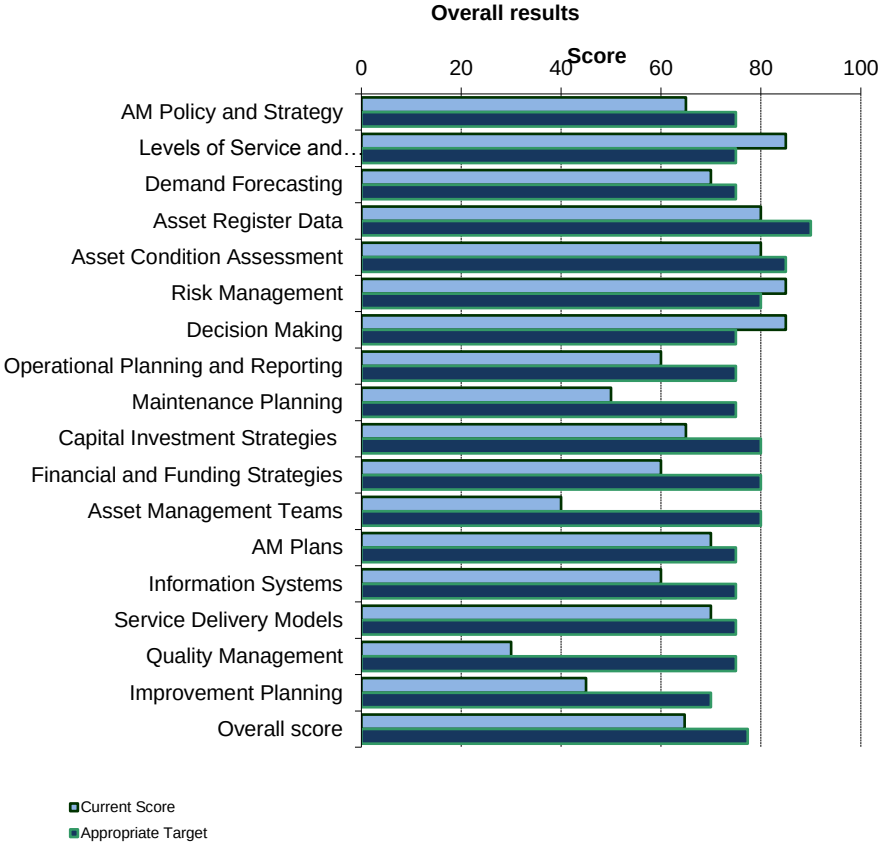
Key elements of the Plan

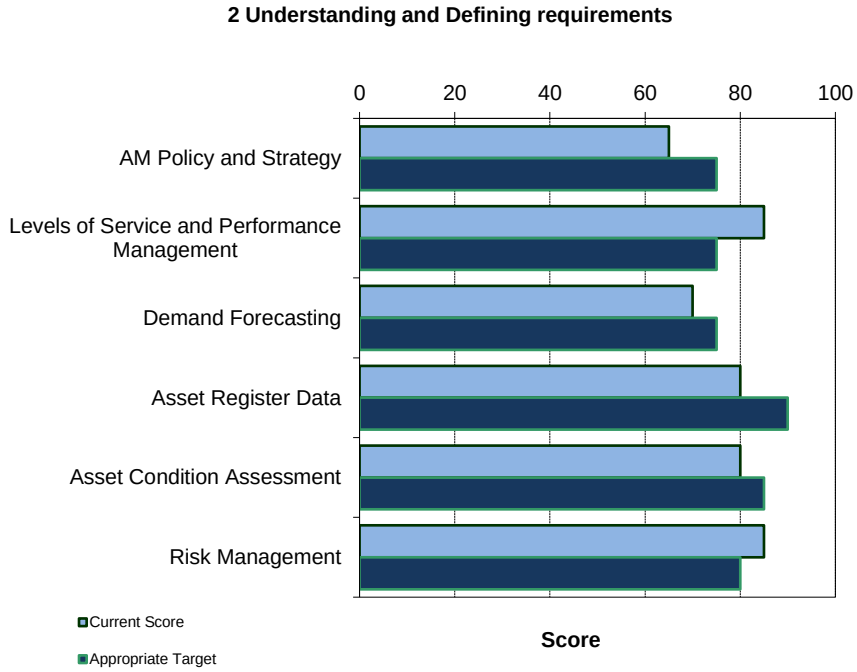
Key issues:

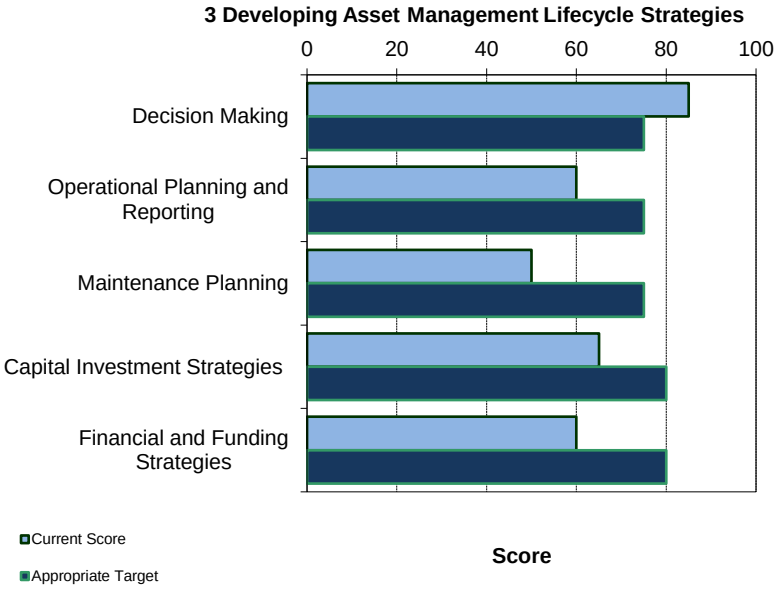
- Road safety – safer journeys development and how this will affect the network;
- Asset knowledge – continue to improve asset data to give more accurate assessments of renewals and maintenance programmes;
- Distance from aggregate sources – the availability of close sources affects the cost to manage the network;
- Funding Assistance Rates (FAR) future reviews;
- Changing demand and a change to larger freight vehicles impacting on the lower classes of roads;
- Higher LoS expectation from tourists and people moving to the Kaipara from large metropolitan areas;
- Changing in demographics on our eastern coast will increase the numbers of retired and semi-retired people requiring different modes of transport; and
- Acceptance of unsealed roads diminishing.

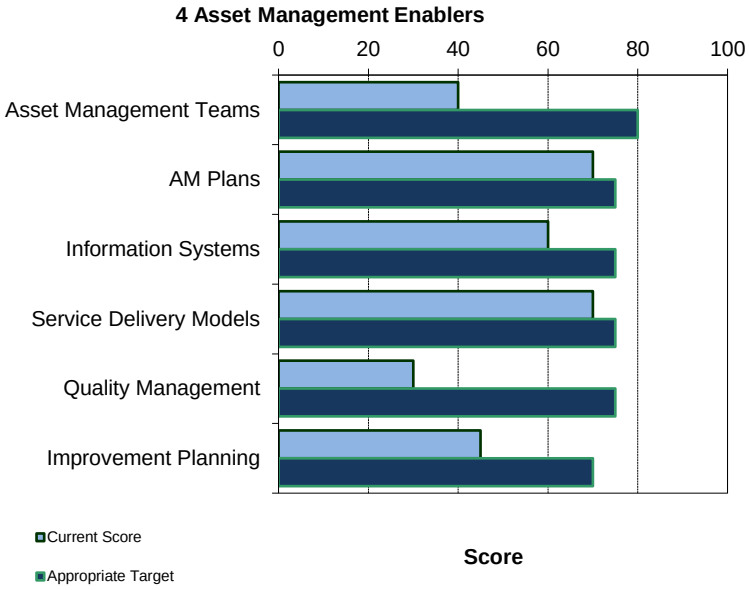
2.3 Sophistication/limitations of this Plan

The below graphs are the New Zealand Audit office assessment of the current/previous Kaipara AMP in the context of the IIMM manual. They indicate a satisfactory level of completeness for LoS, risk management, decision-making but has room for improvement on data.






3 Developing Asset Management Lifecycle Strategies
0
20
40
60
80
100
Decision Making
Operational Planning and Reporting
Maintenance Planning
Capital Investment Strategies
Financial and Funding Strategies
Current Score
Appropriate Target
Score


4 Asset Management Enablers
0
20
40
60
80
100
Asset Management Teams
AM Plans
Information Systems
Service Delivery Models
Quality Management
Improvement Planning
Current Score
Appropriate Target
Score

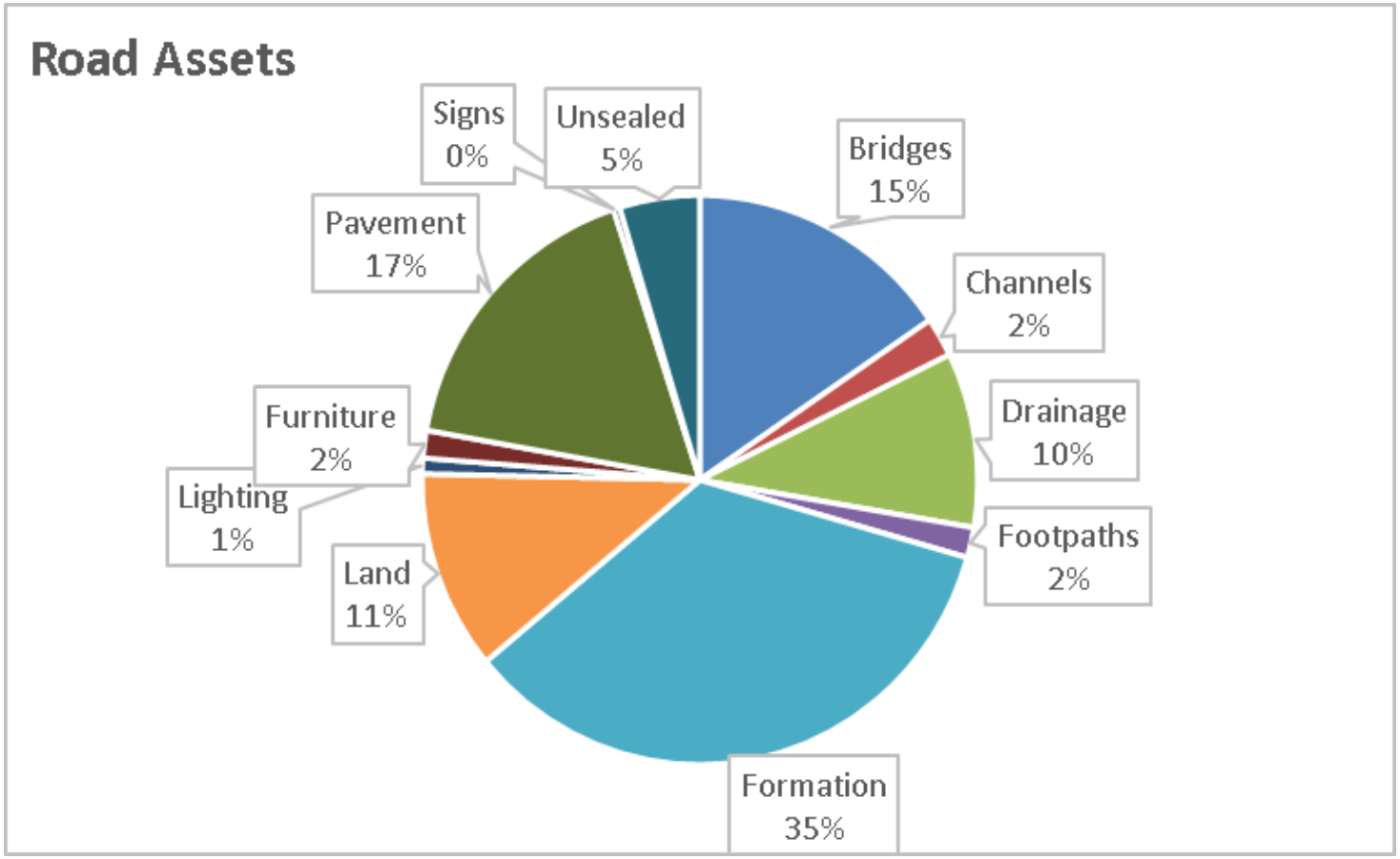
2.4 Major programmes and costs

Work Category Summary									
Phase	**Status**	**2017/2018 FAR**	**2018/2019 $**	**2019/2020 $**	**2020/2021 $**	**Total 2018/2021 $**	**Total 2015/2018 $**	**% change**	
111 Sealed pavement maintenance	Draft		1,800,000	1,800,000	1,800,000	5,400,000	4,416,708	22.3%	To cater for the new proposed grading cycle and the adding of top surface to allow for shape correction.
112 - Unsealed pavement maintenance	Draft		2,200,000	2,200,000	2,200,000	6,600,000	8,170,807	-19.2%	Allow for crack-seal programme and reduction due to renewals catch-up.
113 - Routine drainage maintenance	Draft		650,000	650,000	650,000	1,950,000	1,666,404	17.0%	Increase to cater for improved maintenance on side drains.
114 - Structures maintenance	Draft		250,000	250,000	250,000	750,000	692,870	8.2%	Small increase to allow for increase in damage to narrow bridges by increased freight movements.
121 - Environmental maintenance	Draft		520,000	520,000	520,000	1,560,000	1,546,319	0.9%	No change.
122 - Traffic services maintenance	Draft		720,000	710,000	690,000	2,120,000	2,130,325	-0.5%	Reduction due to LED programme, but slight increase to cover safety sight lines to signage.
131 - Level crossing warning devices	Draft		12,000	12,000	12,000	36,000	28,338	27.0%	Increase dependa+7452nt on the use of the rail network.
151 - Network and asset management	Draft		1,300,000	1,300,000	1,300,000	3,900,000	4,364,796	-10.6%	Decrease due to level of in-house capacity.
Subtotal for road operations and maintenance			7,452,000	7,442,000	7,422,000	22,316,000	23,016,567	-3.0%	Showing a general reduction in maintenance.
211 - Unsealed road metalling	Draft		2,500,000	2,500,000	2,500,000	7,500,000	5,002,815	49.9%	Increase to cater for pavement strength and depth improvements on the secondary collectors and those minor roads carrying freight.

Work Category Summary									
Phase	**Status**	**2017/2018 FAR**	**2018/2019 $**	**2019/2020 $**	**2020/2021 $**	**Total 2018/2021 $**	**Total 2015/2018 $**	**% change**	
212 - Sealed road resurfacing	Draft		2,200,000	2,300,000	2,100,000	6,600,000	3,126,069	111.1%	Major enhanced increase to allow for catch-up on the "First Coat" seal deficit.
213 - Drainage renewals	Draft		800,000	800,000	800,000	2,400,000	1,290,099	86.0%	Increase to catch-up with under size/capacity pipes on primary and secondary class network.
214 - Sealed road pavement rehabilitation	Draft		1,400,000	1,400,000	2,370,000	5,170,000	7,664,325	-32.5%	Reduction due to better information and understanding of network, Modelling and evidential site visits.
215 - Structures component replacements	Draft		750,000	750,000	750,000	2,250,000	821,025	174.0%	Increase to catch-up with damaged one lane bridge components.
222 - Traffic services renewals	Draft		175,000	175,000	175,000	525,000	527,461	-0.5%	Slight reduction due to reduced light replacement which may be set of with a better roadmarking programme.
Subtotal for road renewals			**7,825,000**	**7,925,000**	**8,695,000**	**24,445,000**	**18,431,794**	**32.6%**	
Total budget			**15,277,000**	**15,367,000**	**16,117,000**	**46,761,000**	**41,448,361**	**12.8%**	

2.5 Asset Summary

One glance summary of the asset data



Asset	Quantity	Replacement Cost
Bridges	348	$91,800,044
Channels	1,845 km	$13,250,800
Drainage	139 km	$58,748,155
Drainage Structures	14,462	
Footpaths	91 km	$10,190,923
Land	3,234 ha	$67,155,752
Lighting	1,184	$5,250,095
Furniture	railings, retaining walls, traffic facilities	$9,289,211
Signs	9,459	$2,232,010
Pavement	448 km	$101,571,436
Unsealed	1,125 km	$27,573,035
Formation	1,573 km	$204,776,973
		$591,838,434

Routine maintenance of unsealed and sealed roads comprises:

- Pavement maintenance including potholes, surface defects, edge breaks, rutting and dig out repairs;
- Maintenance of unsealed shoulders;
- Unsealed maintenance including corrugations, potholes, shape correction, gravel loss;
- Drainage maintenance;
- Kerb, channel and carriageway cleaning;
- Repairs to concrete kerb and channel, sumps and leads;
- Vegetation control;
- Signs maintenance;
- Roadmarking;
- Maintenance of railings;
- Maintenance of barriers; and
- Maintenance of bridges.

Routine maintenance is carried out on a continuous basis on all roads by the contractor in accordance with meeting the LOS detailed in the Contract.

Ordered maintenance repair items, such as dig-out or rut repairs, may be deferred if there is insufficient budget in any year to undertake the works. The safety of road users will be considered when prioritising deferred works. The key level of service targets assume an acceptable level of deferred works. Trends in the technical levels of service targets will be monitored to determine if additional budgets are required in future plans, or if a lower LoS should be considered.

2.6 Key Issues

Key issues the Council is currently managing as part of the road activity are summarised in the table below.

Issue	Description
Road safety	There is a safety management strategy in place which takes into account the NZTA Safer Journeys approach. Safe speeds are at the heart of the safe system approach and the development of a safer speeds initiative within all our project work will deliver a continual improvement.
Asset data	RAMM data integrity is a key responsibility for the Asset Systems Technician. Focus is to ensure regular audits are performed and data updates controlled.
Financial affordability	The current level of rate-based Local Share and NZTA funding is providing sufficient funds to manage the network at an appropriate level.
Overall integrity of the network	NZTA technical audit carried out in May 2010 described the sealed network in an unmanaged decline. In the following 7 years this has been turned around to the point that the sealed network is now in good to excellent condition with over 90% VKT on good roads.
Maintaining asset capacity and integrity	We continue annual condition assessments that inform our deterioration/consumption model that then informs and predicts our renewals programme to maintain current LoS on the network.
Unsealed roads	Unsealed roads make up 72% of the Kaipara network. A formal management strategy for unsealed roads is under development to guide the maintenance programme. The strategy will require further development as data becomes available and updated. This has identified areas that require more research such as gravel loss measurements, quarry material analysis and improvement from trials of dust suppressants. However one of the major costs of unsealed maintenance is the supply and transportation of the aggregate to road carriageways. On some areas of the network it costs more to transport the aggregate than the aggregate itself and therefore a search for better located sources would improve the cost efficiencies.

Issue	Description
Government Policy Statement (GPS)	The current GPS determines the Governments focus on the New Zealand transport network. It also provides direction on where the Government would like a Road Controlling Authority (RCA) to target their expenditure. The three areas of focus the Government wants to see for the 2015/2018 period are: • Economic growth and productivity; • Road safety; and • VfM. Council will need to plan its maintenance, renewal and minor works on strategies around these goals.

2.7 Asset Owned/Managed by Council

The following sections provide an explanation of and degree of confidence that the Council has in its knowledge of its assets at the component level. The components include:

- Unsealed road;
- Sealed roads;
- Bridges, large culverts and structures, retaining walls;
- Drainage facilities;
- Corridor facilities (streetlights, carparks);
- Footpaths/walkways;
- Cycleways;
- Traffic services (signs, delineation markings); and
- Guardrails, safety barriers and sight rails.

2.8 Renewal Strategy

Asset consumption rates along with condition surveys and life cycles are considered when building renewals programmes. We also consider the risk of failure and creating a safety risk to road users.

Renewal work is programmed by a combination of:

- High Speed Data survey - 100% of sealed network (video, rutting, texture, roughness and cracking);
- Scala Testing, pavement depth assessments 10 - 20% of unsealed network;
- Running of dTIM's model on sealed network;
- Contractor inspections and feedback;
- Analysis of historical achievement data from RAMM;
- Analysis of ratepayer service requests;
- Results from falling weight deflectometer (FWD) testing and selected test pit analysis – 20% of sealed network;
- Detailed bridge and structures inspections and analysis; and
- Drive-over inspections by area engineers.

The renewal programme is developed in the dTIMs model and loaded into the forward work programme module in RAMM and is reviewed and updated annually. A five year programme is loaded and updated annually.

To comply with the NZTA co-funding rules economic evaluations and NPV calculations are required for specific activities to ensure that the chosen option is the most appropriate solution. Examples of renewal activities which do not attract subsidy are carparks, footpaths, walkways and urban street furniture.

2.9 Delivery of Renewals

Renewals are delivered through a range of delivery models and contracts that have price tension and VfM as core measures.

3 Setting the Scene

3.1 Linkages

Relationship to other Plans and Documents

Amongst other things, this AMP articulates what and how the assets contribute toward community well-being and desired Community Outcomes, how they will be managed, improvements moving forward and financial implications. The AMP relates to the Council's LTP and other key Council Plans, documents, policies and processes. These are mainly driven by legislation and the powers and obligations that central government, through legislation, assigns to local authorities.

3.2 Levels of Service (what we want)

Asset Ownership

Performance relates to the ability of the asset to meet target LoS, and condition reflects the physical state of the asset. Asset condition and performance information drives future programmes.

Organisation Strategic Goals

The AMP demonstrates responsible management of the district's assets on behalf of customers and stakeholders and assists with the achievement of strategic goals and statutory compliance. The AMP combines management, financial, engineering and technical practices to ensure that the LoS required by customers is provided at the lowest long term cost to the community and is delivered in a sustainable manner.

This AMP outlines and summarises the Council's strategic and management long term approach for the provision and maintenance of roading and associated services throughout the district.

Legislation

Acts and regulations state the minimum requirements for some LoS and objectives. The roads and footpaths activity is governed by many statutes, regulations, standards and Codes of Practice.

The key legislation relating to the management of roads and footpaths is found in:

Legislation	Requirement
Local Government Act 2002 and Amendments 2004, 2006, 2007, 2009, 2010, 2012, 2013 and 2014.	The purpose of the Local Government Act is specified in section 3. Section 3(d) "provides for local authorities to play a broad role in meeting the current and future needs of their communities for good- quality local infrastructure, local public services, and performance of regulatory functions." Section 10(2) specifies that good-quality, in relation to local infrastructure, local public services and performance of regulatory functions means infrastructure, services and performance that are: • efficient; • effective; and • appropriate to present and anticipated future circumstances. Section 11A specifies core services. In performing its role, a local authority must have particular regard to the contribution that core services make to the community. Section 11A (e) identifies libraries, museums, reserves, recreational facilities and other community infrastructure.
The Resource Management Act 1991 (RMA)	The RMA is an effects-based piece of legislation that has the overarching purpose of promoting sustainable management of natural and physical resources. The Council, under the provisions of the Act, can acquire reserves as conditions of consent through mechanisms such as the subdivision process to protect values such as the natural character of the coastal environment, lakes and rivers and their margins and maintain and enhance public access to and along these features. Other reserves may be acquired to enhance and maintain amenity values and the quality of the environment.
Public Works Act 1981 (PWA)	This Act enables compulsory land purchases and defines procedural and informational requirements for them.
Building Act 2004	The management, design and construction of any structures must comply with the building consent requirements.
The Health Act 1956	
The Climate Change Response Act 2002	

Legislation	Requirement
The Civil Defence Emergency Management Act 2002 (Lifelines)	
The Local Government (Rating) Act 2002	
The Land Drainage Act 1908	
The Rivers Boards Act 1908	
The Soil Conservation and Rivers Control Act 1941	
The Health and Safety in Employment Act 1992	
The Utilities Access Act 2010	
The Consumer Guarantees Act 1993	
The Sale of Goods Act 1908	
The Fair Trading Act 1986	
The Railways Act 2005	
Land Transport Management Act 2003	
Construction Contracts Act 2002	
Roading Government Powers Act 1989 (formally The Transit NZ Act 1989)	
Telecommunications Act (1987) , Electricity Act (1992), Gas Act, Railway Safety and Corridor Management Act	
Public Records Act 2005	

National Policies and Priorities:	Requirement
The New Zealand Coastal Policy Statement 1994	
The National Energy Efficiency and Conservation Strategy	
The Heavy Motor Vehicle Regulation 1974	
The Building Regulations	

National Policies and Priorities:	Requirement
NZTA Specifications, Rules, Policies, Manuals and Guidelines	
Austroads Guidelines and Manuals	
Government Policy Statement 2017	
Safer Journeys	
The New Zealand Transport Strategy	
Ministry of Transport Statement of Intent	
The Government's Sustainable Development Programme of Action Plan	
NAMS Manuals and Guidelines	
Office of the Auditor-General's publications	
Austroads Assessments of Key Road Operator Actions to Support Automated Vehicles	
The National Energy Efficiency and Conservation Strategy	

The key legislation relating to the management of roads and footpaths is found in:

Regional Policies and Strategies:	Requirement
Northland Regional Plan	
Northland Regional Water and Soil Plan	
Northland Regional Air Quality Plan	
NRC Regional Policy Statement	
NRC Regional Air Quality Plan	
NRC Regional Coastal Plan	
NRC Regional Land Transport Strategy	
KDC District Plan	
KDC Long Term Plan	

Regional Policies and Strategies:	Requirement
KDC Engineering Standards and Policies 2011	
KDC Procurement Policy March 2012	
KDC Maintenance Intervention Strategy	

Kaipara District Plan

Council Bylaws
Council currently has bylaws covering the following aspects of relevance to roads and footpaths: • General Bylaws 2008
Council Strategies
• Unsealed Road Strategy 2017 • Walking and Cycling Strategy update 2017 • Maintenance Intervention Strategy • Sealed Road Strategy • Safety Intervention Strategy

Relevant Standards	
NZS 4404:2010	Land Development and Subdivision Infrastructure
AS/NZS ISO 9001:2008	Quality Management Systems
AS/NZS 4801:2001	Occupational Health and Safety Management Systems
SNZ HB 2002:2003	Code of Practice for Working in the Road
AS/NZS 1158	Lighting for Roads and Public Places
AS/NZS 4676:2000	Structural Design Requirements for Utility Services Poles.

3.3 Understanding our Customers' Needs (Stakeholder Engagement)

Council Vision – *Thriving communities working together* (Kaipara District Council Long Term Plan 2018/2028)

A district with welcoming and strong communities	A trusted Council making good decisions for the future	A district with plenty of active outdoor opportunities
Assisting and supporting community involvement	**Making it simpler to work with us**	**Partnering with communities to develop sports and recreation facilities**
Maintaining and improving infrastructure	**Open, transparent and engaged with communities and business**	**Protecting and enhancing our natural assets and open spaces**
Recognising and supporting achievement	**Intent on lifting Kaipara's well-being**	

The Values: Ko nga uara

Our purpose is to make a positive difference for Kaipara. We aspire to work with:

Integrity

- ✓ We will do what we say we will
- ✓ We will act with good intent
- ✓ We will do the right thing in the right way

Team Work

- ✓ We will work together
- ✓ We will support each other

Delivering Value

- ✓ We will seek to understand needs and deliver to them
- ✓ We will apply our skills and knowledge for the benefit of others

Understandings

Well-planned, developed and implemented community activities that maintain, enhance and protect existing services can be built on for future needs and requirements.

To promote and advance community well-being (social, environmental, economic and cultural) throughout the Kaipara district and to have a roading and footpath network that provides community and recreational opportunities, cultural, landscape and ecological protection and enhancement.

Council wants to ensure that people and goods can move safely and efficiently around the district by a variety of transport modes.

Implications of Community Expectations

Forecasting how road usage may change is related to forecasting development in the district and is derived by considering the best indicators available at the time of writing this Plan.

The Council does, however, play a proactive role in applying drivers and controls to ensure that development is progressed with some consideration of the wider issues of the environment and the impact of development on the Council's infrastructure.

The following assumptions have been made relating to the current community expectations:

- All road construction activities use best practice in the use of the district's natural resources and take into consideration the impact on the environment;
- The network of roads, footpaths, cycleways and carparks are accessible, safe and available; and
- Urban communities have a means of travel for pedestrians and cyclists, which is safe, efficient and effective.

Implications of Industrial productivity demand

The potential growth of the key primary industries in the district is noted in the areas of:

- Forestry;
- Dairy;
- Horticulture and honey; and
- Pastoral and animal farming.

Implications of Legislative Change

Changes to transportation policies may be driven from a number of directions. They could be internally driven or externally driven (for example, changes driven by national organisations like NZTA and the Government Policy Statement). Monitoring internal and external environments enables the impacts of such changes to be anticipated and predicted. While there is no certainty to these predictions, it is important to consider them when developing asset management forecasts and strategies.

Determination of Project Drivers and Programming

All expenditure must be allocated against at least one of the following project drivers:

Operation	The active process of utilising an asset which will consume resources such as manpower, energy, plant and materials.
Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal. Maintenance does not increase the service potential of the asset or keep it in its original condition; it slows down deterioration and delays when rehabilitation or replacement is necessary.
Renewals	Works to replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability.
Increase Level of Service	Works to improve the asset beyond its original capacity or performance to improve the level of service provided to existing customers e.g. seal widening, seal extensions, widening of one-way bridges, installing roundabouts, traffic calming measures, new walking and cycling facilities.
Growth	Works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to provide for the anticipated demands of future growth.

This is necessary for two reasons as follows:

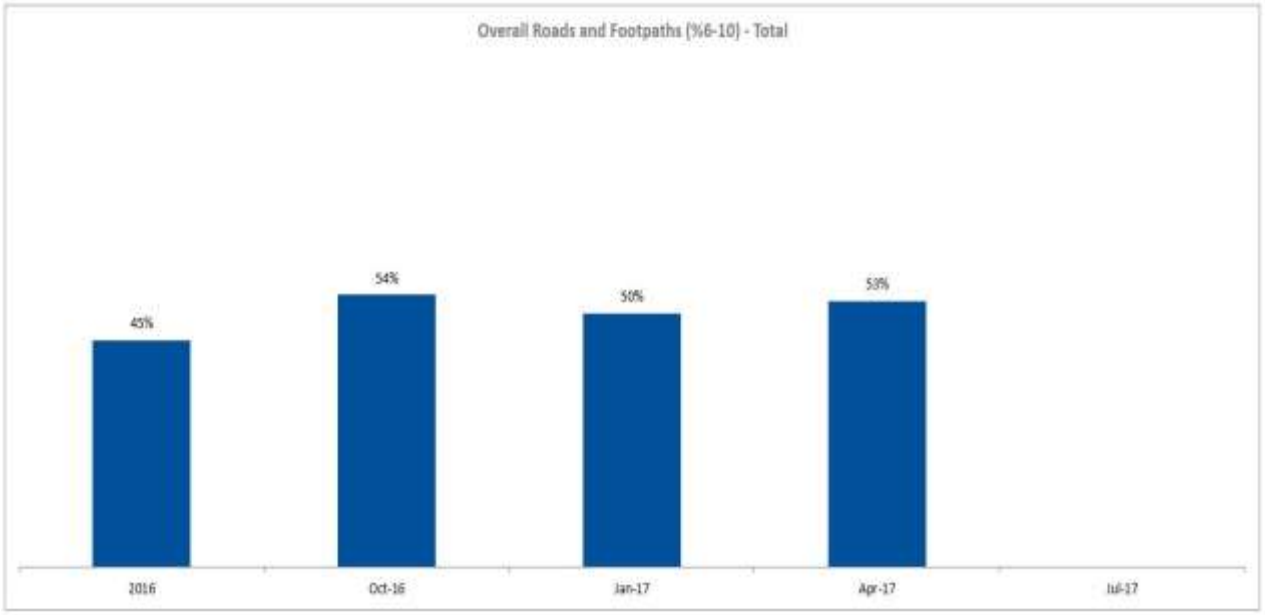
a) Schedule 13(1) (a) of the Local Government Act 2002 (LGA) requires the local authority to identify the total costs it expects to have to meet relating to increased demand resulting from growth when intending to introduce a development contributions policy.

b) Schedule 10(2)(1)(d)(l)-(iv) of the LGA requires the local authority to identify the estimated costs of the provision of additional capacity and the division of these costs between changes to demand for, or consumption of, the service, and changes to service provision levels and standards.

All new works have been assessed against these project drivers. Some projects may be driven by a combination of these factors and an assessment has been made of the proportion attributed to each driver. A guideline was prepared to ensure a consistent approach to how each project is apportioned between the drivers.

Council Community Helpdesk System – Council has a Helpdesk system which captures customer concerns and complaints regarding issues relating to roading and footpath activities.

Current 2016/2017 Residents Survey - April 2017 results show a reasonably stable satisfaction of 50% which is consistent across the network. Improving the roads, footpaths and walkways received the most mention from the general comments and feedback left.



Current Level of Service (what we provide now)

- Roads will be safely passable for all users;
- Every property will have access to the network (not necessarily supplied by Council);
- No fatal accidents are caused by road design or condition;
- Full uptake of all available NZTA subsidies within the three year planning programme;
- Maintenance minimum standards to be developed for each asset type:
  - Sealed network
    - No pothole >70mm in diameter;
    - Edge break <1m in length, to be reacted on within 48 hours of notification; and
    - Edge break >1m in length, to be repaired by agreed programmed date;
  - Unsealed network
    - Pothole repair >200mm in diameter; and
    - Corrugations >25mm deep to be programmed but, if unsafe, within one week of notification;

- Bridges are inspected on a bi-annual basis, in line with NZTA Bridge Manual. Bridges with weight or speed restrictions are inspected annually. Work on bridges is based on outcome of these inspections; and
- Safe and passable by the approved vehicle loads. This relates to all forms of heavy vehicles involved in farming, forestry or produce, which meet the classification for heavy weight vehicles. This measure is in conflict with the NZTA resilience thresholds as below in table.

Table of acceptable outages per year for ONRC road classes when there is an alternative route

Outage Period	ONRC Road Classification				
	National High Volume	National	Regional / Arterial	Primary / Secondary Collector	Access / Access Low Volume
2 - 4 hrs	1	4	10	19	30
5 - 12 hrs	0.5	2	5	9.5	14.8
13 hrs - 2 days	0.2	1	2	3.8	5.9
3 - 5 days	0.1	0.2	0.5	0.9	1.5
6 - 14 days	0.04	0.08	0.2	0.4	0.6
15 - 49 days	0.02	0.04	0.10	0.19	0.30
50 - 120 days	0.01	0.01	0.025	0.047	0.074
more than 120 days	0.004	0.004	0.010	0.019	0.030

Service Level Issues

The service levels for roads are very low. Communities bring up the low quality of roads at every public meeting. Forestry will have some effect on network as the harvest occurs, dust generation is being noted as increasing concern and pavement deterioration.

Service Level Risks

- Council's ability to fund the local share for those parts of the network that may not attract equal/current subsidy in future.
- Decrease in NZTA subsidies levels for low volume rural roads.

Resilience Thresholds

The NZTA has set threshold levels for investment activities to address resilience, given the expected duration of outage and frequency of an event, while also taking the road classification and any alternative routes into account. These thresholds can be used to determine when it is appropriate to propose investment activities to overcome resilience problems.

The table below provides the annual acceptable outages [Note 1] for each road class when there is a viable alternative route. If there is no viable alternative route [Note 2] the acceptable number of outages in the table below is decreased by a factor of 2.5 (i.e. for a regional or arterial road the number of acceptable outages becomes 4 instead of 10 outages per year for the 2 – 4 hour outage period).

When the number of outages are:

- All less than the values shown in the table (adjusted for whether a viable alternative route exists) the resilience gap is low for results alignment;
- If one or two values are greater than or equal to the values shown in the table (adjusted for whether a viable alternative route exists) the resilience gap is medium for results alignment; and
- If three or more values are greater than or equal to the values shown in the table (adjusted for whether a viable alternative route exists), the resilience gap is high for results alignment.

Table of acceptable outages per year for ONRC road classes when there is an alternative route

Outage Period	ONRC Road Classification				
	National High Volume	National	Regional / Arterial	Primary / Secondary Collector	Access / Access Low Volume
2 - 4 hours	1	4	10	19	30
5 - 12 hours	0.5	2	5	9.5	14.8
13 hours - 2 days	0.2	1	2	3.8	5.9
3 - 5 days	0.1	0.2	0.5	0.9	1.5
6 - 14 days	0.04	0.08	0.2	0.4	0.6
15 - 49 days	0.02	0.04	0.10	0.19	0.30
50 - 120 days	0.01	0.01	0.025	0.047	0.074
more than 120 days	0.004	0.004	0.010	0.019	0.030

Notes

1. Average values taken over at least a five year period.

2 A viable alternative route is defined as:

(a) unlikely to be affected by the same or related event that disrupts the availability of the original route; and

(b) available to all vehicles (including HPMVs); and

(c) has the capacity to carry the volume of traffic diverted from the original route; and

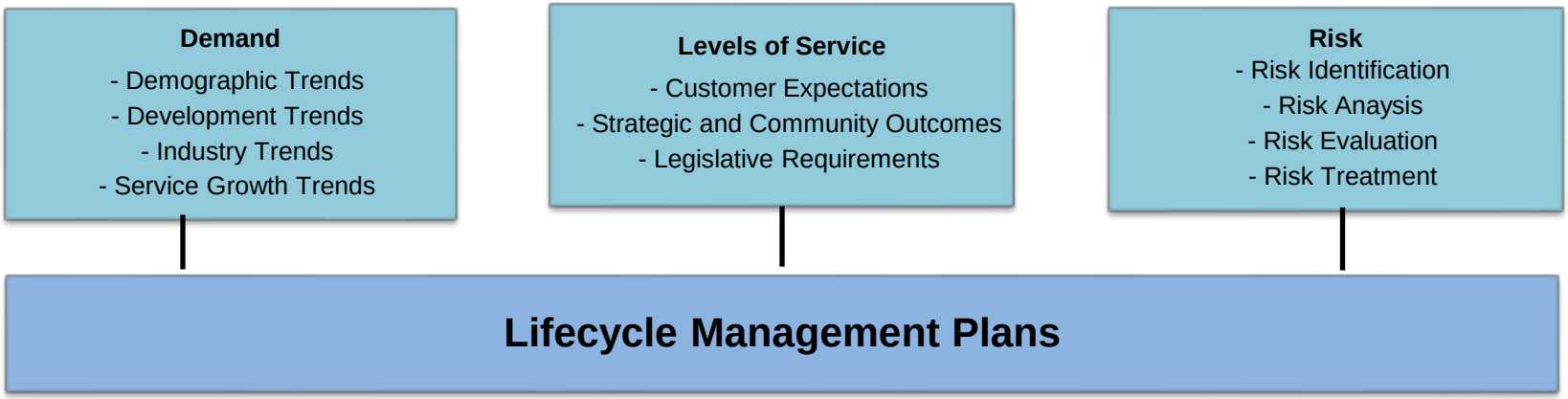
(d) the additional travel time is no more than two hours

Contribution to Community Outcomes

Council wants to work with the people in Kaipara to make it a place where it's easy to live. When it's easy, it will be easy to do business here, easy to join in and easy to enjoy nature.

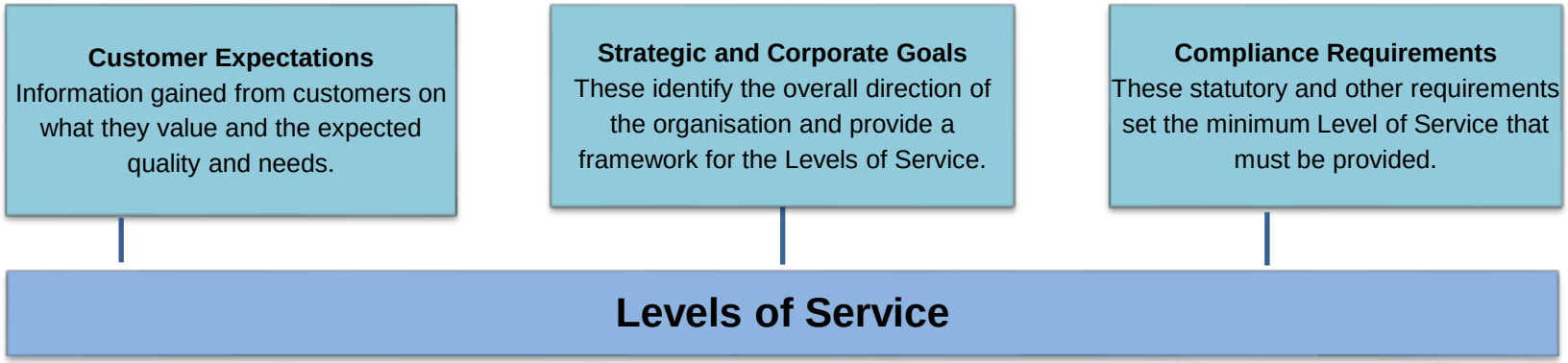
Passable roads connect people to each other, to services and allow businesses to operate.

Levels of Service (LoS) are the performance goals of the Council. This section of the AMP provides a review of the LoS factors that influence the lifecycle management of the roads and footpaths asset.



Lifecycle Management and Level of Service Drivers

Levels of Service are based on the following three factors:



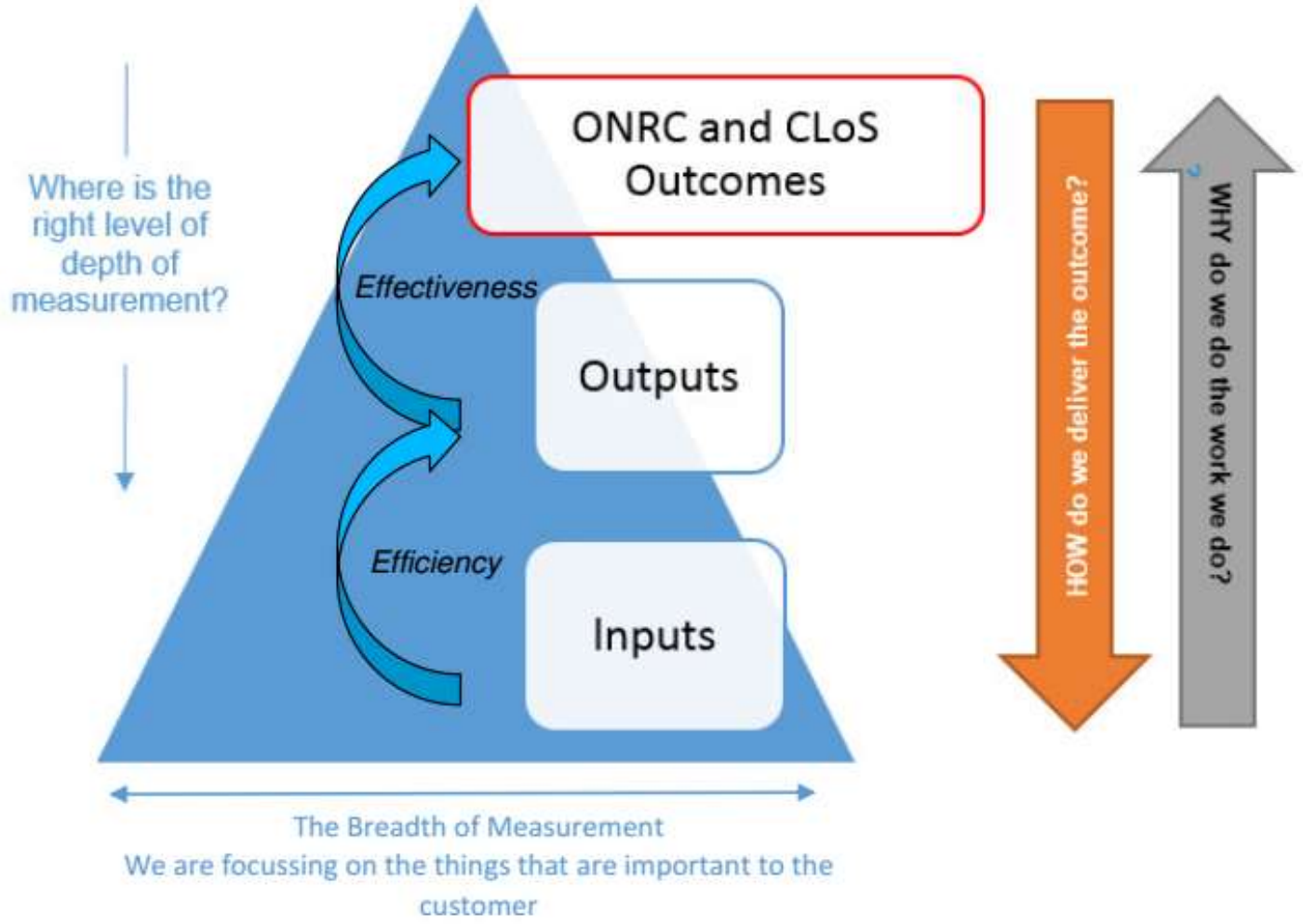
Roads and Footpaths – Performance Measures (KPI's) as indicated in Council's Long Term Plan are indicated in the following table:

Performance indicator/ service level	Annual Report 2017/2018	Annual Plan 2018/2019	LTP Year 1 Target 2018/2019	LTP Year 2 Target 2019/2020	LTP Year 3 Target 2020/2021	LTP Years 4-10 Target 2021/2025
1 Safety *The transportation network is designed and managed for safe use with low crash and injury rates.*						
Measured by						
Number of road fatalities and serious injuries.			13	12	11	10
2.1 Road Condition (Smoothness) *The average quality of ride on a sealed local road network, measured by smooth travel exposure.*						
Measured by						
Smoothness within average range as below: <90 smooth 90-110 average <110 rough			90-110	90-110	90-110	90-110
2.2 Road Condition (Pavement Integrity Index) *The Pavement Integrity Index (PII) is a combined index of the pavement faults in sealed road surfaces. It is a 'weighted sum' of the pavement defects divided by total lane length*.						
Measured by						
PII within average range as below: <7 poor >10 good >11 very good			7-10	7-10	7-10	7-10
3 Road Maintenance *The percentage of the sealed local road network that is resurfaced. (This is based on a design life of 15 years*).						
Measured by						
Minimum reseal percentage of the total sealed length of the network that will be undertaken each year to keep up with surface determination rates.			6.8%	6.8%	6.8%	6.8%

Performance indicator/ service level	Annual Report 2017/2018	Annual Plan 2018/2019	LTP Year 1 Target 2018/2019	LTP Year 2 Target 2019/2020	LTP Year 3 Target 2020/2021	LTP Years 4-10 Target 2021/2025
4 Footpaths *The percentage of footpaths within the district that fall within the level of service as determined by the condition rating (facilities are up-to-date, in good condition and 'fit for purpose').*						
Measured by						
Percentage of residents who are very/fairly satisfied with footpaths.	62%	73%	73%	73%	73%	73%
5 Response to service requests						
Measured by						
Percentage of customer service requests, approved for action, closed (customer informed of intended work schedule) within the target day timeframes set.			90%	90%	90%	90%
Road Maintenance *The length of the unsealed* local road network that is graded.*						
Measured by						
The length of the unsealed local road network that is graded per annum for Secondary Collector.			140km minimum	140km minimum	140km minimum	140km minimum
The length of the unsealed local road network that is graded per annum for Access.			1,200km minimum	1,200km minimum	1,200km minimum	1,200km minimum
The length of the unsealed local road network that is graded per annum for Access (Low Volume).			750km minimum	750km minimum	750km minimum	750km minimum

Future Changes to Levels of Service

Future LoS will be based on community demand and ability/willingness to pay for the services. Growth trends are indicated to remain static over the next 10 years. The Council undertook a review of its LoS in 2013 with the development of its activity plan.



3.4 Procurement

The formation of the NTA has provided the opportunity for a combined regional approach to be agreed and delivered through the adoption of regional procurement strategy. The strategy was adopted by all four councils that make up the NTA in August/September 2017.

This strategy covers the period until 2021. The update of the strategy then will align with the 2021/2024 three year programme and the 2021/2031 10 year Long Term Plan. Any major changes which substantially affect procurement during its term will lead to its review.

The establishment of the NTA provided the opportunity for an integrated approach to local government transportation procurement across Northland. A single strategy covering three local authorities and the regional council creates the potential to deliver local benefits through wider opportunities and regional co-ordination.

Key aspects within this strategy that have the potential to deliver value from procurement are:

- The development of a single procurement programme for transportation works that incorporates each Council's needs, manages conflicting requirements and engages with the supplier industry in a co-ordinated and regional approach;
- The potential to deliver local objectives (e.g. three Tier One contractors established in Northland) through regional procurement that attracts more competition in the market than in the past;
- The ability to work with the industry and encourage, through procurement, the inclusion of increased Small and Medium Enterprises (SME) involvement, recruitment of new trainees, value creation initiatives and staff training in response to tender opportunities;
- The ability to encourage competition from professional services consultants in procuring and developing a region-wide service for a portion of the required work;
- Through the alliance make-up involving the four Councils and the NZTA working closely together to understand each party's procurement needs and collectively work to efficiently deliver these in conjunction with the suppliers;
- The ability to procure three local roads Maintenance, Operations and Renewals (MO&R) contracts for the Northland network that are of a size that will attract companies to compete for these attractive term contracts and to enable opportunities for VfM through efficiencies of scale;
- The ability to co-ordinate the terms of all the local MO&R contracts with those of the NZTA's Network Outcome Contract (NoC) to enable a business case to be researched on the potential for a future one network approach;
- The ability to form a single regional pre-qualification register for both physical works and professional services; and
- The ability to work with the suppliers to identify opportunities for regional co-ordination and support to improve the transport outcomes. An example of this is the suggestion to develop a single regional transport emergency management plan.

The key recommendations from the Regional Procurement Strategy (RPS) are detailed as follows:

- Three MO&R contracts spanning the whole local road network of Northland (currently there are eight road maintenance contracts and numerous other contracts such as roadmarking, reseals etcetera). There would be one contract covering each of the Kaipara, Far North and Whangarei districts.
- The MO&R contracts would have a term of 4+2+1+1 years (eight years maximum) and a start date of 01 July 2018. The 4+2 is to align with the NZTA's NoC completion dates of 2022/2024. This will enable, if appropriate, joint consideration by the Councils and the NZTA of a whole of network approach for MO&R work for State Highways and local roads post 2024. The 1+1 will allow for future staggered timing of contract renewals if a whole of network approach does not occur;
- The MO&R contracts would be fence to fence involving most of the MO&R aspects with roadmarking, bridge maintenance, reseals and a portion of rehabilitation work included;
- The price/quality procurement method will be used for determining the MO&R contractors. It is planned to adopt a two-stage selection process where initially a shortlist of suppliers will be selected;
- The other renewal projects (not carried out by the MO&R contracts) will be bundled into a range of packages that generally have a combined value of between $0.5 million and $1.0 million. These would normally be procured using the price/quality method, although low risk projects may use the lowest price conforming method. These will be tendered and awarded around September each year to enable an early start in the construction season and allow the flexibility for the supplier to decide the delivery programme, but with a completion date of no later than 01 April that financial year;
- The NTA, established as a Shared Services Business Unit, provides in-house professional services to the four Northland councils; and
- External professional services shall be procured where necessary to provide additional technical support and specialist skills as required. One professional services contract will likely be procured using the price/quality method for a portion of the external work (say 40%) using a national consultant. The remaining work will be distributed to smaller consultants by pre-qualification using a professional services register to short list and procured using either direct appointment or closed contest methods.

The NTA will be seeking NZTA endorsement of the Procurement Strategy that the three councils have approved.

New Maintenance Contracts

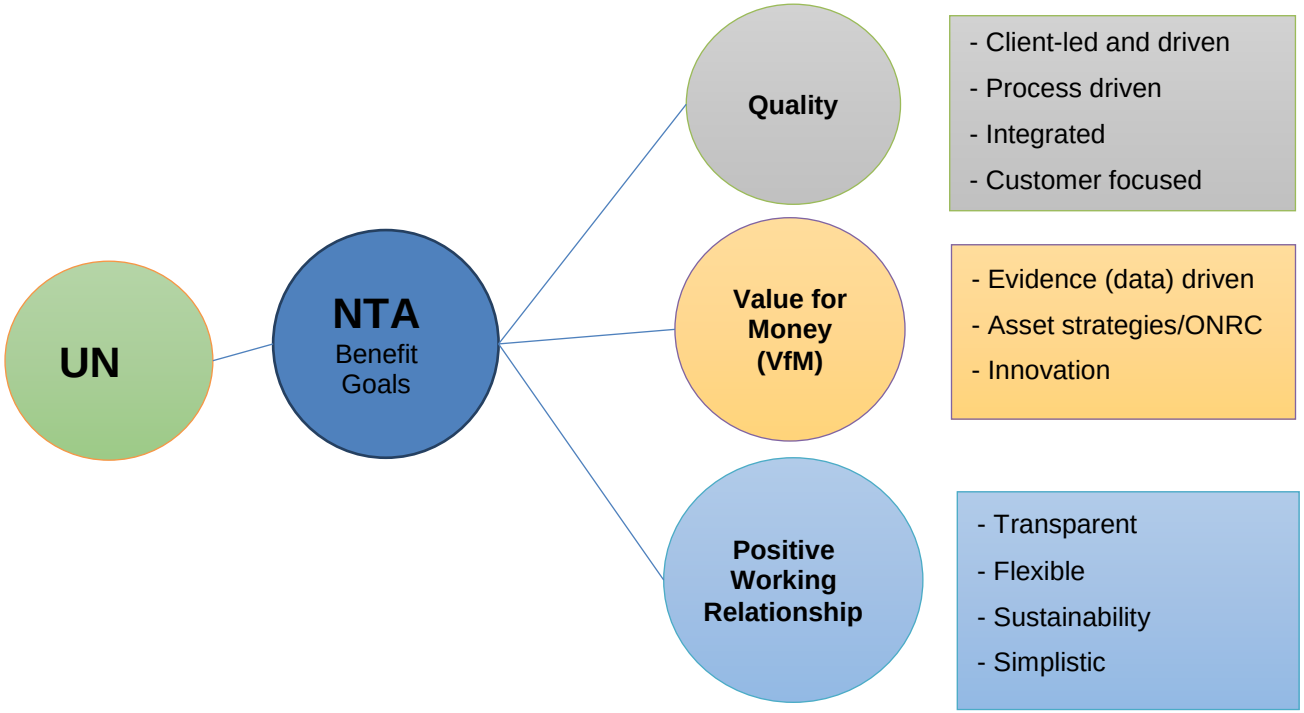
Objective – Develop one best practise maintenance contract to be used in each district that supports the benefits set out under NTA;

1. More engaged and capable workforce delivering superior asset management.
2. Improved Transport/customer outcomes, enabling investment and social opportunities.

3. Improved Regional strategy, planning and procurement.
4. Transport Infrastructure is more affordable.

Status – Development

Outcome – To align how all Northland roads are managed from processes to materials used, resulting in a better outcome for our customers. The new maintenance contracts are seeking several objectives, outcomes and have defined what success means. The development of the contracts identified initially what success means, this was encapsulated in the following:



The Registration of Interest (ROI) released to market, 24 October 2017 set out what is important to the NTA in delivery of the maintenance contracts:

- Delivering VfM;
- Working collaboratively with councils and other suppliers in a positive relationship;
- Sharing learnings with supply partners training and up-skilling their employees and provide opportunities for people to join the industry;
- Fostering a culture of value creation and continual improvement;
- Supporting, upskilling and increasing the learning of Small and Medium Enterprise (SME) contractors and their staff within Northland communities;
- Demonstrating customer-focused outcomes;
- Ensuring excellent health and safety;
- Supporting flexibility over the duration of the contract; and
- Providing a seamless and professional transition for the start-up of the new contract.

Specific to identification and delivery of work within this contract, we expect:

- Use of RAMM Contractor to systematically manage the whole work lifecycle;
- Completeness and accuracy of inspection data;
- Evidence driven decision-making;
- Contribution of knowledge and experience to support programming the right work at the right time;
- Use of asset strategies to support annual and monthly programming processes; and
- Quality of workmanship.

In detail the contracts are being developed to ensure the following:

Apportion Risk Appropriately:

- Through clear scope and transparency in process and requirements the contract will ensure that risk apportionment is appropriate between the client and contractor. If the contractor clearly understands their scope and requirement, then this will mean the contractor will not have to include a risk premium in pricing the contract resulting in lower rates.

Consistency

- Delivering a consistent set of documents across the NTA means that the systems and process required can be developed and implemented once. The contractor understands the requirements are the same across all contracts therefore a singular understanding of system and process requirements. Reduces industry churn in reinventing the wheel multiple times over to slightly different requirements.

Evidence-led

- Inspection-led process in relation to the asset strategies and tactical requirement such as ONRC intervention will provide the greater knowledge and evidenced based approach to how we go about investing. Couched within the consistent system and process focused on delivering quality will ultimately deliver investment as required to the defined service standard.

Flexible

- Through the appropriate allocation of risk this drives more flexibility around how the contract payment mechanisms can be aligned. Providing more control over how the client wishes to invest and when to invest. Flexibility in payment mechanism also provide some opportunity to scale investment dependent on budget allocation.

Quality

- Having inspection-led process through strong auditing processes will ensure that the service standards set out in the contract are met and delivered.

Value for Money (VfM)

- In discussion with industry contracts scale and term was set to provide both opportunity for new competition to enter the Northland market. Bring further price competitiveness to the existing market. Keeping in mind the requirement to support SME in the local market through contract conditions; and
- Increasing the scope of contracts to included resurfacing and pavement rehabilitation will provide cost certainty for these aspects of work which commonly go to the open market. Pavement rehabilitation, which is generally tendered annually, can be particularly cost volatile dependent on market conditions. Bringing this aspect into a term contract provides a level of cost certainty to what is high cost work.

Consideration that need to be considered for these contracts are:

- ONRC has not been fully implemented from a service provision point of view. Early implementation work has been in place to provide some understanding if there is GAP between current service provision and that offered under the ONRC. This early GAP work would indicate that from a maintenance point of view there are opportunities to redirect invest to provide better customer outcomes. From a renewal point of view there would seem to be some GAP in the current investment levels to achieve the service standards for our customers required under ONRC;

- These contracts through a consistent approach to system and process will look to fully embed ONRC on the networks and provide clear investment requirement. Given the flexibility being developed into the new contracts the impact of should be minimised;
- Whangarei District Council's current resurfacing contracts were tendered and won on abnormally low rates. This contract has been delivered successfully. The risk in the new contracts is that these abnormally low rates will not be realised again, resulting in price increase for this portion of work. To offset this, the increase the scope of works to include pavement rehabilitation may provide more competitive rates and cost certainty;
- The contracts are still in development. Cost of compliance remains one of the larger cost risk areas as legislative standards become key requirements ensure safety everyone that these contracts may affect. Estimating the cost of this is not certain; and

The contracts are still in development and have not been fully tested in regards the engineers estimate to provide some scope in cost. The actual cost of these contracts will not be known until March 2018 at which time all funding request will be closed and being assessed by NZTA and councils.

3.5 Demand and Growth

- **Key Demand Drivers**

  Demand for lifestyle, retirement and coastal beachside holiday facilities is driving demand in the east coast Mangawhai region.

- **Demand Forecast**

  The Mangawhai Community Plan (MCP) outlook developed a growth projection of 2% in the construction of permanent residencies. The MCP sets the scene and style that we see development happening along with the proposed projects. Section 3.5 focuses on Mangawhai as this is the growth zone for Kaipara.

- **Demand impact on assets**

  The initial impact that a number of the key routes into the region are being impacted by is the dwelling construction industry timber, joinery and concrete deliveries. This is impacting on several previously suitable and appropriate one-lane bridges that are now questionable in terms of safety with the growth in freight traffic over the last five years at 150%.

- **Demand Management Plan**

  Both the MCP and the MIP (Mangawhai Village and Mangawhai Heads Infrastructure Plan – Transportation) have been developed to enable the rate of development to be managed.

Developer Created Assets

Private developers generally construct new subdivisions with consent from Council. It is very seldom that Council itself constructs subdivisions to service growth. Council is normally responsible for the upgrading/upsizing of existing assets to provide for increased volumes associated with growth.

Council does oversee the subdivision process, from consenting through to construction and handover to Council. Council's engineers inspect design plans and finished works to ensure the assets meet the required standards and are in an acceptable condition to be accepted as a council-owned asset. Should any work not meet the required standards Council will require the developer to remedy the issue prior to accepting ownership.

Project Priority

- **Timing of Capital Projects**

  The timing of many capital projects can be well-defined and accurately forecast because there are few limitations on the implementation other than the community approval through the LTP/Annual Plan processes. The timing of some projects is highly dependent on some factors which are beyond the Council's ability to fully control.

  These can include factors like but not limited to:

  - Obtaining resource consent;
  - Obtaining the community consent;
  - Obtaining NZTA consent;
  - Obtaining a subsidy from central government; and
  - Securing land purchase and/or land entry agreements.

  Where any of these issues may become a factor, allowances have been made to complete in the project timeline.

- **Funding of Capital Projects**

  Funding of capital projects is crucial to a successful project. When forecasting projects that will not occur for a number of years, a number of assumptions have to be made about how the scheme will be funded.

  Funding assumptions are made about:

  - If the Project has a positive Investment case that would attract NZTA co-investment;
  - Whether major beneficiaries of the project/outcome would contribute to the project;

- Whether and how much should be funded from development contributions; and
- Whether the Council would subsidise the development of the project.

The correctness of these assumptions has major consequences on the affordability especially of new assets or substantial increases in the LoS such as for seal extensions. The funding strategy will form one part of the consultation process as the projects are advanced toward construction.

Confidence in new capital development forecasts

The degree of confidence that the Council has in the new capital development forecasts are medium to low due to the unpredictability of development within the district. Most of asset creation is provided through the development of subdivisions.

Lifecycle Estimate Accuracies

Stage in Project Lifecycle	Estimate Accuracy
Concept / Feasibility	± 30% (±25% for projects >$1m)
Preliminary Design / Investigation	± 20% (±15% for projects >$1m)
Detailed Design	± 10%
Construction	± 5%
Commissioning	± 0%

Accuracy of Capital Project Cost Estimates

The financial forecasts contain many projects, each of which has been estimated from the best available knowledge. The level of uncertainty inherent in each project is different depending on how much work has been done in defining the problem and determining a solution. In many cases, only a rough order cost estimate is possible because little or no preliminary investigation has been carried out. It is not feasible to have all projects in the next 20 years advanced to a high level of estimate accuracy. It is preferable to have projects in the next three years advanced to a level that provides reasonable confidence about the accuracy of the estimate.

To get consistency and formality in cost estimating, the following practices have been followed:

- All expenditure is stated in dollar values as at 01 July 2016, with no allowance made for inflation over the planning period;
- All costs and financial projections are GST exclusive;
- A project estimating template has been developed that provides a consistent means of preparing estimates;
- Where practical, a common set of rates has been determined; and

- Specific provisions have been included to deal with non-construction costs like contract preliminary and general costs, engineering costs, the Council's staff costs, resource consenting costs and land acquisition costs.

Specific provisions have been included to deal with estimate accuracy.

3.6 Facing the Challenges

Kaipara District Council recognises the importance of providing assets that are fit-for-purpose and affordable. Over the life span of the Long Term Plan (LTP) the Council faces a variety of issues and challenges:

- Changing legislation and compliance requirements will continue to impact upon the development and management of roads and footpaths assets. The Plan has been prepared having regard to meeting known and anticipated legislative requirements.
    - The Local Government Act 2002 includes the following significant issues to be addressed:
        - Community consultation is required by the Act where it is seen that there is significant change from the previous Plan;
        - The implementation of the international Accounting Standards (IAS16) requires the recording and valuation of roads and footpaths assets; and
        - The Roading Government Powers Act 1989.
- Demand and usage of roads and footpaths assets. The Plan has been prepared having regard to growth trends and current trends.

Whilst Statistics New Zealand predicts static growth for Kaipara with little to no growth over the next 10 years, with the south-eastern area of the district predicted to have some growth between 2015 and 2030.

The Northland region is showing significant growth trends associated with visitors, residents, events and leisure activities, this will result in higher use of Council's road and footpath assets.

The Northland region is experiencing a large Increase in usage by the freight industry which may mean higher expectations for operational LoS to maintain sealed and unsealed roads low volume roads used by the trucking industry.

3.7 Mangawhai Town Growth and Development:

Mangawhai – growing well

In the years 2001 – 2016 there was an increase of 1,304 houses or an average of 87 new houses each year (1,391 to 2,695, almost double). Improvements to State Highway 1 will bring us closer to Auckland, and the growth of Auckland may create migration north in search of a better and simpler life.

Now just under a half of housing is lived in full time. The rest are holiday/weekend homes. This creates peaks of demand and demand for different housing choices.

The permanent population between the 2001 and 2013 Census grew by 57% from 1,391 to 2,429. It is estimated that current population is now around 3,000. This expands considerably every weekend and moreso over summer.

By 2030, it is expected that the number of homes in Mangawhai will have increased by about 1,400 (medium growth scenario) with a usually resident population of more than 4,000, assuming continued half half between permanently occupied/not occupied dwellings.

- **Where will these homes go?**
- **How can we grow without losing what is special about Mangawhai?**
- **What is the impact on the environment?**
- **Will it still be easy to get around?**

87
new houses per year
From 2001 – 2016 the increase in the number of houses

just under 1/2
full time residents
The rest are holiday/weekend homes.

57%
growth in population
It is estimated that current population is now around 3,000.

4,000
Residents by 2030
half-half between permanently occupied/not occupied dwellings.

What does this mean for Transport initiatives?

DRAFT

The suggested approach to transport development is to fix "pain points" in the network (notably the two intersections at the Village shops) but otherwise use cycling and walking to improve connectivity.

The intent is to slow traffic and life down generally when people are in Mangawhai. Roundabouts are the preferred mechanism for improving vehicle flow at intersections, while keeping movement at a reasonable speed that promotes the slow pace and safety for pedestrians and cyclists.

Project	Description	Year (beginning 01 July 2018)	Cost estimate (net) rounded (capex)
Stage one – slow street Mangawhai Village	Shared path and landscaping from: - Mangawhai School to Insley/Moir Streets intersection - Tara Bridge to Pearson Street (including Mangawhai Domain)	1-3 years	$78,000
	Roundabout at Insley/Moir Streets intersection	1-3 years	$1,000,000
	Roundabout at Moir Street/Molesworth Drive intersection.	1-3 years	$600,000
	Review parking provisions	1-3 years	tbc
	Improved arrival experience from the south.	1-3 years	Included above
Stage two – slow street Mangawhai Community Park	Shared path and landscaping along Molesworth Drive from Moir Point Road to the southern end of the Causeway Bridge	4-6 years	$207,100
Stage three – slow street Mangawhai Central	Shared path and landscaping along Molesworth Drive from Pearson Street to the Causeway Bridge	4-6 years	$195,000
	Two roundabouts at entrances to Estuary Estates off Molesworth Drive.	tbc	tbc
Stage four – slow street Molesworth Drive Roundabout to Surf Club	Shared path and landscaping along Mangawhai Heads Road and Wintle Street from the Pearl Street Corner to Surf Club	7-10 years	$180,000
Stage five – slow street Mangawhai Heads	Shared path and landscaping along Molesworth Drive from Moir Point Road to the Mangawhai Heads roundabout	7-10 years	$137,000
	Wood Street/Molesworth Drive roundabout		$600,000
Cycling/walking on road shared paths (other than on "slow street")	Mangawhai Heads loop shared path (Wood Street / Robert Street / North Avenue / Alamar Crescent / camping grounds / Mangawhai Heads Road including Wood Street upgrade	4-6 years	$1,128,000
	Mangawhai Village loop path (signage on existing esplanade) (Kainui Street / Pearson Street / coastal reserve / Moir Street)	1-3 years	$10,000
Footpaths	Footpath along Alamar Crescent	7-10 years	$47,000
	Pedestrian connection on Insley Street causeway and bridge	Beyond 10 years	$224,000
Future stage – cycling/ walking	Shared path to Mangawhai Central via Old Waipu Road.	Beyond 10 years	$250,000
Connecting the two sections of Old Waipu Road	Provide an alternate route into Mangawhai and Estuary Estates from an upgraded and joined up Old Waipu Road.	Beyond 10 years	$1,800,000
Through route for through traffic	Develop an alternate route for travellers to Langs Beach and Waipu Cove to time with Warkworth to Te Hana State Highway 1 upgrade (Cove Corridor).	Beyond 10 years	unknown
	Include 2m verge for cyclists refuge along Cove Rd.		
Plan for other intersection improvements as Mangawhai grows	These may include Molesworth Drive /Sail Rock Drive, Molesworth Drive /Estuary Drive / Thelma Road, Tara Road / Mangawhai-Kaiwaka Road.	Beyond 10 years	unknown

3.8 Disabled Community Transportation options Development:

One of the risks and opportunities is developing a strategy and system to benefit all members of the disabled community 1.1 million, 24% of population, 59% of those over 65 and Northland has approximately 30% of population. This group of the population is currently largely not catered for.

NZTA RTS14 Guideline for facilities for blind and vision impaired pedestrians is a background document for this group.

Mobility Scooters are the next group of transport users:

Mobility scooters

The Research and Guidelines Steering Group has prepared two reviews of international literature on mobility scooters: a 2013 review of international approaches to the classification and regulation of mobility scooters; and a 2015 review of recent United Kingdom and Australian studies on health and safety issues affecting the devices and their users.

New Zealand is facing broadly similar demographic trends to those faced by Australia, North America and Europe. The population is aging and a large segment of the current population is moving towards being over 65. As a broad generalisation, mobility-related disability affects about one third of persons within the over 65 age group. Nevertheless, high personal mobility and personal independence are seen as being particularly important for this age group.

Personal mobility and personal independence are also seen as being particularly important for younger persons with injuries or disabilities that affect their mobility. Obesity-related mobility impairment is also an increasing issue. At the same time there is also a trend away from private car ownership, with increasing interest in alternative personal mobility solutions. For all of these reasons, there has been increasing interest in motorised personal mobility devices.

Mobility scooters are becoming an increasingly common sight on many suburban streets, especially in provincial centres. Improved designs and greater acceptance, or a decrease in a perception of mobility scooters as being for only the physically impaired, have seen these devices become an increasingly popular personal mobility choice.

Although there is a wide variation in regulatory approaches to motorised mobility devices in different jurisdictions, increasing recognition has been given to the need to balance the benefits to the elderly and disabled from improved mobility against the need to ensure that these groups, whether as mobility device users or as pedestrians, are not put at greater risk.

Significant safety issues can attach to mobility scooters used by elderly or disabled operators. These devices tend to be substantially heavier and faster than most pedestrians, and can be beyond the fitness or competence of some elderly or disabled operators to control effectively. Operators of mobility scooters appear to be at significantly greater risk of being in an accident, and of being seriously or fatally injured in accidents, than other groups using the road corridor.

There is also evidence to suggest that serious health concerns exist around increased use of mobility devices. Younger persons and those who have no disability are increasingly using mobility scooters for personal transport. Their adoption by individuals who could otherwise walk is likely to produce substantial personal and public health costs.

Active personal transport modes, such as walking and cycling, have proven benefits at a societal and economic level. Greater investment in active transport choices has been supported by health professionals at a national level. A mobility scooter is an alternative sedentary transport mode and potentially more pernicious, because it allows the entire journey to be completed without taking a single step in many instances.

Mobility scooters have been seen to be comparable to cyclists and pedestrians in safety needs and functionality requirements: low-speed roads, cycle paths and footpaths. Provision of safe travel options that allow easy access to services and amenities is seen as a vital factor in maintaining mobility in the elderly and the disabled. This mobility remains dependent on access to private transport. The need, therefore, is for safer users, safer vehicles, safer infrastructure and innovative alternative personal transport options.

There is a need to balance avoiding creating a barrier to greater independence of the elderly and disabled against putting them and the public at greater risk. Mobility scooter users can have reduced mobility or a physical disability almost by definition. Vision, hearing, perception, reflexes, reaction time, balance, posture, strength, co-ordination, endurance, cognition, lucidity, memory and judgement can all be potentially impaired in scooter users.

Mobility scooter users without prior driving experience can lack experience in planning a journey and the stages needed to reach an objective, reading traffic, making spatial judgements, assessing risk and hazards, using peripheral vision and reacting appropriately to hazards. Alcohol use and medications preventing operation of machinery have also been identified as issues for mobility scooter users.

Despite the claims of some advertisers that tend to portray all mobility scooters in external settings, often on slopes, the ability of mobility scooters to safely negotiate changes in gradient and surface level can be quite limited. This limitation is particularly relevant to the design of infrastructure used by mobility scooters, including temporary footpaths and detours around worksites.

Crossfall gradients and vehicle access crossings on paths are a significant issue for mobility scooter users. Mobility scooters are highly responsive to changes in surface texture or gradient, and a user without the strength, alertness or reactions to avoid or respond to a sudden change can easily lose control. A crossfall of 1:50 is ideal.

For mobility scooters to safely pass each other without risk of collision and without risk of tipping off a path or colliding with a wall or stationary object requires a path width of 2.0m. A 2010 UK study found that the turning circle of a 1500 x 695mm mobility scooter is 4.35m, and a 90 degree turn needs 2.2m.

The time taken for a mobility scooter user to look both ways and commence crossing a road can be up to eight seconds and for a mobility scooter to cross a 7m road can be up to 12.7 seconds. A mobility scooter can, therefore, be up to 46% slower crossing a road than a pedestrian.

Treatment of mobility scooters as pedestrians raises philosophical and potentially legal issues of consistency of treatment if any barrier to use is considered that would not apply equally to a person walking, rather than using a mobility device.

Classification of essentially similar devices as being pedestrian, bicycle or motor vehicle depending on the speed environment in which they operate is confusing and potentially contributing to higher accident rates amongst mobility device users, as devices classed as pedestrian and not equipped with suitable safety and security equipment are nevertheless being taken onto roads. The weight of the international literature tends towards classification of mobility scooters and similar personal mobility devices as a special class of motor vehicle.

4 Strategic Environment

4.1 The Strategic context

As part of the 2015/2018 AMP, Kaipara District Council (KDC) developed a business case which included a strategic case to suit a BCA AMP. As well as being consistent with national and regional strategies, this strategic context was based on the following strategic documents:

- Kaipara District Growth Model;
- Kaipara Transportation Network Strategy;
- Kaipara Forestry Road Strategy;
- Kaipara Walking and Cycling Strategy;
- Kaipara Crash Reduction Study; and
- Kaipara Parking Strategy.

The following strategic context has been identified:

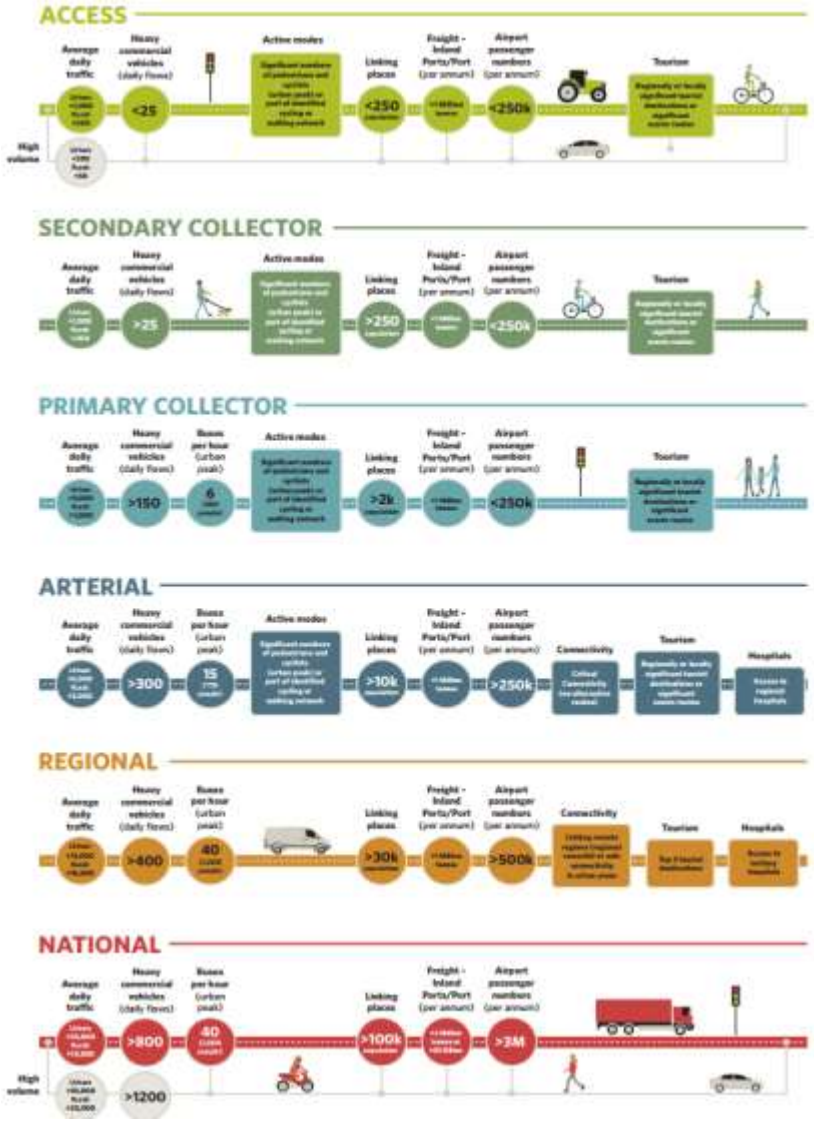
- **Network** - KDC has a network of 1,575km of road of which 448km (28%) are sealed and 1,127km (72%) are unsealed. The network has 348 bridges, 88km of footpaths.
- **Environmental Factors** – The Kaipara district is located in Northland which is subject to subtropical cyclones and storms. The geology of the district is variable with many roads subject to instability and ground creep.
- **Business Unit** – KDC currently operates an in-house business unit for its roading operations. As of 01 July 2016, a Northland business unit (Northland Transportation Alliance - NTA) has been established which include staff from KDC, KDC, and NRC co-located and FNDC in Kaikohe.
- **Forestry** – KDC has 455km of forestry roads which mostly form the "trunk" of Northland's forestry network which accesses Northport. Approximately 4.0 million cubic metres of logs travel to Northport per annum and this level is expected to continue until 2020 when it is forecast to drop to 3.0 million cubic metres per year. Approximately 5% of this freight comes from outside the Kaipara district. Additional funding of $1.5 million per year to maintain these forestry routes was approved for the 2015/2018 period.
- **Resilience** – The Kaipara network is subject to high levels of rainfall and has poor underlying soils in many areas. This results in high likelihood of storm events causing damage to the network. In addition, there are numerous "soil creep" slips that regularly require topping up to maintain the road in a safe condition.

- **Sealed Pavements** – Over the past 10 years KDC's rehabilitations have remained reasonably static and at low levels due to local share funding remaining static. Over the period 2012/2015, KDC had a reseal rate of 6.8%. This relates to 30kms per year and a refresh turnaround of 15 years. However the low strength networks have pavement failure prior to surface failure which requires early intervention. Along with the rate of first coat seals not being attended has created a significant backlog.
- **Unsealed Pavements** – Dust on unsealed roads used by heavy vehicles is a significant issue. KDC has funded a trial of aggregate-blend sites across the network and also a chemical additive trial site to understand what options and opportunities are going forward. There are major concerns about the strength of the unsealed pavements due to lack of pavement depth and this is also creating a high cost maintenance programme and needs to be fixed.
- **Bridges** – The bridge network is generally in good condition. However, there are many corrugated pipe culverts which have previously had their inverts concrete-lined which are now corroding and need to be replaced. KDC also has 12 bridges that do not have sufficient capacity to handle 50MAX trucks.
- **Streetlights** – KDC has 1,175 streetlights on its network. Of these there are a mix of high pressure sodium and mercury vapour lights which are to be phased out. KDC spends about $550,000 on power for these streetlights per annum and is keen to install LED streetlights to reduce these costs.
- **Footpaths** – The footpath network is deteriorating and some areas around Dargaville and the smaller communities are in poor condition. Footpaths are maintained and cracked sections removed. However, there is very little in the renewal programme for footpaths.
- **Cycleways** – KDC is currently implementing a cycleway network in the region which includes links to Mangawhai, Mangawhai Heads and Paparoa.
- **Public Transport** – There is a public bus service (provided by Intercity and Mana) that services Kaipara.
- **Safety** – Road safety has been improving in Kaipara over the last 10 years. However, further improvements can be made on high risk rural roads, high risk intersections and communities at risk.
- **Growth** – Population growth in the district has been about 1% per annum and this is expected to continue into the future. Traffic growth seems to have increased more than population growth and this may be because of the rebound from the global financial crisis. Heavy vehicles growth on the east coast has been substantial due the construction industry.

4.2 State of the Network

Design Capacity

This chart shows the expected capability and capacities for each of the classifications.



Current Asset data confidence profile:

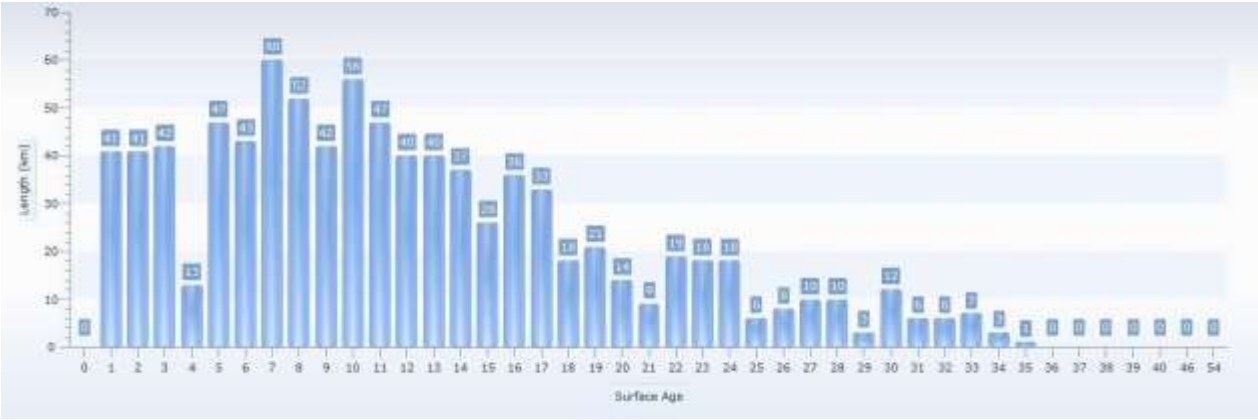
The table below indicates that when benchmarked against the National average Kaipara has a high degree of data confidence.

Condition Monitoring

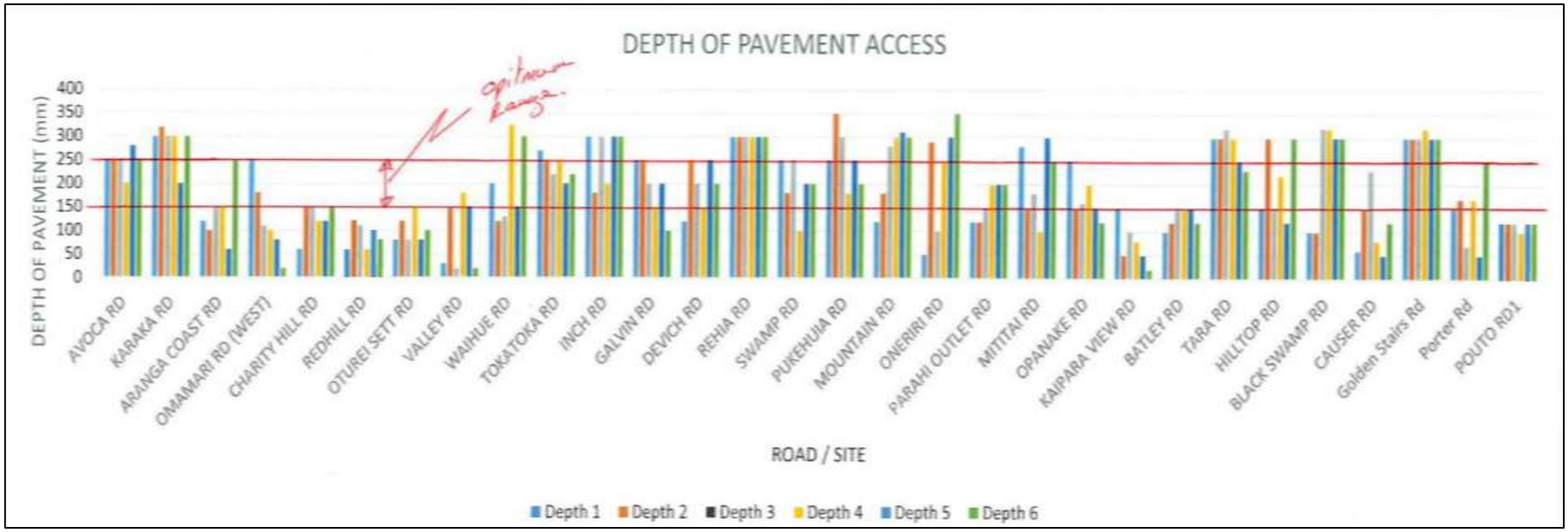
- Sealed road network condition monitoring is carried out annually by implementing a high-speed data annually and a 30% falling weight deflectometer survey, all this information is loaded into RAMM and also mapped into GIS;
- Unsealed road network is monitored by completing a 10 - 15% SCALA, profile and pavement depth survey annually. This is about to be complemented by using the latest technology and driving 100% of the unsealed network with a laser and video bar. This will collect 100% of the shape data along with all the surface faults;
- Bridges and large culverts are inspected bi-annually in accordance with the NZTA Bridge Manual (posted and wooden bridges are inspected annually). We have split the network up into north and south regions with approximately 50% of the bridge stock in each region;
- Drainage structures are inspected by the maintenance contractor on an annual basis and reported on. This exercise is currently under review and will include both a capacity and capability assessment;
- Footpath condition surveys are completed every three years by a professional service provider and reported to Council;
- Signs are audited annually and a night inspection is set into the operations contract;
- Retaining structures are inspected three yearly and both a maintenance and renewal plan developed;
- Safety barriers are to be inspected as part of the new contract routine monthly inspections; and
- Currently we have no inspection process for streetlighting.

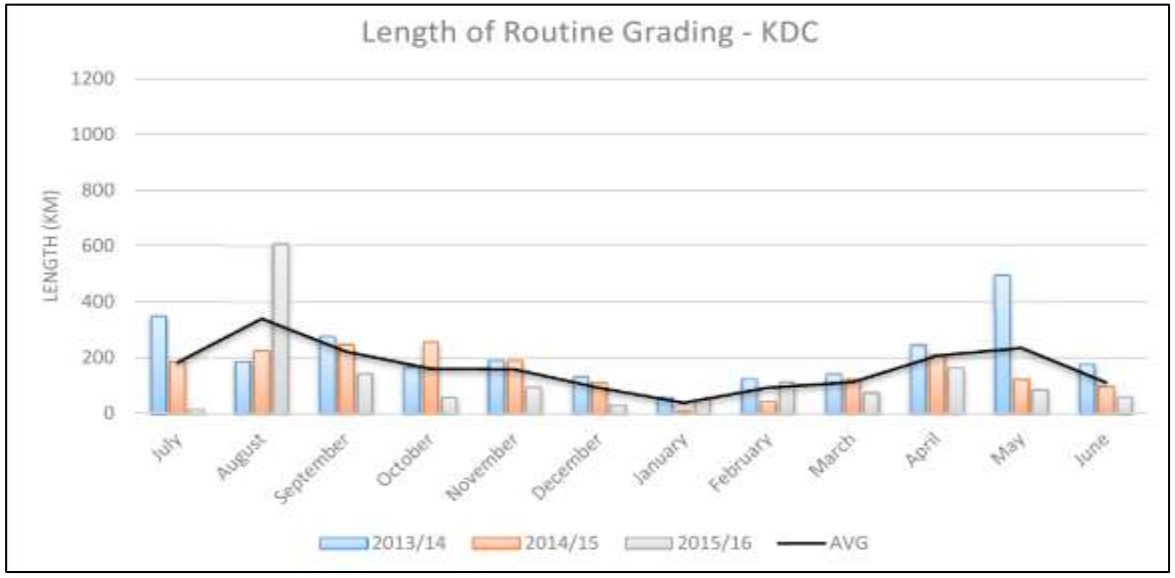
Age and Profile Graphs

Sealed Surface

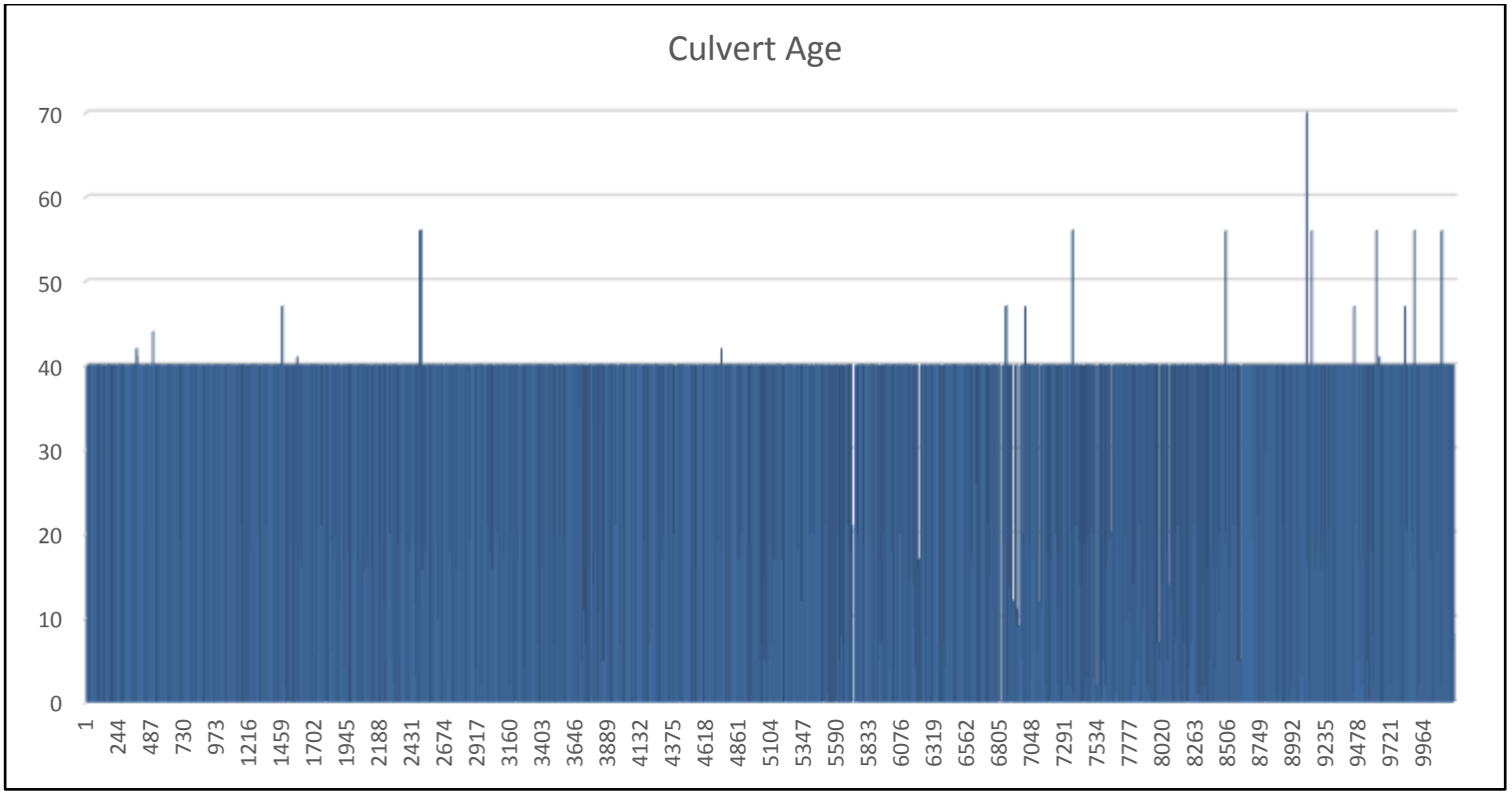


Unsealed pavement

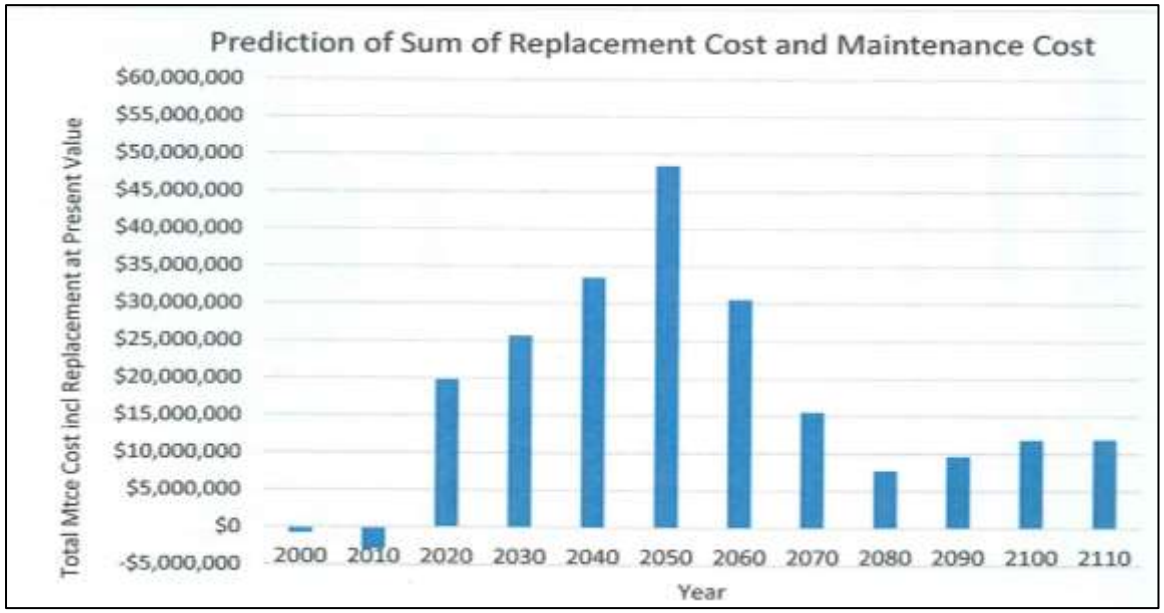




Drainage


Culvert Age
70
60
50
40
30
20
10
0
1
244
487
730
973
1216
1459
1702
1945
2188
2431
2674
2917
3160
3403
3646
3889
4132
4375
4618
4861
5104
5347
5590
5833
6076
6319
6562
6805
7048
7291
7534
7777
8020
8263
8506
8749
8992
9235
9478
9721
9964

Bridges



Structures

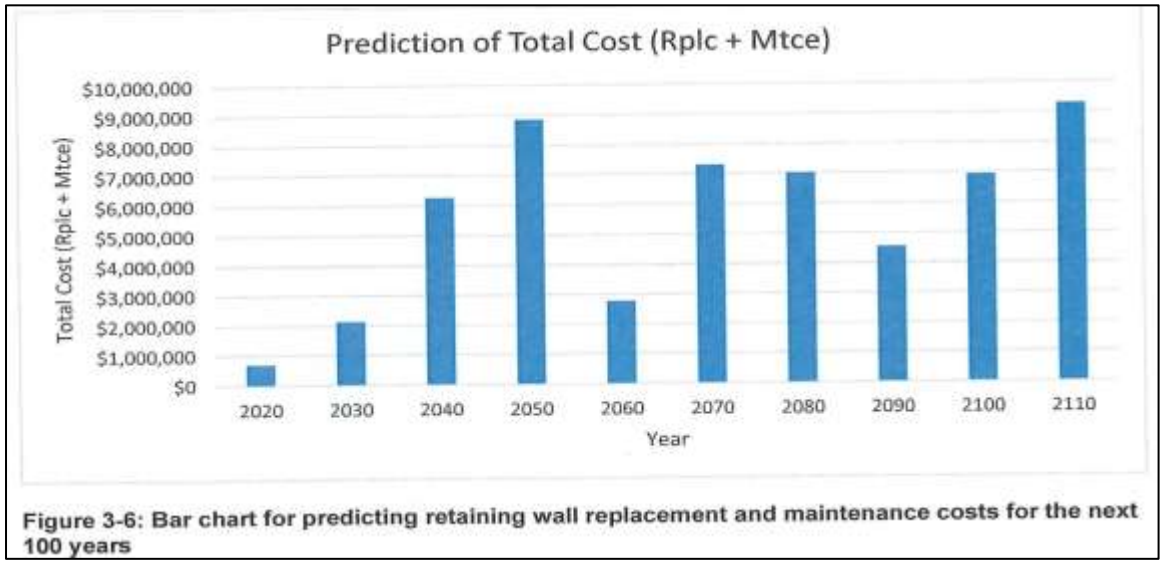
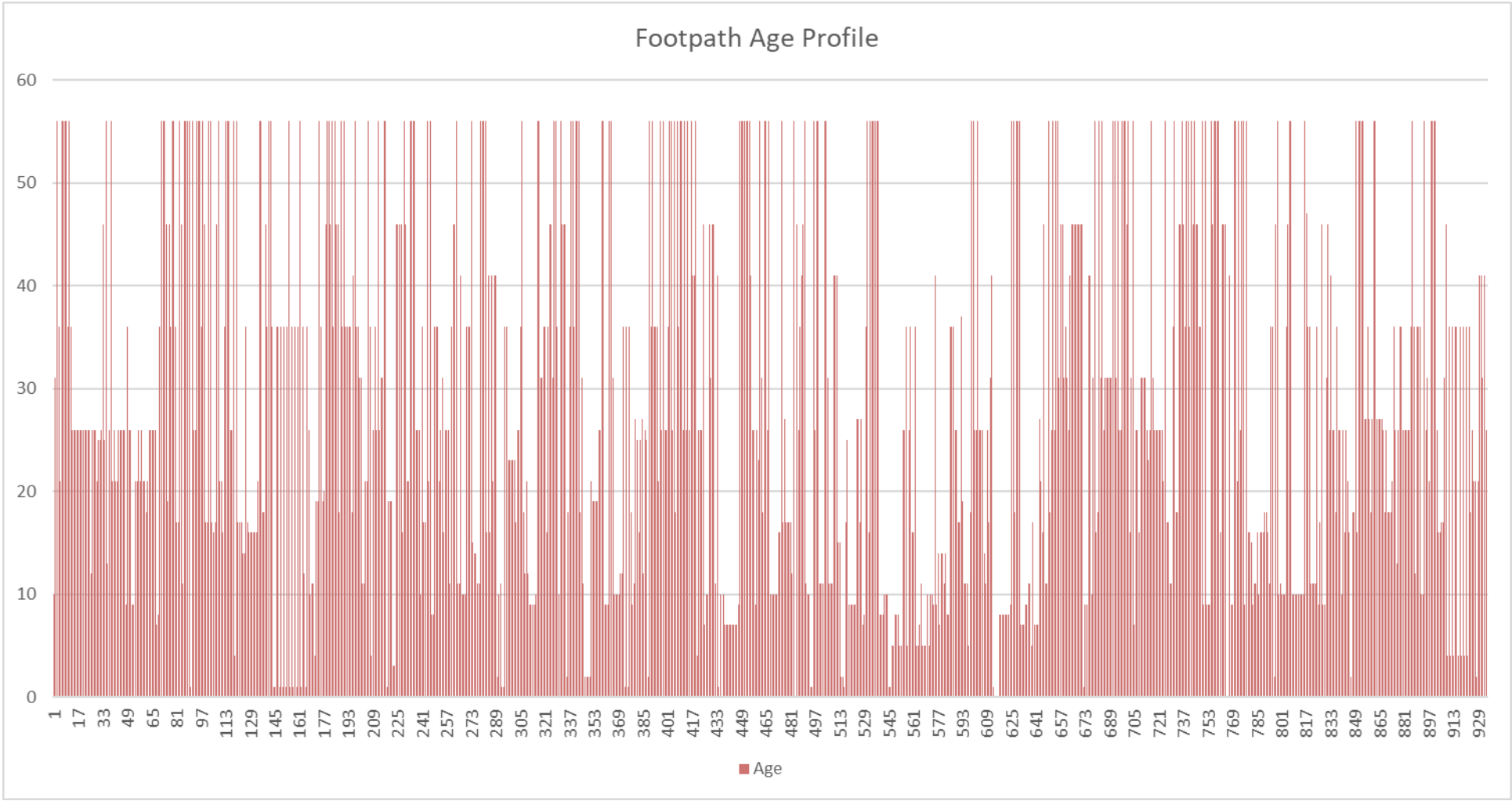


Figure 3-6: Bar chart for predicting retaining wall replacement and maintenance costs for the next 100 years

Footpaths


Footpath Age Profile
60
50
40
30
20
10
0
1
17
33
49
65
81
97
113
129
145
161
177
193
209
225
241
257
273
289
305
321
337
353
369
385
401
417
433
449
465
481
497
513
529
545
561
577
593
609
625
641
657
673
689
705
721
737
753
769
785
801
817
833
849
865
881
897
913
929
Age

Valuation Summary

Summary of the Asset Valuation as at 31 May 2016

Asset Description	Replacement Cost $	Total Accumulated Depreciation $	Depreciated Replacement Cost $	Annual Depreciation $
Land	67,155,752	0	67,155,752	0
Formation	204,776,973	0	204,776.973	0
Sealed pavement surface	10.352.337	6,966,480	3,385,857	685,444
Sealed pavement layers	91,219,099	21,323,943	69,895,156	1,091,294
Unsealed pavement layers	27,573.035	9.472,528	18,100,506	1,922,563
Drainage	58,748,155	25,968,135	32,780,020	799,688
Surface water channels	13,250,800	5,205,093	8,045,707	184,184
Footpath	10,190.032	3,546,991	6.643,932	123,809
Traffic facilities	607,348	229,291	378,057	57.324
Signs	2,232,010	888,250	1,343,760	184,653
Railings	2,621,453	826,795	1,974,658	75,197
Retaining walls	6,060,410	1,571,162	4,489,248	121,208

5 Problems, Benefits and Consequences

This section outlines the problems affecting the Kaipara transportation network and details the benefits or consequences of doing or not doing something to address these problems. Based on our assessment of our stakeholder workshops and customer surveys along with our knowledge of the network we see that there are five key issues within the network that affect the performance, as listed in the table below.

Issue	Problem statement
Sealed road surface	Whilst our sealed network carries low VKT they are the backbone of our network and handle much higher holiday season traffic from Auckland and south. We are also seeing a marked increase in international and national self-drive tourists. The main problem we have is that 20% (approximately 104km) of our sealed network has never had a second seal coat applied and this means there is a high risk of surface failure and a much higher repair cost if a rehabilitation is required. The Kaipara sealed network has had a 0.08 texture decrease since the 2015/2016 survey with marginally more on Pouto Road. See Appendix F for current programme.
Unsealed road pavement and wearing course	Lack of asset data on the unsealed network is constraining what we understand and this has the effect of Kaipara being one of the highest maintenance costs per kilometre in our peer group and leading to very reactive sub-optimal maintenance practices. We are currently undertaking asset data and condition collection and assessment to better understand the network. Our current problems are lack of pavement depth (low strength), lack of running course with low cross-fall values, lack of customer confidence (22% satisfied with unsealed network). Dust is also an issue on nominal heavy routes traversed by dairy tankers, stock trucks and forestry routes, resulting in health effects to those residents living close and adjacent to these roads. We are currently completing a pavement survey to understand the extent of this problem.
Resilience	Poor geology and a subtropical climate make our roads susceptible to slips and flooding during heavy rain events which result in road closures that often effect freight, tourists and detour routes, key lifeline and isolated communities. This is expected to worsen over time given the effects of climate change. In addition to this Kaipara has very little ability to fund this work from its very low rate base on top of the normal operational, renewal and capital funding.
Safety	The number of fatal and serious injury crashes on our roads is too high. Our target is = 0". There is a trend upwards in general (particularly at night). We are currently working to understand if wet (skid) is an issue as a high percentage of our network has low texture. The crashes appear to be occurring on our primary and secondary sealed collectors. See Appendix E in regards to the national communities at risk "road crash".

Issue	Problem statement
Drainage	Currently Kaipara's network drainage has a backlog of low capacity cross culverts of a size that are no longer capable of managing the flows causing local flooding and scour. We have a total of 12,080 culverts with 9,960 (82%) with a diameter of less than 400mm. This has a direct effect on our community resilience, network maintenance costs and the ability to be proactive.

5.1 Problem Identification

Pavement Renewals – KDC has historically ramped up its pavement rehabilitation programme on its sealed road network following a funding increase in 2015/2018. This has had the effect of bringing the pavement into a positive condition and means we can relax this and focus on those higher class roads that are attracting the higher traffic volumes (both cars and freight).

Block cracking of stabilised pavements is also an issue on heavy vehicle routes resulting in premature failure of some pavements. Many roads have little or no shoulders and inadequate drainage which is resulting in early rutting of the outer wheel path (we have increased drainage funding to work on this).

Further investment is also needed on the unsealed road network to restore pavement strength that has been consumed through metal loss.

Forestry – The forestry traffic results in significantly higher maintenance demands than on other routes. The continuation of the programme of additional funding for forestry (albeit at a lower level) is expected to address the forestry demands on the network.

Resilience – There are numerous slips on the road network that are either "slow creeps" or are in the road shoulder and have therefore not been eligible for emergency works funding. These slips are vulnerable to failure during storm events and should be repaired proactively to avoid catastrophic failure. KDC currently has no prioritised programme of slip repairs or nominated detour routes on its key arterial roads.

Dust – Ongoing pressure from residents on unsealed heavy vehicle routes to treat their roads or frontages. This is to reduce the impacts of fine dust on residents' health and to improve road safety.

Footpath Condition – KDC's footpaths appear to be deteriorating due to lack of renewals. This is leading to increased risk of trip hazards and obstructions, particularly with an aging population who are becoming less mobile. In addition, the aging population is demanding wider footpaths and crossings that are suitable for mobility scooters and wheelchairs etcetera.

Emergency Works Funding – KDC does not have an internal budget for emergency works funding and so there is a significant risk of programmed works being cut to fund future emergency events (as has happened frequently in the past). Emergency works have averaged $3.1 million per year over the last 10 years.

Cycleway Connections – The current cycleway project will complete the key routes of the cycleway strategy. However, additional work is required to build connections to schools, parks and businesses to enable the full potential of the cycle network to be realised.

Capacity Issues – No apparent capacity issues exist in Kaipara, however the east area of Mangawhai becomes congested over the summer months.

Parking – There is no active signage to advise customers where parking is available which leads to people aimlessly driving around looking for a park in the Dargaville CBD. Tension between providing sufficient parking with new developments and encouraging public transport use.

ONRC Gap – The gap between the current LoS provided and the ONRC LoS is now underway and still being determined.

5.2 Benefits of Addressing problems

Pavement Renewals – Continuation of the current programme will enable the sealed pavement to be maintained in a fit-for-purpose condition while optimising the long term maintenance costs. Some further investment in heavy metalling of unsealed roads is required to restore strength, particularly on heavy vehicle routes.

Forestry – Continuation of the current programme will enable KDC to maintain the forestry network in a reasonable condition.

Resilience – Addressing slips in a proactive manner will reduce ongoing maintenance costs and reduce the likelihood of catastrophic failure.

LED Streetlights – Replacing the current streetlights with LEDs will remove obsolete lights and will reduce long-term power and maintenance costs. Providing streetlighting that meets the current standards will also improve road safety and crime prevention.

Footpath Condition – Providing an adequate level of footpath renewals will reduce trip hazards and will make footpaths more accessible for an aging population. In addition, these renewals would improve footpath widths and crossings which will make footpaths safer and more accessible for mobility scooters and wheelchairs.

Emergency Works Funding – Providing a dedicated emergency works fund would enable emergency works to be funded without having to defer other necessary renewal and capital projects.

Cycleway Connections – Providing cycleway connections to schools, parks and businesses will encourage cycle use and maximise the full potential of the cycleway network.

Capacity Issues – Some improvement to traffic flow issues in the east coast area would ease the summer congestion.

Parking – Better signage and promotion of the existing off-street parking.

Public Transport – Improving the attractiveness of the bus service and infrastructure will encourage better usage and reduce road traffic and parking demand. A rural bus services would reduce rural commuter traffic on key arterials servicing the city.

ONRC Gap – Will help KDC meet the customer LoS expectations.

5.3 Consequent of no action

Pavement Renewals – Not continuing the current programme will see a worsening of pavement condition (e.g. more potholes and failures) and an increase in long term maintenance costs. Not increasing the heavy metalling funding for unsealed roads will see these road deteriorate further (e.g. more clay punching through the pavements).

Forestry – Not continuing the current forestry programme will result in a worsening condition on forestry routes, more maintenance and costs, slower travel times and potential safety issues.

Resilience – Without a proactive resilience programme, historic slips will continue to be at risk of premature failure and will require ongoing maintenance to repair.

Footpath Condition – Without an adequate level of footpath renewals, width and crossing improvements, trip hazards will increase, footpath condition will worsen and footpaths will be less accessible for the aging population leading to an increased number of customer complaints.

Emergency Works Funding – Without a dedicated emergency works fund, Council will need to defer other necessary renewal and capital projects to generate the local share for the emergency works as they arise. This has led to an under-investment of renewals in the past.

Cycleway Connections – Without adequate cycleway connections, potential cyclist may be put off from using the cycleway network which will result in lower uptake of users and less health and congestion relief benefits being achieved.

Capacity Issues – Without addressing capacity issues at known problem areas, these will continue to cause delays and frustration to road users on these arterial routes.

Parking – Without carrying out any changes to the parking in the CBD, customers will still be frustrated in driving around looking for a park.

Public Transport – Without change to improve the current bus service, public transport will have limited impact on reducing congestion and traffic growth in Kaipara.

ONRC Gap – Not meeting the ONRC gap will potentially result in a worse LoS experienced by the road user.

5.4 Snapshot evidence

Sealed pavement rehabilitation funding has been increased in 2015/2018 to address the lack of strength being put back into KDC's pavements.

Forestry funding has been provided and NZTA (HNO) is to take over the Mangakahia/Otaika Valley forestry route.

The 50MAX vehicles are using the Kaipara network and issues such as turning paths for these larger vehicles are starting to be identified.

ONRC hierarchy has been adopted and performance measures are currently being worked through which is likely to result in a change to the LoS being provided.

The four councils in Northland (KDC, KDC, FNDC and NRC) where combined into a Northland Business Unit on 01 July 2016. This should result in more consistent planning and operations being adopted across the region.

5.5 Sealed Road Network

Sealed Pavements Problems – Over the past 10 years KDC's rehabilitations have remained at a reasonably high level due mainly to previous years of neglect. Over the period 2015/2018, KDC had a reseal rate of 6.8%. This related to 30km per year and a refresh turnaround of 15 years which has enabled a catch-up as shown by the new data as a higher than average pavement strength condition rating but a lower than average surface condition. This is considering the entire network of which a portion is urban low volume, low speed and low weight therefore able to accept a lower level of service, not having the same issues as the freight routes and primary collector routes.

The major problem statements on the sealed network are currently very low texture with a lack of quality drainage, failing sealed surface, as shown by the amount of very low texture, and cracking on the network. The cracking is due to little or no shoulder giving no lateral support along with oxidisation and some rutting.

The graphs below indicate the same finding but on a national rural level. We have had the highest level of rehabilitation costs per kilometre in New Zealand, this has been due, to some extent, by Council suffering a rate strike by the community which is now over and funding is back to normal. The data is now telling us that we have caught up and that our pavements are in a state of service to deliver.

We now need to monitor the condition of the surface and in particular where there are faults that may contribute to early pavement failure e.g. potholes and cracking.

Amenity Customer Outcome 1 Comparative - Smooth Travel Exposure (STE)

The percentage of travel on roads smoother than the specified threshold for each classification.

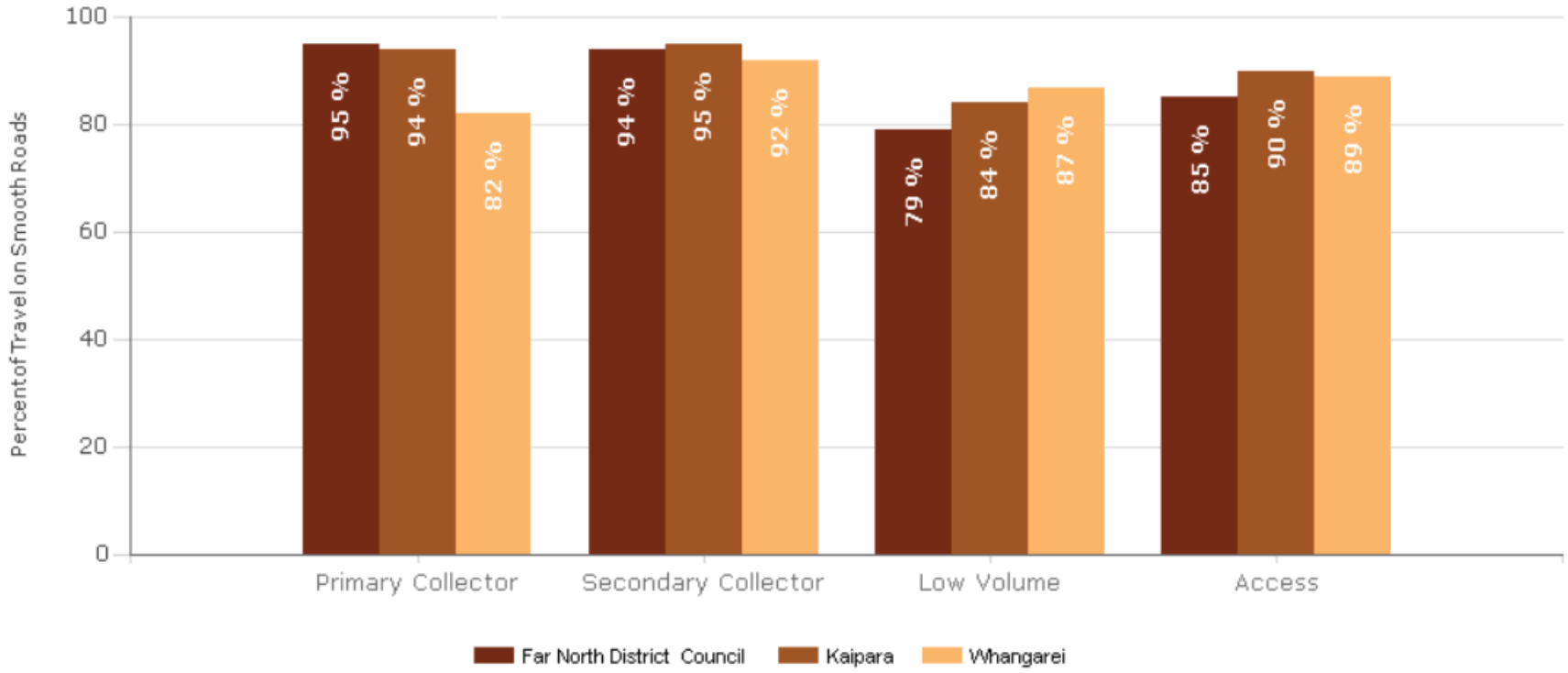
Financial Year: 2015/16

RCAs: Whangarei, Kaipara, Far North District Council

Classifications: Primary Collector, Secondary Collector, Access, Low Volume

Urban/Rural: Urban, Rural

* RCAs chosen (shown above) may not show if they have no data for the selections in this report.



Amenity Technical Output 1 Comparative - Roughness of the Road (Median)

The median roughness of your roads.

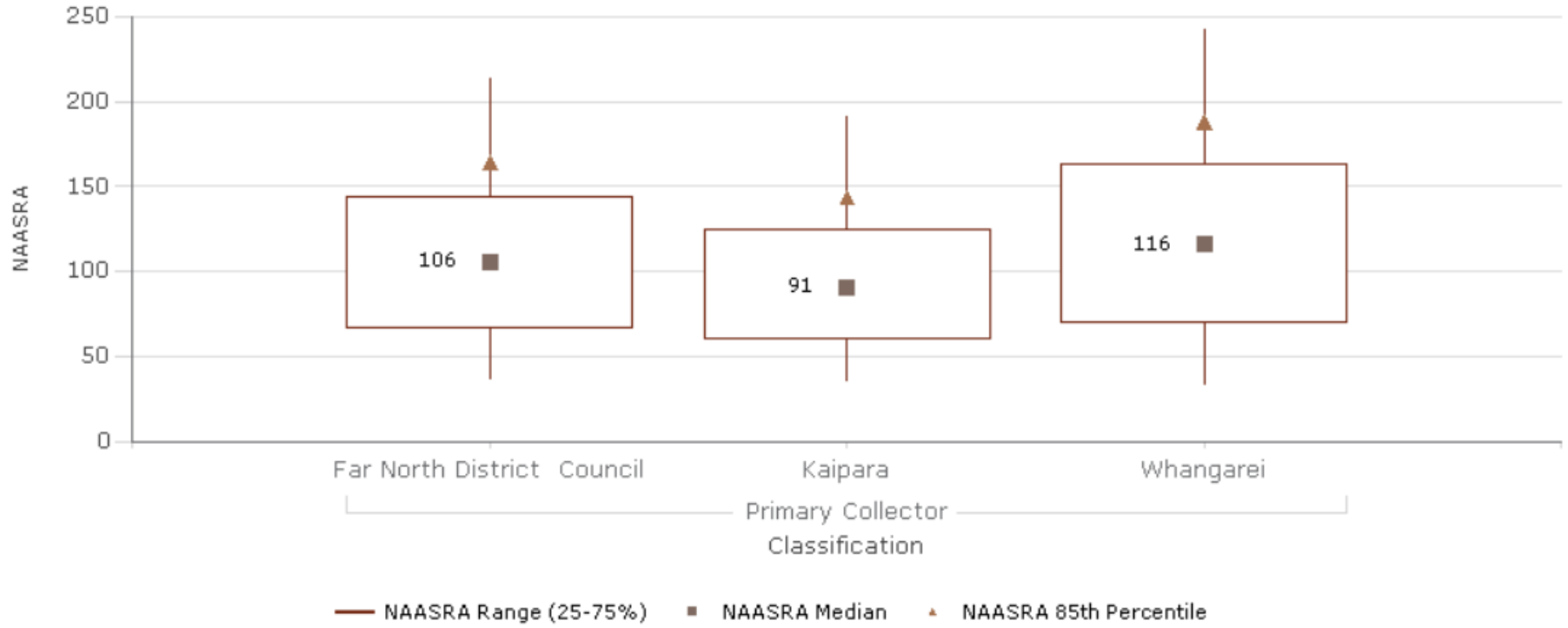
Financial Year: 2015/16

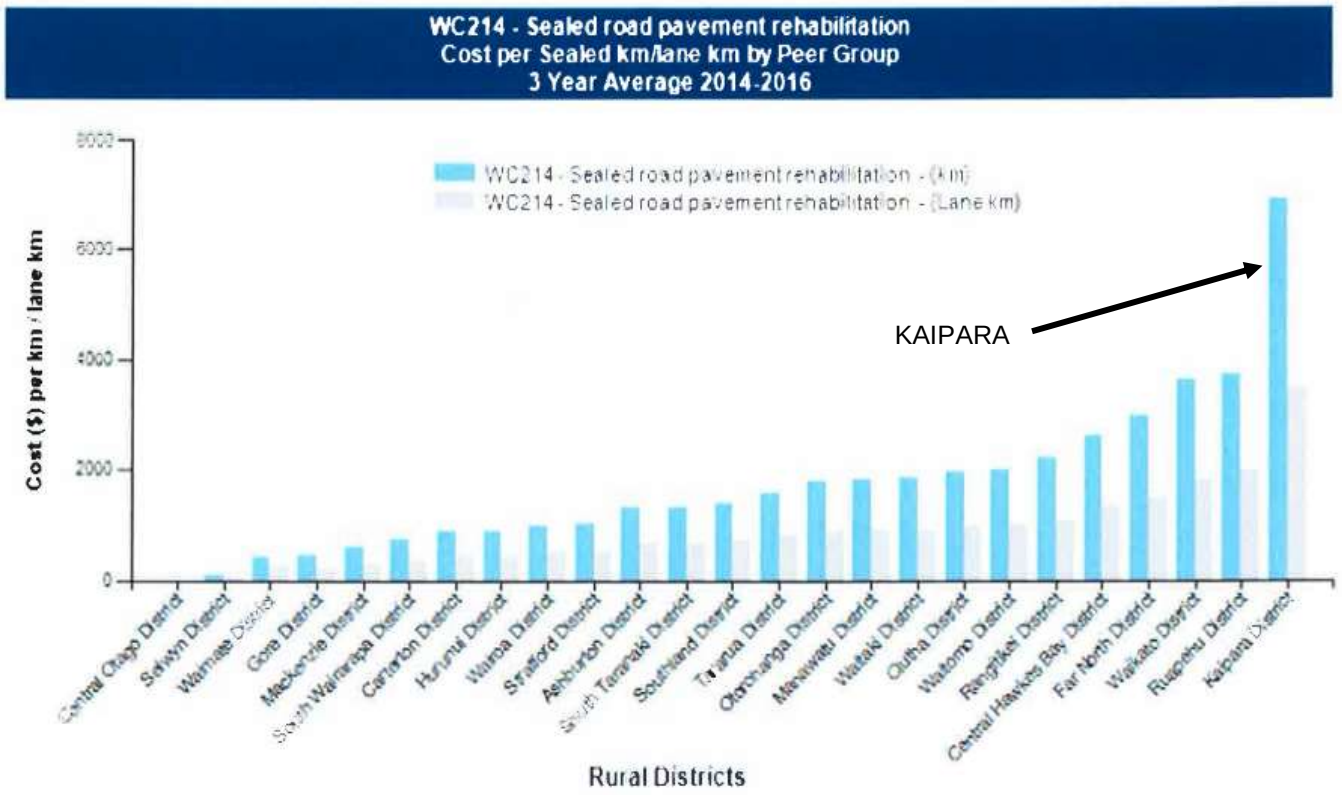
RCAs: Whangarei, Kaipara, Far North District Council

Classifications: Primary Collector

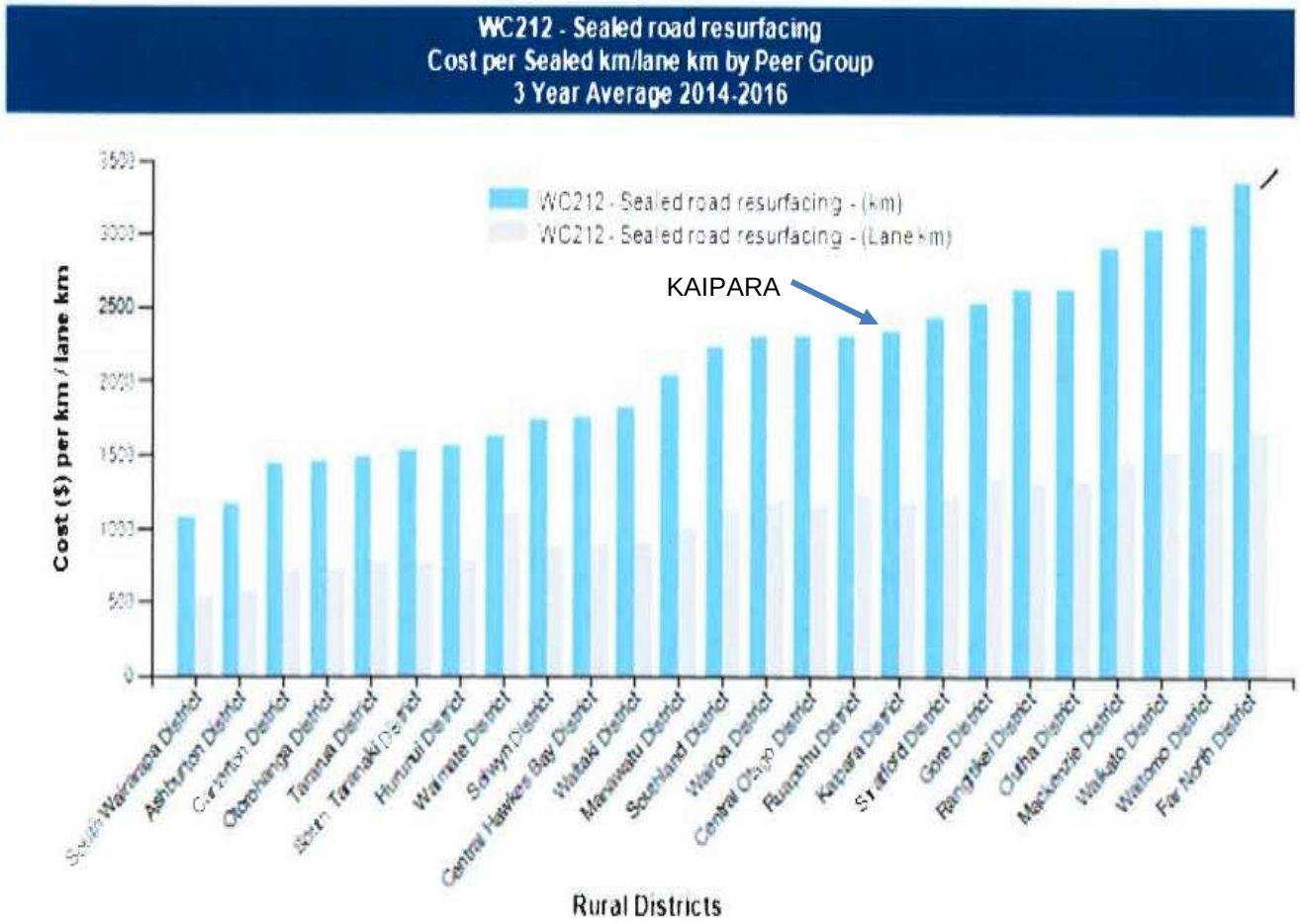
Urban/Rural: Urban, Rural

* RCAs chosen (shown above) may not show if they have no data for the selections in this report.

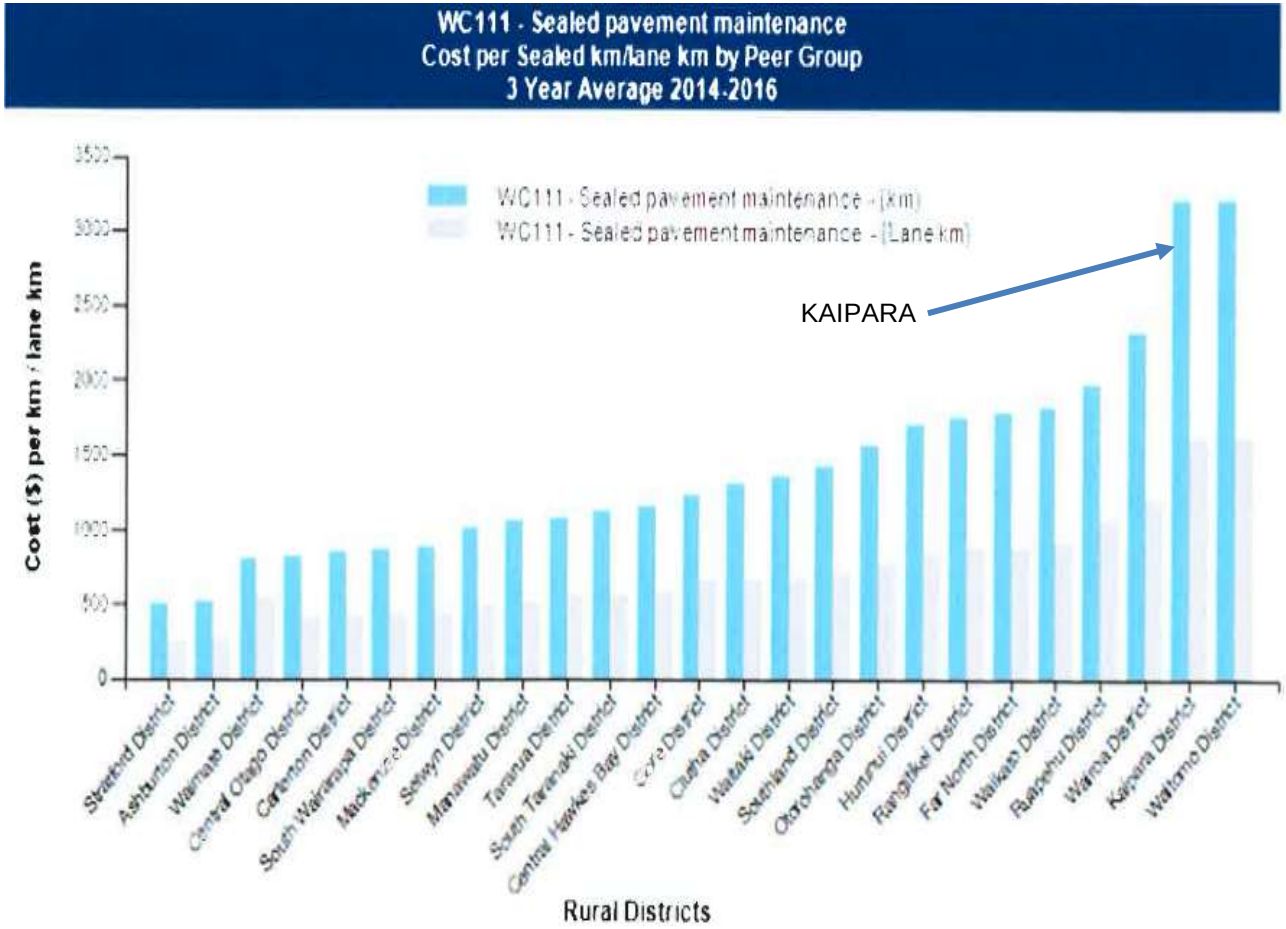




The national sealed road pavement rehabilitation graph shows Kaipara as the highest cost per kilometre in our peer group. As we have benchmarked our contract costs against our peers as being consistent we therefore conclude that there has been a level of over rehabilitating and have corrected this in the next five years.



In comparison this rehabilitation chart shows the resealing has Kaipara at just above the peer group average. This is impacted by the distance we are from suppliers and bitumen plants. We believe this is about the right balance for our network.



Our sealed road maintenance costs are one of the highest in the peer group and that this is attributed to the remoteness of some of our network and the cost being created by the high percentage of first coat seals. We are currently in the process of tendering our maintenance contract which has a more value focused outcome.

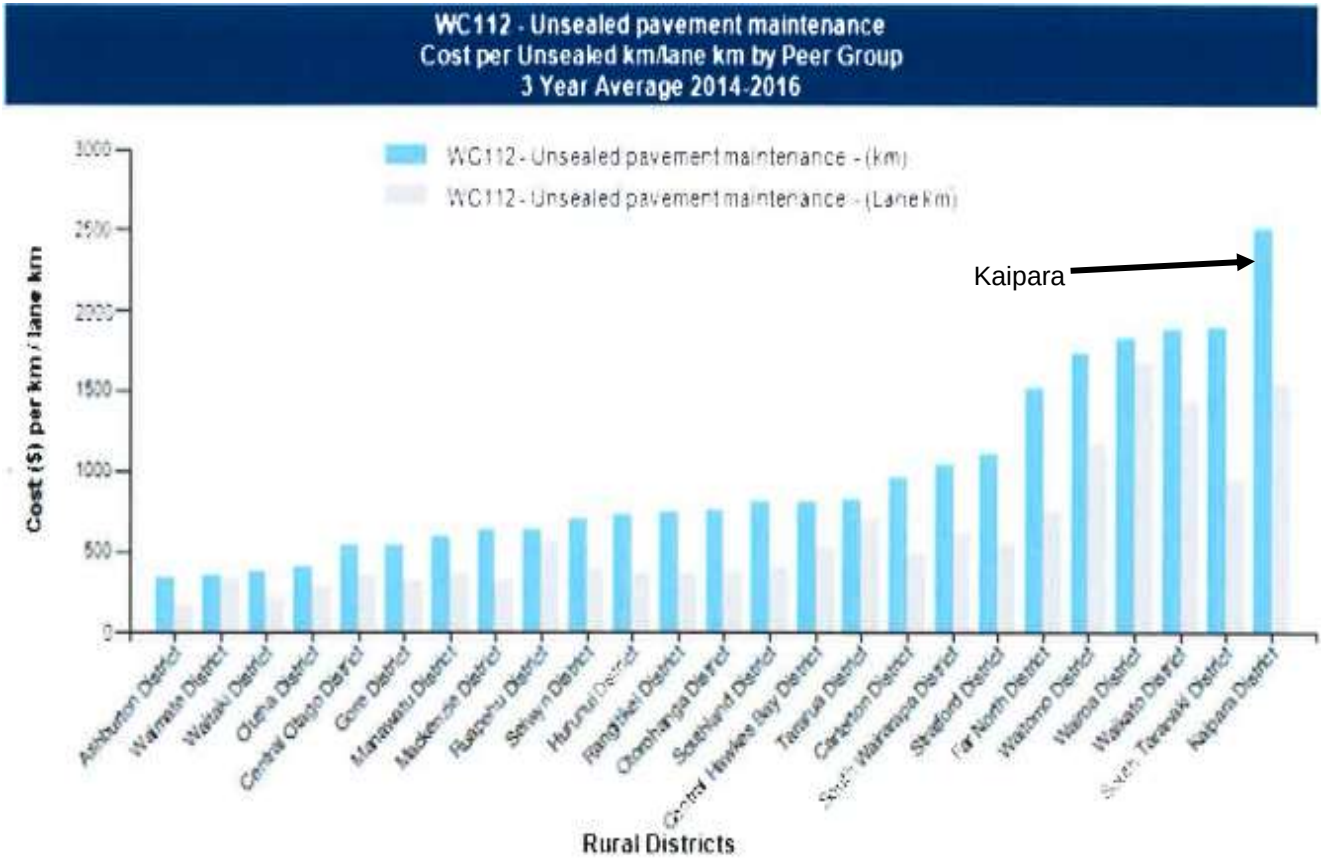
Sealed Pavement Benefits – In managing our sealed network better by a targeted programme will reduce the ongoing faults e.g. potholes, edge break, flushing and texture loss and therefore reduce the amount of maintenance and pavement rehabilitation required. To have an increase in the reseal programme over the next three years along with an increase in the sealed network drainage improvements would increase the life, performance and safety of the roads at a cost less than waiting for failure of the roads then having to rehabilitate at a ratio of 12 times the cost excluding the drainage improvement.

Sealed Pavement Consequence – The consequence of either continuing with the existing programme or a reduction in programme would have the effect of further increasing the general condition through the most expensive work activity and adding no real value to an already over invested network.

5.6 Unsealed Pavements

Problem Statements: - The major problems that confront Kaipara in managing the unsealed network are:

- The current high annual maintenance costs whilst not achieving the desired LoS; and
- Dust on unsealed roads used by heavy vehicles is an issue during the dry weather periods.

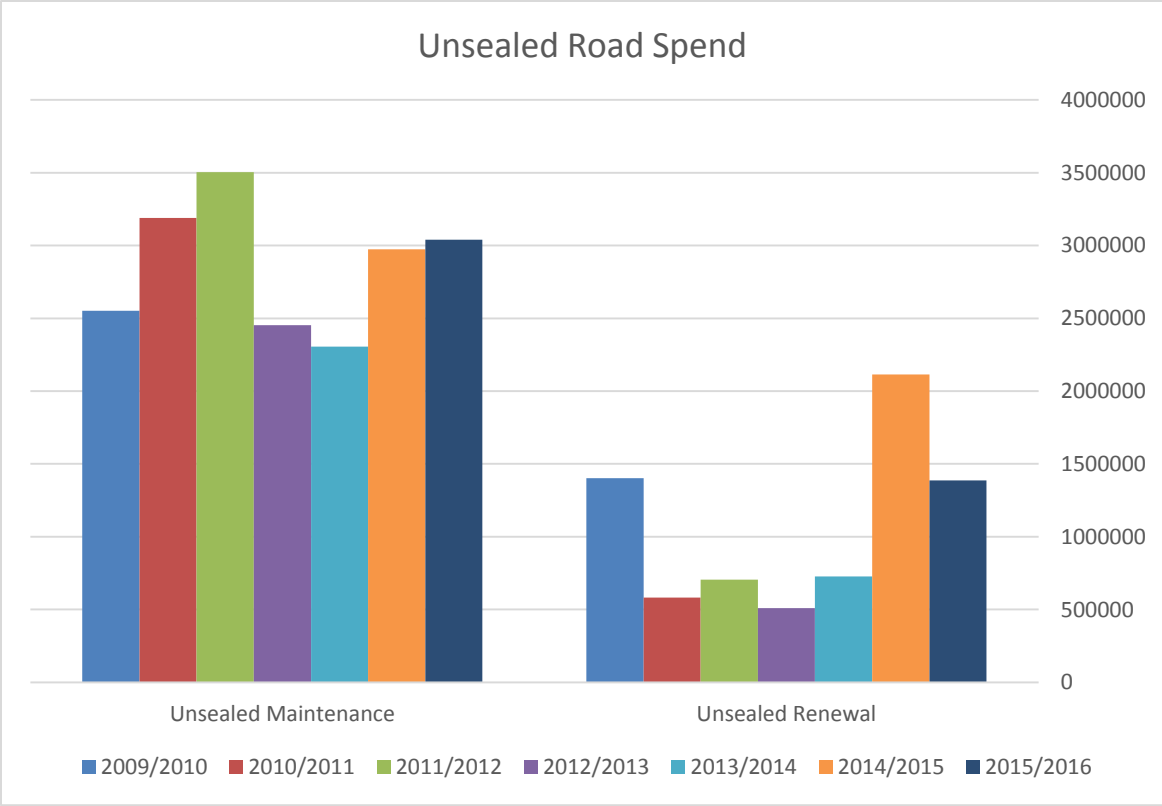


The unsealed pavement maintenance graph shows that we are currently the highest cost per kilometre in our peer group by quite a margin. This has been caused mainly by under-renewing unsealed pavements and therefore losing both running course and pavement due to gravel loss. We are correcting this going forward by having a targeted heavy metal programme where required.

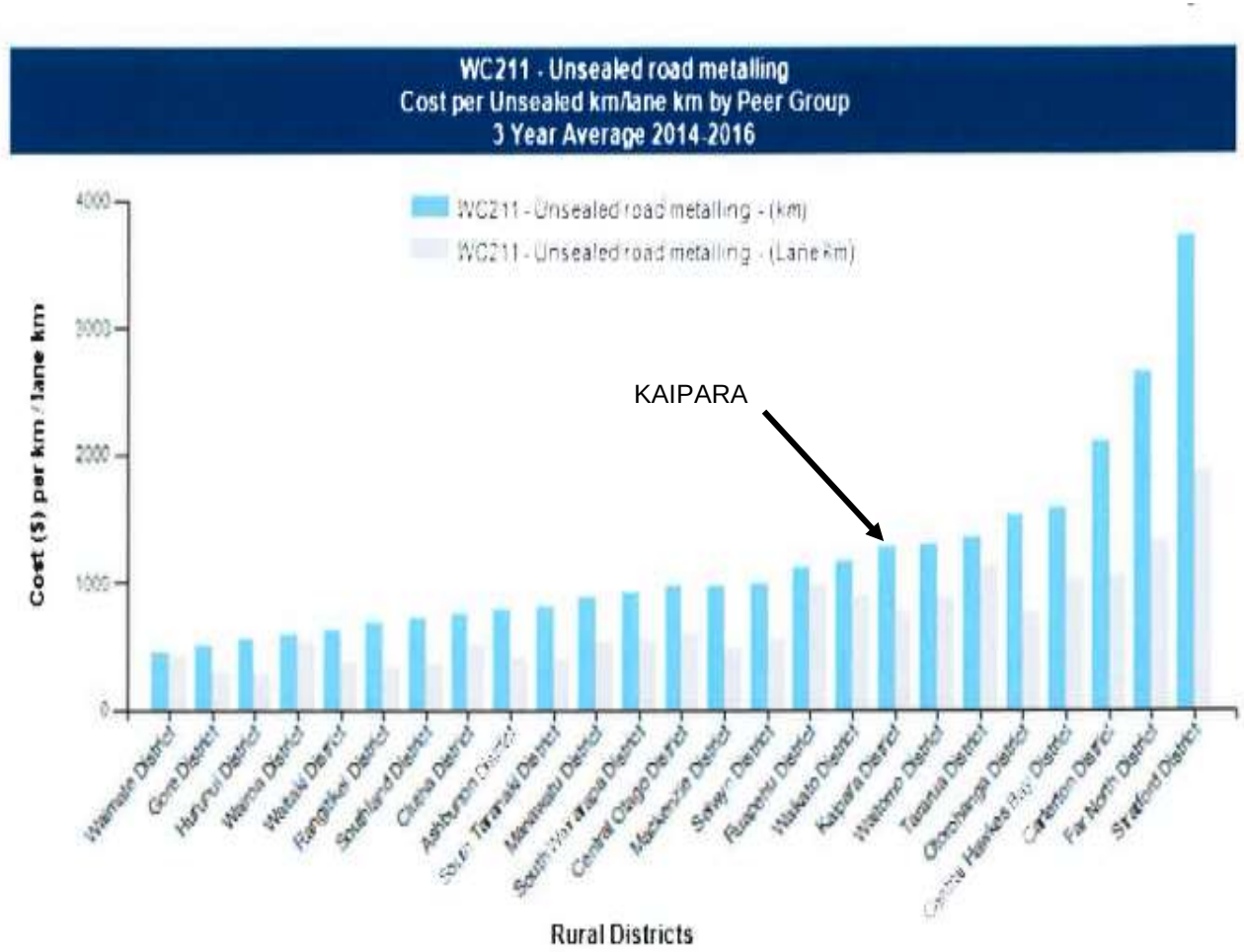
Retaining a wearing surface and shape profile on our unsealed pavements is difficult given the materials that are available. KDC has funded a trial of aggregate-blend sites across the network to understand if we can improve the performance.

There are concerns that the strength of the unsealed pavements is not appropriate and that this is due to having minimal pavement depth of approximately 20% of the network. This has been in part due to the lack of renewals carried out.

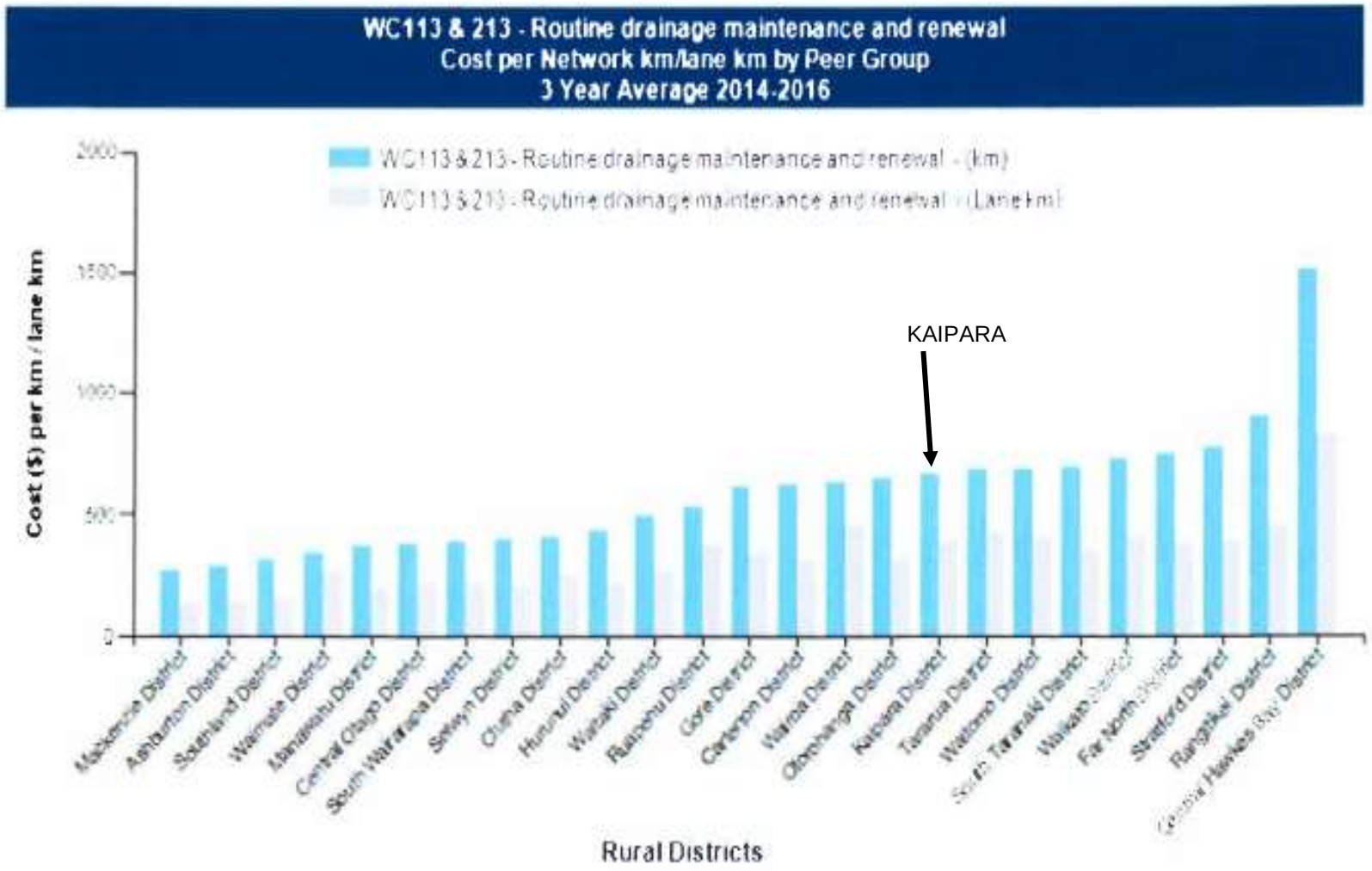
The balance between unsealed maintenance and unsealed renewals has historically been incorrectly focused on maintenance which is not delivering the life, ride quality and improvements.



As discussed above this chart show the highly unsuitable balance between maintenance and renewals. We are developing a programme to correct this.



Again, this chart indicates our low level of renewals when compared to our neighbour (Far North).


WC113 & 213 - Routine drainage maintenance and renewal
Cost per Network km/lane km by Peer Group
3 Year Average 2014-2016
WC113&213 - Routine drainage maintenance and renewal - (km)
WC113&213 - Routine drainage maintenance and renewal - (Lane km)
Cost ($) per km / lane km
KAIPARA
Rural Districts

6 Options, Assessment and Alternatives

6.1 Sealed Roads

Links to Strategic Case

Kaipara District is part of the Northland region tucked in between Kaipara, Far North and Auckland whilst the sealed extent is only 28% of network it carries approximately 80% of the traffic. The large geographical area, large number of small towns and settlements, the remoteness of some communities and the instability of soils, coupled with frequent subtropical storm events which affect the region, gives challenges that most other councils in New Zealand do not face.

The Kaipara sealed network makes up the backbone of a rural production and tourist network which at times are in conflict due to type of driver and use.

Rapid changes in pavement conditions can occur due to factors including increased traffic volumes, storm events, poor drainage and elderly pavements not designed for today's loads.

These impacts upon resilience, availability and reliability of the road network flowing through to a negative impact on the GPS statements of productivity, safety, resilience and VfM.

Problem Statement

Our sealed roads are vulnerable to damage, particularly from heavy vehicles, due to historic thin pavements with poor geology and an unstable climate.

We currently have a backlog of "First Coat" seals amounting to approximately 20% of the network (120kms). This puts the network at a high risk of failure and requires to be caught up over next five years.

Benefit of Addressing Problem

A fit-for-purpose transport network with levels of service suitable for the traffic demands, particularly freight, while optimising the long term maintenance costs.

Work Categories

- 212 - Sealed Road Resurfacing
- 214 - Sealed Road Pavement Rehabilitation.

Levels of Service

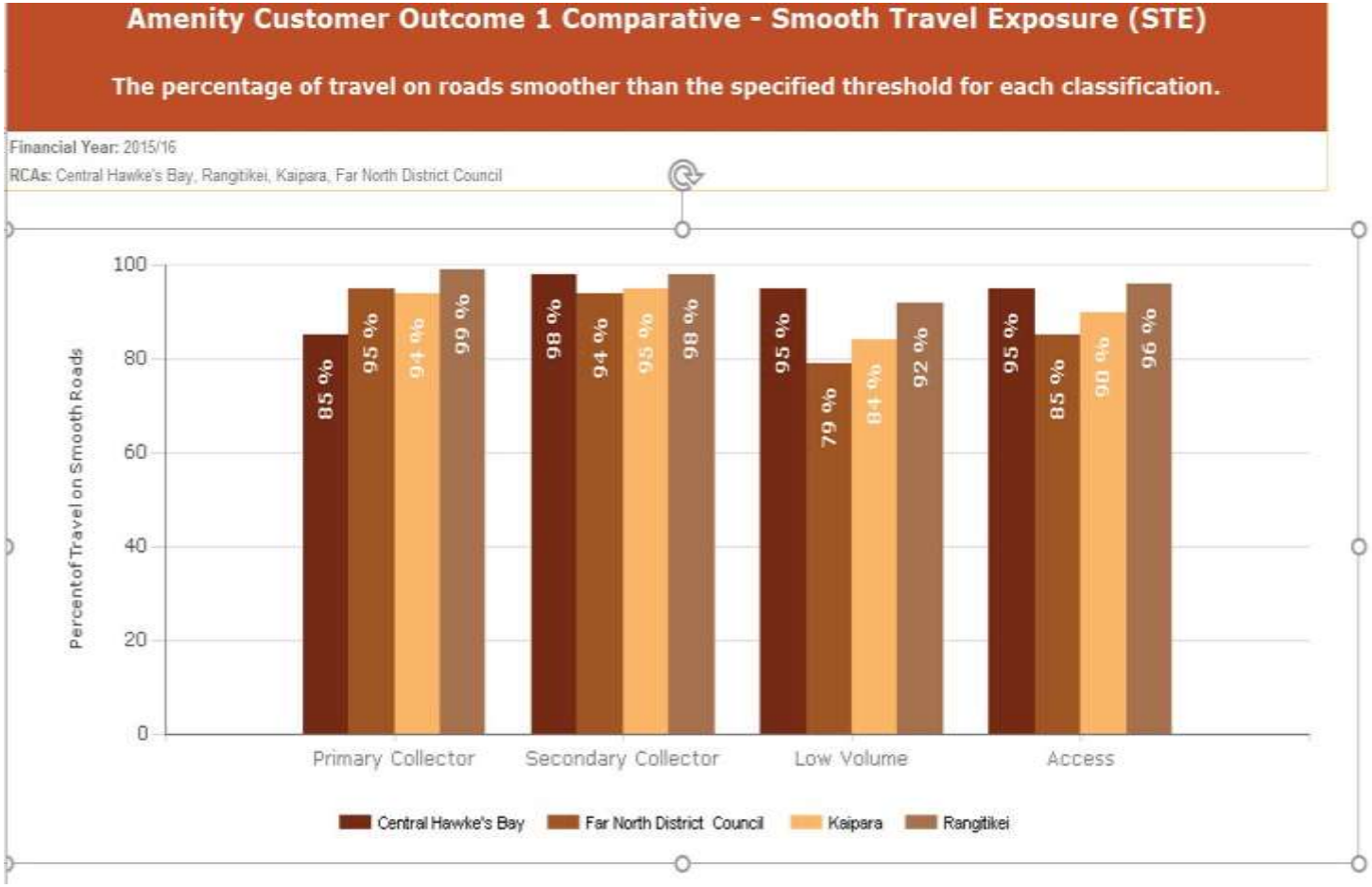
The ONRC Customer Outcomes applicable to this activity are:

ONRC Customer Outcomes	ONRC CO1 – Amenity – Smooth Travel Exposure (STE) – roughness of the road ONRC CO2 – Amenity – Peak roughness
Customer Level of Service	ONRC TO1 – Amenity - Roughness of the road (median and average) ONRC TO1 – Safety – Hazardous faults ONRC Cost Efficiency 1 – Pavement rehabilitation ONRC Cost Efficiency 2 – Chipseal resurfacing ONRC Cost Efficiency 3 – Asphalt resurfacing – Not measurable in KDC ONRC Cost Efficiency 5 – Overall network costs
Long Term Plan (LTP)	A minimum of 6.8% of the sealed network is resurfaced per annum; No minimum % of sealed pavement rehabilitation per annum; % of requests regarding a fault or unplanned interruption to the road network are responded back to the customer within a set timeframe; Attendance for non-urgent call-outs; from the time that the Council receives notification to the time that service personnel reach the site; and Resolution of non-urgent call-outs: from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption.

Levels of Service

The ONRC Customer Outcomes applicable to this activity are:

Customer Outcome Measure 1: Smooth Travel Exposure (STE) % of travel on sealed road that is above the desired threshold.



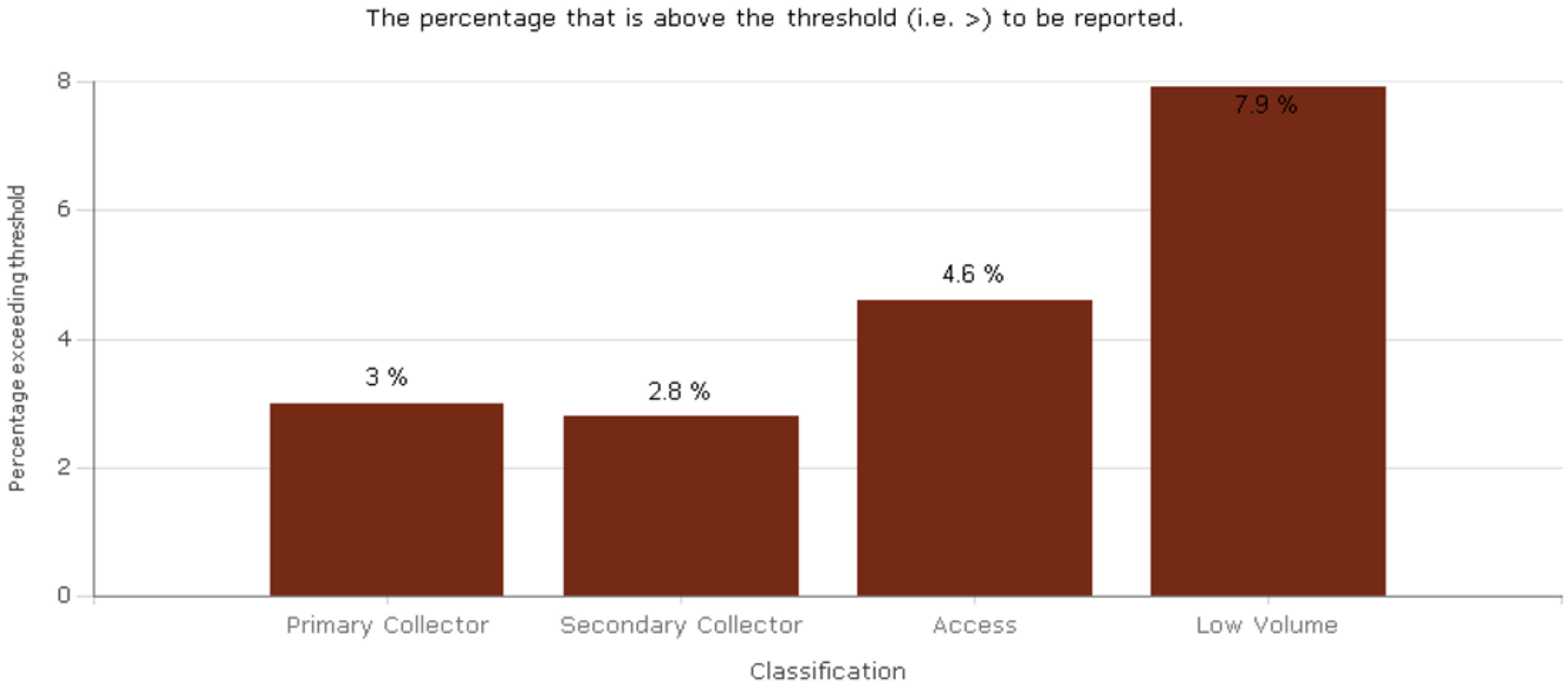
The Kaipara sealed network shows an average value of 90.5% above the thresholds which is an appropriate level. This then indicates a network in a good state from a ride perspective.

Customer Outcome Measure 2: Peak Roughness

Amenity Customer Outcome 2 - Peak Roughness

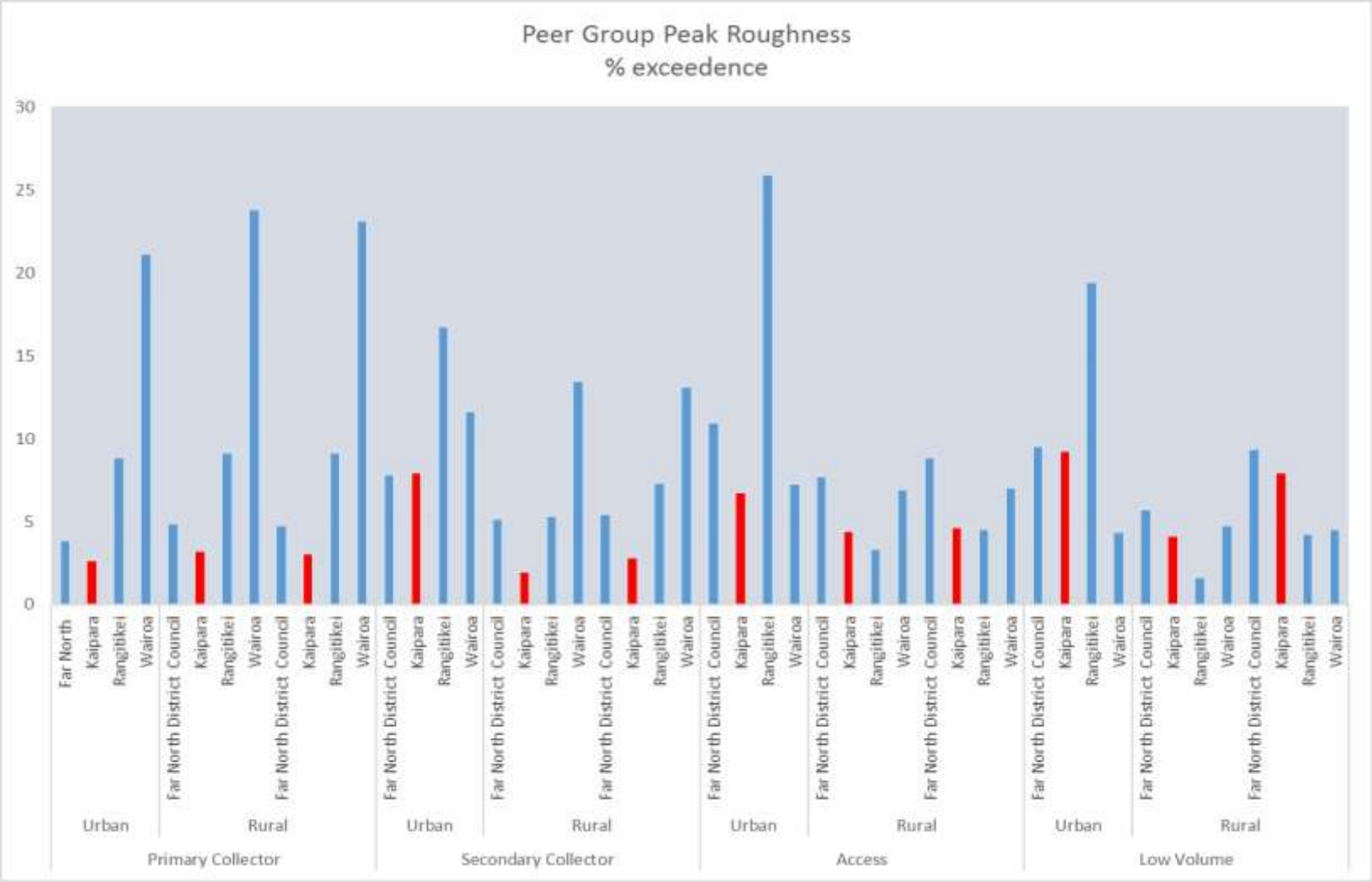
Length of network that does not meet the level specified by classification.

Financial Year: 2015/16
RCA: Kaipara



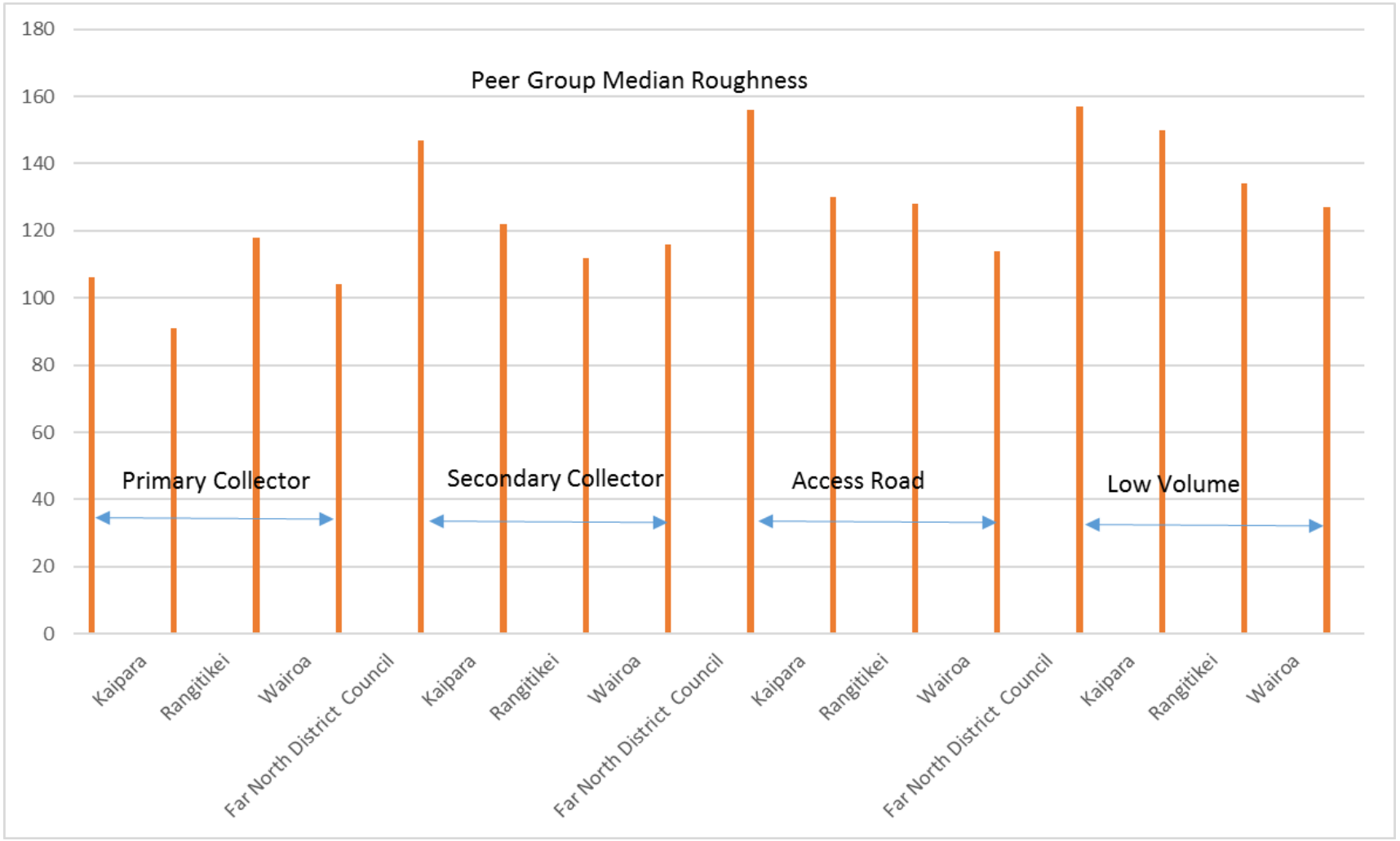
Whilst the ONRC based peak roughness as shown is above the threshold for the low volumes class this generally the low speed urban no exit streets and therefore does not propose an issue.

Customer Outcome Measure 2: Peer Group Peak Roughness



When compared to our peers Kaipara has a much more uniform result with less peaks. This indicates that Kaipara is managing the roughness on the sealed network well apart from the low volume roads that appear to be around the 8%. This result could be highlighted because this measure is taking into account the whole network sealed and unsealed.

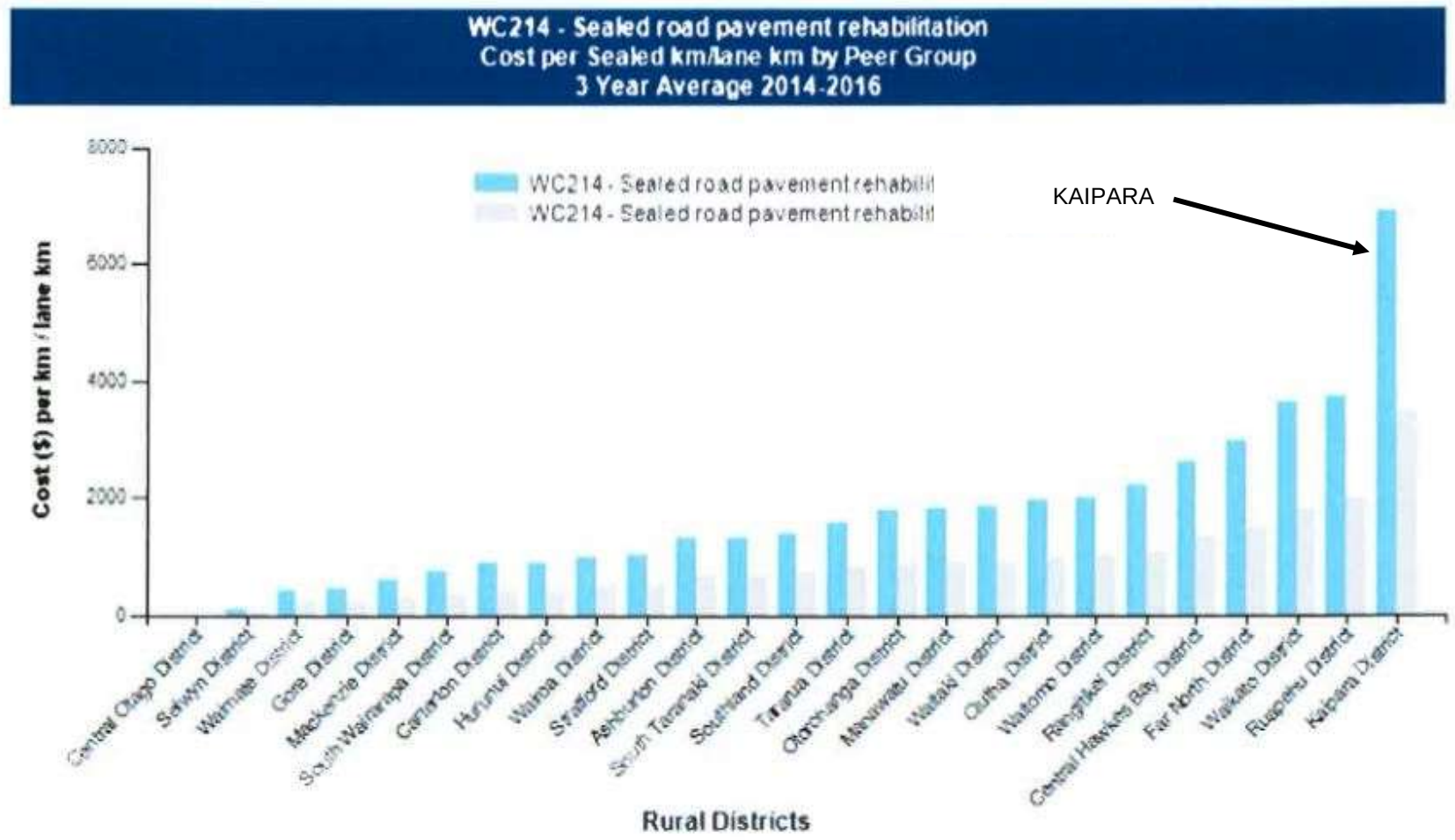
Technical Output Measure 1: Median and Average roughness



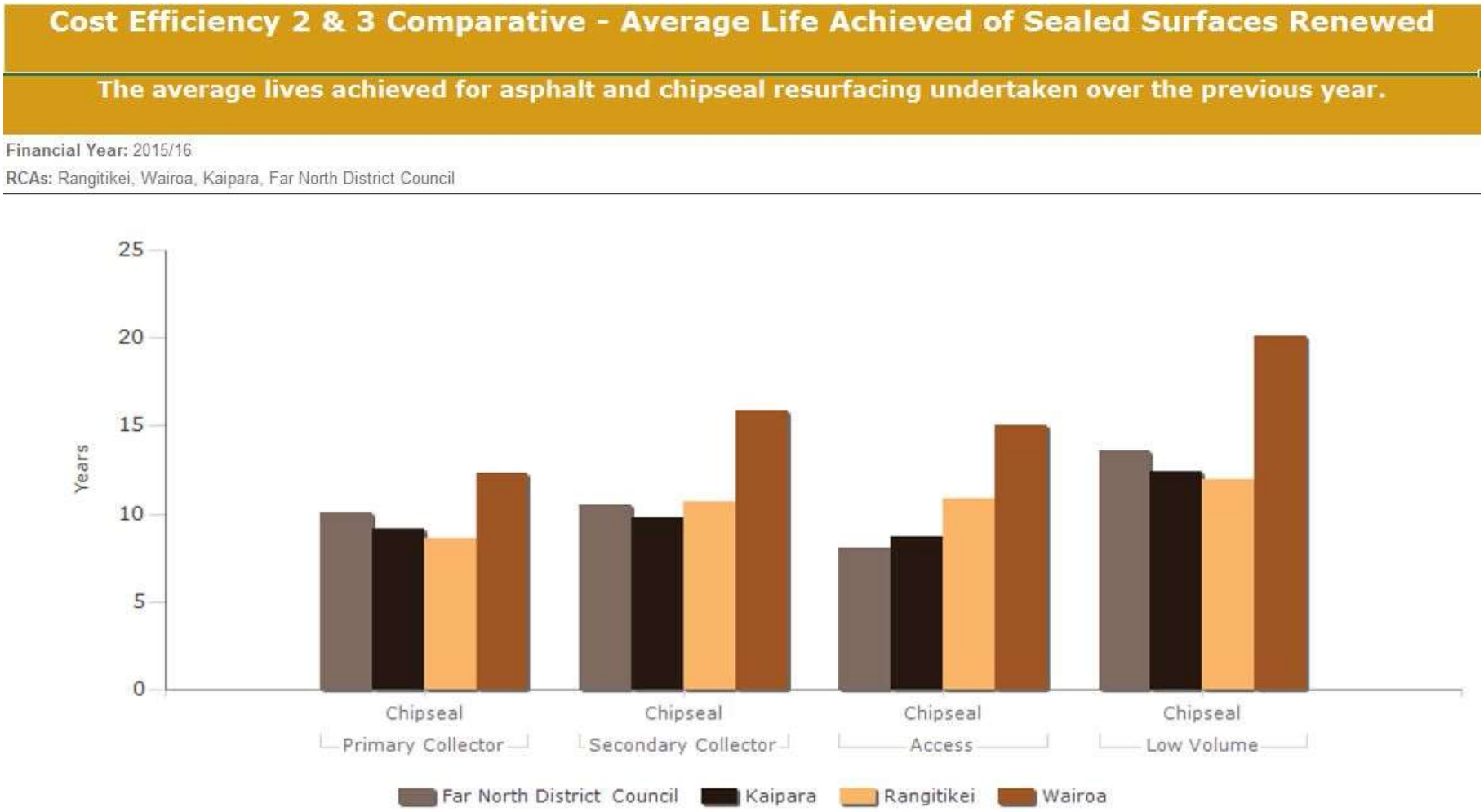
Kaipara is showing a high median/average roughness on the sealed network while the peak is low. This indicates that there are a number of treatment lengths that require renewal work. This data set also includes the whole network - sealed and unsealed.

Cost Efficiency 1: Pavement Rehabilitation

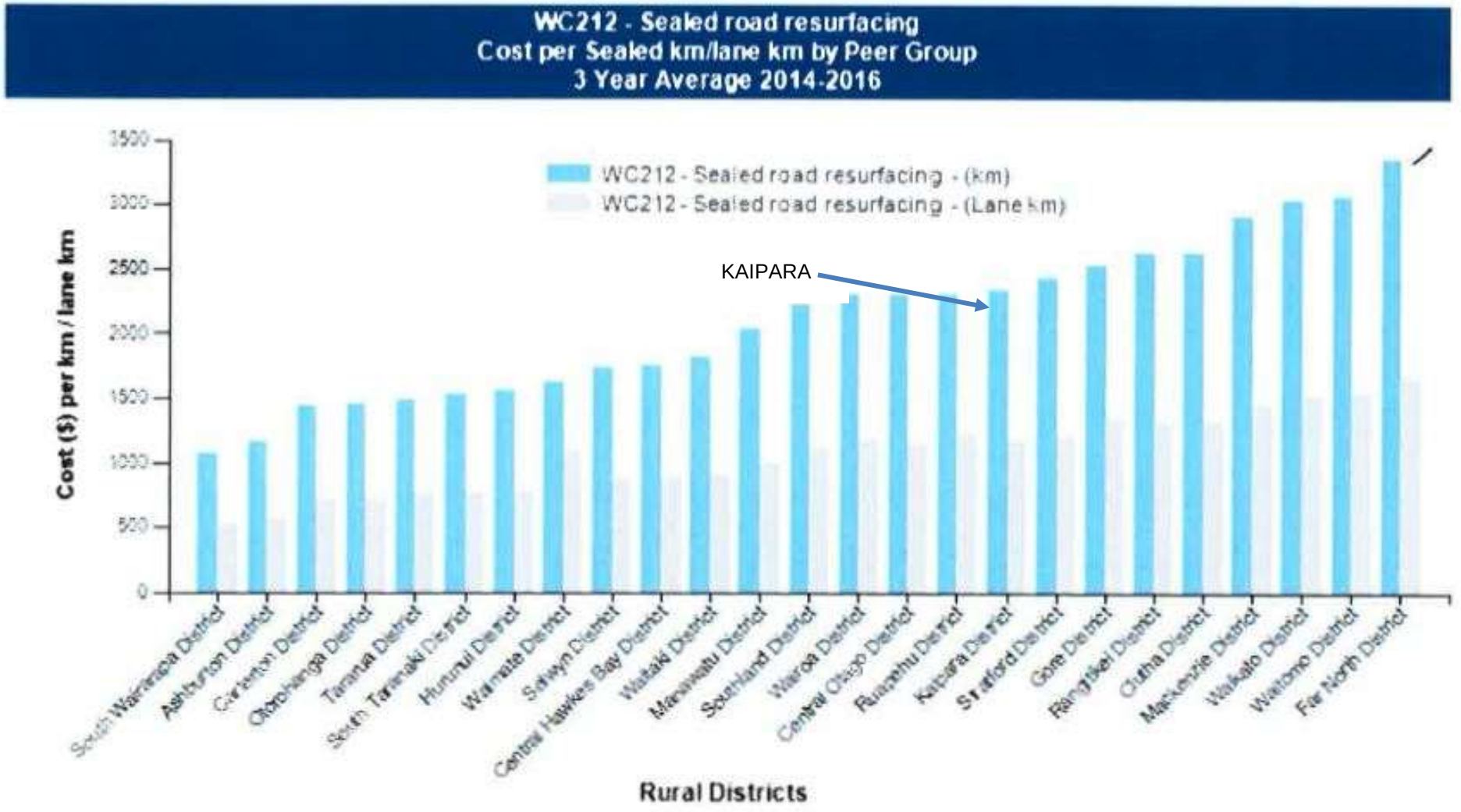
This graph indicates a high rehabilitation rate by total kilometres. This has been a perceived historic catch-up due in part to a five year rate strike by ratepayers in the Kaipara rating area. Our expectation is that this has returned to a more normalised programme and hence we have significantly reduced this budget in the coming three years.

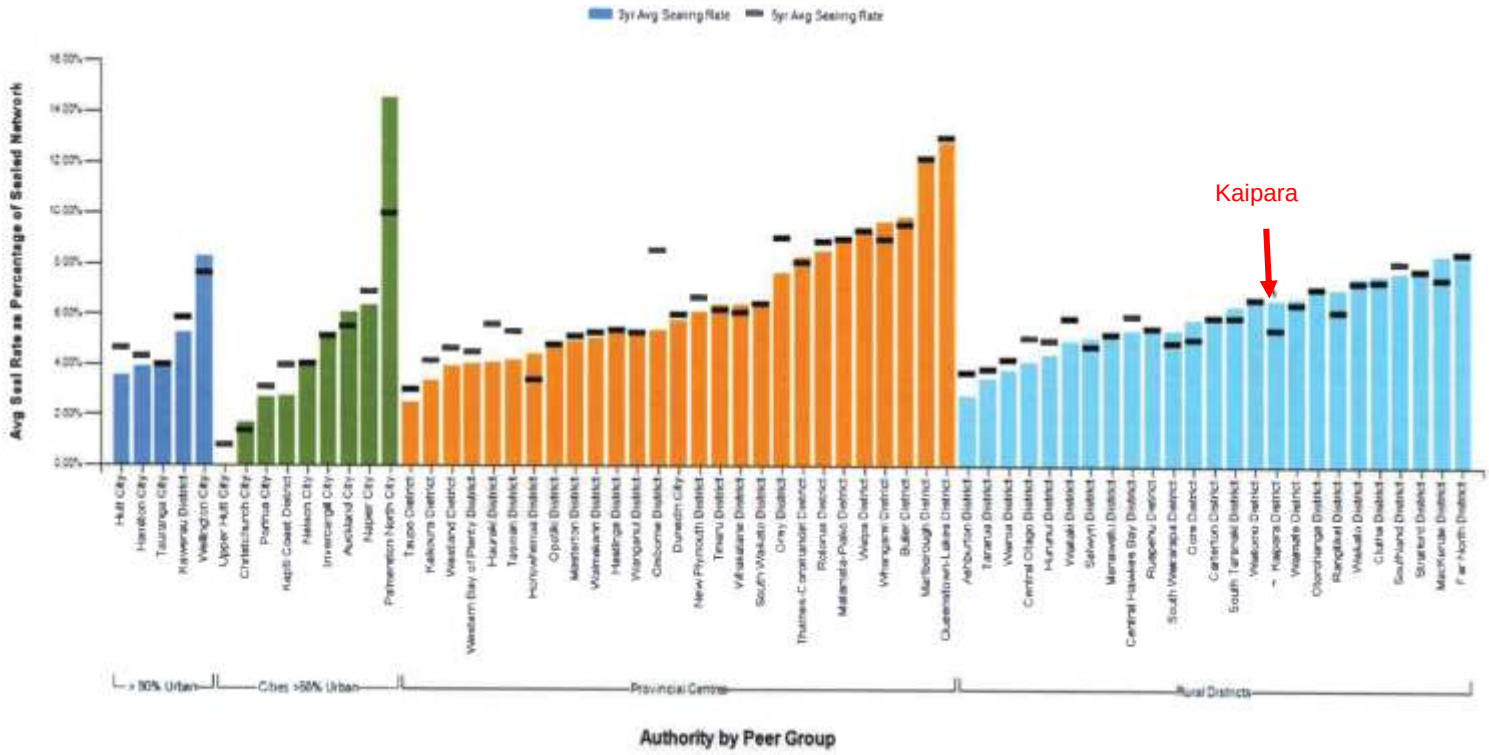


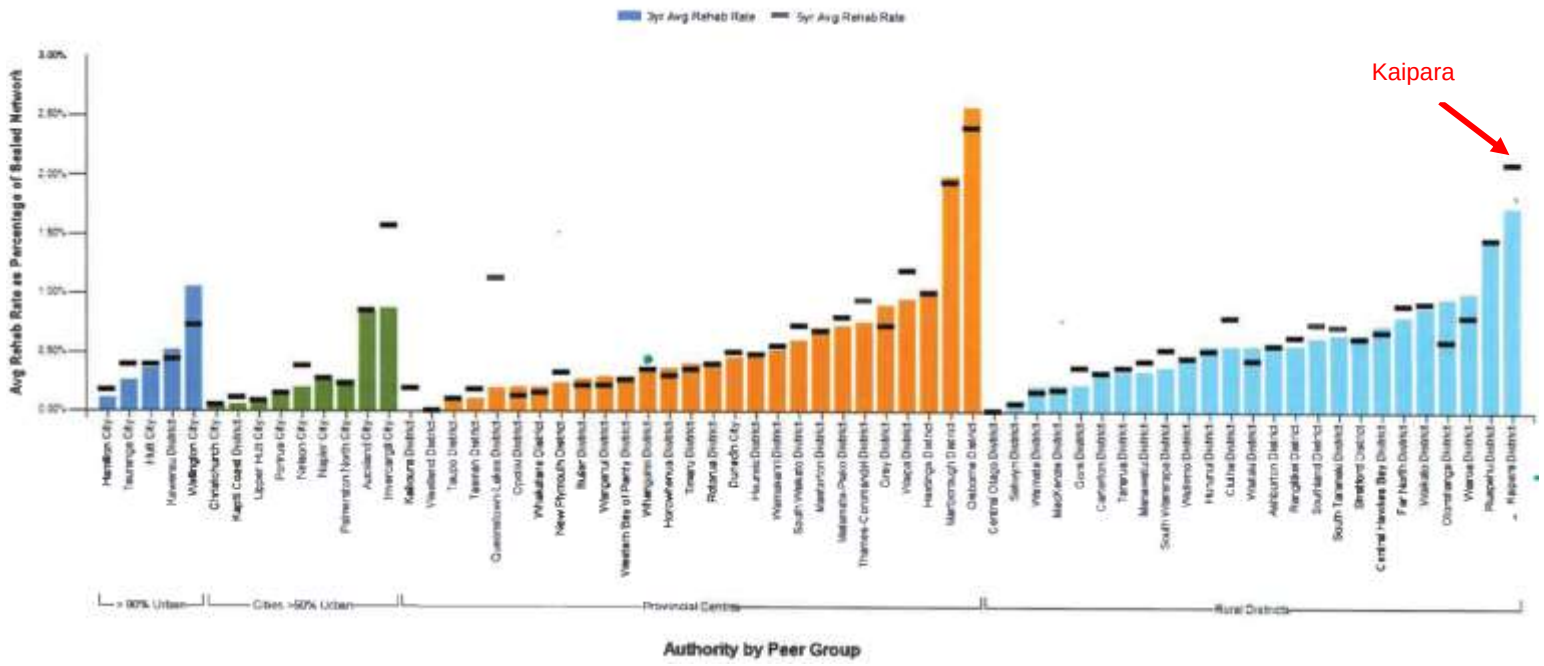
Cost Efficiency 1 and 2: Average life achieved of sealed surfaces renewed

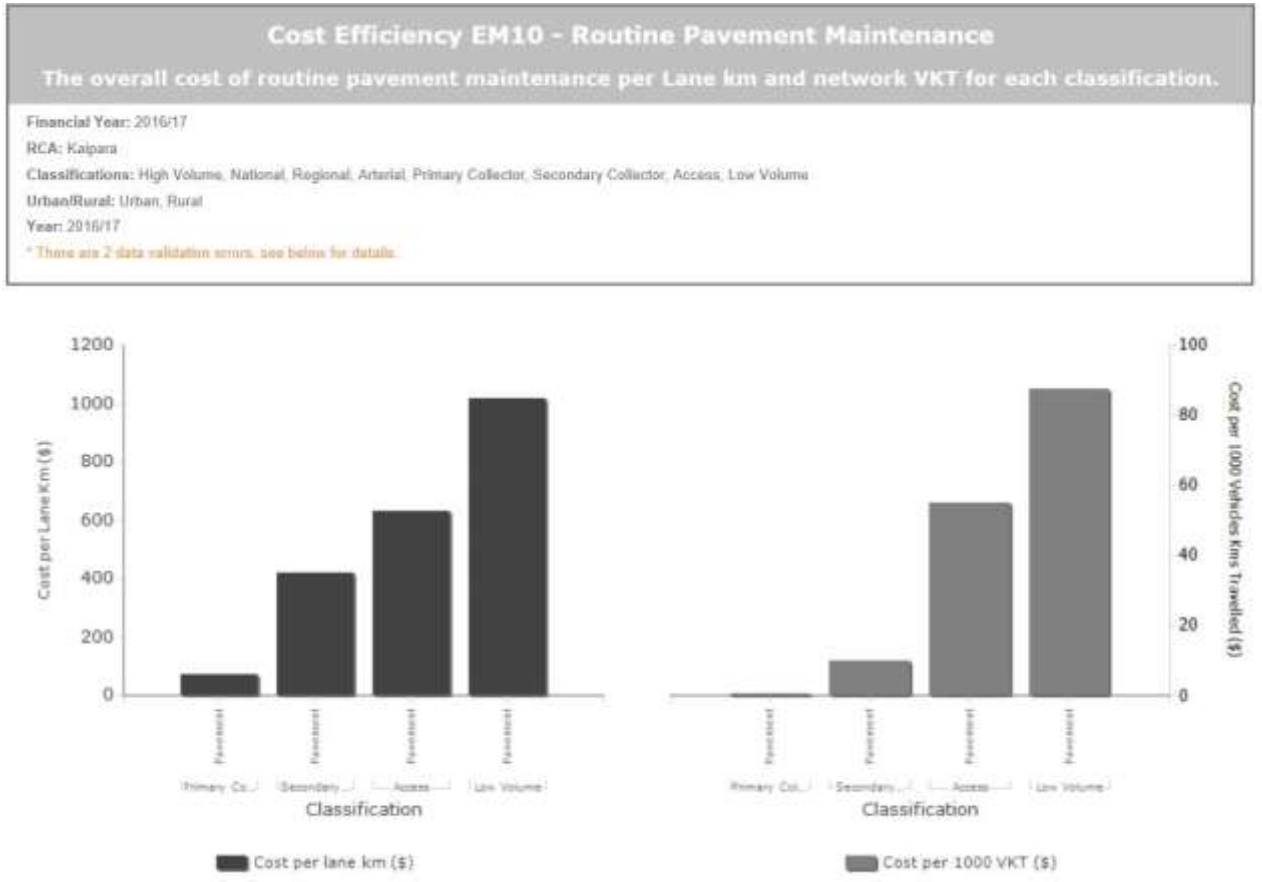


The current average seal life of 10 years across the network appears to appropriate taking into consideration the heavy traffic volumes, subtropical climate and local geology. This is further supported by the peer group graph below showing Kaipara in the median zone.


WC212 - Sealed road resurfacing
Cost per Sealed km/lane km by Peer Group
3 Year Average 2014-2016
WC212 - Sealed road resurfacing - (km)
WC212 - Sealed road resurfacing - (Lane km)
KAIPARA
Cost ($) per km / lane km
Rural Districts

NZ TRANSPORT AGENCY WAKA KOTAHI	**NZTA Peer Group Charts – 3 year Sealing Rates**
When compared to its peer group, Kaipara is in the median of the peer group carrying out resealing per annum. This resurfacing rate we believe is currently appropriate but are also considering what options are available to further provide the LoS and VfM to Council ratepayers and our co-funding partners.	

NZ TRANSPORT AGENCY WAKA KOTAHI	**NZTA Peer Group Charts – 3 year Rehabilitation Rates**
When compared to its peer group, Kaipara is carrying out more pavement rehabilitation per annum than all of our peer group. This has been a catch-up after the rate strike period by the community due to another issue. We believe we are very close to being up-to-date as our new pavement data is confirming that we can start to reduce the Rehabilitation length. We have completed a Northland regional assessment of costs and have found all three RCAs to have similar construction costs for rehabilitations and reseals.	

	Cost Efficiency 5: overall network cost
This measure is showing high cost for the "Low Volume" road network and this is consistent with the very low VKT and high lane kilometres for this class. This measure is also showing the complete network sealed and unsealed.	

KPI Focus	Definition	Performance Measure	Target
Our transport network and infrastructure improves to ensure people, goods and services can move safely and efficiently within the district and region.	Maintain an effective, sustainable and passable transport network.	A minimum of 6.8%, approximately 30kms of the sealed network is resurfaced per annum.	30kms (6.8%) of the network is resurfaced per annum.
	No fatal accidents with a cause due to road design or condition.	Number of fatal accidents measured in year caused by road design or condition.	2018/2019 = 12 A reduction of (1) one per year
Our transport network and infrastructure steadily improves to ensure people, goods and services can easily move safely and efficiently within the district and region. Provide the right services delivered in the right places, to an agreed standard.	Maintain an effective, sustainable and integrated transport network.	Percentage of residents who are very/fairly satisfied with footpaths.	73%
Customer service request response times.	This measure indicates the number of requests that are completed in the timeframe and the customer informed.	Percentage of requests regarding a fault or unplanned interruption to the road network are responded back to the customer within a set timeframe.	>50%
ONRC Safety Measure 7: Hazardous faults.	To reduce the number of maintenance related hazards requiring evasive action.	The number of hazardous faults which require evasive action by the road user. Inspect at least a 10% sample of each classification and record the number of faults per 10kms for rural and 1km for urban.	New KPI Measure

KPI Focus	Definition	Performance Measure	Target
ONRC Resilience Customer Outcome 1: the number of journeys impacted by unplanned events.	To minimise the number of journeys that are impacted by unplanned events.	The number of unplanned road closures and the number of vehicles affected by closures annually. Record the number of unplanned road closures and calculate the total number of vehicles affected annually by classification.	New KPI Measure

KDC's level of service are in the process of aligning with the ONRC intervention levels for each classification.

Risks associated with alternative maintenance and renewal standards

Risk Treatment

Options for risk treatment are yet to be considered. Risk reduction treatments available include:

- Reduce probability of failure by capital works improvements (renew, provide redundancy, upgrade), maintenance expenditure;
- Reduce the impact of a failure by actions such as preparing emergency response plans lifeline systems, alternate routes;
- Accept some risk in that not all traffic will be able to detour or turn around and retrace their route;
- Change the level of service (if not based on ONRC then cost maybe 100% local share);
- Insure against the consequential costs; and
- Communication, monitoring, review and reporting.

KDC has established a detailed risk register for all its transportation related risks and this is located in Appendix 3 on page 236 of this AMP.

Sealed roads are one of the major components of the network along with bridges and are subjected to high traffic volumes and heavy loads, which over time can lead to deterioration and eventually asset failure if not effectively managed. The risk events remaining with a high target risk need to be monitored to determine either that KDC remains comfortable with the target risk level or if there are any additional proposed controls which could be implemented to reduce the target risk level further.

Schedule of Risks

Table 1 below provides a summary of the key risk descriptors, net risk factor and the management option for sealed pavements.

Table 1: Sealed pavements risk summary

Risk Descriptor	Net Risk Factor	Management Options
Crashes on the road network – causing death or serious injury, where road factors were a significant contributor.	**12**	Identify and remedy black spots and implement improvement strategy for identification and monitoring of deficient sites.
Serious injury or death – to personnel working on roadworks. Accidents on active worksites causing death or serious injury.	**16**	Continue and improve with current practice. Safety management systems and further site audits carried out by operational teams. Investigate forms of communication.
Growth in lifestyle development – creating different demands on rural networks.	**10**	Continue to co-ordinate with planning to manage expectation.
Failure to comply with statutory requirements.	**6**	Continue to seek additional funds.
Accelerated asset consumption – due to numbers of heavy vehicles that is not consistent with the ONRC hierarchy.	**12**	Continue to monitor the high demand routes and their deterioration to allow for timely and appropriate intervention.
Unavailability or quality chip and rehabilitation road metal within District – affects Council's ability to maintain the road network economically.	**12**	Carry out Northland-wide investigations of possible new aggregate sources and options.
Significant weather event closes some or all major lifeline routes into and through the district.	**12**	Continue to work with NZTA to ensure lifeline/detour routes are identified and upgraded to an appropriate standard.
Road network deterioration due to historical poor design or construction.	**6**	Continue to use high speed data and pavement strength data to ensure upgrades occur where required.

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

Table 2: Options to be considered for sealed pavements

Option	Description	Benefit
Prioritised maintenance	Enhanced assessment of maintenance repairs based on ONRC hierarchy and LoS with RAPT type assessment of the forward works programme to ensure robustness of programme.	Cost efficiency – will target the right maintenance on the right roads at the right time.
Large chip	Use larger chip for future reseals where possible and appropriate to extend seal life.	Cost efficiency – will extend the life of the chip seals.
Reduced reseal programme	In conjunction with the use of larger chip, consider a reduced reseal programme to reflect progress made in removing the backlog of surfacing required.	Cost efficiency – will reduce the amount of resurfacing work done.
Reduced rehabilitation programme	By more data analysis and understanding of our sealed pavement we believe we can retain a base level of pavement strength with a reduced rehabilitation programme but more focused on those lengths of real need.	Amenity – will bring the overall average roughness of the network back in line with the peer group.
Service Lids	Re-level service lids in the urban area when carrying out renewal activity to minimise roughness. Consider using adjustable service lids where possible.	Amenity – will help address the high level of roughness in the urban area.

Options Assessment

Optimisation of the reseal and rehabilitation programme using the data collected through two years of high speed data and a FWD survey has been run through the dTIMS modelling software using a model specialist. This has been undertaken in 2015, 2016 and about to be completed again in November 2017. This has given us greater confidence in promoting our 10 year sealed pavement maintenance and renewal regime. Please see output below.

KM	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
RHAB	5.05	1.62	2.99	3.62	4.79	3.58	3.90	3.16	5.82	5.36	6.55
TAC	0.00	0.05	0.24	0.07	0.18	0.50	0.21	1.10	0.65	0.22	0.84
RS	12.96	30.55	30.51	31.47	32.34	32.96	32.92	23.06	23.09	23.13	23.54
SC	17.01	31.75	26.54	21.04	19.92	3.77	4.79	3.98	3.98	3.16	5.82
RSEAL	29.97	62.30	57.05	52.51	52.26	36.73	37.71	27.04	27.07	26.29	29.36
Total	**35.03**	**63.92**	**60.04**	**56.13**	**57.05**	**40.30**	**41.61**	**30.20**	**32.89**	**31.64**	**35.92**

2017/2019	2020/2022	2023/2026	2017/2026
2.74	4.09	5.87	5.10
0.12	0.29	0.22	0.22
30.84	32.74	19.63	23.47
26.45	9.49	5.44	9.40
57.29	42.23	25.08	32.87
60.03	**46.32**	**30.95**	**37.97**

Cost$/m^2	$Mill	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
65	RHAB	2.08	0.65	1.31	1.60	2.01	1.43	1.79	1.49	2.80	2.36	2.81
35	TAC	0.00	0.02	0.05	0.02	0.04	0.16	0.06	0.26	0.24	0.04	0.23
5.6	RS	0.50	1.15	1.12	1.13	1.18	1.27	1.23	0.84	0.92	0.88	0.87
5.6	SC	0.61	1.20	1.00	0.75	0.70	0.14	0.17	0.14	0.16	0.13	0.24
	RSEAL	1.11	2.34	2.12	1.88	1.88	1.41	1.40	0.98	1.07	1.01	1.11
	Total	**3.20**	**2.99**	**3.43**	**3.48**	**3.89**	**2.84**	**3.19**	**2.48**	**3.87**	**3.37**	**3.92**

2017/2019	2020/2022	2023/2026	2017/2026
$1.18	$1.74	$2.37	$1.83
$0.03	$0.09	$0.20	$0.11
$1.14	$1.23	$0.88	$1.06
$0.98	$0.34	$0.17	$0.46
$2.12	$1.56	$1.04	$1.52
$3.30	**$3.31**	**$3.41**	**$3.35**

We are running the High Speed Data (HSD) exercise again this year to give us data from a three year period which will calibrate the model and confirm the slope of all the deterioration faults.

Sealed pothole costs

Year	# Potholes	Lump Sum (month)	Lump Sum (year)	Annual Cost per pothole
Total 2013/2014	2,004	$6,861.22	$82,334.64	$41.09
Total 2014/2015	3,674	$6,962.77	$83,553.24	$22.74
Total 2015/2016	1,885	$6,832.40	$81,988.80	$43.50

On balance, when factoring the total cost of the programme and the resulting pavement condition, the most appropriate scenario, given NZTA's push to develop a business case investment funding environment, is the prioritised scenario.

Table 3: Sealed road condition

Option	Description	Problem being addressed	Effectiveness	LoS Impact	Annual Cost	30 year PV Cost ($M)
No Rehabilitation	Reactive routine maintenance and reseals only. Maintenance costs will increase and reseal lives will decrease due to pavement failures.	Sealed road pavement strength integrity and customer ride LoS will decline severely as the network becomes a patchwork of repairs.	**Poor**	Lifecycle costs increase and LoS reduction.		
Status Quo	Significant programme of maintenance repair with planned reseals to address integrity of pavement investment. Reseal programme to maintain pavement integrity rehabilitation programme as detailed by model and physical inspection.	The current programme has been shown to be over renewing our pavements and therefore not recovering all the available pavement strength and life.	**Moderate**	Lifecycle costs continue to escalate and no improvement in LoS.		

Option	Description	Problem being addressed	Effectiveness	LoS Impact	Annual Cost	30 year PV Cost ($M)
Prioritised maintenance and renewal	Enhanced assessment of maintenance repairs based on ONRC hierarchy and LoS. High level of attention given to associated improvements, drainage and safety enhancements which will develop a whole of site project. The reseal and rehabilitation programmes will fail from the dTIMS Model.	This programme will deliver the most opportune programme by incorporating repairs and renewals into a quality model to delivery sealed road pavement strength integrity and customer ride LoS.	**Good**	Lifecycle costs maximised and current LoS maintained.		

Preferred Option

Prioritised maintenance as this reduces the long term costs whilst maintaining the current and proposed ONRC customer levels of service by considering the problem statement as well as the issue. This means that by focusing on the whole network we will be driving down reactive works costs whilst improving the resilience and robustness of the network.

Operations and Maintenance Plan

Routine maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Two categories of routine maintenance are carried out:

- ***Unplanned routine maintenance***

  Work carried out in response to reported customer service requests, network inspections by Contractor and inspectors (e.g. potholes, edge breaks, shoulder maintenance)

- ***Planned ordered maintenance***

  Work carried out to a predetermined schedule or planned in association with other work (scabbing and stripping, flushing and bleeding, crack sealing, pavement surface levelling and repairs).

Pavement Maintenance Planning

Planning of pavement maintenance provides for the normal care and attention of the road to maintain its structural integrity and serviceability. Examples of this work include:

- Pavement patching and repairs;
- Shoulder maintenance, including flanking;
- Routine maintenance and repair of surface water channels and subsoil drainage;
- Renewal or installation of culverts with a diameter less than or equal to 600mm;

Operations and Maintenance Strategies

The key operational maintenance issues for pavements are:

- Maintain the structural integrity of the pavement, the waterproofness of the seal coat and the user safety in regards to skid resistance.

How maintenance is identified and prioritised

Routine cyclic maintenance items will be repaired either as they are identified by the routine maintenance crew or may be recorded and entered on to the Asset Manager's programme for subsequent repair. Items include, pothole repairs, edge break repairs, shoulder maintenance. In addition to roads these routine items extend to the maintenance of service lanes and car parks.

The following technical standards are applicable for pavement maintenance:

- Repair of potholes – sealed (TS 1);
- Repair of edge break (TS 3); and
- Maintain service lanes and car parks

Renewal/Replacement Plan

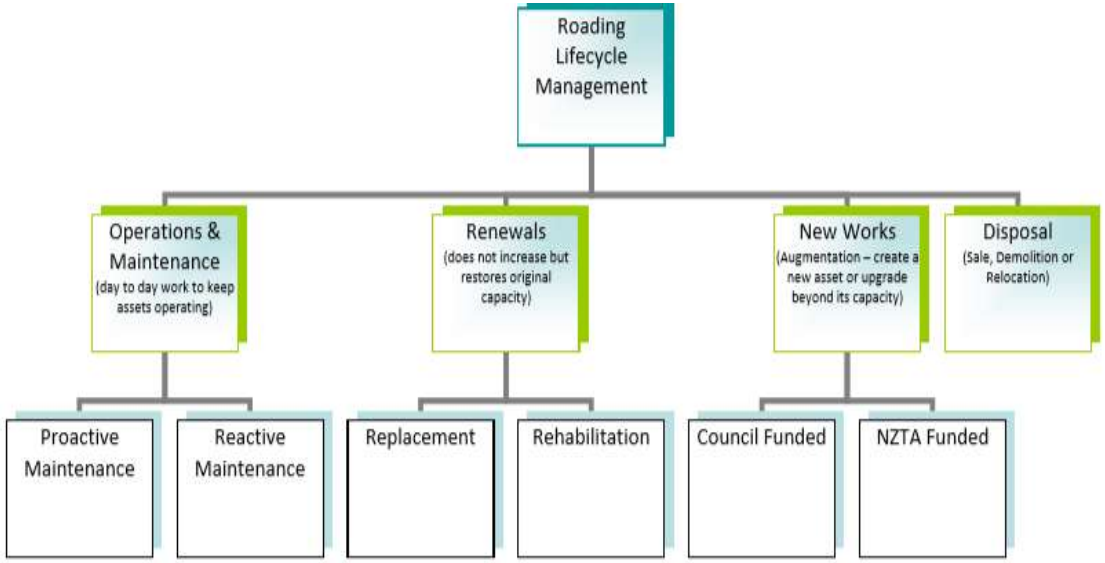
Road pavement renewal is required when the pavement layers are reaching the end of their design life and are showing signs of deterioration. Pavement renewals, rather than resurfacing, become the best option when considering the whole life costs of the pavement.

The international Infrastructure Management Manual (NAMS) 2011 edition defines the lifecycle of an asset as:

- "The time interval that commences with the identification of the need for an asset and terminates with the decommissioning of the asset or any liabilities thereafter".

Lifecycle Asset Management encompasses all management options and strategies from initial planning through to disposal in order to meet the required Levels of Service in the most cost-effective way to provide for existing and future customers as shown in the diagram below:

Figure 1: Lifecycle Management Plan



Renewal Strategies

Renewal expenditure is work that restores the existing pavement to its original level of service i.e. capacity or the required condition. There are a number of activities, which are covered within the pavement renewal area. NZTA subsidy for this form of treatment is available through the following categories:

- Sealed Road Resurfacing; and
- Pavement Rehabilitation.

How Renewals are identified and prioritised

Pavement renewal sites will be identified through performance modelling, Asset Engineer observation and audit, network falling weight deflectometer (FWD) testing (currently being carried out), and Maintenance Contractor inspections and reporting.

The annual programme is developed with an emphasis on road hierarchy. Priority is given to roads with high traffic volumes; especially heavy commercial vehicles. Consideration is given to the likely rate of pavement deterioration should no action be taken i.e. roads with the highest maintenance costs per unit length will be given priority for Road Rehabilitation.

Within the KDC network there are 859km of sealed roads. By assuming an expected pavement life, it is possible to predict an annual pavement renewal requirement. Table 4 shows the consequences of using various effective lives for the sealed network. The adopted design life currently been used is 25 years.

Table 4: Annual pavement renewal requirements – total kms vs design life

Sealed Roads	**445kms**	**445ms**	**445kms**	**445kms**	**445kms**
Mean pavement life for network	45 years	40 years	35 years	30 years	25 years
Annual pavement renewal requirement	**9.8kms**	**11.1kms**	**12.7kms**	**14.8kms**	**17.8kms**

Creation/Acquisition/Augmentation Plan

Pavement creation is related to:

- Increased levels of services required by existing road users (to relieve traffic congestion, improve safety etcetera);
- Growth related capital works projects; and
- Assets resulting from developments.

The development of the road network is undertaken in accordance with the District Plan, which indicates priorities for road widening and new construction. The road designations included in the District Plan form a major commitment which, under the Resource Management Act, must be constructed within the timeframe described in the Plan.

Projects are justified and prioritised on the basis of a cost / benefit analysis which accounts for:

- The benefit to the road user through reducing delays in the time to travel along a given route;
- Vehicle operating cost savings;
- Safety benefits; and
- Intangible benefits, such as community dislocation, environmental issues (pollution, water quality, noise and vibrations) and other local, regional and national issues.

Road lifecycle costs (of which pavements are a major component) may be reduced in the asset creation phase by reviewing the following:

- Ranking criteria for all capital works and projects;
- Evaluation of options and staging for all road creation projects;
- Tendering and contract administration procedures; and
- Review of strategies and plans.

Safety Improvements

Each year, when Council is preparing its capital works programme for the following 12 month period, provision is made for minor safety works, including:

- Visibility improvements;
- Improved streetlighting (rural flag lighting);
- Road curvature realignment;
- Signage;
- Road widening;
- Signage and pavement marking;
- Recommendations from the 2016 Crash Reduction Study; and
- Speed Management community engagement.

Funding is outlined in NZTA's Planning, Programming and Funding Manual 2008 under the Minor Improvements work category.

Capital Investment Strategies

- Strategies to ensure that new assets are driven by growth, changes in use/demand and safety; and
- Procedures and criteria for assessment of design options (including consideration of lifecycle costs, optimised renewal decision-making and risk assessment).

Disposal Plan

Assets are disposed of as a result of other capital works (growth and LOS) and renewal works. However specific tactics may be applied to the disposal phase.

Costs of disposal are generally included in the overall project costs. One exception is the cost of writing off the book value of assets disposed of before their design life is complete.

Disposal tactics are as follows:

- Develop AM systems and asset condition/performance data to allow better planning for the disposal of assets through rationalisation of the asset stock or when assets become uneconomic to own and operate.

When considering disposal options all relevant costs of disposal need to be considered, including:

- Evaluation of options;
- Consultation/advertising;
- Obtaining Resource Consents;
- Professional services, including engineering, planning, legal, survey;
- Demolition/make safe; and
- Site clearing, decontamination, and beautification.

Council has no plans to dispose of any of its transportation assets in the foreseeable future.

6.2 Unsealed roads

Links to Strategic Case

Kaipara District is part of the Northland region tucked in between Kaipara, Far North and Auckland whilst the unsealed is 72% (1,125km) of network it only carries approximately 20% of the traffic. The large geographical area, large number of small towns and settlements, the remoteness of some communities, and the instability of soils, coupled with frequent subtropical storm events which affect the region, gives challenges that most other councils in New Zealand do not face. This has a direct impact on the Lifeline routes for these communities, for example the Pouto Peninsula.

Rapid changes in pavement conditions occur on these roads due to factors including increased traffic volumes Forestry Harvest at the end of a Low Volume Road, storm events, poor drainage mainly due to low-lying areas and poor soils along with elderly low impact pavements not designed for today's loads. Especially between 20 – 80 44t - 50t logging trucks.

These impacts upon resilience, availability and reliability of the road network flowing through to a negative impact on the GPS statements of Productivity, Safety, resilience and VfM.

Problem Statement

Our unsealed roads are vulnerable to damage, particularly from heavy vehicles, due to historic thin pavements with poor geology and an unstable climate. They also have a safety problem in that there widths and geometry when designed were not built for milk tankers, stock truck, aggregate trucks or log trucks all with trailers competing for space along with school buses. This reduces their ability to provide the appropriate level of service to those communities they link to.

Benefit of Addressing Problem

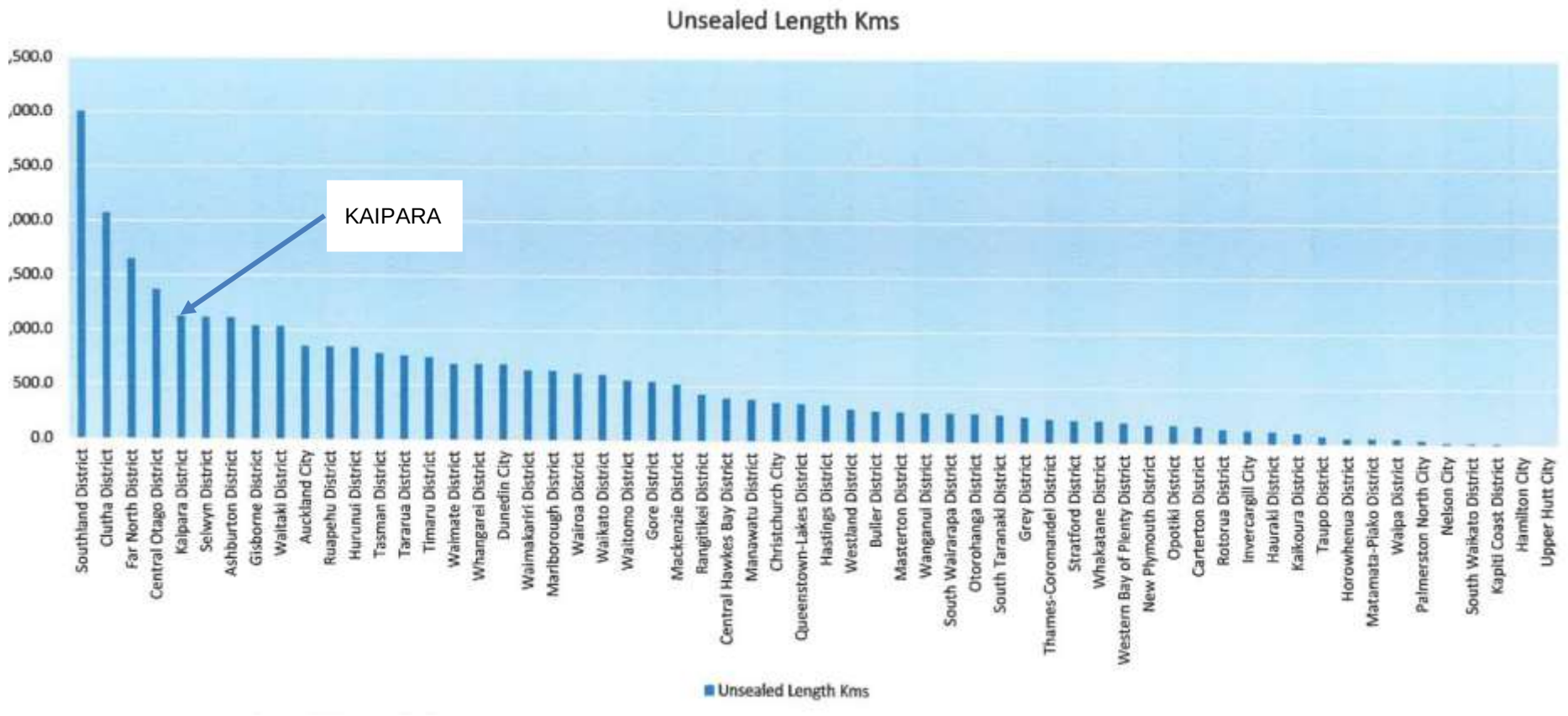
A fit-for-purpose roads and footpaths network providing appropriate access to small communities, primary producers, and isolated properties with levels of service suitable for the traffic demands. But taking into account particularly those routes which, in short term to medium, term higher freight demands than the ONRC would normally dictate, while optimising the long term maintenance costs.

Work Categories

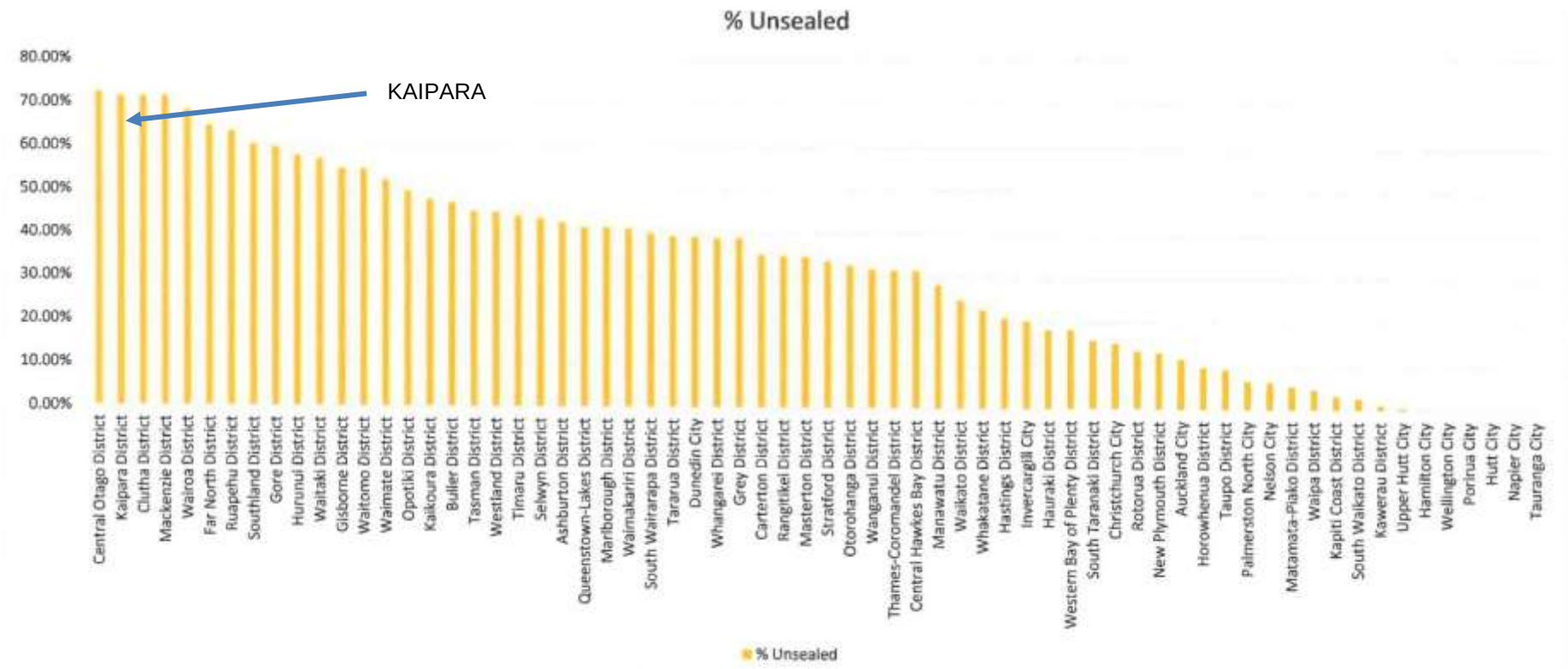
- 112 - Unsealed Pavement Maintenance
- 112 - Unsealed Road Resurfacing (Maintenance Metaling); and
- 212 - Unsealed Road Pavement Rehabilitation (Heavy Metaling).

Levels of Service

ONRC Customer Outcomes	ONRC Resilience 1 and 2 – Journeys lost or impacted by unplanned events. ONRC Accessibility 1 – Proportion of network available to Class 1 and 50MAX.
Technical Levels of Service	ONRC Safety TO1 – Hazard faults. ONRC Safety TO3 – Sight distances. ONRC Cost Efficiency 4 – Unsealed road metalling. ONRC Cost Efficiency 5 – Overall network costs.
Long Term Plan (LTP)	• Roads will be safely passable for all users; • Potholes greater than 200mm in diameter and corrugations greater than 25mm deep to be programmed but if unsafe remediated within one week; • Length of unsealed network that has been graded annual; (SC): 140km, (A): 1,200km, (LVA): 750km. The network lengths are (SC): 25, (A): 455km and (LV): 645km; and • Resolution of non-urgent call-outs; from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.



This graph shows that the Kaipara Unsealed network in kilometres is the fifth largest network in New Zealand.



This graph shows that the Kaipara Unsealed network at 72% of the total network is the second highest in New Zealand and that this has resilience issues in maintaining appropriate access.

Levels of Service

The ONRC Customer Outcomes applicable to this activity are:

Customer Outcome Measure 1 and 2: The number of journeys either impacted on or lost by an unplanned event.

The Kaipara Unsealed network has a very low level of resilience due to carriageway flooding, scouring, slips and general instability. This measure currently has been recorded and no data.

Customer Outcome Measure 2: Proportion of network available to Class 1 and 50 MAX freight.

Bridge structures that are posted to reduced mass limits for all vehicles and the bridges considered unable to carry a 50 MAX load. We have a schedule of all these bridges and working through those that would promote productivity if they were upgraded on a priority based programme. There are some routes however that the geometry also restricts the movement of the larger HCVs and that these are being approached through the associated improvement work profile.

Technical Output 7: Hazardous Faults

This is a measure of the faults within the carriageway which would require evasive action by a road user e.g.: detritus, potholes, ponding, corrugations. Inspect a 10% sample of each classification and record faults per 10kms for rural and faults per 1km for urban.

Unsealed pothole costs

Year	# Potholes	Lump Sum (month)	Lump Sum (year)	Annual Cost p/pothole
Total 2013/2014	22,301	$9,613.57	$115,362.84	$ .17
Total 2014/2015	38,498	$9,573.19	$114,878.28	$ 2.98
Total 2015/2016	34,802	$9,573.19	$114,878.28	$ 3.30

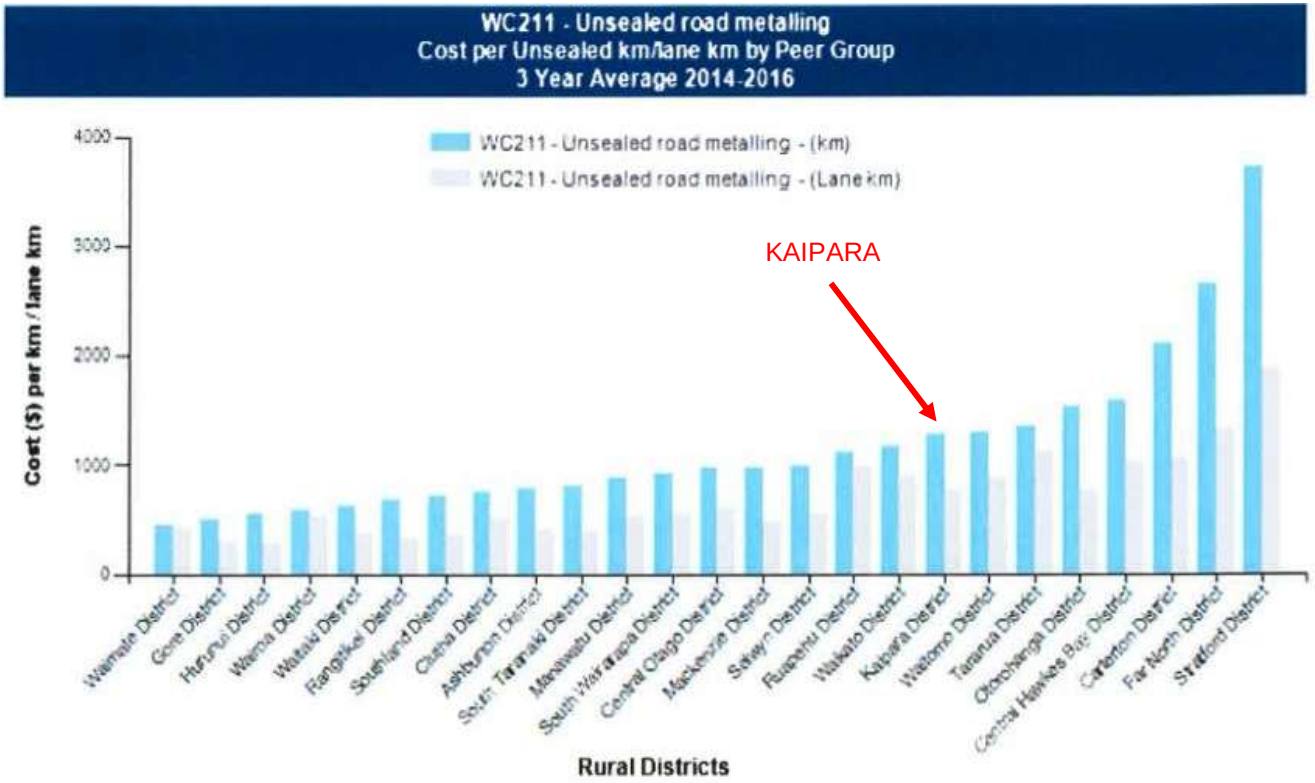
Technical Output 3: **Sight Distances**

The number of locations where sight distance or signs are obstructed by vegetation, unauthorised signs or other items placed within the road reserve. Inspect at least a 10% sample of each classification and record number of instances per 10kms for rural roads; per 1km urban roads.

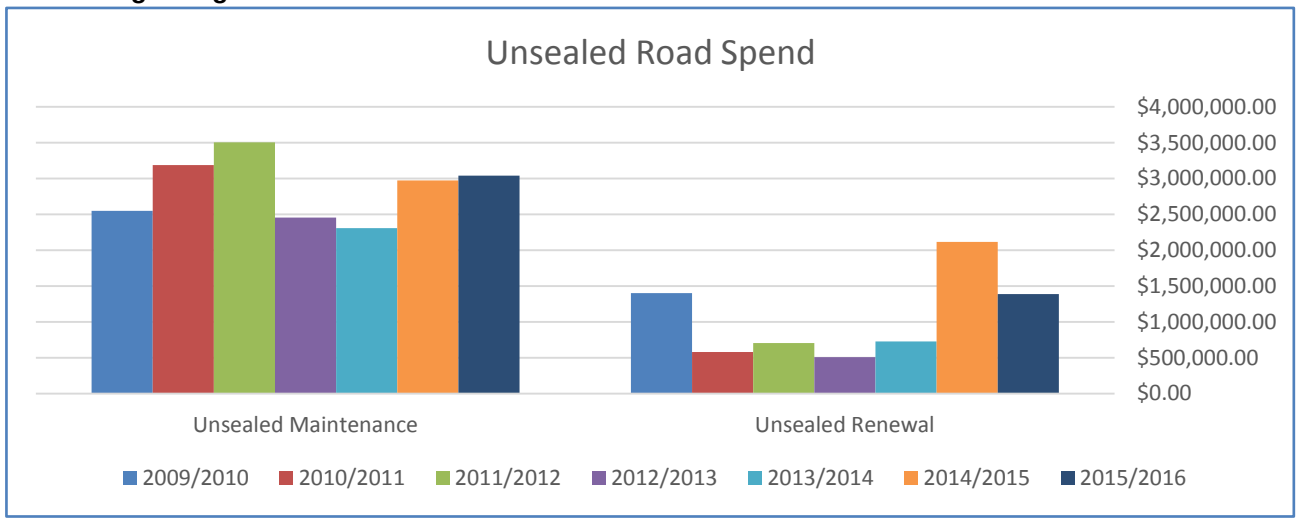
ONRC Cost Efficiency 4: Unsealed Metalling

When compared to its peer group, Kaipara District Council is lying in the mid-span of the North Island Rural Districts. This may appear an appropriate level of investment but given the poor geology of Northland and the increased in primary industry heavy traffic we believe that is currently an underfunded work category. By more innovative and smarter treatments e.g. aggregate blend trials we believe that, with a short term fund injection, these roads will improve their performance and resilience.

The next graph shows that Kaipara has the highest unsealed $/km cost within the Rural peer group and that we agree and the graph below shows that the Renewals/Maintenance balance is possibly not quite right. The bottom graph tends to indicate a high level of unplanned and reactive maintenance. We are in the process of building an Unsealed Road Maintenance and Renewals Strategy that will deliver a more balanced and focused programme which will improve the overall cost and performance.



Unsealed grading costs



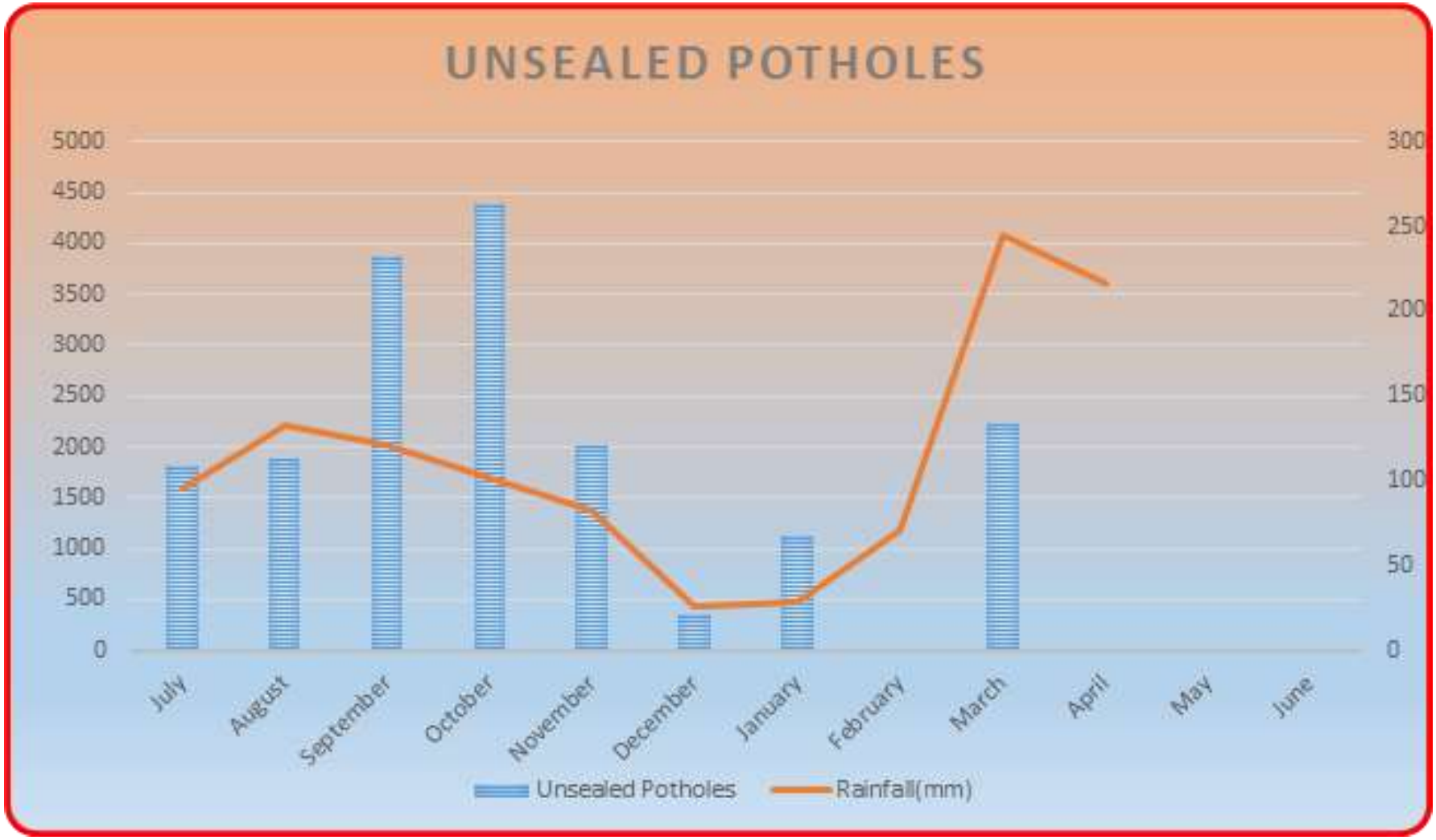
Unsealed grading costs

Year	Length (km)	Lump Sum (month)	Lump Sum (year)	Annual Cost $/km
Total 2013/2014	2,140.552	$ 32,872.65	$ 394,471.80	$ 184.29
Total 2014/2015	1,584.555	$ 33,359.17	$400,310.04	$ 252.63
Total 2015/2016	1,212.672	$ 32,734.58	$392,814.96	$ 323.93

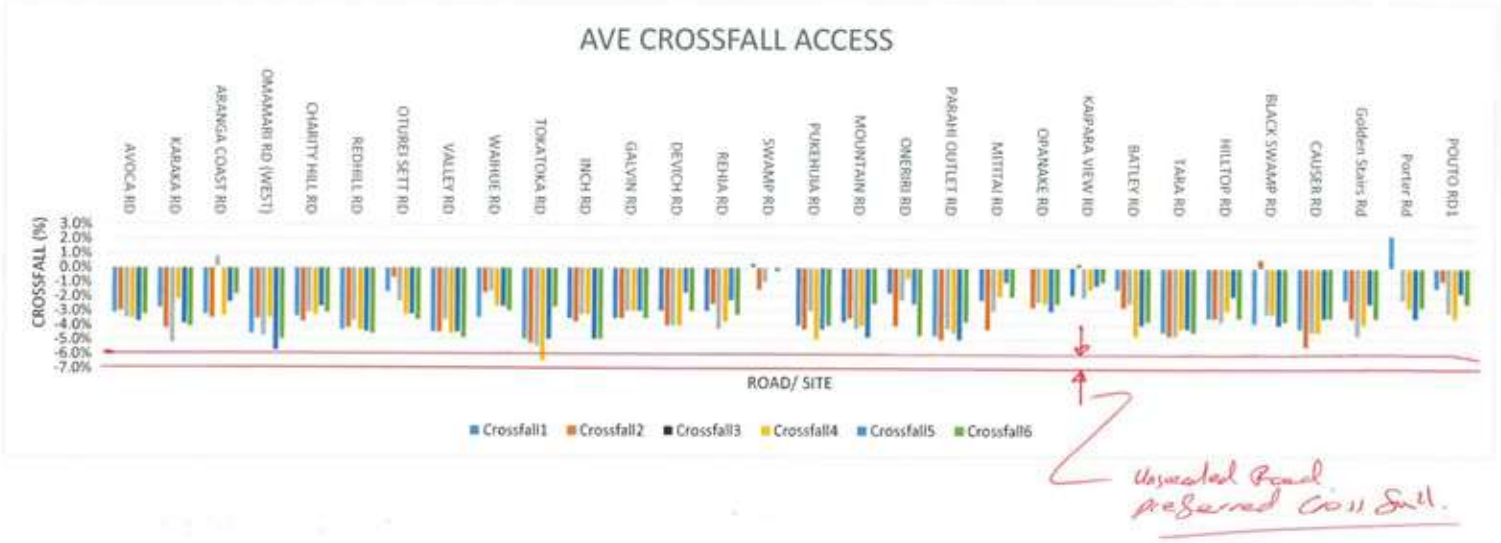
Unsealed Road network total cost to maintain

Year	Low Volume	Access	Secondary Collector	Unsealed cost per km
2009/2010	$2,267,057.66	$1,596,390.83	$89,937.51	$3,513.18
2010/2011	$2,163,110.06	$1,523,194.19	$85,813.76	$3,352.10
2011/2012	$2,414,042.47	$1,699,892.92	$95,768.61	$3,740.96
2012/2013	$1,698,921.27	$1,196,327.02	$67,398.71	$2,632.76
2013/2014	$1,739,860.81	$293,754.07	$69,022.84	$2,696.20
2014/2015	$2,918,314.63	$854,257.06	$115,773.83	$4,522.42
2016/2017	$2,539,242.60	$1,788,054.91	$100,735.49	$3,934.98

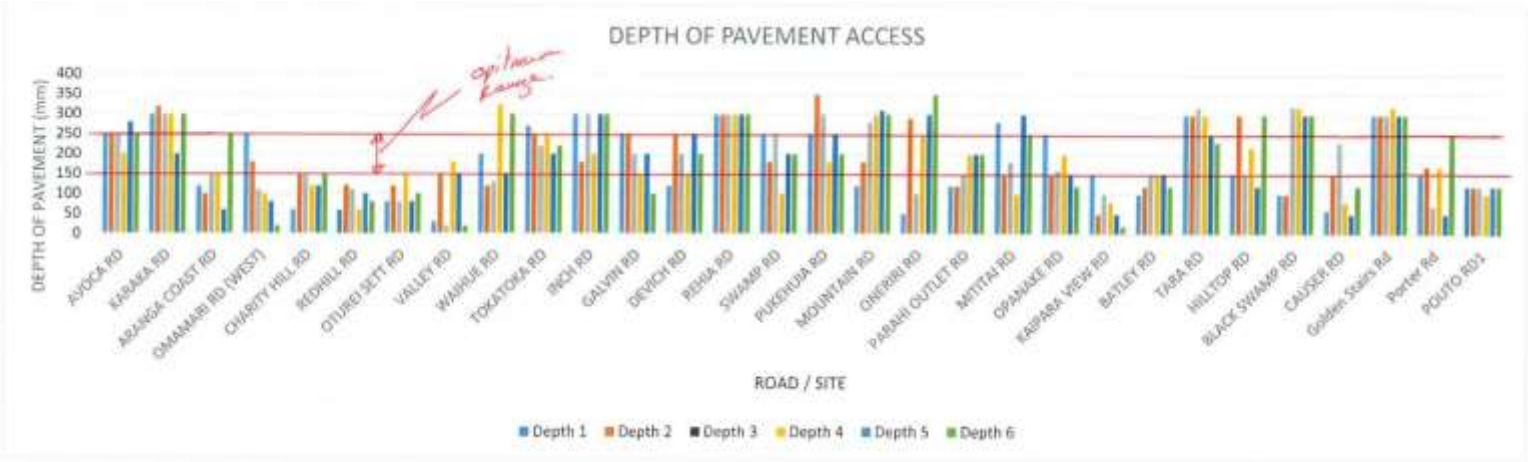
The graph below indicates that the number of pothole faults on the unsealed network have a direct correlation with local rainfall patterns.



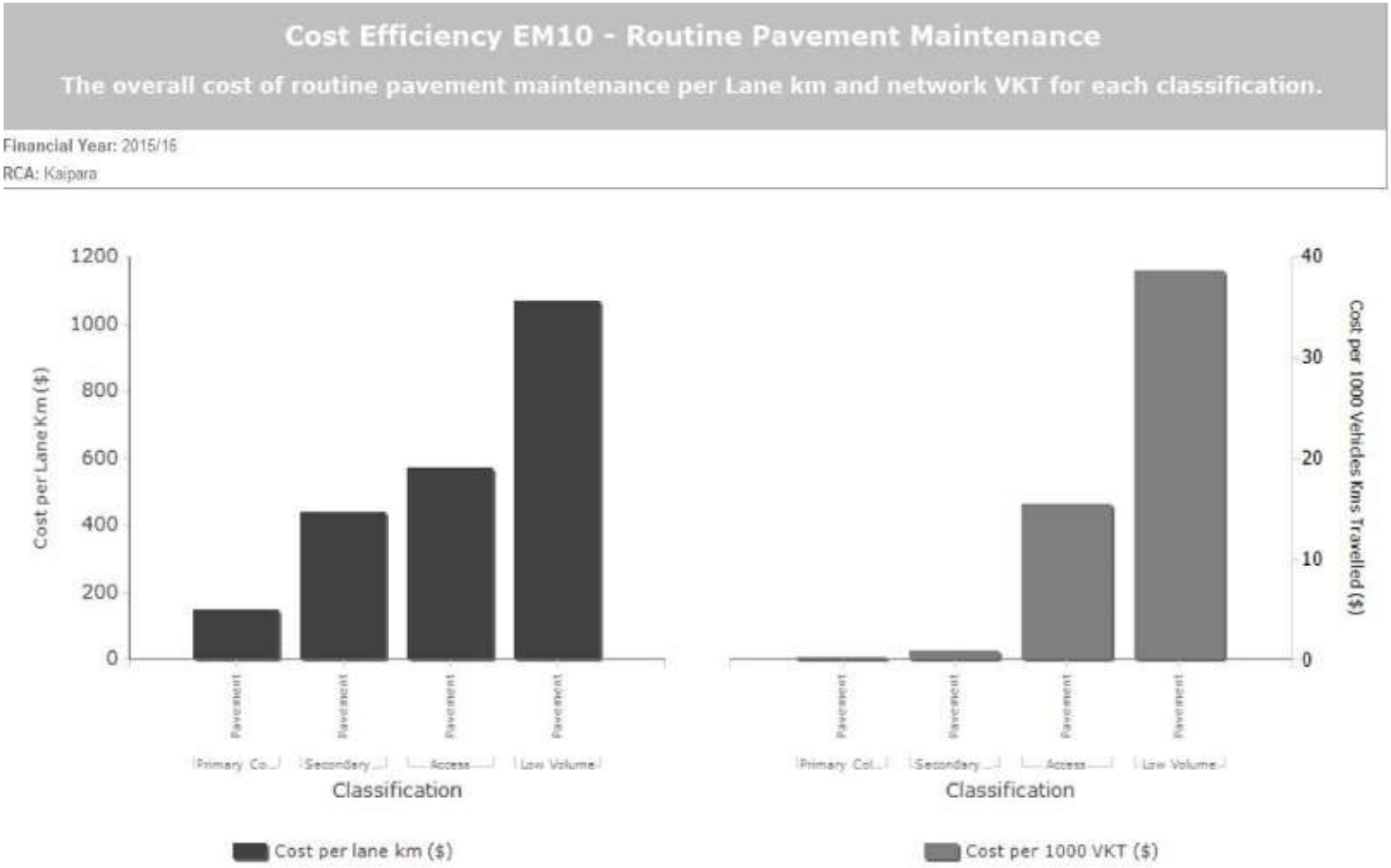
The below graph shows a sample of the crossfall on our access roads, this indicates a major lack of restorative maintenance being undertaking by the network contractor. There are a number of factors including lack of running course and depth of pavement.



The depth of unsealed pavement graph indicates that in general our unsealed access network is served with adequate pavement depth for the level of use. We will however continue work through the sites/roads with minimal pavement to build a heavy metaling programme.



It is to be noted that the Cost Efficiency graph EM10 below incorporates the whole network Sealed and Unsealed and therefore is a complete reflection of the sealed and unsealed network.



The KDC Long Term Plan 2015/2022 KPI's are:

KPI Focus	Definition	Performance Measure	Target
Our transport network and infrastructure steadily improves to ensure people, goods and services can easily move safely and efficiently within the district and region. Provide the right services delivered in the right places, to an agreed standard.	Maintain an effective, sustainable, and passable transport network.	Where Council attends a call-out in response to a fault or unplanned interruption to its road network system, the following median response times are measured:	
		a) percentage of requests regarding a fault or unplanned interruption to the road network are responded back to the customer within a set timeframe: • 3 hours for Emergency/Public Safety Information; • Urgent responses within 7 days; and • Non-urgent responses within 14 days.	>95%
		c) attendance for non-urgent call-outs: from the time that Council receives notification to the time that service personnel reach the site; and	New KPI Measure
		d) Resolution of non-urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	New KPI Measure

KDC's level of service both exceeds the requirements and is unobtainable and therefore needs to be revisited based on the ONRC intervention levels for each classification.

Risks associated with alternative maintenance and renewal standards

Risk Treatment

Options for risk treatment are yet to be considered. Risk reduction treatments available include:

- Reduce probability of failure by managed renewals programme (renew, provide redundancy, upgrade), maintenance expenditure, operational documentation, training etcetera;
- Reduce the impact of a failure by actions such as preparing emergency response plans;
- Accept some risk and carry the consequential costs;
- Change the level of service;
- Insure against the consequential costs; and
- Communication, monitoring, review and reporting.

Unsealed roads are one of the major components of the network and are subjected to low - medium traffic volumes but heavy loads (forestry, dairy, stock), which over time can lead to deterioration and eventually asset failure if not effectively managed. The risk events remaining with a high target risk need to be monitored to determine either that Council remains comfortable with the target risk level or if there are any additional proposed controls which could be implemented to reduce the target risk level further.

Schedule of Risks

Table 5 below provides a summary of the key risk descriptors, net risk factor and the management option for sealed pavements.

Table 5: Unsealed pavements risk summary

Risk Descriptor	Net Risk Factor	Management Options
Crashes on the road network – causing death or serious injury, where road factors were a significant contributor.	**12**	Identify and remedy black spots and implement improvement strategy for identification and monitoring of deficient sites.
Serious injury or death – to personnel working on roadworks.	**8**	Continue and improve with current practice.
Failure to comply with statutory requirements.	**6**	Continue to seek additional funds.
Accelerated asset renewal needed - due to overloaded heavy vehicles, unexpected heavy vehicle use (e.g. forestry) or poor construction.	**12**	Continue and improve liaison with heavy transport operators. Heavy metalling programme underway.
Accidents on active worksites causing death or serious injury	**16**	Safety Management Systems and further site audits carried out by operational teams
Unavailability or quality aggregate within affordable distance – affects Council's ability to maintain the road network adequately.	**16**	Carry out district-wide investigation of new aggregate sources and options.
Significant weather event closes some or all major routes into the district.	**12**	Continue to work with NZTA to ensure lifeline/detour routes are identified and upgraded to an appropriate standard.
Road network deterioration caused by poor design/construction and change of use.		Continue to carry out condition assessments on the unsealed network by using resources available with Contractor

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

Table 6: Options to be considered for unsealed pavements

Option	Description	Benefits
Prioritised maintenance	Enhanced assessment of maintenance repairs based on ONRC hierarchy and LoS. Reduction in the reactive non-planned work.	Cost efficiency – will target the right maintenance, on the right roads at the right time
Aggregate blends	Use a mix of aggregates from different sources to reduce the loss of material from the road.	Cost efficiency – will extend the life of the pavement and wearing course
Increased focus heavy metal	To plan to deliver the appropriate depth of heavy metal 180mm-250mm will improve the strength and ability of the road to perform.	Cost efficiency – by doing the heavy metal overlay programme once correctly will increase the life of the pavement and will reduce the amount of resurfacing work needed.
Develop an appropriate an appropriate grading programme	A grading programme based on the ONRC classification.	Amenity – will bring the overall average ride on the unsealed network back in line with the peer group.
Dust nuisance	Dust on Northland roads is often prevalent during summer and due to fineness can drift from the road corridor.	Amenity – will help minimise the level of dust that on occasions drifts from the road corridor when under heavy use.

Options Assessment

Optimisation using SCALA test pits, surface profile monitoring data collection was undertaken in February 2017 and the results are to be modelled and help inform the most appropriate Maintenance programme. It has indicated that the existing pavement maintenance and renewal regime is in need of a review.

On balance, when factoring the total cost of the programme and the resulting pavement condition, the most appropriate scenario, given NZTA's constrained funding environment, is the Prioritised Scenario in the long term.

Table 7: Unsealed road condition

Option	Description	Problem being addressed	Effectiveness	LoS Impact	Annual Cost	30 year PV Cost ($M)
No Rehabilitation	Reactive routine maintenance and reseals only. Maintenance costs will increase and pavement lives will decrease due to loss of shape and material loss.	Unsealed road condition will deteriorate significantly along with loss of safety	**Poor**			
Status Quo	Very high cost maintenance of unsealed network to try and manage the historic lack of investment in an unsealed pavement renewals programme. This requires the same funding every year and does not manage to improve LoS on network.	Unsealed road condition. The current practice of continually completing maintenance is providing a minimal LoS 78% dissatisfaction from our customer surveys	**Moderate**			
Prioritised maintenance and focused heavy metalling programme	Enhanced assessment of maintenance repairs based on ONRC hierarchy and LoS. Renewals programme developed based on the pavement depth, pavement strength and shape data.	This programme will deliver the most opportune programme by incorporating repairs and renewals into a quality model to delivery sealed road pavement strength integrity and customer ride LoS.	**Good**			

Preferred Option

Proactive Maintenance as this reduces our long term maintenance costs by taking into account budget spent on a proactive heavy metaling programme to help change residents perception that our unsealed network is not being maintained to an appropriate LoS.

Operations and Maintenance Plan

Routine maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Two categories of routine maintenance are carried out;

Unplanned Maintenance: Work carried out in response to reported problems or defects (e.g. pothole repair)

Planned Maintenance: Work carried out to a predetermined schedule or planned in association with other work.

Pavement Maintenance Planning

Pavement maintenance provides for the normal care and attention of the roadway to maintain its structural integrity and serviceability. Examples of this work include:

- Pavement pothole filling and repairs;
- Corrugation and surface defect repairs;
- Routine maintenance and repair of surface water channels and subsoil drainage; and
- Renewal or installation of culverts with a diameter less than or equal to 600mm.

Operations and Maintenance Strategies

The key operational maintenance issues for pavements are:

- Council completes a significant quantity of surface water channel clearing and channel formation each year to ensure the appropriate level of pavement drainage.

How Maintenance is identified and prioritised

Routine cyclic maintenance items will be repaired either as they are identified by the Routine Maintenance Crew or may be recorded and entered into the RAMM Contractor programme for subsequent repair. Items include, pothole repairs, corrugations, shoulder maintenance.

The following technical standards are applicable for unsealed pavement maintenance:

- Repair of potholes – unsealed (Section 5. RU 1.0);
- Repair of corrugations (Section 5. RU 2.0).

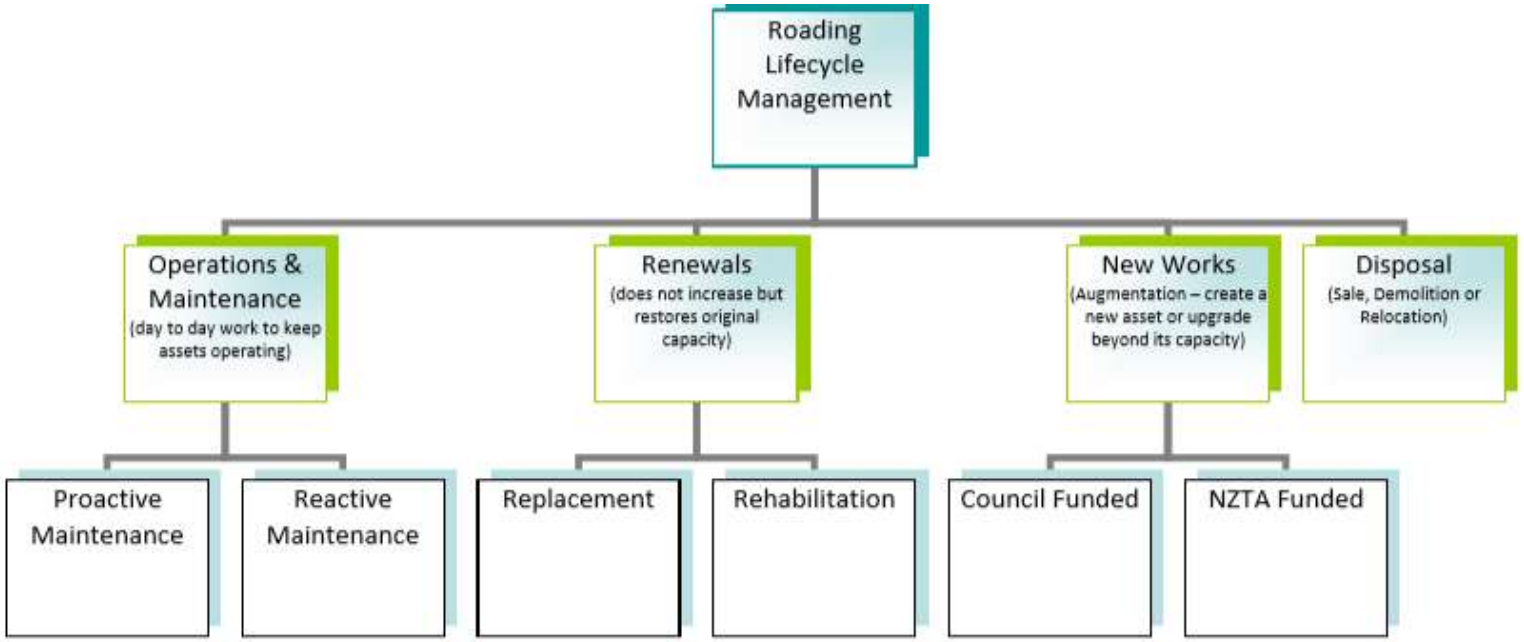
Renewal/Replacement Plan Road pavement renewal is required when the pavement layers are reaching the end of their design life and are showing signs of deterioration. Pavement renewals, rather than resurfacing, become the best option when considering the whole life costs of the pavement.

The international Infrastructure Management Manual (NAMS) 2011 edition defines the lifecycle of an asset as:

- "The time interval that commences with the identification of the need for an asset and terminates with the decommissioning of the asset or any liabilities thereafter".

Lifecycle Asset Management encompasses all management options and strategies from initial planning through to disposal in order to meet the required Levels of Service in the most cost-effective way to provide for existing and future customers as shown in the diagram below:

Figure 1: Lifecycle Management Plan



Renewal Strategies

Renewal expenditure is work that restores the existing pavement to its original level of service i.e. capacity or the required condition. There are a number of activities which are covered within the pavement renewal area. NZTA subsidy for this form of treatment is available through the following categories:

- Sealed Road Resurfacing;
- Pavement Rehabilitation.

How renewals are identified and prioritised

Pavement renewal sites will be identified through performance modelling using the network Scala Penetrometer testing, pavement depth analysis and profile reporting by Maintenance Contractor inspections.

The annual programme is developed with an emphasis on road hierarchy. Priority is given to roads with high traffic volumes; especially heavy freight vehicles. Consideration is given to the likely rate of pavement deterioration should no action be taken i.e. roads with the highest maintenance costs per unit length will be given priority for pavement upgrade.

Within the KDC network there are 1,125 km of unsealed roads. By assuming an expected pavement life, it is possible to predict an annual pavement renewal requirement. Table 8 shows the consequences of using various effective lives for the sealed network. The adopted design life currently been used is 20 years.

Table 8: Annual pavement renewal requirements – total kms vs design life

Unsealed roads	**1,125kms**	**1,125kms**	**1,125kms**	**1,125kms**	**1,125kms**
Mean pavement life for network	35 years	30 years	25 years	20 years	15 years
Annual pavement renewal requirement based mean life	**32.1kms**	**37.5kms**	**45kms**	**56.25kms**	**75kms**

This therefore gives us a renewal length of 75kms per year purely based assuming a birthday date.

6.3 Bridges, large culverts and retaining structures

Links to strategic case

Kaipara District is part of the Northland region tucked in between Kaipara, Far North and Auckland and currently has 348 bridges across the network. Of these there are 285 on the Low Volume and Access part of the network and 63 on the Primary and Secondary Collector part of the network which carries approximately 80% of the traffic. There are 13,278m of retaining walls across the network. The large geographical area, large number of small towns and settlements, the remoteness of some communities, coupled with emerging frequent subtropical storm events which affect the region, gives challenges that most other councils in New Zealand do not face.

High Intensity short duration storm event with low levels of retention within most catchments has changed the demands and capacity expectations of most bridges and catchments.

This impacts upon resilience, availability and reliability of the road network flowing through to a negative impact on the GPS statements of Productivity, Safety, resilience and VfM.

The bridges and large culverts form a critical link in the network as any failure is instant loss of service and to return to service is quite often does not happen quickly. Therefore the impact is such that customers either have to use an alternate route of a longer distance or have no route at all impact severely on their ability to carry on with their life.

Problem statement

Our aging bridge stock is vulnerable to damage, particularly from the modern heavy vehicles prevalent on the network, due to historic load designs and changing weather patterns. We also have a number of bridges that are not Class 1 or 50MAX load approved (27 in total) and that these are restricting productivity from all forms of agricultural product and the ability to get them to the market.

The retaining structure is a mix of gabion baskets, wooden pole and panel and concrete blocks and these are a critical component to the networks ability to provide the required level of service.

Benefit of Addressing Problem

A fit-for-purpose roads and footpaths network with levels of service suitable for the traffic demands, particularly promoting freight productivity, while optimising the long term maintenance costs.

Work Categories

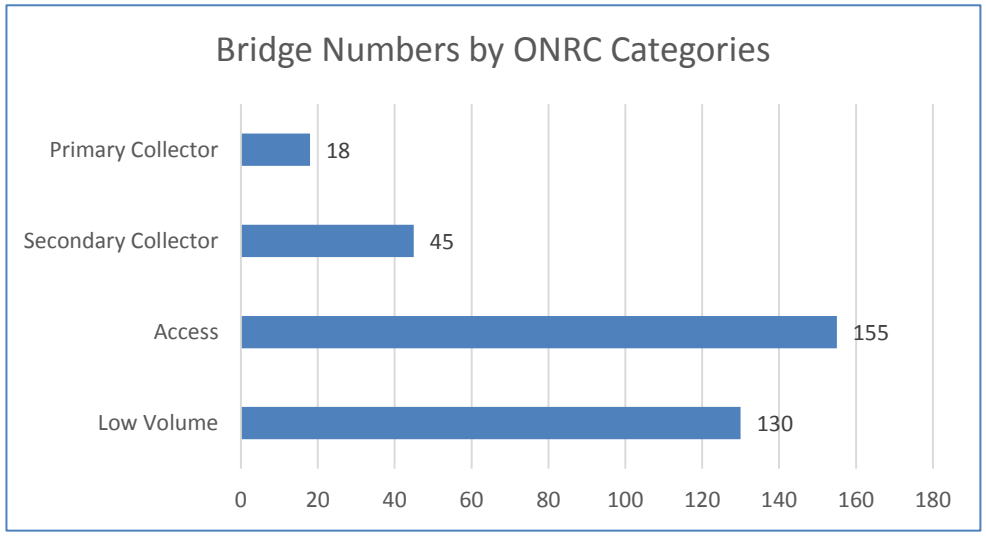
- 114 – Structures Maintenance;
- 215 – Structures Components Renewals;
- 314 – Minor Improvements (bridge and large culvert replacement <$300k); and
- 322 - Replacement of bridges and structures.

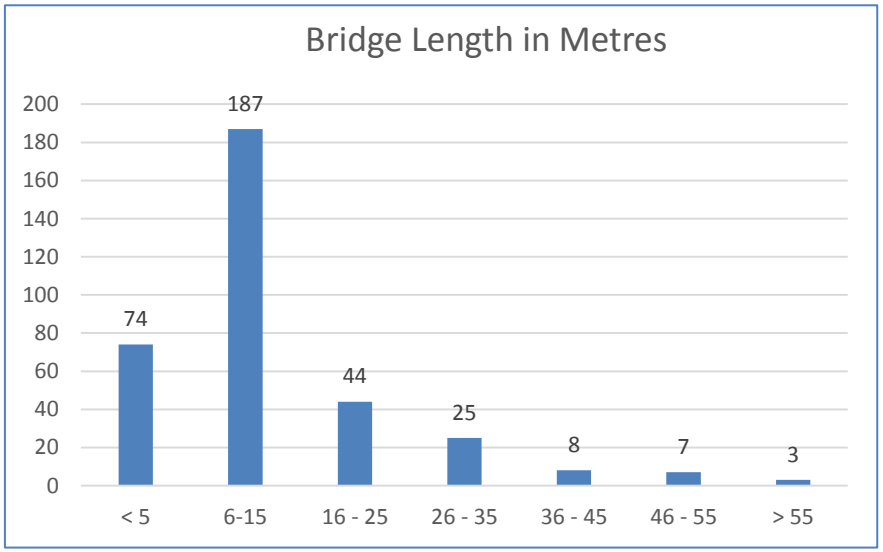
Levels of Service

The ONRC Customer Outcomes applicable to this activity are:

ONRC Customer Outcomes	ONRC CO1 – Resilience – The number of journeys impacted by an unplanned event affecting a bridge or large culvert. ONRC CO2 – Resilience – The number of instances where road access is lost due to a bridge or large culvert failure. ONRC CO1 – Accessibility – Proportion of network not available (a) Class 1 heavy vehicles, (b) 50MAX vehicles due to a bridge structure capacity.

Customer Level of Service	Roads will be managed in a way to be open and passable for users unless closed by an unforeseen event. Bridges will be safe and passable by the approved vehicle loads that comply with the individual bridges loading capacity
Long Term Plan (LTP)	Bridges are inspected on a bi-annual basis, in line with the NZTA bridge manual. Bridges with weight or speed restrictions are inspected annually; Work on bridges is based on the outcome of these inspections; and Bridges are safe and passable by approved vehicle loads.





KPI Focus	Definition	Performance Measure	Target
Our transport network and infrastructure improves to ensure people, goods and services can move safely and efficiently within the district and region.	Maintain an effective, sustainable and passable transport network.	Measure annually the number of bridge closures due to an asset failure not caused by outside causes, vehicle damage etcetera.	Zero
	No fatal accidents with a cause due to road design or condition.	Number of fatal and serious accidents measured in year caused by road design on condition.	Zero
Our transport network and infrastructure steadily improves to ensure people, good and services can easily move safely and efficiently within the district and region. Provide the right services delivered in the right places to an agreed standard.	Maintain an effective, sustainable and integrated transport network.	Percentage of residents who are very/fairly satisfied with the network.	73%
Customer service request response times.	This measure indicates the number of requests that are completed in the timeframe and the customer informed.	Percentage of requests regarding a fault or unplanned interruption to the road network are responded back to the customer within a set timeframe.	>50%
ONRC Accessibility: % of network available to 50MAX and HPMV.	To reduce the number of restricted bridges to allow deeper penetration of freight into the network.	Measure annually the kilometres extension available to 50MAX and HPMV vehicles on the network.	New KPI measure
ONRC Resilience Customer Outcomes 1 and 2: The number of journeys impacted by unplanned events.	To minimise the number of journeys that are impacted by unplanned events that are detoured or not able.	The number of unplanned road closure and the number of vehicles affected by closures annually. Record the number of unplanned road closures and calculate the total number of vehicles affected annually by classification.	New KPI measure

The KDC's level of service is both high and unobtainable on some of the measures.

Risks associated with alternative maintenance and renewal standards

Risk Treatment

Options for risk treatment are yet to be considered for this category. Risk reduction treatments available include:

- Reduce probability of failure by capital works improvements (renew, provide redundancy, upgrade), maintenance expenditure;
- Reduce the impact of a failure by actions such as preparing emergency response plans Lifeline systems, alternate routes; and
- Accept some risk in that not all traffic will be able to detour or turn around and retrace their route.

Change the level of service (if not based on ONRC then cost may be 100% local share):

- Insure against the consequential costs; and
- Communication, monitoring, review and reporting.

KDC has established a detailed risk register for all its transportation-related risks and this is located in Appendix 3 on page 283 of this AMP.

Sealed roads are one of the major components of the network along with bridges and are subjected to high traffic volumes and heavy loads, which over time can lead to deterioration and eventually asset failure if not effectively managed. The risk events remaining with a high target risk need to be monitored to determine either that Council remains comfortable with the target risk level or if there are any additional proposed controls which could be implemented to reduce the target risk level further.

Schedule of risks

Table 9 below provides a summary of the key risk descriptors, net risk factor and the management options for our bridges.

Table 9: Bridge structures risk summary

Risk Descriptor	Net Risk Factor	Management Options
Crashes on the road network – causing death or serious injury, where bridge factors were a significant contributor.	**12**	Identify and remedy black spots and implement improvement strategy for identification and monitoring of deficient sites
Growth in lifestyle development – creating different demands on rural networks especially for our singe lane bridges.	**12**	Continue to co-ordinate with planning to manage expectation and to develop a LoS upgrade plan to match the growth.
Failure to comply with statutory requirements	**6**	Continue to manage our statutory rights in regards to the bridge inventory.
Accelerated asset consumption – due to numbers of heavy vehicles that is not consistent with the ONRC hierarchy.	**12**	Continue to monitor the high demand routes and their deterioration to allow or timely and appropriate intervention.
Consider the safety impact of sealing bridge approaches on the unsealed network.	**14**	Identify funding criteria to remedy prioritised sites.
Significant weather event closes some or all major lifeline routes into and through the district.	**12**	Continue to work with NZTA to ensure lifeline/detour routes are identified and upgraded to an appropriate standard.
Bridge network deterioration due to historically low design/constructions.	**6**	Focus on those bridges that are restricted by weight or speed to develop and upgrade plan to improve accessibility in the region.

Gap Analysis

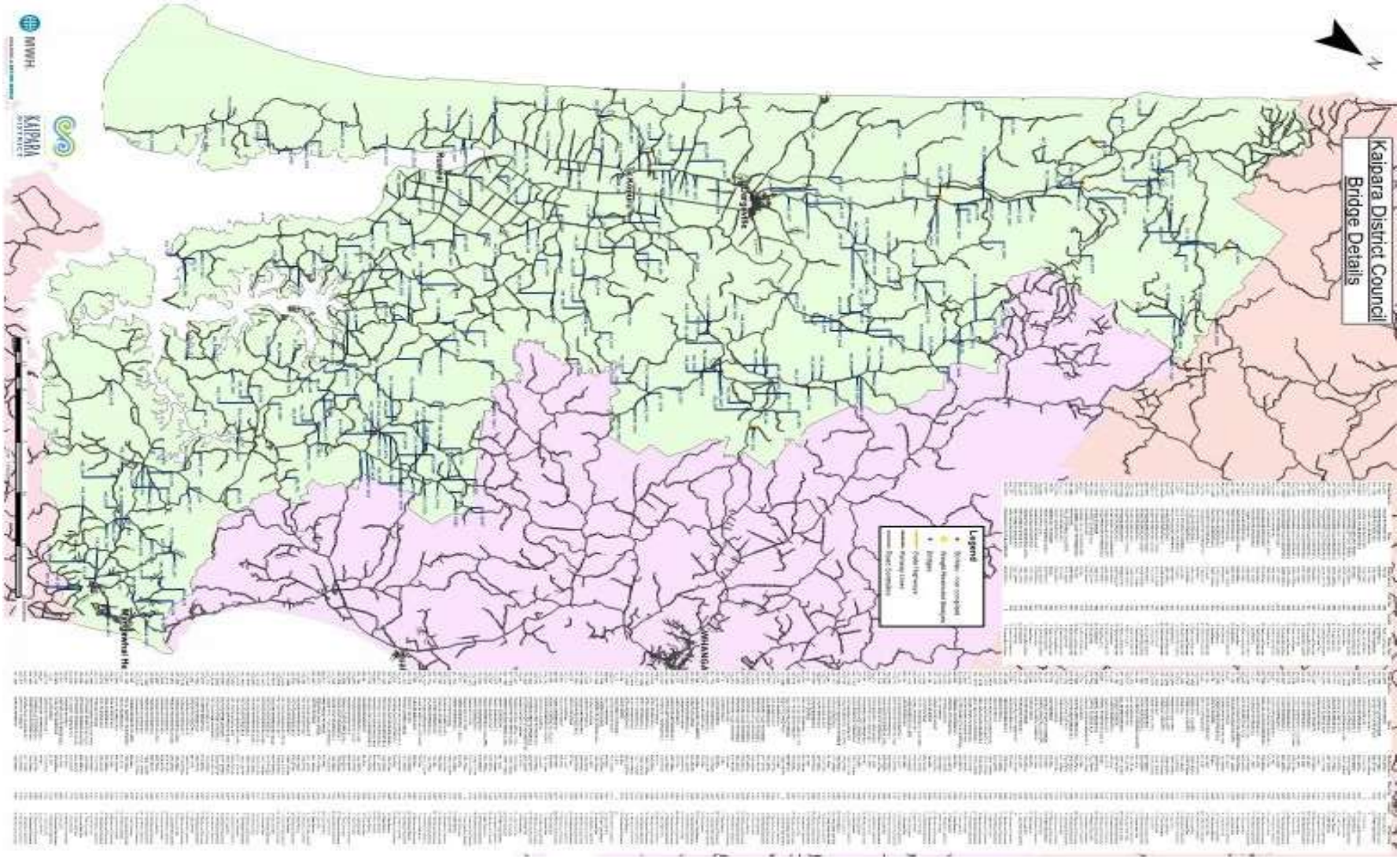
Develop Options

Options to be considered:

- Based on the above data and the problem definition, the following options have been considered for addressing the sealed pavements.

Options Assessment

Optimisation of the bridge and large culvert programme using the data collected through the bi-annual bridge condition survey. Also through the routine inspections of the network by the contractor as they travel the network. This gives us greater confidence in promoting our 10 year bridge renewal/upgrade regime:



On balance, when factoring the total cost of the programme and the resulting pavement condition, the most appropriate scenario, given NZTA's constrained funding environment, is the High scenario in the long term.

Preferred option

Prioritised Maintenance: As this reduces the long term costs whilst maintaining the current and proposed ONRC Customer Levels of Service by considering the problem statement as well as the issue of opening more of the network to Class 1 and 50MAX freight as per ONRC Customer Outcome 1: Proportion of network not available to (a) Class 1 and (b) 50MAX freight meaning that by focusing on the whole of network we will be driving down reactive works costs whilst improving the resilience, robustness and availability of the network.

Operations and Maintenance Plan

Routine Maintenance: Is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Two categories of routine maintenance are carried out.

Unplanned Routine Maintenance: Work carried out in response to reported customer service requests, network inspections by Contractor and inspectors (culvert maintenance repair work to pipes and headwalls).

Planned Ordered Maintenance: Work carried out to a predetermined schedule or planned in association with other work (jetting, flushing and cleaning of culverts, cleaning of table drains, annual inspections).

Drainage Maintenance Planning

- Routine maintenance and repair of surface water channels and subsoil drainage; and
- Renewal or installation of culverts with a diameter less than or equal to 600mm.

Operations and Maintenance Strategies

The key operational maintenance issues for drainage are:

- To maintain the structural integrity of the drainage network; and
- The ability of the network to manage the current expected flows.

Renewal Strategies

Renewal expenditure is work that restores the existing structure to its original level of service i.e. capacity or the required condition. There are a number of activities which are covered within the structures renewal area. NZTA subsidy for this form of treatment is available through the following categories:

- WC 215 Structures Component renewals;
- WC 322 Bridge Replacements; and
- WC 341 Low cost/ Low risk improvements.

How Renewals are identified and prioritised

Bridge renewals are identified through performance modelling and the annual Bridge Inspection process. The annual process inspect all the posted and wooden bridges along with 50% of the balance. This then produces a report of the condition and remaining useful life for each bridge. We can then use this data to inform the annual component replacement programme and to also reset the 10 year Renewal programme.

The annual programme is developed with an emphasis on road hierarchy and failure risk. Priority is given to roads with high traffic volumes; especially heavy commercial vehicles.

Within the KDC network there are 348 bridges and large structures. By assuming an expected structure life, it is possible to predict an annual pavement renewal requirement. Table 4 shows the consequences of using various effective lives for the bridge stock. The adopted design life currently been used is 80 years. This assumes no increase in Level of Service but simply renew like for like. A number of our bridges do not have 50MAX or HPMV Capacity and therefore restrict freight productivity. We are currently working with NZTA to prioritise an upgrade of those bridges deemed to be of value/importance to the freight industry when they become a renewal candidate.

Table 10: Bridge renewal requirements – total vs design life

Bridge numbers	348	348	348	348	348
Average life	85 years	85 years	85 years	85 years	85 years
Annual pavement renewal requirement	**4**	**4**	**4**	**4**	**4**

Creation/Acquisition/Augmentation Plan

Bridge Upgrade is related to:

- increased levels of services required by existing road users (to relieve traffic congestion, improve safety, including walking and cycling etcetera);
- growth related capital works projects; and
- assets resulting from developments.

The development of the road network is undertaken in accordance with the District Plan, which indicates priorities for bridge widening and new construction. The road designations included in the District Plan form a major commitment, which, under the Resource Management Act, must be constructed within the timeframe described in the Plan.

Projects are justified and prioritised on the basis of a cost / benefit analysis which accounts for:

- the benefit to the road user through reducing delays in the time to travel along a given route;
- vehicle operating cost savings;
- safety benefits; and
- intangible benefits, such as community dislocation, environmental issues (pollution, water quality, noise and vibrations) and other local, regional and national issues.

Road lifecycle costs (of which bridges are a major component) may be reduced in the asset creation phase by reviewing the following:

- ranking criteria for all capital works and projects;
- evaluation of options and staging for all road creation projects;
- tendering and contract administration procedures; and
- review of strategies and plans.

Safety Improvements

Each year, when Council is preparing its capital works programme for the following 12 month period, provision is made for minor safety works, including:

- Visibility improvements on bridge approaches (especially single lane bridges);
- Improved streetlighting (rural flag lighting);

- Road curvature realignment at bridges;
- Signage at bridges especially single lane;
- Bridge widening (two laning); and
- Signage and pavement marking at bridge.

6.4 Drainage Systems

Links to Strategic Case

Kaipara District is part of the Northland region tucked in between Kaipara, Far North and Auckland with soils and areas low-lying land that make it difficult to maintain appropriate drainage for the road pavement. The large geographical area, large number of small towns and settlements, the remoteness of some communities, and the instability of soils, coupled with frequent subtropical storm events which affect the region, gives challenges that most other councils in New Zealand do not face.

The drainage component also includes the urban kerb and channel system along with the catch-pits and associated piping to the nearest stormwater system.

Rapid changes in weather conditions can occur which have a varying impact on the ability of existing drainage systems to manage. This then has a direct impact on the soft soils below the pavements in general accelerating pavement failure due to factors including increased traffic volumes, storm events and poor drainage.

These impacts upon resilience, availability and reliability of the road network flowing through to a negative impact on the GPS statements of Productivity, Safety, resilience and VfM.

Problem Statement

Our road networks are vulnerable to damage during the wet periods, particularly from heavy vehicles, due to the poor performance of the current under capacity drainage network exacerbates the damage.

Benefit of Addressing Problem

A fit-for-purpose roads and footpaths network with levels of service suitable for the traffic demands, particularly freight, while optimising the long term maintenance costs.

Also a more appropriate drainage system will ensure water is not able to reside within the pavement area for time it currently does. This have an immediate positive effect on the life and strength of the pavements currently under stress due to have water in or around the pavement.

Work Categories

- 113 – Drainage Maintenance;
- 215 – Drainage Renewals; and
- 314 – Minor Improvements (roadside table drains and small cross culvert replacement/improvement <$300k).

Levels of Service

ONRC Customer Outcomes	ONRC CO1 – Resilience – The number of journeys impacted by an unplanned events caused by drainage failure. ONRC CO2 – Resilience – The number of instances where road access is lost due to drainage. ONRC CO1 – Accessibility – Proportion of network not available (a) Class 1 heavy vehicles, (b) 50MAX vehicles due to a bridge structure capacity.
Customer Technical Levels of Service	ONRC TO7 – Safety - % of hazardous faults e.g. ponding, water across road that would require evasive action.
Long Term Plan (LTP)	Roads are safe and passable to all users with exception of an unplanned event.

The ONRC Customer Outcomes applicable to this activity are:

Customer Outcome Measure 1: The number of journeys impacted by a drainage-related issue.

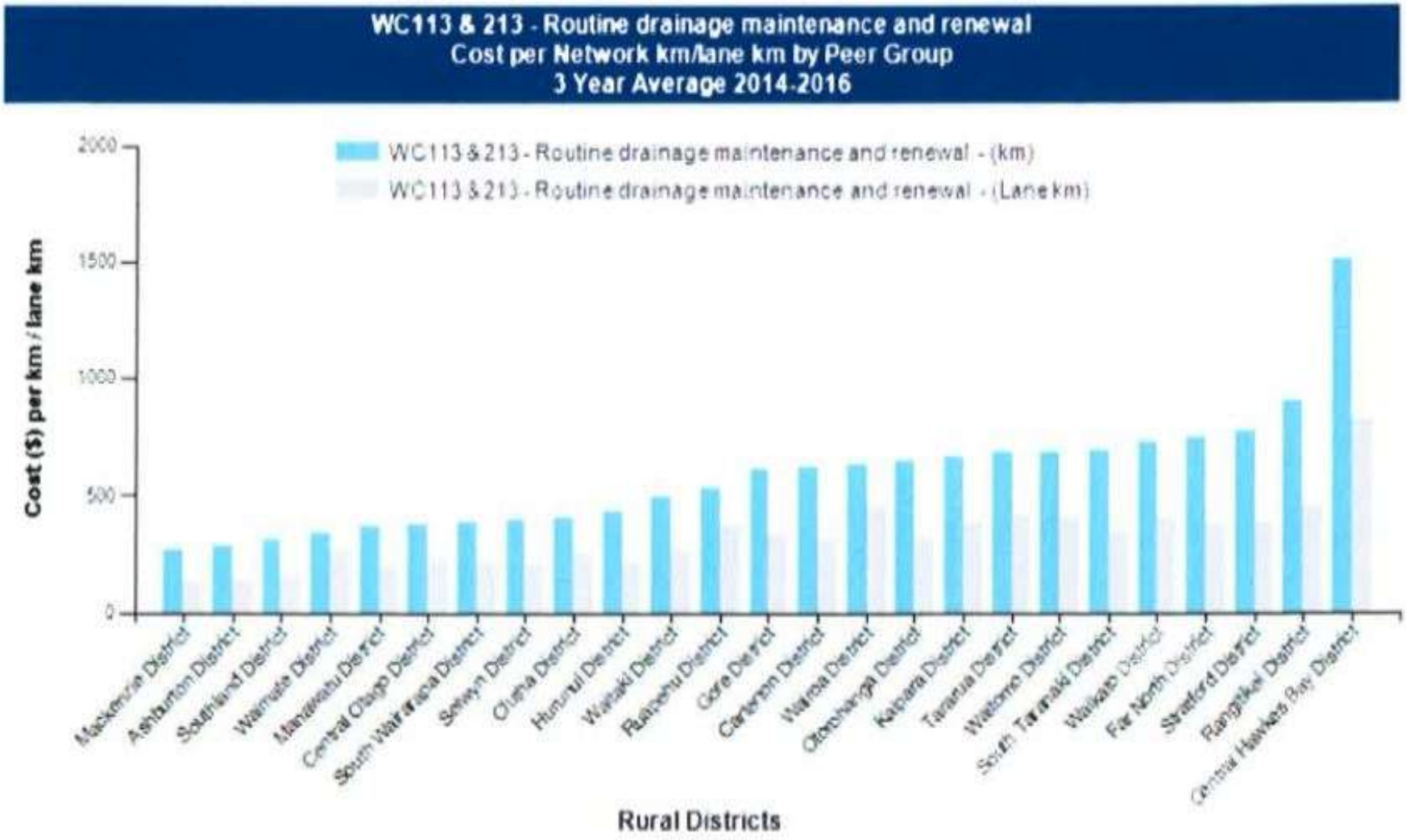
The Kaipara network appears to show a low resilience in parts to rain events and this measure will give confidence to the planning of being able to focus improvements in the right location. This is a new measure and has no current data.

Customer Outcome Measure 2: Number of journeys lost due to loss of access.

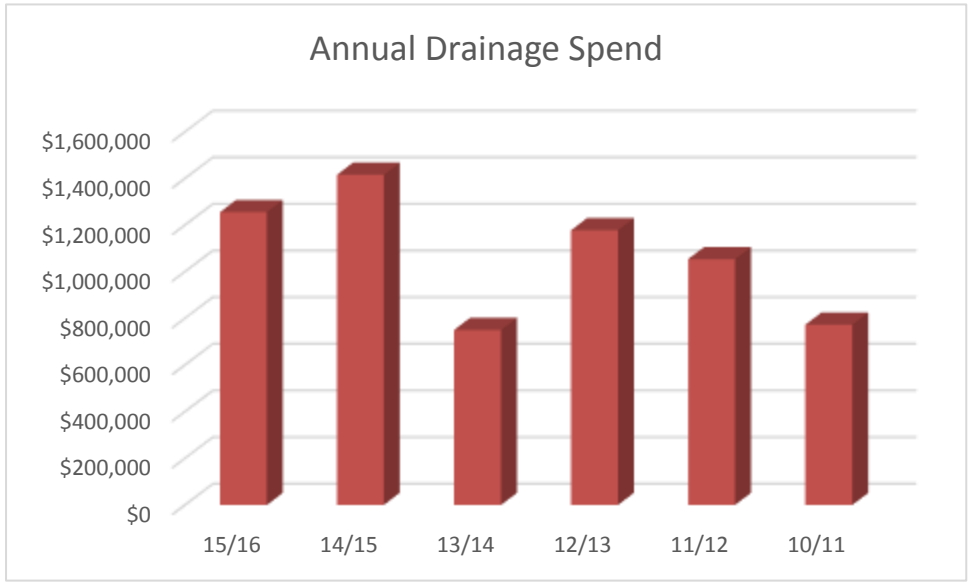
This measure is similar to the above OM 1 but occurs when there is no viable alternate route (detour). As above this is a new measure and currently has no data.

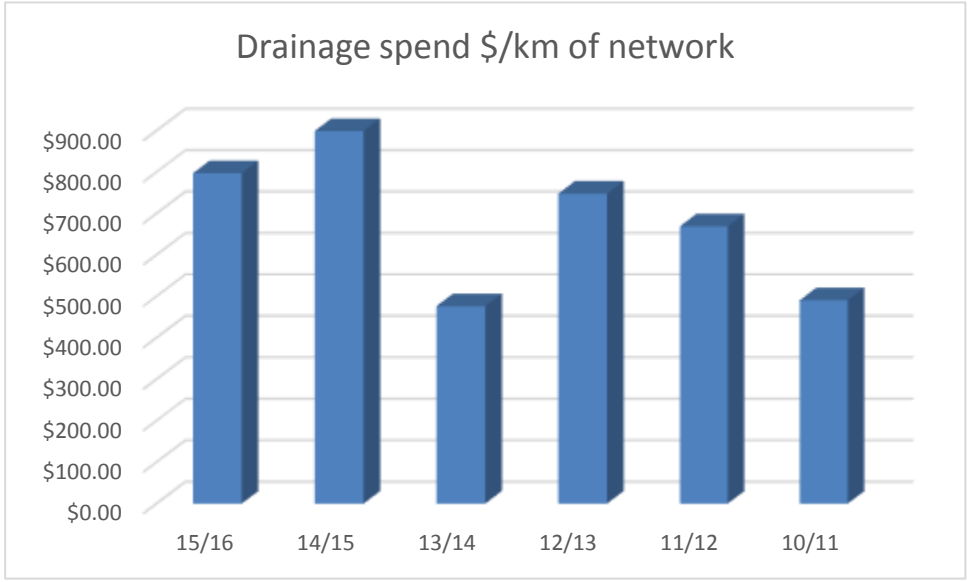
Cost Efficiency 1: General Drainage costs.

The following graph indicates that Kaipara's spend is within the medium for rural New Zealand. This however takes no account of the subtropical climate and weather of Northland along with undulating nature of the country. This creates a higher cost element to the drainage activity.


WC113 & 213 - Routine drainage maintenance and renewal
Cost per Network km/lane km by Peer Group
3 Year Average 2014-2016
WC113 & 213 - Routine drainage maintenance and renewal - (km)
WC113 & 213 - Routine drainage maintenance and renewal - (Lane km)
Cost ($) per km / lane km
2000
1500
1000
500
0
Mackenzie District
Ashburton District
Southland District
Waimate District
Manawatu District
Central Otago District
South Wairarapa District
Selwyn District
Clutha District
Hurunui District
Waitaki District
Ruapehu District
Gore District
Carterton District
Wairoa District
Otorohanga District
Kaipara District
Tararua District
Waitomo District
South Taranaki District
Waikato District
Far North District
Stratford District
Rangitikei District
Central Hawkes Bay District
Rural Districts

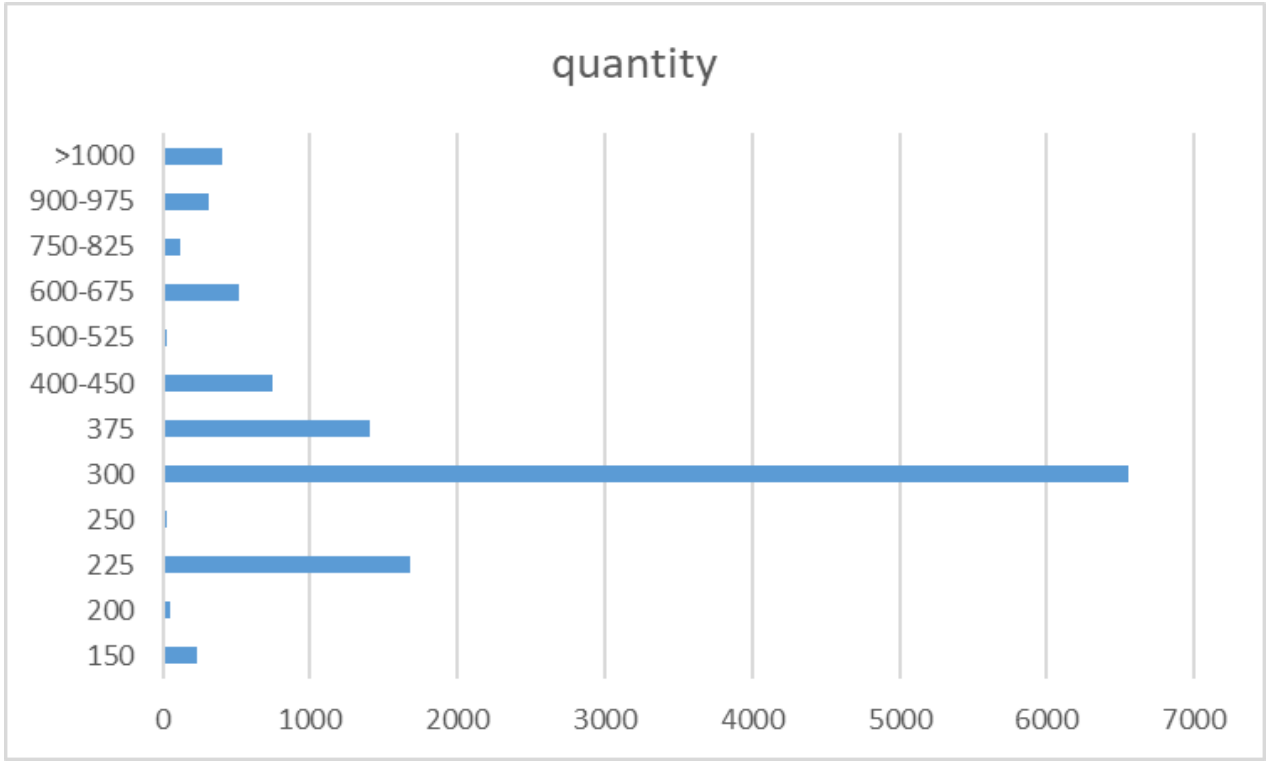
The graphs and data below show a rather reactive approach to managing the drainage component of the road network which at times struggles to maintain the appropriate Level of Service. We are in the process of reviewing both the way in which drainage is managed with the contract and within the management team turn this into a proactive forward thinking and planning maintenance and renewal programme.





KPI Focus	Definition	Performance Measure	Target
Our transport network and infrastructure steadily improves to ensure people, goods and services can move safely and efficiently within the district and region.	Maintain an effective, sustainable, and passable transport network.	Manage and improve the drainage assets to enable a more resilient network.	10% of network renewed or improved annually.
		Percentage of residents who are very/fairly satisfied with footpaths.	73%
Customer service request response times.	This measure indicates the number of requests that are completed in the timeframe and customer informed.	Percentage of requests regarding a fault or unplanned interruption to the road network are responded back to the customer within a set timeframe.	>50%
ONRC Safety Measure 7: Hazardous faults.	To reduce the number of maintenance related hazards requiring evasive action.	The number of hazardous faults which require evasive action by the road user. Inspect at least a 10% sample of each classification and record the number of faults per 10kms for rural and 1km for urban.	New KPI Measure
ONRC Resilience Customer Outcome 1: the number of journeys impacted by unplanned events.	To minimise the number of journeys that are impacted by unplanned events.	The number of unplanned road closures and the number of vehicles affected by closures annually. Record the number of unplanned road closures and calculate the total number of vehicles affected annually by classification.	New KPI Measure

Road cross culverts in Network



Diameter	Quantity
150	233
200	53
225	1,683
250	24
300	6,560
375	1,408
400-450	740
500-525	21
600-675	520
750-825	122
900-975	315
>1,000	400

Risks associated with alternative maintenance and renewal standards

Risk Treatment

Options for risk treatment are yet to be considered. Risk reduction treatments available include:

- Reduce probability of failure by capital works improvements (renew, provide redundancy, upgrade), maintenance expenditure;
- Reduce the impact of a failure by actions such as preparing emergency response plans Lifeline systems, alternate routes; and
- Accept some risk in that not all traffic will be able to detour or turn around and retrace their route.

KDC has established a detailed risk register for all its transportation-related risks and this is located in Appendix 3 on page 283 of this AMP.

Schedule of Risks

Table 11 below provides a summary of the key risk descriptors, net risk factor and the management.

Table 11: Drainage risk summary

Risk Descriptor	Net Risk Factor	Management Options
Lost time due to road closure – lost time due to closure requiring use of an alternative route that will take longer.	12	Identify and remedy lifeline routes, primary routes to those most used facilities and modal connections. School, hospital, airport, supplies and seller to market.
Growth in lifestyle development - creating more non-permeable surfaces (roofs and concrete) which increase run-off and reduce (TC).	10	Carry out catchment studies to highlight those areas needing upgrade.
Failure to comply with statutory requirements	6	Identify shortfalls and remedy as identified.
Accelerated asset consumption – due to increase in high intensity short duration weather events that create higher velocities and shorter retention times. Short (TCs).	12	Identify the implication of these risks and communicate that to decision-makers.
Significant weather events closes some or all major lifeline routes into and through the district	12	Continue to work with NZTA to ensure lifeline/detour routes are identified and upgraded to an appropriate standard.
Road network deterioration due to historically poor design or construction	6	Develop and implement a renewals programme prioritising the under capacity portions of the network.

GAP Analysis

Develop Options

Options to be considered.

Based on the above data and the problem definition, options have been considered for addressing the drainage network.

On balance, when factoring the total cost of the programme and the resulting drainage condition, the most appropriate scenario, given NZTA's constrained funding environment, is the High scenario in the long term with the increasing of culver diameter to a minimum of 450mm as an example.

Preferred Option

Operations and Maintenance Plan

- Routine maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Two categories of routine maintenance are carried out;
- Unplanned routine maintenance: Work carried out in response to reported customer service requests, network inspections by Contractor and inspectors (e.g. Planned Ordered Maintenance: work carried out to a predetermined schedule or planned in association with other work).

Pavement Maintenance Planning

Planning of pavement maintenance provides for the normal care and attention of the road to maintain its structural integrity and serviceability.

How maintenance is identified and prioritised

Routine cyclic maintenance items will be repaired either as they are identified by the Routine Maintenance Crew or may be recorded and entered on to the Asset Manager's programme for subsequent repair.

Renewal/Replacement Plan

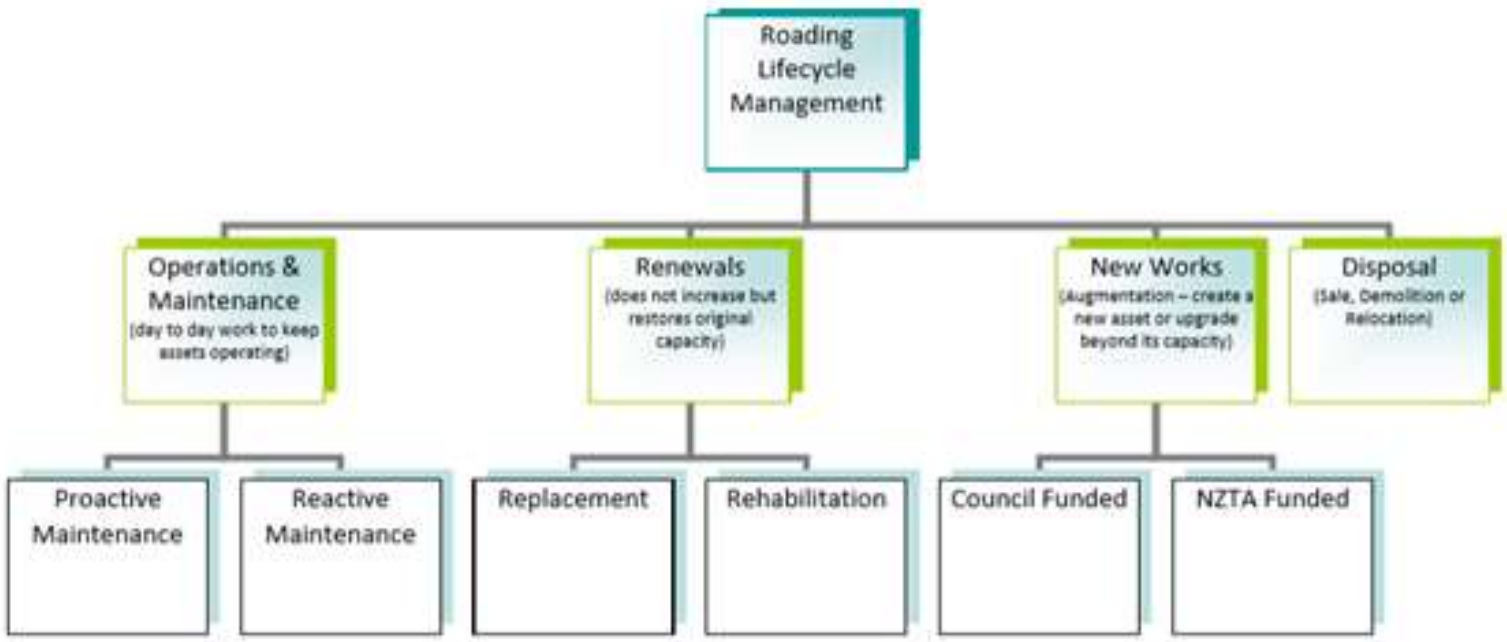
Road pavement renewal is required when the pavement layers are reaching the end of their design life and are showing signs of deterioration. Pavement renewals, rather than resurfacing, become the best option when considering the whole life costs of the pavement.

The international Infrastructure Management Manual (NAMS) 2011 edition defines the lifecycle of an asset as:

"The time interval that commences with the identification of the need for an asset and terminates with the decommissioning of the asset or any liabilities thereafter"

Lifecycle Asset Management encompasses all management options and strategies from initial planning through to disposal in order to meet the required Levels of Service in the most cost-effective way to provide for existing and future customers as shown in the diagram below:

Figure 1: Lifecycle Asset Management



Renewal Strategies

- Renewal expenditure is work that restores the existing pavement to its original level of service, i.e. capacity or the required condition. There are a number of activities, which are covered within the pavement renewal area.

Creation/Acquisition/Augmentation Plan

Asset creation is related to:

- increased levels of services required by existing road users (to relieve traffic congestion, improve safety etcetera);
- growth related capital works projects; and
- assets resulting from developments.

The development of the road network is undertaken in accordance with the District Plan, which indicates priorities for road widening and new construction. The road designations included in the District Plan form a major commitment which, under the Resource Management Act, must be constructed within the timeframe described in the Plan.

Projects are justified and prioritised on the basis of a cost / benefit analysis which accounts for:

- the benefit to the road user through reducing delays in the time to travel along a given route;
- vehicle operating cost savings;
- safety benefits; and
- intangible benefits, such as community dislocation, environmental issues (pollution, water quality, noise and vibrations) and other local, regional and national issues.

Road lifecycle costs (of which pavements are a major component) may be reduced in the asset creation phase by reviewing the following:

- Ranking criteria for all capital works and projects;
- Evaluation of options and staging for all road creation projects;
- Tendering and contract administration procedures; and
- Review of strategies and plans.

Safety Improvements

Each year, when Council is preparing its capital works programme for the following 12 month period, provision is made for minor safety works, including:

- Visibility improvements;
- Improved streetlighting (rural flag lighting);
- Road curvature realignment;
- Signage;
- Road widening;
- Signage and pavement marking;
- Recommendations from the 2016 Crash Reduction Study; and
- Speed management community engagement.

Funding is outlined in NZTA's Planning, Programming and Funding Manual 2008 under the Minor Improvements work category.

Capital Investment Strategies

- Strategies to ensure that new assets are driven by growth, changes in use/demand and safety;
- Procedures and criteria for assessment of design options (including consideration of lifecycle costs, optimised renewal decision-making and risk assessment).

Disposal Plan

Assets are disposed of as a result of other capital works, (growth and LOS) and renewal works. However specific tactics may be applied to the disposal phase.

Costs of disposal are generally included in the overall project costs. One exception is the cost of writing off the book value of assets disposed of before their design life is complete.

Disposal tactics are as follows:

- Develop asset management systems and asset condition/performance data to allow better planning for the disposal of assets through rationalisation of the asset stock or when assets become uneconomic to own and operate;
- When considering disposal options all relevant costs of disposal need to be considered, including:
  - Evaluation of options;
  - Consultation/advertising;
  - Obtaining resource consents;
  - Professional services, including engineering, planning, legal, survey;
  - Demolition/make safe; and
  - Site clearing, decontamination and beautification.

Council has no plans to dispose of any of its transportation assets in the foreseeable future.

6.5 Streetlighting and traffic services

Links to Strategic Case

Kaipara District is part of the Northland region tucked in between Kaipara, Far North and Auckland with a climate and areas of low-lying land that create regular land fogs that make driving very difficult. The need to have well maintained streetlighting, rural intersection flag lighting, signage and road markings on the sealed network under these conditions is essential. We have 1,185 lights, 7,491 signs, 9,999m of guardrail, 3,897m timber sight rails.

Problem Statement

Our road networks are vulnerable to very foggy conditions and time of high intensity rain that make driving safely a challenge. To have high quality lighting, road marking, signage and safety barriers are critical to the road users.

Benefit of Addressing Problem

Having a network with high visibility roadmarking, signs and lighting improves the safety of the network and directly impacts on the probable number of serious and fatal accidents.

Work Categories

- 122 – Traffic Services Maintenance;
- 222 – Traffic Services Renewals; and
- 314 – Minor Improvements (Safety improvements, new guard rails, safety rails, school speed zones etcetera.)

Levels of Service

ONRC Customer Outcomes	ONRC CO1 – Safety – The number of fatal and serious injuries on the network.
Customer Technical Levels of Service	ONRC TO3 – Safety – Sight distances. The number of locations where sight distance or signs are obstructed. ONRC TO5 – Safety – Loss of driver control at night. The number of fatal and serious injuries which occur in crashes at night on our network that can be attributed to poor or insufficient lighting.
Long Term Plan (LTP)	Roads are safe and passable to all users with exception of an unplanned event.

The ONRC Customer Outcomes applicable to the activity are:

- ***Customer Outcome Measure 1: The number of fatal and serious accidents on the network.***
- The graph below indicates that all but the Secondary Collector Classification roads on the network.

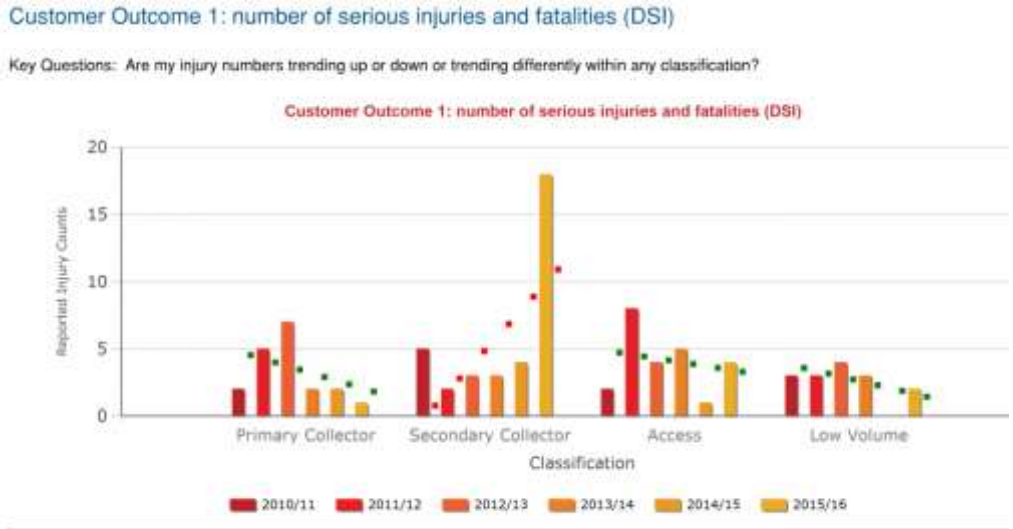


Figure 3: Serious injuries and fatalities (DSI) by ONRC category - Sourced from ONRC performance measures reporting tool

KPI Focus	Definition	Performance Measure	Target
Our transport network and infrastructure steadily improves to ensure people, goods and services can move safely and efficiently within the district and region.	Maintain an effective, sustainable, and passable transport network.	Manage and improve the drainage assets to enable a more resilient network.	
Our transport network and infrastructure steadily improves to ensure people, goods and services can move safely and efficiently within the district and region. Provide the right services delivered in the right places to an agreed standard.	Maintain an effective, sustainable, and passable transport network.	Percentage of residents who are very/fairly satisfied with footpaths.	

KPI Focus	Definition	Performance Measure	Target
Customer service request response times.	This measure indicates the number of requests that are completed in the timeframe and the customer informed.	Percentage of requests regarding a fault or unplanned interruption to the road network are responded back to the customer within a set timeframe.	
ONRC Safety Measure 7: Hazardous faults.	To reduce the number of maintenance related hazards requiring evasive action.	The number of hazardous faults which require evasive action by the road user. Inspect at least a 10% sample of each classification and record the number of faults per 10kms for rural and 1km for urban.	
ONRC Resilience Customer Outcome 1: the number of journeys impacted by unplanned events.	To minimise the number of journeys that are impacted by unplanned events.	The number of unplanned road closures and the number of vehicles affected by closures annually. Record the number of unplanned road closures and calculate the total number of vehicles affected annually by classification.	

Risks associated with alternative maintenance and renewal standards

Risk Treatment

Options for risk treatment are yet to be considered. Risk reduction treatments available include:

- Reduce probability of failure by capital works improvements (renew, provide redundancy, upgrade), maintenance expenditure;
- Reduce the impact of a failure by actions such as preparing emergency response plans Lifeline systems, alternate routes;
- Accept some risk in that not all traffic will be able to detour or turn around and retrace their route;
- Change the level of service (if not based on ONRC then cost maybe 100% local share);
- Insure against the consequential costs; and
- Communication, monitoring, review and reporting.

KDC has established a detailed risk register for all its transportation related risks and this is located in Appendix 3 on page 283 of this AMP.

Sealed roads are one of the major components of the network along with bridges and are subjected to high traffic volumes and heavy loads, which over time can lead to deterioration and eventually asset failure if not effectively managed. The risk events remaining with a high target risk need to be monitored to determine either that Council remains comfortable with the target risk level or if there are any additional proposed controls which could be implemented to reduce the target risk level further.

Schedule of Risks

Table 12 below provides a summary of the key risk descriptors, net risk factor and the management option for sealed pavements.

Table 12: Traffic services risk summary

Risk Descriptor	Net Risk Factor	Management Options
Lost time due to road closure – lost time due to closure requiring use of an alternative route that will take longer.	**12**	Identify and remedy lifeline routes, primary routes to those most used facilities and modal connections. School, hospital, airport, supplies and seller to market.
Serious injury or death to users due to unknown conditions	**16**	Develop a tool.
Growth in lifestyle development – creating different demands on rural networks.	**10**	Continue to co-ordinate with planning to manage expectations.
Failure to comply with statutory requirements	**6**	Continue to seek additional funds.
Accelerated asset consumption: - due to numbers of heavy vehicles that is not consistent with the ONRC hierarchy.	**12**	Continue to monitor the high demand routes and their deterioration to allow for timely and appropriate intervention.
Unavailability of quality chip and rehab road metal within district: - affects Council's ability to maintain the road network economically.	**12**	Continue to work with NZTA to ensure lifeline/detour routes are identified and upgraded to an appropriate standard.
Road network deterioration due to historically poor design or construction	**6**	Continue to use high speed data and pavement strength data to ensure upgrades occur where required.

GAP Analysis

Develop Options

Options to be considered

Based on the above data and the problem definition, options have been considered for addressing the streetlighting and traffic services asset.

Options Assessment

On balance, when factoring the total cost of the programme and the resulting streetlighting and traffic services condition, the most appropriate scenario, given NZTA's constrained funding environment, is the High scenario in the long term.

Preferred Option

Prioritised maintenance as this reduces the long term costs whilst maintaining the current and proposed ONRC Customer Levels of Service by considering the problem statement as well as the issue meaning that by focusing on the whole of network we will be driving down reactive works costs whilst improving the resilience and robustness of the network.

Operations and Maintenance Plan

Routine maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Two categories of routine maintenance are carried out:

- Unplanned Routine Maintenance: Work carried out in response to reported customer service requests, network inspections by Contractor and inspectors; and
- Planned Ordered Maintenance: Work carried out to a predetermined schedule or planned in association with other work.

Planning of Streetlighting and Traffic Services maintenance provides for the normal care and attention of the road to maintain its structural integrity and serviceability. Examples of this work include:

Renewal strategies

Renewal expenditure is work that restores the existing asset to its original level of service i.e. capacity or the required condition. There are a number of activities, which are covered within the traffic services area. NZTA subsidy for this form of treatment is available through the WC222 (Traffic services Renewals) category.

Streetlighting renewal

Pavement marking (currently funded under WC122 as a maintenance item due to annual need).

Signs renewals.

- Safety Barrier renewal programme; and
- Sight Rail renewal.

How Renewals are identified and prioritised:

Streetlighting and Traffic Services renewal sites will be identified through age deterioration, damage, Maintenance Contractor inspections and reporting and improvements in standards or design.

The annual programme is developed with an emphasis on road hierarchy. Priority is given to roads with high traffic volumes; especially heavy commercial vehicles. Consideration is given to the likely rate of pavement deterioration should no action be taken i.e. roads with the highest maintenance costs per unit length will be given priority for Road Rehabilitation.

Within the KDC network there are 1,150 streetlights. We currently have a business case in with NZTA to change all the current streetlights over to more efficient LED lights. Whilst the adopted design life currently been used is 25 years if the complete change over occurs then this will completely reset the whole of asset life.

Table 13: Annual traffic services renewal requirements

Streetlighting					
Signage					
Roadmarkings					
Safety barriers					
Mean pavement life for network	45 years	40 years	35 years	30 years	25 years
Annual pavement renewal requirement	**4**	**4**	**4**	**4**	**4**

Creation/Acquisition/Augmentation Plan

Streetlighting and Traffic Services creation is related to:

- increased levels of safety across the network for all users;
- growth related projects especially the East Coast, and
- assets required resulting from developments (new intersections, higher density).

The development of the road network is undertaken in accordance with the District Plan, which indicates priorities for road widening and new construction. The road designations included in the District Plan form a major commitment which, under the Resource Management Act, must be constructed within the timeframe described in the Plan.

Projects are justified and prioritised on the basis of a cost / benefit analysis which accounts for:

- the benefit to the road user through reducing the collective and personal risk of death or injury along with delays in the time to travel along a given route to improve the journey; and
- intangible benefits, such as community dislocation, environmental issues (pollution, water quality, noise and vibrations) and other local, regional and national issues.

Road lifecycle costs may be reduced in the asset creation phase by reviewing the following:

- ranking criteria for all capital works and projects;
- evaluation of options and staging for all road creation projects;
- tendering and contract administration procedures; and
- review of strategies and plans.

Safety Improvements

1 By converting the Light Network Luminaire from the current high cost HPS lamps to LED will improve the safety of driving at night and in low visibility (fog) environments.

2 To investigate the road markings on our sealed network around our high crash areas to consider higher value marking with reflective capability.

3 To continue to improve our signage and the visibility of that signage.

6.6 Walking and Cycling Strategy

Vision and Objectives

Vision:

The Kaipara district is a safe, pleasant and comfortable place for walking and cycling, where people of all ages choose to walk or cycle for transportation, tourism and recreation.

Objectives:

- To develop safe and connected walking and cycling networks that deliver affordable, accessible and sustainable transport choices;
- To increase walking and cycling participation;
- To become a walking and cycling tourism destination to support economic growth; and
- To identify opportunities for collaboration with key partners to expand and improve Kaipara's walking and cycling network.

Existing Walking and Cycling Infrastructure

Within the Kaipara district there are approximately 90 kilometres (km) of formed footpaths, with more than half of all urban roads providing a footpath on one or both sides of the road. The majority of the footpath network is concentrated in Dargaville, however all urban centres have some formed footpaths. Across the district there are approximately 70km of urban roads that have no footpath infrastructure. Council is prioritising its footpath expenditure programme on creating new footpaths in areas where there are currently none provided, rather than to achieve footpaths on both sides of the road. Approximately 1.5km of new footpaths are created each year through new subdivision developments.

Kaipara district is renowned for its numerous walking tracks that showcase stunning natural landscapes. These include tracks in Waipoua Forest, Trounson Park, Kai Iwi Lakes, Mt Tutamoe, Baylys Beach, Tokatoka, Maungaraho Rock, Paparoa, and Mangawhai's coastal environment.

Te Araroa, New Zealand's Trail, is a national walking route stretching 3,000km from Cape Reinga in the north of New Zealand to Bluff in the south. This trail runs through the Kaipara district, from Mangawhai Heads Reserve to Pacific Road near Te Arai.

Two on-road cycle trails that form part of the New Zealand Cycle Trail pass through Kaipara, using low volume roads and off-road trails. They are:

- Kauri Coast Cycleway – the 113km Heartland Ride links Rawene on the Hokianga Harbour, though to Dargaville. This route uses low volume roads, and passes through Kauri forest and secluded coastal settlements.

- Missing Link Cycleway - the 118km Heartland Ride joins Dargaville, the end of the Kauri Coast Cycleway with Central Auckland. The Kaipara Missing Link heads southwest from Dargaville to the holiday village of Pouto Point at the mouth of the Kaipara Harbour. The missing link to this cycle tour involves a boat trip across the Kaipara Harbour. The trail then follows a surprisingly gentle route into the very centre of Auckland.

Both of these national cycle trails form part of 'Tour Aotearoa', a 3,000km cycling event being held in February 2018. Participants cycle from Cape Reinga to Bluff, drawing hundreds of riders through the Kaipara district to travel the heartland rides. This is currently being investigated as a year-round ride.

While there are currently few dedicated cycle facilities in Kaipara, funding for the development of cycle infrastructure will be included in Council's next Long Term Plan (2018/2028). Community groups are also instrumental in the development of walking and cycling facilities, with many local groups actively involved in maintaining and expanding trails across the district. For example, the Mangawhai Tracks Charitable Trust has strong support and funding to develop walking tracks throughout the Mangawhai township, Ruawai Promotions and Development Group is seeking funding to progress a cycleway along stopbanks of the Northern Wairoa River and the Kauri Coast Promotions Society has applied to external funding sources to develop an historic walking loop within the Dargaville township and riverfront.

Key Issues

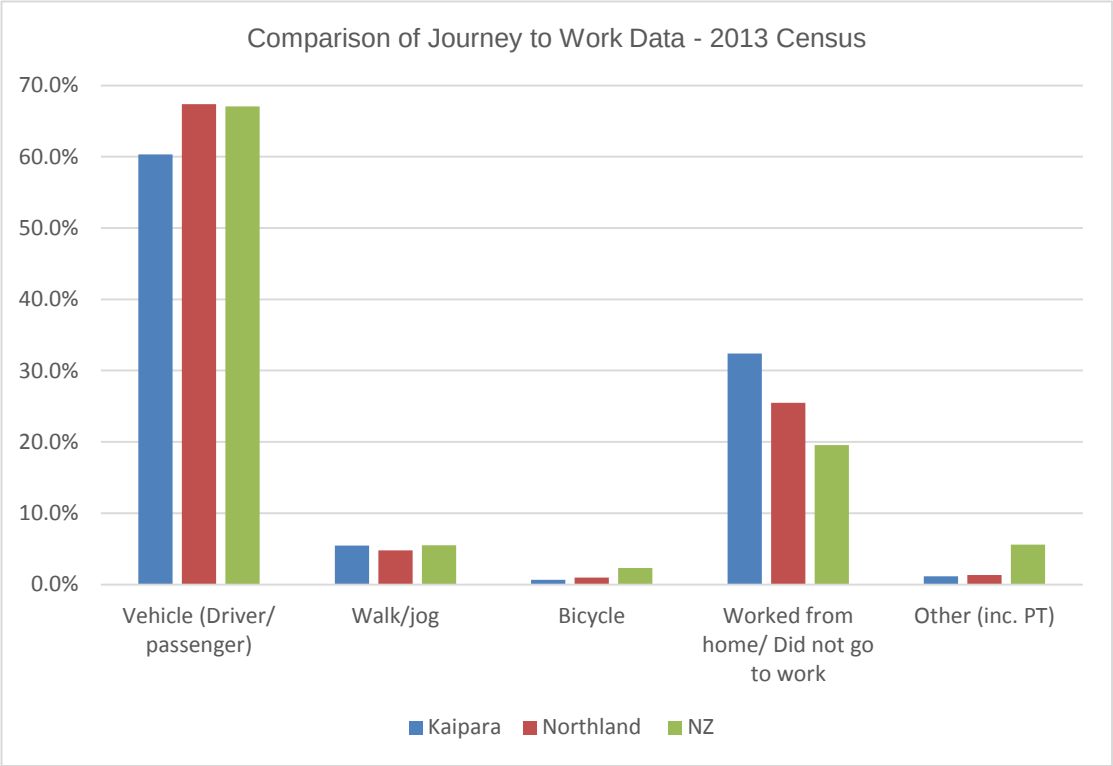
Few Transport Choices

- Kaipara is predominantly rural with a number of small towns and coastal settlements dispersed across the district. The population is just under 22,000, of which 4,500 live in Dargaville, the largest town and main service centre in the district. Given the small and dispersed population, public transport services are not viable and walking and cycling journeys between towns are too vast. Older, more established urban areas such as Dargaville generally have well-developed footpath networks, however many of the coastal settlements such as Mangawhai have narrow roads and few formed footpaths. Cycle facilities across the district are limited to directional signage, with few dedicated facilities available.
- A snapshot of commuter mode share is provided in Figure below and reveals that while few people cycle to work, the proportion of people walking to work is similar to Northland and the New Zealand average. Fewer people drive to work in Kaipara, however this is offset with substantially more people working from home/did not go to work. This is likely to be due to Kaipara's rural environment, where many people are employed in the farming and agriculture industries and work from home. In addition, Kaipara has a greater proportion of older people (refer to), many who may no longer work.

Data on other types of journey mode share, such as recreational and social trips is not available. However, given the compact nature of many townships, it is anticipated that there is significant potential for growth in local walking and cycling journeys.

***Figure 2*: Comparison of journey to work data**

Kaipara, Northland and NZ (Source: Statistics NZ1)

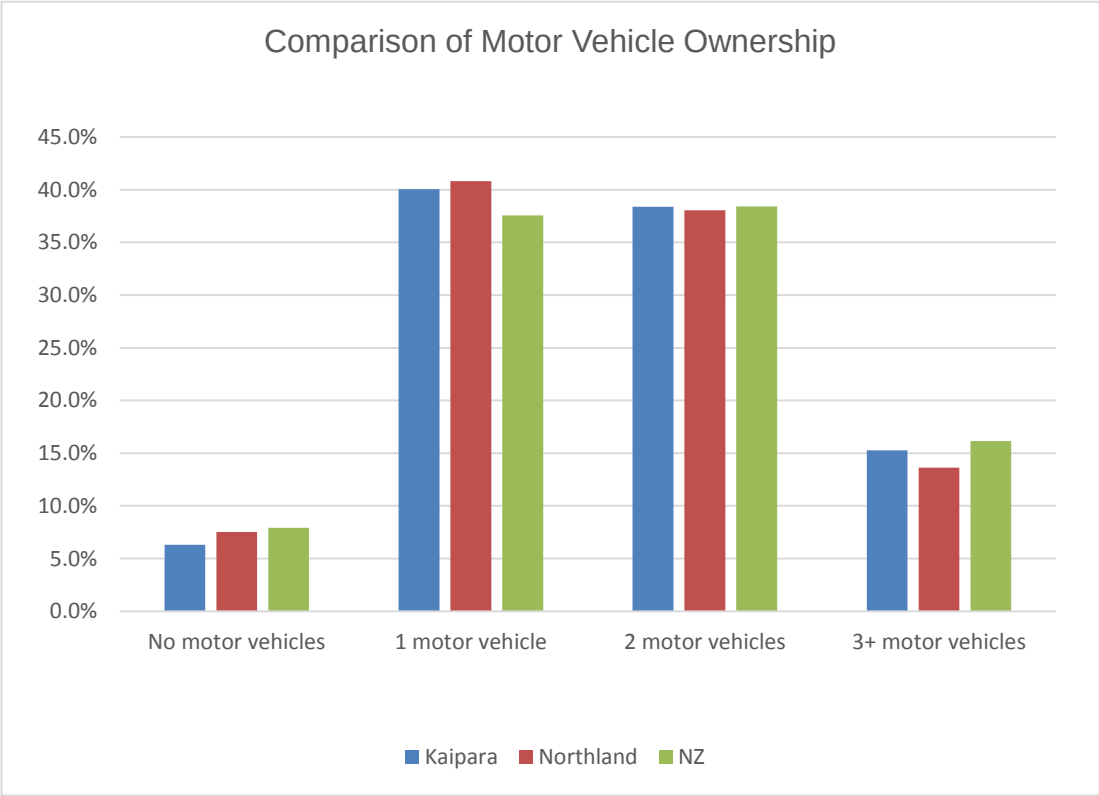


Most households in Kaipara require access to a vehicle due to the isolation of rural communities, and limited access to goods and services. A comparison of motor vehicle ownership between Kaipara, Northland and New Zealand (refer to Figure 3) reveals that the proportion of two and three car households in Kaipara is similar to the New Zealand average, however multiple-car households are more common in Kaipara compared with the Northland average. There are also fewer households in Kaipara with no access to a motor vehicle than the Northland and New Zealand average.

[1] Statistics NZ website - Census 2013 data. http://www.stats.govt.nz/Census/2013-census/data-tables/meshblock-dataset.aspx Accessed 20 January 2017.

Figure 3: **Comparison of motor vehicle ownership data**

Kaipara, Northland and NZ (Source: Statistics NZ[2])



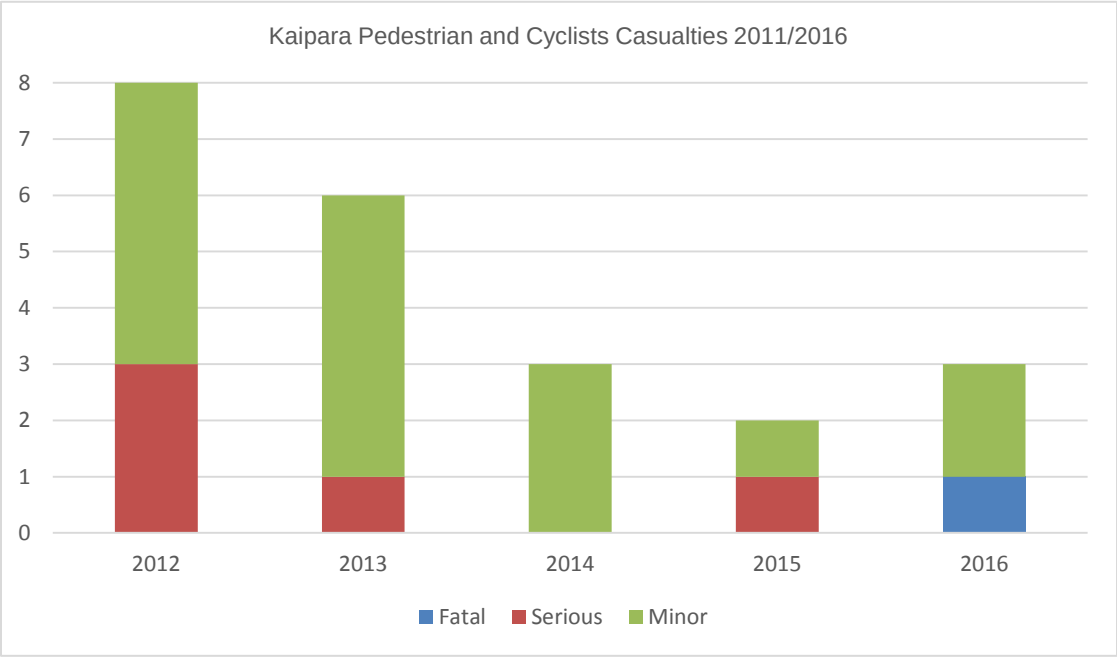
In summary, most households own at least one car as it is challenging to travel beyond key townships without a vehicle.

[2] Statistics NZ website - Census 2013 data. http://www.stats.govt.nz/Census/2013-census/data-tables/meshblock-dataset.aspx Accessed 20 January 2017.

Safety

Over the past five years, there have been 22 reported pedestrian and cyclist casualties in Kaipara. In general, casualties have been declining since 2011 (refer to Figure 4, however there was a cyclist fatality in Maungaturoto in 2016.

Figure 4: **Pedestrian and cyclist casualties in Kaipara – 2011 to 2016**



The largest concentrations of pedestrian and cyclist casualties are in Dargaville, given its higher population (refer to Figure 5 - Statistics NZ[3]).

A cluster of crashes is evident at the intersection of Hokianga Road/ State Highway 12 intersection. This four-legged intersection has relatively high traffic and pedestrian volumes, and no traffic signals. Both intersecting roads are wide, meaning vulnerable road users have longer crossing times, increasing their risk of exposure to crashes. The promotion and signage and therefore subsequent increase of cyclists travelling the Kauri Coast Heartland Ride may have resulted in this cluster of casualties, as this is where cyclists from the Heartland Ride enter the Dargaville township.

[3] Statistics NZ website - Census 2013 data. http://www.stats.govt.nz/Census/2013-census/data-tables/meshblock-dataset.aspx Accessed 20 January 2017.

Figure 5: **Pedestrian and cyclist crash locations in Dargaville - 2011 to 2016**

Most commercial areas throughout the district are located on the State Highway network. The shops and services located on these routes provide a sense of place for these communities, however this conflicts with the movement function of these high order roads. The presence of freight (including logging trucks) travelling through these townships contributes to the real and perceived safety risk of these roads, and hinders walking and cycling participation. Without separated facilities, these streets can be difficult for pedestrians and cyclists to safely navigate. Some rural schools are also located on the State Highway network within high speed environments; many of these schools actively discourage cycling to school.

Conversely Mangawhai has narrow streets including many without footpaths. While this encourages lower traffic speeds and volumes, pedestrians must often share the road with vehicles. This may be particularly challenging for more vulnerable road users such as children and the elderly. Actions identified in the Mangawhai and Kaiwaka improvement plans aim to improve accessibility through these townships.

Changing Demographics

Access to reliable and affordable transport enables people to participate within their communities and provides access to social and economic opportunities. However, few transport options are available in Kaipara and it is difficult to get around without a vehicle. The young, elderly and disabled may be unable or not permitted to drive. Others may be unable to afford a car and some residents may choose not to own one. Kaipara has a greater proportion of residents over 65 years compared to Northland and New Zealand. Furthermore, the median population of the district is 45.3 years, which is substantially higher than the New Zealand median of 38 years.

As the population continues to age, there will be greater need for improved pedestrian facilities and transport options to ensure residents do not become socially excluded. The increased use of mobility scooters on footpaths could be encouraged and drop kerbs and sensory aids (both visual and tactile cues) more readily considered.

Additionally, this is also an opportunity to positively influence the transport choices made by youth, as the above observations on population aging are not true of the district's Maori population which is comparatively youthful. Since 2006 the district's Maori population increased 7.6%. Kaipara's Maori population is increasing both in real terms and in terms of the proportion of the district's population which it comprises (currently 23.1%).[4] Encouraging Maori youth to take up walking and cycling opportunities is key to developing safe road skills early in life, and allowing youth to be more active and develop healthier lifestyles.

[4] Kaipara District Council Environmental Scan 2016

Figure 6: Comparison of population for Kaipara, Northland and NZ

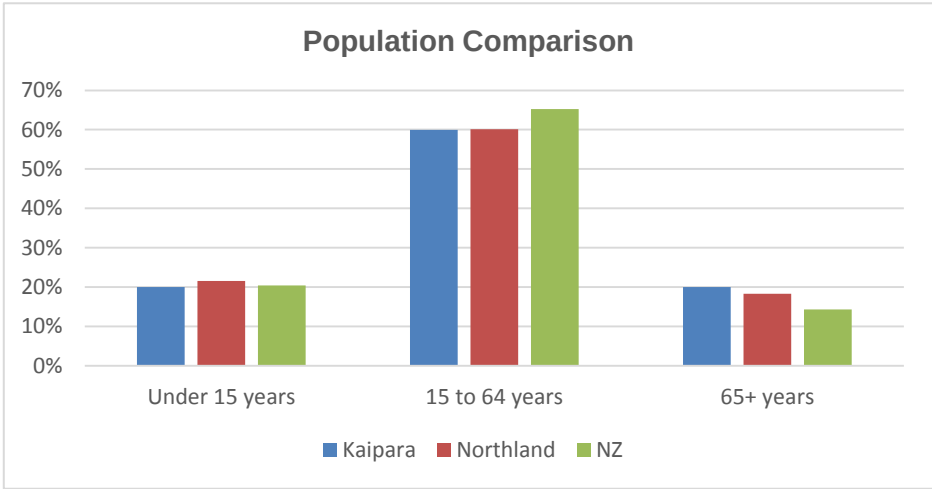
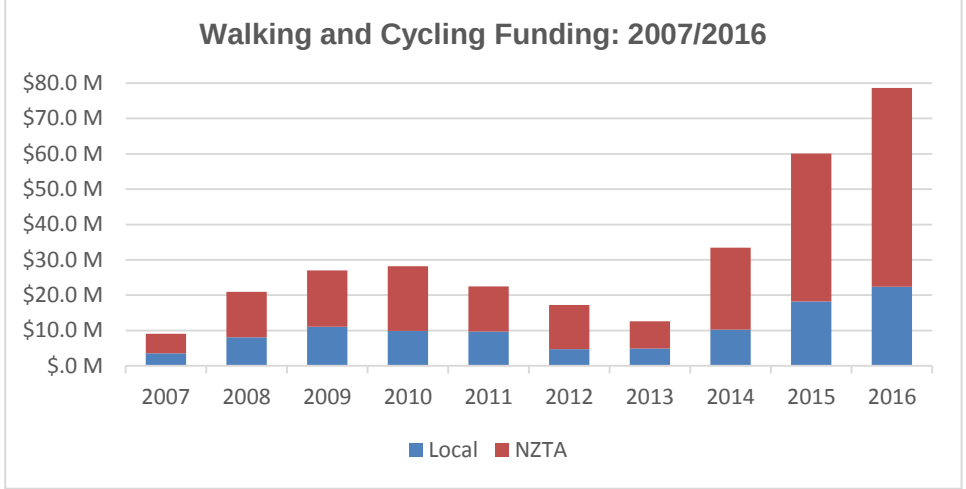


Figure 7: **Walking and cycling funding over the last 10 years**



Funding

Interest in developing cycle infrastructure has gained momentum in recent years and funding for walking and cycling projects and initiatives at the national level has increased significantly (refer to Figure 7 – Source: NZTA[5]). However the focus of NZTA's expenditure has been on urban centres. Funding for this activity class is now oversubscribed as the larger cities can provisionally obtain higher rates of investment for walking and cycling projects. For districts such as Kaipara with no urban centres, funding is not currently available from this activity class.

Councils must also compete for NZTA funding for projects. Projects have to demonstrate VfM, where the benefits of the project must generally outweigh the costs. The benefits of walking and cycling projects consider the projected growth in the numbers of users following the implementation of the project. Projects in areas of low population density such as Kaipara are unlikely to be competitive against projects in large urban centres.

In the past, Kaipara district had limited funding to pay for new walking and cycling facilities. However Council is keen to reverse this trend, and there will be an emphasis on these projects in next Long Term Plan (2018/2028), with funding made available. Council will identify opportunities to leverage and maximise its budget and seek

[5] NZTA website - http://www.nzta.govt.nz/assets/userfiles/transport-data/FundWalkingCycling.html Accessed 24 January 2017.

additional contributions from external sources including NZTA and MBIE, as well as grants and commercial contributions. Kaipara district will also work with local groups to develop community-led walking and cycling facilities in the district.

Opportunities

Leveraging off existing routes

There are significant opportunities to add value to Kaipara's two existing national cycle trail heartland rides as part of a Northland network of cycling trails. Kaipara's existing heartland rides currently appeal to 'strong and fearless' and 'enthused and confident' cyclists who are comfortable travelling longer distances on the State Highway network and/or gravelled roads relatively far from townships. An improved network could therefore provide connections to townships, services and other key attractions, as well as extensions and links to increase the number of visitors and the length of their stay. It also provides opportunities to work with the private tourism industry to address gaps and services in the market that could be enhanced or developed along routes. It is anticipated that the development of these could bring increased economic growth to the district and region.

Kaipara's contribution to the Regional Network includes:

Short term:

- Making the Kauri Coast Cycleway off-road from Dargaville to Donnelly's Crossing via the redundant rail corridor ensuring this Heartland Ride is more user friendly and could cater to a broader set of visitors and local residents;
- Extending further north from Donnelly's Crossing into the Far North District via the Old Waoku Coach Road;
- Establishing a loop linkage between the Kauri Coast cycleway and Kai Iwi Lakes (Taharoa Domain) (as a recreational reserve with high walking and cycling value and existing walking/cycling tracks); and
- Improving the existing 'Kaipara Missing Link' by increasing signage and promotion and installing safety measures such as active warning signs along the route. Additionally, Council can work with ferry providers to enhance ferry services across the Kaipara Harbour and support relevant parties to establish a wharf at Pouto. It is considered that these improvements could increase year round use of this trail and attract more riders from Auckland.

Medium to long term:

- Trail from Dargaville to Maungaturoto, connecting townships and features via off-road routes and low volume roads, in alignment with the 'Ancient Kauri Coast Trail' Byway. This will further contribute towards Dargaville as a central hub for experiencing cycle trails. It is anticipated that this route will be developed as the opportunities arise, capitalising on and connecting existing walking and cycling projects. Existing projects include:

- Ruawai stopbank cycleway;
- Matakohe Bridges shared path connection;
- Route linking Mangawhai with the cycling trail from Waipu in the North and Pakiri and Matakana in the south. Support this to become a Heartland Ride. This would also largely align with the Te Araroa Trail running along the eastern coastline; and
- Trail between Dargaville and Kaipara and/or trail between Dargaville, Maungaturoto and Kaiwaka via rail corridor, if and when it becomes available. A decision on the decommissioning of the railway lines is still to be decided, therefore this is considered low priority. An on-rail cycling experience may also be an option on some sections of the railway track.

Develop safe and connected townships

While many residents will periodically need to travel to larger towns such as Kaipara and Auckland to access key goods and services and employment, the larger towns in the district provide much of what people require on a day-to-day basis. Dargaville, Mangawhai, Maungaturoto and Kaiwaka have predominantly urban catchments in the context of Kaipara and would be ideally placed to promote walking and cycling journeys for school and work travel, following the implementation of supporting infrastructure. As these townships represent some of the larger concentrations of population within the Region; enhancing the local networks for recreation and commuting will offer the greatest benefits and VfM and, given the compact size of many towns, these local trips provide ideal opportunities to encourage residents to walk and cycle.

Collaboration and behaviour change

The third opportunity recognised for the Kaipara district is collaboration with key partners. This collaboration could be in the form of working together to jointly fund and connect key linkages or co-operating to develop behaviour change initiatives to increase positive attitudes to walking and cycling. It is recognised that in both circumstances, Council working alongside community groups or outside organisations will provide greater benefits than attempting to achieve them on its own.

Working with key partners to connect walking and cycling linkages enables Council to support initiatives that may be led by the community or others. This means longer term strategic connections within the Kaipara district may be progressed with more momentum and otherwise could take longer and more funding to achieve in isolation.

Additionally, by working with community groups and agencies to develop cycling skills, walking and cycling safety programmes and increased recreational choices, Council has a stronger ability to increase participation rates in walking and cycling. This may then lead to enhancing economic, social and environmental benefits, and connect with those who currently identify with the ‘interested but concerned’ or ‘no way no how’ attitude towards cycling.

6.7 Implementation Plan – Walking and Cycling Projects

Key District Projects

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Commission feasibility study and develop business case in 2017/2018 Begin implementation in year 2 of LTP (2019/2020)	Trail from Dargaville to Donnelly's Crossing, off-road via the old railway line.	Walking and Cycling	40km	Potential to work in partnership with Te Roroa. Strong community support could then be channelled into establishing trust to maintain and manage after established.	Feasibility still required.
Begin scoping 2017/2018	Mangawhai 'slow street' from school to beach.	Walking and Cycling (Shared Path)	9km	Provides walking and cycling connection from Mangawhai Village and Heads, and key residential, commercial and recreational locations in-between. This will also include significant landscaping to enhance the street scape and reduce speeds on this route.	$2,053,600 (total value of whole path).
Begin scoping 2017/2018	Improvements to existing 'Kaipara Missing Link' Heartland Ride.	Cycling	59km	Improving the existing 'Kaipara Missing Link' between Dargaville and Pouto by increasing signage and promotion, and installing safety measures such as active warning signs along the route.	Feasibility required but low cost initiatives only.
Begin scoping 2017/2018	Mangawhai to cycle trails in north and south, along the eastern coast. Support to become a Heartland Ride.	Cycling		Establish Kaipara portion of route linking Mangawhai with the cycling trail from Waipu in the North and Pakiri and Matakana in the south. Support this to become a Heartland Ride. This	Feasibility still required, but estimated to be relatively low cost.

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
				would also largely align with the Te Araroa Trail running along the coastline.	
Begin scoping 2018/2019	Loop linkage from Taharoa Domain to Kauri Coast Heartland Ride.	Cycling	11km	Would potentially be an on-road route, following Airstrip and Omamari Roads.	Feasibility still required.
Begin scoping 2021/2022	Donnelly's Crossing North via the Waoku Coach Road, to Waima.	Walking and Cycling	43km	The Coach Road is legally an unformed road, however a formed track exists. Potential to work in partnership with Far North District Council as it passes into their district. Strong community interest also.	$1,500,000
Supporting projects as arise	Dargaville to Maungaturoto Trail connecting townships and features	Cycling	90km	Trail from Dargaville to Maungaturoto, connecting townships and features via off-road routes and low volume roads, in alignment with the 'Ancient Kauri Coast Trail' Byway. This will further contribute towards Dargaville as a central hub for experiencing cycle trails. It is anticipated that this route will be developed as the opportunities arise, capitalising on and connecting existing walking and cycling projects. Existing projects include: Ruawai stopbank cycleway; and Matakohe Bridges shared path connection.	Feasibility still required.
Awaiting decision on railway line	Dargaville to Kaipara and/or Dargaville to Maungaturoto and Kaiwaka via railway line.	Cycling		A decision on decommissioning the railway lines still to be decided, therefore this is considered low priority. An on-rail cycling experience may also be an option on some sections of the railway track.	Feasibility still required.

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Safe and Connected Townships - Mangawhai					
LTP 2018/2028	Mangawhai 'slow street' from School to Beach (as above). Stages to be implemented in the following priority: ***Mangawhai Village*:** • Mangawhai School to Insley/Moir Intersection; • Tara Bridge to Pearson Street (including Mangawhai Domain). ***Mangawhai Community Park:*** • Moir Point Road to southern end of the Causeway Bridge. ***Mangawhai Central**:* • Causeway Bridge to Pearson Street. ***Molesworth Drive roundabout to Surf Club**:* • Mangawhai Heads Road; • Wintle Street from the Pearl Street corner to Surf Club; ***Mangawhai Heads:*** • Moir Point Road to Molesworth Drive roundabout.	Walking and Cycling (Shared Path)	9 km	Provides walking and cycling connection from Mangawhai Village and Heads, and key residential, commercial and recreational locations in-between. This will also include significant landscaping to enhance the streetscape and reduce speeds on this route.	$2,053,600 (total value of whole path).
Design 2017/2018 Construction 2018/2019	Mangawhai Heads Loop: • Pearl Street corner to Sellars Carpark (boardwalk); • Wood Street, Robert Street and North Avenue to Sellars Carpark.	Walking and Cycling		Boardwalk along coast to connect to shared path up North Avenue and looping to Robert and Wood Streets.	$775,000

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Heads to Pearl Street 2017/2018 Other projects LTP 2018/2028	Mangawhai Heads to Mangawhai Village via an all-tide coastal walkway. All-tide access needed: • Mangawhai Heads Beach Carpark to Pearl Street corner; • Findlay Street Steps to Evelyn Street Walkway; • Evelyn Street to Heather Street; • Heather Street to Breve Street; • Breve Street to Cheviot Street Walkway; • Cheviot Street Walkway to Lincoln Reserve; • Lincoln Reserve to Jordan Street; • Causeway Bridge to Legal Road (off Estuary Drive); • Legal Road to Moir Point Road; • Moir Street to Insley Street; and • Insley Street to Spinnaker Lane	Walking	6km	Allows for Te Araroa Trail to be continued around the coast.	$1,742,966
LTP 2018/2028	Shared path to Mangawhai Central via Old Waipu Road.	Walking and Cycling	1km	Upgrade Old Waipu Road to the entranceway of Estuary Estates, with a separated shared cycling/walking path. Potential to be completed as part of road upgrades.	$250,000
LTP 2018/2028	Links through and around Mangawhai Central.	Walking and Cycling	3.2km	Links through the proposed Mangawhai Central Subdivision, connecting to and along Esplanade Reserve. A shared cycleway/walkway link through the subdivision would be preferable and make use of any	$64,000

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
				proposed parks, playground, shopping centres and housing. Could be funded through developers' contribution.	
LTP 2018/2028	Thelma Road link.	Walking and Cycling	3.2km	Thelma Road link from unformed road alignment through to existing sections of Thelma Road, 2.8m wide gravel track or better.	$95,500
LTP 2018/2028	Esplanade to Jack Boyd Drive link.	Walking and Cycling	1.8km	An esplanade link through to Jack Boyd Drive is at this point unavailable, and would need to link through to Thelma Road and along proposed future subdivision, then through to Jack Boyd Drive.	$36,000
LTP 2018/2028	Jack Boyd Drive to Thelma Road link.	Walking and Cycling	1.3km	Link from Jack Boyd Drive to Thelma Road and up through Northcoast Subdivision.	$26,000
LTP 2018/2028	Across estuary (Tara Creek).	Walking and Cycling	390m	Link (bridge) across Mangawhai Estuary from Mangawhai Central to Esplanade area near Jack Boyd Drive. Incorporate community-led project currently being developed along esplanade.	$1,000,000
LTP 2018/2028	Insley Street Causeway Bridge.	Walking	51m	Attach a footbridge to the existing Tomarata Road Bridge to allow for pedestrian connection along this bridge for those walking/cycling from Village to Black Swamp Road.	$573,750
LTP 2018/2028	Improved linkages between Fagan Place and Wood Street with Robert Street Reserve.	Walking	600m	Achieved by signage and wayfinding maps.	$10,000
LTP 2018/2028	Mangawhai Village loop, from Pearson to Moir Streets along esplanade reserve.	Walking	1.7km	Achieved by signage and wayfinding maps.	$10,000

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Dargaville Township					
Begin scoping 2017/2018	Walkway from Northern Wairoa Bridge to Dargaville Museum.	Walking	4km	Establish a path along the riverfront. A footbridge would be required over the Kaihu River. Align with historic walkway project initiated by community.	Feasibility still required.
LTP 2018/2028	Hokianga Road to Tuna Street (Silver Fern Farms) along State Highway 12 (SH12).	Cycleway	1.6km	Connection for commuters to Silver Fern Farms.	Feasibility still required.
LTP 2018/2028	Gordon Street from Hokianga Road to Onslow Street (Selwyn Park Primary School).	Cycleway	1.2km	There is ample clear road reserve where a cycle lane could be constructed.	$10,000
LTP 2018/2028	Tirarau Street from Portland Street to Awakino Road	Cycleway	750m		Feasibility still required.
LTP 2018/2028	Ranfurly Street from Hokianga Road to Awakino Road.	Cycleway	900m	Ranfurly Street has kerb and channel making widening of the road pavement more costly (approximately 950m).	$7,500
LTP 2018/2028	Hokianga Road from SH12 to the town limit.	Cycleway	2km	The existing width of this road provides space for a cycleway. This would connect to the existing Kauri Coast Heartland Ride.	$10,000
LTP 2018/2028	Portland Street from SH12 to Dargaville Primary.	Cycleway	350m		Feasibility still required.
LTP 2018/2028	Parore Street from SH12 to Charlotte Street (St Joseph's Primary and Dargaville Intermediate).	Cycleway	930m		Feasibility still required.
LTP 2018/2028	Plunket Street from Gordon Street to Dargaville High School.	Cycleway	300m	The existing footpath could easily be widened to accommodate cyclists.	$1,500
LTP 2018/2028	Awakino Road from SH12 to the hospital entrance.	Cycleway	700m	The existing width of this road provides space for a cycleway (approximately 1.1km).	$7,500

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
LTP 2018/2028	Onslow Street from SH12 to Selwyn Park Primary School.	Cycleway	350m		Feasibility still required.
LTP 2018/2028	Footpath on Tuna Street (to Silver Fern Farms).	Walking	150m	Connection for commuters to Silver Fern Farms.	Feasibility still required.
Kaiwaka Township					
LTP 2018/2028	Pedestrian access on both Mountain Creek and Kaiwaka River bridges.	Walking	40m	Investigate bridge clip-on or alternative pedestrian bridges.	Feasibility still required.
LTP 2018/2028	Riverside walkway loop.	Walking	2km	Establish a riverside walkway loop for visitors and locals to enjoy.	Feasibility still required.
Dependent on future subdivision	Future link between Marshall Road and Kaiwaka-Mangawhai Road.	Walking and Cycling	500m	Allow for connection through township away from SH1. Dependent on future subdivision.	Feasibility still required.
LTP 2018/2028	New footpath with planted verge outside the Kaiwaka Cheese Shop north (to link with Riverside Walkway along Mountain Creek).	Walking	100m		Feasibility still required.
LTP 2018/2028	New footpath along western side of Gibbons Road (from opposite the fire station around to SH1 and Kaiwaka/ Mangawhai intersection).	Walking	110m		Feasibility still required.
LTP 2018/2028	Widening of existing footpath on eastern side of SH1 between the shops and residential area.	Walking	300m		Feasibility still required.
LTP 2018/2028	Widening/realignment of footpath with planted verge along SH1 from Kaiwaka-Mangawhai Road to Mountain Creek Bridge.	Walking	100m		Feasibility still required.
LTP 2018/2028	New footpath along the corner of Gibbons Road and Kaiwaka-Mangawhai Road outside the Four Square.	Walking	80m		Feasibility still required.

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Maungaturoto Township					
LTP 2018/2028	Footpath extension on Gorge Road through cemetery to residential area.	Walking	500m	Upgrade gravel track already in place.	Feasibility still required.
LTP 2018/2028	Footpath extension from Doctors Hill Road to Fonterra.	Walking	400m	Already pedestrian access available on bridge.	Feasibility still required.
Missing Connections					
LTP 2018/2028	Connecting Kaihu settlement with the shop.	Walking and Cycling	1.5km	Connecting the residential settlement with the only shop (gas station). Potential to take this along Kaihu Wood Road (running parallel to SH12) as an alternative to SH12.	Feasibility still required.
LTP 2018/2028	Connecting the Landing with the Village Green (Paparoa).	Walking	260m	Connection between the two green spaces within this settlement.	Feasibility still required.
Other Identified Projects					
Begin 2017/2018	Dargaville Historic Riverside Walk.	Walking	4km	Dargaville Community Development Board establishing an historic walking loop through the Dargaville township showcasing historical features and river.	-
Begin 2017/2018	Ruawai Stopbank Walkway Cycleway.	Walking and Cycling	4km (initial stage)	Ruawai Promotions and Development Group is progressing a walking and cycling trail along the stopbanks of the Northern Wairoa River from the Ruawai Wharf, with the long term goal of connecting with the Matakohe township.	-

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Begin 2017/2018	Matakohe Bridges Walkway Cycleway.	Walking and Cycling	1km	As part of the NZTA's new bridges and road realignment project in Matakohe is a project to develop a walking and cycling path, utilising old bridges and following the harbours edge. Potential to develop into historical trail connecting with Matakohe township.	
In progress	Mangawhai Harbour Walkway Cycleway connection.	Walking and Cycling	1.2km	Community-led project (Mangawhai Recreational Charitable Trust) along public esplanade reserve. Aligns with walking and cycling connection (across estuary - Tara Creek) stated above in Mangawhai projects.	-
	Brown Road Mountain bike Park.	Mountain biking.		Mangawhai Tracks Charitable Trust plans to establish a mountain bike park near the base of the Brynderwyns. Also with potential to connect to existing tracks through bush on the Brynderwyns. Council to support where possible.	-
Begin 2017/2018	Enhance promotion of walkways around key natural features: • Tokatoka • Maungaraho • Tutamoe • Trounson Kauri Park.	Walking	-	Improve signage and promotion of current walking tracks. Investigate areas where a cluster of walks can be packaged together. Also carry out track improvements where required. Potential for Council to work with Department of Conservation and community groups. Support Trounson Kauri Park becoming a Great Short Walk.	Feasibility still required.

Timeframe	Project	Type	Approx. Distance	Comments	Estimated cost (if known)
Begin 2017/2018	Sea links across the Kaipara Harbour.	Ferry		Enhance the existing 'Kaipara Missing Link' Heartland Ride by supporting more regular ferry services across the Kaipara Harbour to Pouto, so more visitors can ride this route year round, including attracting more riders from Auckland. Support the development of a wharf at Pouto Peninsula. Explore alternative ferry entrance into Kaipara district via Tinopai, with potential to connect to Matakohe. This is an opportunity for a private business interest.	-

6.8 Network and Asset Management

6.8.1 Work Categories: 151 Network and Asset Management

Links to Strategic Case	
Problem Statement:	Lack of skilled asset management resourcing is a major issue for the transport industry in Northland and this extends right through the supply chain from Council's ability to hire staff, to having enough consultants to provide technical support. These resourcing issues may mean the work may cost more due to lack of competition or may not be done to the same quality. This is having a major impact on Northland understanding its network and planning appropriately. A key issue for customers is lack of communication of planned road works and the delays these cause motorists, freight operators and bus users.
Benefits of Addressing Problem:	Improving resourcing would result in better quality decisions, smarter and more efficient Investment shorter lead times for professional services and more competition resulting in reduced costs. By providing better communication to the travelling public, they will be able to make informed decisions as to their routes to avoid unexpected delays.

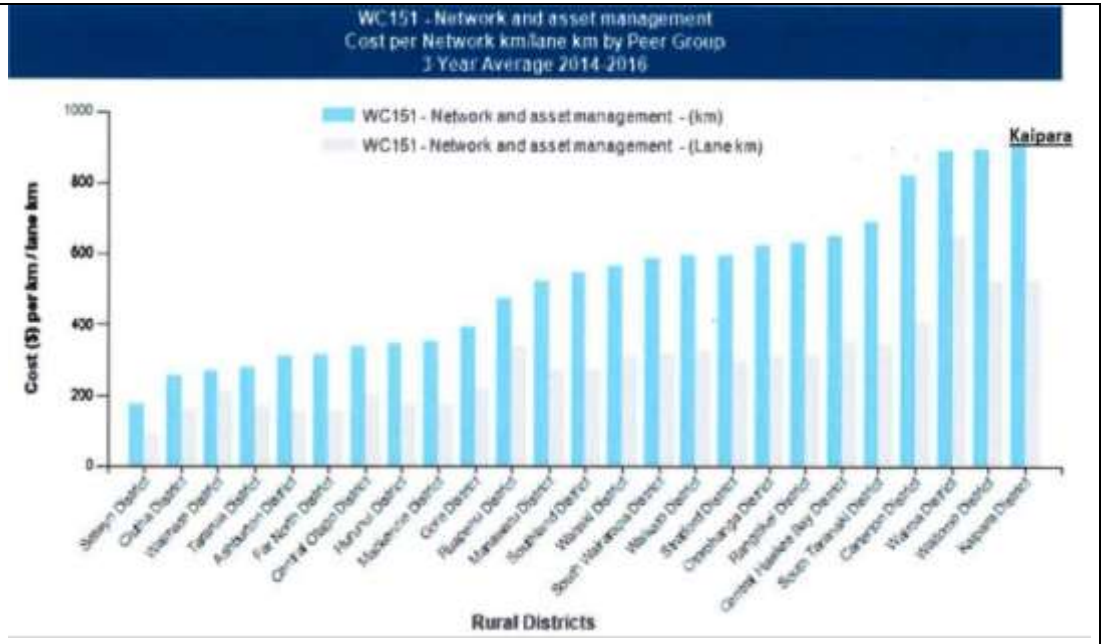
Consequences of Not Addressing the Problem:	Without addressing the resourcing gaps in the industry, there will continue to be shortages of appropriately qualified staff, lack of competition in the market and potentially poorer quality workmanship. This also has an immediate impact on the operations teams to plan and therefore continue with high levels of reactive maintenance. Without changes to the way Council communicates about roadworks, unexpected roadworks will continue to cause delay and frustration, particularly on key commuter, freight and public transport routes.

6.8.2 Levels of Service

ONRC Customer Outcomes:	None
Customer Levels of Service:	**ONRC Safety TO2** – Temporary Hazards (NO DATA CURRENTLY AVAILABLE) **ONRC Safety TO10** – Roadside Obstructions (NO DATA CURRENTLY AVAILABLE) **ONRC Cost Efficiency 5 –** Overall network cost **LTP** – Percentage of CRM's relating to roads and footpaths responded to within LTP timelines (Current measure-DIA) **LTP 1.1.X** – The number of unplanned events and incidents (New measure) (NO DATA CURRENTLY AVAILABLE) **LTP 1.1.X –** Number of freight journeys completed on time (New measure) (NO DATA CURRENTLY AVAILABLE) **LTP 1.1.X –** Residents satisfaction with the road network (New measure).

6.8.3 Evidence and Gap Analysis

NZTA Peer Group Charts – three year Cost/km W/C 151 Network and Asset Management

Kaipara's spend on network and asset management is currently top of the Rural peer group. However, Kaipara has been under the management of Government appointed Commissioner's for the last four years. Although we have a relatively similar network compared to most of its peer group the lack of constitutional knowledge has increased our costs. Also, Northland suffers from lack of adequate in-house professional services resourcing and this also increases costs due to need for consultancy use. We are showing a decrease in the next three year cycle due to bringing this service in-house.	**Overall**	

LTP Measure 1.1.8 – Percentage of Customer Service Requests responded to within Timeframe (DIA)

This is a Department of Internal Affairs (DIA) measure that was introduced in 2015/2016. The percentage of customer service requests relating to roads and footpaths responded to within the LTP timeframe are 95% which is the same as the target. This demonstrates that KDC responds to their customer requests within an appropriate timeframe.	**Overall**	

Summary

The cost of network and asset management on the Kaipara network is high compared to the peer group average, and this is expected to be due to Kaipara having to collect a large amount of data and develop a complete understanding of the network along with lack of professional service providers which is increasing costs. Kaipara is achieving its target for customer service requests being responded to within the LTP timeframes.

Options to be considered

Based on the above data and the problem definition, the following options have been considered for addressing activity and network management of the network:

Option	Description	Benefits / Consequences
Shared Services for Asset Management.	With the implementation of the NTA, a key opportunity is for sharing of asset management services and combining these into region-wide contracts to improve buying power and reduce procurement costs. This includes region-wide contracts for high speed data collection, dTIMS analysis, RAMM database management, traffic counting, forward work planning and activity management planning. These efficiencies will be somewhat offset by the cost of running the NTA.	Cost Efficiency – reduce the costs of data collection and analysis. However, these cost savings will be offset by the running costs of the NTA.
Notifying of Road Works and Diversions on Social Media.	Notify public of maintenance activities, capital project and diversions on social media (e.g. Facebook page, Twitter and AA Road Watch or similar).	Travel Time Reliability – provide real-time information to motorists of potential delays allowing informed route decision-making.
Using technology, Phone Apps to allow public to note faults etcetera.	Using opportunities such as Neatstreets web and telephone-based systems.	Improved customer relations and customer service in regards to service requests having a photograph and a geo location.

6.8.4 Option Assessment

Asset Management

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost
Status Quo.	Asset data such as RAMM, high speed data, FWD and traffic counts are collected by each council separately. In addition, data analysis such as dTIMS and the development of the forward works programme is also carried out by each council separately.	Lack of resourcing.	Poor/Moderate	Neutral	W/C 151: $1,600,000
Shared Services for Asset Management.	Minor cost efficiencies due to sharing of services through NTA. These efficiencies are mostly absorbed by the NTA management costs.	Lack of resourcing.	Good	Slightly Better	W/C 151: -$1,000,000

Preferred Option

Shared services for asset data collection and analysis will result in cost efficiencies and better consistency of decision-making across the region.

Communication with Public

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost
Status Quo.	Continue limited notification of local residents via letter drops and newspapers when carrying out maintenance activities and capital projects.	Communication (Travel Time Reliability).	Poor	Neutral	W/C 151: $0

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost
Notifying of Road Works and Diversions on Social Media.	This option would enable drivers to access information about road works and road closures in real time and make appropriate route choices. The estimated additional cost of this option is $50,000 per year.	Communication (Travel Time Reliability).	Good	Moderately Better	W/C 151: +$50,000

Preferred option

Social Media will allow Council to communicate in real time with a wide portion of the travelling public.

6.8.5 Improvement Plan

Improvements that should be considered during the 2018/20221 period for inclusion in the next AMP are as follows:

- Investigate and develop opportunities for greater use of shared services through the NTA;
- Develop a regional AMP by combining the AMPs for KDC, KDC and FNDC into one document;
- Set rules about how to condition rate various assets and how to develop programmes of work;
- Improve RAMM data quality for inputting into ONRC performance tool; and
- Determine which Council department has ownership and maintenance responsibilities for the Council-owned assets such as carparks, street furniture, shared paths, amenity lighting etcetera.

6.9 Minor Improvements Low Cost/Low Risk, Resilience and Safety

6.9.1 Work Categories: 341 Minor Improvements

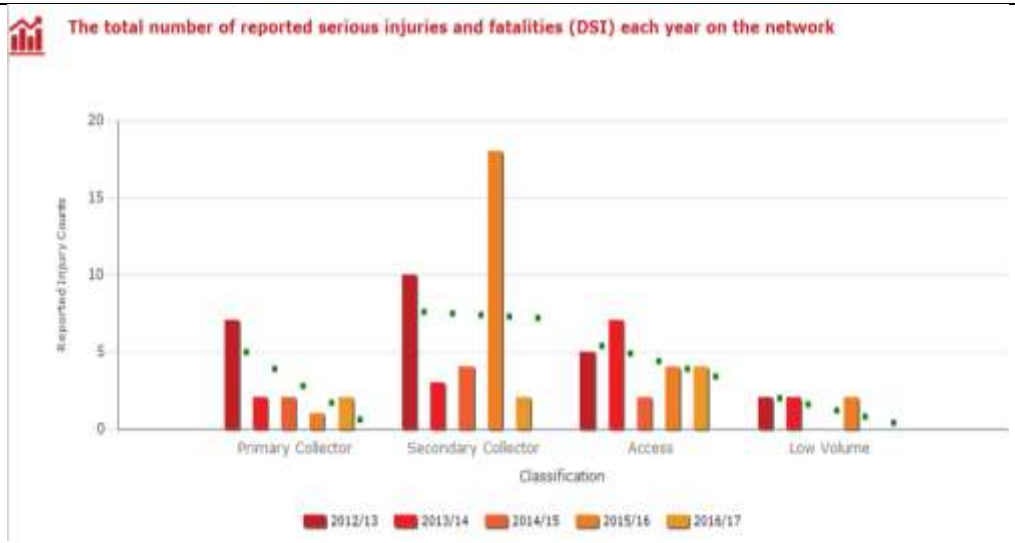
Links to Strategic Case	
Problem Statement:	***Safety:*** The number of fatal and serious injury crashes on our roads are high and are trending upward, particularly in the areas of wet loss of control, night time loss of control and intersection crashes on the Arterial, Secondary Collector and Low Volume network. ***Resilience***: Poor geology and a subtropical climate make our roads susceptible to slips and flooding during heavy rain events resulting in road closures that often affect freight, tourist and detour routes, key lifelines and isolated communities. This is only expected to get worse over time due to the effects of climate change. In addition, lack of funding provision for emergency works has led to renewals and capital programmes being cut in the past.
Benefits of Addressing Problem:	**Safety:** Fatal and serious injury crashes will decrease on our network, reducing the harm to our customers and communities. **Resilience**: Our road network will be more robust during emergency events with reduced likelihood of delay and travel disruption due to road closures on freight tourist and detour routes and key lifelines. Access to isolated communities will be safe-guarded.
Consequences of Not Addressing the Problem:	**Safety:** Fatal and serious injury crashes will continue increasing and will continue to cause significant harm to our customers and communities. **Resilience:** Road closures during emergency events, such as heavy rain events, will continue to cause road closures, jeopardising key freight and tourist routes, lifelines and access to isolated communities

6.9.2 Levels of Service

ONRC Customer Outcomes:	**ONRC Safety CO1** – The Number of Fatal and Serious Injuries on the Network. **ONRC Safety CO2** – Collective Risk **ONRC Safety CO3** – Personal Risk **ONRC Resilience CO1 –** The number of journeys impacted by unplanned events (NO DATA AVAILABLE) **ONRC Resilience CO2 –** The number of instances where road access is lost (NO DATA AVAILABLE) **ONRC Accessibility CO1** – Proportion of the network not available to Class 1 heavy vehicles and 50MAX vehicles **ONRC Travel Time Reliability CO1** – Throughput at indicator sites (NO DATA AVAILABLE)

Customer Levels of Service:	**ONRC Safety TO1** – Permanent Hazards (NO DATA AVAILABLE) **ONRC Safety TO3** – Sight Distances (NO DATA AVAILABLE) **ONRC Safety TO4 –** Loss of control on wet roads **ONRC Safety TO5** – Loss of driver control at night **ONRC Safety TO6** – Intersections **ONRC Safety TO9** – Vulnerable Users **LTP 1.1.2 –** The number change of fatal and serious crashes (Current measure-DIA) **LTP 1.1.X** – Decreasing trend in resilience related faults on key routes (New measure) (NO DATA AVAILABLE) **LTP 1.1.X –** The number of unplanned events and incidents (New measure) (NO DATA AVAILABLE) **LTP 1.1.X –** Number of freight journeys completed on time (New measure) (NO DATA AVAILABLE) **LTP 1.1.X** – Number of rest areas of key routes (Aspirational measure) (NO DATA AVAILABLE)

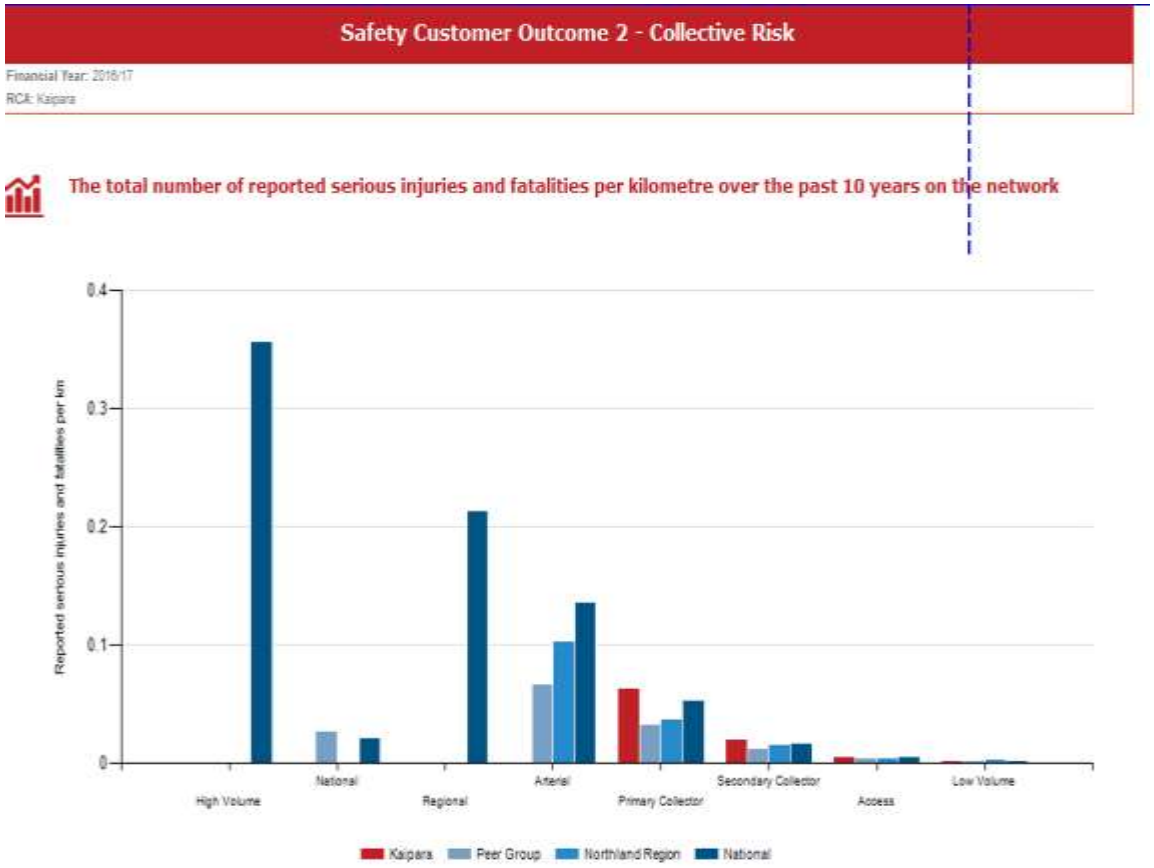
6.9.3 Evidence and Gap Analysis

ONRC Safety CO1 – Number of Fatal and Serious Injuries on the Network This graph indicates that KDCs reported serious injury and fatal crashes are stationary on the Secondary Collector and reducing on all other networks. The serious and fatal crashes on the Secondary Collector are a concern to KDC.	**ONRC**	

ONRC Safety CO2 – Collective Risk

This data indicates that the Collective Risk of Kaipara's road network is above all the peer group average for all ONRC road classifications. Also Kaipara is above the national ONRC grouping average.

ONRC



ONRC Safety CO3 – Personal Risk

The Personal Risk data on Kaipara's road network indicates that while the all the classifications are higher than both the National and peer groups average. The focus is currently on the Access Network as this has the greatest difference between the National average and the Kaipara average.

ONRC

ONRC Safety TO4 –Loss of Driver Control on Wet Roads

It should be noted that there is not much data available for this LOS and this reduces the usefulness of this measure.

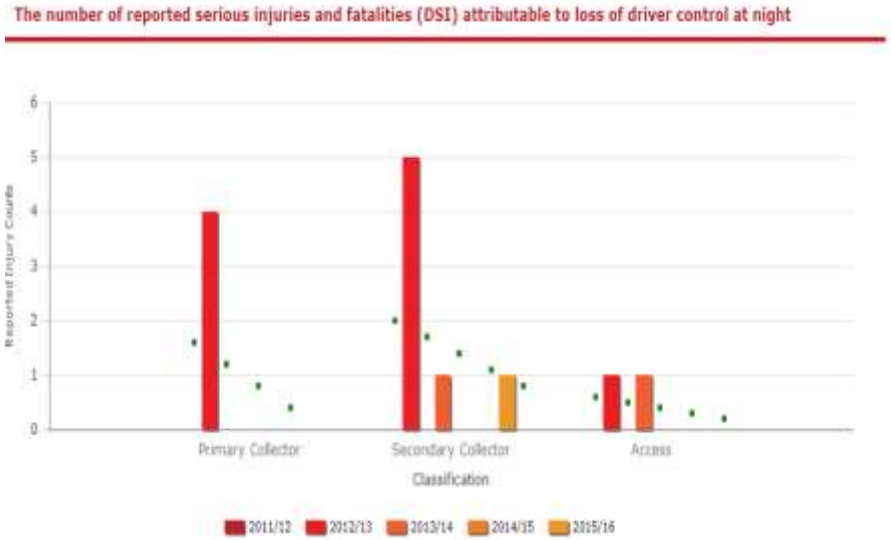
However, it does appear that there is a significantly increasing trend of serious injury and fatal wet road loss of control crashes on the Arterial road network in Kaipara. The crashes in the wet on Secondary Collector roads may also be increasing.

ONRC

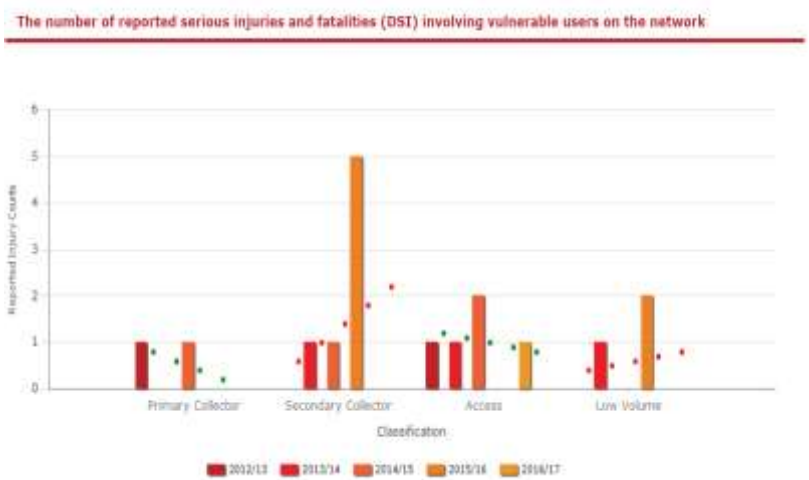
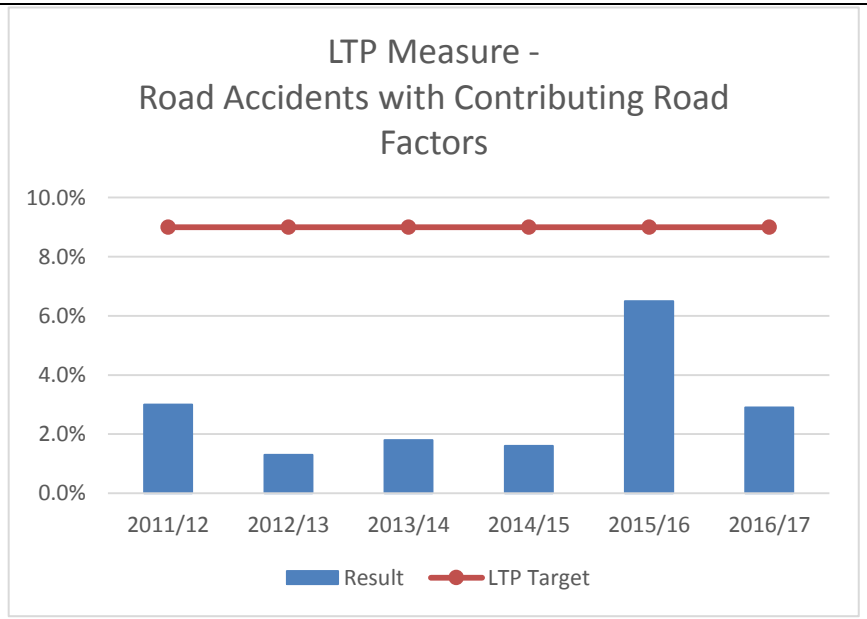
Rural road loss of control and/or head-on (speed zones >70km/hr)

2017 Register

PERSONAL RISK DSI/100MVKT	Ranking Territorial Authority	Standard Deviation	COLLECTIVE RISK 5yr AVG DSI	PERSONAL RISK DSI/100MVKT	Road Safety Regions	COLLECTIVE RISK 5yr AVG DSI
12	Wairoa District		13	8	NORTHLAND	92
11	Kaipara District		20	2	AUCKLAND	99
8	Buller District		11	5	WAIKATO	175
8	Waitomo District		14	5	BAY OF PLENTY	72
8	Far North District		45	5	TARANAKI	31
8	Gisborne District		17	5	MANAWATU WANGANUI	77
8	Opotiki District		8	8	GISBORNE	17
8	Clutha District		21	6	HAWKE'S BAY	51
8	Masterton District		6	3	WELLINGTON	38
7	Thames-Coromandel District		18	4	TASMAN NELSON MARLBOROUGH	34
7	Stratford District	1 STDEV	6	7	WEST COAST	28
6	Queenstown-Lakes District		19	4	CANTERBURY	106
6	Westland District		12	6	OTAGO	93
6	Central Otago District		17	4	SOUTHLAND	42
6	Grey District		6			
6	Waitaki District	0.5 STDEV	15	4	NATIONAL	956
6	Southland District		34			
6	Dunedin City		21			
6	Kaikoura District		7			
6	Ruapehu District		12			
5	Taupo District		24			
5	Hastings District		27			
5	Wanganui District		7			

ONRC Safety TO5 –Loss of Driver Control at Night As for Safety TO4 above, it should be noted that there is not much data available for this LOS and this reduces the usefulness of this measure. However, it does appear that there is a significantly decreasing trend of serious injury and fatal loss of control crashes on the Arterial and Secondary Collector road networks in Kaipara at night.	**ONRC**	

ONRC Safety TO6 – Intersection The serious injury and fatal crashes on Kaipara's Secondary Intersections is showing an increasing trend. The other road classes are showing a static or decreasing trend in high severity intersection crashes, although the lack of data for these road classes is reducing the usefulness of this measure.	**ONRC**	

ONRC Safety TO9 – Vulnerable Users The serious injury and fatal crashes involving vulnerable users in Kaipara is showing a similar increase on the Secondary collector as the intersection statistics.	**ONRC**	
LTP Measure 1.1.1 – Percentage of Road Accidents with Contributing Road Factors This shows that the percentage of crashes with contributing road factors is below the target of 9% over the last six years. This indicates that crashes resulting from road faults or issues are low (averaging about 3%). This suggests that road faults are being adequately managed.	**Overall**	

LTP Measure 1.1.2 – Change in Number of Fatal and Serious Injury Crashes This is a Department of Internal Affairs (DIA) measure that was introduced in 2015/2016. The number of fatal and serious injury crashes in Kaipara are a showing a high rate in the National statistics. This is well above the target of zero, and indicates that the rate of high severity crashes is increasing in the Kaipara. This matches the crash graph included in the problem assessment for safety undertaken in Section 5.1.5.2.	**Overall**	

Summary

Serious injury and fatal crashes are increasing on Kaipara's network, particularly on the Secondary Collector networks. The Secondary Collector crashes are also showing increasing trend of serious injury and fatal loss of control crashes on wet roads and at night

Options to be considered

Based on the above data and the problem definition, the following options have been considered for addressing the safety and resilience issues on the network:

Option	Description	Benefits / Consequences
High PSV Seals/Water Cutting	Introduce a programme of high PSV seals (SCRIM seals) and water cutting on the top 5% of High Risk Rural Roads targeting areas with wet road loss of control crashes. This could include the use of Glenbrook melted slag (GMA). This option was already covered in Section 6.2 Sealed Roads, but has been repeated here because the funding will come from W/C 341.	Safety – will reduce loss of control crashes in the wet.

Option	Description	Benefits / Consequences
Delineation and Hazard Protection Upgrades	This would include improved delineation, new guardrail installations, upgrade hazardous guardrail end terminals, replace inadequate bridge rails and seal widening on High Risk Rural Roads (HRRR).	Safety – will reduce the likelihood and severity of loss of control crashes.
Speed Management	Implement speed management guide as per the speed risk mapping. This will involve extensive community consultation. It is likely to require a full-time equivalent staff position over the 2018/2021 period to implement the current high risk roads. May also require physical works to reinforce the speed limit.	Safety – will reduce the likelihood and severity of crashes.
Pedestrian Crossing Upgrades	This would include upgrading lighting and conspicuity of zebra crossing and upgrading of key disability routes.	Safety – will reduce pedestrian related crashes.
Audio Tactile Profile (ATP) Edgelines and Centrelines	Implement a programme of edgeline ATP on High Risk Rural Roads(HRRR) with high incidence of loss of control crashes or cross centreline crashes, particularly with fatigue or distraction as a factor.	Safety – will reduce the likelihood of loss of control and head on crashes.
Wide Medians	Provide wide medians on HRRR with high traffic volumes and High/Medium High Collective risk, particularly those with a high incidence of head-on or crashes where the vehicle crossed the centreline.	Safety – will reduce the likelihood of head-on crashes.
Intersection Upgrades	Implement a programme of upgrades on High/Medium High risk intersections. Could consider active warning signs and improving pedestrian connections in urban areas.	Safety – will reduce the likelihood of intersection crashes.
Resilience Programme	Develop and implement a programme of resilience upgrades to address high risk areas (slips and flooding) on a proactive basis. Work is to focus on detour routes, major arterials/collectors, freight and tourist routes and roads serving isolated communities. Time work to suit resurfacing and rehabilitations.	Resilience – will reduce the incidence of road closures due to emergency events and help ensure that detour routes remain open.
Sea Level Rise/Climate Change	Programme of coastal protection and lifting low-lying roads in critical areas to provide for the predicted effects of climate change. Also increase in culvert/bridge capacity on known problem areas on critical routes.	Resilience – will help protect against the forecast impacts of climate change.

Option	Description	Benefits / Consequences
Provide Rest/Viewing Areas	Help develop and implement with the freight and tourism industries a programme for the installation and maintenance of rest areas/viewing areas on arterial, freight and tourist routes and byways. These areas should have toilets and rubbish bins etcetera. The Twin Coast Discovery Highway PBC has identified an opportunity for a new rest area on Kaipara – Kaipara link road from and to Mangawhai and Mangawhai heads.	Freight – will provide areas for truck drivers to rest and check their load. Safety – will provide safe rest areas to enable drivers to take a break, thus reducing fatigue crashes. Amenity – will improve the amenity for road users by providing scenic areas, toilet and rubbish bins.

6.9.4 Option Assessment

Safety

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost
Status Quo.	5% of maintenance programme spent on safety. Programme a mix of High Risk Rural Roads (HRRR), Crash Reduction Study (CRS) sites and local road speed management. Safety audits are carried out on capital projects – but safety recommendations not always implemented due to budget restrictions.	Safety	Poor/Moderate	Neutral	W/C 341: $500,000
High PSV Seals/ Water Cutting.	Carry out a programme of high skid resistance surfaces or water cutting on roads which have a high proportion of wet road loss of control crashes. This is likely to result in a reduction in wet road crashes.	Safety	Very Good	Significantly Better	W/C 341: +$315,000

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost
Delineation and Hazard Protection Upgrades.	Enhance the current programme to include more delineation improvements, guardrail protection and seal widening of HRRR routes and at CRS sites. This will result in a reduction of loss of control crashes and a severity reduction on the treated routes.	Safety	Good	Moderately Better	W/C 341: +$725,000
Speed Management.	Implement the Speed Management Guide on high risk routes. This will incorporate both speed limit review and change along with positive reinforcement of appropriate speeds. This is likely to significantly reduce the number of crashes and severity of the treated routes.	Safety	Very Good	Significantly Better	W/C 341: +$130,000
Pedestrian Crossing Upgrades.	Expand upon the current programme of pedestrian crossing upgrades to reduce social severance and reduce pedestrian crashes as identified in the Kaipara Transportation Strategy. Sites will tie in with current pedestrian demand or provide connections to the walking and cycling network.	Safety	Good	Moderately Better	W/C 341: +$10,000
Audio Tactile Profile (ATP) Edgelines and Centrelines.	Carry out a 10 year programme to provide ATP on all rural arterial, freight and tourist routes. There would also be an ongoing maintenance cost to renew the ATP every reseal cycle. This option would significantly reduce loss of control crashes by providing drivers warning when they drift out of their lane.	Safety	Good	Significantly Better	W/C 341: +$100,000 W/C 222: +$75,000 (starting Yr 13)

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost
Wide Medians.	Carry out a 30 year programme to provide wide medians on all rural arterial, freight and tourist routes. This option would significantly decrease the likelihood of a head-on collision on these routes. This would be a substantial programme of widening which is not justified given there are lower costs alternatives which could be implemented first.	Safety	Good	Moderately Better	W/C 341: +$450,000
Intersection Upgrades.	Implement improvements at high risk intersections to improve width, channelisation and turning flares. These works would be identified through the HRRR or CRS processes and would result in a significant decrease in crashes at these intersections.	Safety	Very Good	Moderately Better	W/C 341: +$225,000

Preferred Options

High PSV Seals/Water Cutting, Delineation and Hazard Protection Upgrades, Speed Management, Pedestrian Crossing Upgrades and Intersection Upgrades: these options will reduce the likelihood and severity of crashes occurring on the network.

Resilience

Option	Assessment	Problem being Addressed	Effectiveness	LOS Impact	Annual Cost
Status Quo.	Implement some resilience works (mainly slip repairs) in conjunction with rehabilitations and a few stand-alone repairs as budget allows.	Resilience	Moderate	Neutral	W/C 341: $450,000

Option	Assessment	Problem being Addressed	Effectiveness	LOS Impact	Annual Cost
Resilience Programme.	Carry out an enhanced programme of resilience projects to reduce the incidence of roads being closed due to emergency events. This programme would focus on detour routes, major arterials/collectors, freight and tourist routes and roads serving isolated communities.	Resilience	Good	Moderately Better	W/C 341: +$750,000
Sea Level Rise/Climate Change.	Programme and timing to be determined by Resilience Strategy.	Resilience	Moderate/Good	Slightly Better	TBD

Preferred Option

Resilience Programme: will enable high risk areas to be prioritised and targeted to address known resilience problems on critical routes.

Rest/Viewing Areas

Option	Assessment	Problem being addressed	Effectiveness	LOS Impacts	Annual Cost
Status Quo.	Do nothing.	Freight, Safety and Amenity	Poor	Neutral	W/C 341: $0
Provide Rest/Viewing Areas.	Provide a rest area/pull on Pouto Road. This project has been identified as part of the National Cycle Route improvements. This would provide the current high forestry traffic numbers an opportunity whilst also adding safety for tourist cyclists.	Freight, Safety and Amenity	Good	Slightly Better	W/C 341: +$500,000

Preferred Option

Provide Rest/Viewing Areas: to provide a viewing/rest area on Pouto Road to support the tourism industry as identified by the National Cycle Route innovations and improvements.

6.9.5 Improvement Plan

Improvement that should be considered during the 2018/2021 period for inclusion in the next AMP is:

- Through the NTA, develop a resilience strategy for Northland that focuses on State Highway alternate routes, primary routes, freight and tourist routes as well as access to isolated communities. The Strategy should identify key lifelines that need protecting from the Northland Lifelines project. This Strategy should take into account the expected impacts due to climate change. The result of the Strategy should be a programme of resilience works.

6.10 Education and Promotion of Road User safety

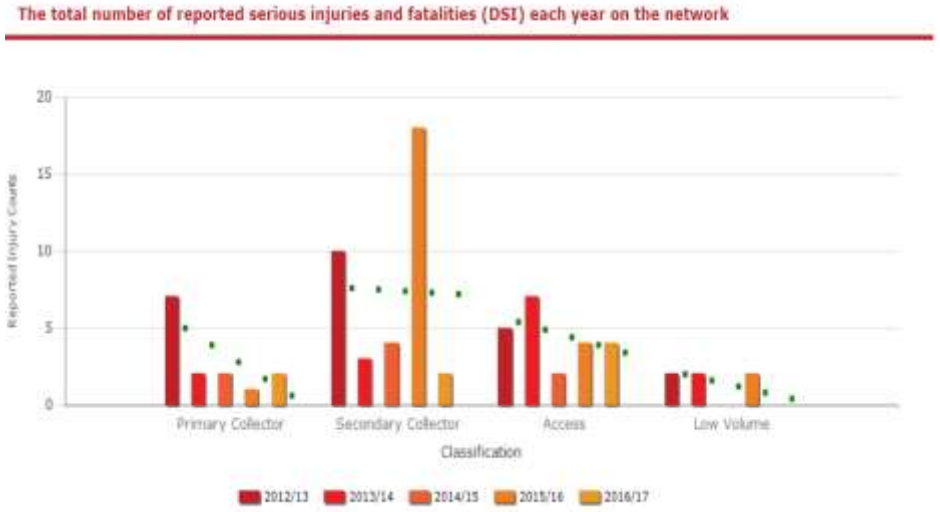
Work Categories: 432 Road Safety Promotions

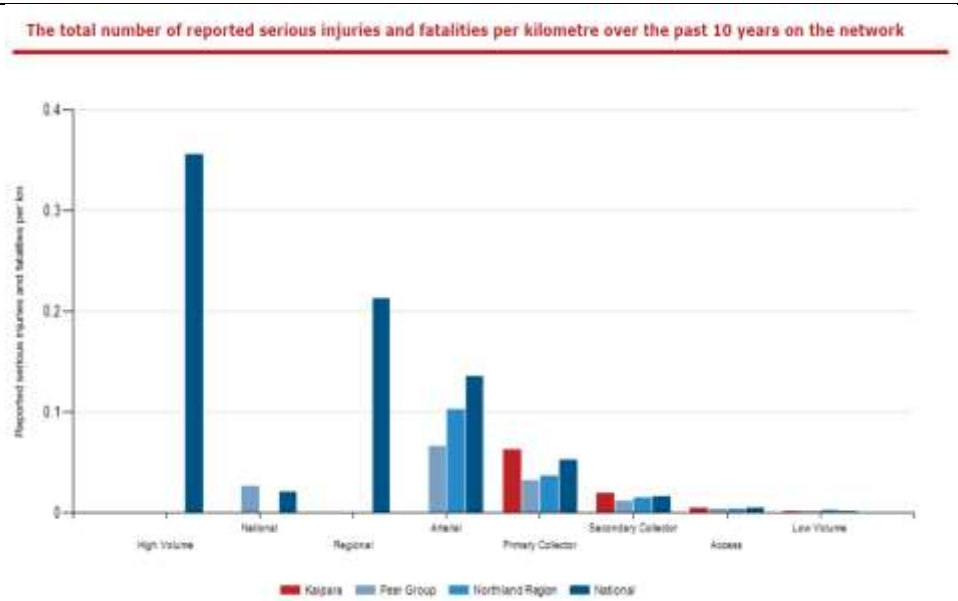
Links to Strategic Case	
Problem Statement:	The number of fatal and serious injury crashes on our roads are high and are trending upward, particularly on our Arterial road network.
Benefits of Addressing Problem:	Fatal and serious injury crashes will decrease on our network, reducing the harm to our customers and communities
Consequences of Not Addressing the Problem:	Fatal and serious injury crashes will continue increasing and will continue to cause significant harm to our customers and communities.

6.10.1Levels of Service

ONRC Customer Outcomes:	**ONRC Safety CO1** – The Number of Fatal and Serious Injuries on the Network **ONRC Safety CO2** – Collective Risk
Customer Levels of Service:	**NZTA Communities at Risk Register** **LTP 1.1.X** – Percentage of road safety promotion projects completed (New measure)

6.10.2Evidence and Gap Analysis

ONRC Safety CO1 – Number of Fatal and Serious Injuries on the Network This graph indicates that KDCs reported serious injury and fatal crashes are decreasing on all classifications. The serious and fatal crashes on the Secondary Collector are very slightly trending downward.	**ONRC**	

ONRC Safety CO2 – Collective Risk This data indicates that the Collective Risk of Kaipara's road network is at or below the peer group average for all ONRC road classifications. The Primary and Secondary Collector have a Collective Risk of Medium and the other road classes have a risk of Low-Medium or Low.	**ONRC**	

NZTA Communities at Risk Register

Kaipara has many Medium Concern areas identified on the Communities at Risk Register. These include all Death and Serious Casualty, Young Drivers, Speed, Rural Intersections, Pedestrians, Fatigue and Older Road Users.

The Northland region as a whole has many High Concern areas identified on the register. Many of these are the same issues that are identified for Kaipara.

Overall

Kaipara District	Northland Region
All Deaths and Serious Casualty (Medium Concern)	All Deaths and Serious Casualty (High Concern)
Young Drivers (Aged 16-24 yrs) (Medium Concern)	Young Drivers (Aged 16-24 yrs) (High Concern)
Speed (too fast for conditions) (Medium Concern)	Alcohol and/or Drugs (High Concern)
Rural Intersections (Medium Concern)	Speed (too fast for conditions) (High Concern)
Pedestrian Involved (Medium Concern)	Rural Road Loss of Control and/or Head-On (High Concern)
Fatigue (Medium Concern)	Motorcyclist Involved (High Concern)
Older Road Users (Aged 75 yrs or older) (Medium Concern)	Restraints (seatbelts not worn) (High Concern)
	Fatigue (Medium Concern)

Summary

Serious injury and fatal crashes are increasing on Kaipara's network, particularly on the Secondary Collector networks. All road classes have higher Personal Risk than the peer group average. The Communities at Risk Register indicates many high and medium risk areas of concern for Kaipara and Northland, including all deaths and serious injuries and continuing themes of alcohol/drugs, young drivers, speed, restraints, fatigue and rural loss of control on bends.

6.10.3Options to be Considered

Based on the above data and the problem definition, the following options have been considered for addressing the safety issues on the network:

Option	Description	Benefits / Consequences
Bike Skills Training	Implement a Bike Skills Training programme to provide skills training for school children to build upon the success of the Bikes in Schools programme. This will provide children with the skills they need to cycle with confidence both on the shared path network and on roads. The programme will also target adult cyclists to encourage mode shift.	Safety – will reduce cycle crashes by improving cyclist skills. Travel Time Reliability – will increase the mode shift to cycling which will reduce road traffic and congestion.
Improved Road Safety Promotion	Implement an expanded education and promotion using internal resources (similar to Far North's Rural Education Activities Programme (REAP) organisation) to target high and medium risk issues identified by the NZTA Communities At Risk register (such as alcohol, young drivers, speed etcetera). This would make the programme less dependent on third party funding arrangements and in-kind donations. The current programme would be expanded to include motorcycle safety to make use of ACC funding and adoption of successful campaigns such as FNDC's One Tear Too Many speed campaign.	Safety – will reduce crashes resulting from poor driver behaviour.

6.10.4 Option Assessment

Road Safety Promotion

Option	Assessment	Problem being addressed	Effectiveness	LOS Impact	Annual Cost	30yr PV Cost ($M)
Status Quo	Continue with current model with an external resource (currently RoadSafe Northland) providing education and promotion of high and medium risk issues identified by the NZTA Communities At Risk register.	Safety	Moderate/Good	Neutral	W/C 432: $313,000	$4.4
Bike Skills Training	This option would help build children and adult cycle skills, giving them the skills and confidence to use the shared path and road networks safely and with confidence. This will encourage uptake of walking and cycling and reduce potential cycle-related crashes.	Safety and Travel Time Reliability	Good	Moderately Better	W/C 432: +$400,000	$9.7
Improved Road Safety Promotion	To be determined through Improvement Plan item.	Safety	Very Good	Significantly Better	TBD	TBD

6.10.5 Improvement Plan

Improvements that should be considered during the 2018/2021 period for inclusion in the next AMP are:

- Development of a REAP-type organisation to undertake road safety promotion and education activities; and
- Develop very public focused seat belt, drug and alcohol, speed and young drivers programmes.

7 Financial Projections

7.1 Introduction

The financial projections reflect the current growth of area and hence the expected traffic growth on the network. It is expected growth will be around 0-1% over the next three years with most of the growth occurring in the Mangawhai area. However, the budget does include the expected growth in logging operations through over the next six years and caters for this through the metal strengthening and rehabilitation programmes. Some minor improvements have been identified to improve road safety and improve the road width on some of our primary and secondary collectors and key heavy haulage routes. Structural component replacements on key bridges are planned to improve route security. Developer contributions are forecasted for the sealing of sections on Estuary Drive, Moir Point Road, Black Swamp Road and Settlement Road.

Financial Statements and Forecasts

The 10-year cash flow forecasts for this Activity are presented in the following tables:

Sealed

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	1,455	1,505	1,539	1,938	1,832	1,877	1,924	1,974	2,028	2,085	2,147
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	1,247	1,043	1,067	1,092	1,229	1,260	1,292	1,326	1,363	1,402	1,445
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**2,702**	**2,548**	**2,605**	**3,030**	**3,061**	**3,137**	**3,216**	**3,301**	**3,391**	**3,487**	**3,592**
Application of operating funding											
Contractors costs	1,812	1,630	1,667	1,708	1,931	1,979	2,031	2,085	2,144	2,206	2,274
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	521	390	398	407	451	462	473	485	498	512	527
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**2,334**	**2,020**	**2,066**	**2,115**	**2,382**	**2,441**	**2,504**	**2,571**	**2,642**	**2,718**	**2,801**
Surplus (deficit) of operating funding	**368**	**528**	**540**	**915**	**679**	**696**	**712**	**730**	**749**	**769**	**791**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	1,768	826	844	1,431	1,062	1,088	1,114	1,142	1,172	1,203	1,237
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**1,768**	**826**	**844**	**1,431**	**1,062**	**1,088**	**1,114**	**1,142**	**1,172**	**1,203**	**1,237**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	2,898	1,354	1,384	2,346	1,742	1,783	1,826	1,872	1,921	1,972	2,028
Increase (decrease) in reserves	-762	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**2,136**	**1,354**	**1,384**	**2,346**	**1,742**	**1,783**	**1,826**	**1,872**	**1,921**	**1,972**	**2,028**
Surplus (deficit) of capital funding	**-368**	**-528**	**-540**	**-915**	**-679**	**-696**	**-712**	**-730**	**-749**	**-769**	**-791**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Unsealed

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	2,015	2,204	2,252	2,310	2,240	2,295	2,352	2,413	2,478	2,547	2,622
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	1,621	1,317	1,346	1,384	1,286	1,318	1,352	1,387	1,426	1,466	1,511
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**3,636**	**3,520**	**3,598**	**3,695**	**3,526**	**3,613**	**3,703**	**3,800**	**3,903**	**4,013**	**4,132**
Application of operating funding											
Contractors costs	2,454	2,035	2,081	2,142	1,979	2,029	2,081	2,138	2,197	2,261	2,331
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	596	510	520	534	505	517	530	543	557	572	588
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**3,050**	**2,545**	**2,602**	**2,676**	**2,485**	**2,546**	**2,611**	**2,680**	**2,754**	**2,833**	**2,919**
Surplus (deficit) of operating funding	**586**	**975**	**996**	**1,018**	**1,042**	**1,067**	**1,092**	**1,120**	**1,149**	**1,180**	**1,213**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	1,296	1,525	1,559	1,593	1,629	1,669	1,709	1,751	1,797	1,845	1,897
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**1,296**	**1,525**	**1,559**	**1,593**	**1,629**	**1,669**	**1,709**	**1,751**	**1,797**	**1,845**	**1,897**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	2,125	2,500	2,555	2,611	2,671	2,735	2,801	2,871	2,946	3,025	3,110
Increase (decrease) in reserves	-243	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**1,882**	**2,500**	**2,555**	**2,611**	**2,671**	**2,735**	**2,801**	**2,871**	**2,946**	**3,025**	**3,110**
Surplus (deficit) of capital funding	**-586**	**-975**	**-996**	**-1,018**	**-1,042**	**-1,067**	**-1,092**	**-1,120**	**-1,149**	**-1,180**	**-1,213**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Drainage

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	463	666	681	696	587	580	573	565	581	597	615
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	344	383	392	401	410	420	431	442	454	467	481
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**807**	**1,049**	**1,072**	**1,097**	**998**	**1,001**	**1,004**	**1,008**	**1,035**	**1,064**	**1,096**
Application of operating funding											
Contractors costs	521	572	585	599	614	629	645	663	681	701	723
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	126	165	168	172	176	180	184	188	193	198	204
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**647**	**737**	**753**	**771**	**789**	**809**	**829**	**851**	**874**	**899**	**926**
Surplus (deficit) of operating funding	**160**	**312**	**319**	**326**	**208**	**192**	**175**	**157**	**161**	**165**	**170**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	250	488	499	510	326	300	273	245	252	258	266
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**250**	**488**	**499**	**510**	**326**	**300**	**273**	**245**	**252**	**258**	**266**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	410	800	818	836	534	492	448	402	412	424	435
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**410**	**800**	**818**	**836**	**534**	**492**	**448**	**402**	**412**	**424**	**435**
Surplus (deficit) of capital funding	**-160**	**-312**	**-319**	**-326**	**-208**	**-192**	**-175**	**-157**	**-161**	**-165**	**-170**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Bridges and Structures

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	455	567	579	592	606	621	637	650	639	625	618
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	164	147	151	154	158	162	166	170	175	173	185
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**619**	**715**	**729**	**746**	**764**	**783**	**802**	**820**	**814**	**798**	**803**
Application of operating funding											
Contractors costs	266	228	233	238	244	250	257	264	271	279	287
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	46	57	58	60	61	62	64	66	67	57	71
Finance costs	55	51	45	42	39	35	30	23	18	13	9
Total applications of operating funding	**367**	**336**	**337**	**340**	**344**	**347**	**350**	**352**	**356**	**349**	**367**
Surplus (deficit) of operating funding	**252**	**379**	**393**	**406**	**420**	**435**	**452**	**468**	**458**	**449**	**436**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	683	458	468	478	489	501	513	525	539	554	569
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	-82	-86	-94	-100	-107	-115	-124	-132	-114	-95	-72
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**601**	**371**	**374**	**377**	**381**	**385**	**388**	**393**	**426**	**459**	**497**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	1,120	750	767	783	801	821	840	861	884	908	933
Increase (decrease) in reserves	-267	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**854**	**750**	**767**	**783**	**801**	**821**	**840**	**861**	**884**	**908**	**933**
Surplus (deficit) of capital funding	**-252**	**-379**	**-393**	**-406**	**-420**	**-435**	**-452**	**-468**	**-458**	**-449**	**-436**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Environment

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	297	298	305	312	319	327	336	345	354	364	376
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	334	319	326	333	341	350	359	368	378	389	401
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**631**	**617**	**631**	**645**	**661**	**677**	**695**	**713**	**733**	**754**	**777**
Application of operating funding											
Contractors costs	517	494	505	517	530	543	557	572	588	605	624
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	115	123	125	128	131	134	137	141	144	148	153
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**631**	**617**	**631**	**645**	**661**	**677**	**695**	**713**	**733**	**754**	**777**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Traffic Services

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	489	477	482	483	491	503	516	530	544	560	577
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	463	432	436	435	442	453	465	477	490	505	520
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**952**	**910**	**918**	**917**	**933**	**956**	**981**	**1,007**	**1,035**	**1,064**	**1,097**
Application of operating funding											
Contractors costs	746	698	704	702	713	731	750	770	792	815	840
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	132	143	144	144	147	150	154	158	162	167	172
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**878**	**841**	**849**	**846**	**860**	**881**	**904**	**928**	**954**	**982**	**1,012**
Surplus (deficit) of operating funding	**74**	**68**	**70**	**71**	**73**	**75**	**76**	**78**	**80**	**83**	**85**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	116	107	109	111	114	117	120	123	126	129	133
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**116**	**107**	**109**	**111**	**114**	**117**	**120**	**123**	**126**	**129**	**133**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	190	175	179	183	187	191	196	201	206	212	218
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**190**	**175**	**179**	**183**	**187**	**191**	**196**	**201**	**206**	**212**	**218**
Surplus (deficit) of capital funding	**-74**	**-68**	**-70**	**-71**	**-73**	**-75**	**-76**	**-78**	**-80**	**-83**	**-85**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Level Crossing

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	6	7	7	7	7	7	7	8	8	8	8
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	6	7	7	8	8	8	8	8	9	9	9
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**12**	**14**	**14**	**15**	**15**	**15**	**16**	**16**	**16**	**17**	**17**
Application of operating funding											
Contractors costs	10	10	10	10	11	11	11	12	12	12	13
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	2	4	4	4	4	4	4	4	5	5	5
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**12**	**14**	**14**	**15**	**15**	**15**	**16**	**16**	**16**	**17**	**17**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Roading Network and Asset Management

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	672	643	655	668	682	697	712	729	746	764	783
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	831	781	796	811	828	845	863	882	902	924	946
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**1,503**	**1,424**	**1,451**	**1,479**	**1,510**	**1,542**	**1,576**	**1,611**	**1,648**	**1,688**	**1,729**
Application of operating funding											
Contractors costs	0	0	0	0	0	0	0	0	0	0	0
Professional services	875	650	664	679	694	711	728	746	766	786	808
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	628	774	787	801	816	831	848	865	883	901	921
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**1,503**	**1,424**	**1,451**	**1,479**	**1,510**	**1,542**	**1,576**	**1,611**	**1,648**	**1,688**	**1,729**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Sealed Resurfacing

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	454	853	912	850	745	763	737	756	775	796	819
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**454**	**853**	**912**	**850**	**745**	**763**	**737**	**756**	**775**	**796**	**819**
Application of operating funding											
Contractors costs	0	0	0	0	0	0	0	0	0	0	0
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	0	0	0	0	0	0	0	0	0	0	0
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Surplus (deficit) of operating funding	**454**	**853**	**912**	**850**	**745**	**763**	**737**	**756**	**775**	**796**	**819**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	710	1,334	1,427	1,330	1,165	1,193	1,153	1,182	1,213	1,246	1,280
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**710**	**1,334**	**1,427**	**1,330**	**1,165**	**1,193**	**1,153**	**1,182**	**1,213**	**1,246**	**1,280**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	1,164	2,187	2,339	2,181	1,910	1,956	1,891	1,938	1,988	2,042	2,099
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**1,164**	**2,187**	**2,339**	**2,181**	**1,910**	**1,956**	**1,891**	**1,938**	**1,988**	**2,042**	**2,099**
Surplus (deficit) of capital funding	**-454**	**-853**	**-912**	**-850**	**-745**	**-763**	**-737**	**-756**	**-775**	**-796**	**-819**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Road Safety Promotion

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	59	84	92	100	99	102	104	107	109	112	115
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	10	88	97	105	104	107	109	112	115	118	121
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**69**	**173**	**189**	**205**	**203**	**208**	**213**	**219**	**224**	**230**	**237**
Application of operating funding											
Contractors costs	0	0	0	0	0	0	0	0	0	0	0
Professional services	16	145	158	172	171	175	179	184	189	194	199
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	3	28	30	33	32	33	34	35	36	37	38
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**19**	**173**	**189**	**205**	**203**	**208**	**213**	**219**	**224**	**230**	**237**
Surplus (deficit) of operating funding	**51**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	79	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**79**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	130	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**130**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Surplus (deficit) of capital funding	**-51**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Minor Improvements

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	759	823	1,121	1,151	868	763	981	1,009	1,062	1,119	1,179
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	671	0	62	63	64	65	67	68	69	71	72
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**1,430**	**823**	**1,183**	**1,214**	**932**	**829**	**1,047**	**1,077**	**1,131**	**1,189**	**1,251**
Application of operating funding											
Contractors costs	1,000	0	0	0	0	0	0	0	0	0	0
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	260	0	102	103	105	107	109	111	113	116	118
Finance costs	0	0	1	2	3	18	35	49	66	84	102
Total applications of operating funding	**1,260**	**0**	**102**	**105**	**108**	**125**	**144**	**160**	**180**	**199**	**220**
Surplus (deficit) of operating funding	**170**	**823**	**1,081**	**1,109**	**824**	**703**	**903**	**916**	**952**	**990**	**1,031**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	3,190	1,763	1,750	1,796	2,408	2,237	2,525	2,588	2,656	2,727	2,804
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	16	17	17	303	304	279	295	292	287	282
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**3,190**	**1,779**	**1,768**	**1,813**	**2,711**	**2,541**	**2,804**	**2,884**	**2,947**	**3,014**	**3,086**
Applications of capital funding											
Capital Expenditure - Growth	199	838	57	61	1,067	1,095	1,118	1,146	1,176	1,208	1,242
Capital Expenditure - LoS	2,424	1,786	2,853	2,925	2,924	2,616	3,021	3,097	3,177	3,263	3,354
Capital Expenditure - Renewal	2,376	361	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	-1,640	-384	-62	-64	-455	-467	-432	-443	-455	-467	-480
Total applications of capital funding	**3,360**	**2,602**	**2,848**	**2,921**	**3,536**	**3,244**	**3,707**	**3,800**	**3,899**	**4,004**	**4,116**
Surplus (deficit) of capital funding	**-170**	**-823**	**-1,081**	**-1,109**	**-824**	**-703**	**-903**	**-916**	**-952**	**-990**	**-1,031**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Footpaths and Berms

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	245	176	180	184	188	193	198	203	209	215	221
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**245**	**176**	**180**	**184**	**188**	**193**	**198**	**203**	**209**	**215**	**221**
Application of operating funding											
Contractors costs	151	136	139	142	146	150	153	158	162	167	172
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	32	40	41	42	42	43	44	46	47	48	49
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**183**	**176**	**180**	**184**	**188**	**193**	**198**	**203**	**209**	**215**	**221**
Surplus (deficit) of operating funding	**62**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Unsubsidised Works

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	599	12	12	12	634	649	664	681	698	717	737
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**599**	**12**	**12**	**12**	**634**	**649**	**664**	**681**	**698**	**717**	**737**
Application of operating funding											
Contractors costs	197	0	0	0	0	0	0	0	0	0	0
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	41	12	12	12	12	13	13	13	13	14	14
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**239**	**12**	**12**	**12**	**12**	**13**	**13**	**13**	**13**	**14**	**14**
Surplus (deficit) of operating funding	**360**	**0**	**0**	**0**	**621**	**636**	**651**	**668**	**685**	**703**	**723**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	35	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**35**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	363	0	0	0	229	234	240	246	252	259	266
Capital Expenditure - LoS	397	0	0	0	533	546	559	573	588	604	621
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	-365	0	0	0	-141	-144	-148	-152	-155	-160	-164
Total applications of capital funding	**395**	**0**	**0**	**0**	**621**	**636**	**651**	**668**	**685**	**703**	**723**
Surplus (deficit) of capital funding	**-360**	**0**	**0**	**0**	**-621**	**-636**	**-651**	**-668**	**-685**	**-703**	**-723**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Emergency Works and Preventative Maintenance

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	236	202	353	361	370	379	388	398	409	420	433
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	153	3	157	161	164	169	173	178	183	188	194
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**389**	**205**	**510**	**522**	**534**	**547**	**561**	**576**	**591**	**608**	**626**
Application of operating funding											
Contractors costs	250	0	256	262	268	275	282	290	298	306	316
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	41	5	50	51	52	54	55	57	58	60	62
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**291**	**5**	**306**	**313**	**321**	**329**	**337**	**346**	**356**	**366**	**377**
Surplus (deficit) of operating funding	**98**	**200**	**204**	**209**	**214**	**219**	**224**	**230**	**236**	**242**	**249**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	195	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**195**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	320	200	204	209	214	219	224	230	236	242	249
Increase (decrease) in reserves	-27	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**293**	**200**	**204**	**209**	**214**	**219**	**224**	**230**	**236**	**242**	**249**
Surplus (deficit) of capital funding	**-98**	**-200**	**-204**	**-209**	**-214**	**-219**	**-224**	**-230**	**-236**	**-242**	**-249**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

District-wide Operations

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	1,997	1,201	1,095	1,138	1,180	1,184	1,227	1,306	1,314	1,365	1,463
Targeted rates	390	390	399	407	417	427	437	448	460	472	485
Subsidies and grants - operational	0	20	21	21	21	22	22	23	24	24	25
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**2,387**	**1,611**	**1,514**	**1,567**	**1,618**	**1,632**	**1,686**	**1,777**	**1,797**	**1,861**	**1,973**
Application of operating funding											
Contractors costs	0	0	0	0	0	0	0	0	0	0	0
Professional services	20	33	34	34	35	36	37	38	39	39	41
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	180	136	137	140	142	145	148	150	153	157	160
Internal charges	1,029	1,407	1,343	1,392	1,403	1,452	1,502	1,549	1,605	1,665	1,729
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**1,229**	**1,576**	**1,514**	**1,567**	**1,580**	**1,632**	**1,686**	**1,737**	**1,797**	**1,861**	**1,929**
Surplus (deficit) of operating funding	**1,157**	**35**	**0**	**0**	**37**	**0**	**0**	**40**	**0**	**0**	**44**

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	250	62	64	66	69	72	75	78	81	85	88
Financial contributions	40	40	41	42	43	44	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**290**	**102**	**105**	**108**	**112**	**115**	**75**	**78**	**81**	**85**	**88**
Applications of capital funding											
Capital Expenditure - Growth	0	8	0	0	9	0	0	9	0	0	10
Capital Expenditure - LoS	0	12	0	0	12	0	0	13	0	0	14
Capital Expenditure - Renewal	0	15	0	0	16	0	0	18	0	0	19
Increase (decrease) in reserves	1,447	102	105	108	112	115	75	78	81	85	88
Total applications of capital funding	**1,447**	**137**	**105**	**108**	**149**	**115**	**75**	**118**	**81**	**85**	**132**
Surplus (deficit) of capital funding	**-1,157**	**-35**	**0**	**0**	**-37**	**0**	**0**	**-40**	**0**	**0**	**-44**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

7.2 Major Assumptions

The key assumptions of Council are described below. The following are the key risks that underlie the forecast financial assumptions:

- Council's level of confidence in the maintenance and operating forecasts is high, however the unpredictability of effects from storm events could affect expenditure forecasts year on year;
- Service levels are generally assumed to remain the same;
- Inflation is based on Council's knowledge of its business base and on Business and Economic Research Limited (BERL) predictors for the next 10 years;
- The cost of new and replacement assets will rise in line with inflation;
- Financial dollars are in today's dollar figures, as opposed to Net Present Value, meaning that long term projected rate of inflation has been included;
- The south-eastern area is prone to population fluctuations with increasing demand for services over the summer holiday period;
- Community activities will be affected by changing age demographics in the district; and
- The rating base will continue to remain static.

7.3 Key Asset Assumptions

Sealed pavement lives have been extended out to 80 years for low volume urban cul-de-sac streets and range up to 40 years life for the highest trafficked roads. Both these changes have occurred after analysing historic pavement achievements records where there is a known initial construction date. Also the subbase layer in the unsealed road pavement asset is not depreciated. Only the top layer is due to the method of maintaining the pavement. Other assets follow the asset life ranges in the table below and follow best practice guidelines

Component	Life (years)
Land, formation, subgrade (sealed) and lower pavement (unsealed)	Infinite
Base course and first coat seal	40-80
Reseal	8-10 depending on seal type
Drainage	Weighted average of 70
Surface water channels	Weighted average of 70
Paths – concrete	80
Paths – AC	40

Component	Life (years)
Traffic facilities	Weighted average of 5
Signs	12
Guard rails – timber	20
Guard rails	40
Hand rails – concrete	80
Retaining walls	50
Streetlighting	Weighted average of 25
Bridge and bridge culverts	40 or 100 depending on material

Summary of the Asset Valuation as at 30 June 2017.

Asset Group	Asset	ORC	ODRC	AD
Roading Assets				
Land and formation	Land	$68,471,031	$68,471,031	$0
	Formation	$195,189,626	$195,189,626	$0
	Subgrade	$38,405,439	$38,405,439	$0
Sealed roading	Basecourse	$34,101,449	$21,819,521	$655,803
	First coat seal	$23,015,057	$14,754,720	$426,457
	Reseal	$10,649,274	$6,002,719	$782,401
Unsealed roading	Lower pavement	$13,032,595	$13,032,595	$0
	Upper pavement	$5,585,398	$2,258,436	$681,536
	Wearing course	$9,681,775	$4,878,545	$1,210,033

Asset Group	Asset	ORC	ODRC	AD
Other roading assets	Drainage	$72,175,096	$39,111,810	$992,376
	Surface water channels	$13,758,468	$8,404,770	$192,035
	Footpath	$10,869,157	$7,008,639	$131,454
	Traffic facilities (paint markings)	$735,768	$367,884	$183,942
	Traffic facilities (other)	$911,824	$387,090	$73,296
	Signs	$2,495,768	$1,522,706	$206,319
	Railings	$3,331,264	$2,060,922	$100,041
	Retaining walls	$6,422,976	$4,673,137	$128,460
	Streetlighting	$2,468,861	$1,248,457	$96,367
	Bridges and bridge culverts	$97,090,738	$42,881,079	$1,070,645
	Roading total	**$608,391,564**	**$472,479,126**	**$6,931,165**

We are not aware of any reason why KDC auditors should not place reliance in the valuation prepared.

The valuations are based on accurate and substantially complete asset registers and appropriate replacement costs and effective lives. The basis of the data inputs used is described in detail in the report.

The lives are generally based upon NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0. In specific cases these have been modified where in the opinion of MWH and Council a different life is appropriate. The changes are justified in the valuation report.

The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

7.4 Budgeting Process

Consistent with the local Government Act 2002 (LGA) the budgeting process is iterative. Initial budgets are set with consultation between senior management and managers which then goes to Council (Commissioners) briefing meetings. At the end of the briefing meetings, Council (Mayor and Councillors) has a budget it feels is in line with community expectations and is prepared to send out for public consultation via the LTP. Based on submissions received from members of the community, feedback is sent back to Council for final ratification before being formally adopted by KDC Mayor and Councillors.

7.5 Funding Mechanisms

Council utilises multiple funding mechanisms with the aim being to distribute the costs evenly to those that benefit most or directly from the service. This section describes the various funding mechanisms available and used by Council.

7.5.1 Revenue

The basic forms of revenue utilised by Council are:

- Rates;
- Grants;
- Fees and Charges (includes rent / leases / licences);
- Targeted rate (forestry); and
- Fines, infringement fees.

The Roads and Footpaths asset is funded by way of general rates and fees and charges, as explained below.

7.5.2 Rates

Every year Council produces a Draft Annual Plan that details the proposed level of rates for the next financial year, along with details of how services will be funded and provided. The public is then invited to make submissions about the Plan. Council considers the submissions and the Mayor and Councillors make the final decision on the amount required by the Annual Plan and then formally set the rates. The rates are set in July of the rating year. There are two types of rates charges that apply to roads and footpaths:

- **General rates**
  - General rates are based on a combination of the property's land value (as assessed by Quotable Value New Zealand) and the characteristics of the property.

- **Uniform annual general charge (UAGC)**
  - The UAGC is a part of the general rate that is assessed on every Separately Used or Inhabited Property (SUIP) in the district.

Fees and Charges

This is the purest form of the user paying directly for the benefit or service they receive.

Development contributions

Development contributions required under the local Government Act 2002 are generally used to fund growth-related capital expenditure on infrastructure provided by Council as part of its normal capital programme.

Financial contributions are required under the Resource Management Act 1991. They are usually imposed to fund local works in the vicinity of developments, parties concerned.

Although Council can require both development contributions and financial contributions, it cannot require both from the same development for the same purpose.

7.5.3 Costs

There are two categories: Operational expenditure (OPEX) and Capital expenditure (CAPEX).

Operational Expenditure

Operational costs relate to all of the costs associated with the operational function of Council's road and footpath activity. Areas related to OPEX are: corporate, management, operations and maintenance. In addition, depreciation is considered Operational expenditure.

Capital Expenditure

Capital expenditure, or CAPEX, consists of renewals and augmentation. The renewal of an asset means to replace or renew the asset so it performs the same function to the same level of service.

Augmentation is the creation of a new asset or to extend an existing asset beyond its current capacity.

7.5.4 Depreciation

The fundamental purpose of accounting for depreciation is to reflect the cost of use of fixed assets in each financial year, measured by the amount of economic benefit consumed. Depreciation is a means by which funding is provided for the replacement of depreciating assets and, where fiscally possible, the repayments of debt.

7.5.5 Asset Management Practices

Information and Data

The AMP provides the direction as to the level of asset management expected and can differ between activities. The appropriate level of asset management to target engineering activities is identified in Section 10.1. The process assesses a range of parameters to establish the base level of asset management to provide the community, for each activity including:

- district and community populations;
- issues affecting the district and each activity;
- the costs and benefits to the community;
- legislative requirements;
- the size, condition and complexity of the assets;
- the risk associated with failures; and
- the skills and resources available to the organisation.

7.5.6 Asset Management Systems and Processes

Asset Management Systems

Council's asset management system (AMS) for transportation assets is RAMM (hosted by RAMM Ltd). The engineering department uses RAMM to record and track customer enquiries, maintain its asset register and for tracking non-routine maintenance of assets. Council's RAMM system is the primary asset management system and data management tool for the transportation activity. RAMM is a modular system and is a powerful tool used for the storage, interrogation and reporting of asset and maintenance data. Valuation of assets is also run from RAMM.

Asset managers, Council's consultants and contractors all have access to the system with levels of access appropriate to their needs.

Information Systems and Tools

Levels of service are reviewed on an ongoing basis, taking account of community outcomes, legislative requirements, financial constraints and knowledge of asset performance.

Grade	Description	Accuracy
1	Accurate	100%
2	Minor inaccuracies	± 5%
3	50% estimated	± 20%
4	Significant data estimated	± 30%
5	All data estimated	± 40%

Grade	Description	Completeness
1	Complete	100%
2	Minor gaps	90 – 99%
3	Major gaps	60 – 90%
4	Significant gaps	20 – 60%
5	Limited data available	20% or less

Information Systems	Data Type	Management Strategy		Data Confidence	
				Accuracy	Completeness
RAMM (all roading assets except slips, walkways, cycleways, street furniture, forestry roads and resource consents)	Asset Location and Inventory	All spatial data relevant to roads is held in RAMM. RAMM is a nationwide database owned and operated by RAMM Ltd. Council, its consultants and contractors have licences to allow access and interrogation of the information. RAMM also records the hierarchy of each road section.	Surfacing	2	2
			Pavements	2	2
			Footpaths	2	2
			Streetlights	1	1
			Bridges	2	2
			Carparks	2	1
			Service lanes	2	2
			Signs	2-3	3
RAMM (all roading assets except slips, walkways, cycleways, street furniture,	Asset Location and Inventory	All spatial data relevant to roads is held in RAMM. RAMM is a nationwide database owned and operated by RAMM Ltd. Council, its consultants and contractors have licences to allow access and interrogation of the information. RAMM also records the hierarchy of each road section.	Surfacing	2	2
			Pavements	2	2
			Footpaths	2	2
			Streetlights	1	1
			Bridges	2	2

Information Systems	Data Type	Management Strategy		Data Confidence	
				Accuracy	Completeness
forestry roads and resource consents)			Carparks	2	1
			Service lanes	2	2
			Signs	2-3	3
			Road markings	3	3
			Drainage structures	3	3
			Retaining walls	2	3
	Asset Valuation	RAMM contains information on asset extent, age, remaining life, condition etcetera. Asset valuations are undertaken through RAMM.		2	2
	Asset Condition	Condition data is held in the RAMM database. This is linked with the inventory data. Condition data is collected by the maintenance contractor or consultants.		2	4
	Asset Performance	Traffic count results and other performance surveys such as high speed surveys are held in the RAMM database.		2	3
	Maintenance Information	Historic maintenance costs are held in RAMM.		2	2
RAMM Contractor	Maintenance Management	RAMM Contractor is a tool linked to the RAMM database which provides for maintenance management including claim processing, inspections, programming and field updating. Tracking repairs and response times is carried out and reported to ensure key performance measures are being achieved.		2	2
Napier Computer Systems (NCS)	Financial Information	Council accounting and financial systems are based on NCS software and GAAP Guidelines. Long term financial decisions are based on the development of 10-year financial plans.		2	2
Exponare	Asset Location	Exponare is compiled from as-built information and should be the first port of call for asset location.		3	3

Information Systems	Data Type	Management Strategy	Data Confidence	
			Accuracy	Completeness
Tenderlink	Tenders	Council uploads all requests for tender documents onto the Tenderlink system which allows contractors to download for tender. The system also holds key information for tenderers. Tenderlink is a national database.	1	1
Crash Analysis System (CAS)	Crash Statistics	The CAS is a national database operated by NZTA which records all police crash reports. CAS provides outputs such as crash location maps, crash reports and crash statistics.	1	3

IntraMaps GIS system is the core system used to store and display the spatial data related to Council's core assets including its urban stormwater assets.

8 Risk Management

The Kaipara district roads are exposed to a range of hazards that effect its ability to deliver services to its community in an economically, socially and environmentally sustainable manner. These hazards can originate from natural events, road accidents, local terrorism and from the road asset deterioration leading to failure.

In today's environment, it is important that Council undertakes all appropriate actions and measures that could be reasonably expected to reduce the impact of a major event.

This section aligns with Kaipara District Council's current "Risk Management Policy and Framework" 2015, due for review Nov 2017.

8.1 Purpose of Risk Management

The purpose of Risk Management is to improve performance. This is achieved by facilitating and improving decision-making and resource allocation by identifying and assessing actual and potential events that could impact on objectives or service delivery and by suggesting mitigations and future controls.

8.1.1 Benefits of Risk Management

- it can help attain long term objectives;
- it can help make better decisions;
- it can help maximise resource utilisation;
- it can help plan "what if" contingencies and build resilience to unwanted events;
- it can help protect Council's assets, reputation and operations;
- it can improve performance and service delivery;
- it can reduce 'surprise' events and losses; and
- it can help identify opportunities.

8.1.2 Achieving the benefits

To achieve the benefits of Risk Management, Council has:

- adopted an integrated Risk Management Framework that provides a consistent and systematic approach to strategic and operational risk identification and management;
- established clear roles and responsibilities for Risk Management throughout Council; and
- developed a reporting framework to ensure that risks can be monitored at an appropriate level and escalated as required.

This will be supported by:

- facilitated Risk Management workshops;
- development of Risk Management tools and best practice guides; and
- development of training modules and learning opportunities.

8.1.3 Roles and Responsibilities

The tables below provide a summary of the main Risk Management roles and responsibilities within Council. Fuller details of roles and responsibilities are contained in Appendix 1.

Roles and Responsibilities

Individual or Group	Summary of role and responsibilities
Council	To ensure that appropriate Risk Management structures, policies and processes are in place; and To make Policy decisions consistent with Risk Management practice.
Audit and Risk Committee	Ensuring that Council has appropriate Risk Management and internal control systems in place; Approving and reviewing Risk Management programmes and reviewing risk treatment plans for significant risks; To monitor organisational performance in mitigating risk; and Form a view on the overall risk profile and its acceptability.
Chief Executive and Executive Team	Ensure that the Risk Management Policy and Framework is implemented throughout Council. To manage strategic risks based on their knowledge and understanding of these risks and how they can be managed to achieve objectives.

Individual or Group	Summary of role and responsibilities
General Managers	To manage operational risks that affect strategic objectives or delivery of their operational objectives.
Activity Managers	To manage operational risks that affect delivery of their operational objectives.
Risk Manager (General Manager Finance)	To facilitate the Risk Management process throughout Council.

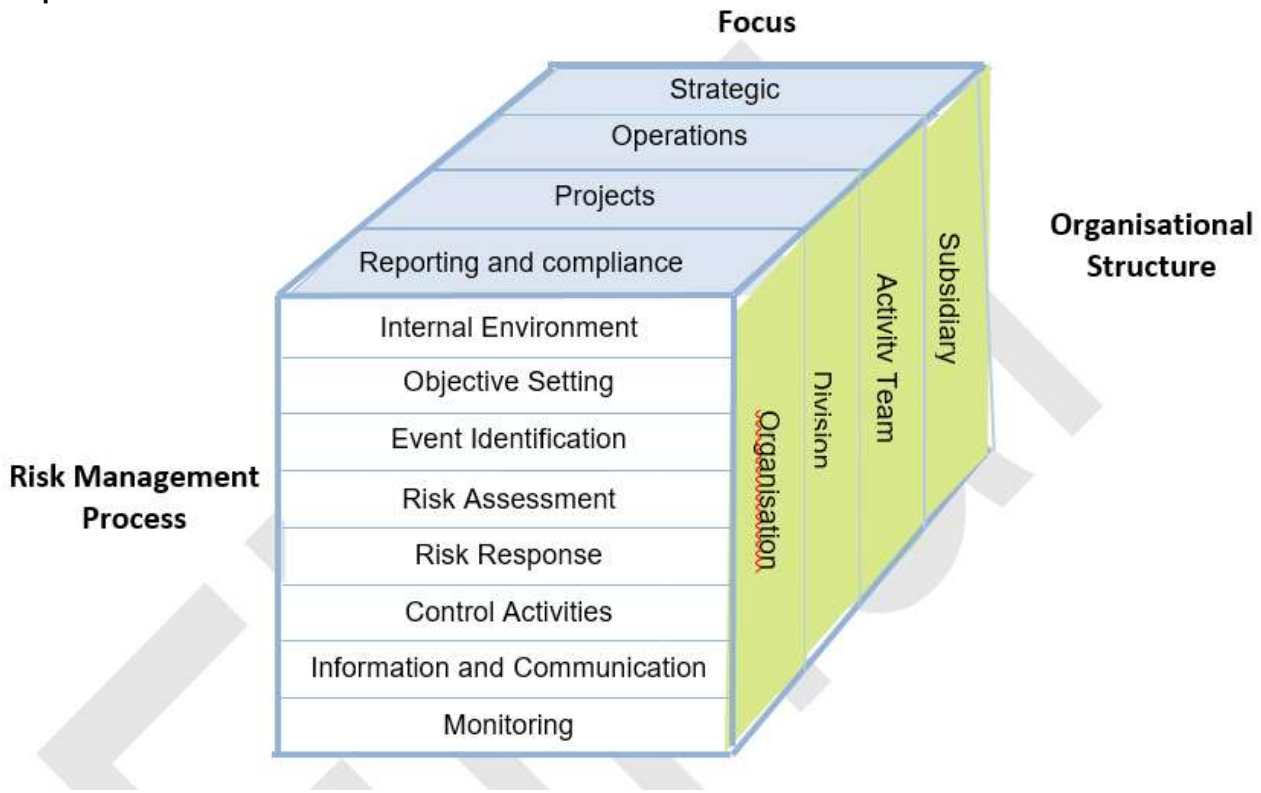
Project Roles and Responsibilities

Managers	To manage risks escalated to the General Manager by the Project Leader.
Project Leaders	To approve the management plan for project risks that affect strategic objectives or delivery of their project objectives.
Project Managers	To manage project risks that affect the delivery of their project objectives.

9 Framework

Council recognises that Risk Management is not an isolated activity, nor a yearly compliance activity. To be truly effective Risk Management must integrate into and permeate through both the organisational structure and the objectives of Council. The integrated framework below visually represents the inter-relationship between:

Risk Management process



This matrix shows that the Risk Management process applies to all the objectives of Council and penetrates down through from the highest level of Council's organisational structure to the very lowest level. In turn, it should also be clear that objectives do not sit in isolation at each level in the organisation structure but that each part of Council's structure works to support the strategic objectives.

9.1 Risk Management Process

9.1.1 Internal Environment

Kaipara District Council is a territorial local authority. The internal environment; governance structure, powers, duties, authorities, codes of conduct, values and ethics and responsibilities are primarily determined by the Local Government Act 2002.

In the same way that commercial enterprises are accountable to their shareholders Council is accountable to the people of Kaipara district. Most citizens expect Council to have higher standards of stewardship and prudence in safeguarding and spending the public purse.

However, Council was in need of transformation to address issues identified by its citizens, a Crown Review Team and Commissioners appointed to replace elected representatives for a period of three years. This has now happened and we are back with a democratically-elected Council. This transformation will change the internal environment. This will reflect in a new organisational culture and in turn influences the setting of strategies and objectives.

9.1.2 Objective Setting

The strategic objectives of Council are set out in the Long Term Plan and these establish the basis of Council's activities and operations, in particular the discrete projects Council will undertake to meet the wants and expectations of people of the district. In addition to the strategic objectives, Council has operational objectives to meet the demand for both statutory and non-statutory Council services.

Setting objectives drives the operational activities required and sets the reporting requirement for monitoring to ensure alignment with objectives. In setting objectives, it is essential that consideration is given to Council's risk appetite and tolerance.

9.1.3 Event Identification

Once objectives are set then events that may stop, delay or otherwise hinder the achievement of objectives are considered. To assist in identifying events it can be useful to categorise risks. The categories below are not an exhaustive list, however are a guide to assist in identifying what can happen.

Internal (direct influence)	External (indirect, limited or no influence)
Governance	Reputation
Delivery of commitments	Partners
Customers	Election outcomes
Operations	Statutory changes
People	Socio-cultural
Processes	Environment
Technology	Economic
Information management	
Financial	
Legal and regulatory compliance	
Assets	

Definitions of the above risk categories are in Appendix 2.

9.1.4 Risk Assessment

By identifying what events can happen we can now consider what effect the occurrence would have on achieving the objective? To assess what the affect would be we need to consider the likelihood, or chance, that the event will occur and the impact, or consequences, of the occurrence.

Please refer to the tables in Appendix 3.

Score	Impact	Likelihood
1	Insignificant	Rare
2	Minor	Unlikely
3	Moderate	Moderate
4	Major	Likely
5	Extreme	Almost Certain

We can plot the likelihood against the impact to create a risk profile that helps us prioritise risks based on their impact and likelihood. This in turn can assist in determining the most appropriate actions to respond to the prioritised risks.

Summary Risk Profile

(enter each risk number on this table)

Impact						
	5					
	4					
	3					
	2					
	1					
		1	2	3	4	5

Likelihood

The above graph is coloured to reflect the likely risk responses described in the following page. Responses range from Accept (green) to Avoid (deep red).

9.1.5 Risk Response

In considering the best way to manage a risk, Council will consider the following options:

Response	Description
Accept (Tolerate)	Recognise that the risk exists but continue with activity.
Share (Transfer)	Transfer the risk, or the consequences of the risk occurring, to another party. Usually this will involve a contractual arrangement - construction contract, contract of insurance.
Reduce (Treat)	Take action to reduce the impact and/or likelihood of the event occurring.
Avoid (Terminate)	Stopping the activity completely or stop and replace with an alternative activity.

There are no set rules in applying these options, although generally low risk activities are acceptable and higher risk activities only undertaken if there is a statutory duty or if there are significant rewards. In considering the identified risks, one must firstly consider the context of the activity that creates the risk to decide whether an option is available. Equally, the options are not mutually exclusive and for some identified risks, the optimum solution will be a combination of the options.

That said it can be useful to look at the Risk Profile alongside the following guide.

Guide	Action Required
Accept	Consequences are insignificant. Manage by regular monitoring.
Share/Reduce	Consequences may be unacceptable and need management action to share and/or reduce likelihood/impact.
Reduce/Share	Consequences are unacceptable and need immediate management action to share and/or reduce likelihood/impact.
Avoid	Consequences are too great. Continue only if there is a statutory duty or with approval of Executive Team.

9.1.6 Control Activities

To ensure appropriate responses to identified risks Council has policies and procedures that have embedded internal controls to manage the normal business risks. In addition to this, Council uses risk registers and action plans to monitor and control the specific key risks to Council, to each team and project.

9.1.7 Information and Communication

To be effective Risk Management requires a reporting structure that ensures that data and information be captured and communicated at an appropriate level to enable decisions.

There is a continual process of event identification, assessment and response that requires the best information available.

9.1.8 Monitoring

Management are responsible for monitoring progress against objectives including the ongoing monitoring of Risk Management activities. This is achieved by measuring performance against objectives having regard to the risk register(s) and action plans.

The Risk Manager provides a technical assessment of Risk Management activities throughout Council to give assurance about the effectiveness of Risk Management within Council.

9.2 Organisational Structure

9.2.1 Organisation

This is the level at which the Executive Team operates to direct and control the divisions, and activity teams to implement Council resolutions.

9.2.2 Division

Council currently has five thematic divisions:

- Corporate Services;
- Community;
- Planning and Regulatory;
- Infrastructure; and
- Finance.

9.2.3 Activity Profiles and Activity Teams

Council services are documented in Activity Profiles. Each Activity Profile is managed by an Activity Manager. The 10 (external facing) Activity Profiles are:

- Community Activity;
- District Leadership;
- Emergency Management;
- Flood Protection;
- Regulatory;
- Roads and Footpaths;
- Solid Waste;
- Stormwater;
- Wastewater; and
- Water Supply.

District Leadership, as a cost centre, includes six (internal) Activity Profiles as follows:

- Finance;
- Customer Service;
- Information Technology (IT);
- Administration and Support;
- Human Resources (HR); and
- Revenue.

Their purpose is to provide access to both statutory and non-statutory services either by direct provision or access to an external provider.

9.2.4 Subsidiary

At the subsidiary level are the Operational Teams that work with Activity Teams to provide Council services to citizens. (Note: At this point Council does not have any subsidiaries, however future activity reviews have indicated that a subsidiary (or business unit) structure will be more conducive to promote efficiencies, hence the establishment of the NTA).

9.3 Focus

9.3.1 Strategic

The strategic focus for Council is to meet the vision, goals and objectives that are contained within the Long Term Plan (LTP).

9.3.2 Operations

This is the provision of services to the community provided directly by, or facilitated by, Council to meet its statutory duties or agreed voluntary obligations. Council will always seek to provide services by the most efficient and effective means.

9.3.3 Projects

These are specific tasks undertaken to meet a particular objective. Some projects are undertaken as part of the day-to-day operations of a Council team e.g. transport projects, and these will generally be considered as operations. In this context, we are concerned with the one-off projects that are not the day-to-day business of Council.

9.3.4 Reporting and Compliance

The permitted activities of Council are primarily contained in the Local Government Act 2002. The Delegations Register outlines the delegated authority of Council officers and Committees to act on behalf of Council. In carrying out duties for Council more specific legislation and regulations may also apply.

Compliance with legislation and regulation, particularly statutory duties, is a key objective. Council must not only be able to demonstrate and report on compliance but have the ability to report and resolve incidences of non-compliance.

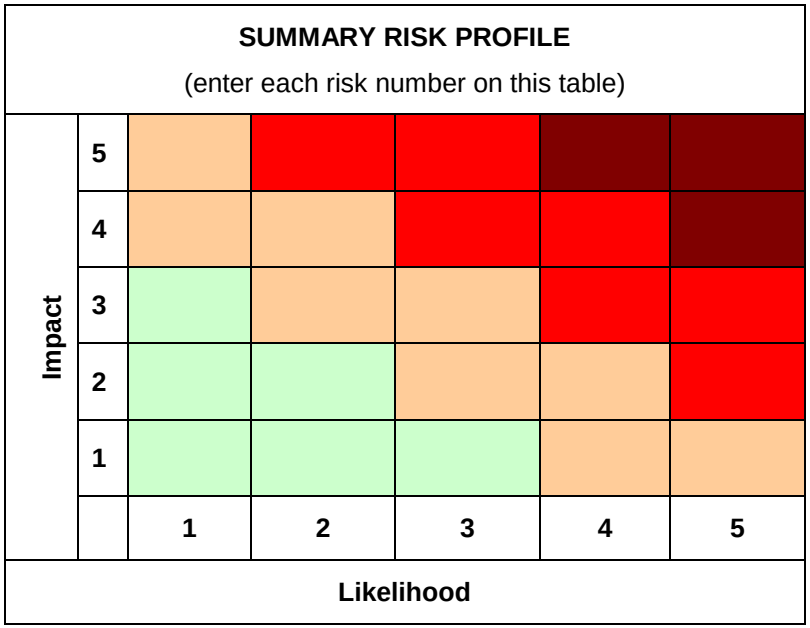
9.4 Risk Appetite and Tolerance

The risk appetite is Council's ability to accept identified risks without any action, usually expressed as a financial sum.

Risk tolerance is the resilience of Council to an overcome the consequences of an event, normally expressed as a financial sum or a time recovery period.

However, the diversity of risks throughout Council and the differing ability of the constituent parts to accept risk and to recover from events make it difficult to impose any set appetite or tolerance limits.

Recognising this difficulty Council accepts that each division/team/project can set its own appetite and tolerance but must use as a very minimum the colour-coding of the risk matrix as a proxy for appetite and tolerance unless a specific measure has been agreed with the General Manager or Executive Team.



Guide	Action Required
Acceptable	Risk is acceptable / Council is very resilient to occurrence and no action required.
Acceptable with controls	Risk is within tolerance limits / Council is resilient to occurrence. Action to mitigate is desirable.
Not Acceptable	Risk is not within tolerance limit / Council has limited resilient to occurrence. Action to mitigate is immediately required.

Totally unacceptable	Risk is intolerable. Continue only if there is a statutory duty or with approval of Executive Team.

Council recognises the limitations of risk matrices as a guide to appetite and tolerance, particularly in relation to high impact/low likelihood and high likelihood/low impact events. The General Manager can provide, or facilitate the provision of, advice in these circumstances.

9.5 Risk Registers

Council uses risk registers to record identified risk, consequences, likelihood and impact, controls to be used, and ownership (responsibility).

To ensure consistency use of a standard template is required (see Appendix 4).

9.5.1 Risk Monitoring and Reporting Framework

Management is responsible for monitoring progress against objectives including the ongoing monitoring of Risk Management activities. This is achieved by measuring performance against objectives having regard to the risk register(s) and action plans.

The Risk Manager provides an independent assessment of Risk Management activities throughout Council to give assurance about the effectiveness of Risk Management within Council.

Appendix 1: Role and Responsibilities

Council

Commissioners have a responsibility to the local community to govern the Council. Proper governance requires that members know and understand the risks to attaining the strategic objectives of the Council. Members are accountable for their policy decisions and should ensure decisions appropriately balance the risks and rewards.

Audit, Risk and Finance Committee

The Audit, Risk and Finance Committee is responsible for ensuring that Council has appropriate Risk Management and internal control systems in place, monitoring organisational performance in managing risk and forming a view on the overall risk profile and its acceptability.

Chief Executive

The Chief Executive is accountable to the Mayor and Councillors and is responsible for the implementation of the Risk Management Policy and Framework approved by the Mayor and Councillors and for ensuring that an appropriate risk reporting mechanism exists between officers and Mayor and Councillors.

Executive Team

The Executive Team is responsible for the management of risks that affect the attainment of strategic objectives or that are a material threat to the operational capacity or reputation of the Council.

General Mangers

General Managers are responsible for the management of operational risks that affect the attainment of their objectives or that are a material threat to the operational capacity or reputation of their division.

Activity Managers

Managers are responsible for the management of operational risks that affect the delivery of their operation or that are a material threat to the operational capacity or reputation of their group.

Risk Manager

- Provides the Council-wide framework and process to be followed for identifying and recording risk activities including reporting methodologies and the format for risk registers;
- Develops standards for identifying and managing risk;
- Ensures a consistent practical approach is adopted to Risk Management throughout Council;
- Facilitates regular risk forums to share information, discuss risk issues being identified and to determine those that are system related, Council-wide, have uniform mitigation methodologies;
- Organises or provides risk training;
- Identifies content/topic experts (both internal and external) for various risks referring on enquiries or obtaining opinions as required;
- Maintains a view of related industry best practice;
- Mentors new risk co-ordinators;
- Maintains the organisation risk register; and
- Undertakes and reports on risk reviews across the Council.

Staff

Staff are responsible for the day-to-day management of risks that affect the performance of their duties with the Council and subject always to the policies, plans and procedures of the Council.

Project Specific Roles and Responsibilities

1 General Manager

- To manage risks escalated to the General Manager by the Project Leader.

2 Project leaders

- To approve the Management Plan for project risks that affect strategic objectives or delivery of their project objectives.

3 Project Managers

- Project Managers are responsible for the management of project risks that affect the delivery of their project objectives.

Appendix 2: Risk Categories

1 Internal Risk Categories (Direct influence)

Governance	Risk arising from the performance of duties of officers and elected representatives. Propriety/compliance with relevant requirements/ethical considerations.
Delivery of commitments	Risks to the development, planning and delivery of political commitments within the Long Term Plan (LTP). Consultation and communication, project management and project delivery issues.
Customers	Meeting needs, wants and expectations of customers in respect of Council facilities, service standards and service provision.
Operations	Risk arising from the day-to-day operations of Council groups and project teams. Risks that affect service delivery standards and best practice. The ability of the Council to compete and provide best value to in the provision of services. Opportunities to reduce waste and inefficiency.
People	Risks related to people and their well-being. Staff talent, recruitment and retention issues, including market competitiveness. Management protocols, training, development and capacity issues. Health and safety, disability and discrimination issues. Resilience and ability to change.
Processes	Risk associated with internal processes and how they relate to each other. The adequacy, efficient and effectiveness of these processes. The interface with other processes.
Technology	Risks arising from current provision of technology and changing demand/capacity. Use or misuse/security of new or existing technology. Obsolescence of current systems; opportunities arising from new technology.
Information management	Risks that affect the Council's ability to store, retrieve and use data and information, including adequacy for decision-making and protection of privacy.
Financial	Risks that affect the finances or financial planning of the Council. Includes management, control and ability to meet financial commitments and support strategies and objectives.
Legal and Regulatory Compliance	Risk from failing to comply with statutory or common law, delegations, regulations and contractual obligations, including failure to address changes to law in policy and procedures.
Assets	Risks that cause loss or damage to assets owned or operated by the Council to provide services. Includes land, property, equipment, information.

2 External Risk Categories (Indirect, limited or no influence)

Reputation	Confidence and trust stakeholders have in the organisation. Risks that may directly, or indirectly, damage the reputation of the Council or any of its Elected Members or key personnel.
Partners	Risk relating to partnerships, alliances, new ways of working, stakeholder management.
Election outcomes	Change of Government (central and local), cross-cutting policy decisions, and machinery of Government changes. Includes the exertion of political influence to set or change policy, direction, objective, strategy etcetera. Potential ratepayer dissatisfaction and/or change in direction.
Statutory changes	New or changed statutory environment.
Socio cultural	Social and cultural demographic changes that effects demand for services. Stakeholder expectation changes over time.
Environmental	Environmental changes such as climactic changes and Acts of God.
Economic	Risk relating to the economic environment. Changes in the demand for Council services, production, distribution, and consumption of goods and services.

Appendix 3: Impact and Likelihood Tables

Impact Table

Score	Impact	Description
1	Insignificant	Event will have little, or no, effect on the objective(s).
2	Minor	Event will have some effect on achieving the objective(s), but well within tolerable limits.
3	Moderate	Event will affect the achievement of the objective(s), but within tolerable limits.
4	Major	Event will affect the achievement of objective(s), beyond tolerable limits. Remedial action will be required.
5	Extreme	Event will affect the viability of the objective(s), may be too late or too costly to take remedial action.

Likelihood Table

Score	Likelihood	Description
1	Rare	Event will only occur in exceptional circumstances and timeframe is usually unpredictable.
2	Unlikely	Event occurs infrequently and is difficult to predict.
3	Moderate	Event occurs occasionally but is not reliably predictable.
4	Likely	Event is a regular occurrence that is predictable.
5	Almost Certain	Event is a frequent occurrence and will generally have an established history of occurrence and a high degree of predictability.

Risk Management Table

Risk #	Rating	Risk Description	Consequences	Existing Controls (and Future Controls)	Impact (Net)	Likelihood (Net)	Planned Mitigations (Treatments)	Owner	Primary Theme
1	High	Community expectations exceed Council's current LOS.	Community becomes dissatisfied with Council delivery. Past disappointments creates disengagement and reduced future participation.	Community Planned approach, meeting with communities, community expectations well-managed.	4	3	New field infrastructure role deployed. Improved advertising of impending roading programmes in local newspapers. Improvement of Network inspection cycle.	Roading Manager	
2	Very High	Community loses confidence that Council is the best service provider to manage rural roads.	Community becomes dissatisfied with Council delivery.	Keep ratepayers better informed and advise of planned works. Community expectations well-managed.	4	4	Ensure that Risk 1 'community expectations exceed Council resources' is well-managed. Communicate better.	Roading Manager	
3	Medium	Communication / consultation that takes place is not all-inclusive and therefore not representative of the whole district.	Perceptions are formed and some sections of the district feel disregarded.	Regular media publications in the local newspapers. Advisory Panels and elected representatives.	3	3	Improved communication with the community via media publications and dialogue with the community during the Annual Plan / LTP process.	Roading Manager	
4	Medium	Increases in storm event intensity and consequential re-definition i.e. Annual Re-currency Interval (ARI).	Unplanned expenditure and resource allocation.	Emergency Event budget. Maintenance Contractors put on stand-by when required.	3	3	Identify high risk areas with a view to improve infrastructure resilience for these areas via the CAPEX programme.	Roading Manager	

Risk #	Rating	Risk Description	Consequences	Existing Controls (and Future Controls)	Impact (Net)	Likelihood (Net)	Planned Mitigations (Treatments)	Owner	Primary Theme
5	High	A one-off large natural event causes extreme damage both physically and economically.	Damaged infrastructure, unplanned expenditure and resource allocation. Loss of Connectivity. Loss of Route Resilience and Essential Services.	Civil Defence legislation. Regional Civil Defence Plans. Contracted Maintenance Contractor (resources). Claim emergency repair costs from NZTA.	4	3	Community Response Plans prepared for all Communities in the district.	Roading Manager	
6	Medium	Contractor's ability is limited in Northland's smaller market.	Annual Roading Programme remains underspent.	No existing controls - market-dependant. Monitor market.	3	3	Go out to the market early. Collaborate with Northland councils. Preferred Supplier Panels.	Roading Manager	
7	High	Unavailability of consultants to tender for work due to market capacity.	Annual Programme remains underspent. Critical information for decision-making unavailable.	No existing controls - market-dependant. Monitor market.	4	3	Establish an in-house Roading Business Unit. Collaborate with Northland councils. Preferred Supplier Panels.	Roading Manager	
8	Very High	Inability to attract and retain quality staff.	High Employee turnover results in loss of expertise, skills, experience. As well as ongoing costs such as training and lost production during recruitment process.	Monitor market conditions. Monitor staff morale and turnover.	4	4	Attract and retain quality staff by offering highly competitive remuneration packages and a good work-life balance. Collaborate with Northland councils.	Roading Manager	
9	High	Decreased NZTA subsidies.	Either rates increase or level of service decreases.	Funding via general rates, UAGC, and targeted rates.	4	3	Ensure good quality AMP with business cases to support Network Strategies.	Roading Manager	

Risk #	Rating	Risk Description	Consequences	Existing Controls (and Future Controls)	Impact (Net)	Likelihood (Net)	Planned Mitigations (Treatments)	Owner	Primary Theme
10	High	One Network Road Classification (ONRC) changes result in a lower LOS for Kaipara roads and therefore less NZTA funding.	Either rates increase or level of service decreases.	Funding via general rates, UAGC and targeted rates. Monitor ONRC benchmarking against peers.	4	3	Ensure good quality AMP with business cases to support subsidy applications. Political lobbying of central government if required.	Roading Manager	
11	High	Failing of the NTA arrangement.	Losing the working together of the other RCA's in Northland. Losing continuity, losing collaboration, losing connectivity. Creating an isolated working environment.	Relocate the KDC internal business unit to share in the joint NTA space. Appropriate skills and resources.	4	3	Resource and skills needed to make this work. Internal organisational support. Monitor performance against agreed SLA and Business Plan.	GM Infrastructure / Roading Manager	

Target Risk Level Remaining High

Risk	Risk Description	Scope	Current Control	Current Risk Level	Proposed Control	Target Risk Level
Integration						
Emergency Services	Ineffective communication and planning of maintenance and renewal works impacts all emergency services.	District	Contract documents ensure that contractors inform emergency services of closures.	**HIGH**	Review communication structure.	**MEDIUM**
Landowners	Inadequate access agreements to access infrastructure (orphan bridges and access to culverts).	District	Ad-hoc co-ordination.	**HIGH**	Divest assets.	**LOW**
Natural Hazards						
Earthquake (1:400)	Significant damage to bridges, critical routes, retaining structures and roads.	District	Implementation of lifelines bridges report recommendations. Design standards. Seismic testing.	**LOW**	Seismic testing and strengthening. Review planning.	**LOW**
Extreme Weather (Rain)	Surface water impacts road safety.	District	Contractor response and resources. Road hierarchy. Maintenance programme.	**HIGH**	Signpost frequently flooded road sections. Consider weather-proofing critical roads and developing awareness plan.	**HIGH**
Technological Hazards						
Contamination (Land)	Accidental chemical spill on network.	District	Emergency services response. Response part of maintenance contracts.	**MEDIUM**	Develop response plans.	**MEDIUM**
Security						
Terrorism (Political)	Incident. road blockade due to dust etcetera. Dissatisfaction.	Unsealed road network	Monitor.	**HIGH**	Develop a strategy for managing dust nuisance.	**HIGH**

Projects to Address Risk Shortfalls

The specific risk mitigation measures that should be planned within the 20 year transportation programme include:

- An allowance for emergency funds;
- A focused maintenance programme for that portion of the network deemed critical;
- Bridge seismic assessments upgrade programme for those critical routes; and
- A resilience/robustness assessment of the KDC transport network.

Business Continuance

The Council needs to develop an up-to-date business continuity / operations recovery plan that will enable it to continue to provide the service, albeit perhaps in a reduced form, should a natural disaster or other emergency occur.

Asset Insurance

Kaipara District Council (KDC) has various mechanisms to insure assets against damage. These include:

- KDC insures the above ground assets, such as buildings, through private insurance; and
- KDC is a member of the Local Authority Protection Programme (LAPP) which is a mutual pool created by local authorities to cater for the replacement of some types of infrastructure assets following catastrophic damage by natural disasters like earthquake, storms, floods, cyclones, tornados, volcanic eruption, tsunami. These infrastructure assets are generally stopbanks along rivers and underground assets like water and wastewater pipes and stormwater drainage, therefore not transport assets.

Civil Defence Emergency Management

The Civil Defence Emergency Management Act (the Act) 2002 was developed to ensure that the community is in the best possible position to prepare for, deal with and recover from local, regional and national emergencies. The Act requires that a risk management approach be taken when dealing with hazards including natural hazards. In identifying and analysing these risks the Act dictates that consideration is given to both the likelihood of the event occurring and its consequences. The Act sets out the responsibilities for local authorities. These are to:

- Ensure they are able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency; and
- Plan and provide for civil defence emergency management within their own district.

Engineering Lifelines

The Northland Lifelines project was established in 2004 to determine the critical elements of Northland's infrastructure and plan to improve the resilience of the infrastructure to hazards. The Northland Lifelines Group works under the auspices of the Northland Regional Council and has been successful at pulling together the various road controlling and utility service providers to develop networks that are better prepared to respond when emergencies occur.

The Lifelines project has previously identified the key routes that should either remain open or be the first routes to open in the event of emergencies. These align with the hierarchy in this AMP. The key Lifeline routes within Kaipara have been identified as Pouto Road, Awakino Road, Cove Road, Mangawhai Heads to Waipu and Kaiwaka-Mangawhai Road.

10 Improvement Plan

10.1 Improvements to Asset Management Planning

The purpose of the Improvement Plan is to:

- Identify and develop asset management planning improvements; and
- Continue to develop the Kaipara systems to align with the ONRC system.

Identify timescales, priorities and human and financial resources required to deliver the most appropriate asset management of the transport assets planning objectives.

This section of the AMP provides an outline of future improvements to asset management information and processes related to Council's Roads and Footpaths asset.

The Kaipara District Council's Asset Management Strategy is oriented around a framework to:

- The Government's current GPS (Transport) focus and priorities;
- Take into account our customer's (ratepayers and users) interests and desired outcomes;
- Developing the management of the road network in accordance with the ONRC Customer Outcomes and the Technical Outcomes; and
- Procure the operational, renewal and project services in the most cost-effective manner delivering VfM in the right place at the right time.

Procurement of capital, maintenance or renewal work is undertaken in accordance with the Council's procurement strategy, in alignment with the NZTA procurement rules and the Government's Tendering policies.

Asset Management Strategies Summary

Strategy	Processes and Systems

Renewals Management	• Renewals identified and scheduled from condition degradation modelling surveys and physical inspection as a calibration of all major assets (Sealed roads, Unsealed Roads, Bridges, Large Culverts and retaining structures;
	• Minor asset renewals are combined with other works to allow for VfM and expediency;
	• Optimising review in order to finalise renewals programme:
	  ○ "bundling" with other projects – associated improvements, safety, drainage; and
	  ○ smoothing of programme to assist with balancing expenditure.

Strategy	Processes and Systems
	• On an annual basis renewal work is programmed for implementation and managed as a programme – either through the Operations and Maintenance contract or through specific tendered capital projects.

Asset Creation Management	• All capital projects identified are listed and with a cost estimate. For consistency, a cost estimating spreadsheet will be developed and a series of base rates developed. The cost estimating spreadsheets require:
	  ○ assessment of construction and non-construction costs (concept, design, construction MSQA, consenting costs, land costs);
	  ○ An assessment of contingency (Risk) needed;
	  ○ An evaluation of the project drivers – increased level of service or growth; and
	  ○ An evaluation of timeline in regards to capacity.
	• Once estimated the forecasts are combined in a capital expenditure forecast database that records the outcomes of the estimate in a manner that allows summation of the work value against various criteria – scheme, project driver (growth or increased LoS), year or project. It is also used as an input into the council's financial system; and
	• The records of the individual project estimate sheets and the overall capital forecast spreadsheet are filed and retained.

Operational and Maintenance Planning	**Developing a Concept of Operations and Maintenance** Network operations planning is a fundamental reason why road authorities exist. Having well planned and implemented processes in place to operate the road network is a priority for government. Network operations planning has come a long way in a relatively short time and is now an integral part of operating the road network in many jurisdictions. Though network operations planning is growing, there is a perceived disconnect between those who work at the strategic end of the process and those involved in the tactical or operational day-to-day end. Roles and responsibilities are not always clear and defined, feedback loops not always transparent, and stakeholders seem to have relatively low visibility of what goes on at each end of the process and the respective challenges faced by those people who operate the road network. • A Concept of Operations (ConOps) document would bridge the gap and provide a best practice resource for all those involved in network operations planning.

10.2 Improvement Plan/GAP Analysis

Process Overview

The Asset Management Plan (AMP) has been developed as a tool to drive how Council manages the Transport assets, deliver the levels of service and identify the expenditure and funding requirements of the activity. Continuous improvements are essential to ensure Council continues to achieve the appropriate (and desired) level of activity management practice; delivering services in the most sustainable, VfM way while meeting the community's needs.

Establishment of a robust, continuous improvement process ensures Council is making the most effective use of resources to achieve an appropriate level of asset management practice.

The continuous improvement process includes:

- Identification of refinements;
- Prioritisation of improvements;
- Improved data collection, quality, coverage and mining;
- Establishment of an improvement programme with timeline priorities; and
- Ongoing review and monitoring of the programme.

All improvements identified are included in a single improvement programme. In this way, opportunities to identify and deliver cross-activity improvements can be managed more efficiently, and overall delivery of improvement can be monitored across this part of Council's business.

10.3 Improvement Plan Process

As part of the Improvement Plan process, the following assessments should be undertaken:

Improvement Projects

Improvement projects are used to assist with the detailed planning and resource allocation.

Each project is allocated a lead and support responsibility to drive the project to completion.

Improvement Programme

The timeframe for each project takes into consideration the availability of resources from the roading team and other support/enabling teams.

10.4 Monitoring

The planned improvement programme will be updated on a three monthly basis to allow complete transparency and management of the programme.

10.5 Transport Improvement Plan Project List

Through the development of the 2017 Transport Asset Management Plan, a schedule of improvement projects have been identified. These are listed in the Improvement Plan Project List below.

Planned Improvement Actions

AMP Action Ref:	Improvement Action	Further Information	Priority (High Medium Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Council Named Position Responsible for Managing to Close	Cost Estimate for Years 1 - 3
01	Continued development of AMP in accordance with business case approach and asset management.	Ongoing management of the improvement plan. Consider how NTA shared skills may be better utilised. Look at how a regional AMP may look and how the current AMP's would assimilate into one. Develop agreement on how a set of regional asset condition measures may be implemented.	H	Ongoing	2017	2021	Asset Engineer	$2k
01A	Concept of operations	Though network operations planning is growing, there is a perceived disconnect between those who work at the strategic end of the process and those involved in the tactical or operational day-to-day end. Roles and responsibilities are not always clear and defined, feedback loops not always transparent, and stakeholders seem to have relatively low visibility of what goes on at each end of the process and the respective challenges faced by those people who operate the road network.	H	Not started	2017	2019	Asset Engineer	$2k

AMP Action Ref:	Improvement Action	Further Information	Priority (High Medium Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Council Named Position Responsible for Managing to Close	Cost Estimate for Years 1 - 3
02	Network management improvements	Develop and implement RAPT style process for sealed network. Continue with HSD annually to allow for more developed network assessment. Develop unsealed network dataset to include gradient, geometry, roughness with an annual snapshot then intervene with RoadRoid system in selected roads. Further segmentation into ONRC sub-classifications. Develop bridge programme in conjunction with NZTA for those routes/bridges identified as on a State Highway Alternate route. This should include 50MAX and HPMV. Complete 50MAX assessment and discuss those bridges and routes with NZTA. Consider a seismic assessment of those bridges on critical lifeline routes. Complete a LUX (HISLAT) survey of the streetlights once the LED conversion is complete to understand where black-spots may need infill. Consider a more durable roadmarking paint for black-spot areas especially edge lines on rural road curves.	H	Under development	2017	2021	Asset Engineer	$100k
03	Levels of Service: Review of road network hierarchy.	Develop an economic network plan to define the KDC roading hierarchy based on economic development and in accordance with the NZTA national road classification system ONRC. Also map most critical Sealed and unsealed roads on network.	H	In progress	2016	2018	Roading Manager	$25k

AMP Action Ref:	Improvement Action	Further Information	Priority (High Medium Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Council Named Position Responsible for Managing to Close	Cost Estimate for Years 1 - 3
04	Unsealed Roads Management Strategy.	Complete development of USMS and implement into operations. This includes incorporating the ONRC LoS	H	In progress	2017	2018	Roading Manager	$15k
05	Sealed Road Management Strategy.	Complete development of a targeted management and intervention strategy for sealed roads. This will drive KPI's into MO&R Contract and will include the ONRC LoS.	H	In progress	2017	2018	Roading Manager	$15k
06	Improve asset data	Review RAMM database in line with the REG Data confidence report to determine where data is missing and or is of low quality. Develop a process to improve this data as well as developing systems for new data based on BIM digital platforms.	H	In progress	2016	2018	Asset Engineer	$15k
07	Asset management practices	Development of new tools such as JUNO and FIT to allow more detailed management of the network. Start collecting all work on network into RAMM FWP to allow for planning and programming. Development a Roading based GIS system to allow improved management of the network. Review and improve the current traffic counting process to better be aligned to the ONRC system and also the freight movements.	H	In progress	2012	2018	Asset Engineer	$45k
08	New asset data acceptance	Review adequacy of developers handover requirements contained within Engineering Standards. Identify programme to enhance – include for asset schedules and capital cost recording for each asset created.	M	Underway	2012	2019	Roading Manager	

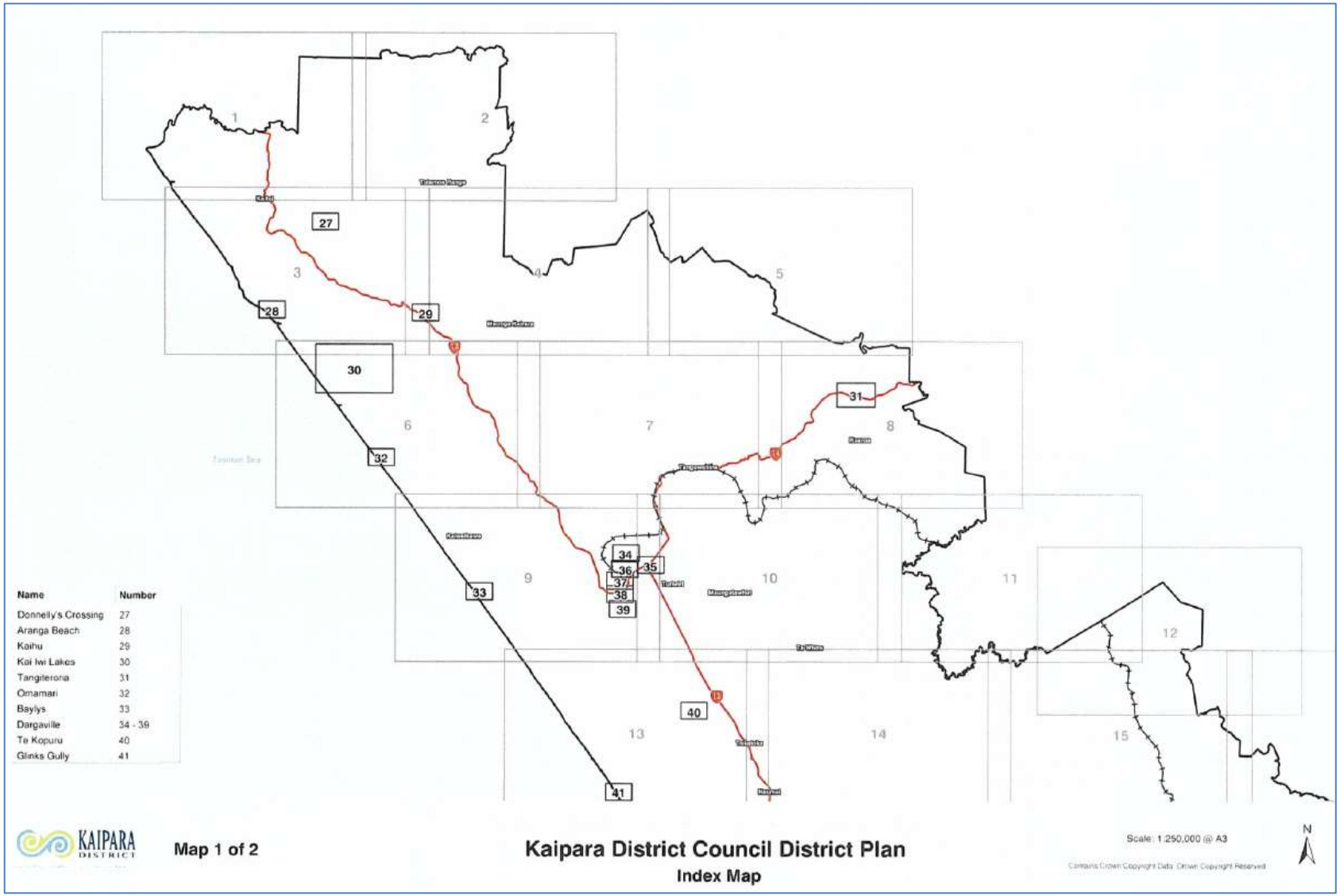
AMP Action Ref:	Improvement Action	Further Information	Priority (High Medium Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Council Named Position Responsible for Managing to Close	Cost Estimate for Years 1 - 3
09	Unsealed road performance	Continue the measurement of gravel loss trials to establish improvements and understanding of unsealed roads. Complete a data collection to develop a snapshot view.	M	Underway	2011	2018	Roading Manager	5k two yearly
10	Maintenance costing analysis	Develop tools to understand and analyse operational costs/road/ONRC. To help asset management drive VfM within MO&R contracts.	H	Started	2017	2018	Asset Engineer	$2k
11	Lifecycle cost analysis.	Analyse these across all asset components to allow optimised decision-making. Also to promote innovation into the delivery of assets.	M	In progress	2012	2018	Roading Manager	$5k
12	Bridge Management Strategy: Includes breakdown between bridge and culverts; and structural renewal needs.	Combine the north and south bridges and structures into one document and strategy from a risk and prioritisation process. Consider an NTA joint bridge and structures inspection contract.	M	Not started	2015	2019	Roading Manager	$10k
13	Risk Management Strategy - Further development of the risk management strategy, to mitigate risks identified.	An integrated risk management process will be developed that aligns with Council's Corporate Risk Strategy. Include risks for disabled population.	M	Not started	2016	2019	Roading Manager	$10k

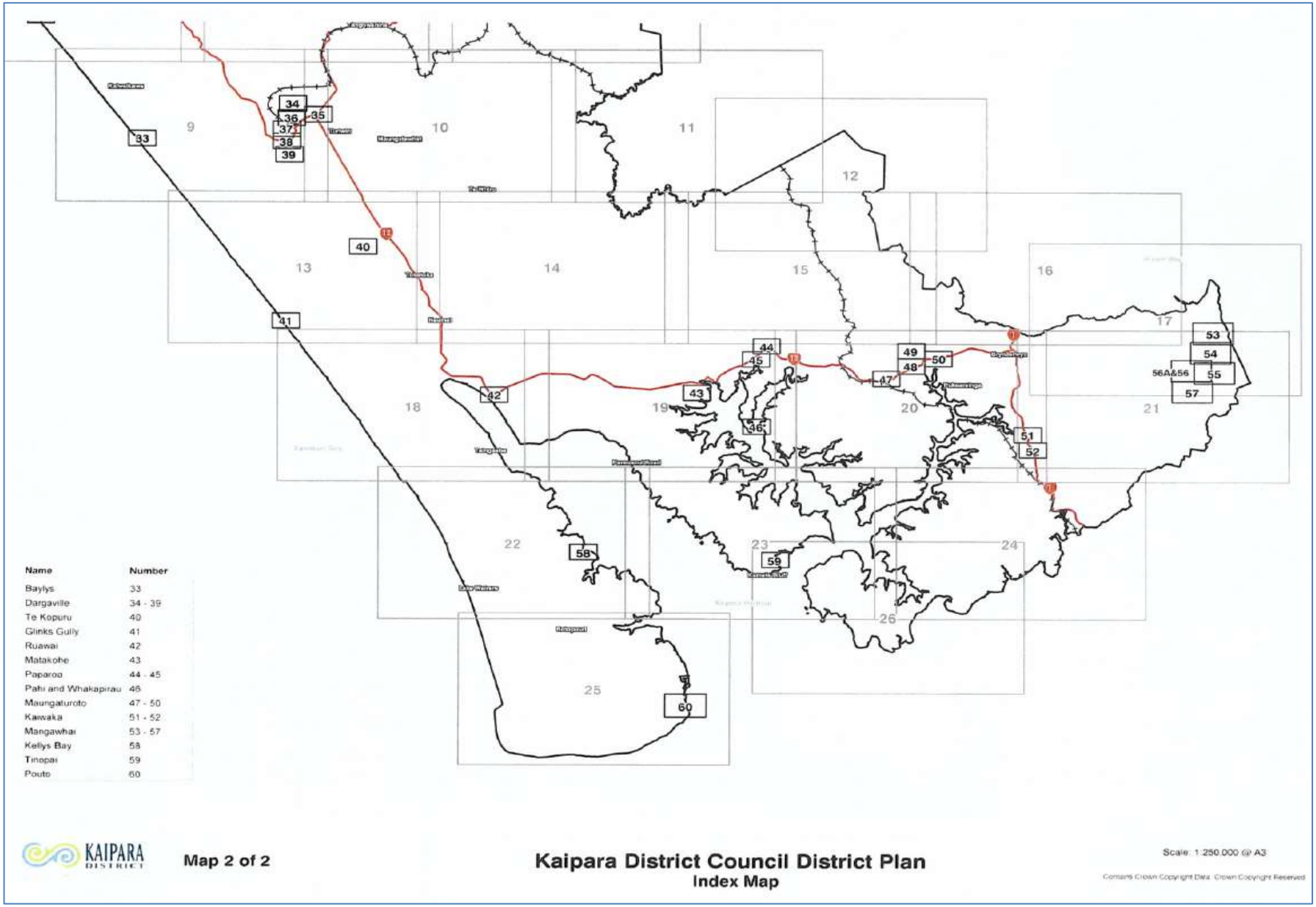
AMP Action Ref:	Improvement Action	Further Information	Priority (High Medium Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Council Named Position Responsible for Managing to Close	Cost Estimate for Years 1 - 3
14	Growth and demand.	Determine walking and cycling programme for new and improved footpaths based around growth and change in transport options. Take account of the Mangawhai Community Plan to assist in new asset creation.	M	Completed	2015	2017	Roading Manager	
15	Asset data (footpaths).	Condition rate all footpaths every five years to develop a robust Forward Works Programme. Include a framework to consider for a disabled customers faults.	M	Not started	2012	2021	Roading Manager	$10k
16	Retaining wall asset data: Collect inventory data and input into RAMM.	Improve knowledge and understanding of the structures assets on the network.	M	In progress	2012	2022	Roading Manager	$2k
17	Asset management collaboration within NTA.	To develop further systems to promote asset management project sharing (data collection, modelling, LIDAR etcetera) sharing of resources and skills, pooling of knowledge base, agreement of analysis constraints, shared innovations.	H	To develop	2016	2019	NTA Manager	$2k
18	Safety	We are developing a strategy based around the new geospatial tool that NZTA is working on to help approved organisations to identify where their roads and roadsides investment will most contribute to reducing deaths and serious injuries and improve network efficiency. This tool will be used by Kaipara to engage communities and key stakeholders, then guide road safety programmes for Activity	Very High	started	2017	June 2018	Roading manager	$10k

AMP Action Ref:	Improvement Action	Further Information	Priority (High Medium Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Council Named Position Responsible for Managing to Close	Cost Estimate for Years 1 - 3
		Management Plans and RLTPs for inclusion in the NLTP. • The tool will include the below options: • Speed management maps – these show the top 5% to10% high benefit opportunities on the road network to manage speed to improve safety and efficiency, and mean operating travel speeds across the network. They also help identify opportunities for road engineering and where possible speed limit changes can be considered. High-risk local rural roads and urban arterials – these are particularly focused on improving safety for people who choose to walk, cycle or ride a motorcycle. Please see Appendix E in regards to Risk areas.						

11 Appendices

11.1 Appendix A: District Maps




Name Number
Baylys 33
Dargaville 34 - 39
Te Kopuru 40
Glinks Gully 41
Ruawai 42
Matakohe 43
Paparoa 44 - 45
Pahi and Whakapirau 46
Maungaturoto 47 - 50
Kaiwaka 51 - 52
Mangawhai 53 - 57
Kellys Bay 58
Tinopai 59
Pouto 60
KAIPARA DISTRICT
Map 2 of 2
Kaipara District Council District Plan
Index Map
Scale: 1:250,000 @ A3

11.2 Appendix B: Weight, Speed and 50MAX Restricted Bridges

Public Notice

KAIPARA DISTRICT COUNCIL

NOTIFICATION OF CHANGES TO WEIGHT AND SPEED LIMITS

NOTIFICATION OF WEIGHT AND SPEED LIMITS ON BRIDGES

Notice is hereby given that, pursuant to regulations 11(3) of the Heavy Motor Vehicle Regulations 1974, the Kaipara District Council has fixed the following maximum weight and speed limits for heavy motor vehicles on the bridges described hereunder:

WEIGHT LIMIT

Name of Road	Old Bridge ID.	Bridge ID.	Location	Maximum Weight of any one axle (kg)	Gross Weight (% of Class 1)	Maximum Speed Limit (km/hr)
Aranga Station Rd	4	204_5696	5696m from SH12	7000	50	10
Bob Taylor Rd	35	215_421	400m from State Highway 14	5500	80	30
Kaikohe Rd	88	228_13693	2813m from Waimatenui Road			10
Kaikohe Rd	89	228_11415	535m from Waimatenui Road			10
Mamaranui Rd (Sth)	122	236_569	600m from State Highway 12	4500		
Monteith Rd	139	246_7495	1900m from Aranga Coast Rd	6500	70	30
Omana Rd	158	156_982	1000m from Pukehuia Rd	6500	80	
Pukehuia Rd	229	165_6588	785m from Omana Rd	7000	100	10
Taipuha Station Rd	266	436_2074	2074m from Paparoa Oakleigh Rd	8000		10
Waihue Rd	313	269_26345	750m from State Highway 12			10
Waoku Rd	325	276_3435	3300m from Marlborough Rd	3000	70	10

These restrictions will apply from 20 July 2017 until repairs necessary for upgrading of the bridge have been carried out.

NOTIFICATION OF WEIGHT AND SPEED LIMITS ON ROADS

Notice is hereby given that, pursuant to Regulations 10(4) of Heavy Motor Vehicle Regulations 1974, the Kaipara District Council has fixed the following maximum axle weight for heavy motor vehicles on the roads described hereunder:

WEIGHT LIMIT

Name of Road	Location	Maximum Weight (kg) of any one axle (kg)	Road Condition
River Rd	From Murdoch St to Cul de Sac	Heavy Vehicle Axle Limit 2000Kg	Instability

These restrictions will apply from 20 July 2017 until repairs necessary for upgrading of the road have been completed

Kaipara District Council
DARGAVILLE

Kaipara te Oranganui • Two Oceans Two Harbours

50MAX Restricted Bridges

Item	Road Name	New Bridge ID	Old Bridge ID	Reason
1	Aranga Station Road	204_5696	4	Posted Bridge. Axle 7000kg, 50% class 1, speed 10km/hr.
2	Bob Taylor Road	215_421	35	Posted Bridge. Axle 5500kg, 80% Class 1, speed 30km/hr.
3	Ford Road	552_489	60	Timber deck in poor condition and very slender pier structures.
4	Girls High School Road	125_13746	70	Based on construction period and span.
5	Houto Road	224_186	78	Based on construction period and span.
6	Kaikohe Road	228_13693	88	Posted Bridge. Speed 10km/hr.
7	Kaikohe Road	228_11415	89	Posted Bridge. Speed 10km/hr. Undermining of the true right abutment.
8	Mamaranui Road	236_569	122	Posted Bridge. Axle 4500kg.
9	Mititai Road	145_3549	130	Based on construction period and span.
10	Mititai Road	145_14588	132	Based on construction period and span.
11	Mititai Road	145_21841	135	Based on construction period and span.
12	Monteith Road	246_7495	139	Posted Bridge. Axle 6500kg, 70% Class 1, speed 30km/hr.
13	Omana Road	156_982	158	Posted Bridge. Axle 6500kg, 80% Class 1.
14	Pouto Road	163_18787	211	Based on construction period.
15	Pukehuia Road	165_6588	229	Posted Bridge. Axle 7000kg, speed 10km/hr
16	Pukehuia Road	165_12124	233	Based on construction period and span.
17	Pukehuia Road	165_22100	238	Based on construction period and span.
18	Swamp Road	434_569	263	Vertical alignment, easily accessible alternative routes available and prolonging structure.
19	Taipuha Station Road	436_2074	266	Beam web splice connection does not appear adequate to transfer full Class 1 loads. Requires detailed inspection and analysis to confirm capacity.
20	Tangowahine Valley Road	267_6024	272	Shear deficiency being assessed.
21	Tangowahine Valley Road	267_13935	276	Shear deficiency being assessed.
22	Wai O Te Kumurau Road	272_1952	303	Based on construction period and span.
23	Waihue Road	269_26007	312	Abutment appears to be rotating and moving towards the waterway. Large cracks in corners of the superstructure.
24	Waihue Road	269_26345	313	Posted Bridge. Speed 10km/hr. Shear deficiency being assessed.

Item	Road Name	New Bridge ID	Old Bridge ID	Reason
25	Wainui Road	186_4383	317	Detailed inspection assessed necessary to confirm extent of corrosion to steel beams which are wrapped in denso. Slender piles may also lack strength.
26	Waoku Road	276_3435	325	Posted Bridge. Axle 3000kg, 70% Class 1, speed 10km/hr.

50MAX Restricted Road

Item	Road Name	Location	Maximum weight (kg) of any one axle (kg).	Reason
1	River Road	From Murdoch Street to cul de sac	Heavy vehicle axle limit 2000kg .	Instability

11.3 Appendix C: Lifeline Maps

Northland Lifeline Project – Overview Map

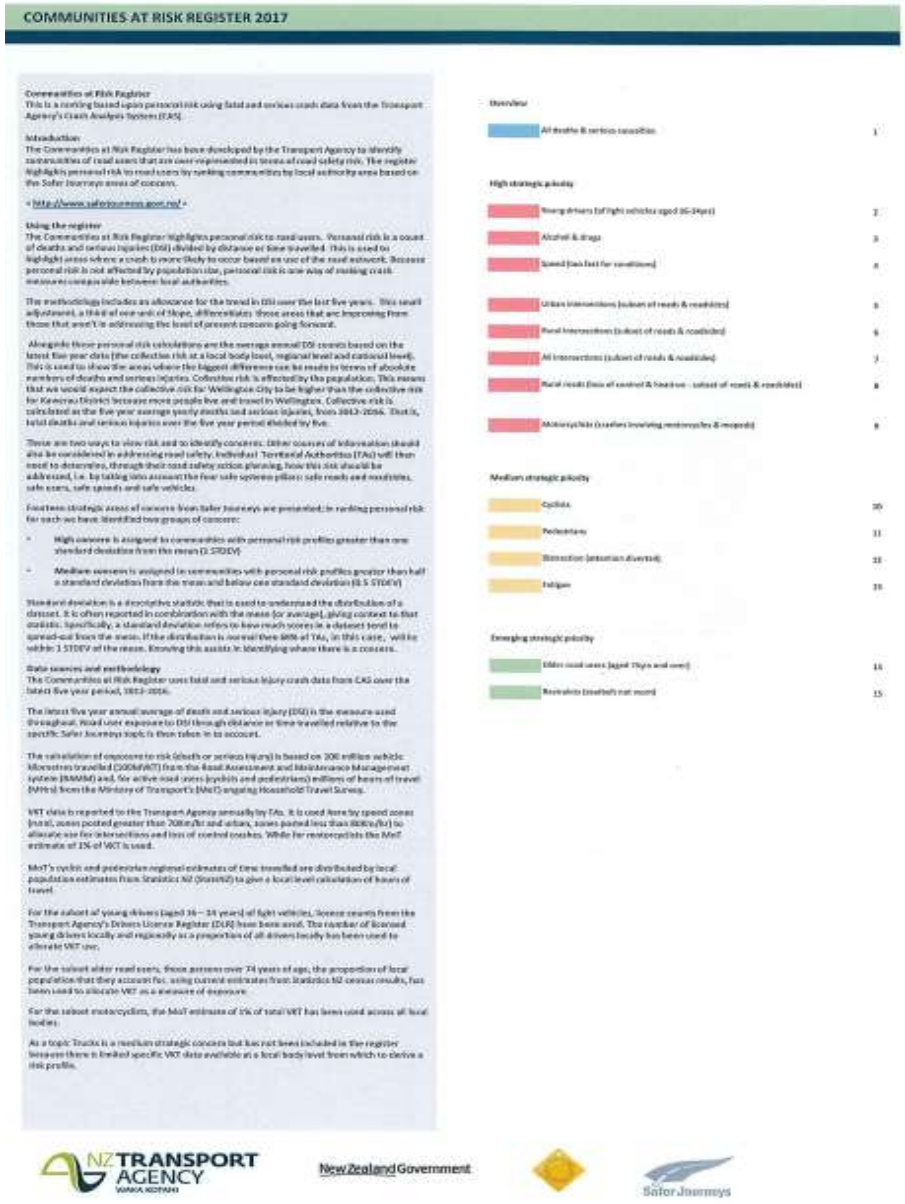
Northland Lifeline Project – Dargaville Map

11.4 Appendix D: Quarry locations

Local Quarry Locations

Quarry Name	Location Road	Metal Produced	Comments
Access Road	Access Road 1	Limestone	Operated by Kevin Reid (Lime) KDC
Aranga Quarry	Hook Road	Hard rock	Operated by Broadspectrum KDC
Brynderwyn	State Highway 1, Brynderwyn	Hard rock	Operated by Atlas KDC
Existing	Existing insitu material		Where reconstruction occurs using existing materials
FH Flygers Quarry	Flygers Road	Limestone	Operated by Ravensdown (Lime) KDC
Glenbrook	Glenbrook Road	Metal Slag	KDC
Greenhill Quarry	Pouto Road	Hard rock	Operated by Broadspectrum (Hard Rock) KDC
Hakaru Landfill	Kaiwaka Mangawhai Road	Landfill	Operated by Broadspectrum KDC
Hukatere Quarry	Hukatere Quarry Tinopai Road	Hard rock	Operated by Atlas KDC
Inch Road Quarry	Inch Road, Ruawai	Metal Slag	Operated by Broadspectrum KDC
Kara Quarry	Wood Road		KDC
Lake Road Quarry	Lake Road	Hard rock	Operated by Lake Rd Quarry RDC
Matakana/Wharehine	Omaha Valley Road		Operated by Wharehine RDC
Otaika/Winstones	State Highway, Otaika/Winstones	Hard rock	Operated by Winstones Aggregates (Hard Rock) KDC
Paradise Quarry	Paradise Road	Metal Slag	Operated by Broadspectrum KDC
Parker Lime Quarry	Gibbons Road	Limestone	(Lime) KDC
Puketona Quarry	Puketona Road	Hard rock	Operated by Broadspectrum (Hard Rock) FNDC
Ravensdown Lime	Arapohue Road	Limestone	Operated by Ravensdown (Lime) KDC
Ruarangi Quarry	Paparoa-Oakleigh Road	Hard rock	Operated by A&S KDC
Titoki Quarry	State Highway 15, Houto Road		KDC
Turiwiri Quarry	Arapohue Road	Hard rock	Operated by McRobbie Dowling KDC
Waihue Quarry	Waimata Road	Hard rock	Operated by Brian Solley KDC
Whangaripo Quarry	Pakiri Road		Operated by Rodney Aggregate Supplies RDC
Williamsons Quarry	Bee Bush Road	Limestone	Operated by Williamsons (Lime) KDC

11.5 Appendix E Communities at Risk to Road crashes'



COMMUNITIES AT RISK REGISTER 2017

Communities at Risk Register
This is a ranking based upon personal risk using fatal and serious crash data from the Transport Agency's Crash Analysis System (CAS).

Introduction
The Communities at Risk Register has been developed by the Transport Agency to identify communities of road users that are over-represented in terms of road safety risk. The register highlights personal risk to road users by ranking communities by local authority area based on the Safer Journeys areas of concern.

< http://www.saferjourneys.govt.nz/ >

Using the register
The Communities at Risk Register highlights personal risk to road users. Personal risk is a count of deaths and serious injuries (DSI) divided by distance or time travelled. This is used to highlight areas where a crash is more likely to occur based on use of the road network. Because personal risk is not affected by population size, personal risk is one way of making crash measures comparable between local authorities.

The methodology includes an allowance for the trend in DSI over the last five years. This small adjustment, a third of one unit of slope, differentiates those areas that are improving from those that aren't in addressing the level of present concern going forward.

Alongside these personal risk calculations are the average annual DSI counts based on the latest five year data (the collective risk at a local body level, regional level and national level). This is used to show the areas where the biggest difference can be made in terms of absolute numbers of deaths and serious injuries. Collective risk is affected by the population. This means that we would expect the collective risk for Wellington City to be higher than the collective risk for Kawerau District because more people live and travel in Wellington. Collective risk is calculated as the five year average yearly deaths and serious injuries, from 2013-2016. That is, total deaths and serious injuries over the five year period divided by five.

There are two ways to view risk and to identify concerns. Other sources of information should also be considered in addressing road safety. Individual Territorial Authorities (TAs) will then need to determine, through their road safety action planning, how this risk should be addressed, i.e. by taking into account the four safe systems pillars: safe roads and roadsides, safe users, safe speeds and safe vehicles.

Fourteen strategic areas of concern from Safer Journeys are presented in ranking personal risk for each we have identified two groups of concern:

- High concern is assigned to communities with personal risk profiles greater than one standard deviation from the mean (1 STDEV)
- Medium concern is assigned to communities with personal risk profiles greater than half a standard deviation from the mean and below one standard deviation (0.5 STDEV)

Standard deviation is a descriptive statistic that is used to understand the distribution of a dataset. It is often reported in combination with the mean (or average), giving context to that statistic. Specifically, a standard deviation refers to how much scores in a dataset tend to spread-out from the mean. If the distribution is normal then 68% of TAs, in this case, will lie within 1 STDEV of the mean. Knowing this assists in identifying where there is a concern.

Data sources and methodology
The Communities at Risk Register uses fatal and serious injury crash data from CAS over the latest five year period, 2012-2016.

The latest five year annual average of death and serious injury (DSI) is the measure used throughout. Road user exposure to DSI through distance or time travelled relative to the specific Safer Journeys topic is then taken in to account.

The calculation of exposure to risk (death or serious injury) is based on 100 million vehicle kilometres travelled (100MVKT) from the Road Assessment and Maintenance Management system (RAMM) and, for active road users (cyclists and pedestrians) millions of hours of travel (MHrs) from the Ministry of Transport's (MoT) ongoing Household Travel Survey.

VKT data is reported to the Transport Agency annually by TAs. It is used here by speed zones (rural, zones posted greater than 70km/hr and urban, zones posted less than 80Km/hr) to allocate use for intersections and loss of control crashes. While for motorcyclists the MoT estimate of 1% of VKT is used.

MoT's cyclist and pedestrian regional estimates of time travelled are distributed by local population estimates from Statistics NZ (StatsNZ) to give a local level calculation of hours of travel.

For the subset of young drivers (aged 16 – 24 years) of light vehicles, licence counts from the Transport Agency's Drivers Licence Register (DLR) have been used. The number of licensed young drivers locally and regionally as a proportion of all drivers locally has been used to allocate VKT use.

For the subset older road users, those persons over 74 years of age, the proportion of local population that they account for, using current estimates from Statistics NZ census results, has been used to allocate VKT as a measure of exposure.

For the subset motorcyclists, the MoT estimate of 1% of total VKT has been used across all local bodies.

As a topic Trucks is a medium strategic concern but has not been included in the register because there is limited specific VKT data available at a local body level from which to derive a risk profile.

Overview

All deaths & serious casualties — 1

High strategic priority

Young drivers (of light vehicles aged 16-24yrs) — 2
Alcohol & drugs — 3
Speed (too fast for conditions) — 4
Urban intersections (subset of roads & roadsides) — 5
Rural intersections (subset of roads & roadsides) — 6
All intersections (subset of roads & roadsides) — 7
Rural roads (loss of control & head on - subset of roads & roadsides) — 8
Motorcycles (crashes involving motorcycles & mopeds) — 9

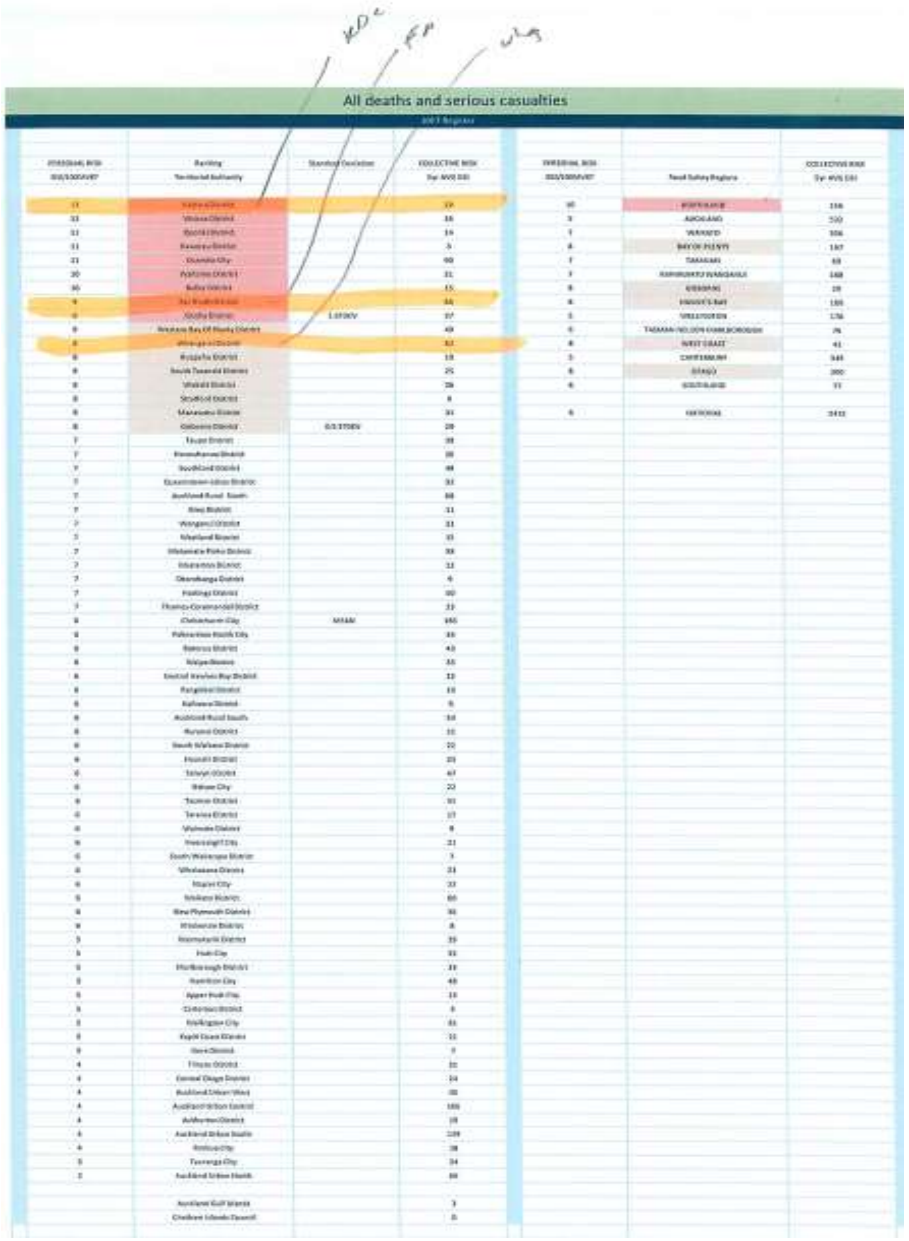
Medium strategic priority

Cyclists — 10
Pedestrians — 11
Distraction (attention diverted) — 12
Fatigue — 13

Emerging strategic priority

Older road users (aged 75yrs and over) — 14
Restraints (seatbelt not worn) — 15

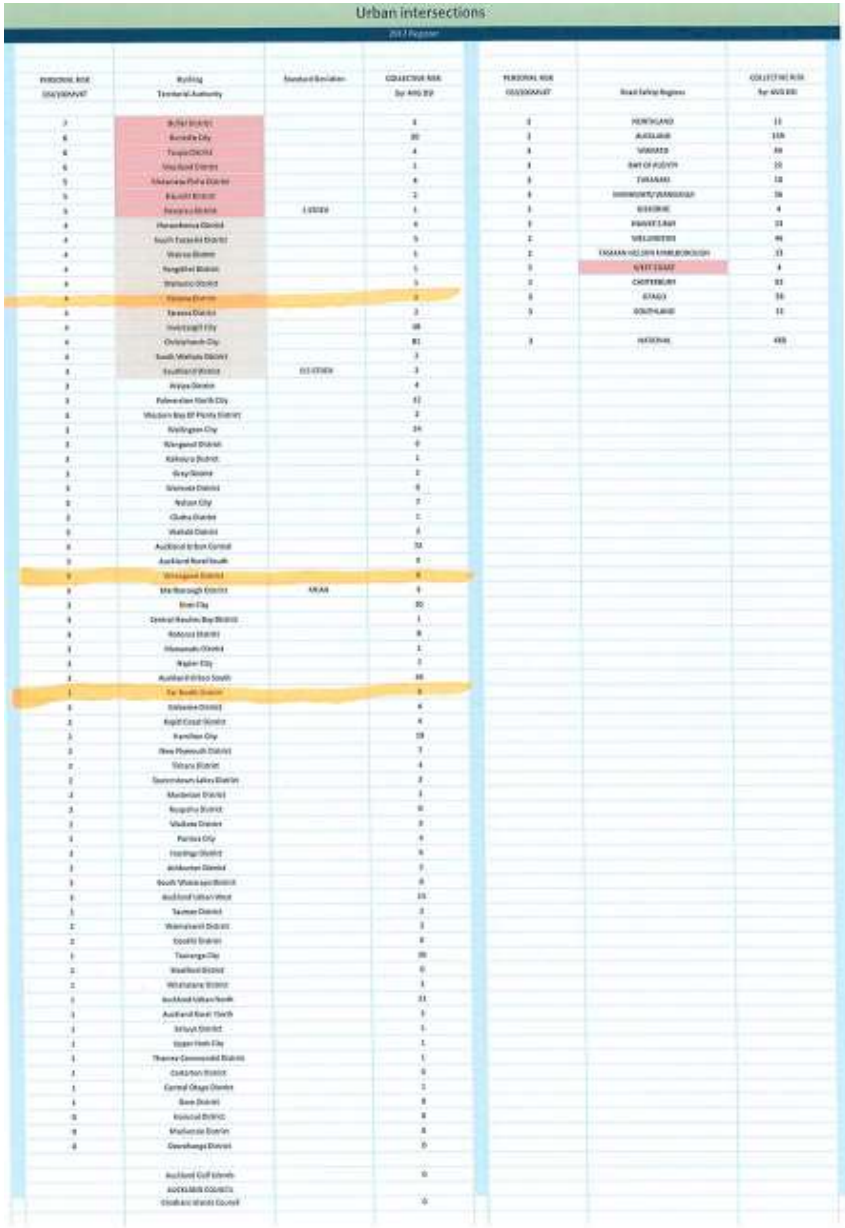
NZ TRANSPORT AGENCY WAKA KOTAHI
New Zealand Government
Safer Journeys

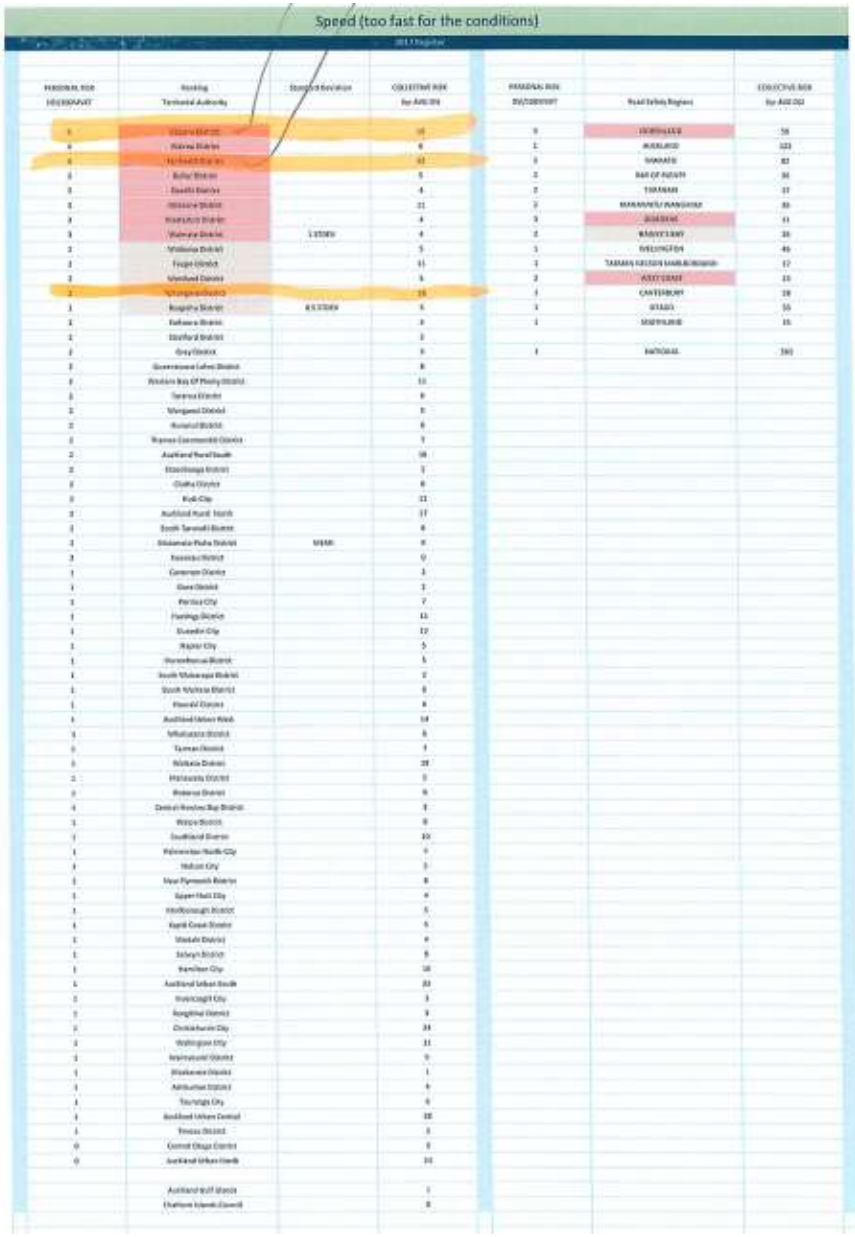


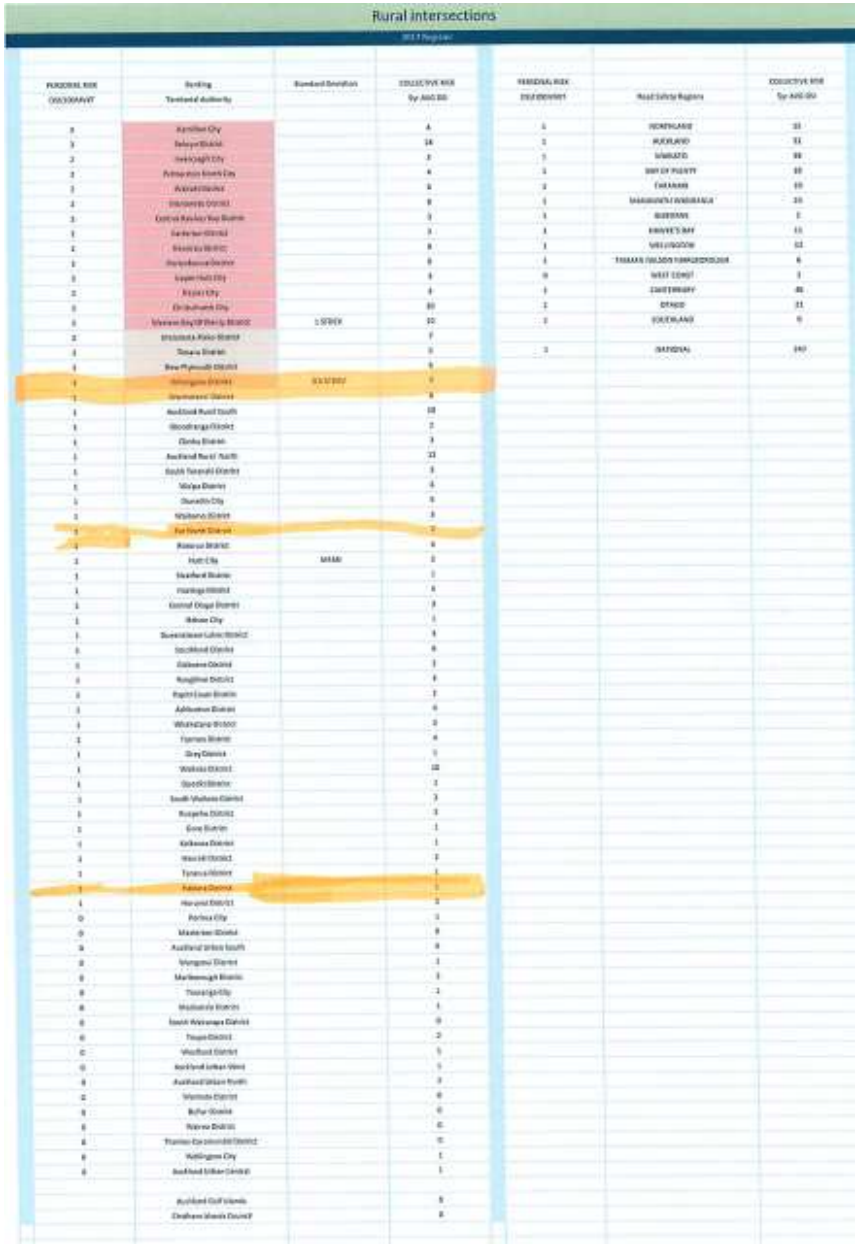
All deaths and serious casualties

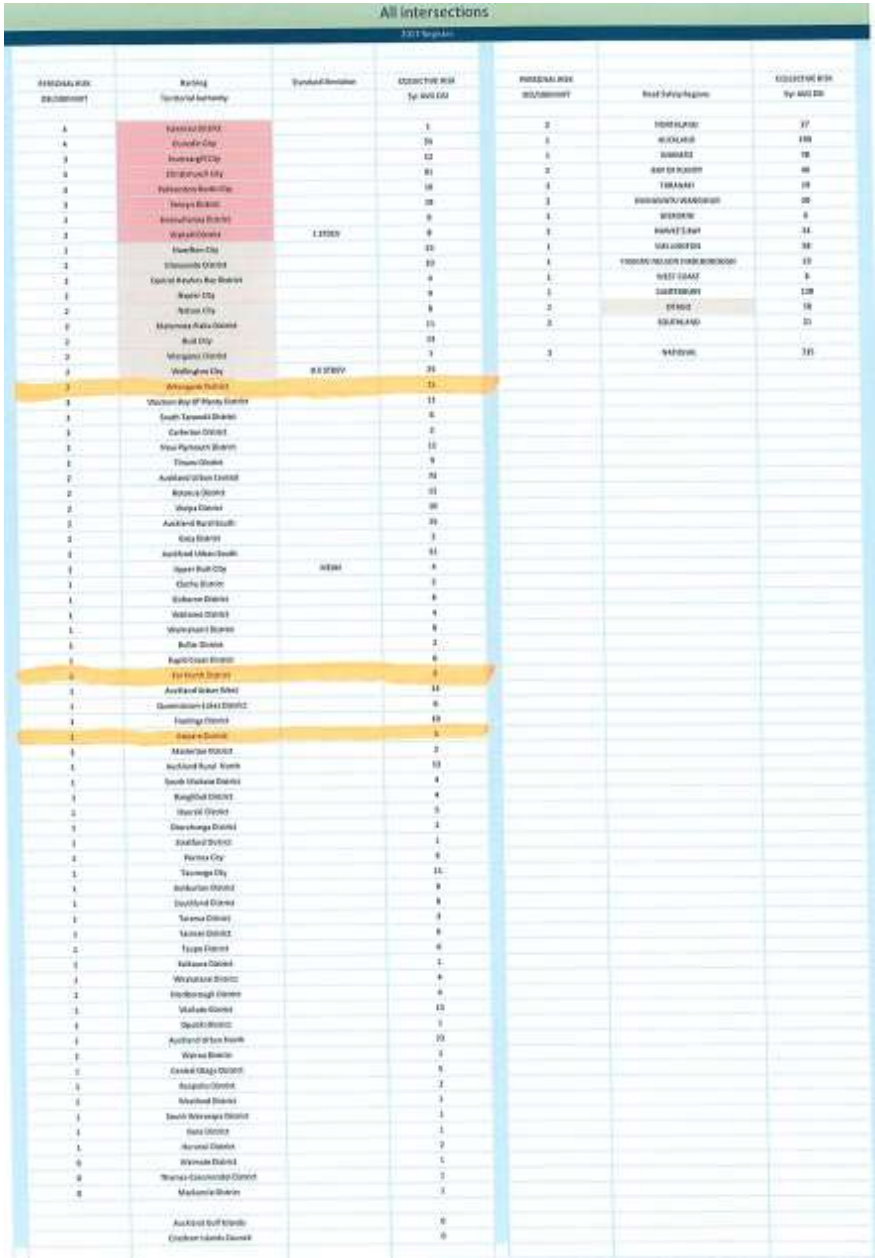

Young drivers (of light vehicles aged 16-24yrs)

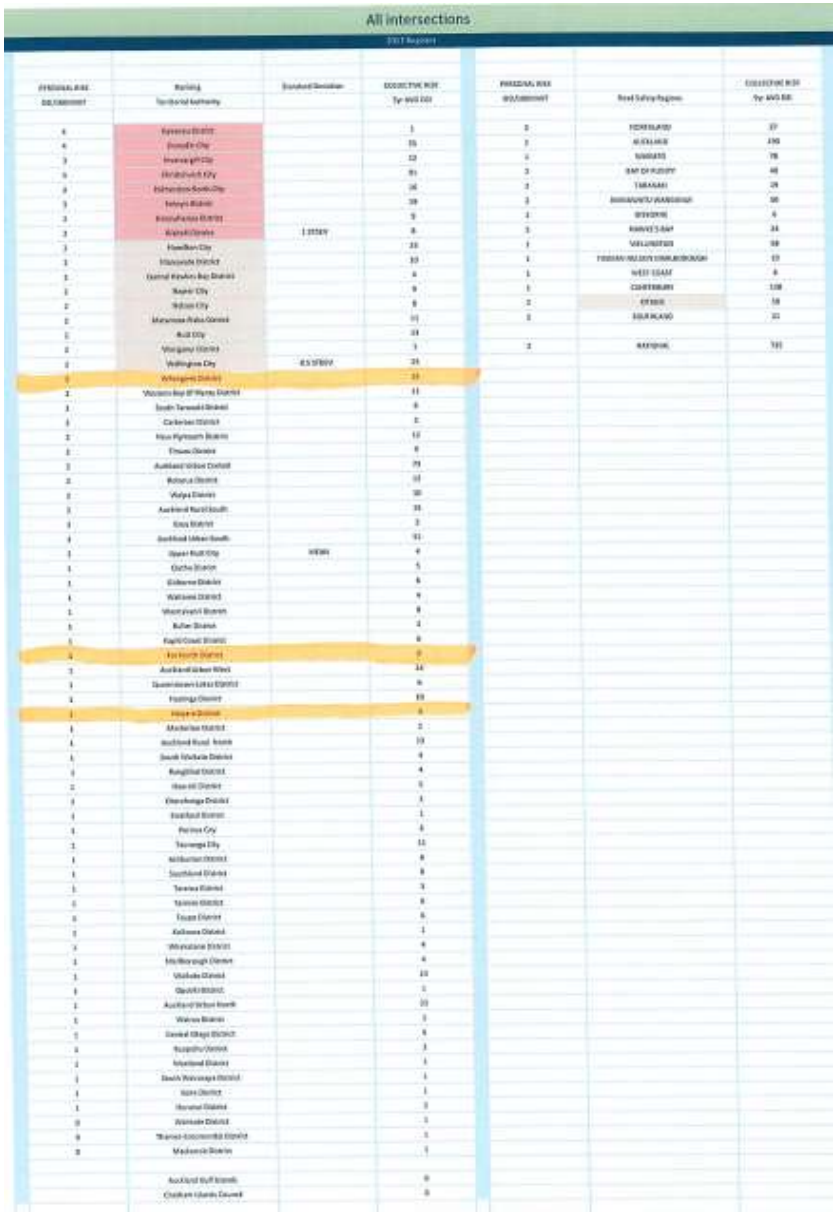

Alcohol and/or drugs

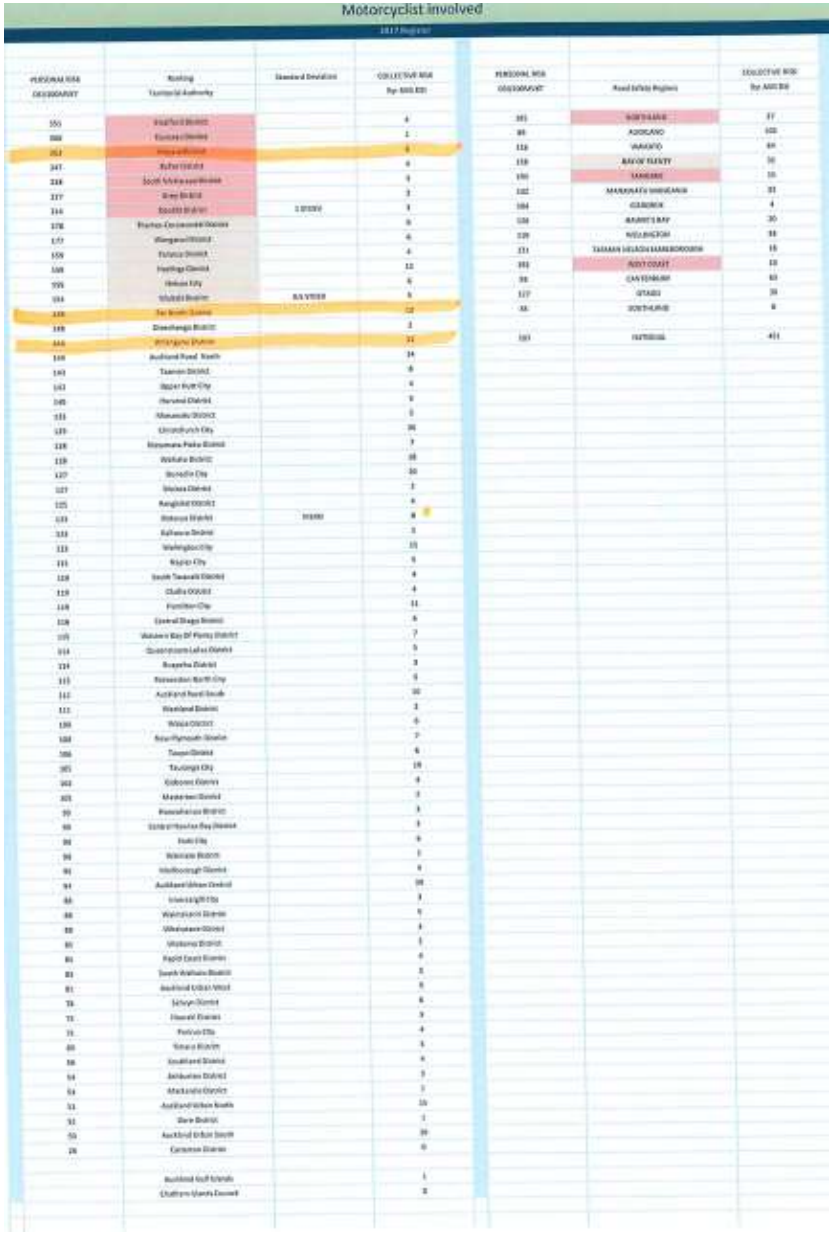

Urban intersections


Speed (too fast for the conditions)

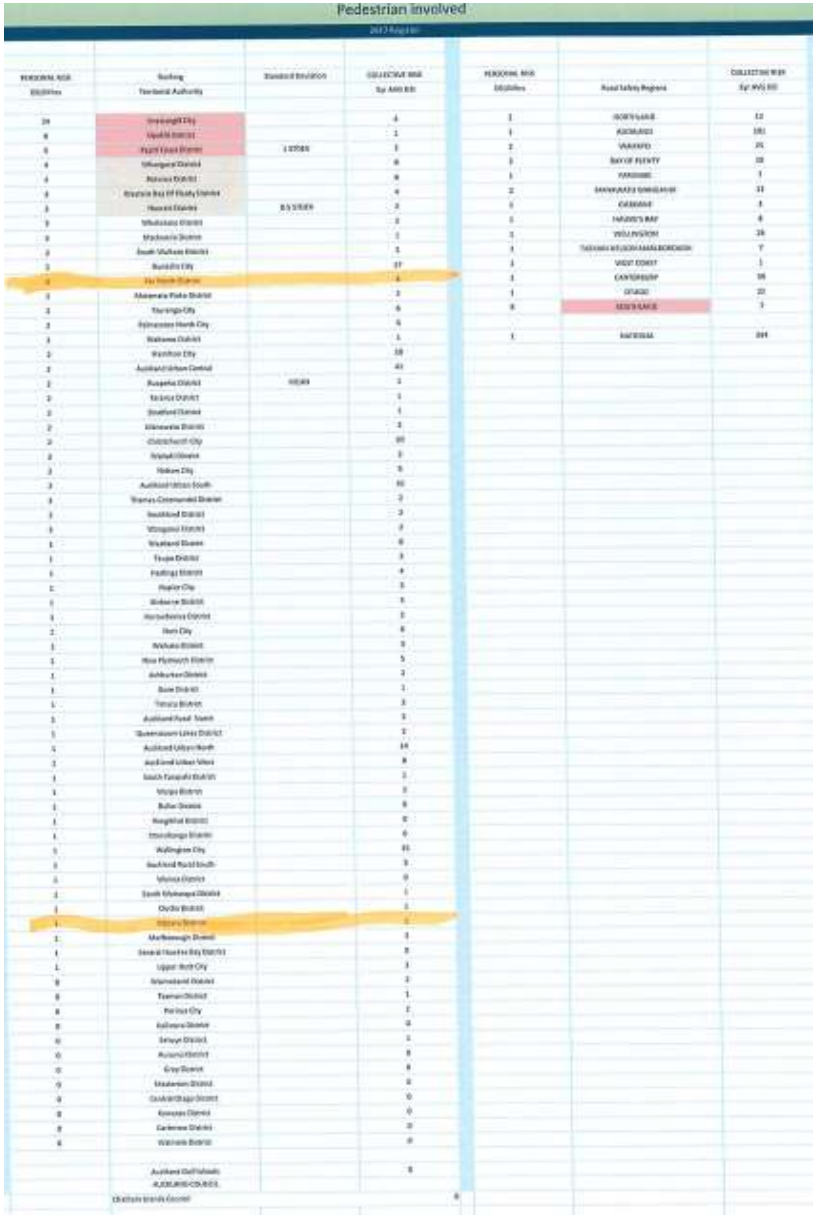

Rural intersections


All intersections

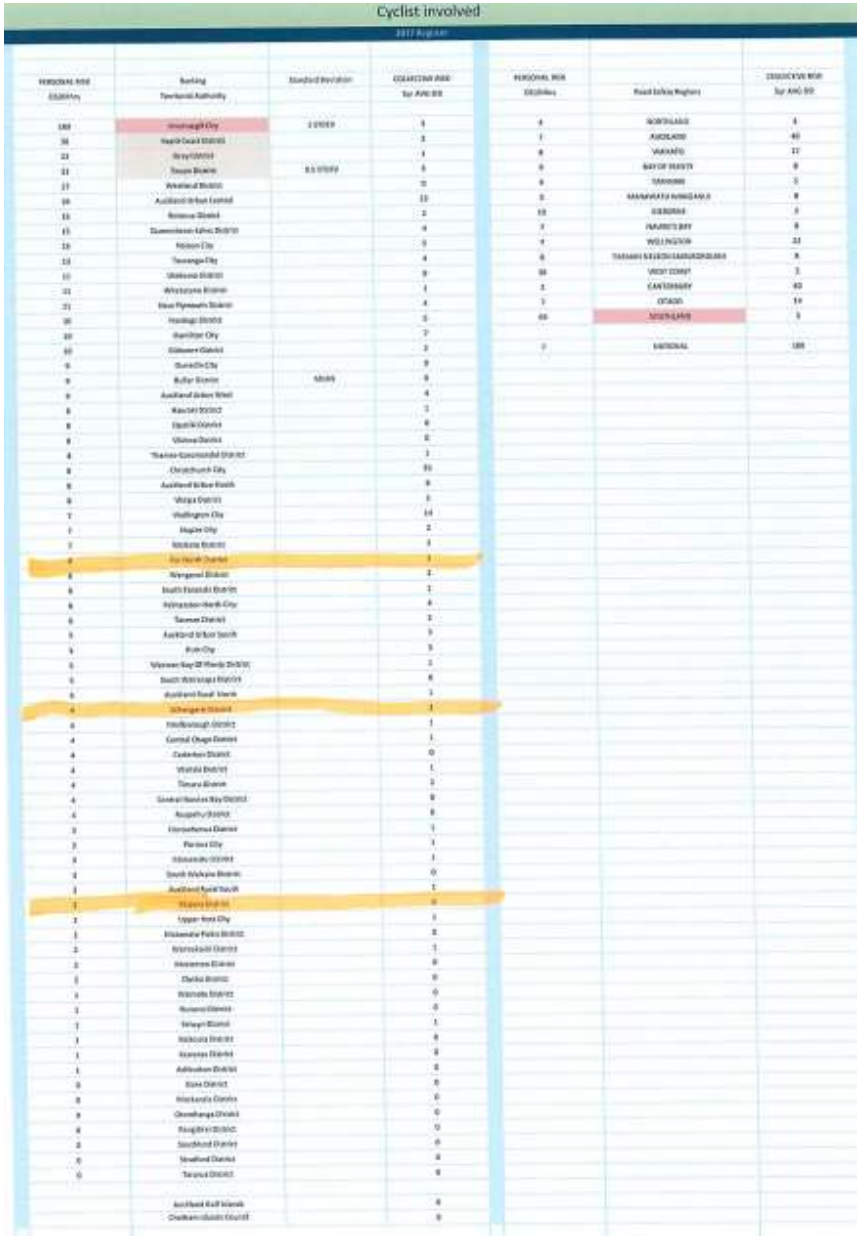

All intersections


Motorcyclist involved

Pedestrian involved

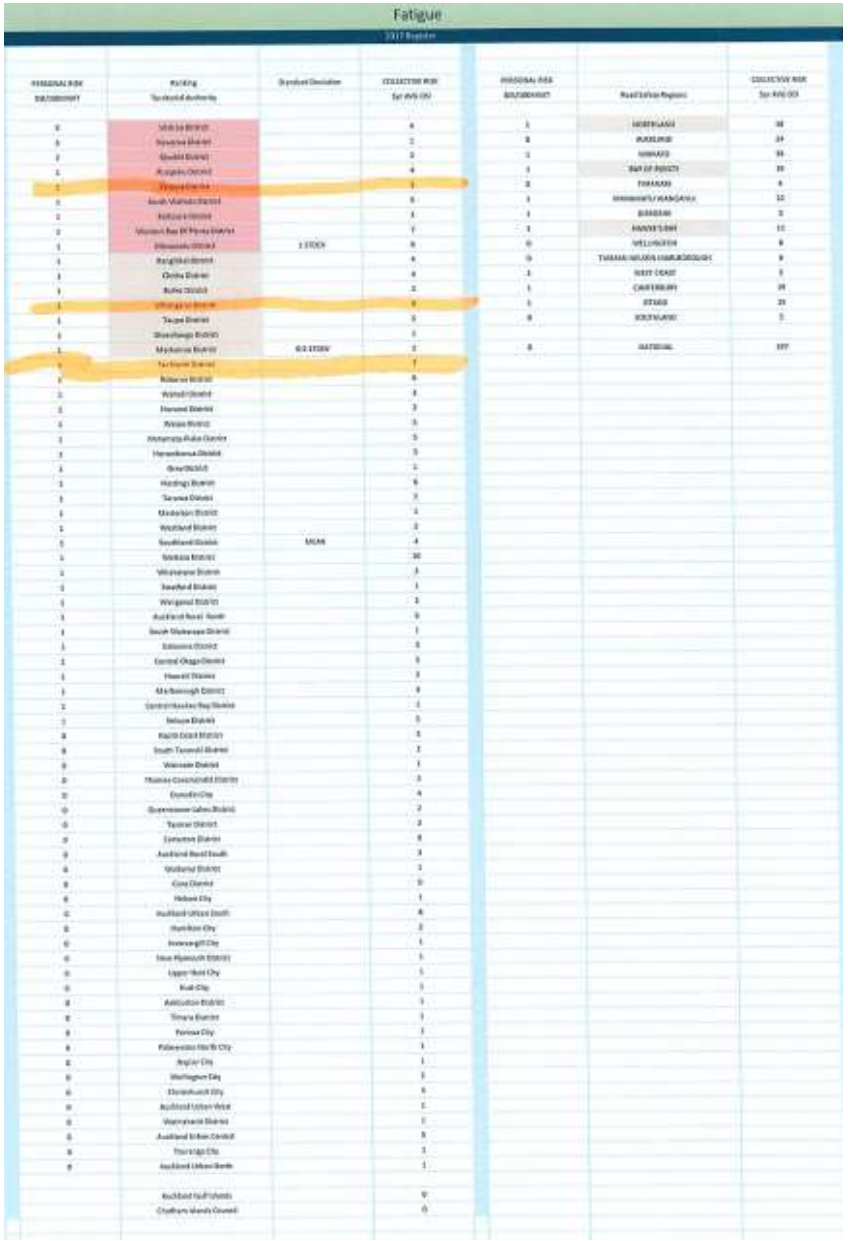


Cyclist involved



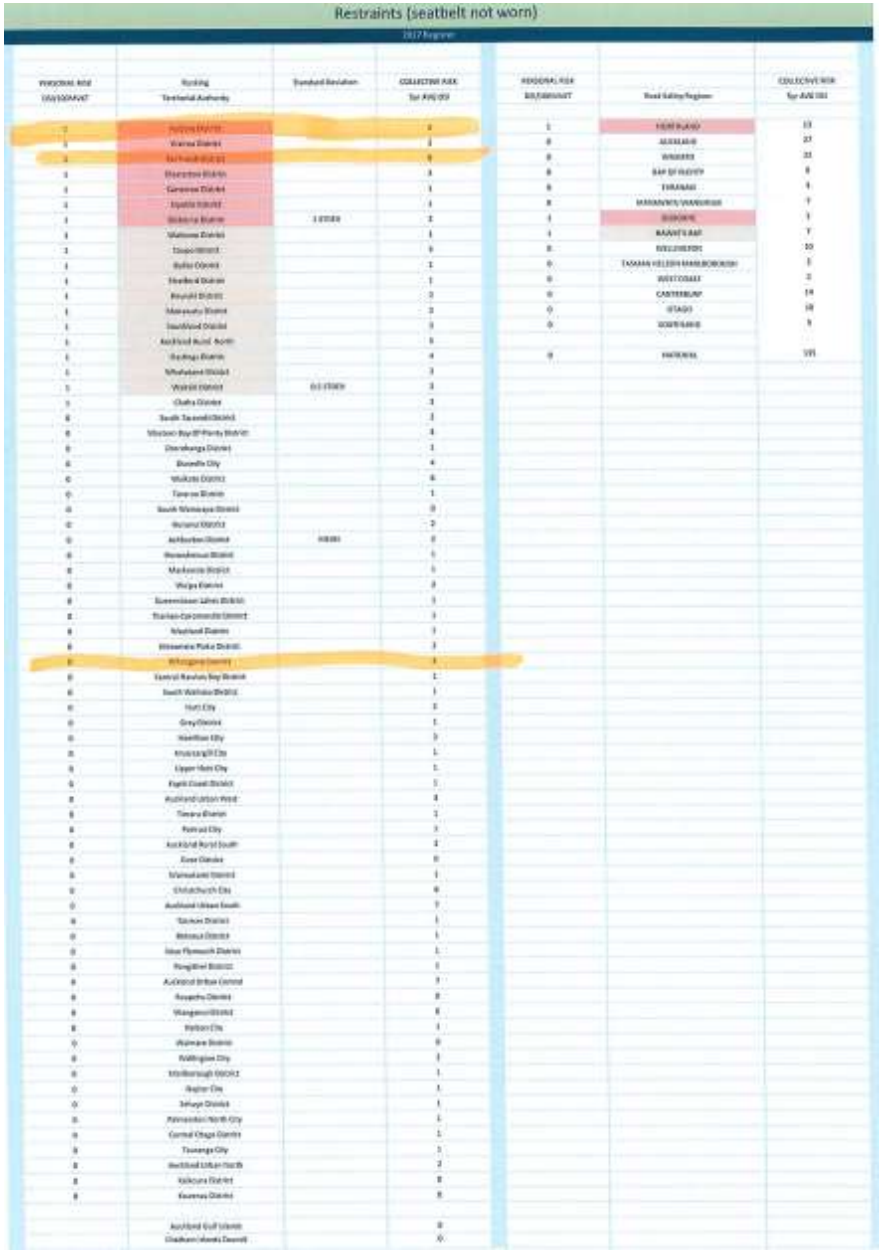
Distraction (crash factor: attention diverted)

Fatigue



Older road users (those aged 75yrs and older)

Restraints (seatbelt not worn)



11.6 Appendix F First Coat Seals locations:

2017 year

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Date	2017
R	Ararua Road	740	1,464	724	7	4,851	9_R_Secondary Collector	D	200	Mar-10	SC
R	Ararua Road	5,820	6,636	816	6	4,733	9_R_Secondary Collector	D	140	Mar-08	SC
R	Ararua Road	6,636	6,727	91	6	528	8_R_Access	D	70	Mar-08	SC
R	Baldrock Road	2,422	3,298	876	7	6,132	9_R_Secondary Collector		344	Dec-09	SC
R	Baldrock Road	3,298	3,579	281	7	1,967	9_R_Secondary Collector		160	Dec-09	SC
R	Baldrock Road	3,579	3,838	259	7	1,813	9_R_Secondary Collector		180	Dec-09	SC
R	Baldrock Road	3,838	4,960	1,122	7	7,854	9_R_Secondary Collector		180	Nov-13	SC
R	Devich Road	0	1,875	1,875	6	12,000	9_R_Secondary Collector		335	Mar-13	SC
R	Dunn Road	3,383	3,809	426	6	2,556	9_R_Secondary Collector		160	Oct-14	SC
R	Dunn Road	3,809	4,101	292	6	1,752	9_R_Secondary Collector		160	Oct-14	SC
R	Dunn Road	4,101	4,820	719	6	4,314	9_R_Secondary Collector		160	Oct-14	SC
R	Franklin Road	4,650	4,670	20	4	82	8_R_Access		70	Dec-99	SC
R	Gallie Road	0	52	52	6	286	8_R_Access		60	Dec-00	SC
R	Gallie Road	3,080	3,117	37	6	204	8_R_Access		60	Dec-08	SC
R	Gibbons Road	4,509	4,576	67	7	469	8_R_Access		110	Nov-09	SC
R	Hilltop Road	0	47	47	6	282	8_R_Access		55	Dec-11	SC
R	Hodgson Road	0	35	35	6	196	8_R_Access		60	Dec-00	SC
R	Hoyle Road	9,349	9,405	56	7	403	8_R_Access		140	Jan-09	SC
U	Insley Street	0	573	573	11	6,017	4_U_Primary Collector		2654	Jul-09	SC
R	Kaiwaka-Mangawhai Road	7,366	9,114	1,748	6	10,488	10_R_Primary Collector		785	Mar-12	SC
R	Kaiwaka-Mangawhai Road	9,114	9,250	136	6	816	10_R_Primary Collector		785	Dec-11	SC
R	Kaiwaka-Mangawhai Road	9,250	9,887	637	7	4,332	10_R_Primary Collector		805	Dec-11	SC
R	Kaiwaka-Mangawhai Road	9,887	10,236	349	8	2,687	10_R_Primary Collector		885	Dec-11	SC
R	Kaiwaka-Mangawhai Road	10,326	10,486	160	7	1,040	10_R_Primary Collector		1105	Dec-11	SC
R	Kaiwaka-Mangawhai Road	11,769	11,908	139	6	884	10_R_Primary Collector		1222	Mar-13	SC
R	King Road	1,450	4,036	2,586	7	18,102	8_R_Access		385	Apr-07	SC
R	King Road	4,036	4,078	42	7	294	8_R_Access		280	Apr-07	SC
R	Lawrence Road	0	59	59	5	266	8_R_Access		185	Dec-11	SC
U	Mangawhai Heads Road (west)	500	792	292	6	1,866	4_U_Primary Collector		1592	Jul-07	SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Date	2017
U	Mangawhai Heads Road (west)	792	1,190	398	6	2,507	4_U_Primary Collector		1540	Jul-07	SC
R	Mangawhai Road	0	54	54	7	367	10_R_Primary Collector		2260	May-10	SC
R	Mititai Road	1,690	1,777	87	6	557	9_R_Secondary Collector		240	Apr-15	SC
R	Mititai Road	1,777	1,977	200	6	1,200	9_R_Secondary Collector		170	Apr-15	SC
R	Mititai Road	1,977	2,416	439	8	3,293	9_R_Secondary Collector		170	Apr-15	SC
R	Mititai Road	2,416	2,703	287	8	2,153	9_R_Secondary Collector		170	Apr-15	SC
R	Mititai Road	9,938	11,860	1,922	7	13,838	8_R_Access		90	Jan-09	SC
R	Mititai Road	11,875	12,335	460	7	3,312	8_R_Access		88	Jan-09	SC
R	Mititai Wharf Road	0	51	51	6	326	7_R_Low Volume		20	Dec-05	SC
U	Moir Street	1,034	1,466	432	7	2,938	2_U_Access		375	Dec-11	SC
U	Molesworth Drive	122	226	104	13	1,310	4_U_Primary Collector		3960	Dec-11	SC
U	Molesworth Drive	226	307	81	9	729	4_U_Primary Collector		3960	Dec-11	SC
U	Molesworth Drive	307	525	218	9	1,962	4_U_Primary Collector		3858	Dec-11	SC
U	Molesworth Drive	525	683	158	8	1,264	4_U_Primary Collector		3745	Dec-11	SC
U	Molesworth Drive	683	904	221	7	1,635	4_U_Primary Collector		3745	Dec-11	SC
U	Molesworth Drive	4,019	4,132	113	7	735	4_U_Primary Collector		3897	Apr-10	SC
R	Oparakau Road	0	20	20	8	160	8_R_Access		100	Dec-00	SC
R	Pahi Road	274	411	137	7	899	9_R_Secondary Collector		490	Dec-11	SC
R	Pahi Road	411	1,056	645	7	4,257	9_R_Secondary Collector		490	Jul-10	SC
R	Pahi Road	1,056	1,091	35	4	140	9_R_Secondary Collector		490	Jul-10	SC
R	Pahi Road	1,091	1,860	769	7	5,075	9_R_Secondary Collector		390	Jul-10	SC
R	Paparoa-Oakleigh Road	1,533	1,800	267	7	1,922	10_R_Primary Collector	SHD	465	May-15	SC
R	Paparoa-Oakleigh Road	1,800	2,609	809	7	5,987	10_R_Primary Collector	SHD	410	May-15	SC
R	Paparoa-Oakleigh Road	2,609	2,984	375	7	2,775	10_R_Primary Collector	SHD	380	May-15	SC
R	Paparoa-Oakleigh Road	2,984	3,050	66	7	488	10_R_Primary Collector	SHD	380	May-15	SC
R	Paparoa-Oakleigh Road	4,844	4,934	90	7	666	10_R_Primary Collector	SHD	380	Oct-03	SC
R	Pouto Road	7,880	8,460	580	7	3,944	10_R_Primary Collector	F	1955	Feb-16	SC
R	Spioenkop Road	0	56	56	6	336	7_R_Low Volume		10	Dec-06	SC
U	Station Road	311	361	50	7	327	3_U_Secondary Collector		699	Nov-14	SC
U	Station Road	361	561	200	6	1,200	3_U_Secondary Collector		510	Nov-14	SC
U	Station Road	561	629	68	6	408	3_U_Secondary Collector		510	Nov-14	SC
U	Station Road	629	805	176	6	1,056	3_U_Secondary Collector		510	Nov-14	SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Date	2017
U	Station Road	805	1,083	278	6	1,668	3_U_Secondary Collector		510	Nov-14	SC
U	Station Road	1,083	1,470	387	6	2,322	3_U_Secondary Collector		510	Nov-14	SC
R	Tangowahine Settlement East Road	0	24	24	7	158	8_R_Access		85	Dec-00	SC
R	Tangowahine Valley Road	851	1,647	796	7	5,254	9_R_Secondary Collector	F	395	Apr-10	SC
R	Te Kowhai Road	995	2,136	1,141	6	6,846	9_R_Secondary Collector		190	May-07	SC
R	Te Kowhai Road	2,136	2,358	222	6	1,332	9_R_Secondary Collector		190	May-07	SC
R	Trounson Park Road	2,093	2,514	421	6	2,568	9_R_Secondary Collector		160	Sep-11	SC
R	Waihue Road	10,961	11,271	310	6	1,922	9_R_Secondary Collector	F	75	Jan-11	SC
R	Waihue r Road d	11,271	11,312	41	6	254	9_R_Secondary Collector	F	75	Jan-11	SC
R	Waihue Road	11,312	11,755	443	6	2,747	9_R_Secondary Collector	F	75	Jan-11	SC
R	Whakapirau Road	6,766	7,633	867	6	5,202	9_R_Secondary Collector		170	Feb-09	SC
U	Wintle Street	29	306	277	10	2,825	3_U_Secondary Collector		1870	Aug-12	SC
U	Wintle Street	306	660	354	7	2,407	3_U_Secondary Collector		1215	Aug-12	SC
U	Wintle Street	660	1,275	615	6	3,690	3_U_Secondary Collector		1100	Aug-12	SC

2018 Year

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AAD T Est	Surface Date	2017	2018
R	Arapohue Road	5,328	5,546	218	7	1,439	9_R_Secondary Collector		220	Nov-11		SC
R	Arapohue Road	5,546	5,594	48	7	317	9_R_Secondary Collector		220	Nov-11		SC
R	Arapohue Road	5,594	6,829	1,235	7	8,151	9_R_Secondary Collector		220	Nov-11		SC
R	Arapohue Road	6,829	6,854	25	7	165	9_R_Secondary Collector		220	Nov-11		SC
R	Arapohue Road	6,854	6,905	51	7	337	8_R_Access		150	Nov-11		SC
R	Awakino Point East Road	0	558	558	10	5,413	7_R_Low Volume		10	Feb-09		SC
R	Awakino Point East Road	558	1,970	1,412	7	9,602	7_R_Low Volume		10	Feb-09		SC
R	Baylys Basin Road	0	54	54	7	389	8_R_Access		60	Dec-08		SC
R	Baylys Coast Road	3,996	4,866	870	7	6,003	9_R_Secondary Collector		1035	Jul-09		SC
R	Baylys Coast Road	6,397	6,450	53	6	329	9_R_Secondary Collector		930	Mar-09		SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AAD T Est	Surface Date	2017	2018
R	Baylys Coast Road	6,450	7,042	592	6	3,552	9_R_Secondary Collector		830	Mar-09		SC
R	Baylys Coast Road	7,119	7,596	477	6	2,862	9_R_Secondary Collector		830	Feb-15		SC
R	Baylys Coast Road	7,596	7,661	65	6	390	9_R_Secondary Collector		830	Feb-15		SC
R	Black Swamp Road	550	592	42	6	252	9_R_Secondary Collector		550	Mar-04		SC
U	Calla Street	98	258	160	8	1,232	2_U_Access		20	Dec-13		SC
U	Church Road	0	64	64	7	435	2_U_Access		365	Dec-09		SC
U	Church Road	209	429	220	11	2,376	2_U_Access		55	Jan-05		SC
U	Church Road	429	516	87	7	626	1_U_Low Volume		30	Jan-05		SC
U	Church Road (west branch)	0	85	85	7	570	2_U_Access		340	Dec-09		SC
R	Coalhill Road Sliplane 1	0	129	129	8	968	8_R_Access		55	May-10		SC
R	Coalhill Road Sliplane 2	0	45	45	6	270	8_R_Access		65	May-10		SC
U	Gorge Road	649	982	333	7	2,198	3_U_Secondary Collector		390	Apr-15		SC
U	Gorge Road	982	1,027	45	7	297	3_U_Secondary Collector		390	Apr-15		SC
U	Gorge Road	1,027	1,160	133	7	878	3_U_Secondary Collector		390	Apr-15		SC
U	Gorge Road	1,160	1,673	513	7	3,376	3_U_Secondary Collector		385	Jul-09		SC
U	Halyard Way	0	86	86	5	430	1_U_Low Volume		45	Jun-06		SC
R	Kai Iwi Lakes Road	0	176	176	6	1,003	9_R_Secondary Collector		295	May-13		SC
U	Kaiwaka Domain carpark	61	181	120	18	2,160	1_U_Low Volume		55	Dec-08		SC
U	Kakapo Place	0	73	73	5	394	1_U_Low Volume		30	Mar-07		SC
U	Kakapo Place	73	93	20	5	108	1_U_Low Volume		30	Mar-07		SC
U	Kedge Drive	0	61	61	8	494	1_U_Low Volume		20	Jun-06		SC
U	Kedge Drive	61	155	94	6	517	1_U_Low Volume		20	Jun-06		SC
U	Kedge Drive	155	441	286	6	1,573	1_U_Low Volume		20	Jun-06		SC
U	Kedge Drive	441	584	143	6	787	1_U_Low Volume		20	Jun-06		SC
U	Longview Street	0	120	120	10	1,224	2_U_Access		110	Mar-07		SC
R	Matakohe Road	2,522	2,813	291	7	2,008	9_R_Secondary Collector	T	230	Jul-15		SC
R	Matakohe Wharf Road	0	53	53	7	382	7_R_Low Volume		30	Mar-08		SC
R	Mountview Place	0	161	161	6	966	7_R_Low Volume		10	Dec-06		SC
U	Old Waipu Road	0	184	184	7	1,362	2_U_Access		245	Dec-09		SC
U	Old Waipu Road	184	214	30	7	195	2_U_Access		245	Dec-09		SC
U	Old Waipu Road	214	793	579	7	3,764	2_U_Access		245	Mar-04		SC
R	Omamari Road (West)	7,588	7,689	101	6	626	9_R_Secondary Collector		130	May-13		SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AAD T Est	Surface Date	2017	2018
U	Pahi Road	0	162	162	9	1,377	3_U_Secondary Collector		530	Dec-11		SC
U	Pahi Road	162	274	112	10	1,064	3_U_Secondary Collector		530	Dec-11		SC
R	Pahi Road	1,860	2,876	1,016	7	6,706	9_R_Secondary Collector		390	Apr-06		SC
R	Pahi Road	2,876	3,895	1,019	7	6,725	9_R_Secondary Collector		390	May-10		SC
R	Pahi Road	3,895	4,381	486	7	3,208	9_R_Secondary Collector		340	May-10		SC
R	Pahi Road	6,323	6,688	365	7	2,449	9_R_Secondary Collector		195	Jul-08		SC
R	Paparoa-Oakleigh Road	3,226	3,342	116	7	858	10_R_Primary Collector	SHD	380	Jul-07		SC
R	Paparoa-Oakleigh Road	12,851	13,014	163	6	945	10_R_Primary Collector	SHD	300	Oct-15		SC
R	Paparoa-Oakleigh Road	18,752	20,330	1,578	6	9,468	10_R_Primary Collector	SHD	320	Dec-11		SC
R	Paparoa-Oakleigh Road	20,330	21,243	913	6	5,478	10_R_Primary Collector	SHD	340	Dec-11		SC
R	Paparoa-Oakleigh Road	21,243	21,370	127	6	762	10_R_Primary Collector	SHD	340	Dec-11		SC
R	Pouto Road	13,952	14,190	238	6	1,452	9_R_Secondary Collector	F	505	Jan-15		SC
R	Reid Road	0	33	33	5	149	7_R_Low Volume		20	Dec-99		SC
R	Robertson Road	1,057	1,810	753	6	4,819	8_R_Access		170	Mar-09		SC
U	Settlement Road	35	100	65	6	384	3_U_Secondary Collector		441	Sep-14		SC
U	Settlement Road	100	408	308	5	1,602	3_U_Secondary Collector		250	Sep-14		SC
U	Spinnaker Lane	0	135	135	5	729	1_U_Low Volume		20	Jun-06		SC
U	Spinnaker Lane	135	160	25	5	135	1_U_Low Volume		20	Jun-06		SC
U	Takahe Place	0	69	69	5	373	1_U_Low Volume		20	Mar-07		SC
U	Takahe Place	69	89	20	5	108	1_U_Low Volume		20	Mar-07		SC
R	Te Opi Road	0	30	30	4	129	7_R_Low Volume		20	Feb-02		SC
U	Thelma Road South	0	194	194	7	1,358	2_U_Access		110	Jan-02		SC
U	Thelma Road South	194	380	186	7	1,302	2_U_Access		55	Dec-10		SC
R	Tinopai Road	0	1,476	1,476	7	10,332	9_R_Secondary Collector	F	440	Dec-11		SC
R	Tinopai Road	2,726	5,510	2,784	7	19,237	9_R_Secondary Collector	F	313	Dec-11		SC
R	Waihue Road	2,350	2,516	166	8	1,245	9_R_Secondary Collector	F	455	Feb-12		SC
R	Waihue Road	2,516	2,569	53	8	398	9_R_Secondary Collector	F	455	Feb-12		SC
R	Waihue Road	2,569	2,790	221	8	1,658	9_R_Secondary Collector	F	300	Feb-12		SC
U	Weka Street	0	77	77	7	570	2_U_Access		85	Mar-07		SC

2019 year

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2017	2018	2019
U	Ambergris Place	0	40	40	5	204	1_U_Low Volume		10	2CHIP	Aug-06			SC
R	Ararua Road	1,880	2,669	789	6	5,026	9_R_Secondary Collector	D	161	2CHIP	Mar-08			SC
R	Baldrock Road	0	417	417	7	2,919	9_R_Secondary Collector		350	2CHIP	Jun-12			SC
R	Baldrock Road	5,207	5,325	118	7	826	9_R_Secondary Collector		180	2CHIP	Nov-13			SC
R	Baldrock Road	5,576	5,680	104	7	728	9_R_Secondary Collector		180	2CHIP	Nov-13			SC
R	Baldrock Road	6,061	6,273	212	7	1,484	9_R_Secondary Collector		180	2CHIP	Nov-13			SC
U	Bassett Street	140	536	396	7	2,701	2_U_Access		105	1CHIP	Dec-06			SC
R	Cove Road	3,584	4,092	508	7	3,658	9_R_Secondary Collector		775	2CHIP	Mar-16			SC
U	Gillespie Drive	0	47	47	6	273	1_U_Low Volume		10	2CHIP	Aug-06			SC
U	Jack Boyd Drive	0	421	421	6	2,526	2_U_Access		185	2CHIP	Apr-16			SC
U	Jordan Street	0	213	213	8	1,619	2_U_Access		55	2CHIP	Jun-06			SC
R	Leaf Road	0	40	40	5	200	7_R_Low Volume		10	2CHIP	Mar-08			SC
R	Maungarahu Rock Road	0	50	50	6	300	7_R_Low Volume		20	2CHIP	May-06			SC
U	Moir Point Road	1,019	1,442	423	10	4,378	2_U_Access		279	2CHIP	Jun-06			SC
U	Moir Point Road	1,442	1,472	30	6	183	2_U_Access		185	1CHIP	Dec-06			SC
U	Moir Point Road	1,472	1,840	368	6	2,245	2_U_Access		185	2CHIP	Apr-16			SC
R	Omamari Road (west)	5,033	5,160	127	6	787	9_R_Secondary Collector		345	2CHIP	May-13			SC
R	Omana Road	5,316	5,357	41	7	271	8_R_Access		70	2CHIP	Jun-15			SC
R	Omana Road	5,357	5,382	25	7	165	8_R_Access		70	2CHIP	Jun-15			SC
R	Omana Road	5,382	5,426	44	7	290	8_R_Access		70	2CHIP	Jun-15			SC
R	Oparakau Road	1,540	1,624	84	7	588	8_R_Access		70	2CHIP	Jun-16			SC
R	Paparoa-Oakleigh Road	10,846	11,525	679	6	3,938	10_R_Primary Collector	SHD	300	2CHIP	Oct-15			SC
R	Paparoa-Oakleigh Road	11,525	11,665	140	6	812	10_R_Primary Collector	SHD	300	2CHIP	Oct-15			SC
R	Paparoa-Oakleigh Road	11,665	12,388	723	6	4,193	10_R_Primary Collector	SHD	300	2CHIP	Oct-15			SC
R	Paparoa-Oakleigh Road	15,115	15,541	426	7	2,939	10_R_Primary Collector	SHD	290	2CHIP	Jul-15			SC
R	Paparoa-Oakleigh Road	16,100	16,421	321	7	2,215	10_R_Primary Collector	SHD	290	2CHIP	Jun-15			SC
R	Paradise Road	0	78	78	8	640	8_R_Access		75	2CHIP	Dec-00			SC
R	Paradise Road	117	159	42	7	298	8_R_Access		75	2CHIP	Dec-00			SC
R	Paradise Road west branch	0	33	33	7	241	8_R_Access		75	2CHIP	Dec-00			SC
U	Pipi Place	0	79	79	5	411	1_U_Low Volume		10	2CHIP	Sep-06			SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2017	2018	2019
R	Pukehuia Road	847	1,016	169	6	1,082	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	1,016	1,046	30	6	192	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	1,046	1,759	713	6	4,563	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	1,759	1,867	108	6	691	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	1,867	1,998	131	6	838	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	1,998	2,014	16	6	102	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	2,014	2,120	106	6	678	9_R_Secondary Collector		200	2CHIP	Sep-11			SC
R	Pukehuia Road	13,101	13,151	50	7	325	8_R_Access		60	2CHIP	Jun-15			SC
R	Pukehuia Road	13,151	13,155	4	7	26	8_R_Access		60	2CHIP	Jun-15			SC
R	Pukehuia Road	13,155	13,211	56	7	364	8_R_Access		60	2CHIP	Jun-15			SC
R	Roberts West Road	0	25	25	7	163	7_R_Low Volume		10	2CHIP	Jun-15			SC
R	Rua Road	0	108	108	7	713	7_R_Low Volume		20	2CHIP	Jun-06			SC
R	Settlement Road	1,525	2,147	622	6	3,732	9_R_Secondary Collector		230	2CHIP	Dec-06			SC
R	Sheppard Oaks Road	0	50	50	6	300	7_R_Low Volume		20	2CHIP	Mar-08			SC
U	Snapper Street	0	80	80	5	416	1_U_Low Volume		10	2CHIP	Aug-06			SC
U	Sunset Drive	0	122	122	6	695	2_U_Access		160	2CHIP	Aug-06			SC
U	Sunset Drive	122	315	193	6	1,100	2_U_Access		110	2CHIP	Aug-06			SC
U	Sunset Drive	315	406	91	6	519	2_U_Access		95	2CHIP	Aug-06			SC
U	Sunset Drive	406	484	78	6	445	2_U_Access		85	2CHIP	Aug-06			SC
U	Sunset Drive	484	556	72	6	410	2_U_Access		75	2CHIP	Aug-06			SC
U	Sunset Drive	556	582	26	6	148	1_U_Low Volume		45	2CHIP	Aug-06			SC
U	Sunset Drive	582	656	74	6	422	1_U_Low Volume		20	2CHIP	Aug-06			SC
U	Sunset Drive rdbt	0	58	58	4	232	1_U_Low Volume		45	2CHIP	Aug-06			SC
R	Tangowahine Valley Road	4,347	4,380	33	7	218	9_R_Secondary Collector	F	290	2CHIP	Jul-13			SC
R	Tara Road	2,850	2,956	106	6	678	9_R_Secondary Collector		550	2CHIP	Oct-02			SC
R	Tara Road	2,956	3,092	136	6	843	9_R_Secondary Collector		335	2CHIP	Oct-02			SC
R	Tara Road	3,092	3,112	20	6	124	9_R_Secondary Collector		335	2CHIP	Apr-05			SC
R	Te Kowhai Road	2,358	2,876	518	6	3,010	9_R_Secondary Collector		152	1CHIP	Jun-13	RH AB		SC
U	Te Whai Street	0	146	146	5	788	1_U_Low Volume		30	2CHIP	Sep-05			SC
U	Thelma Road North	0	176	176	8	1,338	1_U_Low Volume		20	2CHIP	Sep-05			SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2017	2018	2019
U	Thelma Road North	176	292	116	8	882	1_U_Low Volume		45	2CHIP	Sep-05			SC
U	Thelma Road North	292	359	67	8	509	1_U_Low Volume		20	2CHIP	Sep-05			SC
R	Tinopai Road	8,894	9,832	938	6	6,003	9_R_Secondary Collector		210	2CHIP	Dec-11			SC
R	Tinopai Road	9,832	10,093	261	7	1,697	9_R_Secondary Collector		200	2CHIP	Dec-11			SC
R	Tinopai Road	10,093	10,877	784	6	4,782	9_R_Secondary Collector		200	2CHIP	Dec-11			SC
R	Tinopai Road	10,877	11,621	744	6	4,538	9_R_Secondary Collector		200	2CHIP	Mar-08			SC
R	Tinopai Road	11,621	13,860	2,239	6	13,658	9_R_Secondary Collector		200	2CHIP	Dec-11			SC
R	Tinopai Road	15,480	17,048	1,568	6	9,549	9_R_Secondary Collector		200	2CHIP	Dec-11			SC
U	Tua Tua Place	0	59	59	5	319	1_U_Low Volume		10	2CHIP	Aug-06			SC
R	Waihue Road	9,252	9,916	664	6	4,216	9_R_Secondary Collector	F	101	2CHIP	Jun-13	RH AB		SC
R	Waihue Road	9,916	9,990	74	6	459	9_R_Secondary Collector	F	75	2CHIP	Jun-13	RH AB		SC
R	Waihue Road	10,596	10,961	365	6	2,263	9_R_Secondary Collector	F	75	2CHIP	Jun-13	RH AB		SC
R	Waihue Road	26,305	26,427	122	7	793	8_R_Access	F	155	2CHIP	Mar-16			SC
R	West Coast Road	2,470	2,484	14	6	84	9_R_Secondary Collector		230	1CHIP	Feb-15			SC
R	West Coast Road	2,484	2,502	18	6	108	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	2,502	2,580	78	6	468	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	2,580	2,602	22	6	132	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	2,602	2,721	119	6	714	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	2,721	2,741	20	6	120	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	2,741	3,458	717	6	4,302	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	3,458	3,479	21	6	126	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	3,479	3,932	453	6	2,718	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	3,932	3,971	39	6	234	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	3,971	4,230	259	6	1,554	9_R_Secondary Collector		250	1CHIP	Feb-15			SC
R	West Coast Road	4,230	4,377	147	6	882	9_R_Secondary Collector		250	1CHIP	Feb-15			SC

2020 Year

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2020
R	Access Road	6,535	6,588	53	8	424	8_R_Access		80	2CHIP	Jan-10	SC
R	Access Road	6,588	6,649	61	8	488	8_R_Access		60	2CHIP	Jan-10	SC
R	Access Road	9,533	9,583	50	7	350	8_R_Access		60	2CHIP	Jan-10	SC
R	Aranga Coast Road	1,490	1,550	60	7	420	8_R_Access		60	2CHIP	Oct-07	SC
R	Aranga Coast Road	1,550	1,613	63	7	441	7_R_Low Volume		40	2CHIP	Oct-07	SC
R	Aranga Coast Road	3,984	4,102	118	6	708	7_R_Low Volume		50	2CHIP	Apr-07	SC
R	Arapohue Road	20	707	687	7	4,946	9_R_Secondary Collector		410	2CHIP	Feb-16	SC
R	Ararua Road	345	740	395	7	2,647	9_R_Secondary Collector	D	200	1CHIP	Jan-02	SC
R	Ararua Road	7,466	7,534	68	8	537	8_R_Access	D	70	2CHIP	Mar-08	SC
R	Ararua Road	7,534	7,580	46	8	363	8_R_Access	D	90	2CHIP	Mar-08	SC
R	Ararua Road	8,469	9,104	635	6	4,064	8_R_Access	D	50	2CHIP	Mar-08	SC
R	Arcadia Road	7,998	8,078	80	6	480	7_R_Low Volume		30	2CHIP	Jan-10	SC
R	Avoca East Road	1,645	1,692	47	7	329	7_R_Low Volume		20	2CHIP	Mar-08	SC
R	Batley Road	1,380	1,424	44	8	343	8_R_Access		80	2CHIP	Jan-11	SC
U	Bayly Street	112	357	245	5	1,225	2_U_Access		105	1CHIP	Jul-09	SC
U	Cames Road	0	763	763	5	3,815	2_U_Access		110	2CHIP	Dec-05	SC
U	Cames Road	763	823	60	5	300	2_U_Access		110	2CHIP	Dec-05	SC
U	Cames Road	823	1,356	533	4	2,308	2_U_Access		110	2CHIP	Dec-05	SC
R	Cates Road	0	30	30	6	180	7_R_Low Volume		20	2CHIP	Jun-06	SC
R	Causer Road	0	87	87	7	609	8_R_Access		150	2CHIP	Dec-08	SC
R	Central Road	1,198	1,287	89	6	552	8_R_Access		50	2CHIP	Jan-10	SC
R	Central Road	1,287	1,380	93	6	577	7_R_Low Volume		40	2CHIP	Jan-10	SC
R	Central Road	7,286	7,428	142	6	852	7_R_Low Volume		20	2CHIP	Jan-12	SC
R	Charity Hill Road	0	56	56	7	370	8_R_Access		115	2CHIP	Dec-05	SC
R	Charity Hill Road	1,653	1,740	87	7	609	8_R_Access		105	2CHIP	Jun-07	SC
R	Child Road	0	26	26	5	140	7_R_Low Volume		10	2CHIP	Dec-13	SC
U	Churchill Street	443	477	34	6	204	2_U_Access		260	2CHIP	Dec-08	SC
R	Cove Road	0	1,152	1,152	6	6,912	9_R_Secondary Collector		550	2CHIP	Mar-09	SC
R	Devich Road	3,014	3,062	48	7	312	9_R_Secondary Collector		280	2CHIP	Jul-13	SC
R	Driver Road	0	54	54	6	324	7_R_Low Volume		10	2CHIP	Dec-05	SC
R	Dunn Road	7,969	8,021	52	7	364	8_R_Access		90	2CHIP	Jul-09	SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2020
R	Empire Street	0	40	40	8	308	7_R_Low Volume		20	2CHIP	Dec-06	SC
R	Garbolino Road	2,247	2,307	60	6	360	8_R_Access		385	2CHIP	Oct-02	SC
R	Gibbons Road	2,690	2,699	9	5	46	8_R_Access		110	2CHIP	Nov-09	SC
R	Girls High School r Road	13,710	13,795	85	6	527	8_R_Access		50	2CHIP	Jul-09	SC
R	Greenhill Road	3,580	3,631	51	7	357	8_R_Access		50	2CHIP	Jan-10	SC
R	Hall Road	1,910	1,981	71	6	426	7_R_Low Volume	F	40	2CHIP	Apr-05	SC
R	Hood Road	4,448	4,493	45	7	333	8_R_Access		70	2CHIP	Dec-00	SC
U	Hook Road	0	256	256	6	1,536	2_U_Access		60	2CHIP	Jun-07	SC
R	Houto Road	0	250	250	7	1,750	7_R_Low Volume	F	30	2CHIP	Dec-08	SC
R	Hoyle Road	1,669	1,731	62	8	465	8_R_Access		130	2CHIP	Jan-10	SC
R	Hoyle Road	1,731	1,772	41	8	308	8_R_Access		110	2CHIP	Jan-10	SC
R	Inch Road	3,570	3,603	33	6	198	8_R_Access		80	2CHIP	May-06	SC
R	Karaka Road	1,421	1,547	126	7	819	9_R_Secondary Collector		175	2CHIP	Apr-11	SC
U	Kellys Bay Road	6,011	6,132	121	5	581	2_U_Access		80	2CHIP	Dec-10	SC
U	Kellys Bay r Road d	6,413	6,467	54	3	167	2_U_Access		80	2CHIP	Dec-10	SC
R	Kirikopuni Valley Road	3,371	3,464	93	7	651	8_R_Access	F	60	2CHIP	Dec-08	SC
R	Kirikopuni Valley Road	3,464	3,518	54	7	378	7_R_Low Volume	F	40	2CHIP	Dec-08	SC
R	Kirikopuni Valley Road	4,236	4,423	187	6	1,122	7_R_Low Volume	F	40	2CHIP	May-06	SC
R	Kirikopuni Valley Road	8,133	8,555	422	6	2,701	7_R_Low Volume	F	30	2CHIP	Jan-08	SC
R	Kirikopuni Valley Road	8,555	8,632	77	6	493	7_R_Low Volume	F	30	2CHIP	Jan-08	SC
U	Komiti Road	0	28	28	6	154	2_U_Access		225	2CHIP	Dec-13	SC
U	Komiti Road	223	341	118	6	649	2_U_Access		225	2CHIP	Dec-13	SC
R	Lawrence Road	1,930	2,746	816	7	5,304	8_R_Access		131	2CHIP	Jul-13	SC
R	Lawrence Road	2,746	2,829	83	7	540	8_R_Access		111	2CHIP	Dec-08	SC
R	Lawrence Road	6,366	6,453	87	7	626	8_R_Access		95	2CHIP	Dec-09	SC
R	Lutrell Road	500	561	61	7	427	8_R_Access		85	2CHIP	Jun-07	SC
R	Lutrell Road	561	658	97	7	679	8_R_Access		50	2CHIP	Jun-07	SC
R	Mahuta Gap Road	0	62	62	7	434	7_R_Low Volume		40	2CHIP	Sep-07	SC
R	Mahuta Road	0	56	56	7	392	8_R_Access		85	2CHIP	May-07	SC
R	Mahuta Road	6,820	6,963	143	7	1,001	8_R_Access		85	2CHIP	Sep-07	SC
R	Mahuta Road	6,963	7,035	72	7	504	8_R_Access		85	2CHIP	Sep-07	SC
R	Maropiu Settlement Road	1,450	1,539	89	6	534	7_R_Low Volume		40	2CHIP	Feb-08	SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2020
U	Marram Place	337	431	94	7	620	2_U_Access		85	2CHIP	Oct-14	SC
U	Marram Place	431	476	45	7	293	2_U_Access		85	2CHIP	Dec-15	SC
R	Maxwell Rd	0	54	54	6	324	7_R_Low Volume		40	2CHIP	Mar-06	SC
R	Mountain Rd	8,379	8,415	36	5	194	8_R_Access		150	2CHIP	Dec-00	SC
R	Mt Wesley Coast Road	8,598	8,654	56	7	392	8_R_Access		155	2CHIP	Sep-07	SC
U	Ngatoto Road	0	26	26	7	185	2_U_Access		160	2CHIP	Dec-13	SC
U	Ngatoto Road	210	409	199	4	784	2_U_Access		150	2CHIP	Dec-13	SC
U	Norfolk Drive	255	453	198	6	1,089	2_U_Access		110	2CHIP	May-05	SC
U	Norfolk Drive	453	473	20	6	110	2_U_Access		110	AC	May-05	SC
R	Notorious West Road	2,174	2,287	113	7	735	8_R_Access		145	2CHIP	Mar-10	SC
R	Notorious West Road	2,532	2,915	383	7	2,490	8_R_Access		165	2CHIP	Mar-10	SC
R	Notorious West Road	4,512	4,775	263	7	1,841	8_R_Access		125	2CHIP	Dec-08	SC
R	Omana Road	7,109	7,239	130	7	962	8_R_Access		80	2CHIP	Jul-09	SC
R	Omana Road	7,239	7,311	72	7	533	8_R_Access		70	2CHIP	Jul-09	SC
R	Omarae Road	0	32	32	5	160	7_R_Low Volume		20	1CHIP	May-10	SC
R	Oneriri Road	9,493	9,527	34	7	238	9_R_Secondary Collector		340	2CHIP	Nov-13	SC
R	Oparakau Road	2,230	2,344	114	7	798	8_R_Access		60	2CHIP	Jul-09	SC
R	Oparakau Road	8,416	8,466	50	7	350	7_R_Low Volume		30	2CHIP	Jan-10	SC
R	Oparakau Road	8,466	8,518	52	7	364	7_R_Low Volume		30	2CHIP	Jan-10	SC
R	Oruawharo School Road	260	365	105	5	536	8_R_Access		50	2CHIP	Dec-13	SC
R	Paparoa-Oakleigh Road	17,313	17,572	259	6	1,554	10_R_Primary Collector	SHD	310	2CHIP	Jul-15	SC
R	Paparoa-Oakleigh Road	17,572	17,677	105	6	630	10_R_Primary Collector	SHD	310	2CHIP	Jul-15	SC
R	Paparoa-Oakleigh Road	17,677	17,725	48	6	288	10_R_Primary Collector	SHD	310	2CHIP	Jul-15	SC
R	Paparoa-Oakleigh Road	17,725	17,860	135	6	810	10_R_Primary Collector	SHD	310	2CHIP	Jul-15	SC
R	Paparoa-Oakleigh Road	17,860	18,752	892	6	5,352	10_R_Primary Collector	SHD	310	2CHIP	Jul-15	SC
R	Paparoa Station Road	4,344	4,407	63	6	391	8_R_Access		70	2CHIP	Dec-08	SC
R	Paparoa Station Road	4,896	4,940	44	7	308	8_R_Access		70	2CHIP	Dec-08	SC
R	Paparoa Station Road	7,209	7,306	97	7	669	8_R_Access		70	2CHIP	Dec-08	SC
R	Parekura Road	0	54	54	7	378	7_R_Low Volume		40	2CHIP	Mar-05	SC
R	Pebblebrook Road	0	30	30	6	180	8_R_Access		55	2CHIP	Mar-12	SC
R	Phillips Road	0	58	58	6	360	7_R_Low Volume		30	2CHIP	Dec-05	SC
R	Pinaki Road	0	51	51	7	367	7_R_Low Volume		20	2CHIP	Jul-09	SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2020
R	Porter Road	7,440	7,503	63	7	422	7_R_Low Volume		40	1CHIP	Mar-08	SC
R	Pouto Road	790	1,220	430	8	3,440	10_R_Primary Collector	F	2005	2CHIP	Mar-09	SC
R	Pouto Road	1,430	1,750	320	8	2,560	10_R_Primary Collector	F	2005	2CHIP	Mar-09	SC
R	Pouto Road	26,806	27,069	263	6	1,596	9_R_Secondary Collector	F	246	2CHIP	Dec-08	SC
R	Pouto Road	27,126	27,178	52	6	312	9_R_Secondary Collector	F	245	2CHIP	Dec-08	SC
R	Pouto Road	62,527	62,631	104	6	624	8_R_Access	F	70	2CHIP	Jun-07	SC
R	Pukehuia Road	21,352	21,440	88	5	440	8_R_Access		60	2CHIP	Dec-07	SC
R	Pukehuia Road	21,440	21,495	55	4	204	8_R_Access		70	2CHIP	Dec-07	SC
R	Pukehuia Road	21,495	21,579	84	5	420	8_R_Access		70	2CHIP	Dec-07	SC
R	Pukemiro Road	0	58	58	6	348	8_R_Access	F	50	2CHIP	Apr-04	SC
R	Pukenui Road	0	53	53	6	292	8_R_Access		90	2CHIP	Feb-02	SC
U	Quail Way	0	266	266	5	1,447	2_U_Access		60	2CHIP	Dec-05	SC
R	Rehia Road	8,088	8,222	134	6	804	8_R_Access		70	2CHIP	Apr-07	SC
R	Rehia Road	9,102	9,158	56	7	392	8_R_Access		70	2CHIP	Jan-10	SC
R	Robertson Road	1,810	2,352	542	6	3,469	8_R_Access		170	2CHIP	Nov-14	SC
R	Robertson Road	2,352	2,383	31	6	198	8_R_Access		170	2CHIP	Nov-14	SC
R	Robertson Road	2,383	2,512	129	6	826	8_R_Access		170	2CHIP	Nov-14	SC
R	Robertson Road	2,897	3,141	244	6	1,562	8_R_Access		140	2CHIP	Nov-14	SC
R	Robertson Road	3,141	3,165	24	6	154	8_R_Access		140	2CHIP	Nov-14	SC
R	Robertson Road	3,165	3,307	142	6	909	8_R_Access		140	2CHIP	Nov-14	SC
R	Robertson Road	3,307	3,334	27	6	173	8_R_Access		140	2CHIP	Nov-14	SC
R	Robertson Road	3,334	3,500	166	6	1,062	8_R_Access		140	2CHIP	Nov-14	SC
R	Robertson Road	3,500	3,527	27	6	171	8_R_Access		130	2CHIP	Nov-14	SC
R	Robertson Road	3,527	3,690	163	6	1,027	8_R_Access		120	2CHIP	Nov-14	SC
R	Robertson Road	3,690	3,734	44	6	277	8_R_Access		120	2CHIP	Nov-14	SC
R	Rocky Creek Road	0	30	30	6	180	8_R_Access		60	2CHIP	Apr-05	SC
R	Settlement Road	7,253	7,415	162	6	907	9_R_Secondary Collector		240	2CHIP	Sep-14	SC
R	Sommerville Road	0	41	41	7	303	7_R_Low Volume		30	2CHIP	Jan-08	SC
R	Spring Street	0	51	51	6	281	7_R_Low Volume		30	2CHIP	Dec-06	SC
R	Tangowahine Valley Road	18,557	18,653	96	6	576	8_R_Access	F	115	2CHIP	Feb-14	SC
R	Tara Road	7,370	7,499	129	6	774	9_R_Secondary Collector		210	2CHIP	Apr-05	SC
R	Tawa Avenue	0	257	257	7	1,722	7_R_Low Volume		40	2CHIP	Dec-06	SC

Urban/ Rural	Road Name	Start (m)	End (m)	Length (m)	Surface Width (m)	Area (m^2)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2020
R	Tinopai Road	19,260	19,318	58	5	302	9_R_Secondary Collector		180	2CHIP	Dec-13	SC
R	Tokatoka Road	2,239	2,304	65	7	455	8_R_Access		80	2CHIP	Jan-10	SC
R	Tokatoka Road	2,304	2,354	50	7	350	8_R_Access		60	2CHIP	Jan-10	SC
U	Tunatahi Road	0	110	110	8	847	2_U_Access		415	2CHIP	Nov-14	SC
U	Tunatahi Road	110	195	85	8	655	2_U_Access		415	2CHIP	Nov-14	SC
R	Waimatenui East Road	3,414	3,526	112	6	672	7_R_Low Volume		10	2CHIP	Mar-16	SC
R	Wairere Road	4,779	5,038	259	6	1,554	7_R_Low Volume		40	2CHIP	Dec-09	SC
R	Waitapu Road	0	50	50	7	350	7_R_Low Volume		10	2CHIP	Oct-07	SC
R	Waller Road	0	52	52	7	364	7_R_Low Volume		20	2CHIP	Jan-10	SC
R	Webers Bay Road	0	30	30	6	180	7_R_Low Volume		20	2CHIP	Apr-05	SC
U	Well Street	0	190	190	8	1,558	1_U_Low Volume		40	2CHIP	Jan-04	SC
R	Whakapirau Road	6,263	6,766	503	6	3,038	9_R_Secondary Collector		172	2CHIP	Jan-04	SC
R	Wilkins Road	0	15	15	5	75	7_R_Low Volume		20	2CHIP	Dec-80	SC
R	Wonderview Lane	784	1,078	294	6	1,764	7_R_Low Volume		20	2CHIP	Jan-11	SC

2021

End (m)	Length (m)	Surface Width (m)	Area (m+)	Group Description	Forestry(F)/ (T)Tours/ Dairy(D)/SH Detour(SHD)	AADT Est	Surface Type	Surface Date	2017	2018	2019	2020	2021
4,245	511	6	3,061	9_R_Secondary Collector	D	150	1CHIP	Jan-02	MAINT		RHAB		SC
62	62	8	521	4_U_Primary Collector	F	2160	2CHIP	Mar-12			RHAB		SC
151	89	8	745	4_U_Primary Collector	F	2163	2CHIP	Apr-14			RHAB		SC
54	54	7	389	7_R_Low Volume		40	2CHIP	Dec-05					SC
4,411	1,011	7	6,976	9_R_Secondary Collector	T	230	2CHIP	Feb-08			RHAB		SC
4,564	153	7	1,056	9_R_Secondary Collector	T	230	2CHIP	Dec-08			RHAB		SC
1,400	1,300	7	8,580	9_R_Secondary Collector	F	185	2CHIP	Jul-13			RHAB		SC
7,360	49	7	343	8_R_Access		50	2CHIP	May-07					SC
7,405	45	7	315	8_R_Access		50	2CHIP	May-07					SC
1,019	198	10	1,881	2_U_Access		2160	2CHIP	Mar-12			RHAB		SC
4,610	294	6	1,764	9_R_Secondary Collector		130	2CHIP	Feb-12			RHAB		SC

2022

Urban/ Rural	Road Name	Start (M)	End (M)	Length (M)	Surface Width (M)	Area (M2)	Group Description	AADT Est	Surface Date	2020	2021	2022
U	Montgomery Avenue	0	496	496	9	4,365	3_U_Secondary Collector	900	May-13	RHAB		SC
R	Robertson Road	0	202	202	6	1,293	8_R_Access	175	Jan-07	RHAB		SC
R	Robertson Road	202	1,057	855	6	5,472	8_R_Access	170	Jan-07	RHAB		SC
R	Robertson Road	2,512	2,606	94	6	602	8_R_Access	165	Feb-05	RHAB		SC
R	Robertson Road	2,606	2,897	291	6	1,862	8_R_Access	140	Feb-05	RHAB		SC
R	Robertson Road	4,638	4,688	50	6	312	8_R_Access	110	Feb-08	RHAB		SC
R	Robertson Road	4,688	5,018	330	6	2,046	8_R_Access	100	Dec-05	RHAB		SC
R	Robertson Road	5,018	5,620	602	6	3,732	8_R_Access	100	Feb-08	RHAB		SC
R	Trounson Park Road	5,025	6,895	1,870	6	11,220	9_R_Secondary Collector	130	Feb-12	RHAB		SC

Kaipara District Council

Asset Management Plan 2017

Solid Waste

July 2017

This document has been prepared for the benefit of Kaipara District Council.

Quality Statement

Project Manager Henri Van Zyl	Roading and Solid Waste Manager	
prepared by Donna Powell	Infrastructure Technical Officer	18/04/2017
checked by Morrison Low and Associates Ltd	Peer Reviewers	29/06/2017
reviewed by Donna Powell	Infrastructure Technical Officer	08/08/2017
Approved for issue by Curt Martin	General Manager Infrastructure	……/……/……

Revision Schedule

Rev No	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
A	June 2017	Draft for review	Donna Powell	Henri Van Zyl	Morrison and Low Associates Ltd	
B	July 2017	Draft - final review	Donna Powell			
C	July 2017	Draft - approved for adoption				
D	July 2017	Approval of AMP				

Contents

LIST OF TABLES

LIST OF FIGURES

1 Executive summary

1.1 Introduction

The purpose of this Solid Waste Asset Management Plan (AMP) is to ensure that assets are operated and maintained, so that they provide the required level of service for present and future customers.

This AMP is a key planning tool and is directly related to the Waste Minimisation and Management Plan 2017 (WMMP), other documents that may also influence the Solid Waste activity and assets include Kaipara District Council's (KDC/Council) Long Term Plan, Annual Plan, General Bylaws, District Plan, Solid Waste contracts and Closed Landfill Management Plans.

1.2 Levels of Service

Levels of Service (LOS) are driven by customer expectations, compliance with statutory requirements and Council policies.

KDC's Solid Waste vision is "***To reduce waste and increase recycling and resource recovery for the protection of the environment and human health.***". In order to align to this vision KDC aims to provide affordable, hygienic, refuse collection and disposal that is environmentally sustainable, meets statutory requirements and the needs of Kaipara's communities. As such, the Solid Waste assets and services provided by KDC primarily support the community outcomes of 'A trusted Council making good decisions for the future' and 'A district with plenty of active outdoor opportunities'.

1.3 Future demand

This section outlines the existing demand, demand forecasts, growth and expectations. Increase in demand place additional wear on assets and services which may reduce the remaining life of assets and require the development of new capacity.

The future demand in the region for waste management and minimisation services will be driven by a number of primary drivers including:

- Demographic change (e.g. population and/or household changes);
- Change in commercial and industrial activity and economic conditions;
- National policy, legislation and regulation;
- Impact of waste minimisation programmes, services and future initiatives; and
- Community expectations.

1.4 Lifecycle management

Due to the limited number of solid waste assets owned by KDC, the asset groups covered by this Solid Waste AMP are: transfer stations; closed landfills; collection cages; public litterbins. When managing these assets KDC must ensure the interests and expectations of stakeholders are met alongside regulatory compliance requirements. This Solid Waste AMP documents this approach by outlining the asset management processes and practices used to develop optimised lifecycle management strategies. The AMP is therefore a vital component of KDC's planning process and demonstrates how we address multivariate requirements by integrating management, financial and technical practices to deliver the strategies and initiatives planned. This AMP demonstrates how KDC intends to meet key goals and objectives for the solid waste assets, looking ahead 10 years whilst acknowledging that, in practice, asset management planning tends to consider much longer timeframes.

1.5 Risk management

The main risks associated with the solid waste asset include: Illegal substances being deposited without Council knowledge, leachate contamination, legislative and regulatory changes that have the potential to impact on operations, changing market conditions that could potentially make recycling non-viable, adjacent landowner issues, environmental contamination occurs through events beyond the control of Council and a potential risk also exists where operators may fail to meet contractual obligations. Monitoring and management of 14 closed landfills is a significant aspect of the solid waste activity and KDC is working closely with the Northland Regional Council (NRC) on this as well as related consent requirements. Abandoned vehicles are becoming an issue due to the closures of private scrap metal yards and the devaluation in scrap metal This is reflected in budgeted forecasts for this activity.

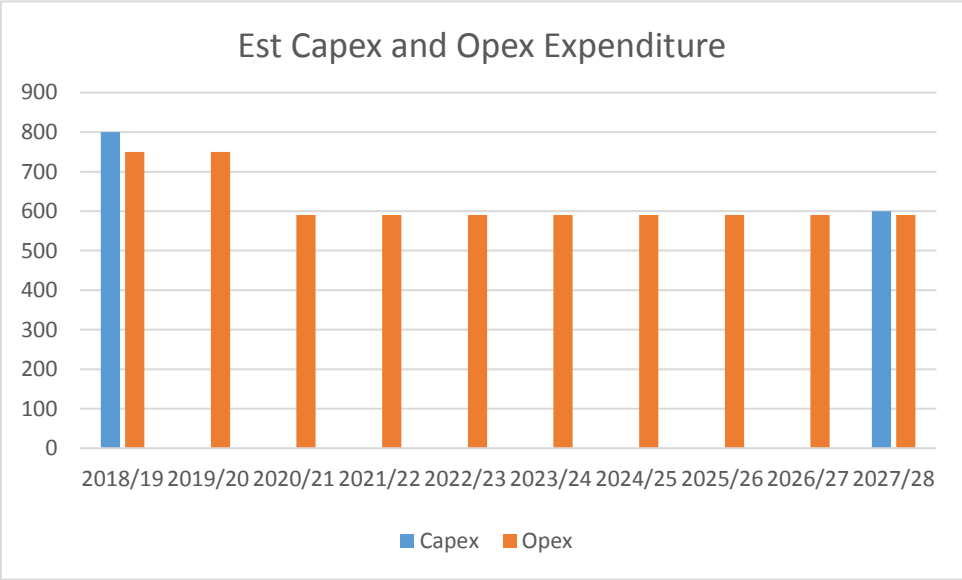
1.6 Financial projections

Council's solid waste collection and disposal service is based on a user pays system for the collection and disposal of kerbside solid waste and recyclables.

Future capital works include the final capping and site compliance of Awakino Landfill and Leachate control/disposal improvements at Hakaru Landfill with estimates of $800,000 and $1.2 million respectively.

See chart below for a summary forecast of expenditure over the next 10 years.

Figure 1: Summary Capex and Opex expenditure.



1.7 Improvement Plan

It is important for KDC to ensure that asset management practice is aligned with best practice and is always forward-looking when it comes to improvement in practices and standards. As such, a Solid Waste Asset Management Improvement Plan is being implemented to address gaps identified and a summary of this is outlined below. Further detail can be found in Section 9:

- resource consent renewals – Awakino Road closed landfill (Dargaville) and Te Maire closed landfill;
- review of litterbin capacity, frequency of clearing and locations;
- implementation of Solid Waste Bylaw (419) to improve the quality of waste disposal data;
- develop and implement Risk Register;
- determine community interest in additional/rural drop-off locations for recycling, develop proposal for consultation;
- investigate provision of district-wide rate funded recycling collection. Develop proposal for consultation;
- investigate options and develop a proposal to promote composting;
- determine community interest in developing holiday home drop-off locations/options, develop proposal for consultation;

- implement preferred option for leachate disposal at Hakaru closed landfill / transfer station;
- complete consent compliance requirements for Awakino Road closed landfill (Dargaville);
- future contracts to be more robust and both East and West Contracts to be aligned;
- implement a database for recording of solid waste-related physical assets and their condition ratings;
- investigate options for improvements and upgrades to transfer stations to better enable waste diversion;
- ongoing investigations of recycling markets and ways to expand on materials currently recycled; and
- provide waste awareness and behaviour change education.

2 Introduction

2.1 Key business activities, goals and objectives

Solid Waste assets and services form an infrastructure network which is critical to the health and quality of life of Kaipara district's residents, primarily supporting the community outcomes of 'Safety and a Good Quality of Life' and 'Special Character and Healthy Environment'. KDC's Solid Waste vision is "To reduce waste and increase recycling and resource recovery for the protection of the environment and human health".

There are currently no operational landfills in the Kaipara district. Instead, two transfer stations are provided in Dargaville (Awakino Road) and Mangawhai (Hakaru) for the handling of non-hazardous solid wastes. Provisions are available for the disposal of some hazardous waste at both transfer stations which are then dealt with as per requirements e.g. paints, televisions.

The Solid Waste assets owned by Council are limited to land and minor site facilities. Most assets used in the delivery of the solid waste services to Kaipara are owned by appointed contractors. This means that Council does not directly carry the capital costs of asset ownership, including finance charges, depreciation and renewal costs. Overall, Council manages approximately $70,000 (excluding land) of solid waste infrastructure assets on behalf of the community. The Solid Waste asset operates as a user pays system with those using the system paying either at the point of collection or disposal. There are also 14 closed landfills that Council monitors in accordance with resource consent conditions.

Council aims to provide affordable, hygienic, refuse collection and disposal that is environmentally sustainable, meets our statutory requirements and meets the needs of our communities. The community expectation is that Council will provide solid waste services and LOS that meet the needs and affordable expectations of the community. We are aiming to continue to deliver the current LOS within this activity.

2.2 Purpose of this Asset Management Plan

The specific purpose of this AMP is to:

- Demonstrate responsible stewardship of the Solid Waste assets including transfer stations and closed landfill sites;
- Provide the basis for compliance with the local Government Act (LGA) tracking changes in service potential and determining optimal long term financial strategies for Solid Waste assets;
- Provide a basis for customer consultation on LOS and price/quality trade-offs;
- Manage the environment, social and financial risks associated with Solid Waste assets; and
- Assess the demand and key performance indicators for Solid Waste assets.

This AMP provides discussion of the key elements affecting management of Council's Solid Waste asset, including the legislative framework, links to community outcomes, policies and strategy, the proposed LOS, performance measures and demand, environmental and service management. This AMP period is 2017/2020.

Asset condition and location are examined and a financial summary is presented to define the investment planned to address issues, enable consent compliance and to ensure that an uninterrupted service is available and facilities provided to meet customers' needs now and into the future.

All financial forecasts have been prepared from Council's historical budget allocations. The information contained within the AMP is substantially complete and up-to-date. With the document being used on a day-to-day basis the information will change to meet the district's changing needs.

2.3 Drivers for asset management

This AMP has been written to provide information required for good asset management planning as set out in:

- LGA 2002 Schedule 10 and amendments;
- Office of the Auditor-General criteria for AMPs 2006; and
- International Infrastructure Management Manual (IIMM) 2011, published by New Zealand Asset Management Support (NAMS).

Key achievements from previous AMP 2014/2017:

- Diversion of waste from landfill is increasing;
- Knowledge of Solid Waste assets and condition of assets has increased – leading to more accurate predictions for future spending;
- Leachate and consent issues at closed landfills are nearing resolution; and
- Bringing Solid Waste back in-house has led to more knowledge of the asset and less reliance on consultants.

2.4 Relationship with other plans and strategies

AMPs are a key component of the Council planning process, linking with the following plans and documents:

- Long Term Plan (LTP) – Required by LGA 2002 to cover a period of at least 10 years, contains key information about Council's activities, assets, LOS and cost of providing services;
- Annual Plan (AP) - Detailed action plan on Council's projects and finances for each particular year; and
- Waste Management and Minimisation Plan (WMMP) – carried out under the Waste Minimisation Act 2008 and follows a waste assessment and is reviewed every six years, the WMMP sets out how Council will progress efficient and effective waste management and minimisation.

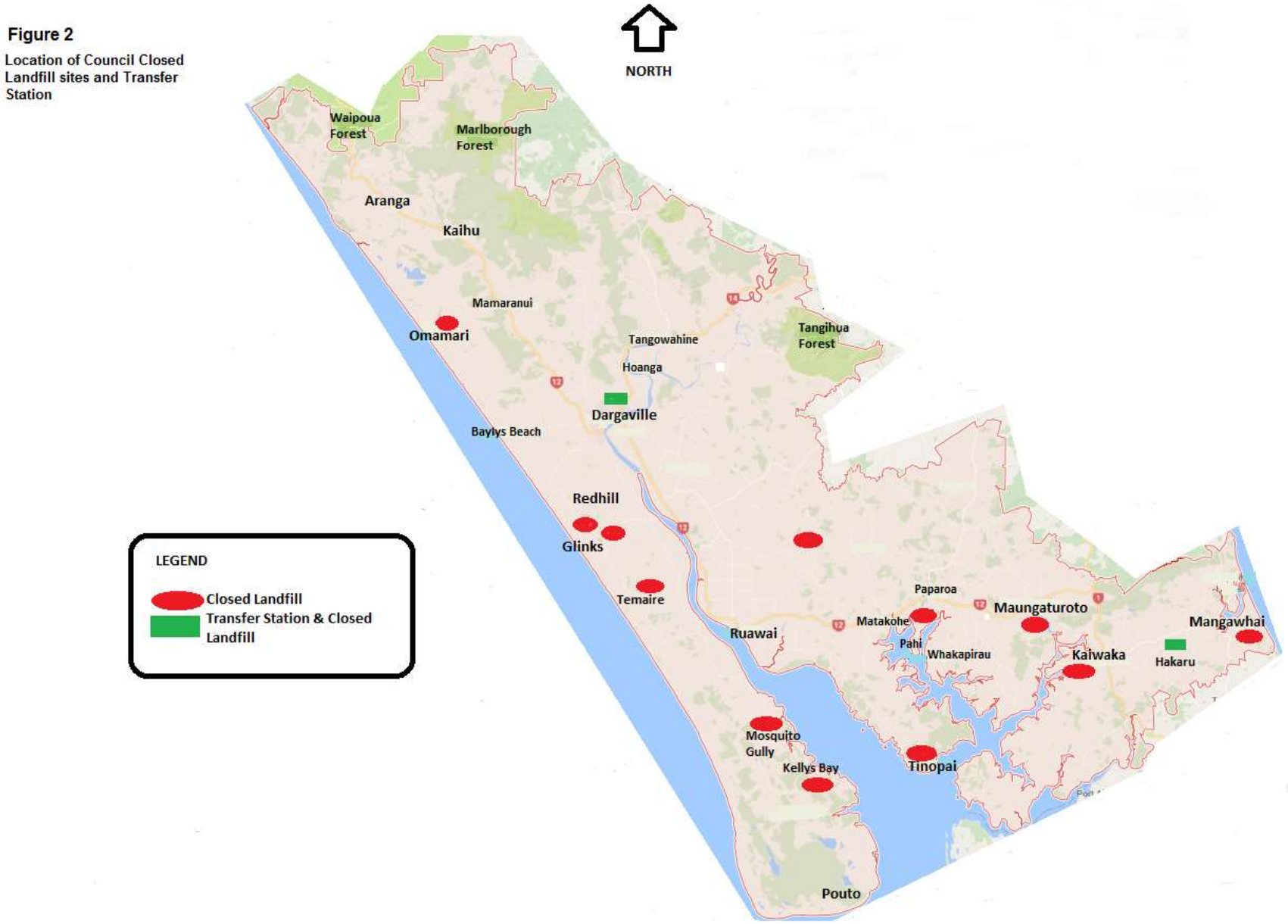
2.5 Scope of assets and services

The Solid Waste assets can be grouped as transfer stations, closed landfills, public litterbins and collection cages owned by Council. These are limited to land and minor site facilities. These are:

- Freehold title (with a 'gift back' clause) to the land on which the Hakaru landfill is situated;
- Freehold title to three of the 14 closed landfill sites;
- Seven closed landfills on Road Reserve;
- Freehold title to the land on which the Dargaville transfer station is situated;
- Leachate detention ponds and landfill capping at some closed landfill sites;
- Leachate monitoring boreholes (Te Maire, Mangawhai, Parawanui and Glinks);
- Minor infrastructure assets at closed landfills (fencing, accesses, stormwater, landscaping and planting);
- Shed/garage located at Dargaville transfer station and used as office/storage by contractor, bottle collection bay and recycling container;
- Collection cages at specific points for bagged solid waste to be dropped into by residents; and
- All assets associated with the Hakaru transfer station are privately owned by the respective contractors, other than the land and a few minor assets (pump station and telemetry) that are owned by Council. At the Awakino Road site, other assets include a wetland and office/storage shed and the recently added recycling storage areas.

Overall, Council manages $70,000 (excluding land) of solid waste infrastructure assets on behalf of the community. The land values are revalued regularly (a copy of the latest valuation is presented in Appendix A of this document). The Council-owned minor site facilities and infrastructure are not currently valued by Council for formal depreciation and renewal purposes. Asset value is relatively minor and most assets are owned by the contractors. Nevertheless, annual budget provisions are made for the replacement of minor site assets as required.

Figure 2 Location Council closed landfill sites and transfer stations



The majority of Solid Waste infrastructure assets have lifecycles far greater than 10 years however, to facilitate and demonstrate alignment with the LTP 2018/2028, the content in this AMP focuses upon the next 10 years. In practice, asset management planning tends to consider much longer timeframes.

The main solid waste services provided to the Kaipara district include:

- Transfer stations (Dargaville and Hakaru);
- Weekly (kerbside) general waste collection;
- Weekly (kerbside) recycling collection;
- General waste and recycling bag kerbside collection;
- Public litterbin servicing closed landfill management;
- Abandoned vehicle removal; and
- Illegally dumped rubbish removal.

More information can be found in the WMMP 2017 which is available on the KDC website (www.kaipara.govt.nz).

The above solid waste services are managed through the following:

- In-house management and overview of Solid Waste Contracts, illegal litter pickup and disposal and abandoned vehicle removals, as reported through Council's Helpdesk system;
- Contract for Eastern and Western waste and recyclables collection, disposal and Dargaville transfer station operation;
- Contract for operation and management of Council's transfer station (Hakaru);
- Closed landfill monitoring and compliance in partnership with NRC and resource consent conditions; and
- Leachate removal (Hakaru Landfill site).

2.6 Rationale for service

To promote and facilitate waste reduction, to collect refuse and recyclables from households, to dispose of waste and hazardous substances safely, and to continue with the rehabilitations and management of closed landfills.

In response to the asset management drivers outlined in Section 1.3, Council aims to provide affordable, hygienic solid waste collection and disposal that is environmentally sustainable, meets Council's statutory requirements and meets the needs of its communities, at the current LOS.

The key legislative rationale for continued Council involvement in the activity and ownership of assets is contained in:

- The Health Act 1956, which requires the Council to provide 'sanitary works', the definition of which includes works for the collection and disposal of solid waste;
- LGA 2002 (Section 130) precludes Council from transferring ownership or control of a strategic asset, or construct, replace or abandon a strategic asset, unless it has first consulted with the community and included the proposal in the LTP;
- The Waste Minimisation Act 2008, the purpose of which is to encourage waste minimisation and a decrease in waste disposal; and
- The Resource Management Act.

2.6.1 Contribution to Community Outcomes

The table below sets out the Community Outcomes in Council's LTP 2018/2028. The solid waste service will contribute to the achievement of the outcomes as follows:

Table 1: Contributions to community outcomes

Refuse contributes to the following Community Outcomes	How this activity or service contributes
A district with welcoming and strong communities	A seamless rubbish collection service at affordable levels make life easy. However, this needs to be balanced against environmental goals of waste minimisation, involving reducing waste to landfill.
A district with plenty of outdoor activities	Pollution from leachate from landfills requires management to protect environmental quality.
A trusted Council making good decisions for the future	To improve available information on waste generation, diversion and disposal. Contract Management ensuring kerbside collections and other contractor-related activities are completed in a timely, safe and efficient manner.

2.7 Effects of Solid Waste activity

Historically, solid waste (refuse) disposal has been provided free to communities. Landfill sites across the Kaipara district provided easy access for the public to dispose of unwanted household and commercial waste with limited controls on what was being deposited. Through legislation, public awareness and changing community expectations regarding waste disposal, recycling and environmental concerns, waste management has changed significantly.

Recognition of the potential effects (both positive and negative) has grown overtime. The main effects of the Solid Waste asset can be described under the categories of: Environmental, Social and Economic.

Table 2: Potential Significant Negative Effects.

Negative effect	Description	Council's mitigation measure
Dust, odour and windblown litter (Social and environment effects)	**Kerbside collections**: Loose kerbside recycling materials and broken solid waste bags may become windblown litter and odorous if not collected promptly.	This is managed through Contract specification with regards to kerbside collection and also bylaws around when refuse and recycling should be placed out for collection.
	Transfer station and recyclable facilities: Excessive recyclable and general refuse materials may become windblown litter.	This is managed through Contract specification and regular inspections by Council staff to insure sites are tidy. Additional storage and fencing will be considered if this becomes an issue.
	Closed landfills: Closed landfills can be targets for illegal dumping (fly tipping) which can become odorous and untidy. Also potential for odour issues arising from landfill gases escaping into the atmosphere.	Closed landfills are inspected quarterly for fly tipping and gas odours.
	Public litterbins: Capacity problems can cause bins to become over full (in holiday seasons) and overflowing litter is blown around the area.	Council regularly reviews bin capacity and suitability with contractors; this is largely managed by contractors, additional collections are completed over the seasonal periods where required.
Discharges of pollutants to water and land. (Environmental effects)	**Transfer stations**: There is a possibility of stormwater contamination onsite if materials are not managed well.	This is managed via separation of leachate and stormwater management systems and regular inspections of the separate systems.
	Closed landfills: If closed landfills are not capped off and vegetated correctly, they may release additional solid waste or leachate to the environment.	Closed landfills are Consented under NRC, there are strict monitoring conditions on leachate discharge.
Disruptions of service Social and economic effects)	**Kerbside and litterbin collections:** Disruption to kerbside solid waste services can cause a public health effect if wastes are not collected in a timely manner.	This is managed by the contractor; Council can utilise sub-contractor if Refuse contractor does not meet Contract conditions.

Negative effect	Description	Council's mitigation measure
	Transfer stations: Failure to open these sites can prevent businesses operating and create public health risks with the storage of waste on properties.	Waste can be stored at residences or business for short periods of time. In the event of a long term closure waste, both kerbside and general waste can be transported directly to Puwera Landfill south of Whangarei.
Discharge or migration of landfill gas (Environmental and economic effects)	**Closed landfills:** Potentially explosive/flammable landfill gases may have a noxious odour and could damage soil health and vegetation. There is also concern around the emissions of greenhouse gases.	Council monitors closed landfills as per resource consent conditions which includes monitoring for evidence of landfill gas. NRC also monitors.
Unaffordable or uneconomic cost of services (Social and economic effects)	**Recycling:** The loss of viable markets for recovered materials can have a negative effect on the economic viability of recycling.	This is managed by Council contractors. Council provides drop-off locations for recycling through the two transfer stations and a recycling kerbside collection in the main urban areas, the contractor is responsible for all marketing. This is a user pays service with no ratepayer funding.
	Self-haul waste: Disposal costs are governed by conditions outside of Council control – gate and other disposal charges are influenced by these.	All refuse disposal is user pays and managed by the Refuse contractors, any rise in costs by contractor has to be justified and approved by Council.
	Kerbside collection: This is also influenced by conditions outside of Council control.	As for above disposal is user pays and managed by Refuse contractors.
	Transfer stations: Gate charges are directly influenced by the cost of disposal at landfill.	Transfer station disposal costs are user pays and any increases in gate charges need to be approved by Council. Transfer station disposal activities are user pay basis, Council provides a small budget for property and asset maintenance.
	Public litterbin collections: Issues caused by illegal dumping of household rubbish and capacity issues over seasonal periods.	This is managed by Council contractors and a free service to the public. Capacity is increase over seasonal periods and bins monitored.

Negative effect	Description	Council's mitigation measure
	Closed landfills: Central government legislation governs how we manage closed landfills, any changes could result in additional cost.	This is beyond Council control and any changes need to be managed and prioritised. Regular inspections are completed to ensure closed landfills are up to the current standards.
Illegal dumping (Environmental, economic and Social effects)	Any reports of dumping are dealt with promptly and if offenders identified they are prosecuted.	When dumping is reported Council manages the clean-up as soon as practicably possible, offenders are prosecuted where evidence is found.

Table 3: Potential significant positive effects

Positive effect	Description
Public health benefits	Council offers kerbside collection services and provides transfer stations in two locations across the district. This provides safe and sanitary disposal to a significant majority of residents.
Economic benefits	Access to waste disposal and recycling services at reasonable cost supports economic activity.
Environmental benefits	Provision of recycling services, and other waste minimisation activities reduces the refuse going to landfill and reduces potential negative effect of these activities.

2.8 Key issues and assumptions for the future

The key issues relating to the future provision of solid waste services in the Kaipara district have been identified as follows:

- **Ability to meet community expectations around the district -** Although the latest NZCPM survey indicated a slight drop in satisfaction from the previous quarter, Council considers that there is still a high percentage of satisfaction with the LOS being provided.
  - Should the demographics of the district change, expectations for services currently not provided may increase or decrease. This directly impacts on the volume being collected and disposed of through the transfer station gates.
  - Market conditions and availability will have an effect on recycling services offered versus what the community expects.
- **Increasing statutory requirements on existing and closed landfills -** The potential for additional (unforeseen?) costs, which have not been forecast, may apply to Council on its closed landfill sites requiring additional resource and/or expenditure to meet requirements e.g. there is a potential risk that any renewed consents will have more stringent conditions than previously.

- **Sustainable pricing for district-wide kerbside solid waste and recycling bag collection -** For the service to continue to be sustainable it requires the contractor to price at a level that maintains its viability, encourages use and grows usage of the service. The contractors rely on the sale of refuse bags to ensure a sustainable collection and disposal service.
- **Increase in illegal dumping (fly tipping) including abandoned vehicles -** This may occur as a result of changes made nationally that can influence disposal costs i.e. the cost of carbon credits effects the cost to dispose to landfill, this could affect the gate charges at transfer stations. Currently abandoned vehicle retrieval costs are on the rise and illegal dumping appears to have levelled off although this may be due to lack of reporting by the public to the Council.
- **Availability of waste data –** There are several waste streams that are known to exist but are difficult to quantify. This means that both waste disposed to landfill and waste diverted/recovered are likely to be underestimated. With the enforcement of Bylaw 4 Section 419 Restrictions on Refuse Collection Operations (IP4), it is assumed that Council will be able to report more accurate quantities.
- **How to increase waste reduction -** Data on recycling stats is becoming more reliable, trends show recycling is increasing.
- **Leachate disposal conditions Hakaru closed landfill -** Until the upgrades to the leachate treatment and disposal have been completed leachate disposal costs at Hakaru could increase beyond those budgeted.
- **Leachate and capping conditions of Dargaville closed landfill (Awakino Road) -** NRC is currently setting the conditions for the consent for the Dargaville closed landfill, it is unknown what these conditions will be and the cost to meet compliance.
- **Whangarei District Council disposal facility -** Should the current situation (availability) of the Whangarei site change e.g. price increase, other options will need to be looked at such as transporting to Auckland's Redvale site (a review of the Solid Waste asset carried out in 2013 identified the option of delivery to Redvale landfill in Auckland; yet status quo is currently the preferred option).
- **Increase in retired population and decrease in solid waste volume -** An increase in retired population directly relates to a decrease in solid waste being picked up and delivered to the transfer stations. The viability of these transfer stations is based on the volumes of solid waste transferring through them.
- **Financial costs associated with closed landfill site management -** Closed landfill sites require ongoing management throughout their resource consent lifespan and following on from that term. The minimum requirement being regular annual inspections of the site, reporting and possible maintenance work as a result, data information updating and resource consent renewals. These are all ongoing costs which have to be allocated and budgeted for.

Organic Waste - There is potential opportunities for Council to work with neighbours to provide shared service arrangements for organic waste management in the future, these will be investigated as part of IP 7.

3 Levels of Service (LOS)

3.1 Introduction

Transfer station facilities are provided at Dargaville and Hakaru. User pays charges apply to solid waste and some recycling deposited at the transfer stations. These are operated as a self-funding enterprise by the appointed contractor.

Solid Waste services are delivered through two main Contracts. These cover:

- Weekly bagged (kerbside) solid waste and recycling collection in urban areas and some rural areas at designated points, public litterbin clearing across the district and operation of the transfer station in the western part of the district (Awakino Road, Dargaville). The kerbside collection service is self-funding (user pays) and the appointed contractor collects revenue from the sale of Council-approved bags, litterbin clearing and litterbin control; and
- The operation of the solid waste transfer station in the south-eastern part of the district (Hakaru, Mangawhai).

Currently all solid waste from Dargaville and Hakaru is transferred to Whangarei's Puwera commercial landfill.

Recycling services are undertaken weekly in association with the weekly bagged kerbside collection (major urban areas only) from Mangawhai to Dargaville.

Abandoned vehicles services and illegal dumping retrieval are carried out as and when required, separate to contracted services.

There are also a number of historic closed landfill sites that Council has responsibilities for and carries liability for ongoing monitoring and maintenance, as well as reinstatement obligations for their closures.

Setting service levels and associated performance measures assists to define the service standard that the customer can expect from Council. Performance measure targets provide a basis for measuring Council's performance through identified indicators.

3.1.1 Proposed LOS

The minimum LOS proposed for use in the development of Council's next LTP 2018/2028 set for activity is:

- Receptacles in public places comply with Litter Act 1979;
- Trend shows reduction in amount of waste to landfill per resident;
- All residents have access to rubbish collection service at cost; and
- Legal compliance for closed landfills.

3.2 Key stakeholders

Council recognises that a key asset management function is to understand who our stakeholders are, what they value and why. Stakeholders are defined as groups or individuals with either a direct or indirect interest in KDC's solid waste asset management policies and practices.

The types of services provided by Council depends on the LOS determined by the community. How these services are provided is determined by Council in response to the requirements of both the key stakeholders and legislation. Key stakeholders are broadly defined as:

Customers

The direct users of the district's solid waste service and associated assets are KDC ratepayers, residents and domestic and international tourists visiting the district.

Understanding our Customers' Needs (Stakeholder Engagement)

Council Vision – *Thriving communities working together* (Kaipara District Council Long Term Plan 2018/2028)

A district with welcoming and strong communities	A trusted Council making good decisions for the future	A district with plenty of active outdoor opportunities
Assisting and supporting community involvement	**Making it simpler to work with us**	**Partnering with communities to develop sports and recreation facilities**
Maintaining and improving infrastructure	**Open, transparent and engaged with communities and business**	**Protecting and enhancing our natural assets and open spaces**
Recognising and supporting achievement	**Intent on lifting Kaipara's well-being**	

The Values: Ko nga uara

Our purpose is to make a positive difference for Kaipara. We aspire to work with:

Integrity

- We will do what we say we will
- We will act with good intent
- We will do the right thing in the right way

Team Work

- We will work together
- We will support each other

Delivering Value

- We will seek to understand needs and deliver to them
- We will apply our skills and knowledge for the benefit of others

Elected Members (Mayor and Councillors)

The Mayor and Councillors have a vital interest in the management of KDC Solid Waste assets and they represent the interests of the community.

Other stakeholders

These are parties with an interest in the management of KDC Solid Waste assets and include, although are not necessarily limited to:

- Police;
- Northland Regional Council (NRC);
- Department of Conservation;
- Business community;
- Private solid waste service providers;
- Special interest groups (e.g. Hakaru Landfill Committee);
- Local Iwi;
- Resident and ratepayer organisations;
- Schools;
- Northland District Health Board; and
- Staff from Kaipara District Council e.g. Roading, Water and Wastewater, Policy and Planning teams, consultants and contractors.

3.3 Compliance and strategy

Solid Waste is governed by many statutes, regulations, standards and Codes of Practice. Council aims to achieve material compliance with all relevant legislation, regulations, standards and codes of practice that relate to solid waste management, including any relevant environmental legislation.

3.3.1 Compliance requirements

Legislation provides the minimum requirements for LOS. The main legislation driving solid waste activities are:

- Resource Management Act 1991 (RMA);
- Local Government Act 2002 (LGA);
- Waste Minimisation Act 2008 (WMA);
- Climate Change Response Act 2008 (CCRA).

The Resource Management Act 1991

The RMA provides guidelines and regulations for the sustainable management of natural and physical resources. Although it does not specifically define "Waste", the Act addresses waste management and minimisation activities and facilities through national, regional and local policy, standards, plans and consent procedures. In this role, the RMA exercises considerable influence over facilities for waste disposal, recycling, recovery, treatment and others in terms of the potential impacts of these facilities on the environment.

Under Section 31 of the RMA, regional councils are responsible for controlling the discharge of contaminants into or onto land, air or water.

Under the RMA, territorial authority responsibility includes controlling the effects of land use activities that have the potential to create adverse effects on the natural and physical resources of their district. Facilities involved in the disposal, treatment or use of waste or recoverable materials may carry this potential. Permitted, controlled, discretionary, non-complying and prohibited activities and their controls are specified within district planning documents, thereby defining further land use related resource consent requirements for waste related activities.

Local Government Act 2002

- The Local Government Act 2002 (Subpart 1) states that the purpose of local government is:

  "to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses."

In this Act, **good-quality**, in relation to local infrastructure, local public services and performance of regulatory functions, means infrastructure, services and performances that are:

(a) efficient;

(b) effective; and

(c) appropriate to present and anticipated future circumstances.

Section 11A(e) of the LGA 2002 specifies that reserves, recreational facilities and other community infrastructure are core activities and Council must have particular regard to the contribution that these services make to the community.

The key drivers of good asset management planning are better accountability to the ratepayer, more sustainable decision-making, effective risk management, enhanced customer service and improved financial efficiency.

The LGA sets out the requirements of Council to deliver services and the responsibility of Council to make assessment of services provided. This Solid Waste Asset Management Plan constitutes the process by which this assessment is carried out by Council and reported to the public through the LTP.

Waste Minimisation Act 2008

The WMA encourages a reduction in the amount of waste generated and disposed of in New Zealand and aims to lessen the environmental harm from waste and aims to benefit the New Zealand economy by encouraging improved use of materials throughout their life. The WMA sets out to achieve this through the following:

- Places a levy on waste disposal to landfills;
- Funds waste minimisation grants;
- Allows regulations to be made to make it mandatory for territorial authorities and the waste sector to report on waste to improve waste minimisation;
- Manages producer responsibility programmes;
- Directs territorial authorities with respect to waste minimisation responsibilities; and
- Sets up a Waste Advisory Board to provide independent advice to the Minister for the Environment with respect to waste minimisation.

Part 4 of the WMA is fully dedicated to the responsibilities of territorial authorities (TAs) which “must promote effective and efficient waste management and minimisation within their districts” (s42). KDC has a statutory responsibility to promote effective and efficient waste minimisation and, for this purpose to adopt a WMMP. This legislation requires the completion of a Waste Assessment prior to the review of the WMMP. Council has recently completed this process with a Waste Assessment completed in 2016 and the 2017 WMMP adopted by Council Nov 2017. . KDC has a statutory responsibility to promote effective and efficient waste minimisation and for this purpose to adopt a WMMP.

Climate Change Response Act 2008

The CCRA provides the basis for the New Zealand Greenhouse Gas Emission Trading Scheme. This Act requires landfill owners to purchase emission trading units to cover methane emissions generated from the landfill.

Other legislation

The following is a summary of other legislation that must be considered with respect to waste management.

- The Hazardous Substances and New Organisms Act 1996 controls the handling and disposal of hazardous substances;
- The Health Act 1956 aims to prevent nuisance and promote public health;
- LGA (Rating) Act 2002 allows Council to determine a rate or charge for any activity Council chooses to get involved in;
- The Health and Safety at Work Act 2015; and
- The Litter Act 1979 is enforced by territorial authorities, who have a responsibility to monitor litter dumping, act on complaints and deal with those responsible for litter dumping.

Along with the above national legislation there is also Northland and Local Legislative Requirements.

Regional and local policies, regulations and strategies

- Northland Regional Policy Statement;
- Northland Regional Air Quality Plan;
- Northland Regional Coastal Plan;
- Northland Regional Water and Soil Plan;
- KDC LTP and Annual Plans;
- KDC Solid Waste Asset Management Plan; and
- KDC General Bylaws 2008 Part 4

Industry guidelines and standards

In addition to Legislation and Policy there are also a number of industry guidelines and standards specific to waste, some of the more relevant standards and guidelines are listed below:

- NZS 7603:1979 Specification for refuse bags for local authority collection;
- SNZ HB 4360:2000 Risk Management for Local Government;
- AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines;
- NZS 3910:2013 Conditions of contract for building and civil engineering construction;
- NZS 4454:2005 Composts, soil conditioners and mulches; and
- MFE – A Guide for the Management of Closing and Closed Landfills in New Zealand.

3.4 Strategic goals

The Acts and Regulations outlined in the previous section state the minimum requirements for some LOS and objectives. Further to this, Council states the following five goals that drive the focus for solid waste services provided:

Table 4: Solid waste goals

Goal	How the solid waste asset contributes
To maximise the diversion of waste from landfill.	The 2017 WMMP sets out how Council will support this goal.
To provide safe, environmentally sustainable and hygienic refuse collection and disposal.	Council provides kerbside general refuse and recycling collections, and two transfer stations for drop-off of refuse and recycling. To implement licensing in accordance with the current (2016) Bylaw no later than March 2018.
To reduce illegal dumping and associated negative environmental impact.	Council provides an affordable user pays system and transfer station facilities located in areas of the district which is financially sustainable. All reported illegally dumped rubbish to be cleaned up within 72 hours. Refuse searched and when offender identified an infringement is issued.
To provide services to residents that represent great value and maximise local employment and business.	Kerbside collection, recycling and transfer station activities are all managed by contractors and are based locally within the Kaipara.
To ensure compliance and knowledge of current and relevant legislation.	Council consults and works with other local authorities/councils.

3.5 Community expectations

The types of services provided by KDC also depends on the community expectations. Understanding community/stakeholder expectations is therefore an important part of the process for setting LOS and managing Solid Waste assets to meet these. The main tools used by KDC to seek feedback from the community is through the customer service request system and an annual survey conducted by Key Research Ltd.

Customer service requests

Figure 3: Comparison between total service requests and solid waste service requests

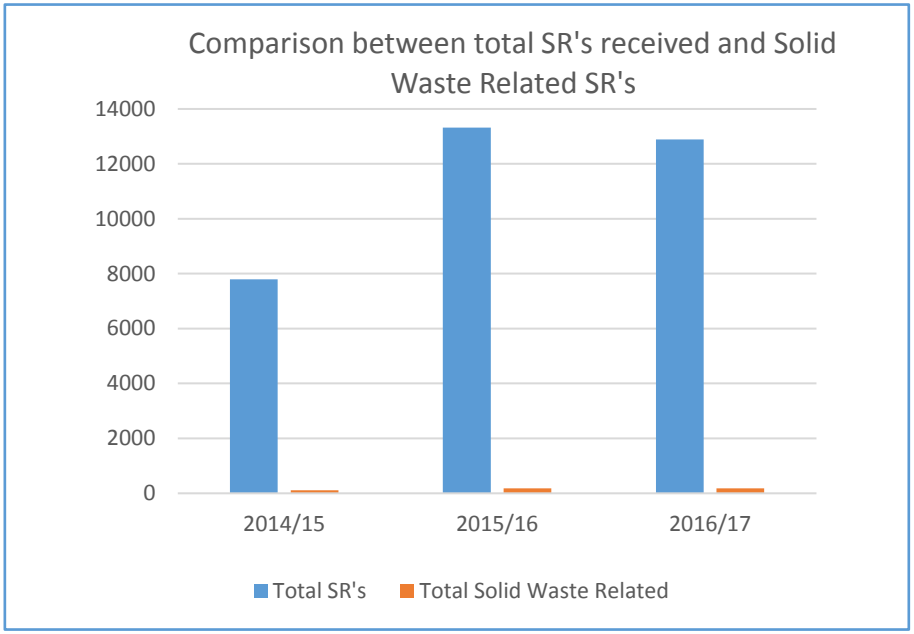


Figure 3 shows a comparison of solid waste service requests with all service requests received by Council.

The percentage of solid waste related service requests ranges from 1.46% in 2014/2015 down to 1.37% in 2016/2017.

This clearly shows that compared to other activities offered by Council that the Solid Waste activity is well received amongst the community.

Figure 4: Breakdown by type of solid waste service request

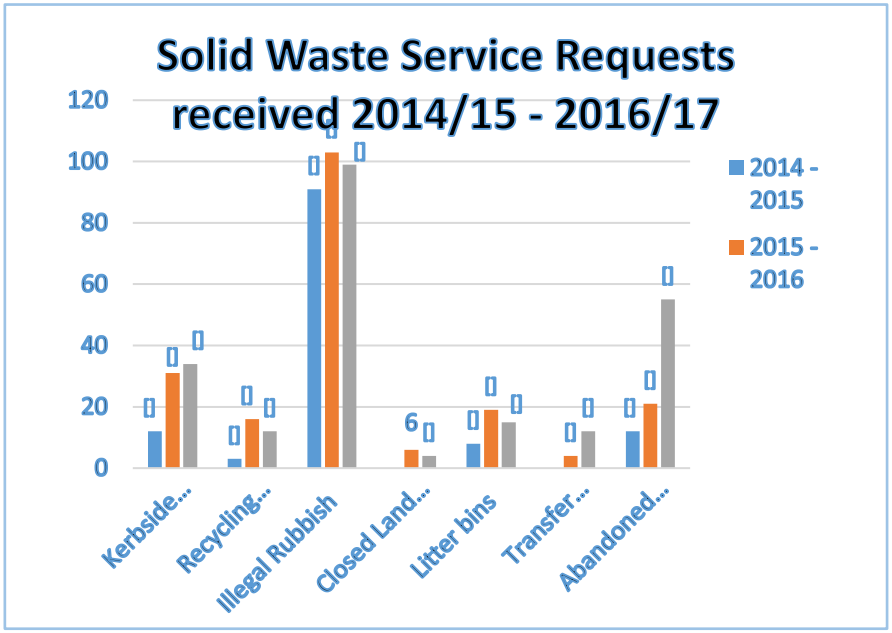


Figure 4 demonstrates a breakdown in service request types, it shows that over the past three years that illegal rubbish is the main complaint(illegal rubbish is mostly made up of roadside dumping of general household rubbish, there is a small component of illegal bags used at collection points, it also shows that abandoned vehicles have become an issue in this the past year, this can be attributed to the closure of a private scrap metal dealer and the cost of scrap steel being the lowest it has been for some time

Survey results

Figure 5: Shows a comparison of survey results from 2014 – 2016.

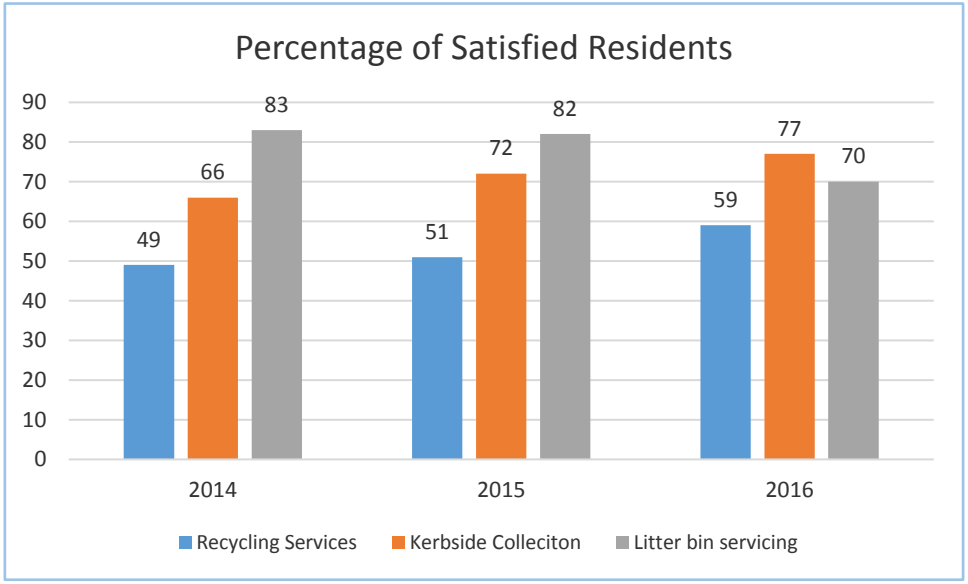


Figure 5 demonstrates that indications from the annual survey conducted by Key Research Ltd 2016 are that recycling and kerbside collection services are improving overall there is a decline in satisfaction with litterbin services being provided across the district, capacity seems to be the main issue, this is an issue due to freedom campers and household rubbish being dumped in litterbins. A review of litterbin capacity, frequency of clearing and locations forms part of the Solid Waste Improvement Plan, Section 7 IP3. This is scheduled for 2017/2018 financial year.

Table 5: Performance levels and targets

Measuring performance					
What the community can expect from Council	**How Council measures this**	**LTP Year 1 Target 2018/2019**	**LTP Year 2 Target 2019/2020**	**LTP Year 3 Target 2020/2021**	**LTP Years 4-10 Target 2021/2028**
Affordable, hygienic refuse collection and disposal that is environmentally sustainable and meets our statutory requirements and the needs of the community. This includes provision of litterbins and transfer stations.	Percentage of residents who are somewhat satisfied to very satisfied with kerbside refuse collection measured by data from quarterly and annual Key Research survey.	75%	75%	75%	75%
	Percentage of residents who are somewhat satisfied to very satisfied or satisfied with Waste Management measured by data from quarterly and annual Key Research survey.	75%	75%	75%	75%
Kerbside recycling collection will be undertaken weekly in key urban areas from Mangawhai to Dargaville in accordance with Council's 2017 WMMP. Recycling drop-off sites will be provided at both Hakaru and Dargaville transfer stations.	Percentage of residents who are very satisfied or satisfied with recycling collection	55%	56%	57%	58%
	Total amount of recycling (diverted from landfill) as a percentage of total waste disposed to transfer stations – Base rate to be determined at the completed of 2017/2018 financial year.	1% more than previous year.	1% more than previous year.	1% more than previous year.	1% more than previous year.
Zero non-compliance notices from NRC.	Percentage compliance with our resource consents.	100%	100%	100%	100%

3.6 Current fees and charges

3.6.1 Solid waste collection

Only one Council bagged (kerbside) collection contract is operational in the district. The contract uses a bag system and the charges are as follows:

Bagged (kerbside) collection $3.10 per bag

The charges are subject to change from time to time, after proof of justification by Council's appointed contractor. The charge per bag is not dissimilar from a variety of other councils in New Zealand as shown in the table below.

Table 6: Cost comparison for rubbish charges: other councils (2017)

Name	Population	Amount for bags (65L)
Tararua District Council	17,550	$3.75
Hauraki District Council	19,550	$3.20
Far North District Council	62,000	$3.00
Whangarei District Council	87,600	$2.80
Matamata-Piako District Council	34,100	$3.00
Waitaki District Council	22,100	$4.00

3.6.2 Solid waste disposal

The rates for disposing of solid waste at the Hakaru transfer station and the Dargaville transfer station are as follows:

Hakaru transfer station $68.00 per cubic metre

Dargaville transfer station $53.00 per cubic metre

Both charges are subject to change based on Consumer Price Index by Council's appointed contractor, any price rise requests have to be approved by a full Council meeting prior to being implemented.

3.6.3 Recycling

The total volume of material currently recycled within the district is not accurately known. From past audits and observation it is expected to be approximately 18-20% of the total waste stream. Recycling is not a Council-owned initiative but is a project being undertaken by Kaipara Refuse Ltd. Council has committed by upgrading storage facilities at the Dargaville transfer station and subsidising Kaipara Refuse Ltd from central government Levy funds which are generated from the Waste Minimisation Act. The remainder of the operation is funded through the sale of approved recycling bags and a small charge at the transfer station if dropping off.

For a comprehensive list of fees and charges refer to the Council website (www.kaipara.govt.nz).

4 Future demand

This section presents the demand factors that impact on Council's solid waste management infrastructure and how we plan to respond to demand for solid waste management services in the future.

Important issues for future demand are: the population within the district (which dictates the service requirements), the number of occupied dwellings (from which revenue is collected) and Waste Minimisation Initiatives (need to improve recycling facilities and options).

4.1 Background

The Kaipara district consists of the towns of Dargaville, Ruawai, Matakohe, Paparoa, Maungaturoto, Kaiwaka and Mangawhai as well as the rural area which surrounds them. It has a resident population of 20,500 (2013 Statistics NZ)) of whom about 4,610 live in Dargaville, the seat of the district council.

The population is largely rural; living in small settlements scattered amongst the rolling hills or nestled on the shores of the Kaipara Harbour.

The nearest city is Whangarei, 45 kilometres northeast of Dargaville.

4.2 Assumptions and forecasts

In August 2016 an 'Environmental Scan' was completed in order to provide an overview of the legal, social, economic, physical and technical environment in which Council operates. The following significant assumptions (in summarised form) are of relevance to the Solid Waste asset.

4.2.1 Population growth

The Kaipara district had an estimated population of 20,500 people as at 30 June 2013. This represents an increase of 10.5% since 2006 (an average increase of 1.5% per annum). Statistics New Zealand's medium series projections for the district indicate growth will continue but will slow with the population eventually stabilising at 26,000 by 2028. (KDC Environmental Scan 2016).

These projections are more optimistic than previous estimates released by Statistics New Zealand. The latest data confirms population growth in Kaipara has accelerated, with the number of residents increasing by 2.8% over the year to June 2016, compared to average growth of 1.2% per annum since 2000. People have been attracted to Kaipara by relatively affordable housing, as well as improving job prospects in the district and in neighbouring Whangarei and Auckland to which they can commute (source: Infometrics Quarterly Monitor September 2016). While it is still too early to be sure, it may be that Statistics New Zealand's high series projections are more appropriate for at least some areas of the district. That is to say, there are upside risks to Statistics New Zealand's projections.

When considering population and demographic trends for the district it needs to be remembered that the Kaipara district spans a large area of rural Northland and includes many individual towns and communities. Hence demographic and population trends vary greatly across the district. This gives the need to consider such trends at a community-by-community level. While some communities are expected to grow, possibly with the influx of retirees, other areas may experience population decline. In general it is anticipated that most growth will continue to occur in eastern areas of the district (those closest to Auckland), particularly Mangawhai and Kaiwaka. By contrast, western areas may experience continuing population loss unless changes to underlying social or economic trends occur.

The table below shows Statistics New Zealand's 2013 base high population projections for the main urban communities in the Kaipara district. There are three different projection series (high, medium and low) that consider the effects of different rates of births, deaths and migration. It should be noted however that the projections shown below for Kaipara district as a whole are from a more recent release than those for the different townships of the Kaipara. These more recent district level projections are more optimistic than those released previously. It is therefore suggested that the high series projections given for Kaipara's towns are likely to be more accurate. This reflects that the district, or at least parts of it, is growing at a faster rate than previously anticipated.

Table 7: Key urban population projections 2013 – 2028(2013 Census based)

Year at 30 June	2013	2018	2023	2028
Kaipara district	20,500	23,100	24,600	26,000
Dargaville	4,610	4,700	4,750	4,770
Ruawai	470	460	470	470
Maungaturoto	810	820	830	830
Kaiwaka	640	690	740	780
Mangawhai	5,200	6,500	7,200	7,880

Implications for Solid Waste: Any increase in demand tends to either place additional wear on assets, which may reduce the remaining life, or require new capacity which may raise the cost of service delivery beyond that which the community can afford or is willing to pay. Based on the above Statistics New Zealand information for the Kaipara district, there will be some impact on the overall volume of solid waste although it is expected that this will be balanced by the predicted Ageing Population increase, through the life of this AMP. The district's kerbside collection and transfer station operations are based on user pays schemes with set costs associated for both activities. Therefore regardless of demand, as a user pays service, there will be little if any impact.

4.2.2 Population fluctuations

The resident population fluctuates during the year in some areas of the district, with a significant increase in the summer holiday period. Many visitors are in residence during the summer period and bring with them increased demands on solid waste disposal, in particular public litterbins.

The day visitor population increases significantly during summer holiday periods from October to Easter.

It is expected that population fluctuations will continue into the future and increase as roading improvements make the area a more accessible holiday destination. This requires careful consideration as to the long term implications on the services provided over the peak periods.

Implications for Solid Waste: While the population of the Kaipara fluctuates greatly from peak summer months to the more stable winter/spring months and will continue, there is little evidence to indicate this will increase significantly. The district's kerbside collection and transfer station operations are based on user pays schemes, therefore there will be little if any impact. However public assets such as litterbins may have more of an impact as this is ratepayer funded.

Population fluctuations have implications when planning for peak demand particularly for infrastructure and services which are underused for much of the year. This can place pressure on capital and operating budgets. However, it is expected that peak demand can be managed and funded for the foreseeable future.

4.2.3 Age demographics

Two main trends appear to be effecting populations in the Kaipara district. First is the "Auckland Effect" which results in population gain in eastern areas due to a spill-over effect from Auckland's growth and population decline in western areas as youth and businesses relocate to the big city as part of a trend towards centralisation. Secondly "Population Aging" is attributing to short term population increase in many areas as retirees seek to find rest in the Kaipara.

The usual resident population in the district will continue to age. The number of residents aged 65 and older will rise from 3792 (20% of the population) in 2013 to an estimated 6753 in 2023 (32% of the population). *Source: Statistics New Zealand – February 2013.*

Implications for Solid Waste: Any demographic change, such as decrease in age groups below 65 and an increase in those over 65 will change the volume and types of waste compared to households with children. Potentially, should this happen, Kaipara is likely to see a reduction in volume and type of collected and disposed of waste.

4.2.4 Dwelling growth

Dwelling growth can be an indicator of where population changes are occurring. Unlike measuring the usually resident population, dwelling growth is also able to show trends in the non-resident/holiday population as well.

The 2013 Census shows that the total number of dwellings in the Kaipara district has increased by 21.8% since 2006 (8,927 – 10,869). The number of occupied dwellings has increased 16.4% and the number of unoccupied dwellings has increased 39.2%. As with population growth, dwelling growth was not spread equally across the district with total dwellings in the Mangawhai area (including Mangawhai Heads and Mangawhai Village) growing 57% from 2006 to 2013 while Ruawai saw an increase of just 2.2%.

Interestingly, the percentage increase in occupied dwellings in the Mangawhai Area (71%) is larger than the percentage increase in unoccupied dwellings for this area (47.1%), indicating that the percentage of permanent residences to holiday homes is increasing.

This trend suggests Mangawhai is transitioning from a coastal holiday destination to a town and service centre in its own right.

Implications for Solid Waste: Because the district's kerbside collection and transfer station operations being a user pays service, there will be no impact on solid waste services.

4.2.5 Absentee ratepayers

An area which is concerning for the Kaipara district is how to recognise absentee ratepayers. Acknowledging that the absentee versus permanent proportions of ratepayers varies between our different communities, absentee ratepayers can make up a significant part of some communities in holiday areas, especially Mangawhai. These areas are important as they are those in which our district's growth is predicted to occur.

The proportion of unoccupied to occupied dwellings in the district (excluding Mangawhai) has been increasing by around 1.6% per year based on historical figures from 2006 to 2013. This suggests the district's absentee population may also be increasing in number.

By comparison, the proportion of unoccupied dwellings in Mangawhai has been decreasing by 0.5% per year since 2006. This suggests more people are moving permanently to Mangawhai and hence the town's absentee population will be decreasing as a percentage of the total population (source: Statistics New Zealand – June 2014).

It is anticipated these trends will continue and intensify as the nation's aging population results in more holiday home owners retiring permanently to their holiday houses in areas such as Mangawhai while the ongoing trend towards centralisation will result in more properties in rural areas being owned by outside investors.

By linking the location of a rateable property to the location given by the owner's postal address it is possible to gain an indication of what percentage of Kaipara's residents live permanently in the district and what percentage are non-resident. It should be noted that due to the scale of this undertaking the results should not be considered totally accurate, rather provide an indication of trends as they were at April 2016.

It was found that 64% of properties in Kaipara are owned by people living in Kaipara, 25% by people living in Auckland, 5% by people living in Whangarei, 1% by people living overseas and 6% by people living throughout the rest of New Zealand.

Implications for Solid Waste: Because the district's kerbside collection and transfer station operations being a user pays service, there is very little impact on solid waste services as a result of unoccupied dwellings increasing.

4.2.6 Rating unit growth

Taking the Statistics New Zealand data and historical rating base data into account, the assumptions used in the AMP are:

Table 8: Rating unit growth assumptions

Area	2017/18 – 2024/2025
Te Kopuru, Glinks Gully and Ruawai	0.0%
Kaiwaka	1.0%
Mangawhai	1.3%
Maungaturoto	0.5%
Dargaville and Baylys	0.4%
Rest of district (including all other areas)	1.0%
Kaipara district (all)	1.0%

The assumptions that Council has made in relation to annual rating unit growth for each community are detailed in the LTP 2015/2025 Figure 1a, page 25, Part 1.

4.3 Solid waste trends

4.3.1 General refuse

The tables below show that Kaipara district residents only create approximately half of the waste per year per capita than those in the rest of New Zealand. Kaipara's total measured waste disposal is equivalent to only 0.2% of New Zealand's overall annual waste disposal; this could be attributed to more relaxed rules in Kaipara that allow open fires, incinerators etcetera, as waste that is disposed of via this method is unreported.

There is insufficient reliable historical data available to analyse long term trends in waste generation in the Kaipara district. However, the trend towards greater recycling and waste minimisation is likely to characterise waste volumes generated over the next decades.

General refuse disposal comparison with the rest of New Zealand

Table 9: Kaipara district disposal quantities

Year	Total waste – tonnes/year	Number of households	Average kg/waste per household	Population	Average kg/waste per capita per day	Average kg/waste per capita per year
2015	4,559	7,890	578	21,100	0.6 kgs	216 kgs
2006	3,550	6,993	508	18,135	0.5 kgs	195 kgs

Table 10: New Zealand disposal quantities

Year	Total waste – tonnes/year	Number of households	Average kg/waste per household	Population	Average kg/waste per capita per day	Average kg/waste per capita per year
2015	2,500,000	1,792,500	1,395	4,596,700	1.49 kgs	544
2006	3,156,000	1,638,200	1,926	4,027,947	2.14 kgs	783

4.3.2 Recycling

Over time recycling data is getting better and more accurate, although Council does not have a lot of data what we do have tells us that we are well on the way to achieving a significant diversion from Landfill, for the 2016/2017 year we are at 21.41% diversion and with another quarter still to report on Council expects to achieve 23% for this year. This is up on the 12.77% for the whole of 2015/2016. This can be attributed to better reporting i.e. Council now gets data from Hakaru transfer station operations and because some private providers are no longer operating the majority of recycling is coming to either Council's Dargaville or Hakaru transfer station.

Table 11: Diverted quantities (tonnes)

Quantities (tonnes)	2014/2015	2015/2016	2016/2017	Notes
Total waste taken to transfer stations	5,075	5,189	5,737	- Hakaru data has been estimated for the last quarter of 2016/2017 (based on quantity reported for previous six months)
Paper	71	86	72	
Cardboard	115	153	328	
Plastic	16	26	36	

Quantities (tonnes)	2014/2015	2015/2016	2016/2017	Notes
Glass	247	239	368	- 2014/2015 and 2015/2016 data only includes an estimate for Hakaru under mixed recyclables. Prior to 2017 there was no reporting of quantities from Hakaru. - Higher recycling figures for 2016/2017 can be attributed to the closure of a private scrap metal dealer (all recycling going to this dealer was unreported, it is now being captured) and the reporting of quantities from Hakaru transfer station. - Dargaville scrap metal data is not included but will be reported from 2017/2018.
Mixed recyclables	81	103	139	
Aluminium		3.9	6	
Steel		11	137	
Total recycling	530	622	1,086	
% Diverted from landfill	10.5%	12%	19%	
Total to landfill	**4,545**	**4,567**	**4,651**	

4.4 Demand management plan

Demand management relates to the development and growth in the district and is concerned with the way Council provides and plans for future developments. Demand management strategies can provide alternatives to the creation of new or improved assets in order to meet demands and can include waste minimisation initiatives, waste diversion strategies or financial tools such as user pays. They address ways of modifying customer needs in order that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

Population growth and changes to the population composition have implications for the provision and capacity of the solid waste service being provided and its associated asset facilities. While overall growth is predicted to remain static in the western area, the eastern area is projected to have some growth requiring further focus from Council when developing any new Contracts to recognise this and any increased service levels that may be required.

There is no current capital plan for growth and demand, it is unlikely that over the period of this AMP there will be significant growth requiring Capital investment.

4.5 Waste minimisation

Notwithstanding the above, there are several drivers for waste minimisation in the Kaipara district:

4.5.1 User pays

The user pays nature of Council's refuse collection service encourages waste minimisation. The advent of recycling in the district is also aimed at reducing current landfill levels. Based on earlier estimates this transferral could reach as high as 35% (through the life of this AMP). Recycling is an initiative that has no ratepayer

funding. Instead, Council currently supports recycling by distributing the Waste Minimisation Levy that is returned from central government. However, only limited recycling services are offered by the service providers undertaking both the kerbside collection and transfer station operations for the Council.

Increasing awareness of waste minimisation opportunities will tend to slow the rate of increase in waste quantities. On this basis, the waste stream from existing waste sources is expected to increase at a slow rate over the next 10 years. The increase generated by population growth can be expected to be offset initially by the effects of increased waste minimisation efforts.

4.5.2 New Zealand Waste Strategy 2010(NZWS)

The NZWS provides a high-level strategic direction around where to focus effort to manage waste, and ways in which this can be achieved. The key aim of the Strategy is to "Reduce Harm, Improving Efficiency". This aim is further defined as:

- Reducing the harmful effects of waste on both the environment and human health; and
- Improving the efficiency of resource use to reduce the impact on the environment and human health and gain potential economic benefits.

Waste reduction programmes generally have effects on the volume of waste disposed of to landfills. Both of Kaipara's transfer station facilities (Dargaville and Hakaru) have recycling collection capacity and are reducing the amount of refuse sent to landfill. For the past three years from 2015 – 2017 the average monthly recycling tonnage has been 46 tonnes, considerably more than initially predicted.

Kaipara currently is unable to offer free recycling in the district due to area size and the dispersed population. This is because the distance between isolated communities and the amount that could be collected does not financially warrant offering a recycling service. In the future a subsidy would need to be looked at to cover any shortfall in the service in particular more rural areas. Recycling is occurring in selected urban areas from Mangawhai to Dargaville.

4.5.3 Organic waste

Another possible waste reduction activity would be diversion of green waste from the landfill. At present only a very small volume of green waste is disposed of at Hakaru and Dargaville transfer stations. The tipping fees in the district are believed to be a significant incentive for users to divert green waste themselves. As a result green waste diversion would be minimal and can be ignored. Council as part of the Solid Waste Improvement Plan Section 7 (IP7) would like to promote and educate people around home composting. This is proposed for 2018.

4.5.4 Waste Minimisation and Management Plan (WMMP)

Council's WMMP (2017) contains strategies for the management of waste streams, minimisation of waste generation and disposal for the Kaipara district over the next 10 years. Details of Council's waste strategies will occur through the LTP 2018/2028.

4.6 Future waste stream options

4.6.1 Transfer stations – Hakaru and Dargaville

Waste from the eastern area is taken to Hakaru transfer station. The estimated volume is approximately 342 tonnes per month. This waste includes the eastern kerbside collection, loose refuse and loose recycling.

Waste from the western area is taken to the Dargaville transfer station. The estimated waste volume is approximately 296 tonnes per month. Refuse disposed here includes kerbside collection, loose refuse and loose recycling.

All the general waste collected at the above transfer stations is transported, moderately compacted in hook bins loaded onto trucks, to Puwera Landfill south of Whangarei. Recycling collected at both transfer stations is managed by the appropriate contractor.

The user pays nature of Council's refuse collection service also encourages waste minimisation. The advent of recycling in the district is also thought to help reduce current transfer station tonnages.

As there are no operating landfills in the Kaipara area, Puwera is the most economical option for refuse disposal.

4.6.2 Kaipara district commercial or industrial waste

Some waste from commercial and industrial undertakings in Kaipara district is currently collected from commercial operators and disposed of outside the district. For example, Countdown in Dargaville operates a waste management system where some material is recovered and recycled (paper and cardboard), organic material (food waste) is diverted to animal feed, and the residual waste is disposed of at Whangarei District Council's Puwera Landfill. The volume of waste available from this source is not known, and could only be established by a detailed and extensive survey of businesses in the district. To redirect elements of this waste stream to either Kaipara owned transfer stations would involve a significant price incentive or subsidy, this is not an option being considered with our current user pays policy.

5 Lifecycle management

5.1 Introduction

It is considered that both transfer station (Hakaru and Dargaville) sites will be able to meet both current and future volume increases.

The assets most likely to require renewal or refurbishment over the twenty year planning period are the leachate control devices, monitoring equipment, improvements to refuse sorting and recycling facilities and minor stormwater matters.

Other aspects of landfill operations will continue such as management and control of pests, dusts, stormwater, leachate along with capping, any other items required by resource consent and liability for any eventual closure of landfill sites and their return to pasture.

The following section outlines what KDC does to manage and operate these assets.

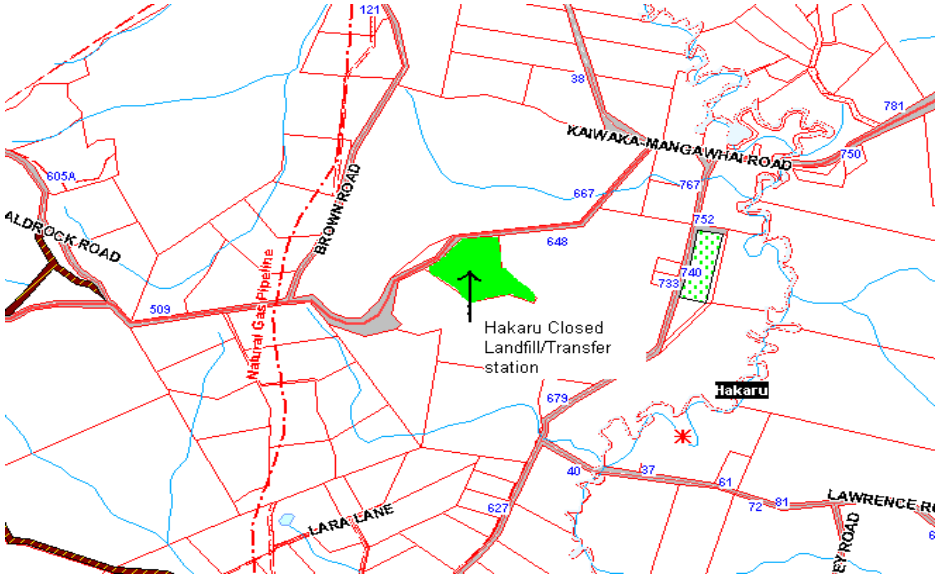
5.2 Transfer stations

5.2.1 Hakaru transfer station

Figure 6: Hakaru transfer station site

Aerial view of site

Location map



Asset description

This facility caters for the south-eastern area of the district which includes the communities of Mangawhai, Kawaka, Maungaturoto and their surrounds and is located approximately six kilometres east of Kaiwaka on the Kaiwaka-Mangawhai Road. The location of the site is shown in Figure 6. The surrounding countryside is rolling pastureland with scattered dwellings and ancillary farm buildings.

While the site now operates as a transfer station, it was initially developed as a landfill in 1997 and operated as such until 2005. In 2007 operation of the transfer station commenced at the site and the landfill was closed. Council has an obligation to restore the site to a levelled high quality pasture and gift the land back to the original owner or benefactors no later than 30 years from settlement, this would be expected around 2027.

The land at this site, which covers an area of approximately 4.4 hectares, is owned by Council however all major infrastructure and processing assets in relation to the transfer station operation on the site are owned and operated by the contractor.

Operation and maintenance

Operations and maintenance of the transfer station are completed by Council's contractor.

Renewals and improvements

All infrastructure associated with the operation of the site as a transfer station facility (e.g. buildings, collection bins, and machinery) are owned and managed by the contractor. There are no planned renewals for any part of the transfer station operation.

5.2.2 Dargaville transfer station (Awakino Road)

Asset description

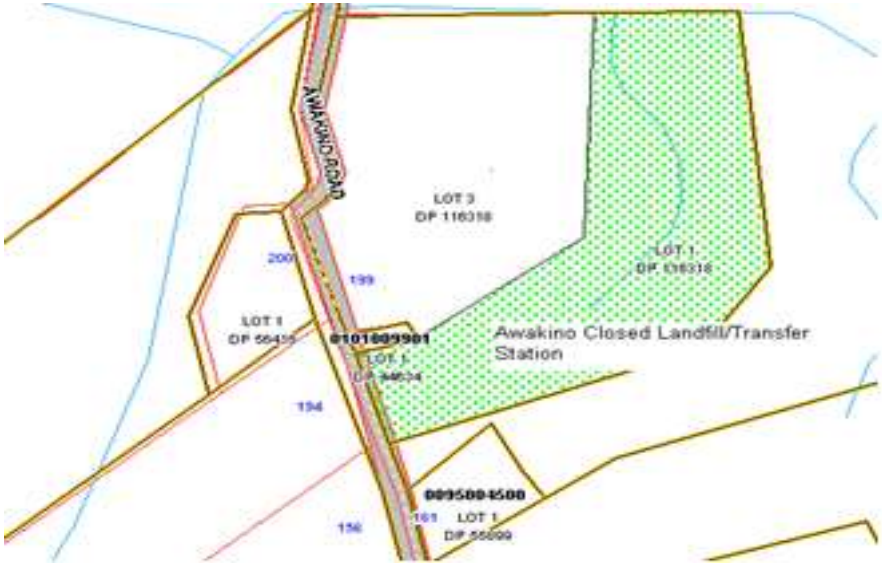
This facility caters for the north-western area of the district which includes the communities of Dargaville, Te Kopuru, Baylys and the surrounding communities and is located on the outskirts of Dargaville in a semi-rural location. The location of the site is shown in Figure 7. The surrounding land is rolling to flat predominately grazing and cropping. The surrounding catchment empties into the nearby Awakino River.

While the site now operates as a transfer station, it was initially developed as a landfill with disposal operations commencing in about 1922. In 2011/2012 an investigation on possible locations and options for a new transfer station and possible recycling facility was carried out. The current site at Awakino Road proved to be the best option for the foreseeable future. In 2000/2001 the landfill was closed and the transfer station commissioned.

Figure 7: Dargaville transfer station site

View of site

Location map



Operation and maintenance

- Stormwater - Stormwater is diverted around the site along a stormwater bypass which feeds into the treatment area. The treatment area consists of an artificial pond/wetland planted to filter and polish the stormwater before entering the surrounding drainage system. In 2009 two sumps were excavated to capture stormwater runoff from the solid waste transfer area.
- Resource consent requirements - The NRC discharge consent (Permit Nº 4433) for any leachate leaving the Awakino Landfill was issued on 10 November 1994 and expired in 30 June 2003. The renewal process is currently underway and it is expected to have consent in the 2017/2018 financial year. Although the consent is essentially for the closed landfill there are likely to be conditions that will effect transfer station operations. Until the consent is finalised it is intended to continue monitoring in accordance with consent Nº 4433

Renewals and improvements

No renewal works are planned at the site. Council-owned infrastructure associated with the operation of the site as a transfer station facility consists of buildings used as office and storage. All other infrastructure e.g. collection bins and machinery, are owned and managed by the contractor. Some improvements to refuse sorting and recycling facilities can be expected.

Disposal/closure plan

While there is currently no defined plan for post-closure use of this site, the intention is likely to be for Council to retain the site and surrounds and incorporate it into the land Council owns surrounding the site into pasture and graze under a lease arrangement.

5.3 Closed landfills

There are 20 known closed landfills, of which 14 are consented, in the Kaipara district. A further six sites were locations identified where informal or illegal dumping has occurred in the past.

The closed landfills require ongoing maintenance, monitoring, periodic renewal of assets, and possible creation of new assets to keep the closed landfills in compliance with NRC requirements and identified Community Outcomes under the LGA 2002. The 14 Consented closed landfills are as follows:

Pahi Road (Paparoa)	Dargaville Borough (Awakino Road closed landfill, now operates as a transfer station)
Glinks Gully	Hakaru (Kaiwaka-Mangawhai Road, Mangawhai, now operates as a transfer station).
Kaiwaka (Oneriri Road)	Parawanui Road
Mangawhai	Te Maire, Cole Road
Tinopai	Mosquito Gully
Access Road (Ruawai)	Kelly's Bay
Omamari	Bickerstaff Road

There are a further six informal or illegal tips (that Council is aware of) that are no longer in operation.

Pouto Point - illegal	Te Kowhai Road - illegal
Tangiteroria - illegal	Te Kopuru, Clean Street - illegal
Kaihu - illegal	Franklin Road - previously consented, no longer required.

At present, maintenance is undertaken on an 'as required' basis, as most of the closed landfills require only reactive maintenance and occasional vegetation control as they are now under pastoral grazing or other passive usage. Historic records and information for these sites is incomplete. While Council records and information on some of the landfill sites is very good, much of the information on many of the sites is limited due to their age and by the information provided at the time of Council amalgamation from the previous Dargaville Borough Council and Hobson and Otamatea County Councils. Most of the sites were developed before resource consenting was required. Council's information and records are improving as information from inspections and monitoring continues and as consents are renewed. Further information is also contained in Appendix B.

5.4 Operation and maintenance of closed landfills

5.4.1 Dargaville (Awakino Road) closed landfill

Figure 8: Location Dargaville closed landfill

Aerial view of site

Location map

While the site now operates as a transfer station, it was initially developed as a landfill with disposal operations commencing in about 1922. The landfilling extended over an area of approximately 30,000m$^{2.}$

The site was operated as an open tip with few controls and few records were kept of volumes received at the site. However, it is estimated that 300,000m^3 to 350,000m^3 of solid waste was landfilled at the site during its 74 years of operation.

Currently the bulk of the old landfill site is being grazed under a lease agreement, assets associated with the old landfill site are minimal and consist of a stormwater diversion system and artificial pond. The remaining land that was part of the original landfill area is the site of the operational transfer station.

Resource consent requirements - The NRC discharge consent (Permit Nº4433) for any leachate leaving the Awakino Landfill was issued on 10 November 1994 and expired in 30 June 2003. Renewal process in currently underway and it is expected to have consent in the 2017/2018 financial year. Until the consent is finalised it is intended to continue monitoring in accordance with consent Nº4433.

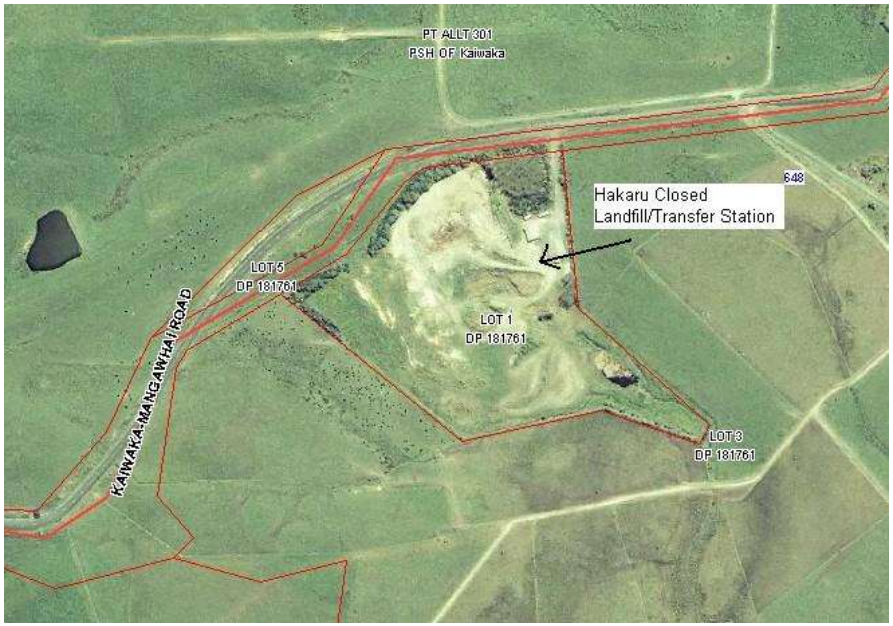
Capping - In 1996 a temporary cap was placed on the landfill site. Final capping is yet to occur, but is proposed to take place between 2017 - 2019. It is anticipated that all physical works required to remediate the site, including reshaping, capping, leachate collection system, topsoil and grassing, will be undertaken within two years of granting of any resource consents by NRC.

The completed consent will detail the type of capping required, it is expected that capping will consist of clean fill that is currently being placed there by contractors and topped up with clayey material from onsite to help waterproof the final cap.

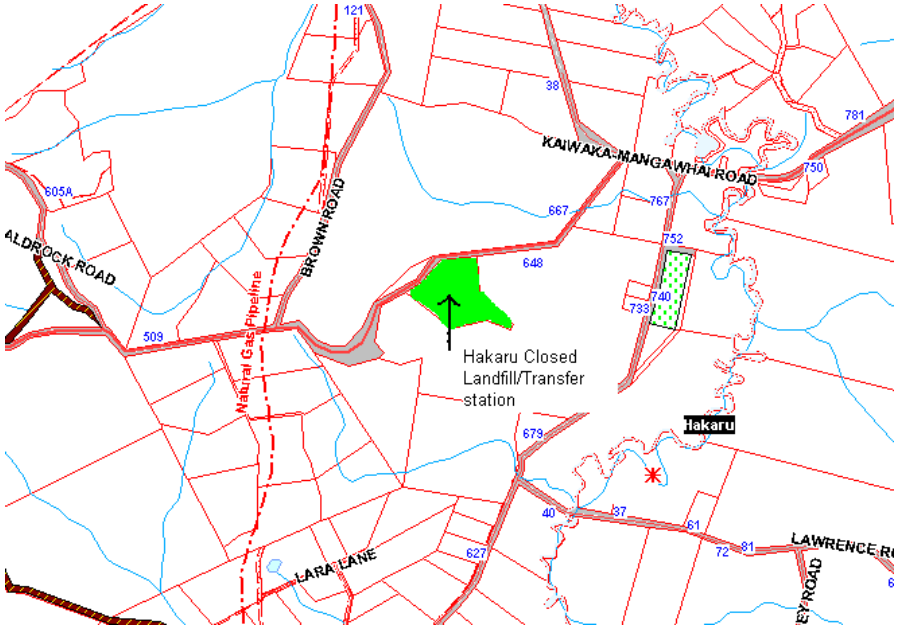
5.4.2 *Hakaru closed landfill*

Figure 9: Location Hakaru closed landfill

Aerial view of site



Location map



While the site now operates as a transfer station, it was initially developed as a landfill by an independent contractor under contract to Council, commencing operation in 1997. The operational and environmental parameters within which the landfill is to be operated is defined in the Hakaru Landfill Management Plan, originally prepared in 1997 and updated in 2003. In 2007, operation of a transfer station commenced at the site and the landfill was closed. Council therefore has no long term asset liabilities, but does have a liability for any eventual closure of the landfill site and return to pasture.

The Hakaru Landfill Management Plan defines the operational and environmental parameters within which the landfill is to be operated by the contractor to the satisfaction of KDC and NRC.

KDC has an obligation to restore the site to a levelled high quality pasture and gift the land back to the original owner or benefactors no later than 30 years from settlement, this would be 2027.

Leachate - The existing resource consents for the site were granted on the basis that leachate would be monitored and an appropriately designed treatment system would be installed once operational volumes and concentration of leachate was determined. Until a suitable onsite treatment facility is developed, leachate is to be transported off-site by tanker for disposal.

The present leachate treatment system provides for the collection of leachate from the base of the landfill in a pump chamber. From this chamber, leachate is then pumped to an elevated holding pond located on the north-eastern side of the site outside of the filling area. Leachate is collected once a week by a local effluent disposal contractor and disposed of at a facility operated by that firm in Wellsford.

Council is going through a process of reviewing options and is expected to finalise options for leachate treatment for physical works in 2018/2019.

5.4.3 Pahi Road closed landfill

Site location: Pahi Road, Paparoa

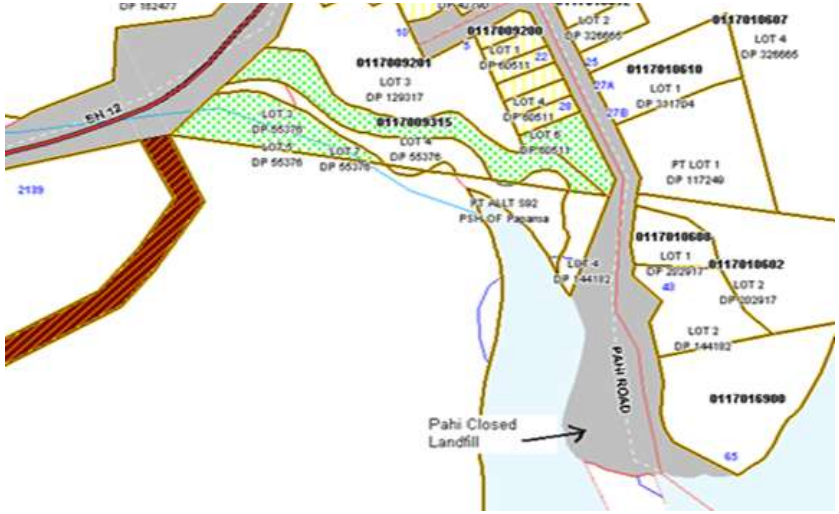
Legal description: The Pahi landfill is located on Pahi Road approximately 1 km south of the Paparoa township. The site is within the road reserve and part is within the former Paparoa Stream bed.

Landowner: Kaipara District Council

Figure 10: Location Pahi Road closed landfill

View of site

Location map



History

The landfill opened prior to 1985 and was operated until 2003 when it was capped and closed. Records show that Water Rights were issued for the landfill by the Northland Catchment Commission as early as 1987 and possibly before. In the earlier stages of its life the landfill was well protected from salt and freshwater intrusion by significant bunds. During this time the extent of the landfill was restricted to the unused portion of the road reserve adjacent to the mangrove swamp beside the Paparoa Stream and part of the site is within the former Paparoa Stream Bed. Records show that toward the end of the landfill's life it was significantly overfilled and had started encroaching on to the neighbouring mangroves.

During operation the site was used similarly to many landfills. Solid waste was tipped at the site and progressively buried by subsequent loads of solid waste. Latterly a trash compactor was used at the site to extend the life of the landfill.

5.4.4 Kaiwaka closed landfill

Site location: Oneriri Road, Kaiwaka (in an old limestone quarry situated between the road and the Kaiwaka River).

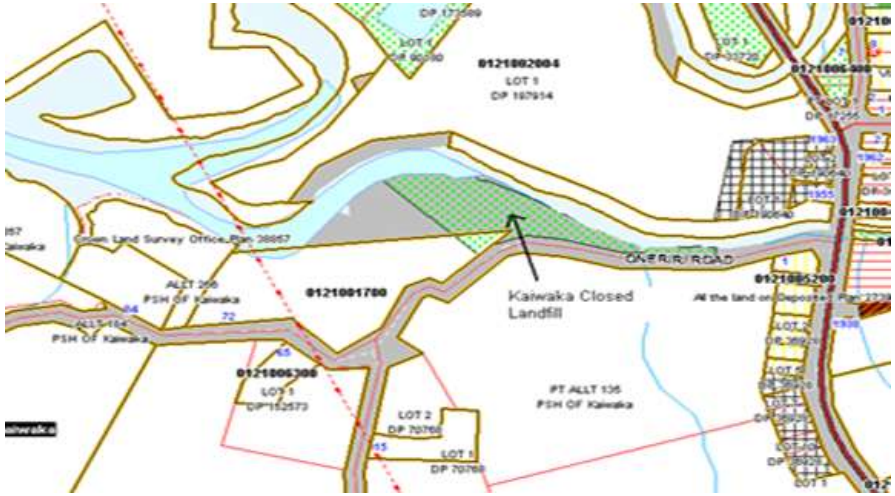
Legal description: The Kaiwaka landfill is located on Oneriri Road between the road and the Kaiwaka River approximately 800m east of State Highway 1. The legal description of the site is Road Reserve and it adjoins Part Allot 141 Blk 111 Otamatea SD.

Landowner: Kaipara District Council

Figure 11: Location Kaiwaka closed landfill

Aerial view of site

Location map



History

Kaiwaka Landfill operated as a landfill prior to 1974 and closed in 1996 when it was used as a transfer facility until the Hakaru landfill was commissioned. The final consent for land filling activity on the site was granted in 1993 and included provisions for the closure of the landfill by March 1995.

During operation the site was used similarly to many landfills. Solid waste was tipped at the site and progressively buried by subsequent loads of solid waste. In the latter years of the landfills operation solid waste was regularly covered, leachate ponds were established to detain leachate and contaminated stormwater runoff from the tip area.

5.4.5 *Mangawhai closed landfill*

Site location: Moir Point, Mangawhai

Legal description: Lot 2 DP 99103.

Landowner: Private owner

Figure 12: Location Mangawhai closed landfill

View of site

Location map

History

Was a 'formal' tip, on privately owned land. Has been closed, capped and consented.

5.4.6 *Tinopai closed landfill*

***Site location**:* Sandy Beach Road, Tinopai

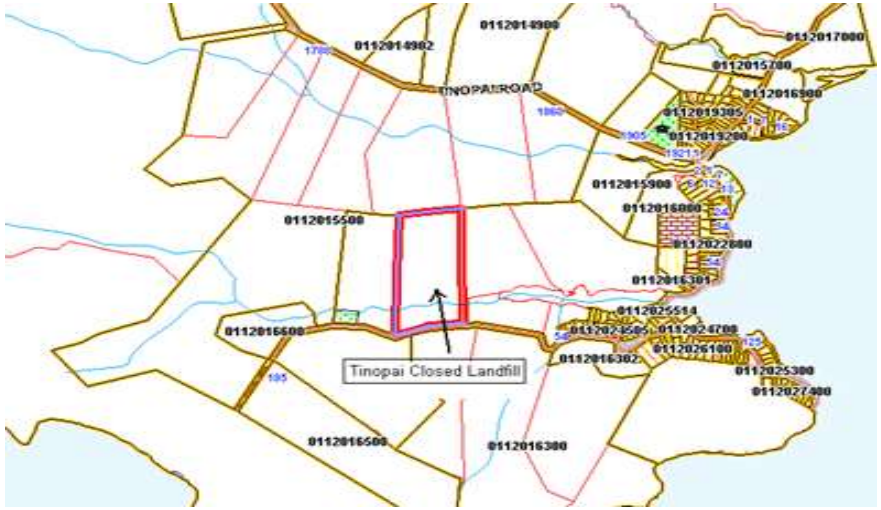
Legal description: Lot 27 DP 16979 Hukatere SD

Landowner: Private owner

Figure 13: Location Tinopai closed landfill

View of site

Location map



History

Was a 'formal' tip, on privately owned land. Has been closed, capped and consented.

5.4.7 Access Road closed landfill (Ruawai)

Site location: The Access Road landfill is located on Access Road near Ruawai. The site is located approximately 1 km south of the intersection with Oparakau Road.

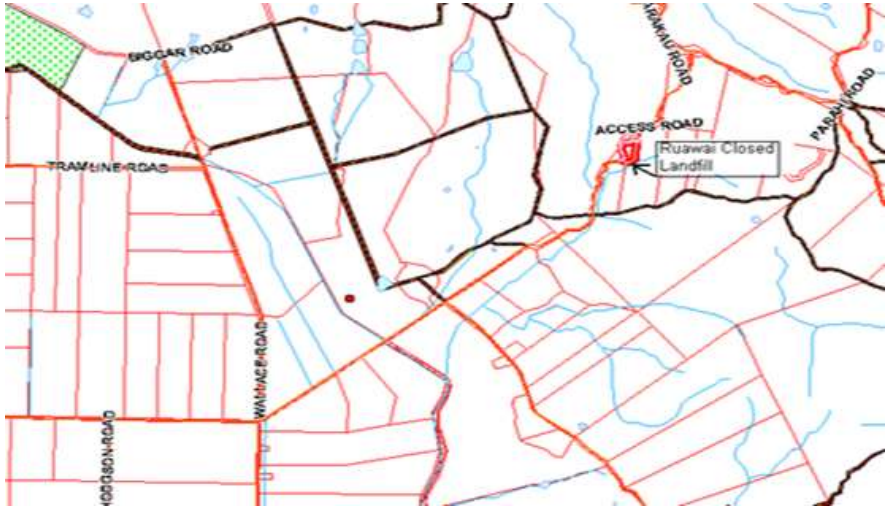
Legal description: The legal description of the site is Lot 1 DP 138215 Blk XIII Tokatoka SD.

Landowner: Kaipara District Council.

Figure 14: Location Access Road closed landfill (Ruawai)

View of site

Location map



History

Access Road Landfill operated as a landfill from 1990 to 2001. Consent for landfilling activity on the site was granted in 1994. During operation the site was used similarly to many landfills. Solid waste was tipped at the site and progressively buried by subsequent loads of solid waste.

5.4.8 Omamari closed landfill

***Site location**:* Omamari Road, Omamari

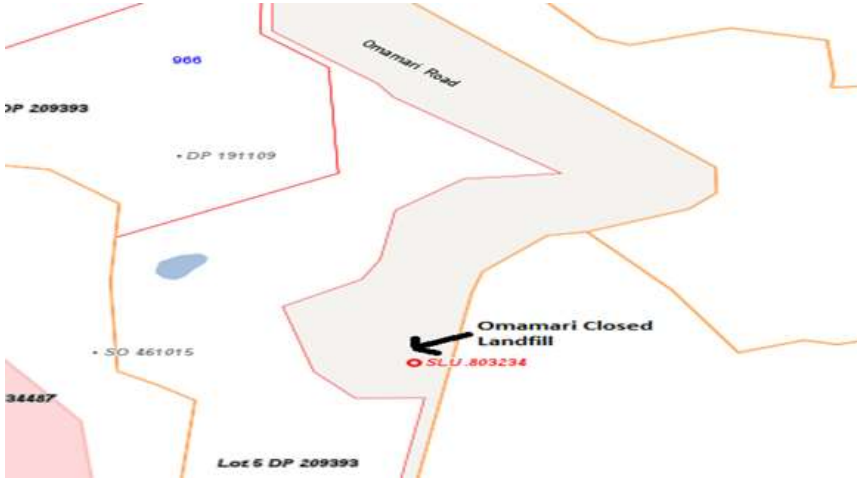
Legal description: Road Reserve

***Landowner**:* Kaipara District Council

Figure 15: Location Omamari closed landfill

View of site

Location map



History

Omamari landfill operated up until 1997 and was capped in 2000.

5.4.9 *Glinks Gully closed landfill*

***Site location**:* Glinks Gully Road, Glinks Gully.

***Legal description**:* Pt Allot 141 Kopuru Parish Blks IV, V Kopuru.

Landowner: Department of Conservation (DOC).

Figure 16: Location Glinks Gully closed landfill

View of site

Location map

History

The Glinks Gully landfill opened sometime during the 1960's and operated until 1992 when it was capped and closed.

5.4.10 Parawanui closed landfill

***Site location**:* Parawanui, Te Kopuru.

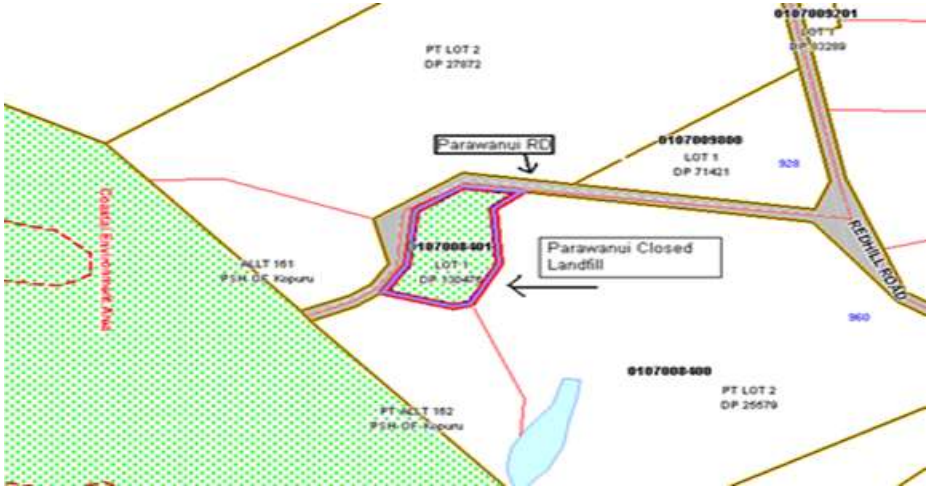
***Legal description**:* Lot 1 DP 130476 Blk IV Kopuru SD - interest in easement.

Landowner: Kaipara District Council.

Figure 17: Location Parawanui closed landfill

Aerial view of site

Location map



History

Parawanui landfill operated from 1950 through until its closure in 1997. It has since been capped and consented.

5.4.11 Te Maire (Cole Road) closed landfill

***Site location**:* Cole Road, Te Maire, Repia.

***Legal description**:* Road Reserve.

***Landowner**:* Kaipara District Council.

Figure 18: Location Te Maire, Cole Road closed landfill

View of site

Location map

History

Was a 'formal' tip. Following the closure of the landfill in 1994, final capping and stabilisation of the site was carried out.

5.4.12 Mosquito Gully closed landfill

Site location: Pouto Road, Mosquito Gully.

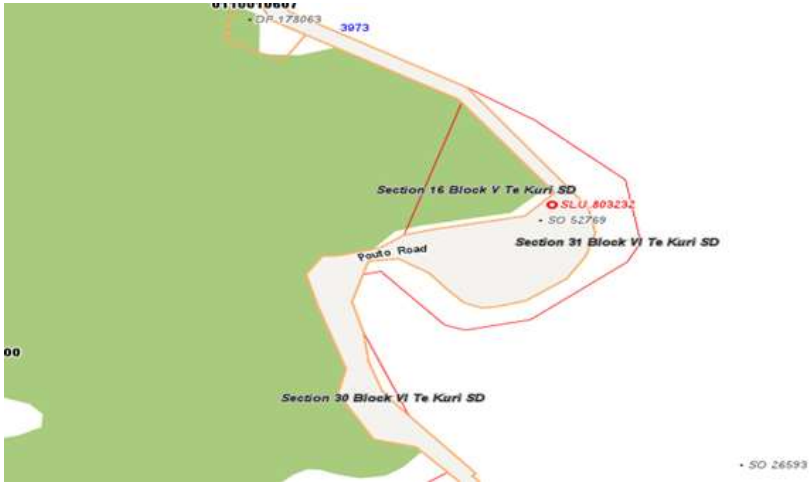
Legal description: The Mosquito Gully closed landfill is located on a portion of road reserve adjacent to the carriageway of Pouto Road, approximately 25km south of Te Kopuru, directly adjoining Section 16 BLK VI Te Kauri SD.

Landowner: Kaipara District Council.

Figure 19: Location Mosquito Gully closed landfill

Aerial view of site

Location map



History

The site operated as a landfill prior to 1985 and closed in 1997. The principal mode of operation was as a 10m x4m pit 2.5m-3m deep. Solid waste was dumped into the pit until the freeboard was reduced to approximately 200mm at which time a new pit was excavated with the material from the new pit being used to cap the old pit. Over its life the only ongoing recorded problems were associated with windblown solid waste littering farmland downwind of the site.

Additional refinements to the operation also included the construction of a “fish pit” to mitigate any potential odour problems. The “fish pit” consisted of a capped circular hold with a manhole lid. Council records also show that burning of solid waste was a regular occurrence at the site.

5.4.13 Kelly's Bay closed landfill

***Site location**:* Kelly's Bay Road, Kelly's Bay.

Legal description: The Kelly's Bay closed landfill is located on a portion of road reserve adjacent to the carriageway approximately 1 km south of Kelly's Bay, directly adjoining Section 40 Blk VIII Te Kauri SD.

Landowner: Kaipara District Council.

Figure 20: Location Kelly's Bay closed landfill

View of site

Location map

History

Council records indicate that the site operated as a landfill prior to 1985 and closed in 1997. The principle mode of operation was as a 10mx4m pit 2.5m-3m deep. Solid waste was dumped into the pit until the freeboard was reduced to approximately 200mm at which time a new pit was excavated with the material from the new pit being used to cap the old pit. Council records show that burning of solid waste was a regular occurrence at the site and the only problem appears to have been associated with these fires resulting in the placement of a water tank for firefighting on the site.

Additional refinements to the operation also included the construction of a "fish pit" to mitigate any potential odour problems. The "fish pit" consisted of a capped circular hold with a manhole lid. Consent conditions restricted each open pit to a maximum of 50m^2 however there are no records that indicate the actual volume or extent of solid waste pits at the site. Following a review of the district's solid waste disposal facilities, it was decided to close the site in 1997.

5.4.14 Bickerstaffe Road closed landfill

***Site location**:* Bickerstaffe Road, Maungaturoto. The site is situated on the boundary of the CMA and is bordered by Bickerstaffe Road to the west and the estuary of the Wairau Creek in the upper Kaipara Harbour.

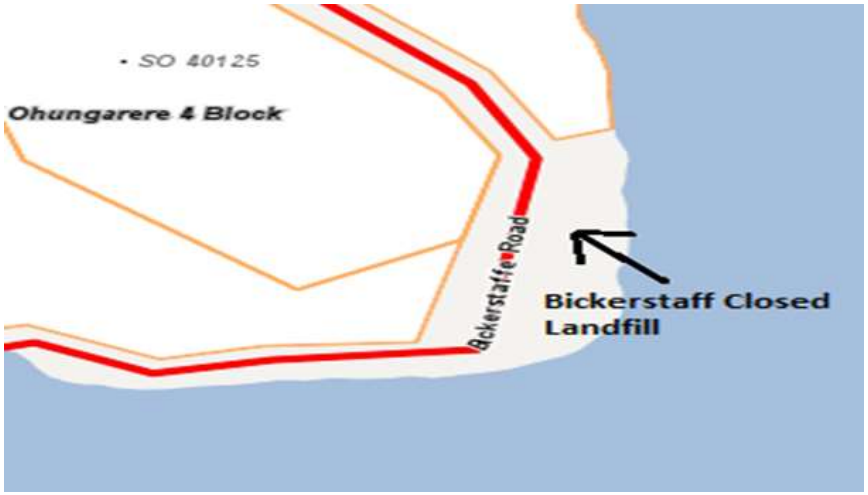
Legal description: The Bickerstaffe closed landfill is located on a portion of road reserve adjacent to the carriageway approximately 1.6kms along Bickerstaffe Road.

Landowner: Kaipara District Council.

Figure 21: Location Bickerstaff Road closed landfill

View of site

Location map



History

The site was used illegally for a number of years for the "fly tipping" of refuse. KDC has no records which indicate the duration of waste disposal or the nature of the waste deposited at the site. The landfill covers an area approximately 0.68ha and extends for approximately 175m along the shoreline.

Remedial works are to be undertaken at the site to mitigate risk associated with recently exposed refuse. The objective of the remedial works is to remove visible Asbestos Containing Material from within the wider site and refuse in the foreshore area, and to encapsulate exposed refuse via the placement of a capping layer and rock buttress. The encapsulation will reduce the risk to human health and the environment from exposure to refuse and contaminants.

The Management and Monitoring Plan will be implemented at the site following the remedial works. Remedial works are to be completed by Nov 2019, with the remaining consent conditions valid until 2051.

5.5 Illegal disposal areas

Pouto Point – was an illegal unconsented tip. Area is filled, covered and forms part of an open space recreational area

Tangiteroria - was an informal (illegal) tip and has not been consented.

Kaihu - was an informal (illegal) tip and has not been consented.

Te Kowhai Road - site has been covered with fill, fenced off and partly planted with native plant species.

Te Kopuru, Clean Street - site has been covered with fill, fenced and is currently grazed.

Franklin Road - previously consented, no longer required.

5.6 Litterbins

Litterbins are provided in the urban areas of Dargaville, Ruawai, Paparoa, Maungaturoto, Kaiwaka, Mangawhai Heads and Mangawhai Village and the holiday areas of Omamari, Baylys, Glinks Gully, Pouto, Kelly's Bay, Tinopai, Pahi and Paparoa.

In total, there are approximately 105 litterbins located throughout the Kaipara district. Most are between five and 10 years old and in reasonable condition.

The frequency of litterbin collection depends on seasonal demand, but is at least three times per week. This increases to daily between December and March.

Over the next 10 years it is expected that approximately $20,000 will be spent on litterbins, based on the current spend of approximately $2,000 per year. This is mainly a result of replacement of damaged litterbins or to undertake maintenance of existing bins to enable continued operation.

5.6.1 Illegal litter and abandoned vehicles

Illegal litter remains a concern for Council and the public. Levels of illegal litter dropping have remained static. Most service requests received through Council's Helpdesk system are associated with the same specific locations in the district. Council's involvement with abandoned vehicles removal has increased over time as the value of metal, vehicles and vehicle parts has decreased. There are limited opportunities within the Kaipara district to sell unwanted cars that have reached the end of their life and operators outside the area will charge for collection rather than pay. For both abandoned vehicles and illegal litter, costs are requested (where possible) from the perpetrator and infringements are issued where a perpetrator is identified.

Abandoned vehicles and illegal litter are removed as a health and safety and aesthetic service. This service is carried out on an as required basis when Council is notified.

5.7 Collection cages

Council has in the past provided some collection cages at points where some rural roads intersect, over the past two years these are being replaced with collection extensions and collection points (smaller catchment of properties). Collection cages were notorious for attracting illegal dumping and the pest animals that come with illegal dumping.

Of the original 11 there are now only two formal collection cages located in the Kaipara district, these are both in small coastal holiday areas where the collection and disposal service passes a road which services a number of residential properties but does not warrant individual pickup from each property on the road.

These remaining cages are emptied weekly in association with the kerbside collection and disposal service carried out in the area.

Remaining cages are six to eight years old, of wooden construction and in average condition.

Past maintenance of the cages has been limited to minor repairs due to vandalism. Any renewal of the cages will be done on a case-by-case basis and based on the amount of use and the location of the cage. If there is a noticeable increase in volumes of solid waste at particular sites or if there is a reduction in the use of the cage Council may remove the cage. Council does not intend to increase the number of cages in the foreseeable future.

5.8 Resource consents

Council is responsible for a number of consents associated with solid waste management. Historically it has struggled to keep track of expiry dates of consents and undertake timely renewal of consents before they expire. Renewal of resource consents can be costly and resource hungry. This is potentially a big issue and area of risk to Council.

The key issues are:

- Tracking of expiry dates, and ensuring that renewal of the consents is undertaken in good time;
- Monitoring of sampling and leachate composition, and reporting trends to NRC as appropriate;
- Monitoring of general consent conditions relating to stormwater, public health safety etcetera; and
- Installation of additional leachate facilities may be required in the future, as a result of any consent monitoring.

KDC is committed to working with NRC to ensure better communication on consenting and renewal of consents. Currently there are only two expired consents with no others due to expire until 2025. These has been noted as an area of improvement and part of the Solid Waste Improvement Plan (IP3).

Refer to Appendix B for individual closed landfill requirements.

5.9 Condition assessments and planned renewals

The asset base for the operational transfer stations and closed landfills are minimal with respect to Council's obligations to plan for asset renewals. The undertaking of formal condition assessments is therefore not considered to be a high priority exercise at present, as the costs will outweigh the risks. However, the monitoring of assets that are directly relevant to the resource consents is an area that carries moderate risk and Council will be undertaking annual visual inspections of closed landfill sites as per consent requirements and in association with NRC.

5.10 Asset valuations

The Council-owned minor site facilities and infrastructure are not currently valued by Council for formal depreciation and renewal purposes. Nevertheless, annual budget provisions are made for the replacement of minor site assets as required. The valuation of Council's Solid Waste assets is currently limited to valuation of the land only, at closed and operational landfill sites. The current land values, where known, are provided in Appendix A and further information is in Section 7.

6 Risk management

6.1 Introduction

Council recognises that risk management is fundamental to asset management and as such has adopted a Risk Management Policy and Framework. A formal approach to risk management has been established, with the development of a Risk and Issues Register reported quarterly to the Audit, Risk and Finance Committee. This is now supplemented by risk registers for all major project work. Risk management best practice has therefore shifted from the traditional operational focus into enterprise wide Risk Management.

6.2 Risk management framework

Council recognises that risk management is not an isolated activity nor a yearly compliance activity. To be truly effective risk management must integrate into and permeate through both the organisational structure and the objectives of Council. The integrated framework[1] below visually represents the main inter-relationships.

Figure 22: Risk management framework

[1] Adapted from The Committee of Sponsoring Organisations of the Treadway Commission

6.3 Risk assessment and management

Risk is measured by likelihood and consequence. By identifying what events can happen, consideration of the effect that the occurrence would have on achieving objectives is then required. To assess what the effect would be, consideration needs to be given to the likelihood, or chance, that the event will occur and the impact, or consequences, of the occurrence. The likelihood is then plotted against the impact to create a risk profile that helps us prioritise risks based on their impact and likelihood. See table below.

Table 12: Likelihood vs impact

Score	Impact	Likelihood
1	Insignificant	Rare
2	Minor	Unlikely
3	Moderate	Moderate
4	Major	Likely
5	Extreme	Almost Certain

This in turn can assist in determining the most appropriate actions to respond to the prioritised risks. Refer to Council's Risk Management Policy and Framework for further detail.

There are a range of ways risks can be addressed, depending on the assessed level of risk. In considering the best way to manage a risk, the following options are considered:

Table 13: Risk management options

Response	Description
Accept (Tolerate)	Recognise that the risk exists but continue with activity.
Share (Transfer)	Transfer the risk, or the consequences of the risk occurring, to another party. Usually this will involve a contractual arrangement – construction contract, contract of insurance.
Reduce (Treat)	Take action to reduce the impact and/or likelihood of the event occurring.
Avoid (Terminate)	Stopping the activity completely or stop and replace with an alternative activity.

There are no set rules in applying these options although, generally, low risk activities are acceptable and higher risk activities are only undertaken if there is a statutory duty or if there are significant rewards.

6.4 Solid waste risks

The main risks identified to date are outlined in Tables 14, 15 and 16 below.

6.4.1 Moderate-high risks

At present, there are very few Solid Waste asset risks that are rated *high* or *extreme.* The Solid Waste asset risks have generally all been rated as *low* or *moderate*. A summary of risks as well as proposed risk management strategies are as follows:

Closed landfills

Since closure, little is known of the specific contents of the 14 (legal) closed landfills. Whilst most of the solid waste deposited is most likely to have been domestic waste, there is also some possibility that over time pesticides, paint, oil and/or other potentially hazardous wastes were also deposited at some landfills. Ongoing monitoring of groundwater samples indicates that the risk of leachate contamination is fairly low, and over time is reducing.

Table 14: Closed landfills – risk ratings

Risk identified	Risk rating	Risk management strategy
Illegal substances deposited without Council knowledge.	High	Regular inspection of closed landfills.
Leachate contamination from groundwater.	Moderate	Ongoing monitoring programme.
Adjacent landowner issues.	Moderate	Early resolution if/when issues arise.
Resource consents	Moderate	Regular inspections and monitoring carried out with NRC staff. Working closely with NRC on resource consent renewals processes.
Resource consent expiry	Low	Consent database created for forward planning of consent renewals.
Unknown historic illegal landfills on Council land.	Moderate	Document known sites and develop/maintain relationships with NRC and or stakeholders to ensure minimal cost incurred.

Operational solid waste facilities

As with the closed landfills, the main risk issues with the operational solid waste facilities are concerned with potential environmental contamination, either as a result of negligence or through accidental of unintentional acts.

Table 15: Operational solid waste facilities – risk ratings

Risk identified	Risk rating	Risk management strategy
Environmental contamination occurs through events beyond the control of Council.	High	Monitor contractors' QA processes on a regular basis.
Operator fails to meet contractual obligations.	Moderate	Work with operator to resolve issues in a 'partnering' environment.
Central government legislation drives up disposal costs - this relates to Waste Minimisation Levies.	Moderate	Joint advocacy with industry organisations and other councils.
Illegal dumping of rubbish – due to decrease in service level (e.g. missed collections, costs of disposal, distance to travel).	Moderate	Signs disallowing dumping of rubbish. Management of contracts. Monitor complaints. Bylaw enforcement.
Public and contractor health – Contractors and members of the public are not exposed to health risks.	Moderate	Monthly site audits and reporting. Contract management.
Public and contractor safety - accidents causing injury and damage to Kaipara residents, visitors or property.	Moderate	Monthly site audits and reporting. Contract Management.

Other business risks

The main business risks are centred around potential loss of corporate knowledge relating to the Solid Waste asset, therefore to capture it all in the AMP has identified this risk and manages it accordingly.

Table 16: Other business risks - risk ratings

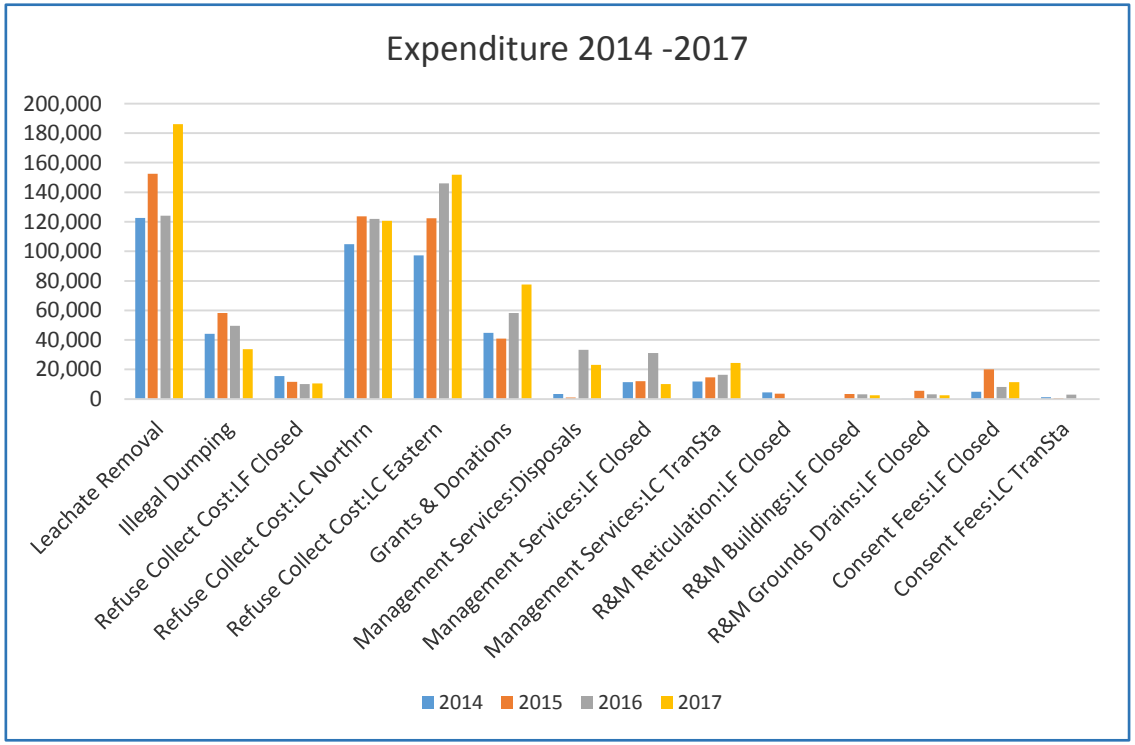
Risk identified	Risk rating	Risk management strategy
Environmental contamination occurs through events beyond the control of Council.	High	Monitor contractors' QA processes on a regular basis.
Inadequate condition/performance assessments – lack of reliable data for renewals/replacements and valuations.	Moderate	Develop a process to ensure that knowledge is transferred, stored and accessible.
General Maintenance, Operation and Collection Contract Management – unsatisfactory resulting in unnecessary or excessive costs and/or insufficient output or quality. Poor contractor performance.	Moderate	Develop contracts with clear delivery targets and performance measures. Contract Management with Quality Assurance Audits and updates where necessary.
Loss of information, caused by staff turnover or illness.	Moderate	Electronic filing system utilised. Databases kept update.

7 Financial projections

7.1 Introduction

Along with community outcomes and customer expectations, the issues, challenges, risks and works outlined in the previous sections all impact on expenditure. The following section outlines the budgeting process, summarises the main assumptions, describes the standards applied, outlines the different funding mechanisms and overall affordability and impacts in regards to rates.

Figure 23: Expenditure 2014/2017



Fees and charges are approved by Council for solid waste disposal and are set out below. Both Contracts for refuse disposal are zero dollar contracts i.e. income to cover disposal is covered by user pays at the time of disposal, rates only fund litterbin emptying, illegal dumping retrieval and closed landfill consents and monitoring. Make reference to website as fees can change.

7.2 Budgeting process

Consistent with the Local Government Act 2002 (LGA), Council's budgeting process is iterative. Initial budgets are set with consultation between senior management and managers which then goes to Council meetings. At the end of the meetings, Council has a budget it feels is in line with community expectations and is prepared to send out for public consultation via the Long Term Plan (LTP). Based on submissions received from members of the community, feedback is sent back to Council for final ratification before being formally adopted by Council.

Future capital works include the final capping and site compliance of Awakino landfill and leachate control/disposal improvements at Hakaru landfill with estimates of $800,000 and $1.2 million respectively.

With respect to the Hakaru (closed landfill) site, Council currently spends approximately $127,000 - $180,000 annually on the removal and disposal of leachate from the site. An investigation of options surrounding the disposal of leachate at the site is nearing completion and it is expected works will commence on improvements in the 2017/2018 financial year.

Other assets likely to require renewal or major refurbishment over the twenty year planning period are: leachate control devices, monitoring boreholes, capping, minor stormwater and other site assets. Minor assets including litterbins are replaced as operational expenses, and are not capitalised.

Overall, the bulk of the costs likely to arise in the 10 year forecast horizon are related to operational costs. Minor maintenance work is identified and carried out as a result of quarterly consent monitoring. See the table below for a summary forecast of expenditure over the next 10 years.

Table 17: Summary Capex and Opex expenditure.

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
CAPEX	$800									$600
OPEX	$750	$750	$590	$590	$590	$590	$590	$590	$590	$590

7.3 Financial assumptions

The key assumptions of Council were outlined in previously in Section 1 and are summarised again below.

- Service levels are generally assumed to remain the same;
- Ability to meet community expectations around the district, should the demographics of the district change, expectations for services currently not provided may increase or decrease. This directly impacts on the volume being collected and disposed of through the transfer station gates;
- Inflation is based on Council's knowledge of its business base and on Business and Economic Research Limited (BERL) predictors for the next 10 years;
- Financial dollars are in today's dollar figures, as opposed to Net Present Value, meaning that long term projected rate of inflation has been included;

- The south-eastern area is prone to population fluctuations with increasing demand for services over the summer holiday period;
- Solid waste volumes will be affected by changing age demographics in the district (any demographic change, such as decrease in age groups below 60 and an increase in those over 60 will typically change the volume and types of waste compared to households with children. Potentially, should this happen, Kaipara may see a reduction in volume and type of collected and disposed of waste);
- The rating base will continue to remain reasonably static throughout the course of this AMP;
- Leachate disposal costs for the closed Hakaru landfill site will continue to increase;
- Leachate and capping conditions of Dargaville closed landfill will require capital expenditure;
- Sustainable pricing for district-wide kerbside solid waste and recycling bag collection can be maintained;
- Financial cost for maintaining closed landfills to consent compliance; and
- Whangarei District Council Disposal Facility remains financially viable.

7.4 Asset valuation

The Solid Waste infrastructure assets owned by Council can be summarised as:

- Freehold title with gift back clause to the land on which the closed Hakaru landfill is situated;
- Freehold title to the land occupied by three of the closed landfill sites;
- Freehold title to the land on which the Dargaville transfer station is situated (also the associated closed landfill);
- Leachate detention ponds at several closed landfill sites;
- Leachate monitoring boreholes;
- Capping;
- Other minor stormwater drainage, accesses, fencing etcetera;
- Resource consents for the closed, current and future landfill sites;
- Building located at the Awakino Road Dargaville transfer station and used by the contractor as storage and office; and
- Recycling storage at Awakino Road Dargaville transfer station.

The valuation of Council's Solid Waste assets is currently limited to valuation of the land only, at closed and operational landfill sites. The current land values, where known, are provided in Appendix A.

The majority of solid waste infrastructure and plant assets are all owned by the contracted service providers and are not subject to valuation from a Council point of view. The minor site assets such as leachate control devices, monitoring boreholes, and stormwater pipes etcetera are not currently valued and hence are not currently being depreciated by Council. This has been noted as an Improvement Plan item (IP1) in Section 9.

7.5 Depreciation

There is currently no depreciation charge for the minor Solid Waste assets employed. Although not likely to be a large sum, given the relatively modest size of the Solid Waste asset portfolio, it is a requirement of PBE IPS AS 17 Accounting Standards that all infrastructure assets are depreciated. PBE IPS AS 19 Accounting Standards also require that contingent liabilities be identified and brought into account. These are outlined further in the following sections.

7.6 Solid Waste Revenue and Financing Policy

Table 18: Council's Revenue and Financing Policy. Relevant extracts with regard to closed landfills and transfer stations.

Closed landfills: maintenance of sites			
User group	**Economic allocation**	**Fairness and equity adjustment**	**Final financing mechanism**
Private Reason for Decision	0% -	0% No adjustment	0% -
Public Reason for Decision	100% Provision of environmentally acceptable, low risk closed landfill facilities	100% No adjustment	100% Uniform Annual General Charge
Transfer stations: provision for the sanitary disposal of solid waste			
User group	**Economic allocation**	**Fairness and equity adjustment**	**Final financing mechanism**
Private Reason for Decision	0% -	0% No adjustment	0% -
Public Reason for Decision	<5% Provision of environmentally acceptable, low risk transfer station facilities	0% No adjustment	95% User pays <5% Uniform Annual General Charge

7.7 Financial forecasts and forward works programme

The financial forecasts presented in this AMP are based upon the assumption/scenario that Council will implement strategies and policies over the next 10 years that will have the effect of significantly reducing solid waste volumes to landfill. The impact of such strategies and policies are likely to mean that unit costs of disposal to landfill will go up (if full cost recovery is to be achieved) and that recycling initiatives will become a more significant cost to Council.

7.7.1 Validation and confidence levels

With respect to capital expenditure Council has a standardised Project Information Sheet for proposed Capex expenditure projects. These will be used on solid waste projects that are undertaken directly by Council. Major capital projects will be undertaken through Council's normal contracting process, which has its own project information and reporting sheets.

Council is confident with the financial forecasts presented within this AMP with, Initial forecasts being set after consultation with senior management which then goes to Council, when Council feels it is in line with public expectations, this then is send out for public consultation via the LTP. Based on submissions received, feedback is sent back to Council for final ratification before being adopted.

Consistent with the Local Government Act 2002 (LGA) the budgeting process is iterative.

7.7.2 Capex expenditure summary

The timing of the Forward Works Programme is subject to finalisation of both costs and options presented to Council for the works e.g. estimates for Hakaru leachate management and restoration of the old landfill of approximately $1.2 million are subject to investigation into the options available and underway.

Over the lifespan of this AMP Council will be undertaking the following capital works:

- Litterbins - $20,000 for replacement of litterbins expected over the next 10 years (2018/2028). Based on the current spend of approximately $2,000 per year;
- Hakaru closed landfill – estimates approximately $1.2 million for leachate management and restoration of the old landfill. Expenditure is subject to investigation of options and methods 2017 – 2027; and
- Dargaville closed landfill (Awakino Road) - $800,000 for capping and restoration of the old landfill site area (2017 - 2019).

7.7.3 Renewal of existing assets

The Solid Waste assets likely to require renewal or major refurbishment over the 20 year planning period are leachate control devices, monitoring boreholes, capping, minor stormwater and other site assets.

At this stage, the likely timing of these renewals is still largely unknown, as further work will be required to assess their current condition and remaining effective lives. Minor maintenance work is identified and carried out as a result of quarterly consent monitoring.

See Tables 19 and 20 for more detail on 10 year expenditure forecasts.

7.7.4 Operational and maintenance expenditure summary

The bulk of the costs likely to arise in the 10 year forecast horizon are related to operational costs. These are categorised in the forecasts under the following headings:

- District disposal operations – user pays;
- Maintenance of closed landfills – cost to Council;
- Transfer station operations – user pays (ultimately):

The Hakaru transfer station contract is a zero dollar value and user pays applies, all buildings, major plant and machinery are owned by the contractor and there is very little cost to Council for providing this service.

The Dargaville transfer station contract is a zero dollar value and user pays applies, all buildings, major plant and machinery are owned by the contractor and there is very little cost to Council for providing this service. Council has some minor budgets for building and grounds maintenance; and

- Litter control – this covers the costs associated with the collection (and disposal) of litter from the litterbins situated in all towns at Council's cost and includes abandoned car retrievals.

In summary, the preferred option identified for service delivery is for the status quo, with improved efficiencies through bundling of the current separately operation contracts into a new single contract model.

The table below shows key information for each of the closed landfill sites. Further information is also contained in Appendix A and B. The following pages provide further detail for site specific operations and maintenance requirements for the closed landfills.

7.8 Expenditure forecast for 2017/2018 - 2026/2027

Current expenditure forecast for the period 2017/2018 – 207/2028 are:

Table 19: Solid Waste - consolidated financial forecast* $000

District closed landfills

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	552	650	684	496	508	520	533	547	559	565	591
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**552**	**650**	**684**	**496**	**508**	**520**	**533**	**547**	**559**	**565**	**591**
Application of operating funding											
Contractors costs	144	199	204	45	46	47	48	49	51	52	54
Professional services	7	27	27	28	29	29	30	31	32	32	33
Repairs and maintenance	10	10	11	11	11	11	12	12	12	13	13
Other operating costs	43	43	44	45	46	47	48	49	50	51	52
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	34	55	59	29	30	31	31	32	33	35	39
Finance costs	23	21	19	18	17	16	14	12	10	8	7
Total applications of operating funding	**261**	**355**	**364**	**175**	**178**	**181**	**183**	**185**	**188**	**192**	**199**
Surplus (deficit) of operating funding	**291**	**295**	**320**	**321**	**330**	**340**	**350**	**362**	**372**	**373**	**393**
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	-35	-37	-39	-33	-36	-38	-41	-45	-47	-32	-27
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**-35**	**-37**	**-39**	**-33**	**-36**	**-38**	**-41**	**-45**	**-47**	**-32**	**-27**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	600	800	0	0	0	0	0	0	0	731	0
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	-344	-542	281	287	294	301	309	317	325	-390	366
Total applications of capital funding	**256**	**258**	**281**	**287**	**294**	**301**	**309**	**317**	**325**	**341**	**366**
Surplus (deficit) of capital funding	**-291**	**-295**	**-320**	**-321**	**-330**	**-340**	**-350**	**-362**	**-372**	**-373**	**-393**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

District disposals

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	80	108	111	113	116	118	121	125	128	131	135
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	79	79	81	82	84	86	89	91	93	96	98
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**159**	**186**	**191**	**196**	**200**	**205**	**210**	**215**	**221**	**227**	**233**
Application of operating funding											
Contractors costs	54	54	55	57	58	59	61	62	64	66	68
Professional services	15	35	36	37	38	39	40	41	42	43	44
Repairs and maintenance	2	2	2	2	3	3	3	3	3	3	3
Other operating costs	65	65	67	68	70	72	73	75	77	79	81
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	22	30	31	31	32	33	34	34	35	36	37
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**159**	**186**	**191**	**196**	**200**	**205**	**210**	**215**	**221**	**227**	**233**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Surplus (deficit) of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Litter control

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	331	340	349	357	365	374	383	393	403	414	426
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**331**	**340**	**349**	**357**	**365**	**374**	**383**	**393**	**403**	**414**	**426**
Application of operating funding											
Contractors costs	286	286	293	300	307	314	322	330	339	348	358
Professional services	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	0	0	0	0	0	0	0	0	0	0	0
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	46	54	56	57	58	60	61	63	64	66	68
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**331**	**340**	**349**	**357**	**365**	**374**	**383**	**393**	**403**	**414**	**426**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Surplus (deficit) of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Solid waste administration

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018 $'000	2018-2019 $'000	2019-2020 $'000	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000
Operating funding											
Sources of operating funding											
General rates	151	109	111	113	110	112	114	116	119	121	124
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**151**	**109**	**111**	**113**	**110**	**112**	**114**	**116**	**119**	**121**	**124**
Application of operating funding											
Contractors costs	0	0	0	0	0	0	0	0	0	0	0
Professional services	5	1	1	1	1	1	1	1	1	1	1
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	13	20	20	21	16	17	17	17	18	18	19
Employee benefits	0	88	89	91	93	94	96	98	100	102	104
Internal charges	132	0	0	0	0	0	0	0	0	0	0
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**151**	**109**	**111**	**113**	**110**	**112**	**114**	**116**	**119**	**121**	**124**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Surplus (deficit) of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Transfer Station Operations

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	40	41	42	37	38	39	40	41	42	43	44
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**40**	**41**	**42**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
Application of operating funding											
Contractors costs	0	0	0	0	0	0	0	0	0	0	0
Professional services	24	24	25	25	26	27	27	28	29	30	30
Repairs and maintenance	0	0	0	0	0	0	0	0	0	0	0
Other operating costs	10	10	10	6	6	6	6	6	7	7	7
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	6	7	7	6	6	6	6	7	7	7	7
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**40**	**41**	**42**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
Surplus (deficit) of operating funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	0	0	0	0	0	0	0	0	0	0	0
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - Renewal	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Surplus (deficit) of capital funding	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

8 Asset management practices and information systems

8.1 Asset management planning

Given the drivers, assumptions and uncertainties outlined in the previous sections, Council recognises that effective asset management requires an appropriate and practical balance between performance, risk and cost throughout an assets lifecycle.

In addition to this, Council also recognises it is important to ensure continuous improvement in asset management functions and capabilities to achieve key service levels and community outcomes. The following section outlines the main asset management process and practices undertaken for the management of Solid Waste assets and services.

8.1.1 Asset management systems

There are several systems and processes that contribute to the management of Council's Solid Waste assets for planning, maintenance programming, operational requirements, financial monitoring and performance measurement. Currently Council uses the support tools listed in the following table to manage its portfolio of assets.

Table 20: KDC asset management systems

System name	System purpose	Purpose
MapInfo (GIS)	Asset location	The location of assets are stored within tables and represented spatially.
NCS (Napier Computer System)	Accounting	Council accounting and financial systems are based on NCS.
Hard copy	Asset reports/files	Historic knowledge.
Infra maps	Customer service tracking	To record customer enquiries and to register and track tasks allocated to the maintenance contractor for follow-up investigation and resolution within appropriate timeframes.
Helpdesk system	Tracks customer requests for progress reporting	Council operates a Helpdesk system which is able to track by activity group service requests received. These can then be used to see if the number of requests is reducing or increasing against previous years. This information can be further defined to track progress against individual service requests received and the action carried out.

System name	System purpose	Purpose
Work order and contract management?	Contract performance	The contractor liaises with Council to ensure co-ordination between the parties and co-operation in the provision of services. The contractor and Council hold regular (monthly) meetings to discuss any relevant issues regarding the provision of services. The contractor submits a monthly report for work completed during the previous month, the contractor also submits a quarterly report summarising the activities of the previous quarter. The contractor is also required to submit an Annual Report detailing the activities and performance of the previous year.
Maintenance programming and management?	Asset management	Maintenance is undertaken on an 'as required' basis, as most of the closed landfills require only reactive maintenance and occasional vegetation control, as they are either under pastoral grazing or other passive usage.

8.1.2 Asset information and data confidence

Council is working with contractors to ensure improved asset information and data. Seasonal waste audits have been carried out by contractors since 2013 and will continue. Notwithstanding the good progress being made to improve the completeness and confidence in asset data, Council faces challenges in the areas of asset and works management. Many of the current asset management business processes and systems are supported by manual, paper-based environments.

In the past solid waste management has largely been managed by consultants on Council's behalf, this has now fully in-house within the Roading Assets team. A review of the data and information is required to ascertain its reliability, a form of database will be developed and populated with asset data and condition ratings. This review will be carried out as part of the Solid Waste Improvement Plan (see Section 9).

8.1.3 Asset management practice and process

As part of Council's desire to continually improve the way we deliver services, a regular review of our asset management 'processes and practices' is undertaken. This review identifies the areas or issues that Council needs to improve on towards meeting the goal of providing the best service we can. Asset management 'processes and practices' include:

- How we forecast demand for services;
- How we capture and store knowledge about the assets we employ;
- How we monitor the condition of the assets;
- How we value, depreciate and budget for renewal of assets;
- How we strategically plan to acquire and use assets in future service delivery;

- How risks are identified, quantified and addressed;
- How we operate and maintain the assets; and
- How we manage contracted-out services.

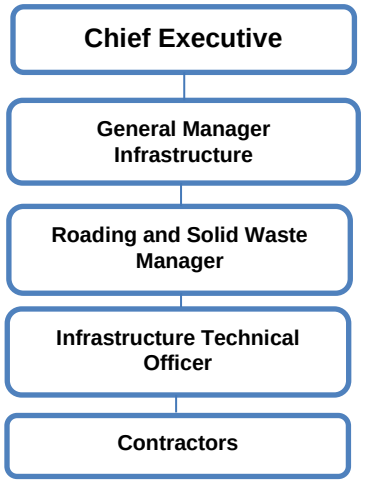
See Section 9 for detail on the Improvement Plan being implemented to target gaps identified is Council's asset management practices and processes.

Council also measures its market performance via a Customer Perception Survey conducted by Key Research on an annual basis. Council has been conducting these surveys since 2000. The benefits of using this method as a performance measure is that comparisons can be made with other local authorities across New Zealand. These surveys are however only a "yardstick", providing an indication of typical resident perceptions. Results from the most recent survey are discussed in Section 3.

8.2 Accountabilities and responsibilities

Council has a dedicated in-house team that manages both the strategic and operational matters for solid waste. This is done through direct employment of: a General Manager Infrastructure, a Roading and Solid Waste Manager and an Infrastructure Technical Officer. In summary, reporting occurs as follows: Contractor(s) report to the Infrastructure Technical Officer, who reports to the Roading and Solid Waste Manager. The Roading and Solid Waste Manager reports to the General Manager Infrastructure, who reports to the Chief Executive. Overall, asset management is the responsibility of the General Manager Infrastructure, with responsibility being delegated to the Roading and Solid Waste Manager's team for the day-to-day operations.

Figure 24: Asset management accountabilities and responsibilities – solid waste



Physical works associated with the assets are primarily provided for through two contracts. These cover the bulk of Council's Solid Waste assets across the district and deal with the day-to-day operations and maintenance. Council staff undertake inspections of all sites over the course of a year. As well as this NRC staff undertake inspections as part of resource consent monitoring. Any work identified in either inspection is then arranged by KDC staff .

The assets are managed, both strategically and operationally, by in-house staff. There is one primary contact which provides for daily operational management of its solid waste services, contracts and asset.

9 Improvement Plan

9.1 Introduction

It is important for Council to ensure that asset management practice is aligned with good practice that is fit-for-purpose and is always "forward-looking" when it comes to improvement in practices and standards. The previous sections have highlighted some of the main issues and challenges Council is facing for solid waste management. In response to this, an asset management improvement plan for solid waste is being implemented, with a number of items identified for improvement.

9.2 Improvements to solid waste asset management

The purpose of the Improvement Plan is to:

- Identify and develop implementation of the asset management planning process;
- Identify and prioritise ways to cost-effectively improve the quality of the AMP; and
- Identify indicative tasks, timescales, priorities and human and financial resources required to achieve asset management planning objectives.

The main drivers for asset management and thus improvements have been outlined in the previous sections (e.g. meeting regulatory requirements, managing risks, improving data and information).

Improvement tasks

Table 21: Key improvement tasks

N°	Task for improvement	Priority	Target date	Responsibility
IP1	Resource consent renewals – Dargaville closed landfill and Te Maire closed landfill, no other consents due to expire throughout this AMP period.	1	2017/2018	KDC
IP2	Review of litterbin capacity, frequency of clearing and locations.	2	2017/2018	KDC
IP3	Implementation of Solid Waste Bylaw (419) to improve the quality of waste disposal data.	1	2017/2018	KDC
IP4	Develop and Implement Risk Register.	2	2018/2019	KDC
IP5	Determine community interest in additional /rural drop-off locations for recycling, development proposal for consultation.	2	2018/2019	KDC

Nº	Task for improvement	Priority	Target date	Responsibility
IP6	Investigate provision of district-wide rate funded recycling collection costs. Develop proposal for consultation.	1	2018/2019 Annual Plan	KDC
IP7	Investigate options and develop a proposal to promote composting.	2	2018	KDC
IP8	Determine community interest in developing holiday home drop-off locations/options, develop proposal for consultation.	2	2018/2019 Annual Plan	KDC
IP9	Implement preferred option for leachate disposal at Hakaru closed landfill.	1	2018/2019	KDC – May utilise consultants for design
IP10	Complete consent compliance requirements for Dargaville closed Landfill (Awakino Road).	1	2018/2019	KDC
IP11	Future Contracts to be more robust and both East and West Contracts to be aligned.	1	Nov 2019	KDC
IP12	Implement/develop a database for recording of solid waste related physical assets and their condition ratings.	2	2020/2021	KDC
IP13	Investigate options for improvements and upgrades to transfer stations to better enable waste diversion.	1	2020/2021	KDC and Contractor
IP14	Ongoing investigations of recycling markets and ways to expand on materials currently recycled.	2	2021/2028	Contractor and KDC
IP15	Provide waste awareness and behavior change education.	1	2018/2028	KDC or through Contract for Service

PRIORITY: 1 = High, 2 = Medium, 3 = Low

9.3 Monitoring and review

The Improvement Plan will be monitored, reviewed and updated on an annual basis. The AMIP will then be adjusted accordingly (demonstrating an iterative cycle of continuous improvement) taking into account overall progress, changing business priorities, risks and affordability.

Appendix

Appendix A: Asset valuations (land values only)

Table 22: Asset valuations (land values only)

Location	Legal land description	Land ownership	Consent number	Land valuation	Leachate treatment	Comments
Access Road, Ruawai	Lot 1 DP 138215 Blk XIII Tokatoka SD – Val 0113018100 – Freehold Land.	KDC	7234	LV $47,000 CV $53,000	Detention pond	Not operated since 1998. Has been capped.
Awakino Road, Dargaville	Lots 1, 3 , 4 DP 116318 Blk XII Kaihu SD Blk IX Maungaru SD – Val 0101009300 Freehold land	KDC	4433	LV $220,000 CV $270,000	Detention pond and wetland	Transfer station operated by Kaipara Refuse. Landfill closed, temporary cap installed pending consent, still requires final cap.
Hakaru, Kaiwaka-Mangawhai Road	Lot 1 DP 181761 Blk XV Waipu SD – Freehold land with gift back clause.	KDC	7562	LV $220,000 CV $530,000	Pumped to holding pond.	Transfer station operated by Northland Waste. Landfill closed and capped
Kelly's Bay	Road Reserve	KDC	7226	N/A	No	Operated as trench and burn system. Closed and capped.
Mosquito Gully Pouto Road	N/A	KDC	7227	N/A	N/A	Closed and capped.
Moir Point, Mangawhai	Lot 2 DP 99103	B Ogilvy	4816	Private Land	Monitoring bores exist	Privately owned land. Closed and capped.
Glinks Road	Pt Allot 141 Kopuru Psh Blks IV, V Kopuru	DOC	7227	N/A	No	Operated as trench and burn system. Closed and capped.
Omamari Road	Road Reserve	KDC	4814	N/A	Wetland	Closed and capped.
Oneriri Road, Kaiwaka	Road Reserve	KDC	4809	N/A	No	Closed and capped.

Location	Legal land description	Land ownership	Consent number	Land valuation	Leachate treatment	Comments
Pahi Road	Road Reserve	KDC	2257	N/A	No	Closed and capped.
Parawanui Road	Lot 1 DP 130476 Blk IV Kopuru SD Freehold Land	KDC	4811	LV $28,000 CV $28,000	No	Closed and capped.
Te Kowhai Road, Ruawai	Road Reserve	KDC	N/A	N/A	No	Capped.
Te Maire, Cole Road	Road Reserve	KDC	4815	N/A	No	Closed and capped.
Sandy Beach Road, Tinopai	Lot 27 DP 16979 Hukatere SD	Liang Li	4812	Private land	No	Closed and capped.
Bickerstaffe Road	Road Reserve	KDC	38848	N/A	No	Closed to be capped

Appendix B: Database of all closed landfill consents

Table 23: Database of all closed landfill consents

Site		Land Ownership	Post Closure Management Plan	Current consent	Expires	Consent conditions	Monitoring Required	Inspection	Outstanding work Requirements
1	Dargaville (Awakino Road)	KDC	Completed	**4433**	**2003**	Regular testing by NRC	yes	Six-monthly	Capping and leachate control, renew consent
2	Ruawai (Access Road)	KDC	Completed*	**7234**	**2035**	Cap and leachate pond check yearly, water and sediment tests NRC twice yearly. Drains, fly tipping quarterly.	yes	Quarterly	
3	Pahi	KDC	Completed	**2257**	**2035**	Annual water and sediment tests NRC (winter and ebbtide).	yes	Annually	
4	Kaiwaka (Oneriri Road)	KDC	Completed*	**4809**	**2035**	Cap and leachate pond check yearly, water and sediment tests NRC twice yearly. Drains quarterly.	yes	Quarterly	
5	Kaiwaka (Hakaru)	KDC	Outstanding	**7562**	**2025**	Regular testing by NRC – cap.	cont	Quarterly	Leachate improvements required
6	Mangawhai	Private	Completed	**4816**	**2050**	Regular testing at two piezometers by NRC.	yes	Annually	
7	Tinopai	Private	Completed	**4812**	**2030**	Drains and cap check yearly, water tests NRC yearly.	yes	Quarterly	
8	Parawanui	KDC	Completed	**4811**	**2035**	Cap check yearly, water tests NRC yearly.	yes	Quarterly	
9	Glinks Gully	DOC	Completed	**4810**	**2035**	Sampling completed by KDC.	yes	Six-monthly	
10	Omamari	KDC	Completed	**4814**	**2049**	Cap check yearly, water tests NRC yearly.	yes	Annually	
11	Kelly's Bay	KDC	Completed	**7226**	**2035**	Cap check yearly. Drains, fly tipping quarterly.	yes	Quarterly	
12	Mosquito Gully		Completed	**7227**	**2035**	Cap check yearly. Drains, fly tipping quarterly.	yes	Quarterly	
13	Te Maire		Completed	**4815**	**1996**	Cap check yearly. Drains, fly tipping quarterly.	yes	Quarterly	Renew consent if required.

Site		Land Ownership	Post Closure Management Plan	Current consent	Expires	Consent conditions	Monitoring Required	Inspection	Outstanding work Requirements
14	Bickerstaffe Road	KDC	Completed	**38848**	**2051**	Cap and leachate check yearly, sediment monitoring annually for first five years.	yes	Annually	Capping to be completed
15	Franklin Road	KDC	No	**4916**	**1992**		nil	nil	
16	Te Kowhai Road		No	**illegal**			nil	nil	
17	Tangiteroria		No	**illegal**			nil	nil	
18	Pouto Point		No	**illegal**			nil	nil	
19	Kaihu		No	**illegal**			nil	nil	
20	Te Kopuru		No	**illegal**			nil	nil	

Appendix C: Acronyms

AMP	Asset Management Plan
CCRA	Climate Change Response Act 2008
LGA	Local Government Act
LOS	Levels of Service
RMA	Resource Management Act
SR	Service Requests
WMA	Waste Minimisation Act
WMMP	Waste Minimisation and Management Plan