NORTHLAND TRANSPORTATION ALLIANCE

"Moving Northland Forward"

Northland Regional Activity Management Plan 2021 - 2051

Transportation

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Contents

1 Executive Summary

1.1 Introduction

This Activity Management Plan (AMP) has been prepared by the Northland Transport Alliance (NTA) on behalf of the Far North District Council (FNDC), Kaipara District Council (KDC) and Whangarei District Council (WDC). The AMP outlines how the district councils will maintain, operate and develop its transportation activities over the next three year period (2021/2024) in detail and indicate the intentions over the next 10 and 30 years.

The purpose of the Transportation AMP is to provide good-quality local infrastructure, local public services, and performance of regulatory functions in a way promotes the social, economic, environmental, and cultural well-being of communities in the present and for the future. It is also to meet the vision and objectives of councils commitments to the community, as defined in the Long Term Plan (LTP), and to be consistent with the strategic direction both nationally through the Government Policy Statement (GPS) and regionally through Northland's Regional Land Transport Plan (RLTP).

The Roading Efficiency Group (REG) have developed the One Network Road Classification (ONRC) principles and performance measures and these have been embedded into this AMP. The AMP has also adopted the NZ Transport Agency's Business Case Approach.

Figure 1-1 shows the links between the strategic documents at the national (GPS), regional (RLTP) and local level (LTP).

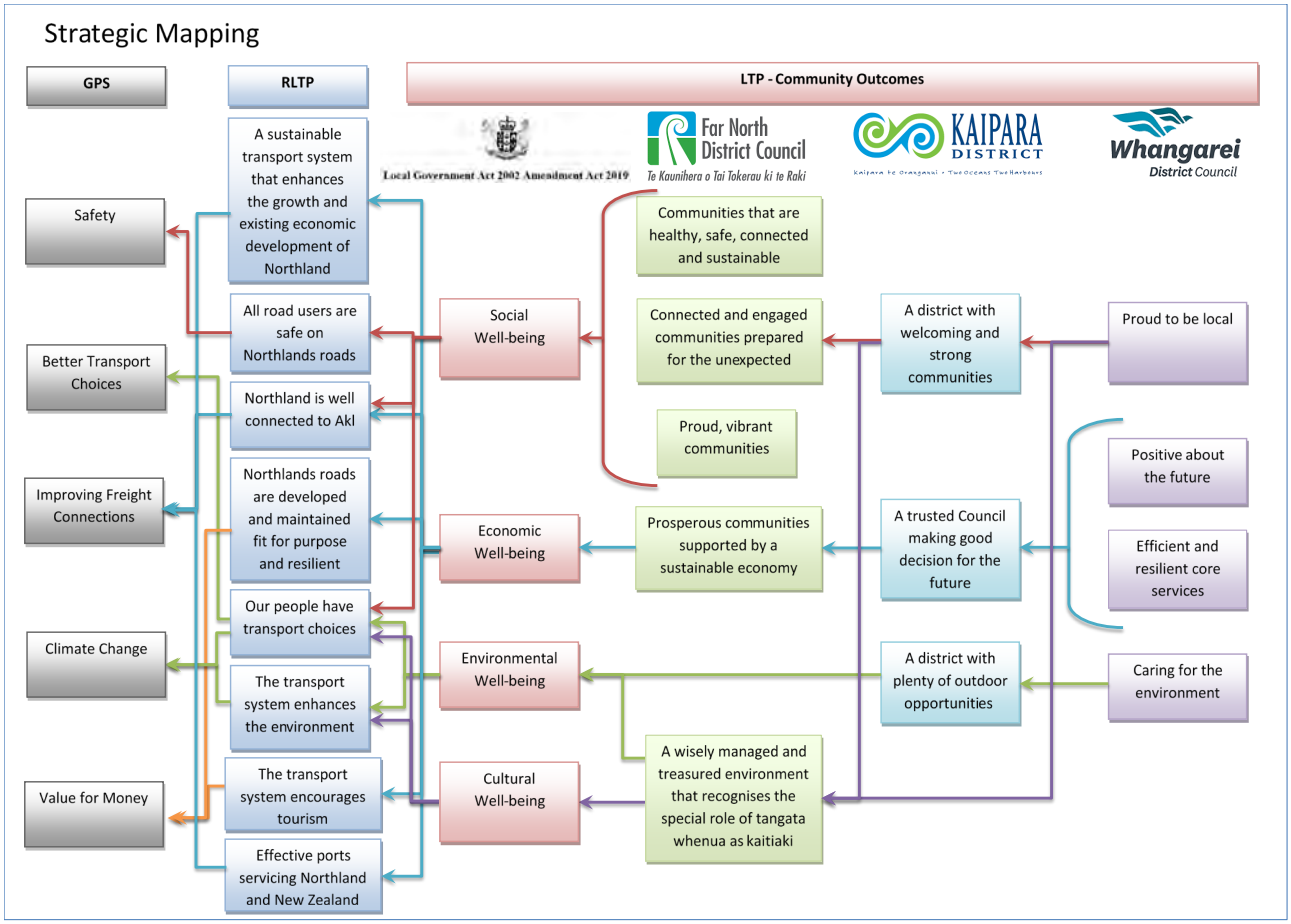

Figure 1-1: Strategic Mapping

1.2 What Do We Manage?

The NTA manages the following transportation assets:

<table>
<tr><th colspan="5">Northland's Local Road Network</th></tr>
<tr>
<td>  </td>
<td>  </td>
<td>  </td>
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</tr>
<tr>
<td>Total Road Network

FNDC - 2,507km
KDC – 1,574km
WDC – 1,750km

Total – 5,831km</td>
<td>Sealed Roads

FNDC – 877km
KDC – 455km
WDC – 1,056km

Total – 2,388km</td>
<td>Unsealed Roads

FNDC – 1,630km
KDC – 1,119km
WDC – 694km

Total – 3,443km</td>
<td>Bridges and Large Culverts
FNDC – 723
KDC – 349
WDC – 485

Total – 1,557</td>
<td>Drainage Systems

FNDC - 25,521
KDC – 14,504
WDC – 20,216

Total – 60,241</td>
</tr>
<tr>
<td>  </td>
<td>  </td>
<td>  </td>
<td>  </td>
<td>  </td>
</tr>
<tr>
<td>Footpaths

FNDC - 217km
KDC – 94km
WDC – 436km

Total – 747km</td>
<td>Cycleways

FNDC – 87km
KDC – 0km
WDC – 21km

Total – 108km</td>
<td>Streetlights

FNDC – 1,828
KDC – 1,185
WDC – 5,407 +
26 traffic signals
Total – 8,420</td>
<td>Signs

FNDC – 15,365
KDC – 8,935
WDC – 15,049 +
49 Active Signs
Total – 39,349</td>
<td>FNDC Hokianga Ferry Service

WDC - 2 Opening Bridges</td>
</tr>
<tr>
<td>Asset Valuation (excluding land)
FNDC
KDC
WDC

Total</td>
<td>Total Asset Value

$1,476M
$675M
$1,277M

$3,428M</td>
<td>Current Value

$1,106M
$536M
$815M

$2,457M</td>
<td>Annual Depreciation

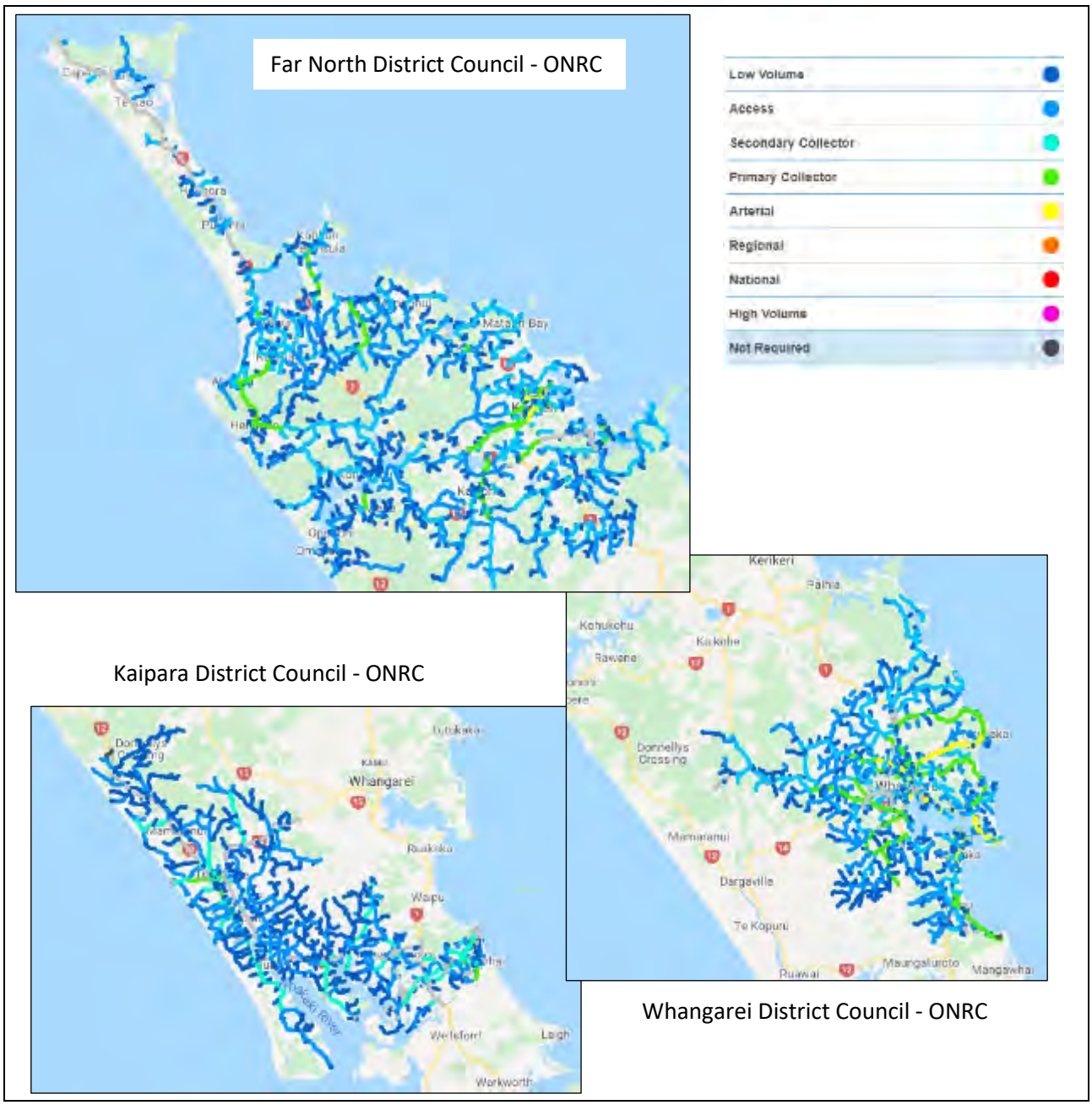
$18.9M
$7.5M
$20.6M

$47.0M</td>
<td></td>
</tr>
</table>

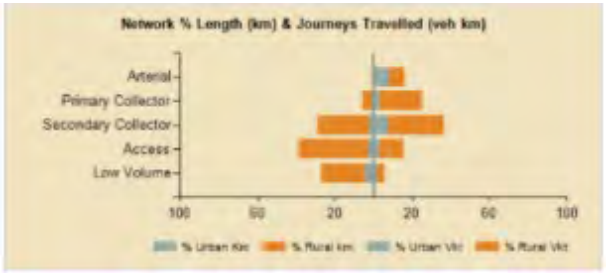
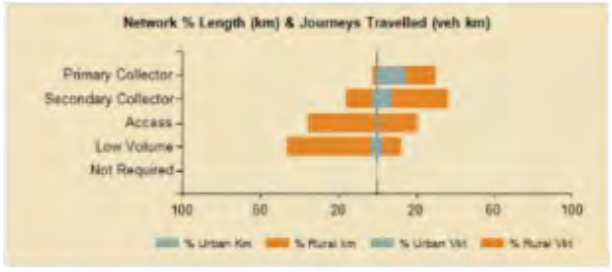
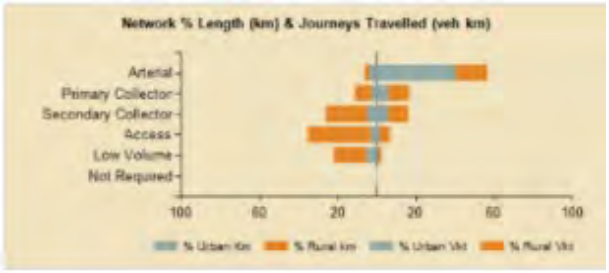
The NTA also carries out the following key transportation functions:

- Network and asset management
- Safety management
- Management of Corridor Request and traffic management
- Traffic signal operations (on both local and NZTA roads in the District)

The One Network Road Classification of the road network is shown in the following maps.



The length and journeys travelled by ONRC classification is shown in the following table.

	**FNDC** – 94% of the network consists of Secondary Collector roads or below. A significant number of trips (42%) are undertaken on Arterial or Primary Collector roads which collectively make up only 6% of the network length.
	**KDC** – 98% of the network consists of Secondary Collector roads or below. Two thirds of all trips (67%) are undertaken on Primary or Secondary Collector roads which collectively make up 18% of the network length.
	**WDC** - 83% of the network consists of Secondary Collector roads or below. More than half of all trips (57%) are undertaken on Arterial roads which make up only 6% of the network length.

The network is currently managed through several contracts as described below:

- 5 x term road maintenance contracts (FNDC x 2, KDC x 1, WDC x 2). These maintenance contracts include reseals, most pavement rehabilitations and pavement markings.
- 1 x term traffic signal contract (WDC)
- 2 x term streetlight contract (FNDC x 1, WDC x 1). KDC has a monthly streetlight maintenance contract.
- 1 x term ferry operation contract for the Hokianga Ferry service (FNDC)
- 4 x term bridge maintenance & operations contracts for the Whangarei opening bridges
- A range of other one-off contracts for bridge works and other activities.

The NTA have been managing the transport networks on the council's behalf since the NTA was formed in July 2016. In early 2019, the NTA carried out a restructure of its organisational structure into four management teams. These teams are:

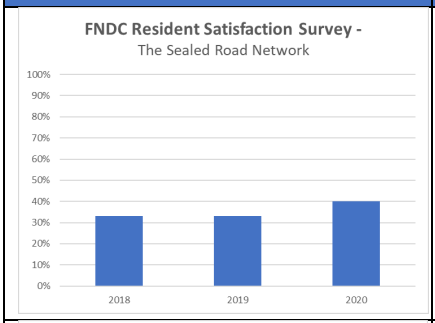
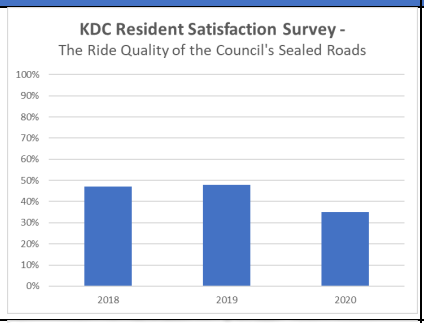
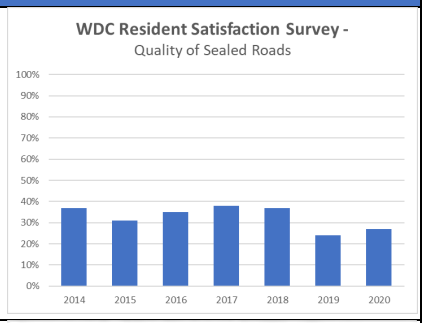
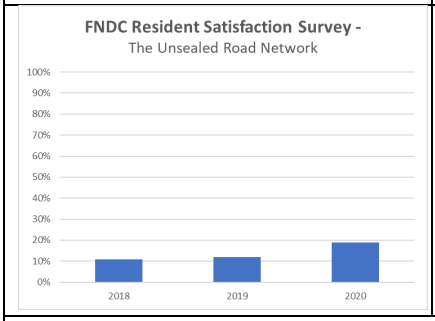
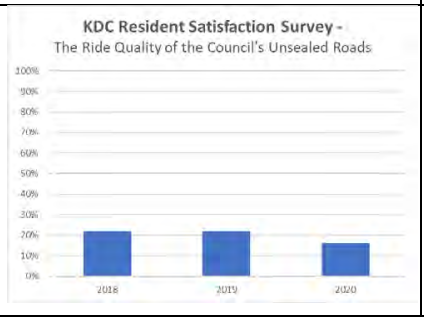
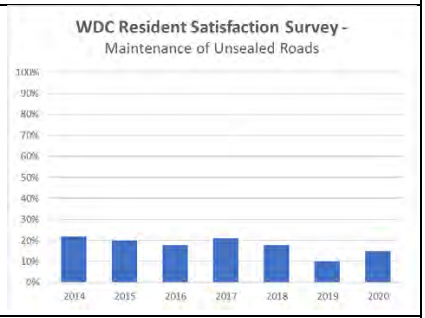
- Strategy and Planning
- Capital and Procurement
- Maintenance and Operations
- Administration and Business Development

This business structure is intended to provide greater efficiencies, by developing "centres of excellence", breaking down the boundaries between the individual council staff and developing the right culture across the organisation. A rigorous employment campaign has been undertaken over the past year to employ the right staff in the right positions and all of the required positions have now been filled.

Early 'wins' through the NTA have been:

- The development of a regional procurement strategy
- The roll-out of standardised road maintenance contracts with coordinated procurement to drive the best outcome (and price)
- The development of a regional AMP and strategy development (doing things once instead of three times)
- Joint council contracts for streetlight, traffic counting and asset management
- Coordination of programmes across the region to ensure delivery, notably the 2020/21 reseal programme which was 50% larger due to projects being delayed through the COVID-19 lockdown in 2019/20.
- In 2020/21 the NTA is on track to deliver the largest programme of capital work (including PGF and CIP projects) on the local road network ever achieved in Northland.

1.3 What do Our Customers Want?

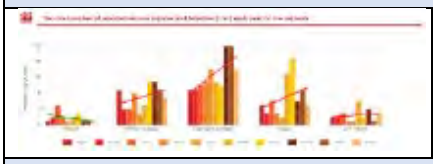
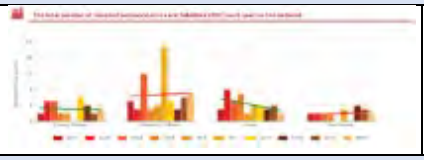
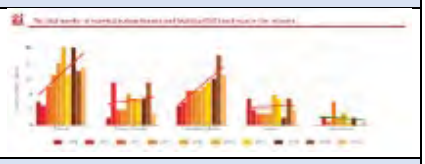
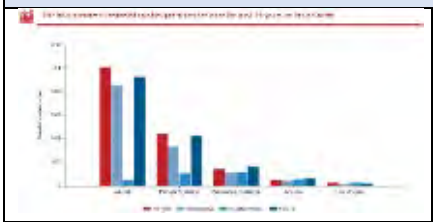
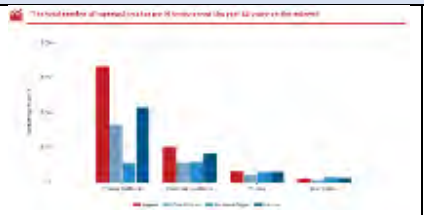
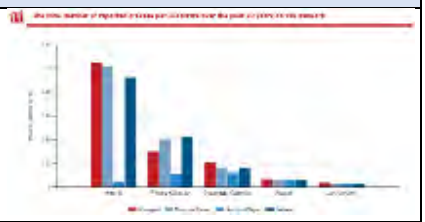
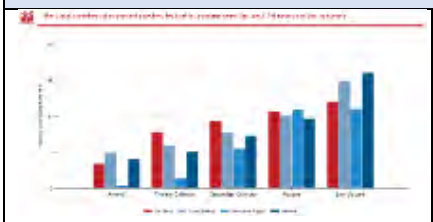
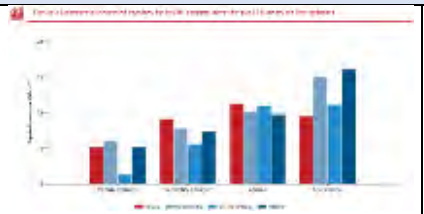
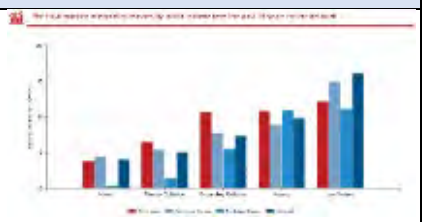
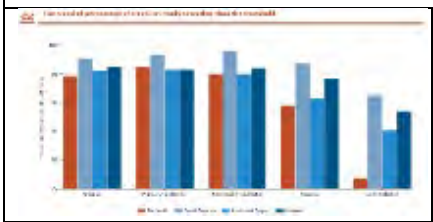
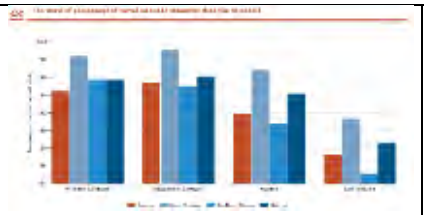
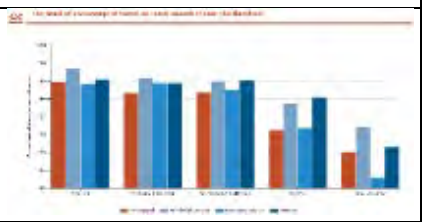
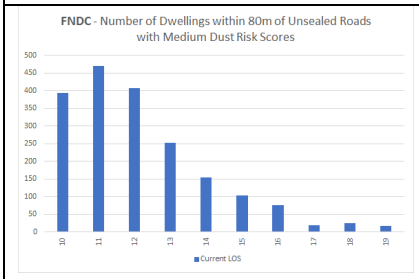
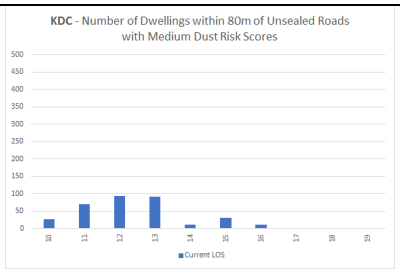
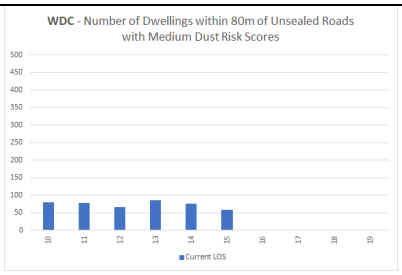
FNDC	KDC	WDC
		
		

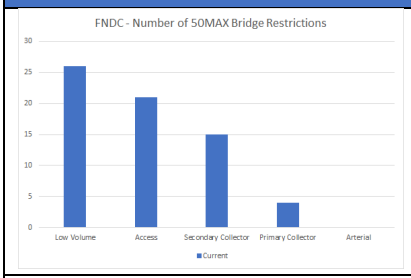
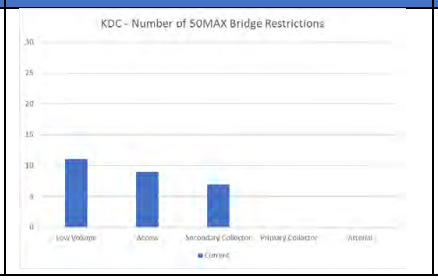
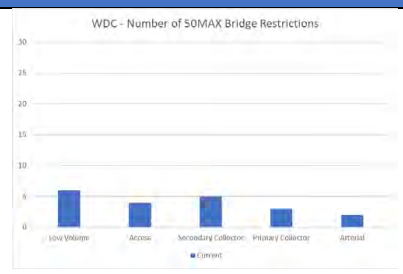
RESIDENT SATISFACTION – Satisfaction for the sealed road network is generally low with scores of between 27% for WDC, 35% for KDC and 40% for FNDC. The satisfaction with the unsealed road network is very low with scores of only between 15% and 20% across the region. This is due to issues with road condition (potholes and corrugations), maintenance costs and dust generation.

STAKEHOLDER WORKSHOPS – Stakeholder workshops were held in 2016 and the key issues identified were:

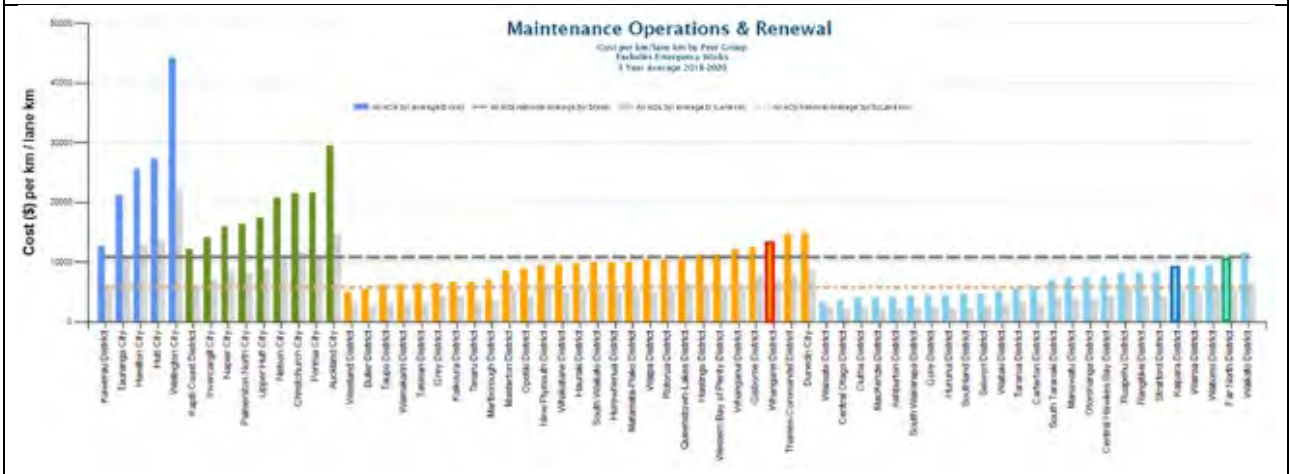
- **Freight/Forestry/Resilience** – Connectivity to Auckland, high forestry level, communication of roadworks, fit for purpose detour routes, travel time reliability, lack of rest areas, potential growth of NorthPort.
- **Tourism and Economic Development** – High growth in tourism, revival of the Twin Coast Discovery Highway, Tai Tokerau Economic Action Plan.
- **Public Transport** – New bus terminal required, balancing parking with public transport uptake.
- **Walking and Cycling** – Continue investment in shared paths in Whangarei, develop travel plans and bike training, aging population requires smoother and wider footpaths for mobility scooters etc.
- **Road Safety** – Focus effort on the safety issues, difficulty in getting local share funding for road safety promotion, road network narrow and unforgiving, driver behaviour is poor.

1.4 What is Our Current Performance?

FNDC	KDC	WDC
Death and Serious Injury Crashes (per year)		
		
Safety - Collective Risk		
		
Safety - Personal Risk		
		
SAFETY SUMMARY - Fatal and serious injury crashes on the local road network have generally been increasing over the last 10 years in the Far North and Whangarei districts. The Collective Risk in the Far North and Kaipara Districts are also higher than their peer group. Each district has several road classes that have a higher Personal Risk than their peer group. The NZTA Communities at Risk Register for 2019 identifies that Northland is a high risk for death and serious casualties. When broken into the individual districts, the Far North and Kaipara Districts are also high risk and Whangarei District a medium risk for death and serious casualties.		
		
AMENITY SUMMARY – The roughness of the road network for each of the councils is worse than its peer group, particularly for the Access and Low Volume roads. This is due mainly to Northland's poor subgrade conditions, the numerous slips on the network and the uneven service covers in urban areas.		
		
PUBLIC HEALTH SUMMARY – There are many dwellings located on unsealed roads that are subject to medium dust risk that is likely to cause health concerns to local residents. Far North District has the highest number of over 1,900 dwellings, with KDC having over 300 and WDC having over 400.		

FNDC	KDC	WDC
		

ACCESSIBILITY SUMMARY – There are many bridges that have restriction for 50MAX (50 tonne) trucks, particularly in the Far North which has the most of any district in the country. 25% of Far North's bridges are also in poor or very poor condition which is a significant concern.



COST SUMMARY – Each of the councils have some of the highest maintenance, operations and renewals (MOR) costs in their respective peer groups. This is not surprising given that Northland has poor subgrade conditions, lack of access to good quality pavement aggregate, a wet sub-tropical climate and higher heavy vehicle loadings than most of the South Island and upper Northland Island councils within the peer groups. FNDC also operates the Hokianga Ferry service which contributes to their high cost/km. WDC operates two opening bridges, has 26 traffic signals sites and has the third highest traffic volume in its per group which contributes to its high cost/km.

1.5 What are the Future Demands?

Unite against COVID-19

NOTE - This AMP was developed using information that was developed before the COVID-19 pandemic. This may mean that the demand and growth predictions in the AMP may be different post-COVID-19.

New Zealand Government

The demands on the Northland transport network can be summarised as follows:

- The effects of the COVID-19 pandemic to date have not been as significant as originally anticipated. Growth in Northland has been strong since the lockdowns, due to a buoyant housing market fuelled by ex-pat New Zealander's returning home from overseas as well as strong domestic tourism.
- Growth in GDP in Northland was 2.8% in 2019 which is similar to the national average, and unemployment is at a 10 year low, but household incomes are less than the national average.

- Northland is one of the most socially deprived regions in the country and so supporting growth opportunities, and providing alternative transport opportunities such as walking, cycling and public transport are important.

- The freight task in Northland has grown by 2% per annum over the past 5 years to 16.6M tonnes being carried by road (in 2017/18). This is forecast to remain at these levels for the next 30 years due mainly to a drop in forestry harvest over the next few years from the current 4 million cubic metres to 3 million cubic metres. However, recent developments such as the potential for NorthPort to grow into a container port and the investment in water storage projects to support expansion of horticulture activities may increase freight movements. The recent investment in the North Auckland rail line may slowly reduce the current reliance on the road network for most freight movements (currently 99% of freight is carried by road).

- Tourism in Northland is at an all-time high with almost 2 million visitor nights and $1.12 billion being spent by Tourists in 2018. While COVID-19 has had an impact, the tourist industry is expected to continue to grow in Northland through strong domestic tourism and investment in many tourist attractions through the Provincial Growth Fund (PGF), including the revitalisation of the Twin Coast Discovery Highway. Campervans and freedom campers are also increasing.

- The population in Northland increased by 3.6% per annum between 2013 and 2018 which is an all-time high. Much of this growth occurred in the Mangawhai, Kerikeri/Waipapa and Whangarei areas. This growth is expected to continue into the future with strong growth opportunities through Northland's proximity to Auckland, potential growth in Northport, the motorway extension to Warkworth and government investment such as through the Provincial Growth Fund.

- The transport network has grown slowly over the last 10 years. There has been modest growth of between 0.3-0.6%/year in the length of sealed roads through subdivision activity and seal extensions. There has also been rapid growth in cycleways in Whangarei. This growth is likely to continue into the future with the expected business and population growth as well as new road sections being handed to WDC through the SH1 Whangarei to Ruakaka 4-laning project.

- Overall growth in traffic volumes (including State Highways) in Northland is currently high at 5%. Based on traffic count data over the past 4 years, the traffic growth on Kaipara's local roads is 12% and for Whangarei's local roads is 6%. The largest growth is the Mangawhai area which is identified as one of the fastest growing areas in the country.

- The investment in walking and cycling projects across Northland, through the implementation of the Walking and Cycling Strategies, is likely to create a mode shift and partially mitigate the growth effects on traffic demand in urban areas. In addition, the proposed upgrade to the Whangarei CityLink bus service is also likely to result in a shift to public transport in the city. These initiatives will also help mitigate transports impact on greenhouse gas emissions.

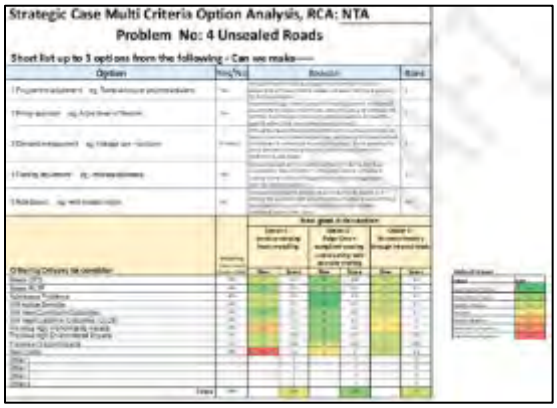
- The impacts of climate change are likely to create more extreme weather events, sea level rise and more droughts. These impacts will create further demands on the transport system, particularly increased likelihood of slips, flooding and inundation of low lying coastal roads.

The impacts of these demands on the maintenance, operations and renewals programme is to increase the volume of traffic and freight on the network. Population growth will also result in growth of the road network

through roads being vested to Council. These impacts will result in more wear and tear and a larger network which will require increasing levels of funding to maintain.

1.6 How was the AMP developed?

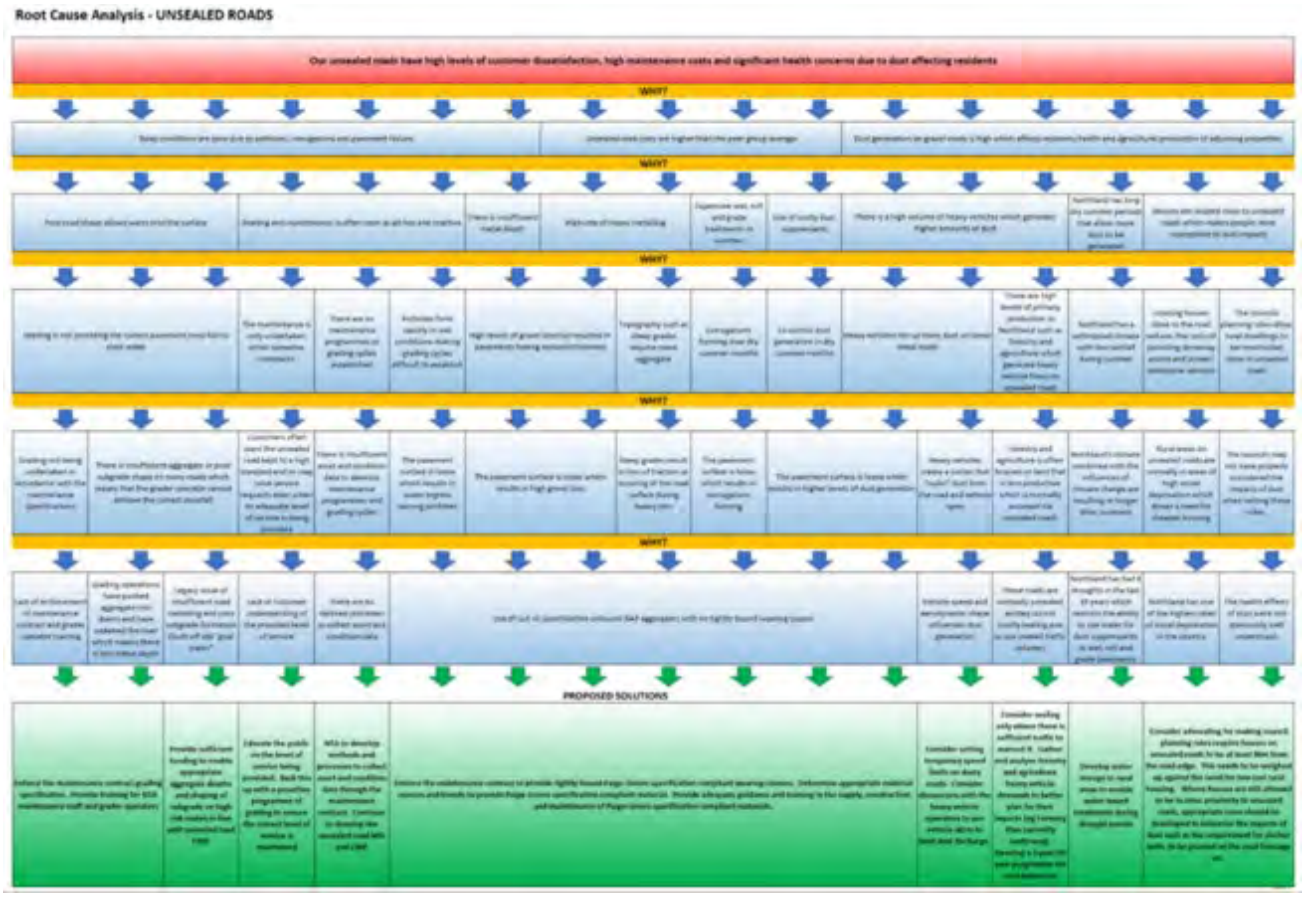
During the development of this regional AMP, a review of the previous AMP documents for the three councils (FNDC, KDC and WDC) was undertaken to determine common issues. Draft region-wide problem statements were drafted and a 'bottom up' review of the current practices was undertaken to determine what was working well to address these problems and what was not working.



Gaps and opportunities for possible improvement were identified and a 'top down' review of strategies and activities was undertaken to determine what could be done to address these issues.

High level strategic responses were determined and tested using a multi-criteria assessment to determine the preferred responses.

An analysis was then undertaken to determine the root cause of these problems and the potential solutions to address these. A second round of multi-criteria assessments was then undertaken to identify the preferred options to be adopted in the AMP. The outcome of these assessments and analysis is captured in the following sections.



1.7 What are Our Problems?

Based on the above assessments, problem statements for the seven key issues affecting the Northland transport network and how they link to the RLTP have been developed as follows:

Issue	Problem Statement	RLTP Problem Statement
Sealed Roads	Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.	Major local variances in the quality of our infrastructure and services and lack of resilience means we fail to support the transport needs of the regional economy (40%)
Drainage	Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.	
Resilience	Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.	
Unsealed Roads	Use of out of specification GAP aggregates on our unsealed roads is resulting in: • adverse health impacts to residents due to dust • high levels of community dissatisfaction due to poor road condition and • high maintenance costs.	Heavy vehicles must use local unsealed roads to access arterial routes, which means that all users of local roads, the environment and people health are adversely affected by dust (10%)
Structures	Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement	Northland remains reliant on road transport, but the demands on the transport network are changing, which means that we fail to meet community/business expectation (20%)
Growth and Alternative Transport	Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	
Safety	Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for FNDC and WDC. FNDC and KDC also have higher Collective Risks than their peer group.	Drivers lack of respect for the environment, other road users and the rules of the road results in a high number of crashes involving death or serious injury (30%)

Table 1-1: Problem Statements

The benefit statements of addressing the above problems and how they link to the ONRC outcomes and the RLTP are summarised in Table 1-2 below:

Problem	Benefit Statement	ONRC Outcome	RLTP Benefit Statement
Sealed Roads **Unsealed Roads** **Drainage**	Our network is fit for purpose, sustainable and efficient.	 Amenity  Cost Efficiency	Ability to proactively manage the impact of freight on the region A transport system that enhances and supports the region's cultural and environmental values
Resilience	Our network is resilient and key lifeline routes will be accessible during adverse conditions.	 Resilience	Greater regional resilience
Structures	Our network is accessible and efficient for all modes and users.	 Accessibility	Ability to proactively manage the impact of freight on the region
Growth and Alternative Transport	Our network has reasonable and reliable travel times and can accommodate future growth.	 Travel Time Reliability	Enabling an increase in economic development activity (including tourism) Contributing to a reduction in social deprivation People having transport choices to access work and amenities Reducing the environmental impact of travel A transport system that is configured for growth
Safety	Our network is safe for all modes and users.	 Safety	Improved safety (a reduction in deaths and serious injuries)

Table 1-2: Benefit Statements

1.8 What is Being Proposed to Address these Problems?

The following key improvement initiatives and changes are being proposed to address the above problems:

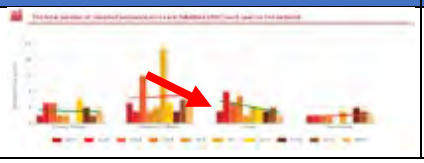
Problem	GPS Priority	ONRC Outcome	Key Improvement Initiatives
Sealed Roads **Unsealed Roads** **Drainage**	Value for Money	 Amenity  Cost Efficiency	• Continue to optimise Rehabilitations and Reseals • Increase the thin asphaltic surfacing renewal programme for FNDC and WDC to protect high risk urban pavements with TAC surfacings that are overdue for replacement. • Respread in-house maintenance charges into WC 151 and reallocate contract management costs. • Complete the unsealed road Centre of Excellence, FWP and MIS. • Unsealed strengthening with Paige-Green compliant wearing courses to improve road condition, reduce maintenance costs, reduce dust impacts and improve user satisfaction. • Improve grading with operator training and pro-active operations based on condition • Improve watertable maintenance to avoid water ingress into pavements
Resilience	Climate Change	 Resilience	• Develop resilience strategy targeting critical routes. Discuss NZTA funding opportunities on SH detour routes. • Programme of crack sealing on slip sites • Upgrade the culvert sizes in areas that are high risk for flooding or slips • Repair historic slips on high priority routes • Strengthen the resilience of routes serving isolated communities. • Raise/Protect/ Retreat roads subject to coastal inundation
Bridges	Improving Freight Connections	 Accessibility	• Develop long term bridge strategy and FWP in conjunction with Forestry Plan. Detailed 50MAX assessments to reduce restrictions • Increase number of bridge inspections and carry out retaining wall inspections. • Provide sufficient bridge maintenance and renewal funding for FNDC and KDC, to avoid expensive bridge replacement. • Secure professional services for bridge design, supplier panel for bridge contractors. Simplify FNDC procurement process.
Growth and Alternative Transport	Better Travel Choices	 Accessibility  Travel Time Reliability	• Continue the implementation of the Whangarei shared path network • Develop shared path networks for Kerikeri/Waipapa and Mangawhai • Construct rural Heartland rides identified in the Northland Integrated Cycle Business Case – through alternative funding (PGF etc) • Complete missing links of footpaths • Upgrade intersections and mid-blocks to remove pinch points • Implement travel planning such as New Plymouth's LetsGo programme • Provide bus priority lanes in Whangarei • Increase the frequency of bus services in Whangarei • Provide rural commuter bus services in Whangarei • Develop shuttle bus services or ride share schemes in rural towns. • Increase parking fees for all-day parking in Whangarei to promote bus use

Problem	GPS Priority	ONRC Outcome	Key Improvement Initiatives
Safety	Safety	 Safety	• Targeting speed management, delineation improvements such as audible tactile profile (ATP) and signage as well as hazard protection through the Safe Network Programme (SNP) • Increase funding to allow for a full annual remark also consider Long Life markings • Prioritise safe pedestrian and cyclist crossing points. • NTA inhouse road safety coordinator to drive improved driver behaviour change programmes.

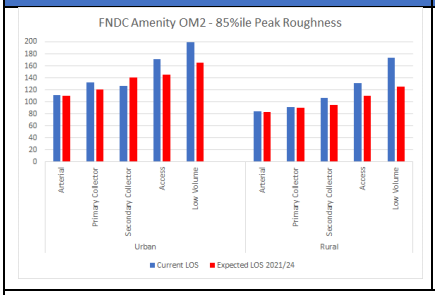
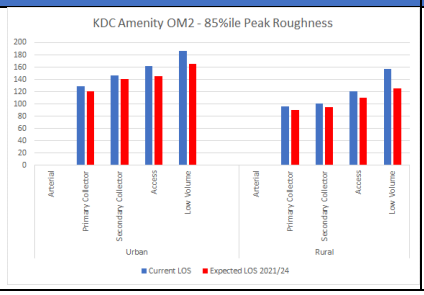
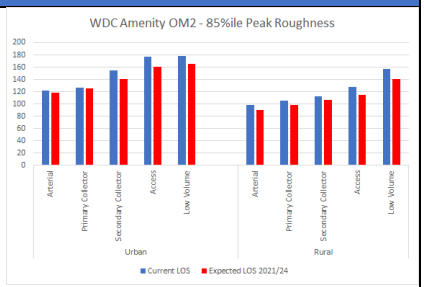
Table 1-3: Improvement Initiatives

1.9 What Effect will this Have?

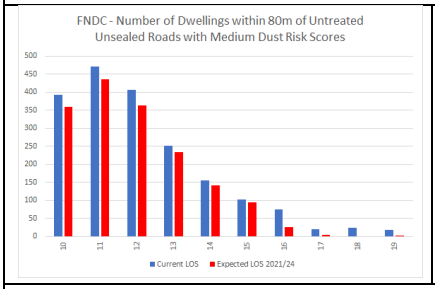
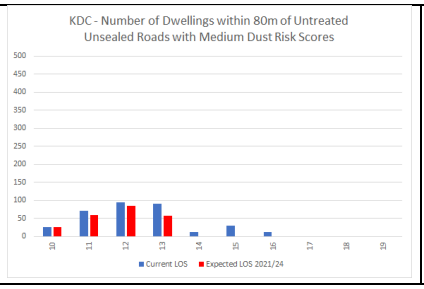
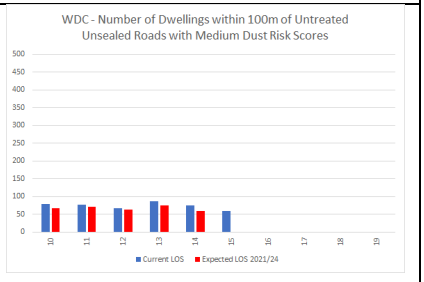
The expected change to the current level of service is shown below:

FNDC	KDC	WDC
		

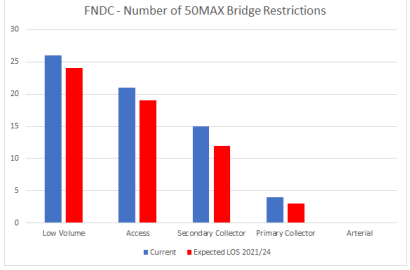
SAFETY SUMMARY – We expect a decreasing trend in death and serious injury (DSI) crashes across all road classes for each council through investment in corridor treatments such as speed management, signs and markings, hazard protection and pedestrian safety in urban areas.

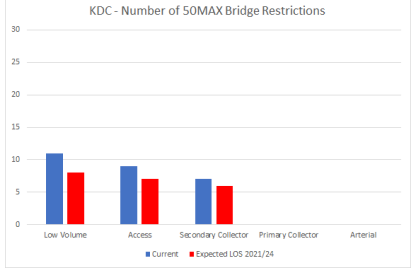
FNDC	KDC	WDC
		

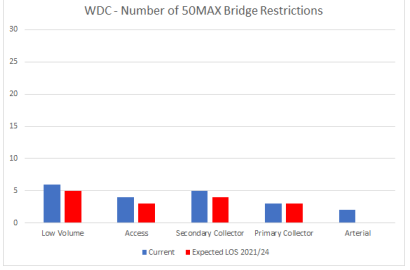
AMENITY SUMMARY – We expect a decreasing in peak roughness on on both the rural and urban networks for each council through sustained invetsment in sealed roads, and a new programme of thin asphaltic resurfacing in the Far North District.

PUBLIC HEALTH SUMMARY – We expect to reduce the number of dwellings subjected to medium dust risk by implementing tightly bound Paige Green compliant wearing courses, and for FNDC and WDC, by carrying out dust suppression and seal extension programmes.







ACCESSIBILITY SUMMARY – We expect that the number of 50MAX restrictive bridges on each network will reduce through investment in bridge strengthening and replacement as well as detailed bridge assessments.

1.10 How is this to be Procured?

The Northland Transport Alliance has developed a region-wide Procurement Strategy which has resulted in five standardised maintenance contracts commencing across the region on 1 July 2018. Most of the maintenance and renewal work will be undertaken through these contracts. These contracts are described below:

- They are 'fence-to-fence' contracts that include reseals, rehabilitations and pavement markings.
- They have a term of 8 years (4yr+2yr+1yr+1yr).
- There are 2 x FNDC contracts, 1 x KDC contract and 2 x WDC contracts
- They include ONRC principles to help ensure that response times for maintenance work is appropriate for the ONRC class of the road being treated.

Other procurement initiatives for 2021/24 include:

- More use of joint-council contracts and combining projects into multi-year contracts
- Further develop procurement plans for each contract
- Develop and implement an NTA Supplier Panel both for physical works and professional services
- Simply the FNDC Procurement Board process

Improvement projects will be separately tendered for both the design and construction phases.

1.11 What is the Impact on Cost?

Unite against COVID-19

NOTE - This AMP was developed using information that was developed before the COVID-19 pandemic. Due to funding uncertainty post COVID-19, we have assumed that funding will be largely similar to the Draft 2021/31 GPS.

New Zealand Government

The proposed cost of the 2021/24 programme is shown below. This includes allowance for asset growth, traffic growth and escalation:

FNDC Proposed Programme for 2021/24

Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24
Maintenance, Operations and Renewals (MOR)	$105.7M	$73.2M	+$32.4M
Low Cost/Low Risk Improvements	$41.7M	$22.0M	+$19.7M
Road Safety Promotions	$5.7M	$3.4M	+$2.3M
Major Capital Projects	$8.8M	$0M	+$8.8M
Investment Management	$4.8M	$0.2M	+$4.7M
Sub-Total NZTA Co-Investment Work	**$166.7M**	**$98.8M**	**+$67.9M**
Major Capital Projects (Alternative Funding)	$0M	$14.2M	-$14.2M
Unsubsidised Activities	$9.4M	$7.6M	+$1.8M
TOTAL	**$176.1M**	**$120.6M**	**+$55.5M**

FNDC is proposing a 44% increase in its maintenance, operations and renewal (MOR) budget. This increase is mainly due to price increases in its retendering of its maintenance contracts as well as proposed step change in how it manages the unsealed road network through the use of Paige-Green compliant wearing courses. The increase also includes a new programme to address a backlog of urban arterial asphalt surfacings as well as the new work category 216 for bridge and structures renewals which was previously funded from the Low Cost Low Risk Improvement programme.

FNDC is also proposing a substantial increase in the Low Cost/Low Risk Improvements and Major Capital Projects budget to achieve the desired gains in safety, resilience and active modes as signalled by the GPS and identified though the Far North's Integrated Transport Plan.

KDC Proposed Programme for 2021/24

Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24
Maintenance, Operations and Renewals (MOR)	$55.8M	$46.5M	+$9.3M
Low Cost/Low Risk Improvements	$6.9M	$9.7M	-$2.8M
Road Safety Promotions	$1.0M	$0.5M	+$0.5M
Major Capital Projects	$17.7M	$2.7M	+$15.0M
Investment Management	$0M	$0M	+$0M
Sub-Total NZTA Co-Investment Work	**$81.4M**	**$59.4M**	**+$22.0M**
Major Capital Projects (Alternative Funding)	$12.5M	$5.3M	+$7.2M
Unsubsidised Activities	$0.5M	$0M	+$0.5M
TOTAL	**$94.4M**	**$64.7M**	**+$29.7M**

KDC is proposing a 20% increase in its maintenance, operations and renewal (MOR) budget. This increase is mainly due to an increase in its heavy metalling programme to continue the roll-out of Paige-Green compliant wearing courses on its unsealed network. The increase also includes for the new work category 216 for bridge and structures renewals which was previously funded from the Low Cost Low Risk (LCLR) Improvement programme (hence the decrease in the LCLR programme).

KDC is also proposing an increase in its Major Capital Projects budget to carry on the development and implementation of the shared path network in Mangawhai.

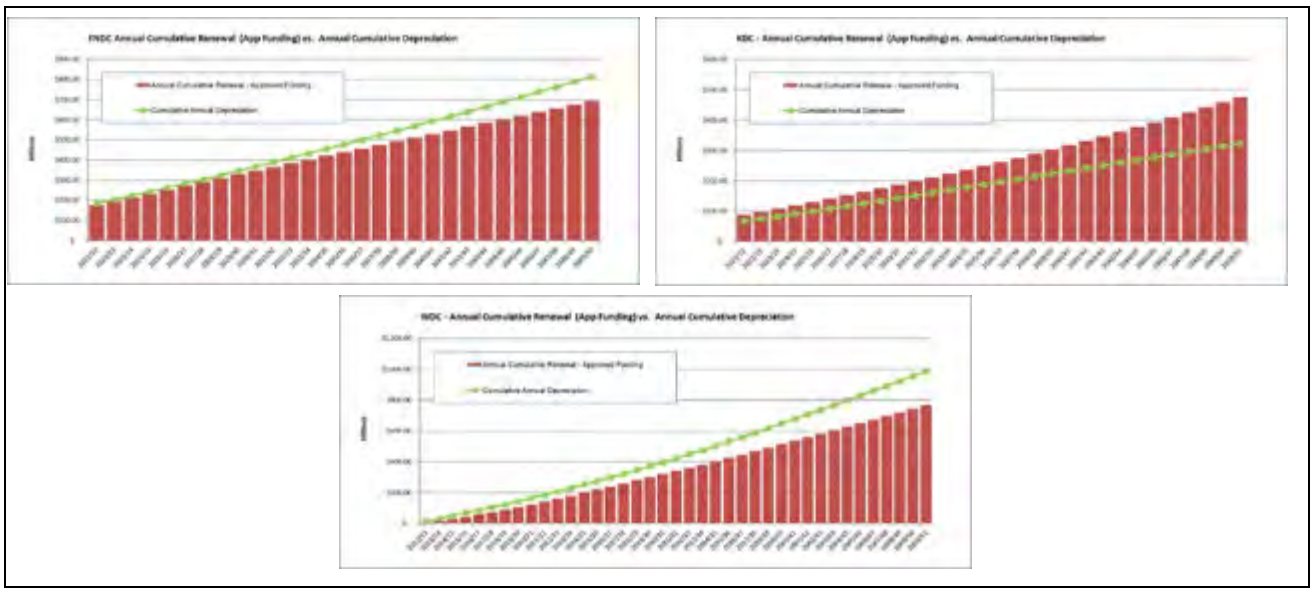
WDC Proposed Programme for 2021/24

Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24
Maintenance, Operations and Renewals (MOR)	$91.6M	$75.6M	+$16.1M
Low Cost/Low Risk Improvements	$30.8M	$20.5M	+$10.3M
Road Safety Promotions	$2.6M	$1.4M	+$1.3M
Major Capital Projects	$43.8M	$16.6M	+$27.2M
Investment Management	$0.6M	$0.6M	+$0M
Sub-Total NZTA Co-Investment Work	**$169.4M**	**$114.7M**	**+$54.9M**
Major Capital Projects (Alternative Funding)	$14.2M	$2.5M	+$11.7M
Unsubsidised Activities	$18.2M	$7.0M	+$11.2M
TOTAL	**$201.8M**	**$124.2M**	**+$77.8M**

WDC is proposing a 21% increase in its maintenance, operations and renewal (MOR) budget. This increase is mainly due to a proposed step change in how it manages the unsealed road network through the use of Paige-Green compliant wearing courses. The increase also includes an increase in structures component replacement as well as the new work category 216 for bridge and structures renewals which was previously funded from the Low Cost Low Risk Improvement programme.

WDC is also proposing an increase in the Low Cost/Low Risk Improvements and Major Capital Projects budget to achieve the desired gains in safety, resilience, walking and cycling and public transport as signalled by the GPS and identified though the Whangarei City Transportation Network Strategy programme business case.

The renewal profiles largely matches the depreciation profiles of the transportation assets for each council as shown in the following graphs.



These budgets have been allowed for in the councils draft 2021/2031 Long Term Plans which are currently being developed.

1.12 What Improvements are Proposed to the AMP?

The following improvement plan activities identified in the AMP are proposed to be undertaken during the 2021/24 period:

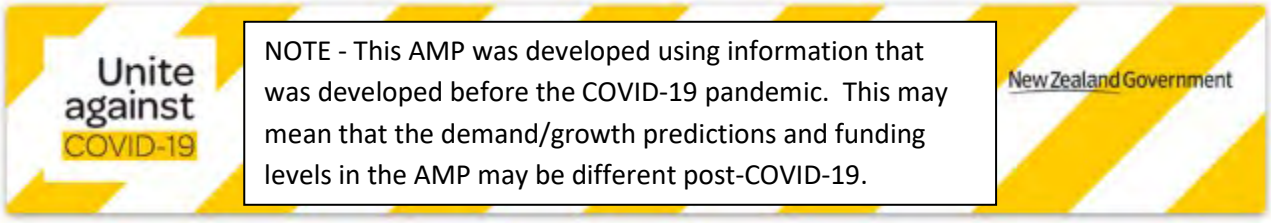
- Investigate and trial alternative seal designs.
- Air monitoring of adjoining unsealed sections with and without Paige-Green compliant material to determine the reduction in PM10 dust emissions.
- Change unsealed Lump Sum items for pothole patching and grading in Maintenance Contracts to measure and value items to realise the savings through the Unsealed Centre of Excellence.
- Improve unsealed road data collection including implementing regular roughness monitoring through RoadROID or similar, and visual dust assessment tool.
- Continue to carry out full assessment on key bridges that have current 50Max restrictions to determine whether these restrictions are necessary.
- Seismic assessments to be carried out on structures on key life lines, arterials and freight routes.
- Bridge and retaining wall asset data to be broken into their component parts in RAMM and condition, maintenance dispatches (including photos) and repairs to be stored in RAMM.
- Investigate and develop a programme of sediment control measures for roadside drainage systems and maintenance practices to minimise sediment runoff into harbour catchments (particularly the Kaipara Harbour).
- Climate Change - Carry out a stock take of assets likely to impacted by climate change and determine adaptation strategies. This could be done as part of the Resilience Strategy.
- Climate Change - Develop a strategy to identify and implement initiatives that reduce the greenhouse gas emissions from transport related maintenance and construction activities.
- Develop forward works programme of high priority “black” areas resulting from the lux mapping survey (HISLAT survey) of the P-Category (local road) lights.
- Undertake an assessment of long-life markings to determine where and when these should be used.
- Undertake cyclic night-time inspections with safety engineers to determine improvements to signs, markings, RRPMs and edge marker posts.
- Carry out an audit of existing guardrails to determine their condition and compliance with current safety standards.
- Determine which Council department has ownership and maintenance responsibilities for the Council-owned assets such as carparks, street furniture, shared paths, amenity lighting etc.
- Standardise the Annual Achievement Return reporting process using RAMM data, TIO data and council financial accounts.
- Implement the Asset Data Management System (ADMS) and merge the three council databases into one combined database for efficiency gains.
- Carry out annual assessment of customer requests (CRMs) and requests for service (RFS) to determine trends.
- Procurement Strategy – Update the NTA Procurement Strategy.
- Application of the One Network Framework (ONF) including implementation of the ONF performance measures and levels of service into the AMP and maintenance contracts.
- Development of an electronic “living” AMP document that is simple to understand and easy to update.
- Determine the feasibility of rural commuter bus services to rural towns in the Whangarei District.

PART A – STRATEGIC CASE

2 Introduction

The purpose of local government is to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.

This Activity Management Plan (AMP) has been prepared by the Northland Transport Alliance (NTA) on behalf of the Far North District Council (FNDC), Kaipara District Council (KDC) and Whangarei District Council (WDC). The AMP outlines how the district councils will maintain, operate and develop its transportation activities over the next three year period (2021/2024) in detail and indicate the intentions over the next 10 and 30 years to help achieve these well-beings.



2.1 Purpose, Framework and Key Elements of the Transportation AMP

The ease of movement of people and goods is of critical importance to a thriving Northland Region. The way we move supports economic transactions, growth and development, social cohesion, health and the day-to-day running of our communities. It is one of the most important functions we provide.

Strategically, as a core service it is important that our transport network is efficient and provides choice. It recognises that, in certain parts of the network, pedestrians and cyclists are the priority. As our Region grows, public transport will become more important.

An integrated, safe, responsive, and sustainable land transport system is a fundamental requirement of every district council under the Local Government Act 2002. The Far North District Council, Kaipara District Council and Whangarei District Council are the road-controlling authorities for the Region and we are responsible for planning, creating, operating, maintaining and rehabilitating all roads (except State Highways) in a financially responsible manner.

The purpose of the Transportation AMP is to meet the vision and objectives of the councils commitment to the community, as defined in the Long Term Plan (LTP), and to be consistent with the strategic direction both nationally through the Government Policy Statement (GPS) and regionally through Northland's Regional Land Transport Plan (RLTP).

To meet these obligations, the Northland Transportation Alliance undertakes an asset management process that applies the Business Case Approach (BCA) principles of accurately identifying problems, opportunities and consequences, along with benefits associated with correcting these problems and clear logic and evidence to support it.

The framework and the key element of asset management used in this plan are:

- Providing a defined level of service and monitoring performance
- Managing the impact of demand changes
- Taking a lifecycle approach to developing cost effective strategies
- Identifying, assessing and appropriately managing risk
- Long term financial planning which identifies expenditure and how it will be funded.

Potential negative effects

Transportation activities contribute to a number of negative environmental effects including water quality, air quality, noise and safety-related issues. However, all activities are undertaken in accordance with environmental standards. We invest in walking and cycling and public transport to help reduce some of these impacts.

2.2 Regional Overview - Northland

Northland is approximately 260km in length from Cape Reinga to Te Hana. It consists predominantly of rolling terrain with generally poor slip prone geology and includes a number of harbours, inlets and rivers. The population of Northland is 179,000 (in 2018).

The region has approximately 6,700km of road network, including 900km of state highway and 5,831km of local roads, of which only 40% is sealed. Northland's main artery, State Highway 1, is around 340km long and connects Northland to Auckland and the rest of the country. For this reason State Highway 1 is Northland's economic lifeline.

The region is administered by four councils:

- Northland Regional Council (NRC)
- Far North District Council (FNDC)
- Kaipara District Council (KDC) and
- Whangarei District Council (WDC)

From a transport perspective NRC run the subsidised public bus and total mobility services, and the three district councils maintain and operate the local road network in Northland. In addition, the New Zealand Transport Agency (NZTA) are responsible for the maintenance and operation of state highway network.

Northland presently has a rail link to Auckland with lines that terminate at Otiria and Dargaville. Both the Otiria and Dargaville lines have been temporarily closed due to track condition and a reduction in the volume of freight moved.

Northland also has a major marine port at Marsden Point – Northport – and a number of smaller coastal ports. Northport is capable of supporting coastal shipping as well as the storage and movement of bulk freight. It is connected to the national highway network, though lacks direct rail access. Other smaller ports (such as Opua) are able to support recreation, tourism and fishing.

The region's three airports – Kaitaia, Kerikeri and Whangarei – all presently have flights to Auckland. Air New Zealand has withdrawn services from Kaitaia to Auckland and Whangarei to Wellington. Barrier Air has stepped in to run a service on the former Kaitaia - Auckland route.

Subsidised contracted public bus services operate in urban Whangarei (CityLink), Kaitaia (Far North Link), trial Mid-North service operating between the Hokianga, Kerikeri and Bay of Islands (Mid-North Link), a service operating from Omapere/Opononi to Kaikohe (Hokianga Link), and a service operating from Mangawhai/Kaiwaka to Whangarei via Waipu and Ruakaka (Bream Bay Link).

A Total Mobility Scheme operates in the Whangarei area for people with disabilities.

The region also has a Great Ride (part of the New Zealand Cycle Trail) in the Far North (the Twin Coast Cycleway), which connects the east and west coast. There is also a shared path network under development in Whangarei City.

The Twin Coast Discovery Highway also traverses the Region and links into Auckland which encourages tourists to Northland.

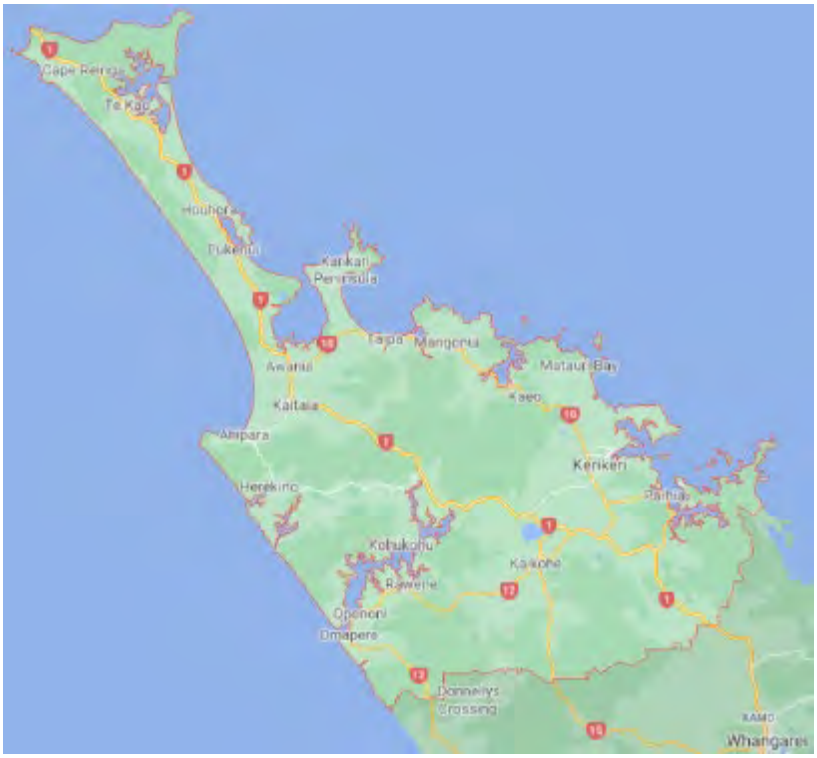
Northland as a region has a number of natural and physical advantages, for example:

- Strong tourism and growth potential with well regarded beaches, historic heritage, a warm climate, safe harbours and close proximity to Auckland.
- Strong industry potential with a rural-based and manufacturing economy comprising pastoral farming, forestry and fishing as well as New Zealand's only oil refinery, two large dairy factories, a large cement factory at Portland and wood processing facilities around the region.
- Auckland's need for raw materials and food to sustain its growth is being sourced from Northland.

2.3 District Overview – Far North, Kaipara and Whangarei Districts

An overview of the transport "story" for each district council is given in the following section to provide some context about the key outcomes that these communities want to achieve as well as the issues they face.

2.3.1 Far North's "Story"



The Far North District stretches from Cape Reinga in the north to the Waipoua Forest and Whangaruru Harbour in the south. It includes both east and west coastlines and has many harbours and inlets including the Bay of Islands and Hokianga Harbour.

The population of the Far North is 65,250 (in 2018) and this is spread over the whole district with Kaitaia, Kaikohe and Kerikeri being the largest towns. The district is predominantly rural in nature with many small communities located on the coast or up river valleys. The Far North has a growing population with most of this growth occurring on the east coast, particularly in the Kerikeri/Waipapa and Doubtless Bay areas. There is a static or declining population on the west coast and some mid north communities.

The Far North has one of the largest maori populations in the country and strong cultural ties to the past. Far North is the home to many iwi tribes including Ngapuhi, Te Aupouri, Te Rarawa, Ngati Kahu and Ngati Kuri. It also has a strong historic connection being the birthplace of the nation and includes the historic Waitangi and Russell.

Far North's economy is similar to the rest of Northland in that it is based on primary production including farming, forestry and horticulture in Kerikeri and more recently Houhora. It also has a strong tourism industry focused around the Bay of Islands which, until the COVID-19 pandemic, was receiving up to 60 international

cruise liner visits per annum. There is a power station at Ngawha which is being upgraded to cater for the Far North's power needs and an adjacent business park is planned to make use of this power supply.

There are high levels of social deprivation in the Far North and it, along with the Gisborne area, are recognised as having the highest levels of deprivation in the country.

A summary of the Far North District Council's transport system is provided below:

Far North District Council				
				
2,507km Total Road Network	**877km** of Sealed Roads	**1,630km** of Unsealed Roads	**723** Bridges and Large Culverts	**25,521** Drainage Systems
				
217km of Footpaths	**87km** of Cycleways	**1,828** Streetlights	**15,365** Signs	**Hokianga Ferry Service**

The Far North has a high proportion of unsealed roads and many of these serve forestry areas. This has resulted in problems with poor road condition and dust, which has driven public demand for dust suppression and road sealing.

The bridge network has been run down and many bridges are in poor and very poor condition. There are a high number of weight restricted bridges and the Far North has the most 50MAX restrictive bridges in the country.

The Hokianga Ferry service provides an essential part of the transport system, linking Rawene to Kohukohu across the Hokianga Harbour.

The Far North has a developing footpath network in many towns and villages, although several communities have little or no facilities.

The Twin Coast Cycle Trail is part of the national Great Ride network and stretches from Opua on the east coast to Horeke on the west coast (Hokianga Harbour) and allows recreational and tourist cyclists to explore this historic area of the Far North.

As described in the Northland Overview above, there are several subsidised bus service in the Far North, including the Far North Link, Hokianga Link and Mid North Link.

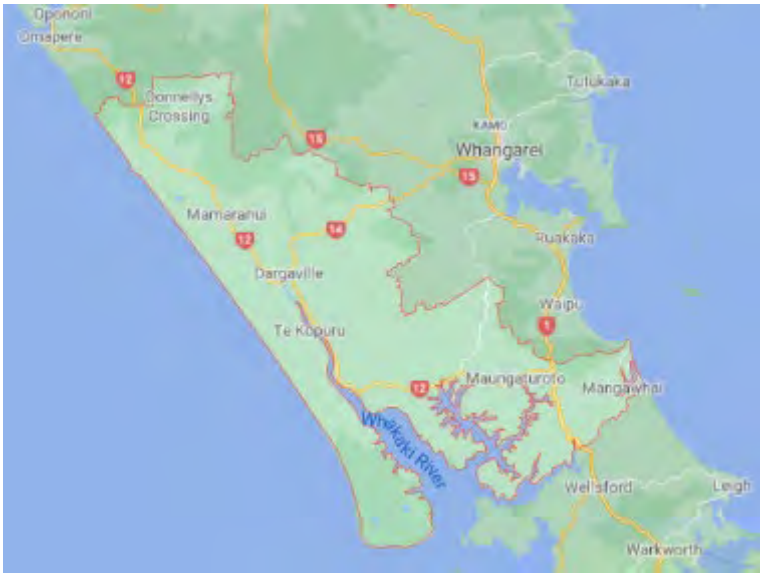
The North Auckland Rail Line stretches to Otiria, near Moerewa, in the Far North and this line is currently mothballed, although this line may be revitalised through recent funding from the Provincial Growth Fund.

Key issues for the Far North's transport system are:

- Poor safety record with an increasing rate of death and serious injury crashes.
- A large unsealed network which is subject to high forestry traffic volumes resulting in poor condition and dust impacts to local residents.

- Few transport links with the rest of the region which are prone to slips and flooding during storm events resulting in many road closures.
- Many isolated coastal communities which are heavily reliant on a vulnerable road network for access.
- Poor bridging stock which is restricting freight routes and making the transport network more vulnerable to failure.
- Growing congestion in summer holiday periods from sustained growth in the Kerikeri and Waipapa areas.
- Lack of transport choice in most communities which contributes to higher levels of social deprivation.
- A backlog of asphalt surfacing on arterial roads in the major towns.

2.3.2 Kaipara's "Story"



The Kaipara District covers the west coast and hinterland of Northland from the Waipoua Forest in the north to the Kaipara Harbour in the south and stretches across to the east coast at Mangawhai. As well as including the northern shore of the Kaipara Harbour, it includes the major watercourses of the Northern Wairoa and Kaihu Rivers.

The population of the Kaipara District is 24,100 (in 2019) and is sparse, with Dargaville and Mangawhai being the largest towns. It is mainly rural in nature with many small, predominantly coastal villages. The Kaipara District is the fastest growing district in Northland, with most of this growth occurring in Mangawhai which is the fastest growing town in the country due to overflow housing pressure from Auckland.

Kaipara has a strong maori heritage with Ngati Whatua being the local iwi. There are many marae in coastal communities along the Kaipara Harbour coastline and this ties back to the past when the Kaipara Harbour and Northern Wairoa Harbour were the main means of transportation in the area. Likewise, there are many wharves that were built in colonial times to cart freight, and in particular kauri logs, from Northland to Auckland.

Like the rest of Northland, Kaipara's economy is based mainly on primary production, particularly dairy farming, forestry and horticulture including kumara farming on the coastal plains of the lower reaches of the Northern Wairoa River. Kaipara also has a large Fonterra milk-processing facility in Maungaturoto. Tourism is a growing sector in Kaipara with access to the Matakohe Kauri Museum, west coast beaches and Waipoua Forest. Mangawhai is a holiday destination, particularly for Aucklanders, and they add to the seasonal economy of the local area.

In the 2012-2014 period, many residents in Mangawhai and in the wider District, refused to pay their rates in protest to rapidly increasing rate hikes being imposed by the Council following a significant cost increase in the Mangawhai sewerage scheme. This rates strike resulted in lower levels of funding for maintenance and renewal activites.

A summary of the Kaipara District Council's transport system is provided below:

Kaipara District Council				
				
1,574km Total Road Network	**455km** of Sealed Roads	**1,119km** of Unsealed Roads	**349** Bridges and Large Culverts	**14,504** Drainage Systems
				
94km of Footpaths	**0km** of Cycleways	**1,185** Streetlights	**8,935** Signs	

The Kaipara District has a high proportion of unsealed roads, which are used by freight including quarries and agriculture, and several of these serve forestry areas. This has resulted in problems with poor road condition and dust. To date Council has resisted public demand for dust suppression and road sealing. It has instead invested in alternative quarry sources and blends for its unsealed roads to good effect.

The bridge network is starting to deteriorate due to lack of maintenance in the recent past and this has recently led to expensive repairs on the Tomarata Road bridge in Mangawhai.

The footpath network in Kaipara is mainly located in towns and villages within the District. Many of these communities such as Dargaville, Maungaturoto and Kaiwaka are severed by the State Highway network and have poor crossing points. There are currently no cycleways in the Kaipara District, although funding for the design of a shared path in Mangawhai has been approved.

There is only one subsidised bus service in Kaipara which is the Bream Bay Link which provides access from Mangawhai and Kaiwaka to Whangarei.

The North Auckland Rail Line cuts through the Kaiwaka and Maungaturoto areas on its way to Whangarei and further north. This line is currently being revitalised through recent funding from the Provincial Growth Fund. The Dargaville Branch Rail Line which runs from Mangapai to Dargaville is currently mothballed.

Key issues for the Kaipara's transport system are:

- Poor safety record with Kaipara being a High Community at Risk for death and serious injury crashes.
- A large unsealed network, some of which is subject to high forestry traffic volumes resulting in poor condition and dust impacts to local residents.
- Many isolated coastal communities which are heavily reliant on a vulnerable road network for access.
- Bridges which are deteriorating due to lack of maintenance in the recent past.
- Growing congestion in summer holiday periods from rapid growth in Mangawhai.
- Lack of access to public transport, no cycleways and severance of local communities caused by the State Highway network results in poor use of alternative transport modes.

2.3.3 Whangarei's "Story"

The Whangarei District is a triangular shaped district that reaches from Whangaruru Harbour and Twin Bridges in the north to the Brynderwyn Ranges in the south. It is bounded by the Far North District to the north and the Kaipara District to the west and south. The District surrounds the Whangarei Harbour and has many other harbours and inlets.

The population of the Whangarei District is 90,960 (in 2018) and approximately two thirds of this is located in Whangarei City which is the only city in Northland. There are also several towns including Hikurangi, Ruakaka and Waipu as well as many coastal and rural villages and communities. The population has been growing strongly in Whangarei for the past five years and much of this growth has occurred in Whangarei City and the Ruakaka/Marsden area.

There is a significant maori community in Whangarei and historically the Whangarei Harbour was the main means of transport for maori. The local iwi is Ngati Whatua and there are still many marae located on the coastal fringe and waterways of the District. There is also a more recent history of colonial use of the harbour, with many industries being developed around the harbour edge.

Whangarei's economy is more diverse than the rest of Northland as it is the main service centre in the Region. As well as primary production industries such as dairy farming, forestry and horticulture in the rural areas, the city provides many commercial, retail and social services to the wider region. Whangarei City also has a strong marine and ship building industry. The economy is supported by the main regional port of Northport and the country's only oil refinery, both located at Marsden Point. Fonterra also has a large milk processing facility at Kauri just north of Whangarei.

A summary of the Whangarei District Council's transport system is provided below:

Whangarei District Council				
				
1,750km Total Road Network	**1,056km** of Sealed Roads	**694km** of Unsealed Roads	**485** Bridges and Large Culverts	**20,216** Drainage Systems
				
436km of Footpaths	**21km** of Cycleways	**5,407** Streetlights **26 (+4 on SH)** Traffic Signals	**15,049** Signs **49** Active Signs (ITS)	**2** Opening Bridges

The urban sealed road network in Whangarei City has deteriorated over time and is slowly being addressed, although further work is required. Due to high traffic loads on many arterial routes, expensive renewal treatments have been required.

Although Whangarei does not have a significant unsealed road network compared to the other districts, several of these serve forestry areas. This has resulted in problems with dust affecting local residents, and calls for dust suppression and sealing of roads. Much of the unsealed road network has a lack of aggregate due to lack of investment in the past.

The bridge network in Whangarei is generally in adequate condition, although there are a significant number of large steel (armco) culverts that are in poor condition and have been progressively replaced. In Whangarei City, the Te Matau a Pohe and Kotuitui Whitinga opening bridges are operated to enable marine traffic to pass through.

The footpath network in mature in the city but is still being developed in towns and villages within the District. Communities within the city are severed by the State Highway network and main arterial roads which have poor crossing points. A shared path network is currently being constructed in Whangarei City to provide safe walking and cycling opportunities. A rural cycle path is also being constructed between Waipu and Waipu Cove.

The CityLink bus service provides public transport in Whangarei City and has several routes from the outer suburbs into the city centre. However, this service is not well utilised because the buses get stuck in the same queue as private vehicles, the service is not convenient and all-day parking in Whangarei is cheaper than the bus fare. There is only one rural subsidised bus service in Whangarei which is the Bream Bay Link which provides access from Mangawhai, through Waipu and Ruakaka to Whangarei.

The North Auckland Rail Line travels in a north south direction through the District cuts through Whangarei City and further north. This line is currently active through to Kauri north of Whangarei, but is mothballed beyond this point, although this line may be revitalised through recent funding from the Provincial Growth Fund. The Dargaville Branch Rail Line which runs from Mangapai to Dargaville is currently mothballed.

Key issues for the Whangarei's transport system are:

- Poor condition of the urban sealed road network in Whangarei City.
- Congestion in the city which is being exacerbated by high population growth.
- High fatal and serious crash rate on the district's arterial roads.
- An unsealed road network that has a lack of aggregate, some of which is subject to high forestry traffic volumes resulting in poor condition and dust impacts to local residents.
- Many isolated coastal communities which are heavily reliant on a vulnerable road network for access.
- A poorly used bus system in Whangarei City, lack of access to public transport in rural areas, incomplete shared path network and pedestrian severance caused by the State Highway and arterial road network results in poor use of alternative transport modes.

2.4 Our customers and stakeholders

Our customers and stakeholders are summarised as follows:

- New Zealand Transport Agency
- Ministry of Transport
- Regional Land Transport Committee
- Local Iwi
- Ratepayers and Residents
- Utilities providers
- Freight operators
- Public transport operators including school bus operators
- Pedestrians, cyclists, scooter users etc
- Mobility challenged users
- Vehicle operators and passengers

The needs of these customers and stakeholders have been considered during the development of this Activity Management Plan. For significant projects, affected stakeholders and customers will be consulted to determine any specific requirements and impacts.

2.5 Relationship with Other Documents

The AMP is a living document reflecting best practice, and central and local government requirements, policy and guidance. It will be used to inform the Council's Long Term Plan and National Land Transport Programme as well as providing guidance and direction of asset management strategies and operations for roading staff and contractors.

This section describes how the AMP aligns to relevant national, regional and local organizational strategies. The strategies with the most direct impact on this AMP are outlined below.

2.5.1 Local Government Act 2002 amendment act 2019

The Local Government Act 2002 defines the purposes and functions of 'local government' as well as providing the legal framework for establishing and administering Councils.

In 2019, the Government passed an amendment to the Act to reinstate the four well-beings which were removed by amendment in 2012. The purpose is to provide for: Local Authorities to play a broad role in

promoting the social, economic, environmental, and cultural well-being of their communities, taking a sustainable development approach.

2.5.2 Transport Outcomes Framework

The Ministry of Transport's Transport Outcomes Framework (June 2018) identifies what the government is trying to achieve through the transport system. It has established that the purpose of the transport system is to improve people's wellbeing, and the liveability of places. It does this by contributing to five key outcomes, summarised in the diagram below:

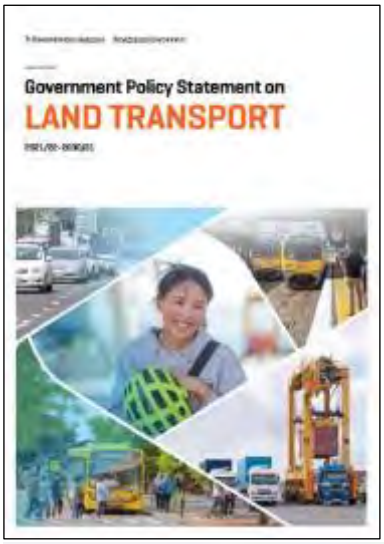
A guiding principle in the framework is mode neutrality. Mode neutrality involves two important aspects:

1. Making sure all modes and options are considered and evaluated to find the best system solution.
2. Making users and decision-makers more aware of the benefits and costs of transport choices, to incentivise robust decision-making and smart travel choices.

Specifically, the framework notes that more attention needs to be given to public transport and active modes as well as rail and coastal shipping.

The Transport Outcomes Framework is a guiding document for the Government Policy Statement (GPS) for Transport as described in the following section.

2.5.3 Government Policy Statement on Land Transport 2021/22 -2030/31 (GPS 2021)



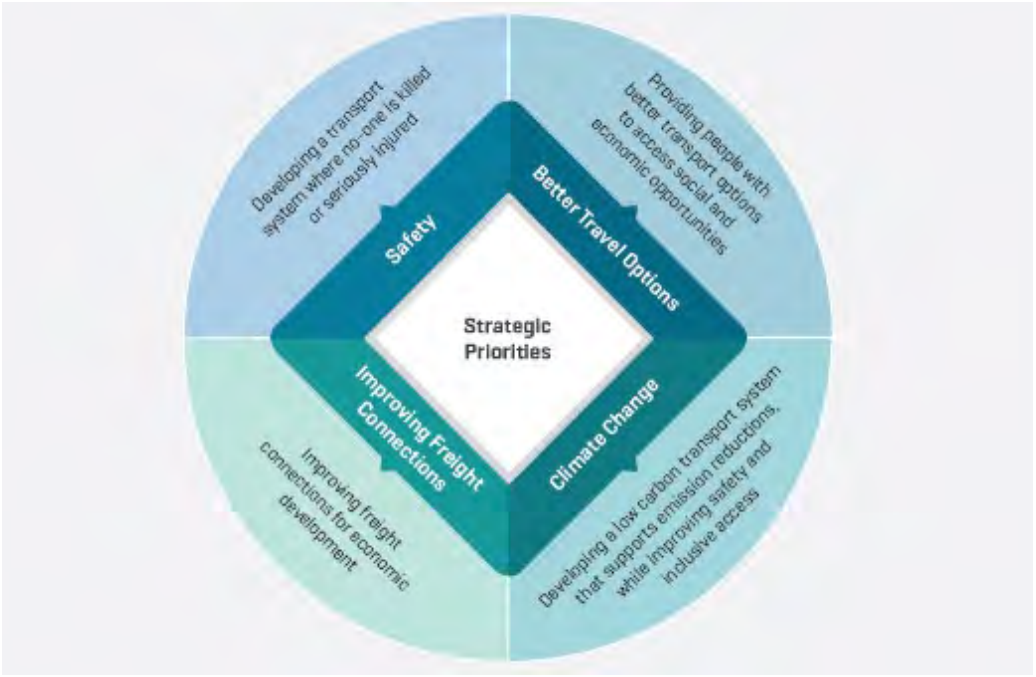
The Ministry of Transport's GPS 2021 sets out the priorities, outcomes and funding levels for land transport, establishing funding ranges for land transport activity classes and identifying the results expected from this investment over the next 10 years.

The GPS is underpinned by the Ministry of Transport's Road to Zero strategy for safety and the Draft NZ Rail Plan.

The GPS 2021 strategic priorities are as follows:

- Safety
- Better Travel Choices
- Improving Freight Connections
- Climate Change

These priorities and a description of each is shown in the diagram below:



Value for Money is a guiding principle underlying all of these priority areas.

The GPS aims to deliver the following desired outcomes in the short to medium term (by 2031):

Safety

- Reduced number of deaths and serious injuries
- Safer land transport network

Better Travel Options

- Improved access to social and economic opportunities
- Public transport and active modes are more available and/or accessible
- Increased share of travel by public transport and active modes
- Reduced greenhouse gas emissions
- Reduced air and noise pollution

Improving Freight Connections

- Freight routes that are more reliable
- Freight routes that are more resilient

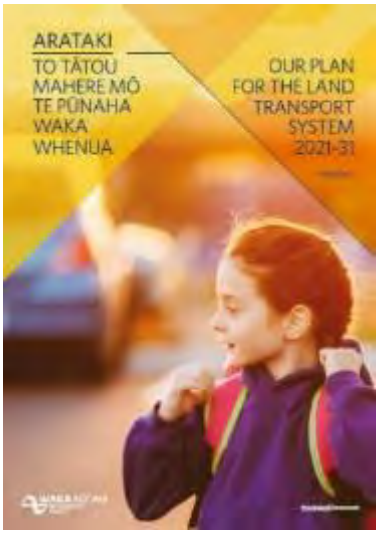
- Reduced greenhouse gas emissions
- Reduced air and noise pollution.

Climate Change

- Reduced greenhouse gas emissions
- Reduced air and noise pollution
- Improved resilience of the transport system

This AMP will use these priorities to develop programmes to help achieve the outcomes desired by the GPS.

2.5.4 NZTA's Arataki



Arataki is the NZ Transport Agency's 10-year view of what is needed to deliver on the government's current priorities and long-term objectives for the land transport system. Arataki is not a strategic document, but instead aims to inform what demands and changes the NZ Transport Agency see nationally and regionally, and seeks to help shape the transport system to achieve the best outcome. It also develops a shared understanding of the needs of the transport system and common evidence to support in the development of the Regional Land Transport Plans.

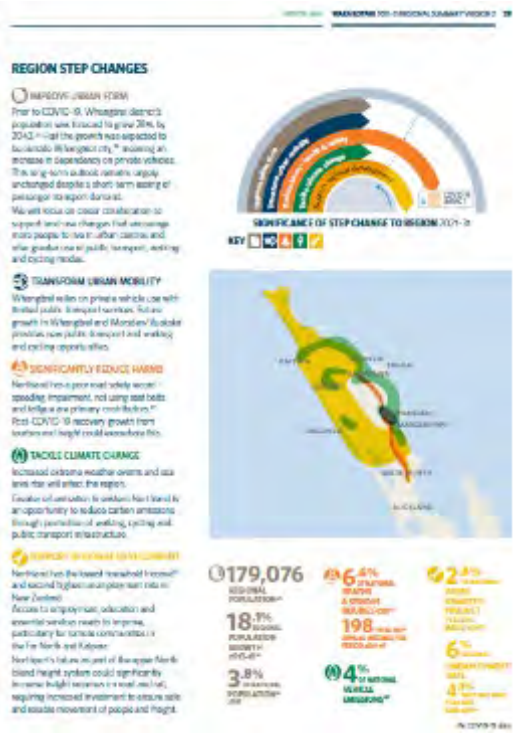
The NZ Transport Agency have summarised the six key drivers that will shape the future land transport system as:

1. demographic change
2. climate change
3. technology and data
4. customer desire
5. changing economic structure
6. funding and financing challenges.

The NZ Transport Agency has also identified five step changes as the basis for action:

1. Improve urban form – enhance transport's role in creating land use and urban form that provides connections between people, product and places
2. Transform urban mobility - shift from our reliance on single occupancy vehicles to more sustainable transport solutions for the movement of people and freight
3. Significantly reduce harms - transition to a transport system that is free of deaths and serious injuries and improves public health
4. Tackle climate change - support the transition to a low-emissions economy and enhance communities' long-term resilience to the impacts of climate change
5. Support regional development - optimise transport's role in enabling regional communities to thrive socially and economically.

Specifically for Northland, Arataki is proposing to support the following initiatives in each of these five step change areas:



Significantly Reduce Harms (High Priority)

- Targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, people not wearing seatbelts and speeding
- Safety treatments targeting run-off road and head-on crashes on high-risk rural roads
- Speed management to provide safe and appropriate speeds on high-risk rural roads with targeted use of safety cameras to reduce speeding
- Supporting opportunities to reduce conflict between visiting drivers and heavy vehicles on the network north of Whangarei
- Exploring with Northland district councils how the sealing programme can be accelerated to reduce harms.

Improve Urban Form (Medium)

- Increase focus on collaborative work with WDC in producing the Future Development Strategy (FDS). Review district plan urban sections and support the city centre masterplan with appropriate transport investment for growth that make the best use of existing infrastructure.
- Support for WDC's FDS to incorporate their revised programme business case.
- Support land use changes that enable better public transport, walking and cycling facilities to significantly increase the number of residents living in the town centre
- Support improved connections between the Whangarei city centre and waterfront (Town Basin)
- Advocate for increased strategic integrated planning for land-use and transport along the Auckland – Whangarei corridor, including growth in coastal communities along the route and the future role of NorthPort.

Transform Urban Mobility (Medium)

- Assisting and enhancing the Whangarei District Council (WDC) with the implementation of their Walking and Cycling Strategy
- Assisting and supporting Northland Regional Council with planning and implementation of the Revised Regional Public Transport Plan
- Supporting initiatives to improve connections and travel choice between the main Whangarei urban area and the growing urban area at Ruakaka/Marsden Point
- Investigating opportunities for on-demand transport services in Whangarei and smaller regional centres
- Working with Whangarei District Council to encourage actively managed car parking in the city centre, city fringe area and other key centres to increase uptake of public transport, walking and cycling trips to these locations.

Climate Change (Medium)

- Engaging in local planning processes to avoid infrastructure and development in locations at increased risk of natural hazards and effects of climate change.
- Enabling continuous improvement in network resilience through maintenance and renewals, and "low cost low risk" investments.
- Engaging in long-term strategic planning to respond to the vulnerability of existing assets
- Enabling quick recovery following disruption to the land transport system.
- Engaging in local planning processes so that development supports reduced carbon emissions by reducing private vehicle travel and average trip length
- Ensuring network design makes the best use of existing transport systems to manage demand and reduce emissions by prioritising the move to public transport and low emission options, and actively managing speed, urban freight and congestion

Support Regional Development (Medium)

- Provide a safer and more resilient journey on SH1 Auckland to Whangarei, including Northport, for people, freight and visitors.
- Provide a safer and more resilient new 22km four-lane corridor of SH1 from Whangarei to Northport, with a separated shared walking and cycling path.
- Support freight initiatives that are multi-modal, efficient and safe, such as improving the efficiency and reliability of the North Auckland Rail Line and rail connections to NorthPort
- Delivery of priority cycle trails and walkways
- Support improvement to prioritised rest areas with essential amenities to improve safety and journey experience
- Support planning initiatives and township improvement plans in the Far North and Kaipara to deliver safer and more accessible local travel options
- Support improvements in social and economic outcomes in areas of high deprivation, particularly improving access to employment, education and essential services for isolated communities.
- Explore opportunities to support the mobile delivery of education and essential services.
- Maintain focus on selected, high-priority state highway improvements, including SH11 and SH12 for the benefit of forestry and horticulture industry development initiatives in the Far North and Kaipara.

2.5.5 Road to Zero

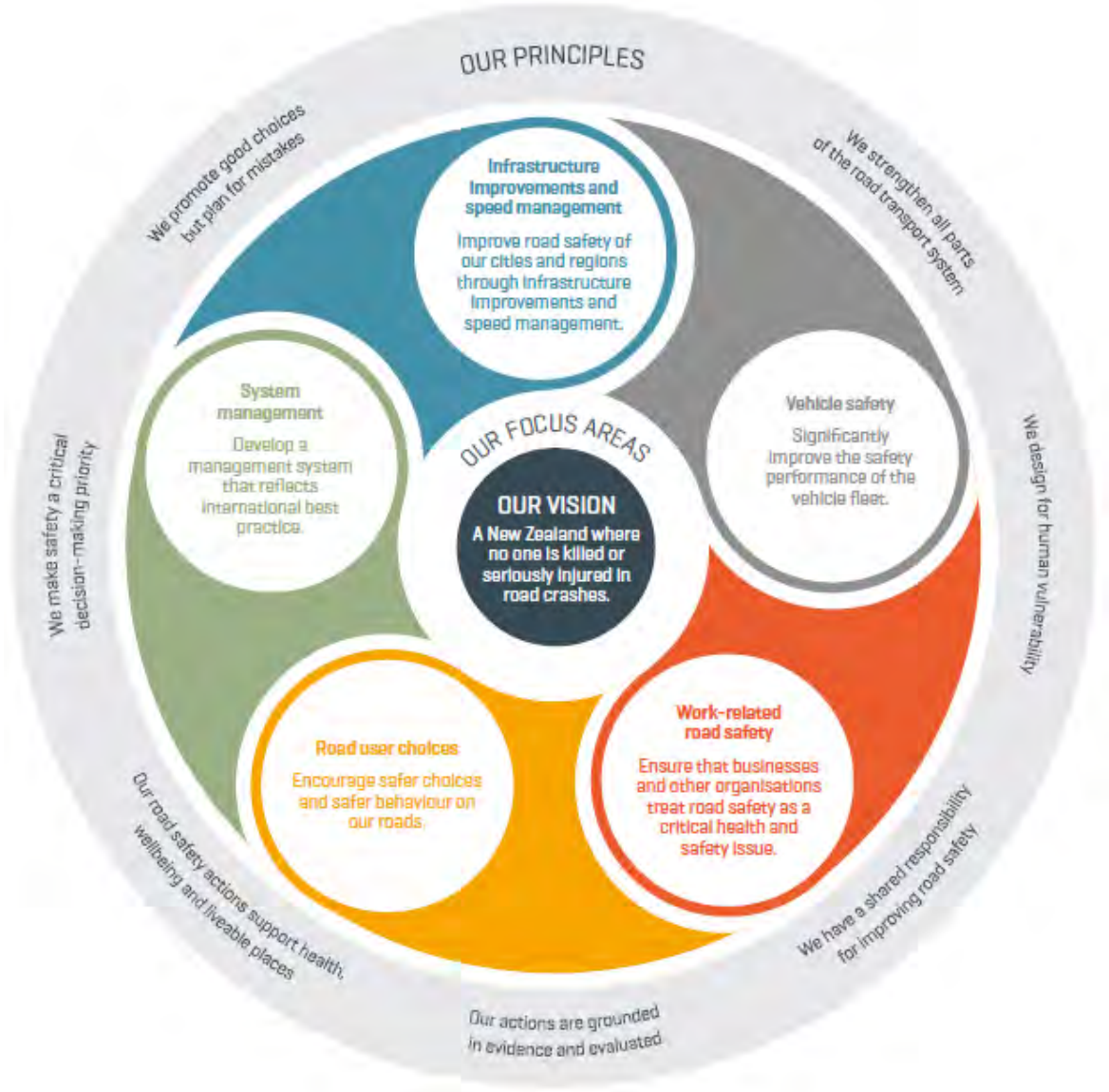
The Road to Zero is the Ministry of Transport's strategy for road safety to 2031. The vision for the strategy is "A New Zealand where no one is killed or serious injured in road crashes". It is based on the following principles:

- no loss of life is acceptable in the transport system
- deaths and serious injuries on our roads are preventable
- we all make mistakes, but these mistakes should not cost us our lives.

The strategy is based on the "Vision Zero" concept which is based on no deaths being acceptable on the road network. This means that we are no longer will to pay a "road toll" for using our road network. The strategy is founded on the principles of the Safe Systems approach embedded in the previous Safer Journeys strategy.

As a step towards achieving this vision, a target has been set of a 40 percent reduction in deaths and serious injuries by 2030.

The vision, focus areas, and guiding principles of the strategy are shown in the following diagram:



These focus areas and principles will be incorporated into this AMP wherever possible. In particular, the following four focus areas are likely to supported by the AMP:

- Infrastructure improvements and speed management (through low cost low risk safety improvements and speed limit reviews)
- Vehicle safety & work-related road safety (through Council support for high safety rated vehicles)
- Road user choices (through road safety promotion activities)

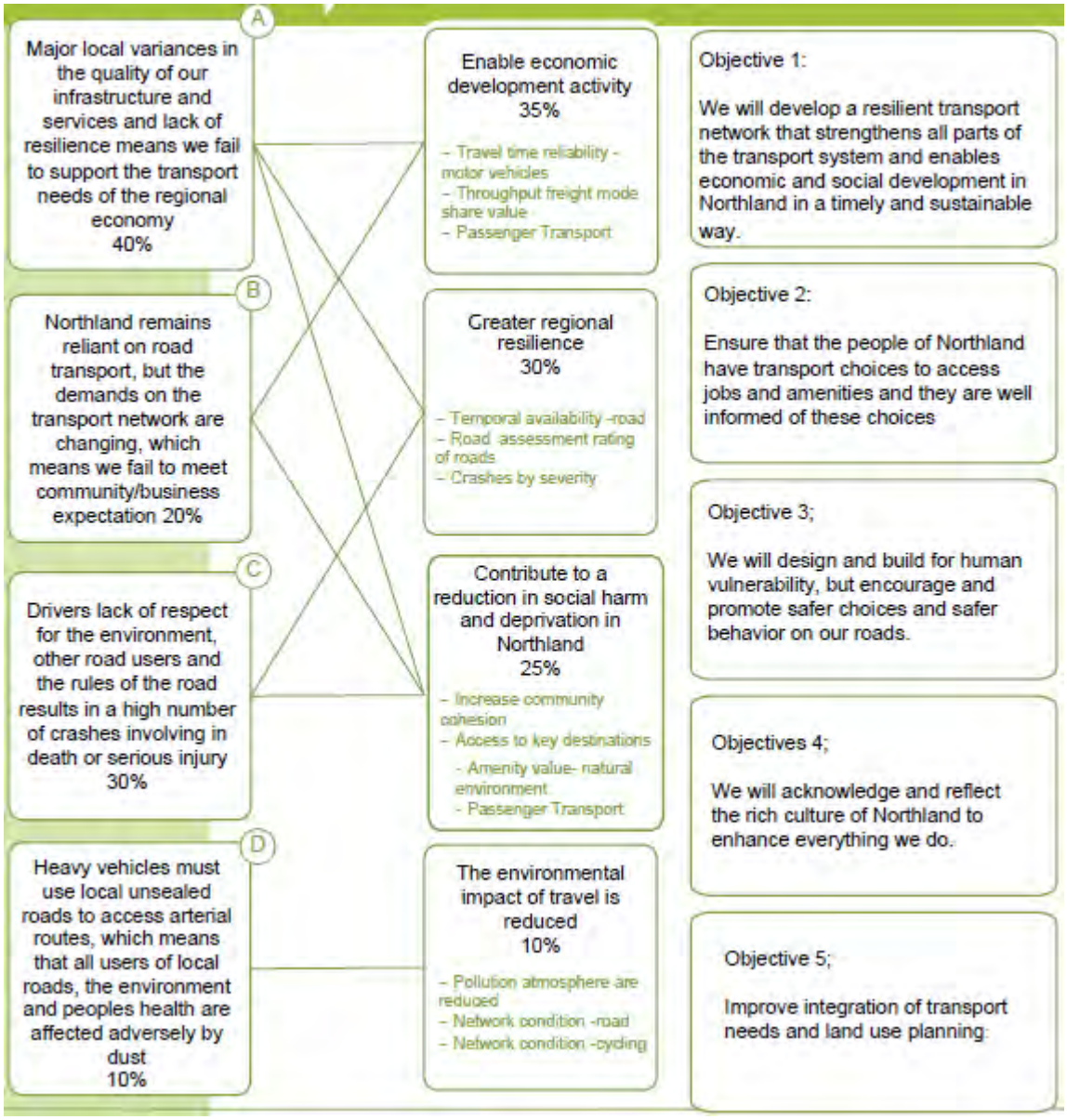
2.5.6 Draft Northland Regional Land Transport Plan, 2021-2027 (RLTP)

The draft Northland Regional Land Transport Plan (RLTP) for 2021 – 2027 identifies seven key priorities that the region seeks to achieve. These are:

- Reducing transport related deaths and serious injuries;
- Regional and national connectivity;
- Route resilience and security;
- Regional economic and tourism development;
- Reducing the environmental effects of the transport network;
- Considering the needs of the transport disadvantaged (including transport choice in rural areas);
- Future proofing and long term planning.

These priorities will be used to develop programmes through this AMP.

As part of the development of the draft RLTP, an Investment Logic Mapping (ILM) exercise was undertaken and this identified the following key problems, benefits and objectives with the Northland transport network:



These issues are directly relevant for the Northland local road network and are reflected in the AMP problem statements described in Section 5.

2.5.7 Community Outcomes - Long Term Plans, 2018-2028 (LTP)

The Long Term Plans (LTP) for each council for the 2018-2028 period, identifies the key Community Outcomes that each district plans to achieve. These outcomes have been agreed by each council and are detailed below. The outcomes for the 2021-2031 Long Term Plans are still to be considered as part of the Long Term Plan development.

2.5.7.1 Far North District Council – Community Outcomes

Communities that are healthy, safe, connected and sustainable

Connected and engaged communities prepared for the unexpected

Proud, vibrant communities

Prosperous communities supported by a sustainable economy

A wisely managed and treasured environment that recognises the special role of tangata whenua as kaitiaki

2.5.7.2 Kaipara District Council – Community Outcomes

Community Outcomes

A district with welcoming and strong communities

- Assisting and supporting community involvement.
- Maintaining and improving infrastructure.
- Recognising and supporting achievement.

A trusted Council making good decisions for the future

- Making it simpler to work with us.
- Open, transparent and engaged with communities and business.
- Intent on lifting Kaipara's well-being.

A district with plenty of active outdoor opportunities

- Partnering with communities to develop sports and recreation facilities.
- Protecting and enhancing our natural assets and open spaces.

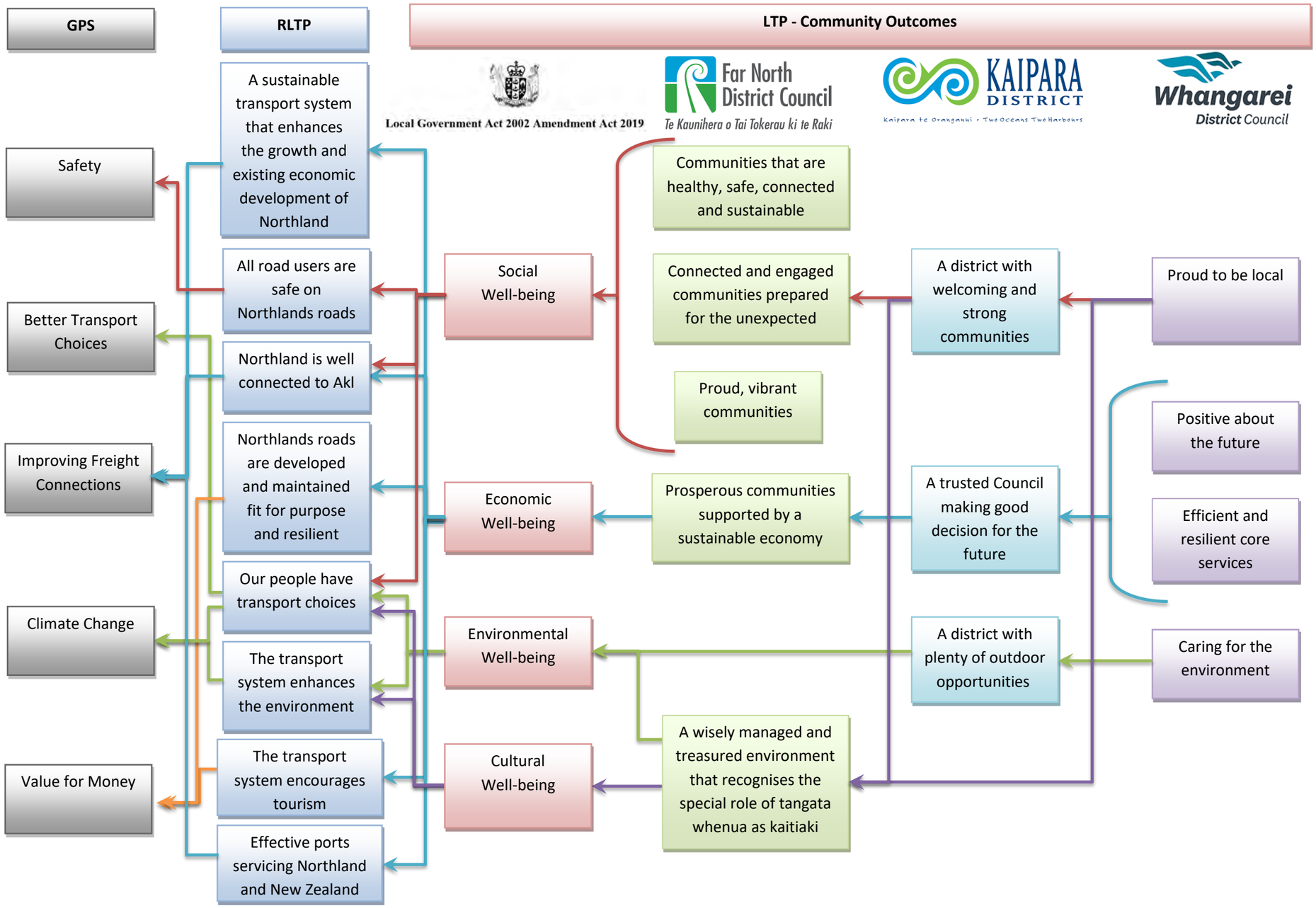
2.5.7.3 Whangarei District Council – Community Outcomes

The Community Outcomes are reflected in the activities within this AMP. The section below shows the linakages between these Community Outcomes and to the higher level strategies.

2.5.8 Linkages Between Strategic Documents

The following diagram shows the links between the strategic documents at the national (GPS), regional (RLTP) and local level (LTP Community Outcomes).

Strategic Mapping



2.5.9 Other Strategic Documents

There are other strategic documents that informs the AMP as follows:

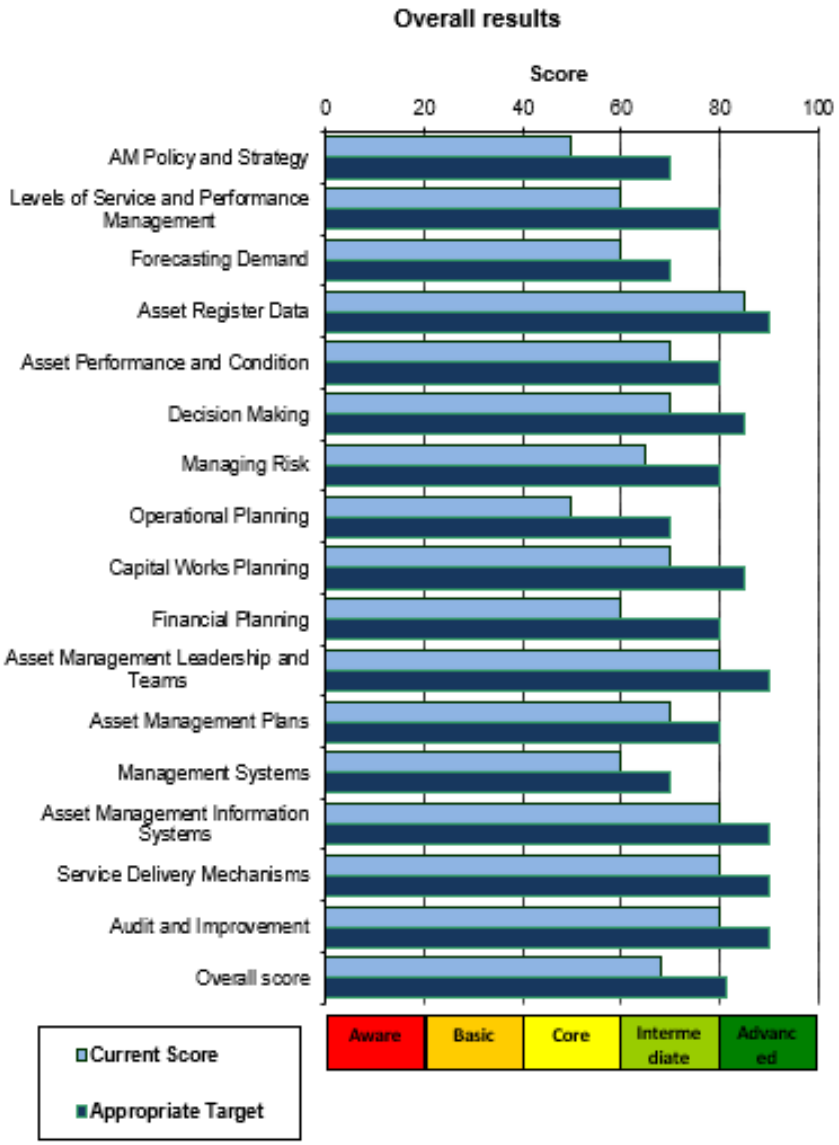
- Tai Tokerau Economic Action Plan
- Council Growth Strategies
- Council Transportation Strategies
- Council Walking and Cycling Strategies
- Council Parking Strategies

These documents mainly affect the future demand, and are therefore detailed in Section 4 Growth and Demand.

Another key strategic document is the Procurement Strategy which has been developed for the Northland Region. This is detailed further in Section 6 Options, Assessment and Alternatives.

2.6 Maturity Index

A comparison of the maturity index is provided in the figure below:



This compares the International Infrastructure Management Manual elements with the Treasury elements requirement. Councils are required to assess the maturity of their plans against the elements identified.

This shows that the NTA's asset management processes are operating at an Intermediate level with an overall score of 68%. This is slightly less than the desired Advanced level with an overall desired score of 81%.

2.7 Value of what we Manage

The table below outlines the assets groups we manage and their respective values. This does not include the land under roads. As at 30 June 2020, the council's transportation assets are described in the table below:

Asset Group	Asset	Far North District Council (FNDC)			Kaipara District Council (KDC)			Whangarei District Council (WDC)		
		Optimised Replacement Cost (ORC)	Optimised Depreciated Replacement Cost (ODRC)	Annual Depreciation (AD)	Optimised Replacement Cost (ORC)	Optimised Depreciated Replacement Cost (ODRC)	Annual Depreciation (AD)	Optimised Replacement Cost (ORC)	Optimised Depreciated Replacement Cost (ODRC)	Annual Depreciation (AD)
Transport Assets	**Pavement, Surfacing and Formation**	$1,003,557,894	$830,394,949	$11,516,215	$472,585,636	$434,419,278	$4,224,985	$843,949,325	$594,053,007	$13,619,750
	Bridge	$170,195,340	$78,261,838	$1,896,753	$93,491,532	$37,765,169	$998,370	$178,724,493	$97,913,625	$1,984,638
	Drainage	$132,593,171	$86,346,628	$1,744,816	$52,343,826	$26,388,892	$796,405	$61,579,979	$37,493,721	$832,924
	Footpath & Cycleway	$45,526,232	$30,196,799	$1,135,521	$12,416,615	$7,296,658	$169,314	$62,460,612	$24,458,289	$1,156,726
	Intelligent Transport Systems	$0	$0	$0	$0	$0	$0	$224,751	$164,962	$20,101
	Railing	$13,924,544	$6,934,361	$327,663	$5,887,288	$2,432,072	$142,512	$3,945,245	$1,972,622	$199,349
	Retaining Wall	$74,561,459	$48,061,238	$1,575,154	$10,656,542	$8,536,307	$213,023	$41,867,303	$22,208,808	$726,099
	Signs	$3,888,620	$2,029,151	$197,465	$3,338,367	$1,547,532	$236,062	$3,438,806	$1,258,245	$228,747
	Street Lights	$5,846,760	$3,105,224	$219,289	$2,834,699	$2,158,411	$101,894	$13,463,811	$7,442,596	$440,371
	SW Channel	$15,829,655	$15,537,794	$20,058	$19,790,576	$14,009,722	$270,963	$61,835,470	$25,585,514	$1,030,516
	Traffic Facilities	$2,943,130	$2,365,201	$46,842	$2,094,965	$1,053,349	$380,620	$1,364,917	$682,459	$80,214
	Traffic Signal	$0	$0	$0	$0	$0	$0	$3,869,457	$1,645,512	$289,014
	Ferry	$6,273,823	$2,621,813	$210,217	$0	$0	$0	$0	$0	$0
	Quarry	$1,008,267	$570,000	$0	$0	$0	$0	$0	$0	$0
Total for Transport Assets		**$1,476,148,896**	**$1,106,424,996**	**$18,889,992**	**$675,440,046**	**$535,607,390**	**$7,534,148**	**$1,276,724,169**	**$814,879,360**	**$20,608,450**

2.8 Roading Network Overview

The following diagrams shows a snap shot of the road networks for each council and high level information to give an overall picture of the network, its One Network Road Classification (ONRC) and usage.

Far North DC Network Stats

ONRC	Urban (Km)	Rural (Km)	Total Length(Km)	Lane (Km)	Urban Journeys (M VKT)	Rural Journeys (M VKT)	Annual Total JourneysTravelled (M VKT)	Percentage of length
Arterial	8	9	17	33	24.3	25.4	49.7	1%
Primary Collector	10	128	138	277	9.7	67.2	76.9	6%
Secondary Collector	43	674	717	1,434	23.3	87.6	110.9	29%
Access	52	908	960	1,919	9.6	38.3	48.0	38%
Low Volume	93	584	677	1,353	6.6	10.7	17.3	27%
Unclassified								0%
TOTAL NETWORK	205	2,304	2,509	5,017	73.6	229.3	302.9	

Table 1: Network Statistics for network length (km) and journeys travelled (Million vehicle km) by ONRC Class

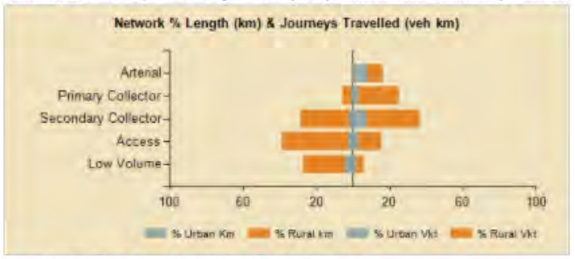


Figure 1: Network Percentage Length and Journeys Travelled

Figure 2: Sealed v Unsealed

Kaipara DC Network Stats

ONRC	Urban (Km)	Rural (Km)	Total Length(Km)	Lane (Km)	Urban Journeys (M VKT)	Rural Journeys (M VKT)	Annual Total JourneysTravelled (M VKT)	Percentage of length
Primary Collector	13	23	36	72	22.8	23.7	46.5	2%
Secondary Collector	38	209	247	494	11.6	44.4	55.9	16%
Access	12	543	556	1,053	1.4	30.4	31.8	35%
Low Volume	53	675	728	1,097	4.3	14.6	18.9	46%
Not Required	3		3	3	0.1		0.1	0%
Unclassified			4					0%
TOTAL NETWORK	118	1,451	1,573	2,719	40.2	113.0	153.2	

Table 1: Network Statistics for network length (km) and journeys travelled (Million vehicle km) by ONRC Class

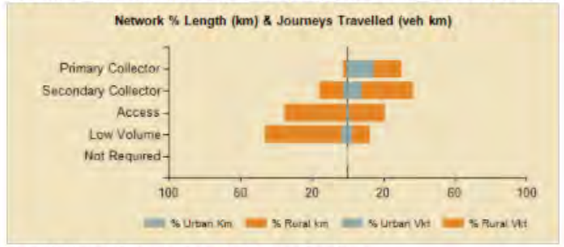


Figure 1: Network Percentage Length and Journeys Travelled

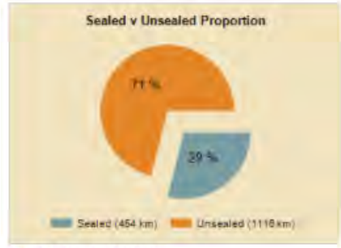


Figure 2: Sealed v Unsealed

Whangarei DC Network Stats

ONRC	Urban (Km)	Rural (Km)	Total Length(Km)	Lane (Km)	Urban Journeys (M VKT)	Rural Journeys (M VKT)	Annual Total JourneysTravelled (M VKT)	Percentage of length
Arterial	57	51	108	225	214.6	86.7	301.3	6%
Primary Collector	41	155	197	393	31.6	58.1	89.7	11%
Secondary Collector	77	371	447	883	31.5	55.6	87.1	26%
Access	52	555	607	1,121	9.1	28.6	37.7	35%
Low Volume	84	296	380	667	5.6	7.5	13.1	22%
Not Required				1				0%
Unclasssified			1					0%
TOTAL NETWORK	312	1,428	1,741	3,291	292.4	236.6	529.0	

Table 1: Network Statistics for network length (km) and journeys travelled (Million vehicle km) by ONRC Class

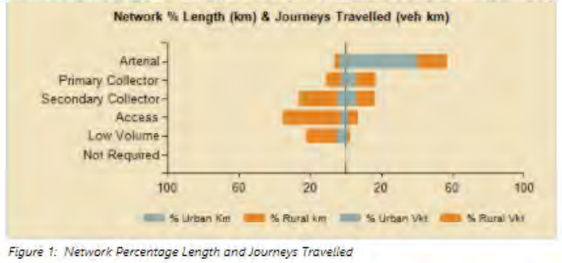


Figure 1: Network Percentage Length and Journeys Travelled

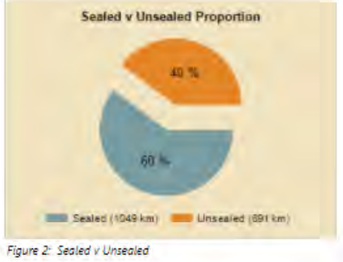
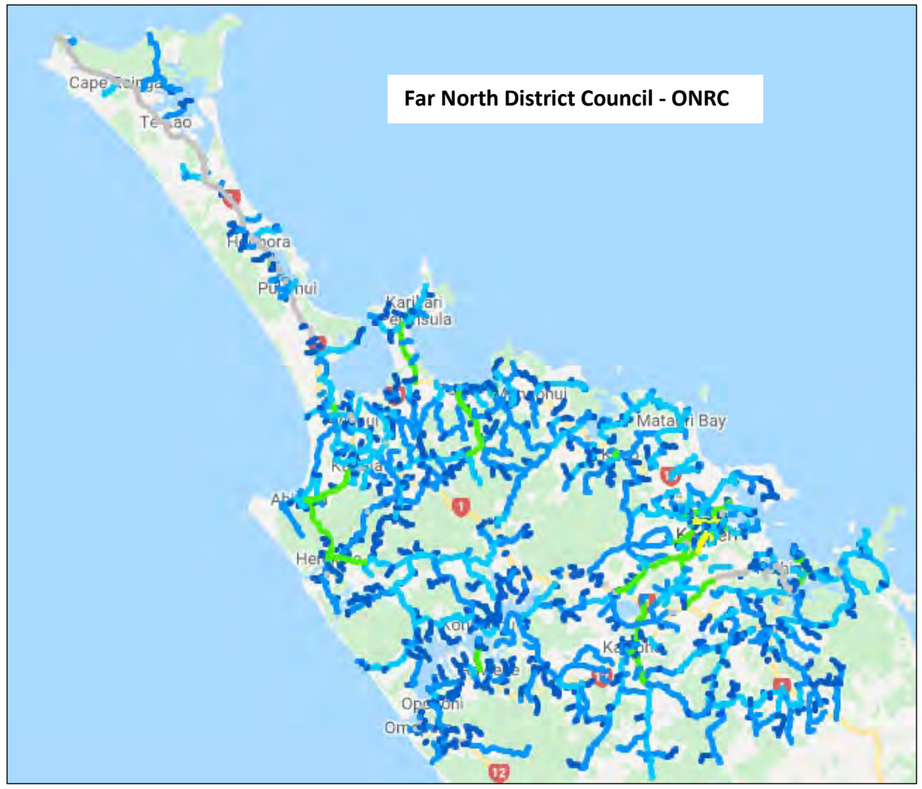
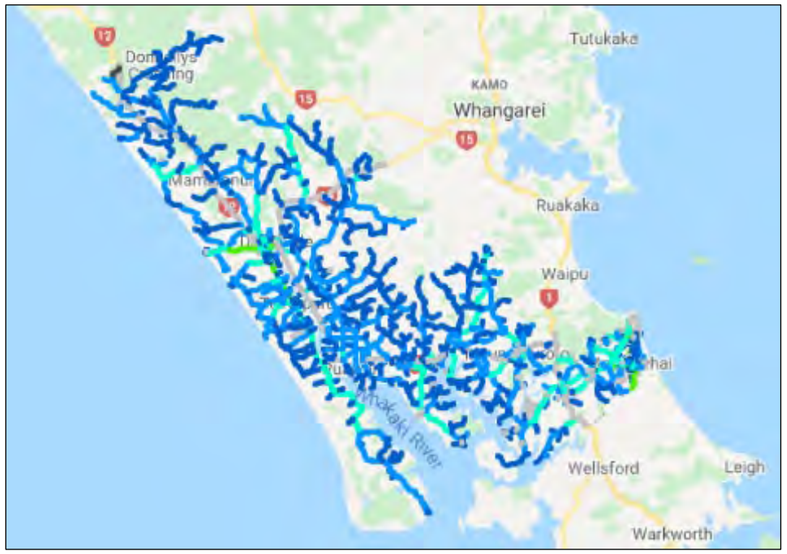


Figure 2: Sealed v Unsealed

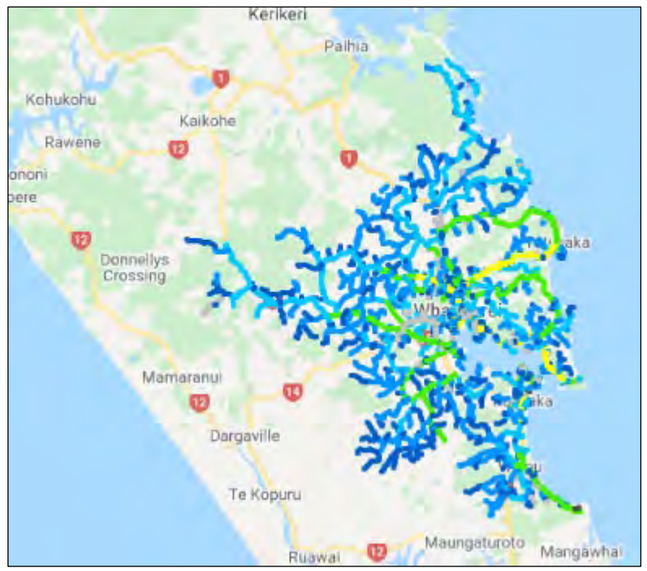
Far North District Council - ONRC



Kaipara District Council - ONRC



Whangarei District Council - ONRC



2.9 Services Provided

Table 2-1: Activities and Services sets the activities we undertake and the services and contribution these activities make to the deliver on the desired outcomes from local level to the GPS.

Activity Type	Services Provided	How this is Delivered	Contribution to ONRC Customer Outcomes	Contribution to GPS Outcomes
Sealed Pavements	Repairing pot holes, roughness, rutting and cracking to avoid pre-mature pavement failure. Also includes repairing of sunken service covers. Resurfacing to provide waterproofing and skid resistance and rehabilitation to restore shape and pavement strength	Repairs, Resurfacing and Rehabilitations (when put through term contracts) – 5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC) Rehabilitations outside of term contracts – Packaged into one-off contracts	Safety – Reduced hazards on the road (ie pot holes) and improved skid resistance Efficiency – Optimised whole of life costs Amenity – Smoother roads	Safety – Reduced hazards on the road (ie pot holes) and improved skid resistance Value for Money – Optimised whole of life costs
Unsealed Pavements	Repairing pot holes, smoothing corrugations, application of running course and grading. Heavy metalling to restore shape and pavement strength.	5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC)	Safety – Reduced hazards on the road (ie pot holes and corrugations) Efficiency – Optimised whole of life costs Amenity – Smoother roads	Safety – Reduced hazards on the road (ie pot holes and corrugations) Value for Money – Optimised whole of life costs
Drainage	Clearing watertables and culverts, street sweeping, repairing scour. Replacement of broken culverts and kerb and channel and re-cutting watertables to maintain drainage flows and avoid water ingress into pavements.	5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC)	Safety – Reduced flooding on roads Resilience – Reduced slips and flooding resulting in road closures Efficiency – Reduced pavement damage through water ingress	Safety – Reduced hazards on the road (ie flooding) Improving Freight Connections – Reduced road closures Value for Money – Reduced pavement damage through water ingress
Structures	Repair of bridges and retaining walls, repair of bridge rails, painting of bridge beams and rails, clearing of bridge waterways, scour protection. Maintenance of the Te Matau a Pohe lifting road bridge. Maintenance, operation and component renewal of the Hokianga Ferry Service. Replacement of bridge decks, rails, beams, piers and abutments. Replacement of old retaining walls.	Repairs – 5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC) Component Replacement & Scour Protection – Packaged into one-off contracts WDC Opening Bridges – Term contracts for electrical and hydraulic maintenance (2+3yr). Term contract for structural maintenance (2yr). FNDC Hokianga Ferry Service – Term contract for maintenance, operations and component renewal (3+3+2+2yr)	Safety – Maintaining bridge rails in good condition Accessibility – Reducing bridges that cause restriction to HCVs. Providing access across the Hokianga Harbour (Hokianga Ferry Service) Resilience – Reduced likelihood of bridge collapse Efficiency – Optimised whole of life costs	Safety – Maintaining bridge rails in good condition Improving Freight Connections – Reducing bridges that cause restriction to HCVs. Reduced likelihood of bridge collapse. Providing direct access across the Hokianga Harbour. Value for Money – Optimised whole of life costs
Environmental	Vegetation control by spraying road shoulders and clearing tree growth encroaching into the road corridor. Maintenance and operation of clean fill dumpsites and water treatment devices.	5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC)	Safety – Clearing sightlines and removing roadside tree hazards Amenity – Improved water quality	Safety – Clearing sightlines and removing roadside tree hazards

Activity Type	Services Provided	How this is Delivered	Contribution to ONRC Customer Outcomes	Contribution to GPS Outcomes
Traffic Services	Repair and replacement of signs, re-marking of pavement markings, installation of edge marker posts and RRPMs. Streetlight maintenance, repair, renewals and operation.	Signs and Markings – 5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC) Streetlights – 3 x Streetlight maintenance contracts: - FNDC (3+1+1yr) - KDC (Monthly) - WDC (3+2yr) Streetlights – 3 x Term power supply contracts (3yr): (1 x FNDC, 1 x KDC, 1 x WDC)	Safety – Providing signs and markings to guide road users and warn of hazards. Streetlighting to improve safety at night. Accessibility – Guide signage to direct road users to their destinations.	Safety – Providing signs and markings to guide road users and warn of hazards. Streetlighting to improve safety at night. Improving Freight Connections – Ease of way finding by providing adequate guide signage.
Operational Traffic Management	Traffic signal and school zone active sign maintenance and operation. Renewal of traffic signal and school zone components as they fail or through vehicle damage. Operation of the Te Matau a Pohe and Kotuitui Whitinga opening bridges.	WDC Traffic Signals and School Zone Active Signs – Term traffic signal contract (2+3yr) WDC Opening Bridges – Term bridge operation contract (2+3yr)	Safety – Reduced likelihood of crashes at signalised intersections and around schools. Travel Time Reliability – Improved traffic flows through signalised intersections and across opening bridges.	Safety – Reduced likelihood of crashes at signalised intersections and around schools. Improved Freight Connections – Improved traffic flows through signalised intersections and across opening bridges.
Walking & Cycling	Repair of broken footpaths and cycleways, removal of trip hazards and maintenance of hand rails. Sweeping of broken glass and removal of other rubbish on paths. Maintenance of the Kotuitui Whitinga opening walking/cycle bridge.	Repairs and Replacement – 5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC) WDC Opening Bridges – Term contracts for electrical and hydraulic maintenance (2+3yr). Term contract for structural maintenance (2yr).	Safety – Keeping footpaths and cycleways clear of hazards Accessibility – Maintain alternative modes of transport	Safety – Keeping footpaths and cycleways clear of hazards Better Transport Options – Maintain active modes of transport which provides travel choice and reduces congestion. Climate Change – Reduce vehicle emissions by maintaining active transport modes
Network and Asset Management	Management and operations of the maintenance contracts. Emergency response management. Activity management including operations of the AMP, traffic counting, forward works planning etc. Approval and coordination of corridor access requests and traffic management.	General Network and Asset Management – Council in-house business unit Specialist Services – One-off engagement with specialist consultants	Safety – Prioritisation and management of safety related works Resilience – Management of response to emergency events Efficiency – Optimising whole of life costs through good activity management Travel Time Reliability – Reducing traffic impact due to works on the road	Safety – Management of safety related works Improving Freight Connections - Reducing traffic impact due to works on the road or during emergency events. Planning for freight traffic and resilience on strategic routes. Value for Money – Optimising whole of life costs through good activity management
Minor Improvements	Safety improvements such as sight benching, guardrail, signage upgrades, minor intersection upgrades and speed management. Associated improvement works such as road widening when undertaking pavement rehabilitation.	Packaged into one-off contracts. Smaller works undertaken through the maintenance contracts - 5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC)	Safety – Reducing the impact of roadside hazards, improving intersections, providing safer speed management and providing wider roads. Accessibility – Reducing bridges that cause restriction to HCVs. Improving travel time	Safety – Reducing the impact of roadside hazards, improving intersections, providing safer speed management and providing wider roads. Better Transport Options – Providing improvements to support alternative transport modes.

Activity Type	Services Provided	How this is Delivered	Contribution to ONRC Customer Outcomes	Contribution to GPS Outcomes
	Full bridge replacements, bridge widening or strengthening to provide for 50Max/HPMV. Resilience improvements such as slip repairs and flood protection. New footpath and cycleway connections. Pedestrian crossing improvements. Bus priority lanes to improve travel time reliability for public transport.		reliability for public transport. Improving pedestrian and cyclist connections and safety. Resilience – Reducing the likelihood of road closure due to slips, flooding or bridge collapse.	Improving Freight Connections - Reducing the likelihood of road closure due to slips, flooding or bridge collapse. Reducing bridges that cause restriction to HCVs. Climate Change – Reduce vehicle emissions by improving alternative transport modes. Improving resilience of the transport network to reduce the impacts of climate change.
Education and Promotion	Education and promotion campaigns to improve road safety in the following high risk areas: Alcohol, Young Drivers, Restraints, Fatigue and Loss of Control on Bends. Travel demand management such as travel plans to reduce private vehicle use.	Road Safety Promotion - Term service contracts: - FNDC 6mthly rolling - KDC & WDC – 3yr Travel Demand Management – Term service contract: - WDC (Bike Skills Training) – 2.25yr	Safety – Reducing crashes by improving driver education and behaviour in high risk areas. Accessibility – Promoting the shift to alternative transport modes.	Safety – Reducing crashes by improving driver education and behaviour in high risk areas. Better Transport Options – Promoting the shift to alternative transport modes. Climate Change – Reduce vehicle emissions by promoting alternative transport modes.
Public Transport	Operation and maintenance of the Far North Link, Mid North Link, Hokianga Link, Whangarei CityLink and Bream Bay Link bus services. **(Note – This is funded by the NRC and is covered separately in the Northland Regional Public Transport Plan (RPTP)** Maintenance, renewal and provision of new bus shelters. **NOTE – the Hokianga Ferry Service is captured under the Structures activity because that is where this work is funded from.**	NRC Bus Service Operations - Term service contracts: - Whangarei CityLink – 6+3yr - Far North Link – 2yr - Mid North Link – 1.5yr - Hokianga Link – 1.5yr - Bream Bay Link – 1yr (trial) WDC Bus Shelter Maintenance – separate contracts and agreements WDC Bus Shelter Renewals – Term service contracts 4+2+1+1yr	Accessibility – Providing public transport opportunities for commuter traffic in Whangarei and the transport disadvantaged in rural areas.	Better Transport Options – Providing public transport opportunities for commuter traffic in Whangarei and transport disadvantaged in rural areas. Climate Change – Reduce vehicle emissions by promoting public transport.
Parking (Non Subsidised)	Operations and maintenance of parking meters. Renewals of parking meters when broken or obsolete. Maintenance and marking of off-street carparks. Resurfacing of off-street carparks.	WDC Operations & Maintenance of Parking Meters– Term service contract 10yr+3yr+2yr Maintenance and Renewal of Off-Street Carparks– 5 x Term area maintenance contracts (4+2+1+1yr): (2 x FNDC, 1 x KDC, 2 x WDC)	Accessibility – Parking provides accessibility to commercial and retail areas. Parking pricing strategy to increase the price of all-day parking to support uptake of alternative modes by commuters. Efficiency – Parking is self-funded by the revenue earnt by parking charges.	Better Transport Options – Parking pricing strategy to increase the price of all-day parking to support uptake of alternative modes by commuters. Climate Change – Reduced vehicle emissions by increasing the price of all-day parking to support uptake of alternative modes by commuters

Table 2-1: Activities and Services

3 Setting the Scene

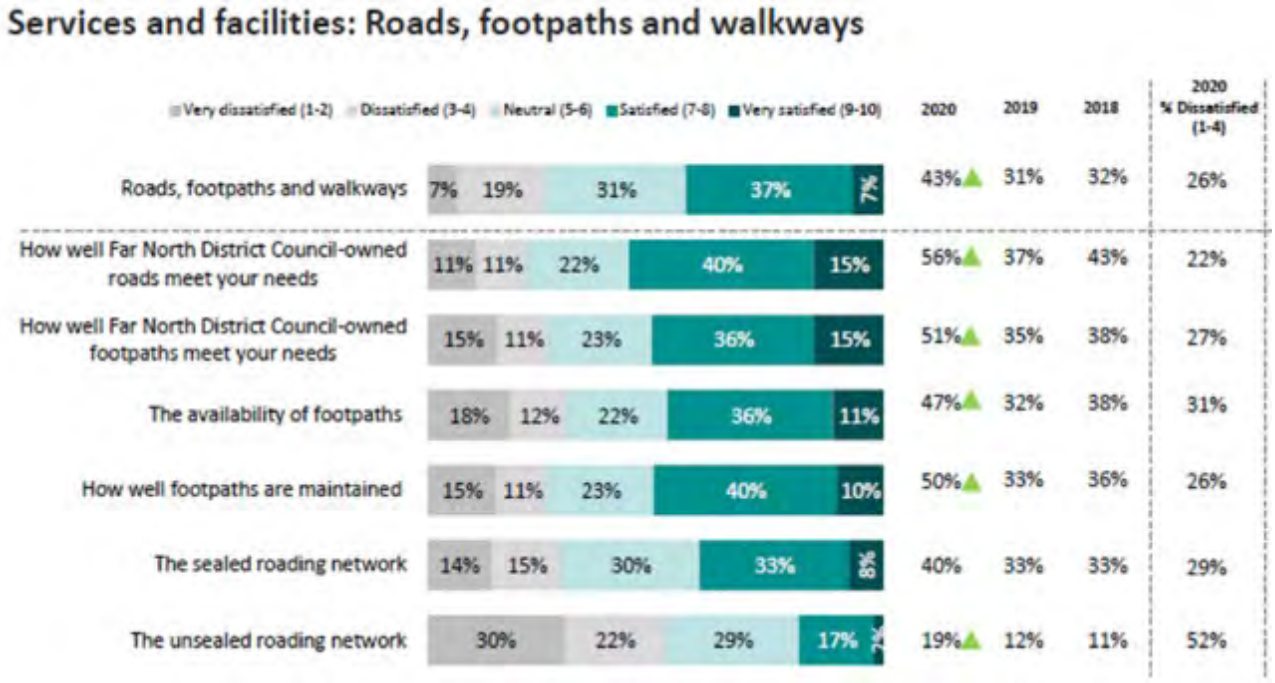
3.1 Understanding our Customers Needs (Customer Research and Expectations)

3.1.1 Resident Satisfaction Surveys – 2020

All three councils undertake an annual survey of residents to measure satisfaction with Council's performance. The results of the 2020 survey results for each council are shown below.

3.1.1.1 Resident Satisfaction Survey – Far North

The Far North resident satisfaction survey was undertaken by KeyResearch on a sample of 501 residents in the Far North District and reported in July 2020. The results as they relate to roading and transport are shown below:



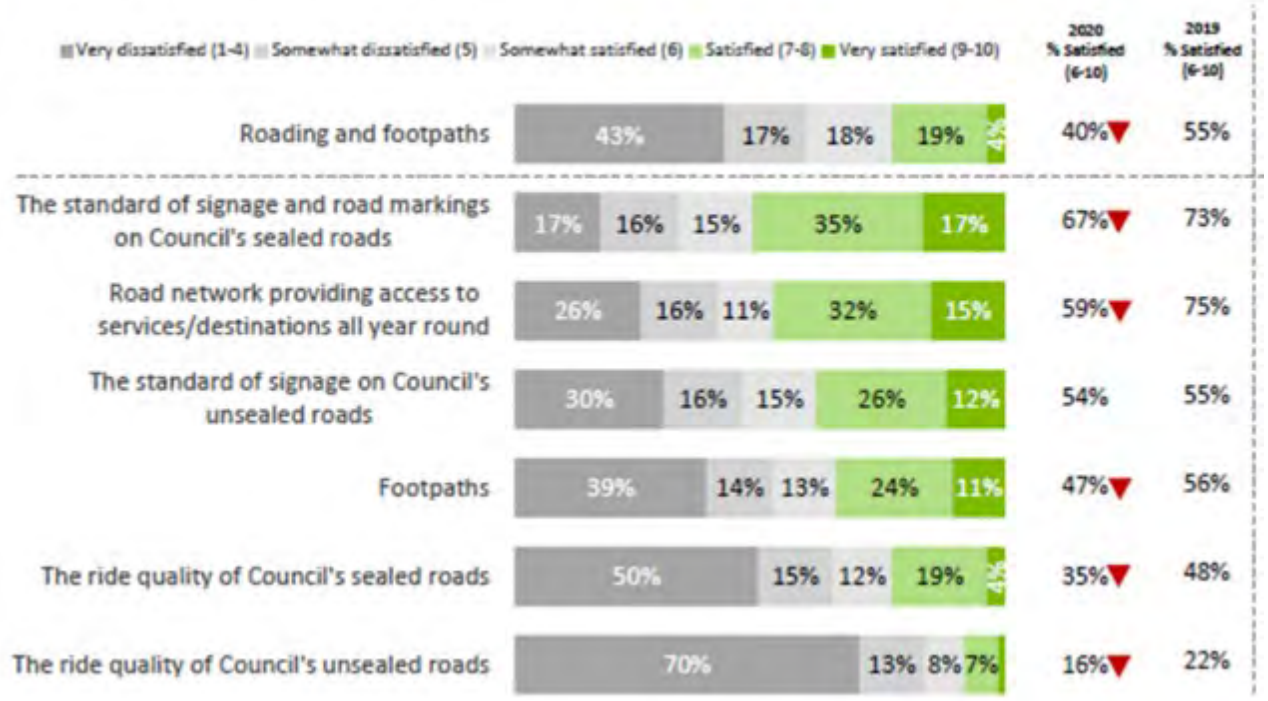
The percentage satisfied or very satisfied with the FNDC transport network increased across all categories in 2020. This is expected to be as a result of a larger programme of renewal and improvement work undertaken in 2019/20 which has been achieved through the new maintenance contracts and the Northland Transportation Alliance.

Overall satisfaction with the transport network is at 43%. However, the satisfaction with unsealed roads is 19% and although this was an increase over previous years, it is very low, particularly when those dissatisfied with the unsealed road network is 52%. The main reasons for dissatisfaction with the unsealed road network were poor quality of surface (potholes, corrugated etc) and lack of maintenance.

3.1.1.2 Resident Satisfaction Survey – Kaipara

The Kaipara resident satisfaction survey was undertaken by KeyResearch on a sample of 825 residents in the Kaipara District and reported in June 2020. The results as they relate to roading and transport are shown below:

Roading and footpaths

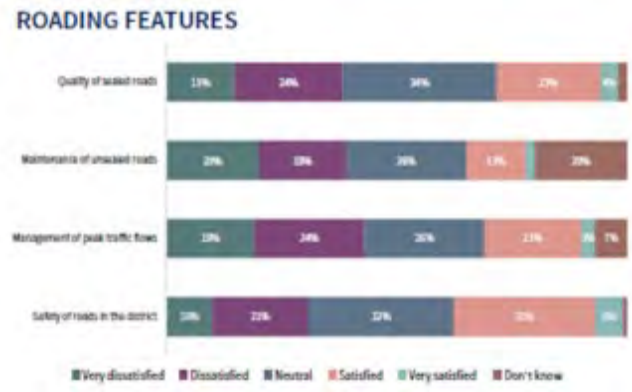


It should be noted that for the Kaipara survey, the overall level of satisfaction is scored from 6-10, whereas the other two councils measure satisfaction with a score of 7-10. This may mean that the satisfaction scored for Kaipara may be higher than for the other councils.

Overall satisfaction with the transport network is at 40%. As for FNDC, the satisfaction with unsealed roads in Kaipara is very low at 16%, particularly when those dissatisfied with the unsealed road network is 70%. The main reasons for dissatisfaction with the unsealed road network were poor quality of surface (potholes, corrugated etc) and poorly maintained, repairs are quick fixes and the roads need sealing.

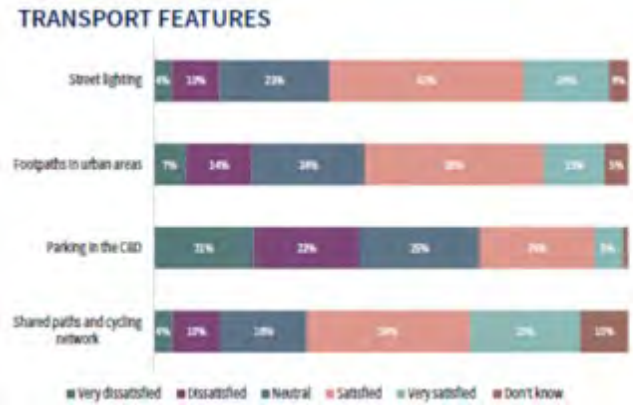
3.1.1.3 Resident Satisfaction Survey – Whangarei

The Whangarei resident satisfaction survey was undertaken by Versus Research on a sample of 600 residents in the Whangarei District and reported in July 2020. The results as they relate to roading and transport are shown below:



OVERALL AGREE BY YEAR

	2014	2015	2016	2017	2018	2019	2020
Quality of sealed roads	37%	31%	35%	38%	37%	24%	27%
Maintenance of unsealed roads	22%	20%	18%	21%	18%	10%	15%
Management of peak traffic flows	43%	31%	30%	18%	24%	18%	24%
Safety of roads in the district	37%	36%	35%	58%	49%	30%	27%



OVERALL AGREE BY YEAR

	2014	2015	2016	2017	2018	2019	2020
Street lighting	49%	46%	49%	61%	55%	52%	59%
Footpaths in urban areas	36%	43%	45%	54%	47%	46%	51%
Parking in CBD	28%	27%	22%	37%	26%	26%	30%
Shared paths and cycling network	-	-	-	-	-	47%	57%

The percentage satisfied or very satisfied with the WDC transport network increased across all categories in 2020. For most categories this appears to be due to a rebound from a drop in satisfaction in 2019. It also reflects progress being made on the LED streetlights, new footpaths and the progress on the Kamo Shared path.

As for the other two councils, the satisfaction with unsealed roads is very low 15%, particularly when those dissatisfied with the unsealed road network is 39%. The survey report did not detail the main reason for this dissatisfaction.

3.1.2 Regional Stakeholder Engagement Workshops

A series of stakeholder engagement workshops were undertaken in late June/early July 2016 to determine some of the key issues facing stakeholders in the transport system. In 2019, consideration was given to carrying out a follow up stakeholder engagement workshop. However, it was considered that not enough progress had been made on implementing the 2018/21 programme, and that there had not been any other significant changes at that time to justify a follow up workshop.

The 2016 workshops were held on a regional basis and included representatives from the following organisations:

- New Zealand Transport Agency (NZTA)
- Northland Regional Council (NRC)
- Whangarei District Council (WDC)
- Kaipara District Council (KDC)
- Far North District Council (FNDC)
- Northport
- Northland Inc
- Northland Road Carriers
- New Zealand Police
- Road Safety Northland
- Ritchies Buses
- Bike Northland

The workshops were broken into a series of sessions which focused on specific topics.

The key issues for the Whangarei District were:

Freight / Forestry and Resilience

- Connectivity / Reliable Routes / Route Resilience
- Connection to Auckland – Freight at night, tourism during the day would support economic growth in many sectors.
- Forestry - currently at peak production (4.5m tonnes/yr) and will stay at that level until 2026.
- Communication and Co-ordination of road works regionally.
- Fit for purpose detour routes
- Travel time reliability

- Rest Areas
- Growth of the port – investing in container market.

Tourism and Economic Development

- Tourism growth in Northland expected to grow significantly. No regional figures available.
- Hundertwasser – game changer for Whangarei consider impact on tourist facilities, congestion and parking.
- Tourist routes "twin coast discovery" also by-ways. Route aesthetics and facilities, toilets/electric charging stations/pull off areas important.
- Travel time reliability
- Tai Tokerau Action Plan – support and enable.

Public Transport

- New / upgrade bus terminal required – clean / safe and inviting.
- Need to consider and balance the creation of new parking facilities on public transport.

Walking and Cycling

- Need to continue with investment in walking and cycling and ensure attractive and safe.
- Need to consider travel planning and education and training
- We have an aging population infrastructure needs to accommodate for mobility scooters etc.

Road Safety

- Need to continue to be evidence based and focus on the issues.
- Road safety promotions – difficult to get funding
- The road network is generally narrow and unforgiving which results in high loss of control crash rates.

These issues have been considered in the development of the AMP.

3.1.3 Northland Transportation Alliance Team Workshops

Due to the recent restructure of the Northland Transportation Alliance (NTA) and the move to a joint regional AMP, a series of workshops were undertaken with the NTA team in February and March 2020 understand what the constraints, issues and problems the teams are facing. These workshops were held on a regional basis and included representatives from each of the three councils. The results of these workshops are summarised below:

Unsealed Roads

- Strategy is likely to be:
  - high risk roads (eg forestry etc) to be fully strengthened with a wearing course
  - medium risk roads to have some strengthening (perhaps 100mm overlay) with a wearing course
  - low risk roads to just have routine maintenance with any metalling using blended material.
- Need to transition to wearing courses - timing to suit demand (eg forestry) and available funding.
- Quarry sources that can provide wearing courses are an issue.

Sealed Roads

- Sealed roads are generally in good condition and we can possibly reduce spend on these, particularly for rehabs, but we cannot afford to let the condition drop too much, because hard/costly to recover.
- However, AC roads are an issue that needs to be addressed.
- Services under road often cause premature failure – biggest risk of failure for urban roads which are also expensive to fix.

Drainage

- Drainage biggest area where we can get good bang for buck – payback is reduced pavement maintenance by keeping water out of our pavements.
- Need to provide a budget high enough to allow for drainage improvement.

Footpaths

- Footpath maintenance and renewals being identified through Onsite video data develop FWP.
- Apply modern equivalent standard width when carrying out renewals – ie replace a 0.9m wide footpath with a 1.6m wide path. Can fund the difference through Low Cost Low Risk.

Environmental

- Boom mulching working well.
- FNDC mostly mow, KDC and WDC mostly spray. Potential for FNDC to change to spraying – mowing is largely a historic treatment. However, spraying may be outlawed in the future due to glyphosate toxicity.

Traffic Services

- Big cost increase for line marking in new contract which has affected the long term viability of doing a full line mark per annum.
- New line marking, edge marker posts and RRPMs can be installed through Low Cost Low Risk programme.

Structures

- There is a large backlog of bridge renewals for FNDC and KDC.
- Need an annual inspection of structures on critical routes and in coastal areas.
- Lack of market competition for structural work in FNDC.

Streetlights

- More relay (ripple switch) faults occurring (ie lines company network faults). Need an MOU with the lines company to define the demarcation point.
- FNDC not receiving power savings from Top Energy through the LED upgrade due to pricing structure.
- Lighting maintenance contract – WDC & FNDC have term contracts with Curries and McKay respectively. KDC has an informal arrangement with Northpower. Considering joint NTA maintenance contracts.

- Testing of steel columns – There is a pole tester based in Whangarei. What is the cost per pole to do testing and can this be developed into a programme of testing?

Parking

- WDC have lots of parking meters. FNDC have no meters apart from in Paihia (privately owned). KDC have no meters. All councils have parking restrictions in specific locations.
- WDC replacing old technology with new EFTPOS machines over 5 years. Then probably go to number plate parking.

Resilience

- Map of critical routes being developed – this should be taken to the teams to validate this before locking this down.
- Drainage works required to try and avoid slips in the first place. Should be captured by the Drainage Plan & FWP.
- Need to consider the extra HCV and traffic loading effects on detour routes.
- Operational resilience – ie who gets contacted when an event happens, how to communicate (ie what secure lines of communication do we have during an event). This needs to be captured in the Resilience Plan.
- Treatment Tool Box could be developed – considering alternative solutions, vegetation control, overslip management, flood mitigation (ie stream bed realignment) rather than engineering solution.

Major Projects

- Transport Strategy or similar needs to be developed for KDC to support projects identified in the Mangawhai Community Plan and township spatial plans.
- Alternative funding sources such as PGF, TIF, ACC, Northland Inc and Iwi funding should be considered.
- Separate discussion with Far North required regarding projects coming out of the FNDC Integrated Transport Plan.
- Robust costs need to be developed for major capital projects before being included in the AMP/LTPs.

Safety

- Safety of KiwiRail crossings needs to be considered due to rail revitalisation. Who should pay for this? – should be part of revitalisation works (ie funded through KiwiRail).
- Programmes for High Risk Rural Roads and Speed Management are generally well-defined and are being progressively rolled out.
- Need to do more to improve pedestrian safety. This includes more signalised crossings in Whangarei.

Road Safety Promotion

- Rationale doing assessment of the best mechanism to carry out road safety promotion. This is considering either of the current models, a combined model or an in-house model.
- Would like to budget for a ½ FTE position in the North and a ½ FTE position in the South to do community engagement support of physical works that help road safety promotion.

- Funding of road safety promotion is a big constraint for WDC and KDC. Need to see if this can be increased. WDC probably need about $500k (ie $250k local share and whatever Road Safe can provide). KDC should be $300k.

Cycleways

- WDC has well define cycleway programme focusing on completing the Kamo Shared Path, linkages through the City Centre and the Maunu route.
- KDC need to prioritise their programme based on demand, but probably Kaihu Rail Trail and Mangawhai Shared Path as likely priorities.
- FNDC's programme to be determined through the Far North Integrated Transport Plan.
- Need to develop an implementation plan over say a 10 year period for any major cycleway projects. This should include route definition, improved estimates and prioritisation/staging.
- Slow Streets – Dargaville, Kaiwaka, Kaikohe, Moerewa. Need a budget to address these. FNDC and KDC slow streets prioritisation matrix being delivered.

Seal Extension

- Strategy – Intervention hierarchy: 1. wearing course, 2. speed management, 3. dust suppression, 4. house frontage sealing, 5. full sealing.
- Dust comparison between wearing courses and non-wearing course pavements is to be undertaken to determine the impacts on dust emissions (particularly PM_{10}). We should allow for funding in the AMP for this.
- FNDC dust matrix – too complex and needs to take into account local knowledge of priorities. Sensitive to traffic counts, so need a programme of peak traffic counts to identify top 20 sites.
- FNDC and WDC currently spending about $3M/year unsubsidised for seal extensions. Second coat seals of unsubsidised seal extensions are also to be unsubsidised. Difficult to convince NZTA to provide subsidy. KDC do not currently do any seal extensions.
- Bridge approach sealing, traction seals and intersection safety seals often will qualify for NZTA subsidy if they have a positive NPV, or have a known safety issue.

General

- Would like to see advance design funding allowed for rehabs, bridge renewals, low cost/low risk projects etc to advance design works so tenders can be called in June/July.
- The FNDC procurement board process can take 3-6 months to get work approved and awarded which means that projects need to be planned well in advance of the actual start date.

These issues, problems and opportunities have been considered during the development of this AMP.

3.1.4 Investment Logic Mapping

Over the last 4-5 years, investment logic maps (ILM) workshops have been held with key stakeholders to identify problems with some sections of the Northland transport network. These ILMs were undertaken for the following projects:

- Whangarei to Auckland – Connecting Northland
- Twin Coast Discovery Highway
- Far North Integrated Transport Strategy
- Whangarei City Transportation Network Strategy

The problems identified through these ILM workshops are described below:

Whangarei to Auckland – Connecting Northland

1. Poor resilience and costly journeys between Northland and key markets is undermining economic growth and investor confidence (50%).
2. The corridor is sub-standard for a national strategic route, resulting in a higher number of crashes involving injury and death (30%).
3. The lack of a long term, integrated investment approach creates sub-optimal outcomes in transport and reduced economic investment in Northland (20%).

Twin Coast Discovery Highway

1. The Twin Coast Discovery Highway is a component of Northland's visitor economy, but the lack of supporting amenity does not increase the visitors length of stay or expenditure / participation in Northland (50%).
2. The concept of the Twin Coast Discovery Highway as a 'destination trip' is not well known by both domestic or international visitors, resulting in lost opportunity for economic development in Northland (30%).
3. Inconsistency in the level of service of the Twin Coast Discovery Highway is sufficient to fail to meet the safety, amenity and resilience expectations of users (20%).

Far North Integrated Transport Strategy

1. Changing demographics and land uses increase pressure to provide a better, safer transport system with more travel choices (60%).
2. Increasing impacts of climate change disrupt a vulnerable transport network, essential services, critical supplies, and commerce (25%).
3. Limited funding to deliver the disparate transport needs of the Far North leads to dissatisfied communities (15%).

Whangarei City Transportation Network Strategy

1. Whangarei's topography has constrained the City's state highway and arterial road footprint which means we cannot easily expand infrastructure to meet future growth in demand (50%).
2. SH1 and other urban arterial routes traverse the City centre which results in severance for pedestrians and cyclist access between key areas (30%).
3. Whangarei has a high number of crashes, which results in a high collective risk (20%).

These ILMs are being used to develop strategic cases and programme business cases to justify investment to address these issues. Where relevant, these issues will be reflected in this AMP.

3.2 Key Issues and Current State of Play

Environmental Factors – The Northland Region is subject to sub-tropical cyclones and storms. The geology of the Region is also variable with many roads subject to instability and ground creep or slow land movements. Climate change is a very real threat that puts coastal communities at risk from rising sea levels and the frequency and is likely to increase the intensity of storm events.

Northland Transport Alliance (NTA) – The Northland Transport Alliance, which was originally formed on 1 July 2016, is a shared service business unit and incorporates transport staff from WDC, KDC, FNDC and NRC. The objective of the NTA is to share services, create a centre of transport excellence, to encourage collaboration and sharing of ideas and to create efficiencies by increasing buying power and combining contracts. This should result in more consistent and efficient planning and operations being adopted across the region.

In early 2019, the NTA carried out a restructure of its organisational structure into four management teams. These teams are:

- Strategy and Planning
- Capital and Procurement
- Maintenance and Operations
- Administration and Business Development

This business structure is intended to provide greater efficiencies, by developing "centres of excellence", breaking down the boundaries between the individual council staff and developing the right culture across the organisation. A rigorous employment campaign has been undertaken over the past year to employ the right staff in the right positions and all of the required positions have now been filled. Some early "wins" through the NTA are the standardised road maintenance contracts (described below), joint LED streetlight contracts and shared asset management planning.

Standardised Maintenance Contracts – On 1 July 2018, new standardised council MO&R contracts started across Northland. These contracts incorporate best practice principles and are fence to fence, involving most of the M&O aspects with road marking, bridge maintenance, reseals and a portion of rehabilitation work included. These contracts span the whole local road network of Northland. There are two contracts covering each of the Whangarei and Far North Districts and one contract covering the Kaipara District. The MO&R contracts have a term of 4+2+1+1 years (8 years maximum).

These maintenance contracts are dispatch based, with the maintenance contractor carrying out inspections based on frequencies set based on the ONRC hierarchy. NTA staff carry out audits of the inspections and then programmes of work are set based on agreed works. For Kaipara and Whangarei, this is a similar approach to their previous contracts. However, for the Far North it is a significant change to their previous contract which was largely performance based with many lump sum items. The inclusion of reseals and pavement rehabilitations is also a significant change for Kaipara and Whangarei, which previously had separate contracts for this work.

Forestry – Northland's local road network caters for significant forestry traffic which accesses Northport, sawmills and forestry plants around the region. Most forestry traffic starts its journey on unsealed roads which creates greater maintenance demands and dust generation to local residents on these routes. Approximately 4M m^3 of logs travel to Northport per annum and this level is expected to continue until 2020 when it is forecast to drop to 3M m^3/year.

Safety – Road safety has been worsening in Northland over the last 4 years. Improvements need to be made on High Risk Rural Roads through the Safe Networks Programme and to address poor driver behaviour issues identified in the Communities at Risk register to change this worsening trend. The release of the Road to Zero Strategy has changed the focus to using Standard Safety Interventions and larger safety programmes to try and achieve the strategy's objective of a 40% reduction in fatal and serious crashes by 2030.

Economic Growth - The Tai Tokerau Action Plan identifies opportunities for improving Northland's economic future. Transport is identified as an enabler to economic growth and in particular, the improvement of the Twin Coast Discovery Route and its associated byways is an important step in maximising tourist growth in Northland. Investment in Northland to stimulate economic growth has been occurring over the past two years through the Provincial Growth Fund (PGF), Tourism Investment Fund (TIF) and more lately the Crown Infrastructure Partnership (CIP) funding.

High Growth – Northland is growing rapidly (18% in the last 5 years) due to the effects of record immigration into the country and overflow from the Auckland housing pressure. The transport network will need to accommodate additional traffic flows resulting from this high growth rate.

3.3 Changes Since Last AMP

From one of the Roading Efficiency Group (REG) workshop a chapter to identify the potential changes to the new AMP was recommended. The changes since the last AMPs were prepared and are detailed below.

- **What changes have occurred in your City/District since the existing AMP was adopted in 2018? E.g. new growth areas, completion of projects, population and demand? Are assumptions still valid?**
  - Growth in Northland has been a lot more rapid than expected. The 2018 census indicated that growth in the past 5 years was 18% (or 3.6%/pa) which made Northland one of the fastest growing provincial areas in the country. High growth areas were Whangarei City, Ruakaka/Marsden Pt, Kerikeri/Waipapa and Mangawhai. The longer term effects of the COVID-19 pandemic may stifle growth over the next few years, although currently there is still a housing boom and more and more families moving to Northland due to house pressure in Auckland and elsewhere.
  - In the medium to long term, there are several projects which are likely to support continued economic and population growth in Northland such as:
    - the motorway extension to Warkworth
    - 4-laning from Whangarei to Ruakaka
    - potential for Ports of Auckland to partially move to Northport
    - the revitalisation of the Northland rail network and possible rail link to Northport
    - the benefits of the PGF investment into economic growth projects
    - COVID-19 recovery plan "shovel ready" projects.
  - The restructure of the NTA has occurred and this is bringing efficiencies, but also challenges and changes to the way things are managed and delivered.
  - The new maintenance contracts have also moved to a contractor inspection-led process. Some costs have gone up (notably pavement markings and contract management costs) while others have gone down (such as pavement rehabilitations for WDC and KDC). Overall, there has been an increase in maintenance contract costs as a result of tendering the new contracts in 2018. This is mainly due to market correction to reflect actual costs.

- The GPS 2021/31 has changed the priority to more focus on safety, better travel options, climate change and improved freight connections. Less focus is being given to roading projects, particularly those that favour private vehicle use.
- Forestry is winding down from a peak of about 4M m^3/year of logs to about 3M m^3/year. The impacts of COVID-19 on the forestry industry, had a significant short-term impact, but the industry has bounced back post-lockdown.
- The development of transport strategies and AMP improvement plan strategies will have an impact on the project being proposed and the processes that are adopted in the AMP.
- The COVID-19 economic recovery plan "shovel ready" projects may result in significant additional investment in transportation which may affect funding and projects in the next 3-5 years.
- The urgency to undertake initiatives to help mitigate climate change appears to have increased and this may affect the types of activities that are undertaken in the future.

- **Are the existing problem statements still relevant? Are the most pressing issues captured? Do you have any new evidence or data? Has urgency changed?**
  - The problem statement have already been updated to reflect a top-down assessment, and have been developed across the NTA using the previous problem statement from the three district councils. The bottom-up assessment has modified and streamlined the problem statements (this is described in detail in Section 5). The most pressing matters are:
    - High sealed road costs when compared to the peer group
    - Insufficient focus on drainage maintenance
    - Resilience to adverse events (increasing urgency due to climate change – more storms and more drought conditions are likely)
    - Unsealed road condition, dust and maintenance costs.
    - Poor condition of FNDC and KDC bridges (increasing urgency)
    - High growth and lack of alternative transport modes (increasing urgency due to high growth and greater expectation of long-term growth)
    - Poor safety due to unforgiving rural road network and poor driver behaviour

  These issues are all captured by the problem statements

- **Have there been or will there be changes in Council's strategic goals set through the LTP?**
  - Not sure yet. LTP process still being worked through for each council.

- **How effective has your existing strategic case been in guiding decision making?**
  - It has generally been effective, and has resulted in regional maintenance contracts which are generally aligned with the principles of the AMP. However, it is taking a while for the correct culture and behaviours from the AMP to be adopted throughout the NTA, particularly by those on the ground carrying out the work. This is a work in progress. Also, the NTA restructure has occurred almost one year into the maintenance contracts, which has allowed old behaviours to continue and has made it more difficult to drive the right culture through the contracts.

- **What benefits, KPIs and transport outcomes have been or will be achieved in the 2018-21 programme?**

- Reseal and rehabilitation programming improved for FNDC through use of dTIMS. Sealed road rehabilitation costs/km have come down for WDC due to carrying these out through the new maintenance contracts.
- Wet road crashes are being considered during the development of the reseal programme and is generally resulting in lower wet road loss of control crashes for KDC and WDC. This should also start to show in the FNDC statistics going forward.
- Improvement in unsealed road maintenance through new contracts and improvements in dust control through use of dust suppressants on forestry roads and sealing of the Wright Rd, Ngapipito Rd and Pipiwai Rd forestry routes.
- Annual culvert inspections and cleaning being undertaken which should reduce flooding, scour and potential for slips.
- Boom mulching through the new maintenance contracts is making a big difference in keeping sight lines clear.
- School zone sign renewals in WDC have reduced the maintenance costs of these signs.
- Better focus on high risk safety areas and speed management is likely to show benefits going forward.
- Resilience upgrades being undertaken to address long standing slips and flooding areas.
- Development of strategies for unsealed roads, forestry routes, drainage system, footpath renewals, retaining walls, resilience and traffic counts. This will inform the 2021-24 AMP.
- Development of transport strategies for Whangarei City and Far North District, and a Network Opertaing Framework (NOF) for Mangawhai and Whangarei will guide capital investment in these areas.

- **How is Council performing in their measured levels of service?**
  - This is described in Section 3.4 Current Level of Service.

- **How is Council performing relative to their peers using PMRT and ONRC performance measures?**
  - This is described in detail in Section 3.5 Desired Levels of Service.

- **What new national/regional strategic drivers have important relevance to investment on your network e.g. Safe Networks Programme and adoption of Road to Zero**
  - New GPS – Strategic priorities: Safety, Better Travel Options, Climate Change and Improving Freight Connections.
  - NZTA's Arataki – Step changes: Urban Form, Urban Mobility, Safety, Climate Change and Regional Development
  - New RLTP and RPTP
  - Revitalisation of the Northland Rail Network and connection to Northport
  - Potential Ports of Auckland shift to Northport
  - Safe Networks Programme, Road to Zero and Tackling Unsafe Speeds
  - Transport Strategies: Whangarei City Transport Strategy PBC, Far North Integrated Transport Plan, Mangawhai and Whangarei Network Operating Frameworks and Township Spatial Plans
  - Twin Coast Discovery Route business cases

- Additional funding sources: PGF, TIF and CIP "Shovel Ready" funding (COVID-19 Recovery Plan). There is also a question of how we show these additional but uncertain funding sources in the AMP.

- **What changes (if any) need to be considered through adoption of your new procurement strategy?**
  - The NTA procurement strategy was adopted in September 2017 and will need to be updated in 2021.
  - The NTA undertook the REG Procurement Improvement Plan process and this identified the following changes that should be undertaken:
    - Procurement plans should be developed for projects to identify the best procurement model for the available market.
    - A supplier panel should be developed (or use the NZTA Framework) to attract more competition and reduce the tendering costs to the industry.
    - Better communication with suppliers to enable them to better gear up for the available work. This is made more challenging by uncertainty in when projects are likely to be funded due to NZTA's business case environment and current funding availability, the lottery of PGF funding and the potential roll-out of Covid-19 economic response "shovel ready" work.
  - In addition to the above, the FNDC procurement board process, which can take up to three to six months to get procurement plans approved and contracts awarded, is currently being reviewed to provide a more streamlined process.

- **Are there any new risks or uncertainties that impact on the delivery of your programme: e.g. lack of suppliers for competitive procurement, complexities with community engagement impacting scope and timeframes, changes in Council staff etc?**
  - As mentioned above, the FNDC procurement board process can delay contract procurement in the Far North. It can take up to 3 months to award contracts and 6 months to go through the whole procurement process. This process is currently being reviewed.
  - Lack of suppliers in Northland is an ongoing issue, and particularly for work in the Far North for specialist work such as bridging or streetlights etc.
  - NTA restructure has just been completed, with approximately 30% new staff being employed in the last 1.5 years. This restructure still needs to be fully bedded-in, communication systems need to be improved between teams and the right culture developed throughout the organisation.
  - Approval of funding is a current risk, with capital projects delayed due to NZTA funding constraints or business case processes. Uncertainty of PGF timing and approvals and the likely Covid-19 response plan "shovel ready projects" are also a risk of diverting resources from core activities to these improvement works.
  - There is the potential risk of zero or low rate increases being set by councils in response to the COVID-19 outbreak. There was a short term impact on rate increases for the 2020/21 year for all three councils. However, the councils are now proposing rate increases for their 2021/31 LTPs.

- **Have you completed your improvement programme? How will you capture/integrate the outcomes of your improvement plan into the development of your AMP e.g. new evidence, improved RAMM data, new systems for collecting and analysing ONRC performance measures, new spatial tool etc**
  - Although the NTA is still working through the improvement plan, there has been good progress made (about 91% complete as of November 2020). We have had a significantly larger improvement plan for the 2018/21 period due to recognition that there were many strategies/processes still to be developed (ie unsealed roads, drainage, resilience, forestry update, footpath process).

- Most of these improvements have been completed in time for incorporation into the new AMP. As the improvements are being developed, we are progressively including this into the AMP thinking.

- **Increased knowledge and maturity - Are there any changes you would like to make to your document considering your learnings from the REG programme over the last couple of years? What examples have you seen that you thought were relevant and useful in the Waimakariri context?**
  - We continue to work on making the document more streamlined and easier to read and understand. This is likely to be achieved with continuing focus on more pictures and less text. This recognises the different way in which people digest information.
  - Moving from three individual district-wide AMPs to one regional AMP. This will result in a consistent approach across the region and will streamline the AMP development and assessment process (just one AMP instead of three to be developed and assessed).
  - We have also taken into account the feedback from REG on the previous AMPs and this is being incorporated into the regional AMP.

Additional prompts associated with COVID-19 impacts:

Prompts for Community Resilience

1. Are there changes in my community that mean some of my problem statements are no longer relevant?
   - Tourism down? No, tourism has bounced back following the COVID-19 lockdowns. This is due to domestic tourism taking over from international tourism because New Zealander's are no longer be able to take holidays overseas. It is hard to know the long-term impact, but it is likely that tourism in Northland will need to be more orientated towards domestic tourists until the country's borders are opened again which could be months away from selected countries being able to visit and years away from the borders being fully opened. Overall, there is unlikely to be a significant change in the number of tourists visiting hot spots like Paihia, Kerikeri and Mangawhai.
   - Industry closures? Some industries are partially shutting down, including the LVL plant in Marsden Point and the Marsden Point Oil refinery which is looking to stop refining oil and become an import storage depot for petrol and diesel. This will also mean that bitumen will no longer be refined locally. It is too early to know the full impacts of these changes. In the example of the LVL plant which takes logs etc, this will make little difference because the logs will just be shipped out via Port Marsden which is located next door. However, the changes to the Marsden Point Oil refinery will make a significant impact to road sealing in Northland because 70% of Northland's bitumen supply comes directly from the refinery. Imported bitumen will be more expensive and this cost impact will affect sealing and asphalt costs in Northland more than any other region in the country who already mostly use imported bitumen.
   - People working from home? Following the COVID-19 lockdown, there are more people working from home at least a day or two a week. However, this has not had a significant impact on traffic volumes and peak hour congestion in Whangarei is busier than ever. The FNDC has implemented a directive for its staff to work from home wherever possible.
   - Less traffic, etc? There was a short-term impact on traffic flows during the COVID-19 lockdown which saw traffic volumes on most roads be reduced to between 20%-40% of normal. However, traffic volumes have bounced back to pre-lockdown levels. Immigration levels have stayed high with ex-pat New Zealanders returning and the normal outward migration being curtailed due to fears of COVID-19 in other countries. This has been

combined with an increase in domestic tourism which has more than replaced the international visitors. Long term growth predictions by both NZTA and WDC, indicate that growth in Northland is unlikely to be significantly affected by COVID-19 impacts. This is described in more detail in Section 4.1.

2. Are there new community goals that will change the way we approach delivery of our projects?
    - Unknown at this stage, but possibly there will be a desire to be target initiatives that stimulate job growth, but at the same time reduce cost to ratepayers.
3. Are the benefits we are seeking now different from those prior to Covid-19?
    - Possibly, but new initiatives to drive job growth are likely to be funded separately outside of the NLTF which means that the core benefits that we are trying to achieve will remain the same.
4. Do I need to start working with providers to help them increase their capacity and capability?
    - The NTA worked with the public transport providers during the COVID-19 lockdown to help them navigate the social distancing restrictions. The NTA is continuing to promote public transport to make sure that passenger numbers do not drop due to virus fears. This has seen bus patronage bounce back to pre-lockdown levels.
    - The government stimulus investment through the CIP "shovel ready" and PGF projects is starting to put pressure on workloads for the NTA, consultant and contracting industries in Northland. This is currently being managed, but more capacity may be required through the development of these projects.

Other practical considerations associated with COVID-19 impacts

a. Is your Council looking to hold or reduce its rates? FNDC, KDC and WDC have all reduced their proposed rate increases for 2020/21, but still allow for escalation. Currently the three councils are looking a lifting rates increases to pre-lockdown levels for their 2021/2031 LTPs at this stage.

b. Will your Council reduce its work programme? Possibly, but this is most likely to be in the Capital area, rather than MOR.

c. Will CIF PGF investment impact on your M, O & R programmes? This is not likely to have much of an impact in the short-term, although in the medium to long term there is likely to addition costs due to greater lengths of sealed network through PGF funded seal extensions. The three council's were awarded forestry redeployment funding for maintenance/renewal activities such as vegetation clearing, heavy metalling of unsealed roads and watertable clearing. This work has been undertaken and has had a minor impact on the MOR programme.

d. Is development work in your area (if any) likely to slow? There was a short-term decrease in development during the lockdown, but this has rebounded back to pre-lockdown levels and beyond. The impact of returning ex-pat New Zealanders and upsurge in domestic tourism is keeping the economy growing, and long term predictions are that Northland will continue to grow.

e. If so, are you likely to see a reduction in prices? No, prices are likely to increase due to the impacts of CIP investment in additional "shovel ready" infrastructure spending and PGF projects this is starting to result in too much work for the construction industry to handle and result in their rates increasing for new tenders. The NTA have recently (2018) let new maintenance contracts across the region and these will not need to be retendered for up to another 6 years, so most of the MOR programme rates are locked in for the foreseeable future and will not change much apart from escalation. However, the change to the business model for the Marsden Point Oil Refinery will result in all bitumen being sourced from overseas. This is likely to result in bitumen prices increasing in Northland because it currently sources 70% of its bitumen from the refinery and the additional cartage and cost of overseas bitumen will impact sealing costs.

f. Do the contractors in your area have sufficient resources? No, the contractors are currently stretched, and as explained above, more work is likely to result in increased prices.

g. How will you deliver your AMP if you are expected to manage additional works? We are outsourcing a lot of the CIP and PGF work using external consultants to develop the designs and supervise the construction, to avoid having a negative impact on our core AMP programme which is largely based around the MOR programme.

h. Have you any projects already designed and ready to go? There are some projects which are designed or mostly designed and ready to go. There are also some projects, such as tree clearing, heavy metalling, watertable maintenance, cycle trail construction, which need very little design and have been commenced quite quickly through CIP investment.

3.4 Council LTP Level of Service (what we provide now)

Levels of service is used as a mechanism to communicate to our customers what we promise to deliver, the rationale to which assets are managed and how funding is invested.

The LOS link directly to performance measures allowing progress to be monitored and reported to our stakeholder and customers through the annual reports.

They are set by legislative requirements, national and regional policies and plans and what our customers and stakeholders have told us what is important to them while being balanced with what the desired level of investment is.

The current Levels of Service are set in the Council's Long Term Plan and are monitored through the Annual Report prepared at the end of each financial year.

The following monitoring of the Levels of Service has been taken from the council Annual Reports over the past three years. Results shown in green indicate that the LOS was achieved or in red indicating that it was not achieved.

Mandatory performance measures required by the Department of Internal Affairs are shown with (DIA) beside them.

The overall council performance against the LTP measures is detailed below and in the following table.

- **FNDC** – Achieved 6 of its 10 LTP measures in 2018/19, three were not achieved and one could not be determined.
- **KDC** – Achieved 6 of its 9 LTP measures in 2018/19, with two not achieved and one partially achieved.
- **WDC** – Achieved 2 of its 8 LTP measures in 2018/19, with six not achieved.

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

NTA Council Long Term Plans - Level of Service Performance Measures Assessment

CURRENT MEASURES - PERFORMANCE & PROPOSED CHANGES

Includes FNDC, KDC and WDC Feedback

Key Driver	Performance Measure	LG Mandatory Measure?	FNDC ID	FNDC Results 2016/17	FNDC Results 2017/18	FNDC Results 2018/19	FNDC 2018/19	FNDC 2019/20	FNDC 2020/21	FNDC 2021-28	KDC ID	KDC Results 2016/17	KDC Results 2017/18	KDC Results 2018/19	KDC Comments	KDC 2018/19	KDC 2019/20	KDC 2020/21	KDC 2021-28	WDC ID	WDC Results 2016/17	WDC Results 2017/18	WDC Results 2018/19	WDC 2017/18 Target	WDC 2018/19	WDC 2019/20	WDC 2020/21	WDC 2021-28	Comments
Road Safety	The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number	Yes	1.1.1	36	33	31	No increase	No increase	No increase	No increase	2	N/A	N/A	4		<=10	<=10	<=10	<=10	1.1.1	6	3	0	0	0	0	0	0	0	Mandatory measure - but standardise the target to 0 change in fatal and serious injury crashes.
~~Road Safety~~	~~The percentage of fatal and serious injury crashes on the district's roading network where the road condition (i.e. skid resistance testing factor, in relation to vehicle kilometers travelled on curvature~~	No	1.1.2	N/A	N/A	0	< previous year	< previous year	< previous year	< previous year																			Measure is essentially a duplicate of the mandatory measure above and is not in line with the Safe System Approach. Remove measure if possible. FNDC, KDC & WDC - Happy to remove measure
~~Road Safety~~	~~There are no fatalities or serious injury crashes on the local roads/streets directly contributed to road condition (measured by coroner/utility findings)~~	No									1	N/A	0	0		0	0	0	0										Measure is basically a duplicate of the mandatory measure above and is not in line with the Safe System Approach. Remove measure if possible. FNDC, KDC & WDC - Happy to remove measure
Road Condition	The average quality of ride on a sealed local road network, measured by smooth travel exposure	Yes	1.1.3	78%	77%	74%	>=87%	>=87%	>=87%	>=87%	3	72%	73%	71%		>=90	>=90	>=90	>=90	1.1.1	88%	82%	78%	>=87%	>=87%	>=87%	>=87%	>=87%	Mandatory measure - consider standardising the target if appropriate
Road Condition	The percentage of the sealed local road network that is resurfaced	Yes	1.1.4	3.2%	3.2%	3.2%	>=2%	>=2%	>=2%	>=2%	6	6.4%	5.3%	11.6%		>6.7%	>6.7%	>6.7%	>6.7%	1.1.4	12%	6%	7.6%	>=4%	>=4%	>=4%	>=4%	>=4%	Mandatory measure - consider standardising the target if appropriate
~~Road Condition~~	~~Residents' satisfaction with the rolling network~~	No																		1.1.2	77%	79%	51%	>=81%	>=81%	>=81%	>=81%	>=81%	Difficult measure, because very subjective and often affected by the State Highway network. WDC happy to remove
Road Condition	Our sealed and unsealed network will meet the agreed Council's levels of service specified in our roading contracts and the network is at least 75% compliant at all times	No	1.1.5	88%	91%	83.5%	>=95%	>=95%	>=95%	>=95%																			Probably a good measure but how to measure this? Maybe use Customer Satisfaction?
Road Condition	The percentage of the sealed local road network that is rehabilitated	No																		1.1.5	0.8%	0.8%	0.8%	>=1.2%	>=0.8%	>=0.8%	>=0.8%	>=0.8%	Probably a good measure - should look to have this as a standard measure for all Councils. FNDC, KDC & WDC happy with this.
Achievement	~~Resurface the roading network as planned in Council's roading programme~~	No	1.1.6	N/A	N/A	93%	>=90% of planned work completed	>=90% of planned work completed	>=90% of planned work completed	>=90% of planned work completed																			This is almost a duplicate of the mandatory measure for resurfacing above. Need to have flexibility to manage programme to target the right areas. Look to remove this measure. FNDC, KDC & WDC - Happy to remove this measure
Achievement	~~Extend the footpath and cycleway network as planned~~	No	1.2.1	N/A	N/A	98%	>=90% of planned work completed	>=90% of planned work completed	>=90% of planned work completed	>=90% of planned work completed																			This measure is probably not required because it is partially covered by the mandatory footpath condition measure. Given the scale of the footpath programme is this measure required? Look to remove measure? FNDC - Local Board issue. Keep and roll out for KDC & WDC but change name to be "Extend the Footpath and Cycleway Network as Planned".
Achievement	Maintenance of the sealed network measured by the actual spent to budget percentage for the surfacing renewal budget	No									5	N/A	N/A	187.81%		Y=95% +=105%	Y=95% +=105%	Y=95% +=105%	Y=95% +=105%										This is almost a duplicate of the mandatory measure for resurfacing above. Need to have flexibility to manage programme to target the right areas. Look to remove this measure. FNDC, KDC & WDC - Happy to remove.
Achievement	The length of high, unsealed local network that is graded meets or exceeds NZTA One Network Road Classification measurement sets (agreed from RAMM Contractor)	No									6	140km 1318km 859km	159km 1169km 617.7km	141.66km 1169.7km 756.2km		Secondary Collector 140km min, Access 1200km min, Low Volume 750km min	Secondary Collector 140km min, Access 1200km min, Low Volume 750km min	Secondary Collector 140km min, Access 1200km min, Low Volume 750km min	Secondary Collector 140km min, Access 1200km min, Low Volume 750km min										This is too specific a measure to be useful and we are wanting to go away from grading as an outcome in fact we want to limit grading by applying an appropriate wearing course. Look to remove this measure. FNDC, KDC & WDC - Happy to remove
Achievement	Execution of capital works programme - maximum uptake, within 3 year period, of the approved NZTA budget for Kaipara District provide Council can also fund the local share	No									7	N/A	N/A	102%		>=95%	>=95%	>=95%	>=95%										Whilst this measure may have some merit (applying to LCLR and capital programme), there are many things which affect projects that are outside of Council's controls. Can only be considered as a 3 year performance objective because LTP/NLTP owned on 3 year funding cycle. Perhaps consider including this but changing the measure. FNDC, KDC & WDC - happy to have this measure.
Service	The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the time frame specified in the LTP	Yes	1.1.4	93%	91%	92.75%	>=95%	>=95%	>=95%	>=95%	9	92%	95%	91.67%		90%	90%	90%	90%	1.1.6	95%	94%	80%	>=95%	>=95%	>=95%	>=95%	>=95%	Mandatory measure - consider standardising the target if appropriate
Service	The Hokianga Ferry Service will run in accordance with advertised timetable	No	1.1.7	99%	98.9%	99.3%	>=95%	>=95%	>=95%	>=95%																			Probably a good measure which should be kept. Could also have the same measure for the Te Matau a Pohe and Kotuitui Whitinga bridges in Whangarei. Keep as FNDC only measure. WDC does not need this measure as the Te Matau a Pohe and Kotuitui Whitinga bridges are operational 99% of the time.
Footpath Condition	The percentage of footpaths within a territorial authority district that fall within the level of service or service standard for the condition of footpaths that is set out in the territorial authority's relevant documentation (such as its annual plan, activity management plan, asset management plan, annual works programme or LTP)	Yes	1.2.3	N/A	N/A	Gr 1 - 9% Gr 2 - 48% Gr 3 - 41% Gr 4 - 1% Gr 5 - 2%	Maintain/ increase	Maintain/ increase	Maintain/ increase	Maintain/ increase	8	54%	53%	56%	Percentage of residents fairly/very satisfied with footpaths	71%	71%	71%	71%	1.2.1	75%	15%	74%	>=65% in fair or better condition	>=65% in fair or better condition	>=65% in fair or better condition	>=65% in fair or better condition	>=65% in fair or better condition	Mandatory measure - consider standardising the measurement of target (based on Onsite survey results). Also consider standardising the target if appropriate.
Traffic Flow	~~Residents' satisfaction with the way our District is managing its commuting evening traffic flows~~	No																		1.3.1	54%	30%	46%	>=70%	>=70%	>=70%	>=70%	>=70%	Specific measure to Whangarei. Difficult measure to achieve given any congestion will cause dissatisfaction and it doesn't matter if this is on the local roads or on the State Highways. Should consider changing the measure? Keep as WDC only measure

Performance Measure Legend

- Mandatory Measure (Department of Internal Affairs)
- ~~Measure Proposed to be Deleted~~

Results Legend

- Achieved
- Not Achieved
- Partially Achieved
- Not Applicable

To standardise the council LTP performance measures over the three councils, discussions with the individual councils have been held to consolidate the performance measures. The results of these discussions and the proposed measures and targets are shown in the table below:

NTA Council Long Term Plans - Level of Service Performance Measures Assessment **PROPOSED FINAL MEASURES**

			FNDC							KDC							WDC						
Key Driver	Performance Measure	LG Mandatory Measure?	Results 2016/17	Results 2017/18	Result 2018/19	2021/22	2022/23	2023/24	2024-2031	Results 2016/17	Results 2017/18	Result 2018/19	2021/22	2022/23	2023/24	2024-2031	Results 2016/17	Results 2017/18	Result 2018/19	2021/22	2022/23	2023/24	2024-2031
Road Safety	The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number	Yes	N/A	-3	-2	<= 0	<= 0	<= 0	<= 0	N/A	N/A	4	<= 0	<= 0	<= 0	<= 0	-6	3	0	<= 0	<= 0	<= 0	<= 0
Road Condition	The average quality of ride on a sealed local road network, measured by smooth travel exposure	Yes	95%	92%	94%	=>88%	=>88%	=>88%	=>88%	93%	93%	91%	=>90	=>90	=>90	=>90	86%	83%	84%	=>85%	=>85%	=>85%	=>85%
Road Condition	The percentage of the sealed local road network that is resurfaced	Yes	8.2%	8.7%	4.2%	=>6%	=>6%	=>7%	=>8%	6.4%	9.7%	12.0%	=>8%	=>8%	=>7%	=>7%	12%	8%	7.8%	=>9%	=>9%	=>8%	=>8%
Road Condition	The maintenance of the roads meets the Council level of service targets as specified in our roading maintenance contracts	No	88%	91%	83.5%	=>85%	=>85%	=>85%	=>85%	N/A New Measure	N/A New Measure	N/A New Measure	=>85%	=>85%	=>85%	=>85%	N/A New Measure	N/A New Measure	N/A New Measure	=>85%	=>85%	=>85%	=>85%
Road Condition	The percentage of the sealed local road network that is rehabilitated	No	N/A New Measure	N/A New Measure	N/A New Measure	>=0.5%	>=0.5%	>=0.6%	>=0.5%	N/A New Measure	N/A New Measure	N/A New Measure	>=0.6%	>=0.6%	>=0.5%	>=0.6%	0.8%	0.8%	0.4%	=>0.4%	=>0.4%	=>0.5%	=>0.5%
Service	The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the time frame specified in the LTP	Yes	95%	91%	92.75%	=>95%	=>95%	=>95%	=>95%	92%	96%	93.87%	=>95%	=>95%	=>95%	=>95%	95%	94%	80%	=>95%	=>95%	=>95%	=>95%
Service	The Hokianga Ferry Service will run in accordance with advertised timetable **(FNDC ONLY)**	No	99%	98.9%	99.3%	=>95%	=>95%	=>95%	=>95%														
Footpath Condition	The percentage of footpaths within a territorial authority district that fall within the level of service or service standard for the condition of footpaths that is set out in the territorial authority's relevant documentation (such as its annual plan, activity management plan, asset management plan, annual works programme or LTP)	Yes	N/A	N/A	Gr 1 - 9% Gr 2- 45% Gr 3 - 44% Gr 4 - 1% Gr 5 - 2%	=>90% in fair or better condition	=>90% in fair or better condition	=>90% in fair or better condition	=>90% in fair or better condition	56%	63%	56%	=>90% in fair or better condition	=>90% in fair or better condition	=>90% in fair or better condition	=>90% in fair or better condition	95%	95%	99%	=>90% in fair or better condition	=>90% in fair or better condition	=>90% in fair or better condition	=>90% in fair or better condition

Performance Measure Legend

= Mandatory Measure (Department of Internal Affairs)

Results Legend

= Achieved

= Partially Achieved

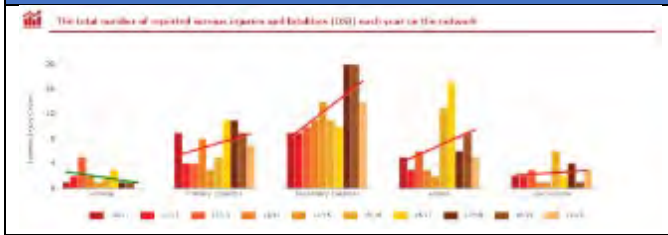
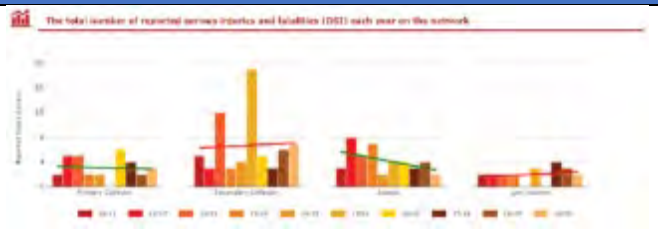
= Not Achieved

= Not Applicable

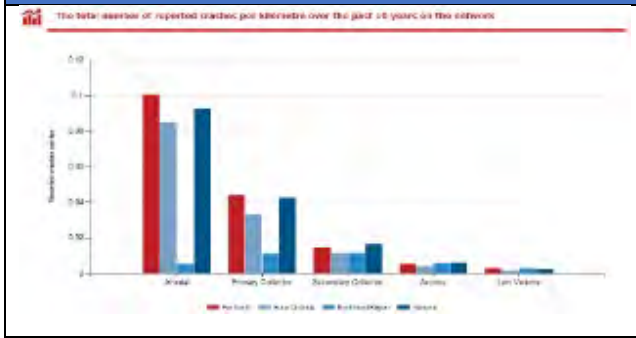
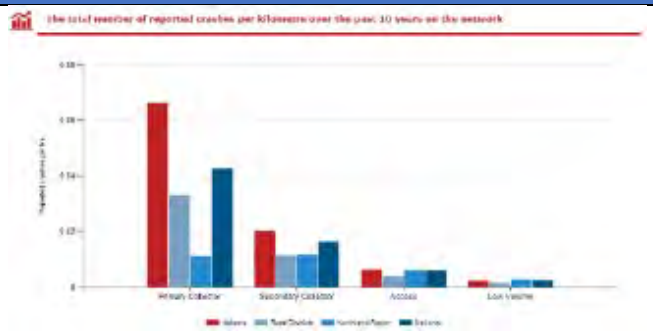
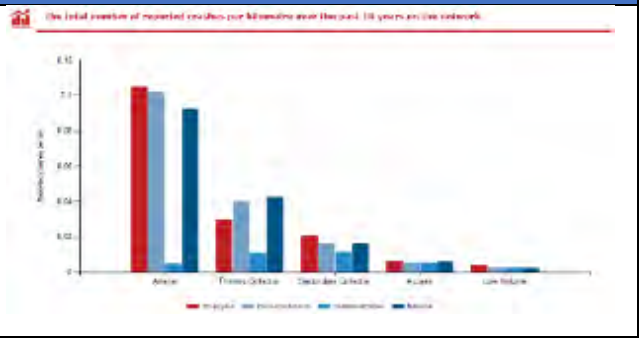
3.5 Nationally-Rated Key Customer Levels of Service

Customer Levels of Service have been determined by performance against the Roading Efficiency Group's (REG) One Network Road Classification (ONRC) performance measures. The following graphs show how the networks are performing against the ONRC Customer Level of Service and NZTA Peer Group Comparison Charts.

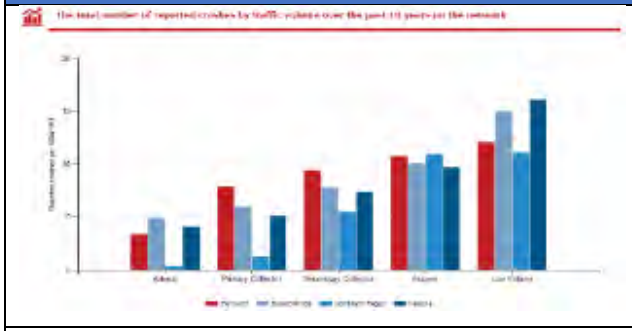
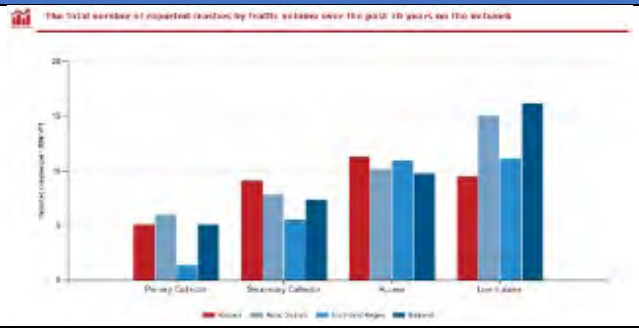
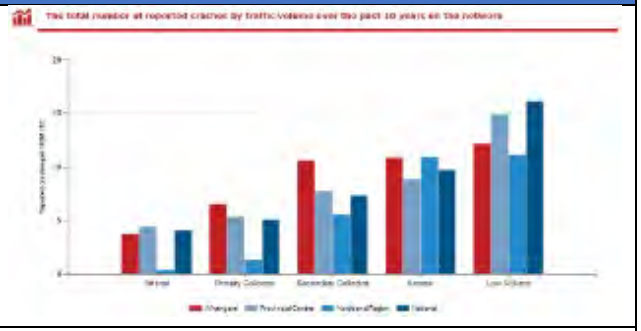
ONRC Safety CO1 – Number of Fatal and Serious Injuries on the Network

FNDC	KDC	WDC
		
Arterial ↓ Primary Collector ↑ Secondary Collector ↑ Access ↑ Low Volume ↑	Primary Collector ↓ Secondary Collector ↑ Access ↓ Low Volume ↑	Arterial ↑ Primary Collector ↑ Secondary Collector ↑ Access ↑ Low Volume ↓
FNDC Number of DSI – There appears to be an increasing trend in death and serious injury (DSI) crashes on all of FNDC's road classes, apart from the Arterial roads which are showing a decreasing trend. This increasing trend is a significant concern. Whilst some of this increase will be due to rebound in traffic volumes from the global financial crisis, it also reflects the unforgiving nature of the road network and often poor driver behaviour.	**KDC Number of DSI** – There appears to be a slightly increasing trend in death and serious injury (DSI) crashes on KDC's Secondary Collector and Low Volume roads. The other road classes appear to be decreasing. This is a generally good result and shows the impact of safety interventions over the past five years.	**WDC Number of DSI** - There appears to be an increasing trend in death and serious injury (DSI) crashes on all of WDC's roads, apart from the Low Volume roads. The Arterial and Secondary Collector roads have a rapidly increasing trend which is a significant concern. As for Far North, this is likely to be a reflection of the unforgiving nature of the road network and growth in traffic volumes following the Global Financial Crisis. The focus should be on addressing crashes on Arterials and Secondary Collectors.

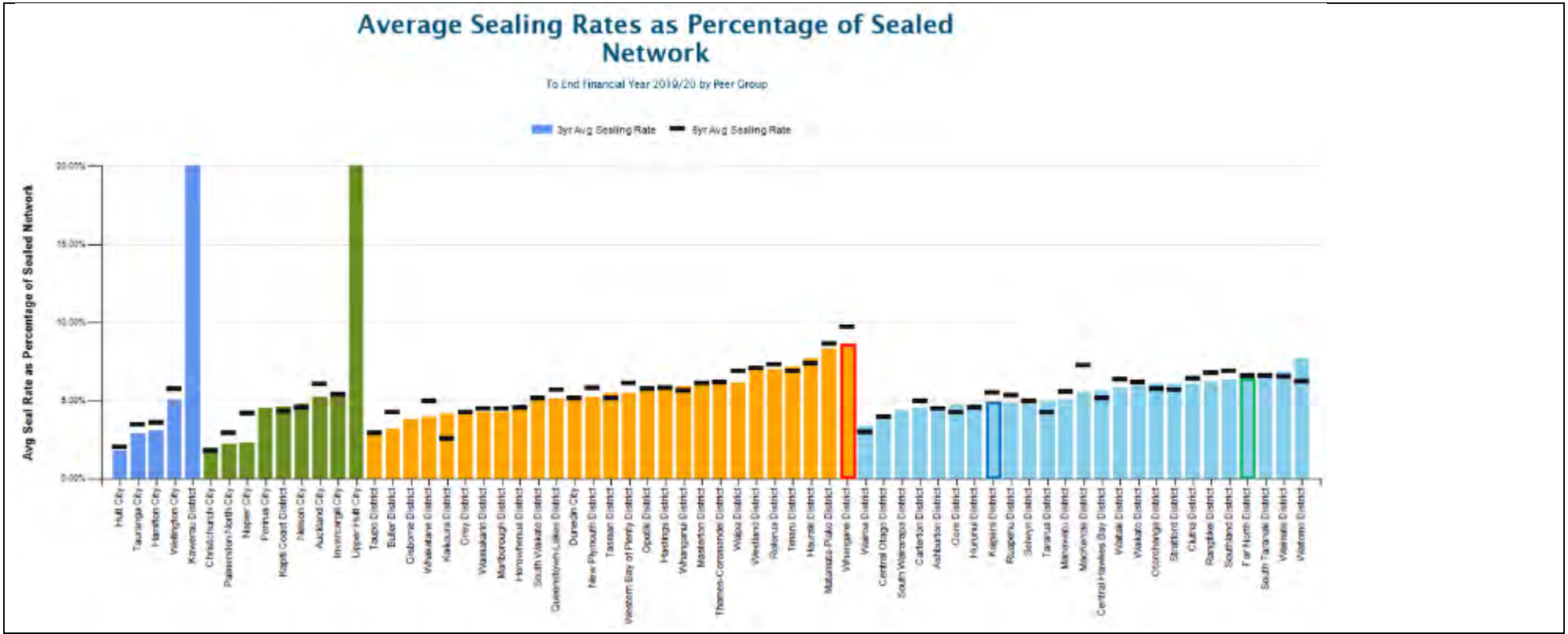
ONRC Safety CO2 – Collective Risk

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
FNDC Collective Risk – The collective risk of the FNDC network is higher than its peer group for all road classes and is significantly higher for Arterial and Primary Collector and Low Volume roads. This is a strong indicator that FNDC have a higher number of DSI crashes/km (ie crash density) than its peer group and is a significant concern. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Arterial roads is Medium and is Low-Medium or Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Arterial road network.	**KDC Collective Risk** - The collective risk of the KDC network is higher than its peer group for all road classes and is significantly higher for Primary and Secondary Collector roads. This is a strong indicator that KDC have a higher number of DSI crashes/km (ie crash density) than its peer group and is a significant concern. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Primary Collector roads is Medium and is Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Primary Collector road network.	**WDC Collective Risk** – The collective risk of the WDC network is mostly equal to its peer group, but is slightly higher for its Arterial and Secondary Collector roads. This reflects the investment in road safety on the WDC network over the past 5 years. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Arterial roads is Medium-High and is Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Arterial road network.

ONRC Safety CO3 – Personal Risk

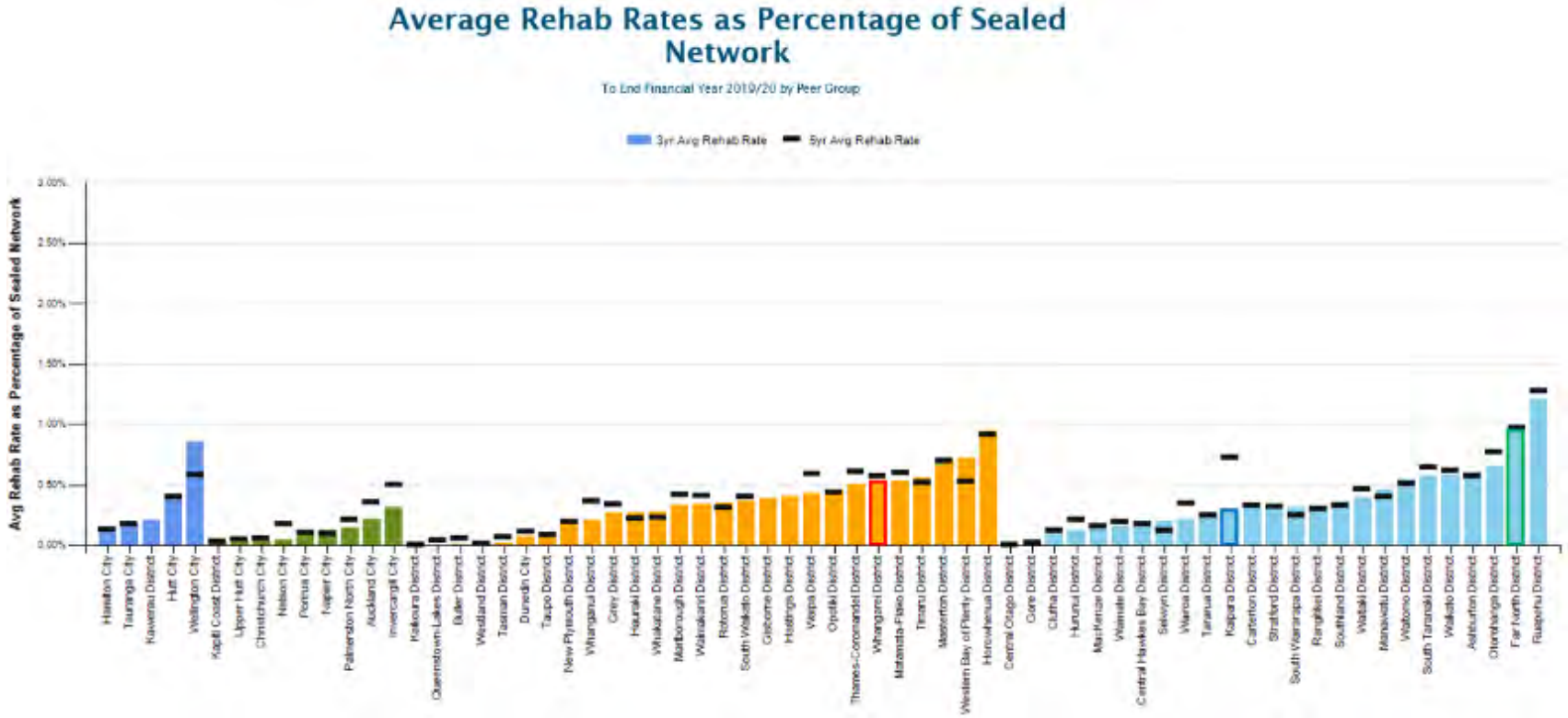
FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
FNDC Personal Risk – The personal risk of the FNDC network is significantly higher for Primary and Secondary Collector roads and higher for its Access roads. The Arterial and Low Volume roads are lower than the peer group. This is a strong indicator that FNDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its collector and Access roads which is a significant concern given the amount of travel on these road classes. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for all road classes apart from Primary Collectors which is Medium-High and Arterial roads which is Low-Medium.	**KDC Personal Risk** - The personal risk of the KDC network is higher than the peer group for its Secondary Collector and Access roads, but is lower for the other road classes. This indicates that KDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its Secondary Collector and Access roads which is a concern. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for Secondary Collector, Access and Low Volume roads and , Low-Medium for Primary Collector roads.	**WDC Personal Risk** - The personal risk of the WDC network is higher than the peer group for the Primary and Secondary Collector and Access roads, but is lower for the other road classes. This indicates that WDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its collector and Access roads which is a concern. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for Secondary Collectors, Access and Low Volume roads, Medium-High for Primary Collector roads and Low-Medium for Arterial roads.

NZTA Peer Group Charts – 3 year Sealing Rates



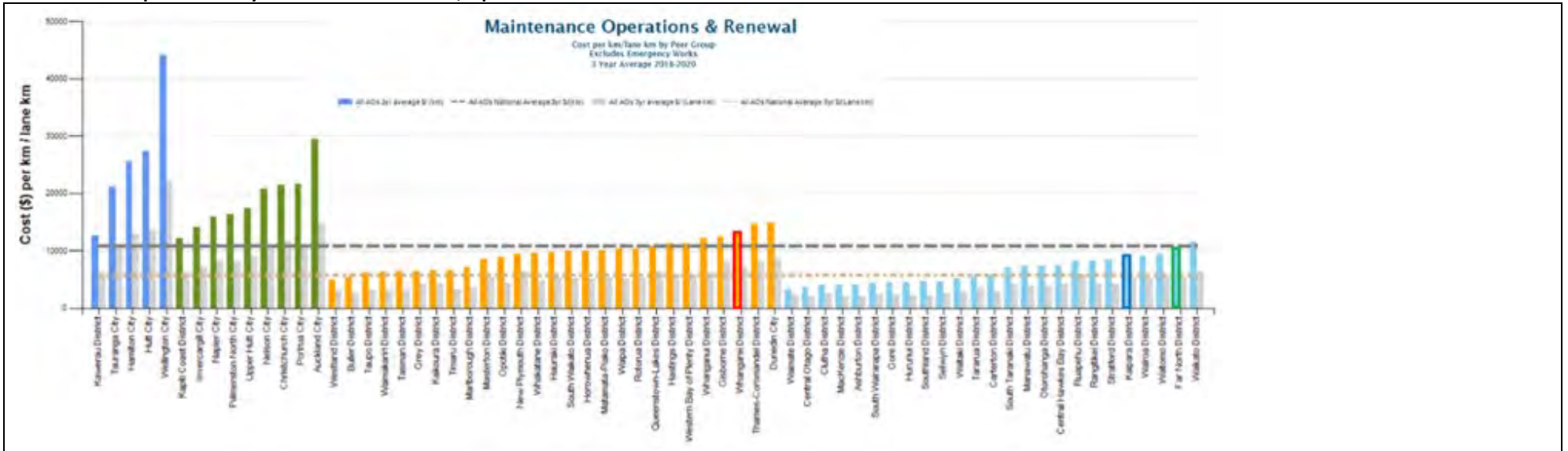
FNDC	KDC	WDC
FNDC Sealing Rate – The sealing rate in the Far North is towards the top of their peer group. This high rate of resurfacing is due largely to a historic Long Term Plan KPI that specifies a target resealing rate of 9%. For the last two years, resurfacing has been optimised through dTIMS and this should see a reduction over time to a relatively sustainable target of 12-13 year cycle (8% sealing rate).	**KDC Sealing Rate** – KDC's sealing rate is below average for its peer group. There is currently a backlog of first coat seals that KDC is resealing due to the historic funding constraints caused by the Kaipara rates strike. This is currently increasing the amount of reseals, and this should stabilise to a relatively sustainable target of 12-13 year cycle (8% sealing rate) from 2021 onward.	**WDC Sealing Rate** – WDC's sealing rate is the highest in its peer group. This is primarily due to a catch up in resurfacing that has been ongoing for the last 5 years. In 2020/21 WDC is aiming to get on top of its legacy of old void fill seals. This should enable Whangarei to lower its reseal programme to a more sustainable target of a 12-13 year reseal cycle (8% sealing rate) from 2021 onward.

NZTA Peer Group Charts – 3 year Rehabilitation Rates



FNDC	KDC	WDC
FNDC Rehabilitation Rate – FNDC has the second highest rehabilitation rate in its peer group. This has mainly been due to early failure of "cheap" seal extensions built in the late 1990's, unstable surfacings through high historic sealing rates and poor optimisation of the programme. The rehabilitation programme is now optimised through dTIMs, field validation and a RAPT type process and should see this rate drop over time.	**KDC Rehabilitation Rate** – KDC's rehabilitation rate is lower than the peer group average, and is considered appropriate and sustainable with more focus on reseals. This rate is less than half of the 5 year average, due to a significant period of catch up in rehabilitations in 2014/15 and 2015/16 following the Kaipara rates strike. The rehabilitation programme is now optimised through dTIMs, field validation and a RAPT type process.	**WDC Rehabilitation Rate** – WDC is in the top third of its peer group and the rehabilitation rate has decreased in the last 3 years. This is primarily due to a catch up in backlog of rehabilitations during the 2015/18 period. Whangarei is now targeting a programme of about 6km of rehabilitation per annum (0.6%) which is considered sustainable. The rehabilitation programme is optimised through dTIMs, field validation and a RAPT type process.

NZTA Peer Group Charts – 3 year Total Maintenance, Operations and Renewal Costs



FNDC	KDC	WDC
FNDC Maintenance, Operations and Renewals (MOR) Costs – FNDC has the second highest MOR costs/km in its peer group (2nd out of 25 councils). However, the South Island and lower North Island councils should be excluded from this comparison because they have far different geology, climate and heavy vehicle loading. This would result in FNDC being 2nd out of 7 Upper North Island councils in its peer group. It should also be noted that FNDC maintain and operate the Hokianga Ferry service which results in them having a higher cost/km.	**KDC Maintenance, Operations and Renewals (MOR) Costs** – KDC has the fifth highest MOR costs/km in its peer group (5th out of 25 councils). As for FNDC, the South Island and lower North Island councils should be excluded from this comparison because they have far different geology, climate and heavy vehicle loading. This would result in KDC being 4th out of 7 Upper North Island councils in its peer group. This shows that KDC's MOR costs are average for the Upper North Island councils in its peer group.	**WDC Maintenance, Operations and Renewals (MOR) Costs** – WDC has the third highest MOR costs/km in its peer group. As for FNDC and KDC, the South Island and lower North Island councils should be excluded from this comparison because they have far different geology, climate and heavy vehicle loading. This would result in WDC being 2nd out of 11 Upper North Island councils in its peer group. While this is still high, it should be recognised that WDC is one of only two Upper North Island councils which has a city and it also has the third highest vehicle travel (VKT) in the overall peer group. WDC also maintain and operate 26 traffic signal sites and two opening bridges which contribute to this cost/km.

3.6 Desired Levels of Service (what our customers want)

Based on the levels of service in the current LTP and the ONRC Customer Levels of Service, and analysis of the stakeholder and customer feedback, we have determined that the following levels of service should be adopted.

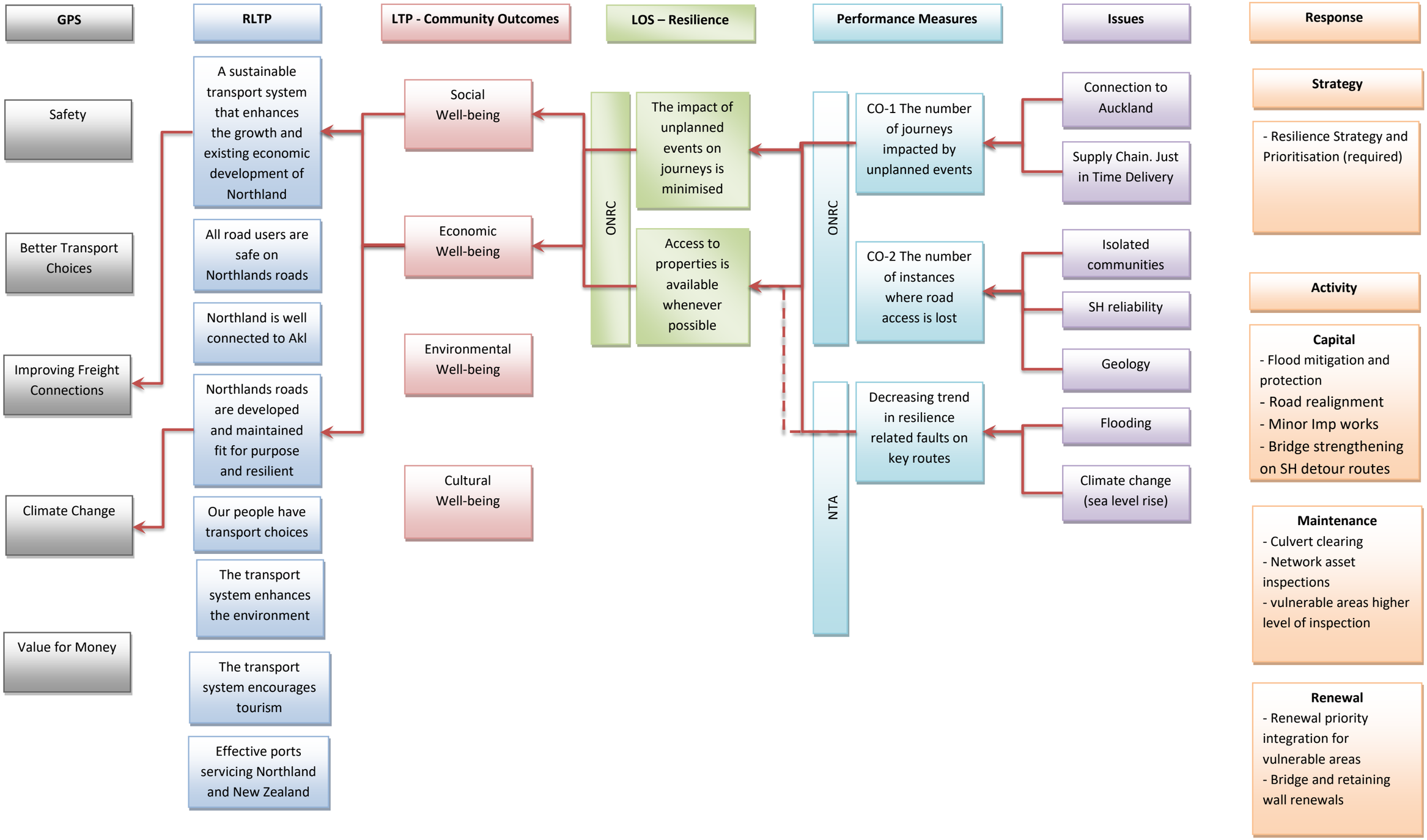
The desired Levels of Service (LoS)have been determined as shown in the diagrams set out under the diagrams below. These diagrams map the logical progression from the identified problems, the corresponding performance measures both council and ONRC measures to the Levels of Service (LoS) set out within councils Long Term Plan (LTP), the Regional Land (RLTP) to the national outcomes sought through the Government Policy Statement (GPS).

A number of these LoS and measures are predetermined through One Network Road Classification (ONRC) and Department of Internal Affairs (DIA). The remaining being determined through community consultation and the stakeholder engagement process.

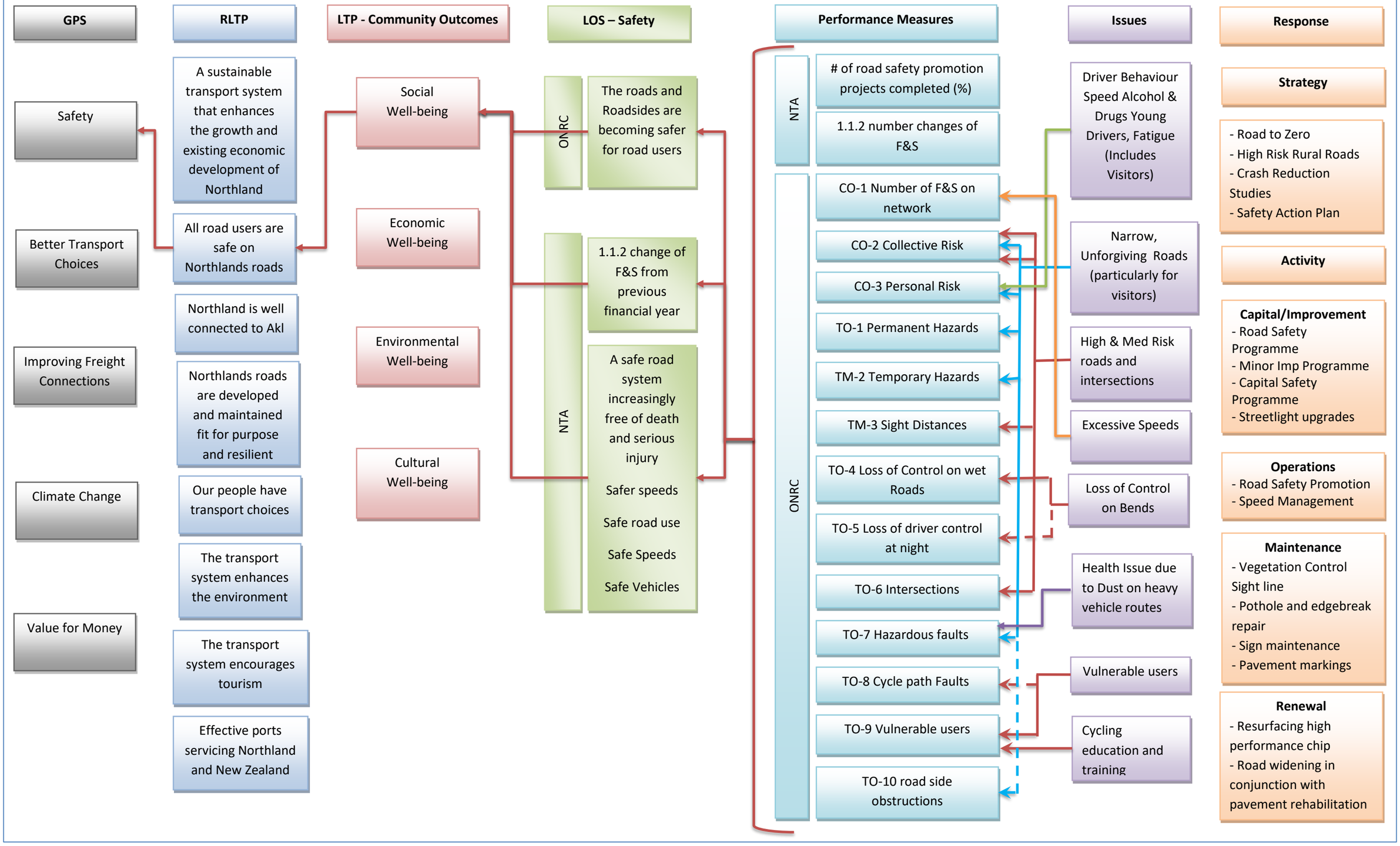
Based on the LoS investment mapping analysis of the stakeholder and customer feedback, the following LoS, performance measures and resulting targets have been adopted, refer to the following Service Area flow charts.

These flow charts present all measures being adopted both customer and technical measures to provide completeness. Sections 3.6.1 to 3.6.3 provides detailed analysis/peer group comparison for each council. This analysis has been completed to help set outcomes for the adopted LoS in relation to the peer groups and/or past performance of the transport network where there is no peer group comparison.

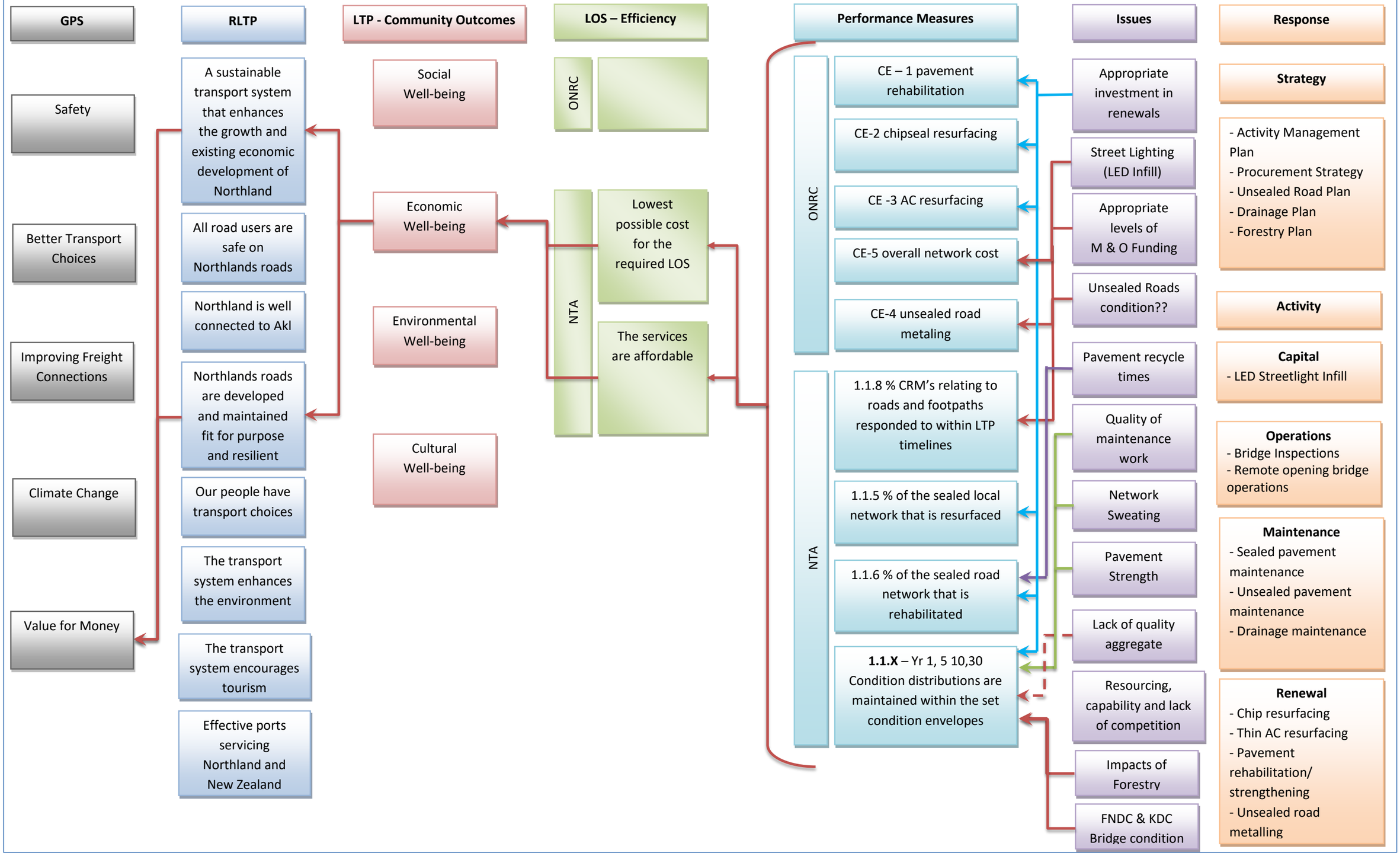
Service Area - **RESILIENCE**



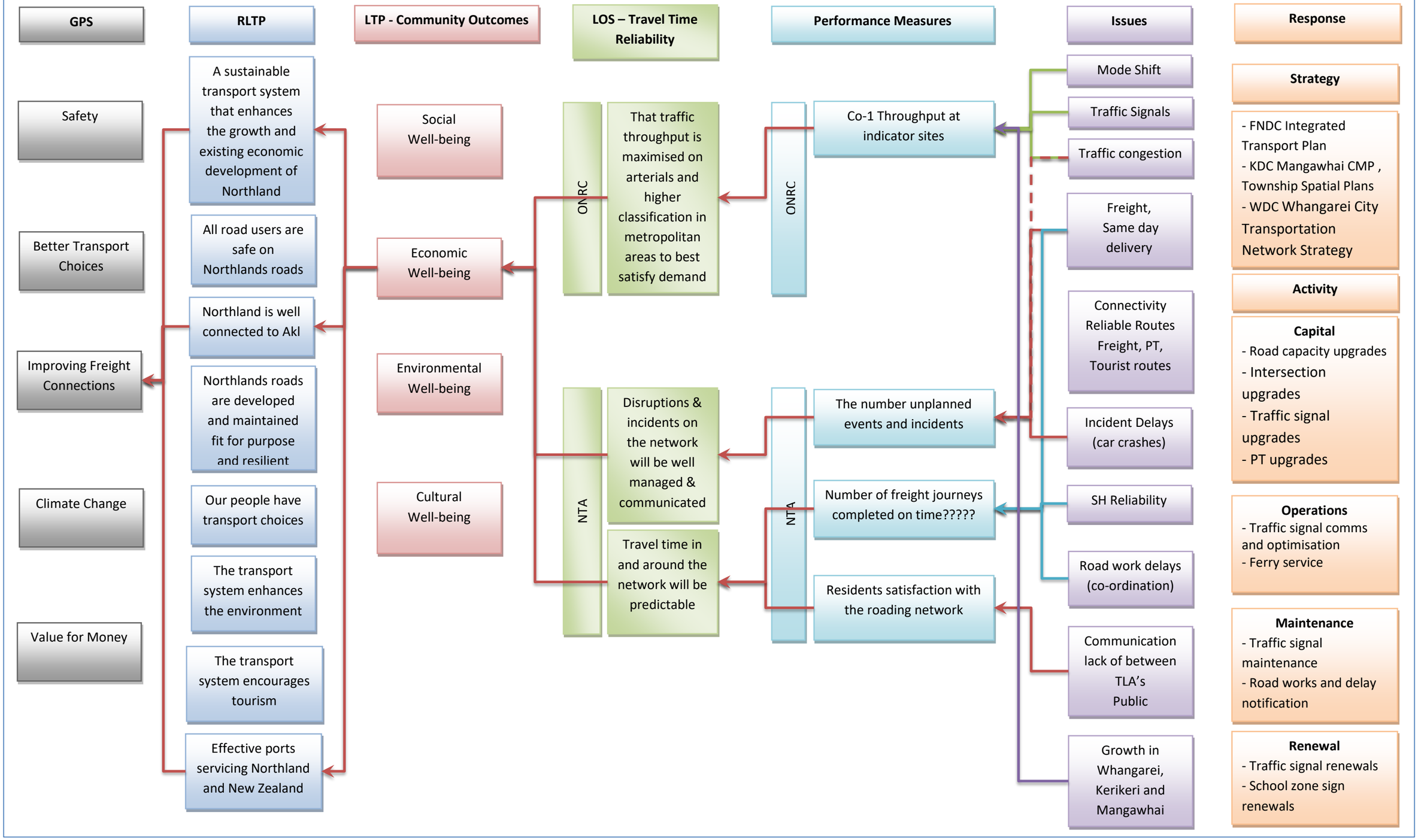
Service Area - **SAFETY**



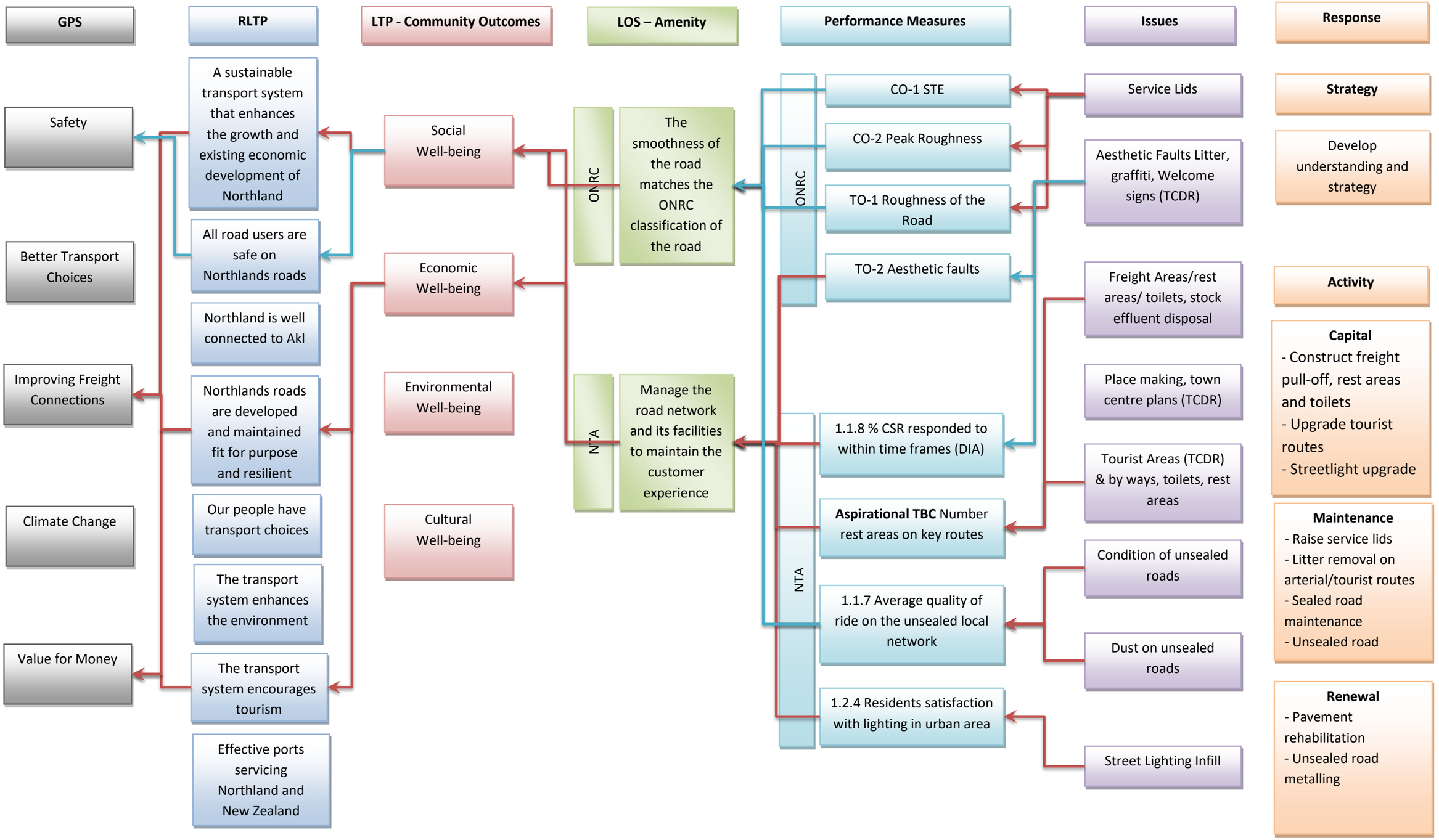
Service Area - **Efficiency**



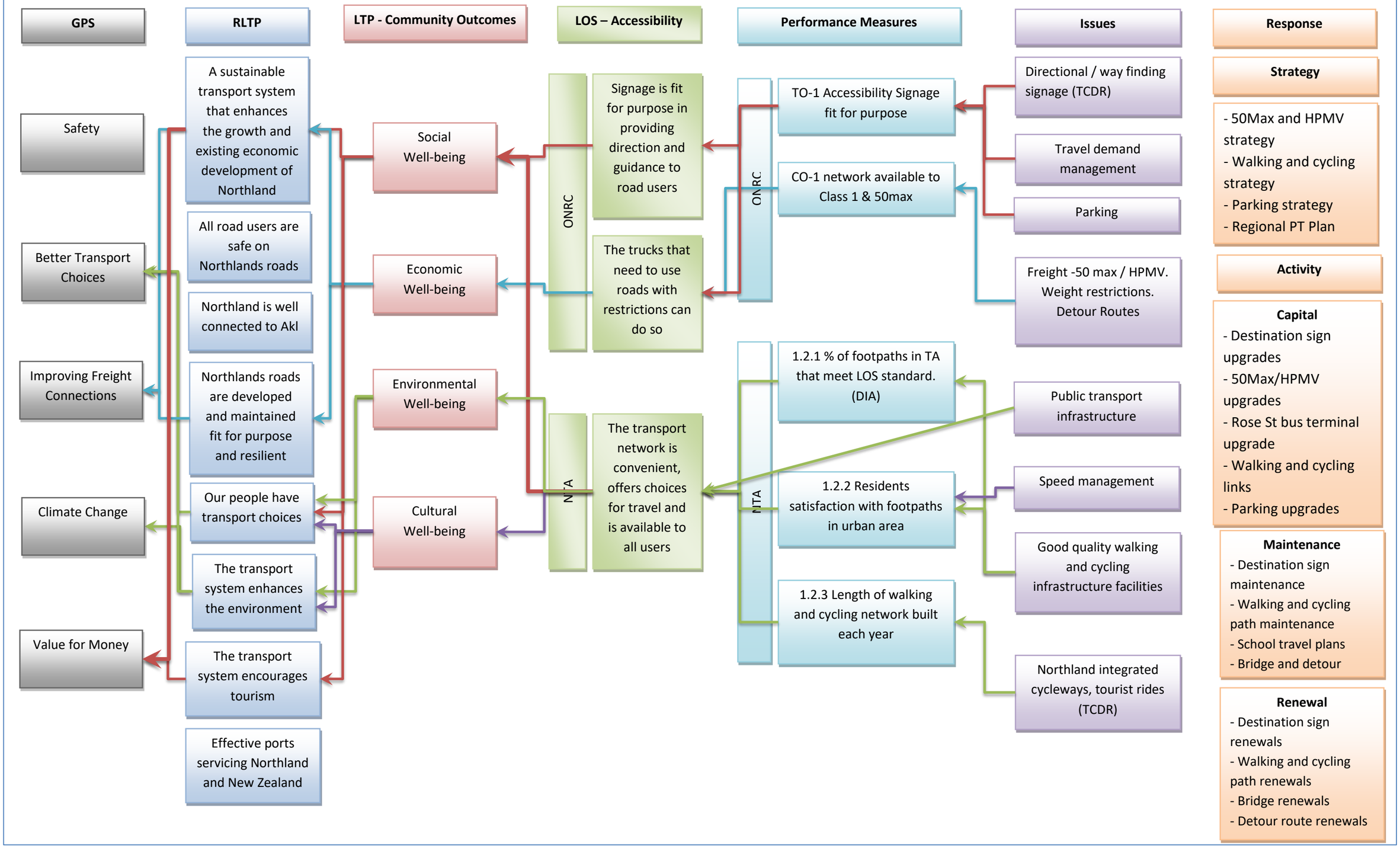
Service Area – **Travel Time Reliability**



Service Area – **Amenity**



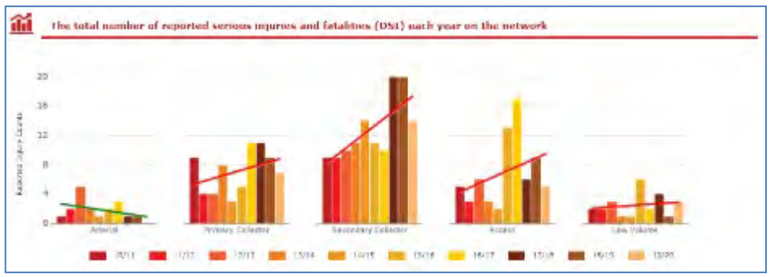
Service Area – **Accessibility**



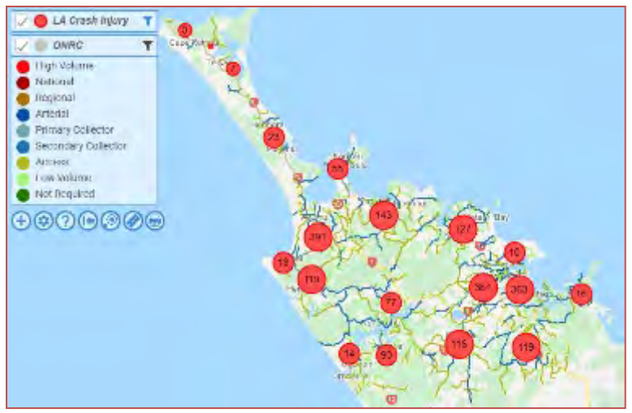
3.6.1 ONRC Customer Level of Service Analysis – Far North District Council (FNDC)

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/Peer Group Comparison	GAP/Response
FNDC **Safety - DSI Crash Trend**	Safety	Customer Outcome	OM1	DSI Crash Trend	Arterial		Decreasing Trend			Reducing trend	**GAP –** Primary, Secondary Access, Intersection, Night Time Loss of Control, and Vulnerable users **Response:** - Increase delineation on the network through the form of route treatments - Improve speed management - Identify intersection on network for intersection improvements - Develop Strategy in regard to Vulnerable User treatments - Identify and specify the use high quality road surface sealing chip
					Primary Collector		Decreasing Trend			Trending upward. Wet, Night, Intersection and Vulnerable users feature heavily as underlying issue to this outcome. .	
					Secondary Collector		Decreasing Trend			Trend upward, vulnerable uses are key trend in this stat	
					Access		Decreasing Trend			Trend upward, need to monitor back ground measures, Intersection, Vulnerable Users remain a consistent issue.	
					Low Volume		Decreasing Trend			Generally static trend monitor, Wet loss of control.	

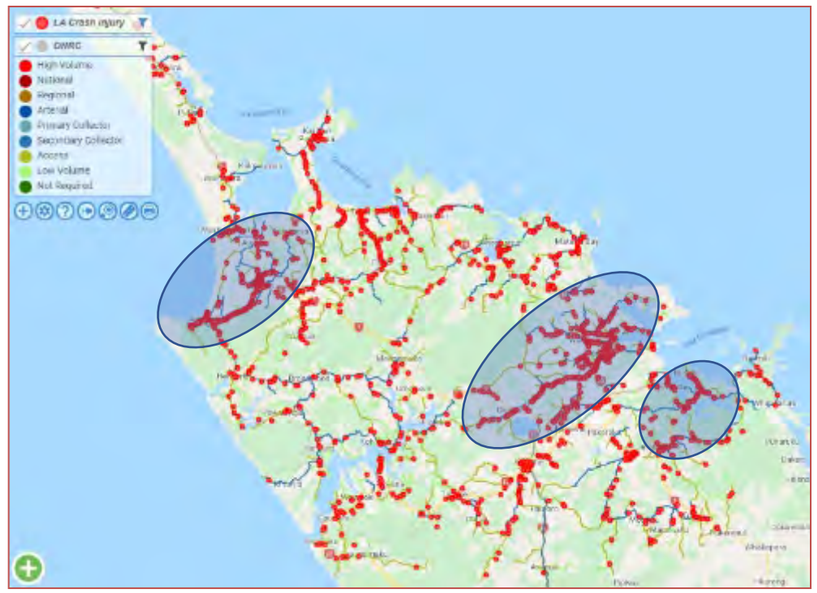
Peer group comparison shows that Far North District shows the increase in DSI across all ONRC apart from Arterial compared to peer and other. The routes that prove the most at risk is the part of the Twin Coast Discovery with Vulnerable users and Intersection featuring the highest in these stats. Motor Cyclist remain an overrepresented group in the vulnerable users stats.

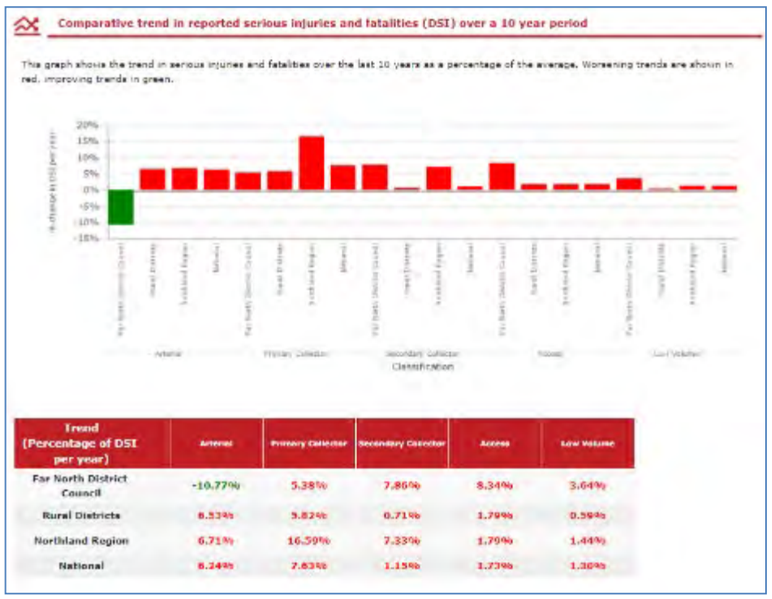


Crash Map Clustered – Minor, Serious and Fatal

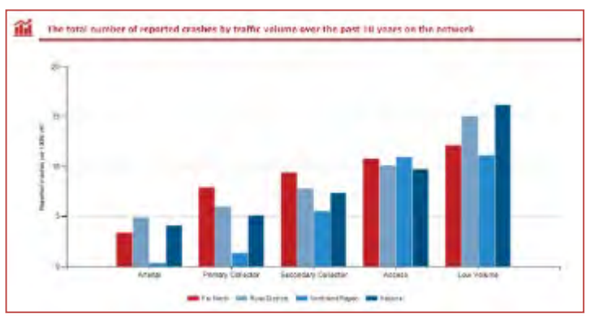


Crash Map Unclustered – Minor, Serious and Fatal



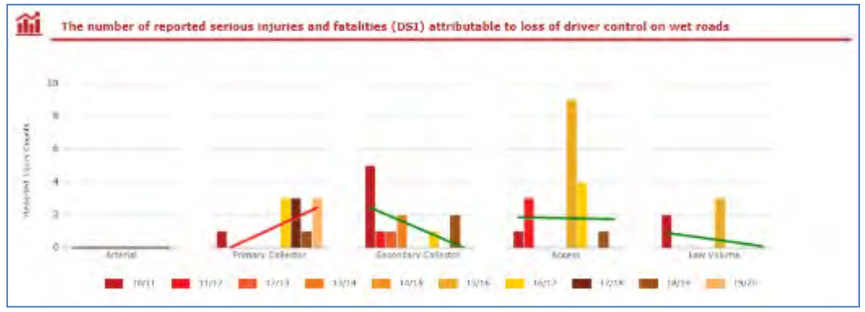


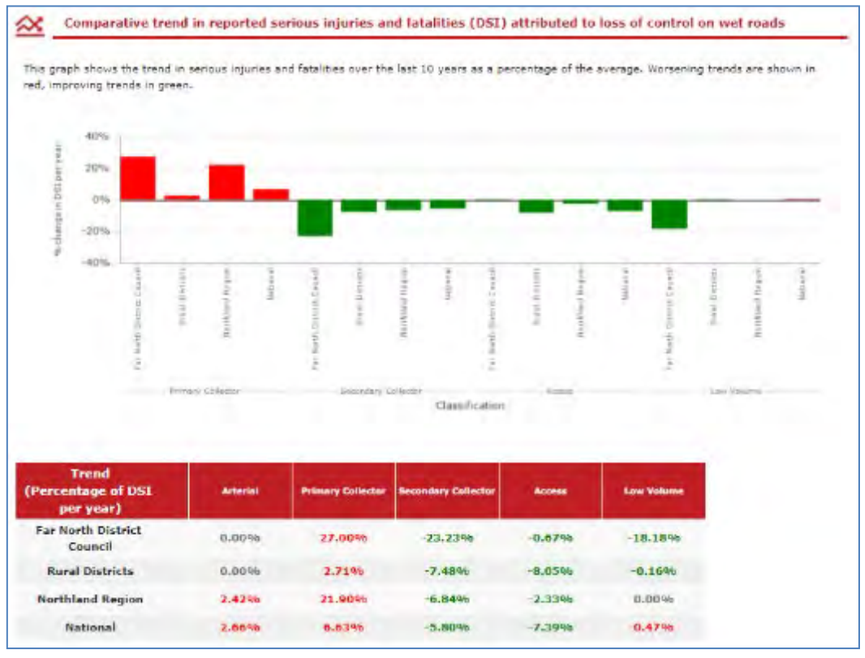
Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Far North District Council	-10.77%	5.38%	7.86%	8.34%	3.64%
Rural Districts	8.53%	9.82%	0.71%	1.79%	0.58%
Northland Region	6.71%	16.59%	7.33%	1.79%	1.44%
National	8.24%	7.83%	1.15%	1.73%	1.36%



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Safety - DSI Trend Wet Road Crash**	Safety	Customer Outcome	OM1	DSI Crash Trend on Wet Roads	Arterial		Decreasing Trend				**GAP –** High Speed Rural Primary Collector network. **Response** - Continue to fund Road Safety Education Programmes - Identify and specify the use high quality road surface sealing chip. Undertake localised out of context corner improvements.
					Primary Collector		Decreasing Trend			Upward trend for this class. The increase in resurfacing programme will help deal reduce this.	
					Secondary Collector		Decreasing Trend				
					Access		Decreasing Trend				
					Low Volume		Decreasing Trend				

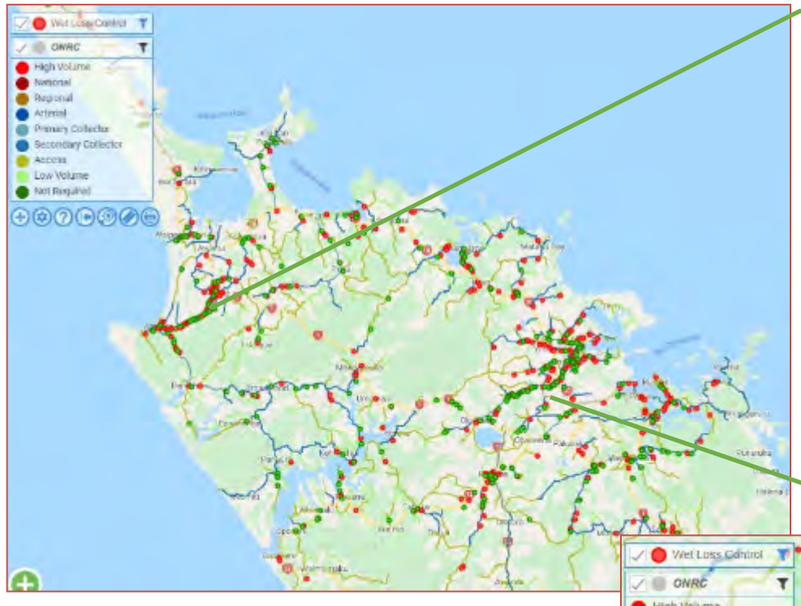
Comparative average change shows an increase on the Primary Collector network. Initiatives such as refresh of network geometry data and Corner Risk analysis is being undertaken to assist in Resurfacing investment process.



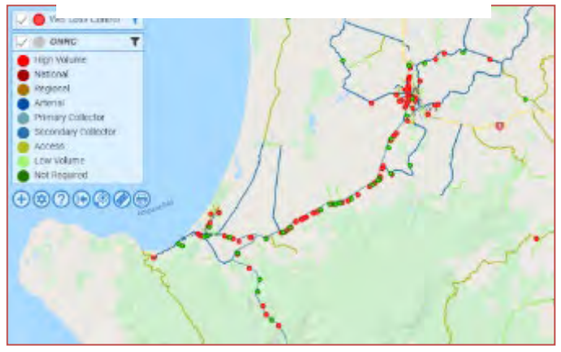


Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Far North District Council	0.00%	27.00%	-23.23%	-0.67%	-18.18%
Rural Districts	0.00%	2.71%	-7.48%	-8.05%	-0.16%
Northland Region	2.42%	21.90%	-6.84%	-2.33%	0.00%
National	2.66%	6.63%	-5.80%	-7.39%	0.47%

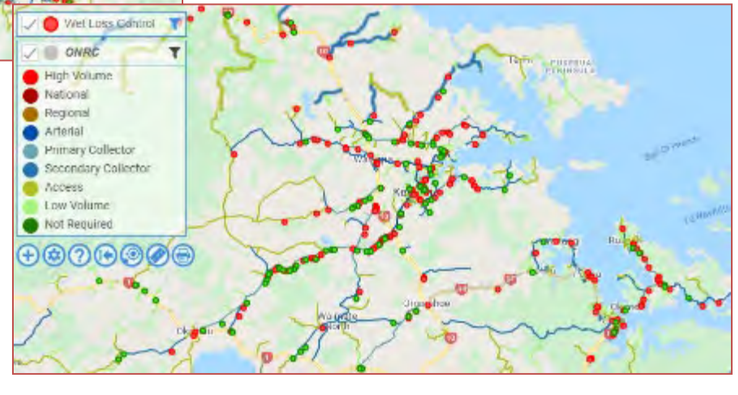
Wet Loss Control – Injury and Non-Injury



KAITAIA-AWAROA ROAD

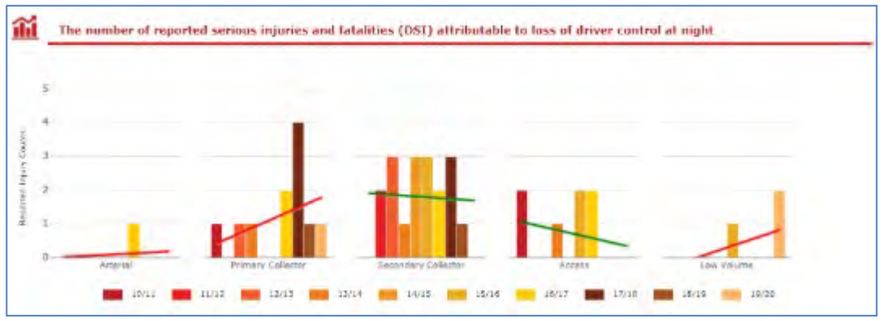


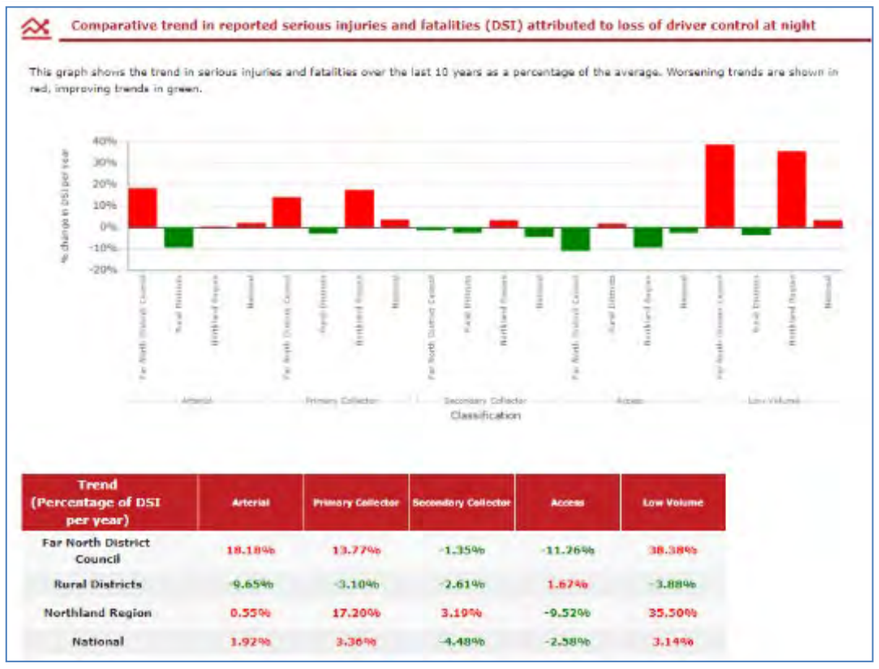
Kerkeri, Wairoa, Waipapa Rd and Russell area



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Safety - DSI Trend Night Time**	Safety	Technical Output	PM5	Loss of Control DSI Crash Trend Night	Arterial		Decreasing Trend				**GAP –** Primary and Low volume network, road width and ability to install effective delineation without causing secondary issues i.e. Edge line install pushing vehicles to the centre of the road. **Response** - Continue to fund Road Safety Education Programmes - Increase delineation on the network through the form of route treatments - Consider widening and camber correction on high risk corners
					Primary Collector		Decreasing Trend			Upward trend over the last 10 years.	
					Secondary Collector		Decreasing Trend			Shows a slight decrease, however numbers remain high	
					Access		Decreasing Trend			Decreasing, may require review of delineation fit for purpose	
					Low Volume		Decreasing Trend			Increase, as above.	

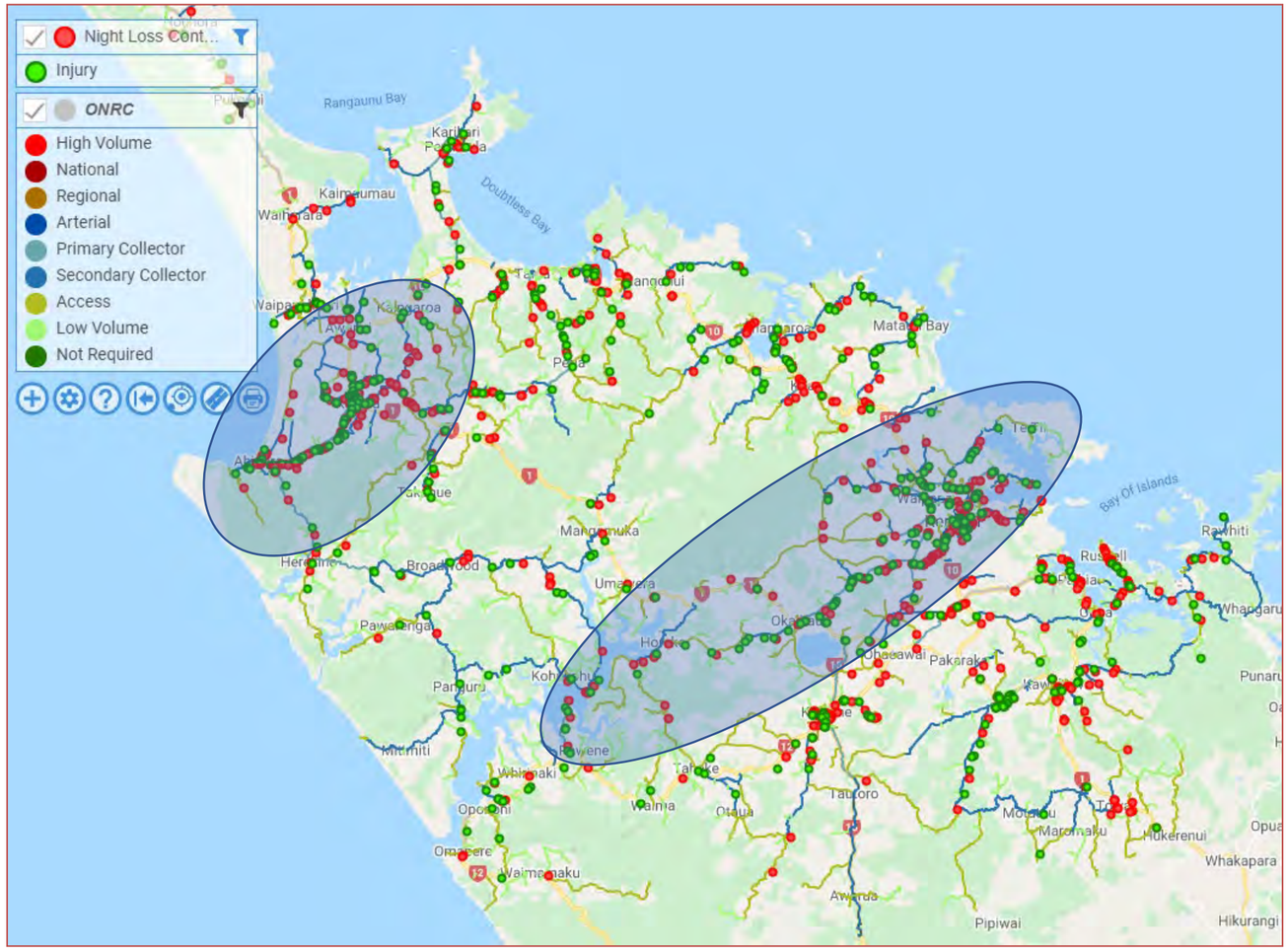
Comparative analysis indicates the Primary Collector as well as Low Volume network is out of step with the rural districts and nationally. The Arterial roads are also high, but there is limited data on this network.





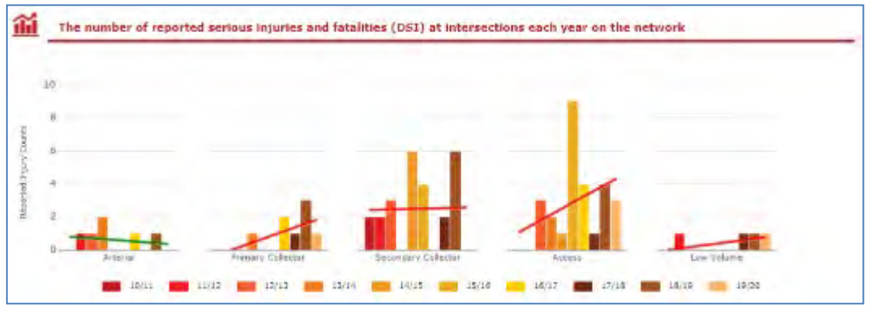
Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Far North District Council	18.18%	13.77%	-1.35%	-11.26%	38.38%
Rural Districts	-9.65%	-3.10%	-2.61%	1.67%	-3.88%
Northland Region	0.55%	17.20%	3.19%	-9.52%	35.50%
National	1.92%	3.36%	-4.48%	-2.58%	3.14%

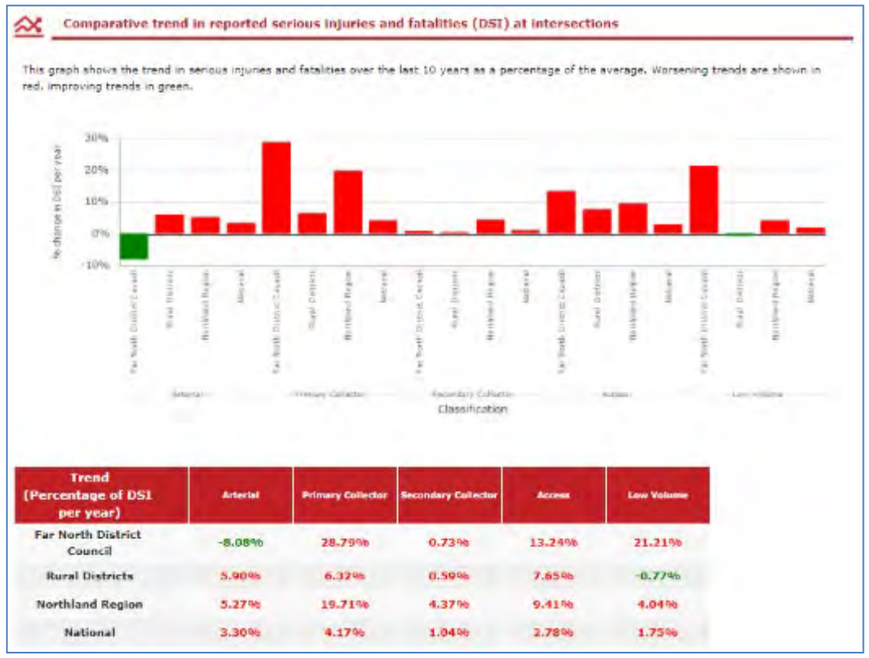
Night Loss Control – Injury and Non-Injury



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Safety - DSI at Intersections**	Safety	Technical Output	PM6	DSI Crash Trend at Intersections	Arterial		Decreasing Trend				**GAP** – Primary, Secondary, Access and Low Volume have increasing trends in Intersection crashes. Twin Coast Discovery route appears the highest risk **Response** - Continue to fund Road Safety Education Programmes - Review intersection controls/sight lines and implement intersection treatments such improvement in Sealed Unsealed junctions to ensure appropriate stopping opportunity is provided.
					Primary Collector		Decreasing Trend			Increasing trend	
					Secondary Collector		Decreasing Trend			Increasing trend, spike in 19/20	
					Access		Decreasing Trend			Increasing trend	
					Low Volume		Decreasing Trend			Limited data set, requires monitoring	

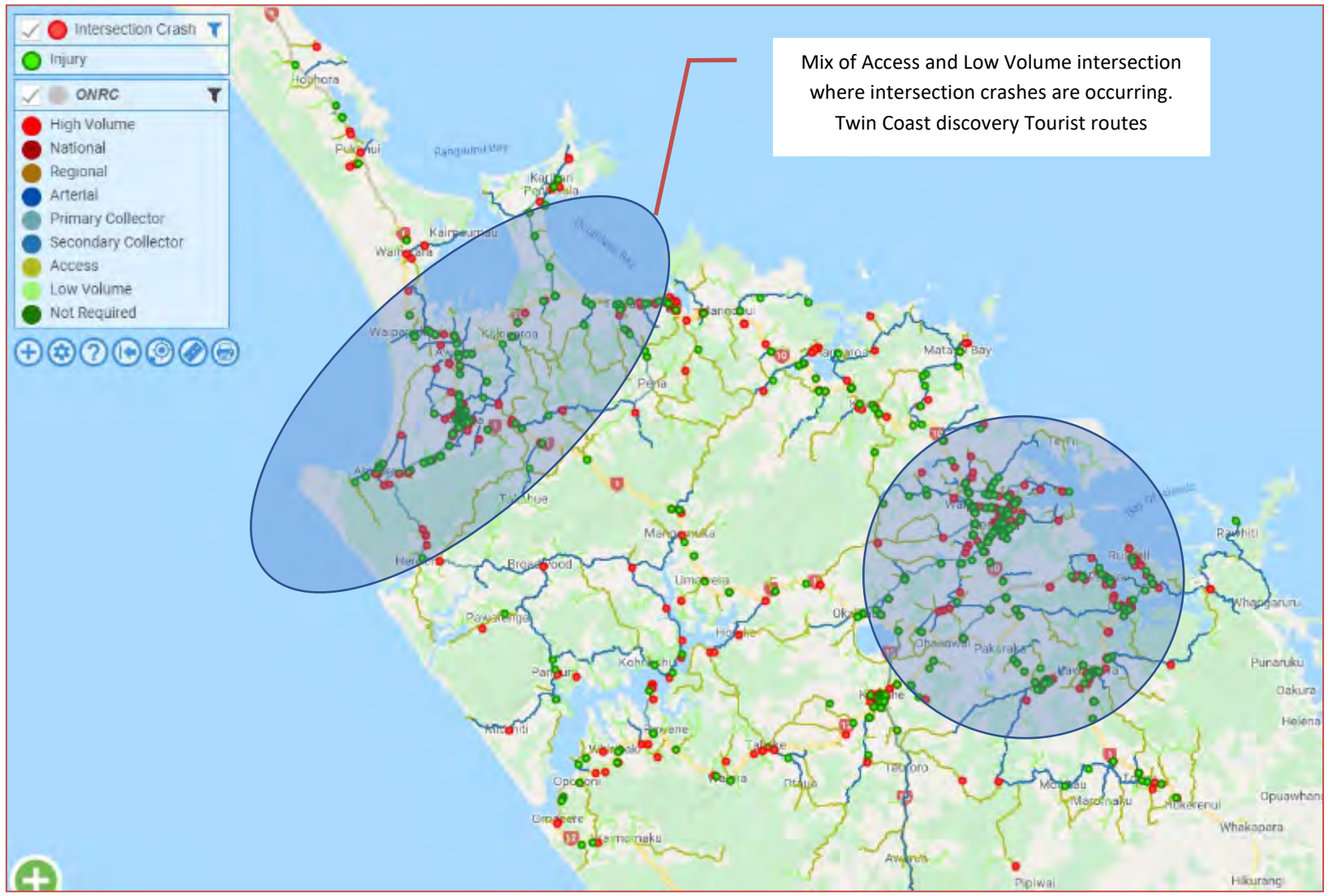
Comparative analysis would indicate the Intersection crashes remain an issue across the board, apart from on Arterials. Compared to rural districts FNDC has a worsening trend for all road classes, again apart from Arterials. Given that the trend for increasing crashes is across the nearly all ONRC classes a programme of Intersection control review along with validating the short-unsealed approaches to sealed roads would be beneficial. Typically, Access/Low Volume roads intersecting with Secondary Collector and Primary Collectors are the most high risk sites around stopping opportunities. This trend is also present in Whangarei.





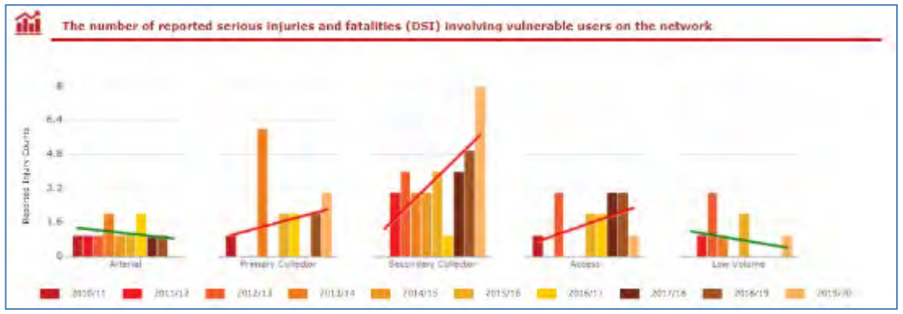
Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Far North District Council	-8.08%	28.79%	0.73%	13.24%	21.21%
Rural Districts	5.90%	6.32%	0.59%	7.65%	-0.77%
Northland Region	5.27%	19.71%	4.37%	9.41%	4.04%
National	3.30%	4.17%	1.04%	2.78%	1.75%

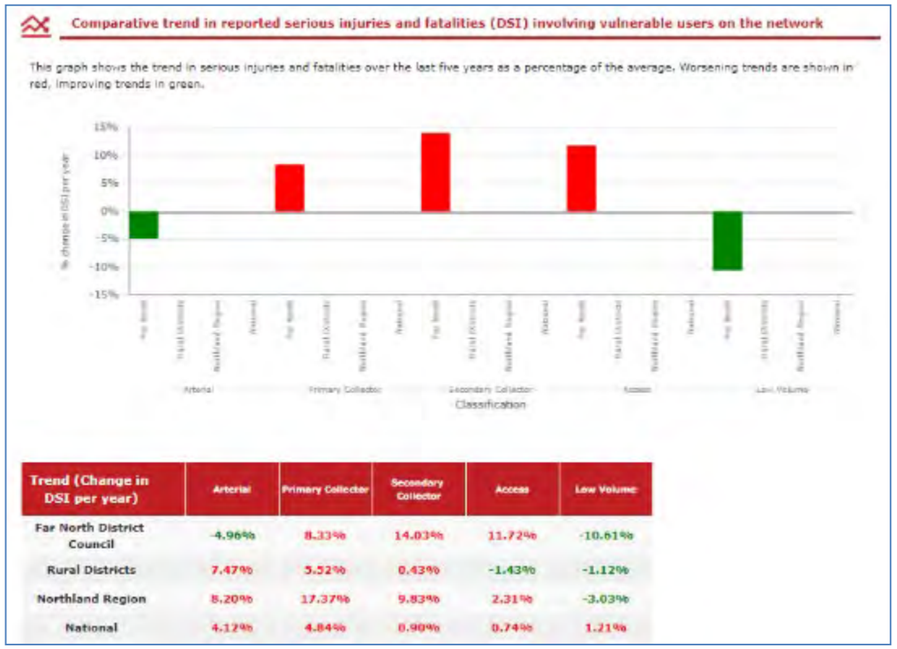
Crash Intersection – Minor, Serious and Fatal



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Safety - Vulnerable Users**	Safety	Technical Output	PM9	Vulnerable users	Arterial		Decreasing Trend			Static but needs to be revised in detail	**GAP** – Increase across most ONRC Motor cyclists are heavily represented in these stats. **Response** - Continue to fund Road Safety Education Programmes - Consider the ride quality of the network as key drive to motor cyclist crashes. This is also an issue in the Whangarei network. Programme of Peak roughness to focus on improving ride quality.
					Primary Collector		Decreasing Trend			A general increasing trend, it would appear motor cyclist represent this increase.	
					Secondary Collector		Decreasing Trend			As above	
					Access		Decreasing Trend			As above	
					Low Volume		Decreasing Trend			Limited data to make any real conclusion	

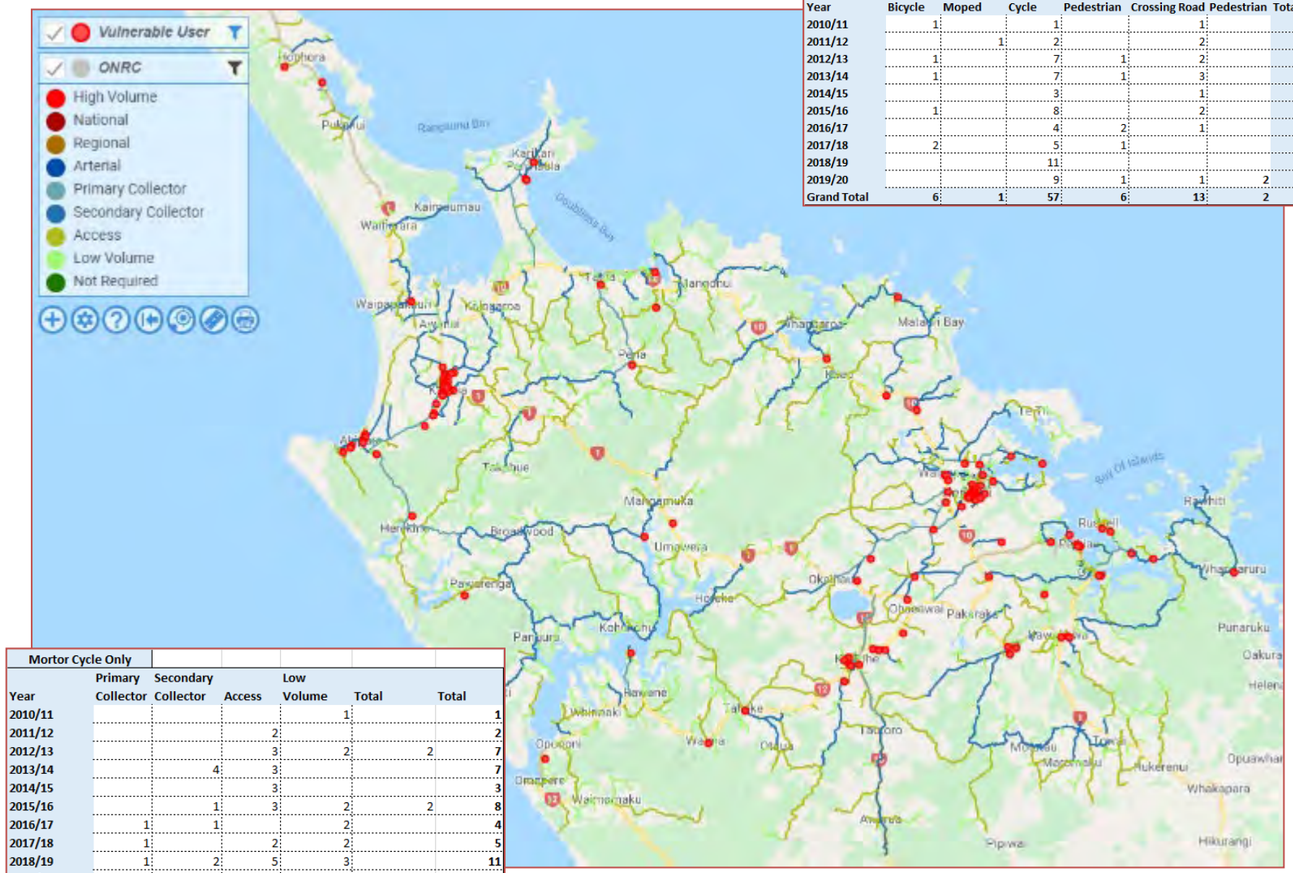
Comparative analysis show FNDC network has had an increase in the Primary and Secondary Collector as well as Access networks. As noted, motor cyclist over represent the vulnerable users crash. The Arterial and Low Volume network show an improvement, this would need to be monitored.





Trend (Change in DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Far North District Council	-4.96%	8.33%	14.03%	11.72%	-10.61%
Rural Districts	7.47%	5.52%	0.43%	-1.43%	-1.12%
Northland Region	8.20%	17.37%	9.83%	2.31%	-3.03%
National	4.12%	4.84%	0.90%	0.74%	1.21%

Crash Vulnerable Users (Cyclist, Peds) – Minor, Serious



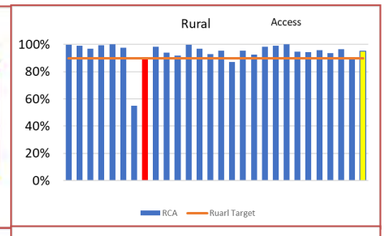
Year	Bicycle	Moped	Motor Cycle	Other Pedestrian	Pedestrian Crossing Road	Wheeled Pedestrian	Grand Total
2010/11	1		1		1		3
2011/12		1	2		2		5
2012/13	1		7	1	2		11
2013/14	1		7	1	3		12
2014/15			3		1		4
2015/16	1		8		2		11
2016/17			4	2	1		7
2017/18	2		5	1			8
2018/19			11				11
2019/20			9	1	1	2	13
Grand Total	6	1	57	6	13	2	85

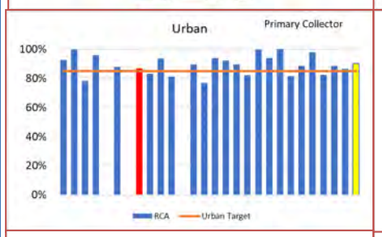
Mortor Cycle Only

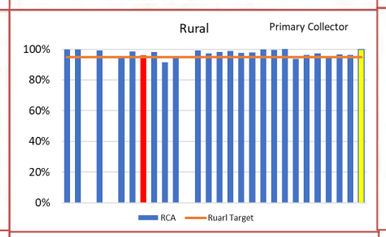
Year	Primary Collector	Secondary Collector	Access	Low Volume	Total	Total
2010/11				1		1
2011/12			2			2
2012/13			3	2	2	7
2013/14		4	3			7
2014/15			3			3
2015/16		1	3	2	2	8
2016/17	1	1		2		4
2017/18	1		2	2		5
2018/19	1	2	5	3		11
2019/20		3	5	1		9
Grand Total	3	11	26	13	4	57

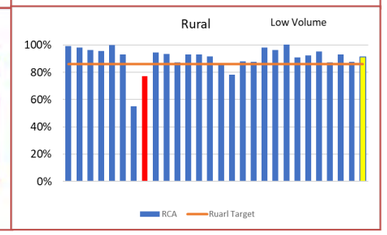
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
FNDC **Amenity - Smooth Travel Sealed Roads**	Amenity	Customer Outcome	OM1, LTP	The % of Roads Classed as Smooth (STE) DIA	Arterial	Urban	84	84	84	Maintain current level of ride quality.	**GAP** – There has been a significant increase in rough roads on the Arterial Access and Low Volume. There is some crash evidence, Motor Cycle, that may be in relation to poor ride quality. **Response** - The key focus is on maintaining safe smooth ride in the high speed rural environments especially in the Secondary and Access portion of the network, which represents 60 % of the sealed network. This will mean continued investment level in pavement rehabilitation at current levels and resilience work.
						Rural	96	96	96	Maintain current level of ride quality	
					Primary Collector	Urban	85	85	85	The peer group average is 90%. A target of 85% has been set against a current achievement of 87%..	
						Rural	95	95	95	Target has been set 95% against an achievement of 96%. Trend has shown a steady improvement, and this now needs to be held steady to maintain a safe ride. This target is in keeping with majority of the peer group.	
					Secondary Collector	Urban	87	87	87	Target of 87% against an achievement of 90%. This looks to maintain steady state and a reasonable Customer LoS.	
						Rural	93	93	93	Target of 93% against an achievement of 95%. As noted above.	
					Access	Urban	83	83	83	Access and Low Volume are increased slightly to continue to provide a safe smooth travel environment. These have deteriorated quite rapidly over the last three years and are now quite low compared to peer group.	
						Rural	90	90	90		
					Low Volume	Urban	80	80	80		
						Rural	86	86	86		
					Network Average (Target >=)	**All**	88	88	88		

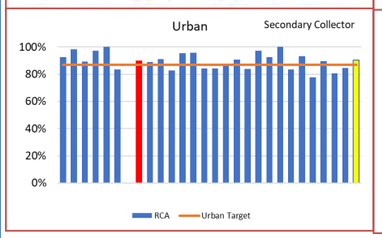
Yellow bar shows the peer group average the red bar is Far North DC current achievement. The Orange line is the target being set in relation to peer group average and the peer group as whole. A number of key issue can be observed; **1**. Far North DC features poorly against the majority of comparative groups; **2**. Far North DC STE across ONRC has been reducing over the term in the Arterial and Access LV over last LTP.

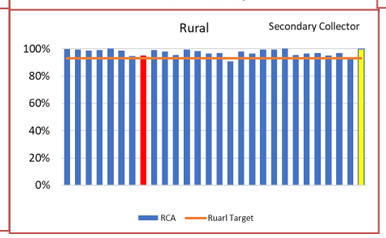


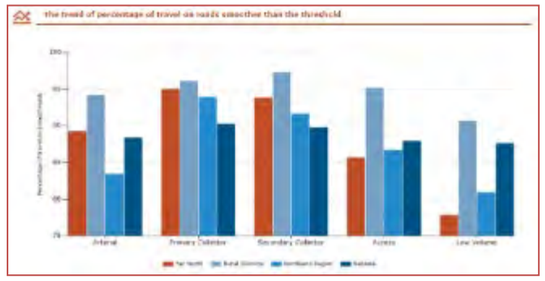


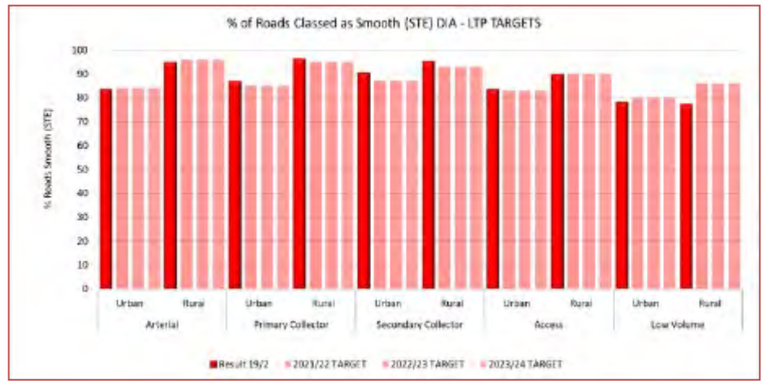






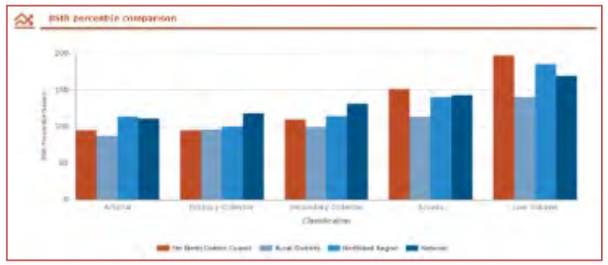


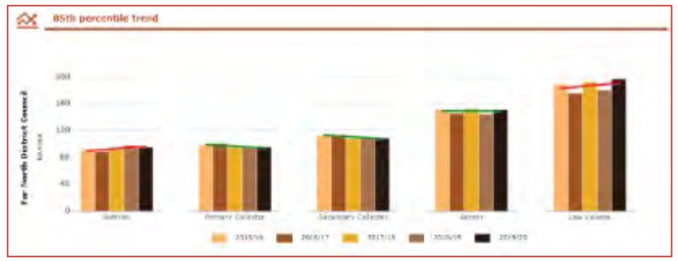


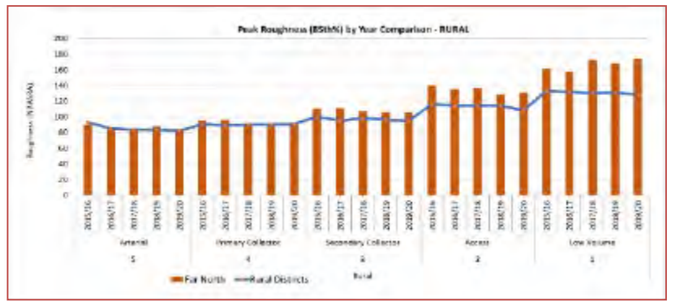


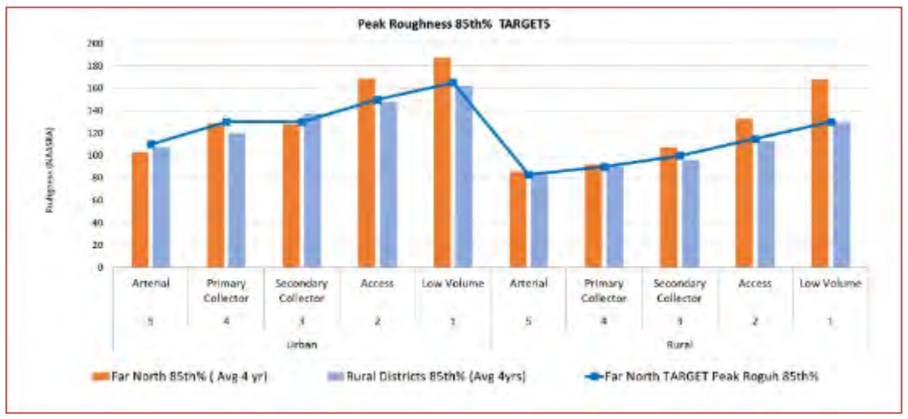
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
FNDC **Amenity - Peak Roughness**	Amenity	Technical Output	PM1	Peak Roughness (85th%)/ Ride comfort	Arterial	Urban	110			Allowed to deteriorate against peer group	**GAP** - FNDC is above the peer group peak rough across the board. The secondary, Access and low Volume are deteriorating in relation. Vulnerable geology to water is a related symptom to peak rough. **Response** – Continue with Rehabilitation as set and fund along with targeted peak roughness programmes to address the issue, such as resilience, given the increasing trend in motor cycle crash on the network and the rat of deterioration Access and Low Volume.
						Rural	83			Set at peer group	
					Primary Collector	Urban	130	120	120	Allowed to deteriorate against peer group.	
						Rural	90	90	90	Set at peer group	
					Secondary Collector	Urban	130	140	140	Set at peer group	
						Rural	100	95	95	Some improvement required to meet peer group	
					Access	Urban	150	145	145	Ride quality is quite poor reduction in target to improve ride quality	
						Rural	115	110	110	As above	
					Low Volume	Urban	165	165	165	As above	
						Rural	130	125	125	As above	

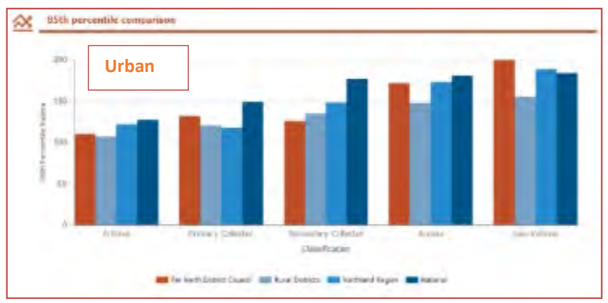
Far North DC peek roughness is above peer group across the board in all classes. The Primary Collector and Low Volume networks have been in state of deterioration over the last LTP period. Low Volume network has moved significantly out of step with peer group.

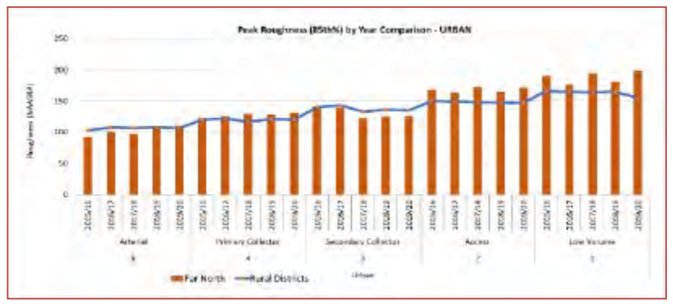






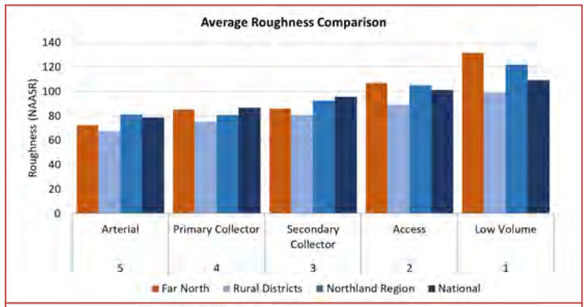


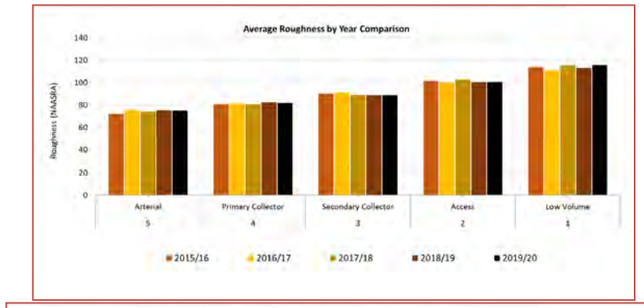


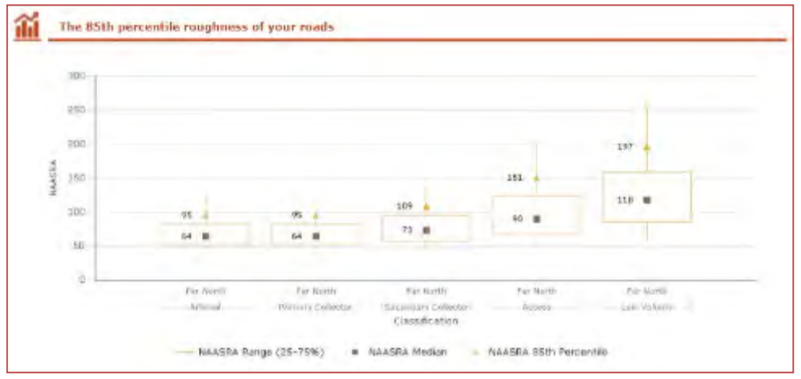


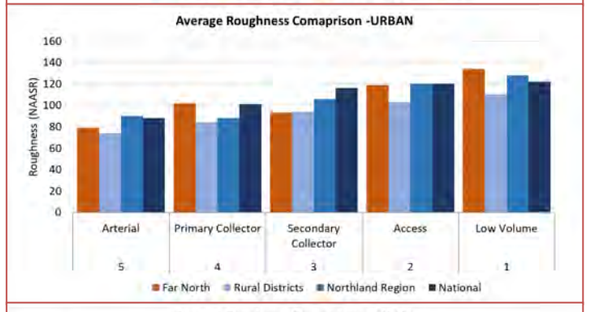
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
FNDC **Amenity - Average Roughness**	Amenity	Customer Outcome	OM2	Average Roughness	Arterial	Urban	80	80	80	Maintain target to keep steady state	**GAP** –FNDC network is above the peer group with the biggest gap on the Rural network. The most significant gap is on Access/Low Volume network. The trend for FNDC has continued to deteriorate year on year. Whilst the average shows small increase this needs to monitored. **Response** – Deliver rehab programme as developed to maintain ride comfort for the network. There is adjustment required on the Secondary and Access/LV classes, this is naturally occurring as pavement start fail and become expensive to maintain/seal. This should have an impact on reducing DSI and peak rough/STE.
						Rural	70	70	70	Maintain target to keep steady state	
					Primary Collector	Urban	100	100	100	Maintain target to keep steady state	
						Rural	73	73	73	Maintain target to keep steady state	
					Secondary Collector	Urban	100	100	100	Maintain target to keep steady state	
						Rural	77	77	77	As above	
					Access	Urban	115	115	115	Reduce target to support STE and Peak rough improvement	
						Rural	82	82	82	As above	
					Low Volume	Urban	120	120	120	As above	
						Rural	105	105	105	As above	
					Network (Average)	**All**	**93**	**93**	**93**		

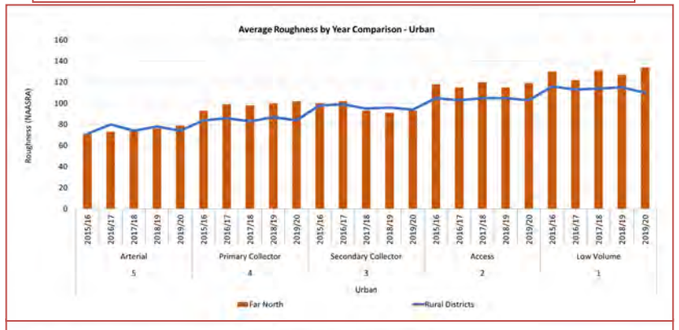
In comparison FNDC has higher roughness than the peer group. This is most apparent on the Rural Access and Low Volume network. Targets are being set against peer group to help reduce the overall average roughness to support the reduction in peak roughness and improvement in ride quality for STE.

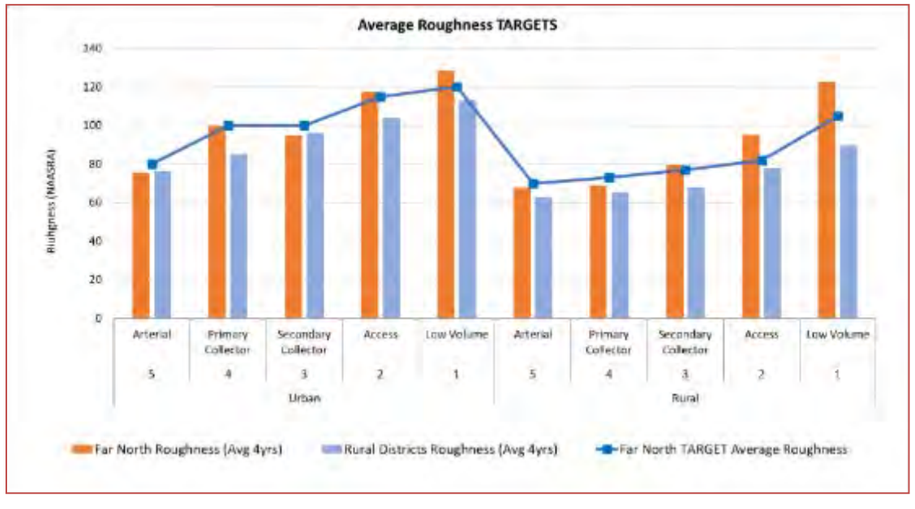


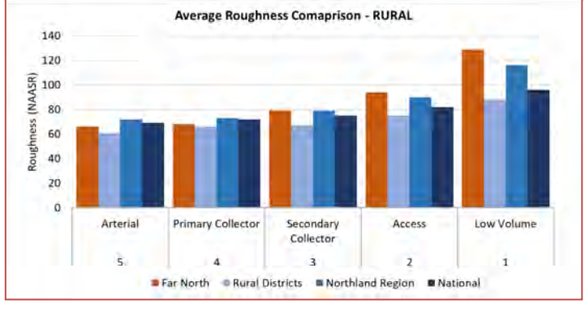








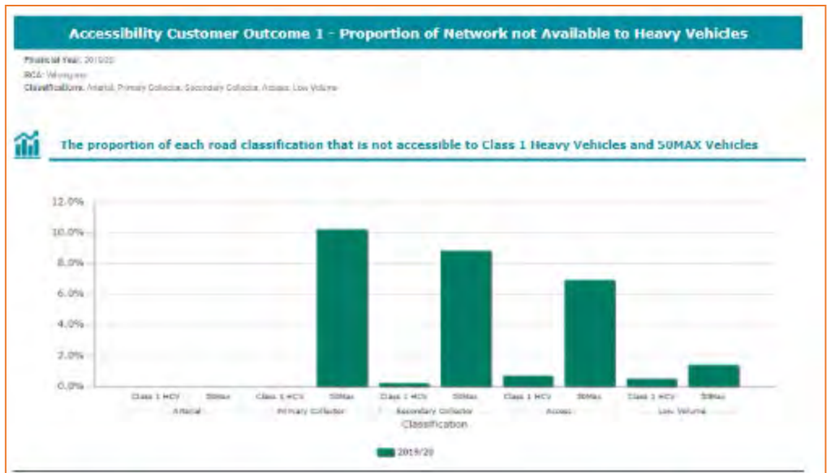




Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
FNDC **Accessibility - Network not available to HCV/50max**	Accessibility	Customer Outcome	OM1	Proportion of Network not Available to HCV & 50Max	Arterial	HCV					**GAP** - Programme has been set to investigate and analyses the upgrade option of the bridges that are restricting the network. This will enable more choice for freight industry and open access to industry to travel the network more efficiently. **Response** - This programme has been completed and is now with in this plan for funding to remove restrictions on some routes.
						50Max					
					Primary Collector	HCV					
						50Max					
					Secondary Collector	HCV					
						50Max					
					Access	HCV					
						50Max					
					Low Volume	HCV					
						50Max					

No peer group comparison is available for this measure

50Max Limited Bridges



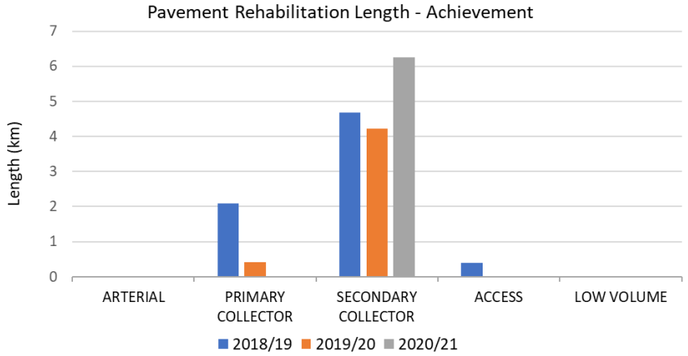
Financial Year	Arterial		Primary Collector		Secondary Collector		Access		Low Volume	
	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max
2019/20	0.0%	0.0%	0.0%	10.2%	0.2%	8.8%	0.7%	6.9%	0.5%	1.4%

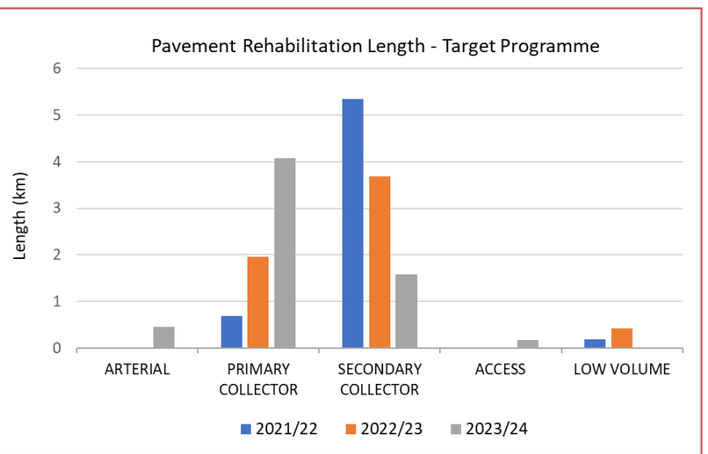
Weight Restricted Class 1 - Bridges

TBC

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Cost Efficiency – The percentage of the sealed local road network that is rehabilitated**	Pavement Rehabilitation - Cost Efficiency	Efficiency Measure	EM	Was REG measure. Has been removed from PMRT. Change Target to % of network **OLD** Pavement Rehabilitation length - Lane km	Arterial	0.00%	0.00%	2.7%		This programme has been directed by several condition drivers, one of which is the customer ride comfort as set out under ONRC. Given that the network is exceeding roughness targets, this is where 2021-24 programme is targeted to deliver on the customer outcome. With targeted ride issue on Secondary and Low Volume roads.
					Primary Collector	0.51%	1.45%	3.00%	Loaded Rural roads and urban roads in poor condition	
					Secondary Collector	1.11%	0.76%	0.33%	Rural loaded ride quality	
					Access	0.00%	0.00%	0.11%	Peak roughness rural	
					Low Volume	0.19%	0.43%	0.00%	In response to peak roughness rural	
					Network (Total)>=0.4%	0.5% (4.3km)	0.5% (4.3km)	0.6% (4.4km)	On average 6.1km/yr next three years.	

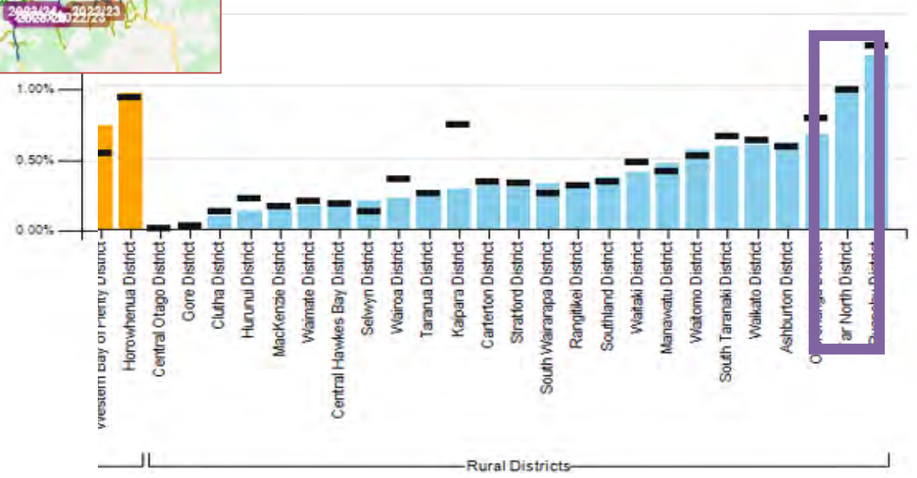
Comparative analysis shows FNDC 5 year average at about 1.0% (bottom right NZTA report). This is out of step with actual which was around 0.7% or 6km/yr. This is a concern given this data is being used to measure historic investments. The rehab programme is designed to target highly loaded rural pavements to maintain current performance and keep in check the deteriorating ride quality on rural Secondary and LV network. Further reduction in rehabilitation programme would see continued deterioration in customer outcomes. Northland sub quality construction materials and sensitive geology continue to have an impact on ride quality of the network. This makes northland network somewhat different from other networks.





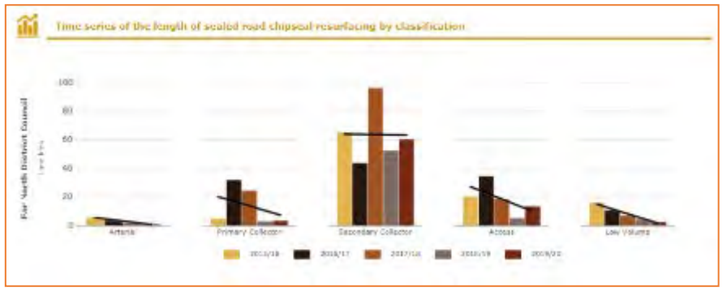
Pavement Renewal – 2021-2025

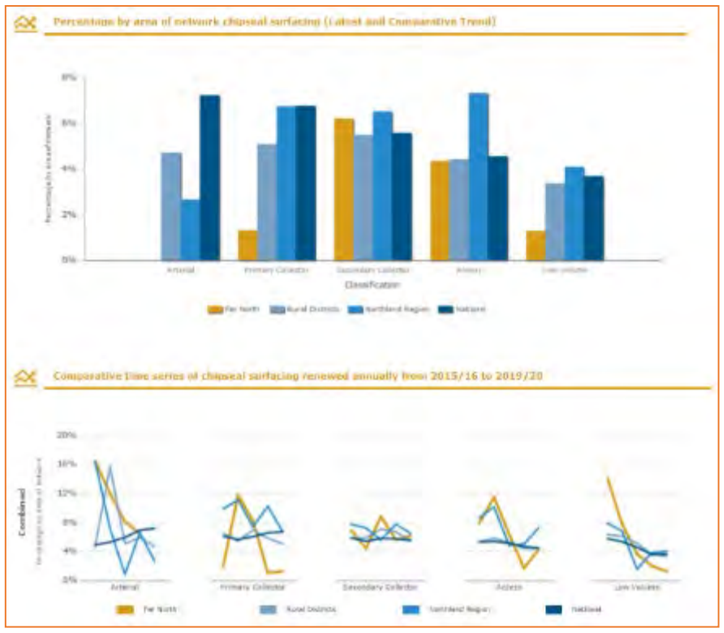
Achievement as Percentage	2018/19	2019/20	2020/21	Average
ARTERIAL	0.0%	0.0%	0.0%	0.0%
PRIMARY COLLECTOR	1.5%	0.3%	0.0%	0.6%
SECONDARY COLLECTOR	1.0%	0.9%	1.3%	1.0%
ACCESS	0.3%	0.0%	0.0%	0.1%
LOW VOLUME	0.0%	0.0%	0.0%	0.0%
Grand Total	**0.83%**	**0.53%**	**0.72%**	**0.70%**



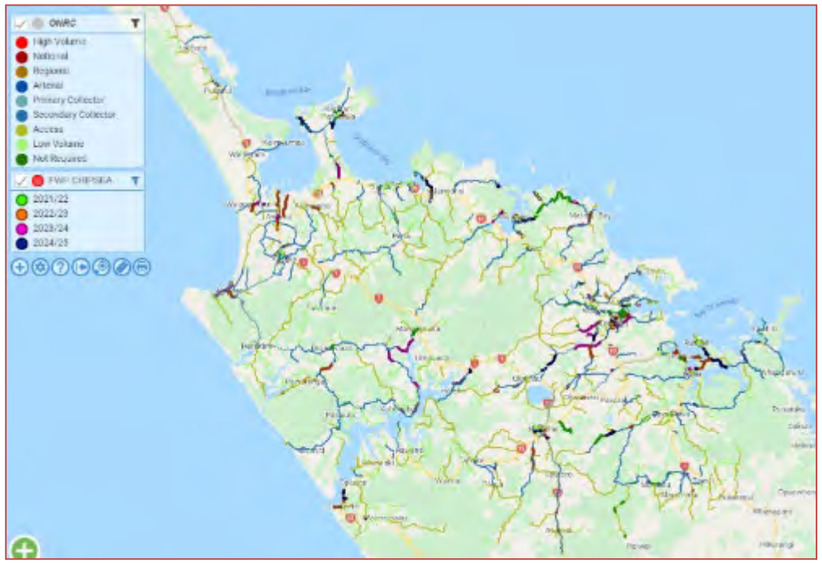
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Cost Efficiency - Chipseal Lane/km**	Chip Seal - Cost Efficiency	Efficiency Measure	EM2(a)	Chipseal Resurfacing Quantity - lane km (DIA mandatory) expressed as both Ln.km and % of sealed Network	Arterial	0lnkm /0%	0lnkm /0%	3.2lnkm /10%		**GAP** – Reducing Rehab programme on Access/LV network. Heavily constrained environment has meant an under delivery of resurface compared to the network need. **Response** - Chipseal resurfacing programme is designed in response to the pavement renewal programme. No rehab for the LV. Resurfacing will help protect these parts of the network. The programme is clearly targeted at what is needed when it is needed as given the quantities based on ONRC and year. There are vulnerable seals and if not treated have will to premature pavement failure.
					Primary Collector	11.1lnkm /4%	12.77lnkm / 5%	30.8lnkm/ 11%	Continued programme of sealing old first coats	
					Secondary Collector	69.02lnkm/ 7%	70.6lnkm/ 7%	58.8lnkm/ 6%	Continuing catch up on first coat seals from previous plan with decreasing programme over the period of this plan.	
					Access	12.7lnkm/ 4%	30.9lnkm/ 10%	13.0lnkm/ 4%	As above	
					Low Volume	11.6lnkm/ 6%	9.1lnkm/ 5%	11.7lnkm/ 6%		
					Network (Total) =>6%	**104lnkm/ 6%**	**123.4lnkm / 7%**	**117.6lnkm / 7%**		

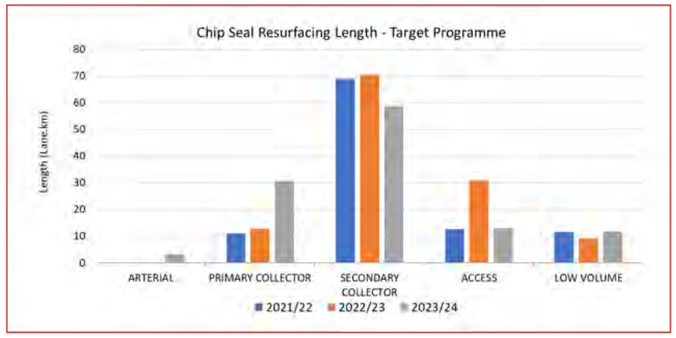
Peer group comparative shows that for FNDC less resurfacing of Arterial, Primary Collector and Low Volume is being undertaken. The FNDC programme on average is under delivering on the requirements of protecting the network and compared with its peers. The programme over the last 4 years has been significantly impacted by budget constraints and has had to focus in on the Secondary network, which represents 55% of the sealed network length.





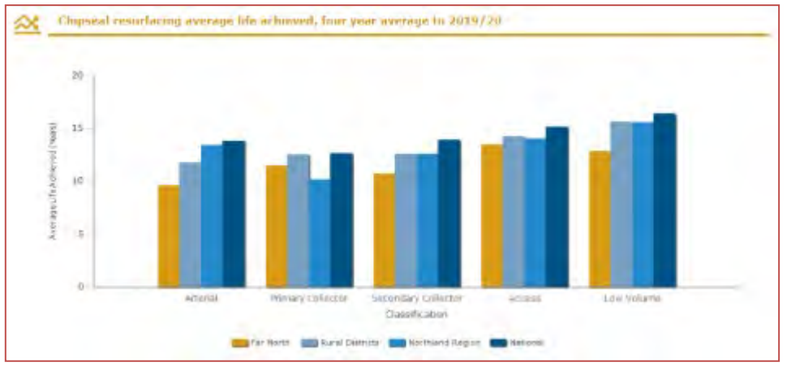
Chipseal Resurfacing – 2021-24



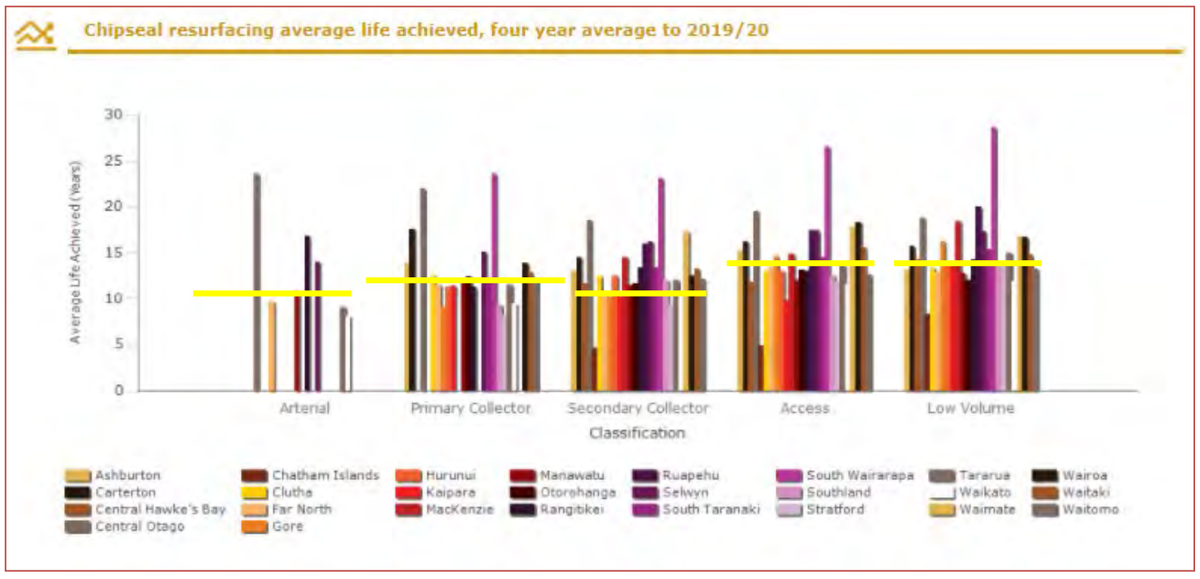


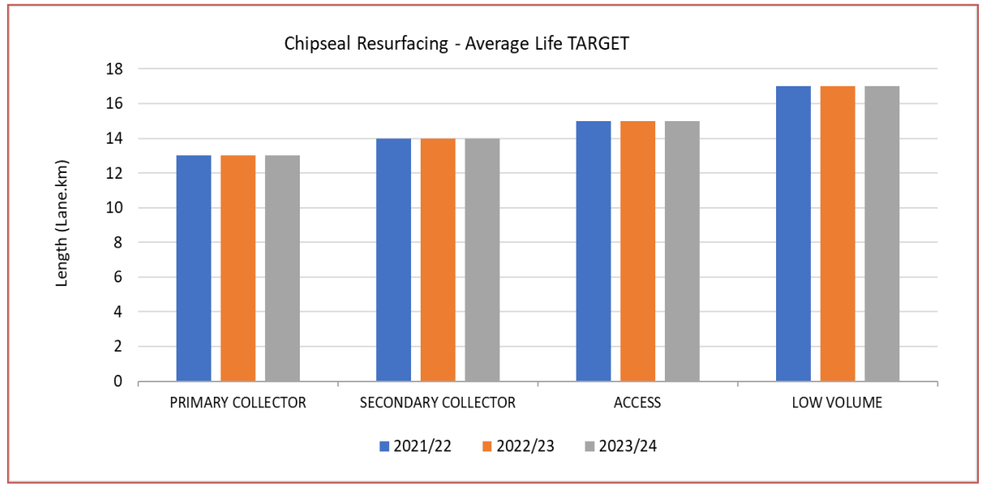
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Cost Efficiency - Chipseal Average Life Achieved**	Cost Efficiency	Efficiency Measure	EM	Chip Seal Resurfacing - Average life achieved	Arterial	12	12	12	Targeted against the surface life analysis of the network and validated	**GAP** - Pre-surface cost $/km starting to rise associated with preparing first coat site for second coats. This would also appear to be in relation to resurfacing unstable areas of the network and investment to correct through maintenance is significant. **Response** – Deliver the programme as derived to continue to achieve average life profile and protect the network from escalating maintenance costs.
					Primary Collector	13	13	13	As above	
					Secondary Collector	14	14	14	As above	
					Access	15	15	15	As above	
					Low Volume	17	17	17	As above	
					Network (Avg)	14	14	14	This is the theoretical average life and, on the whole, will be achieved given the programme	

Comparatively FNDC compare well with the average life achieved (yellow bars) as they are sitting within the in average range of the peer. There is slight increase in the average life targets.



Chipseal Return Life Cycle of Proposed Programme				
ONRC	**2021/22**	**2022/23**	**2023/24**	**Average**
ARTERIAL	0	0	10	3
PRIMARY COLLECTOR	24	21	9	18
SECONDARY COLLECTOR	14	14	16	15
ACCESS	23	10	23	19
LOW VOLUME	17	21	17	18
Average	**17**	**14**	**15**	**15**

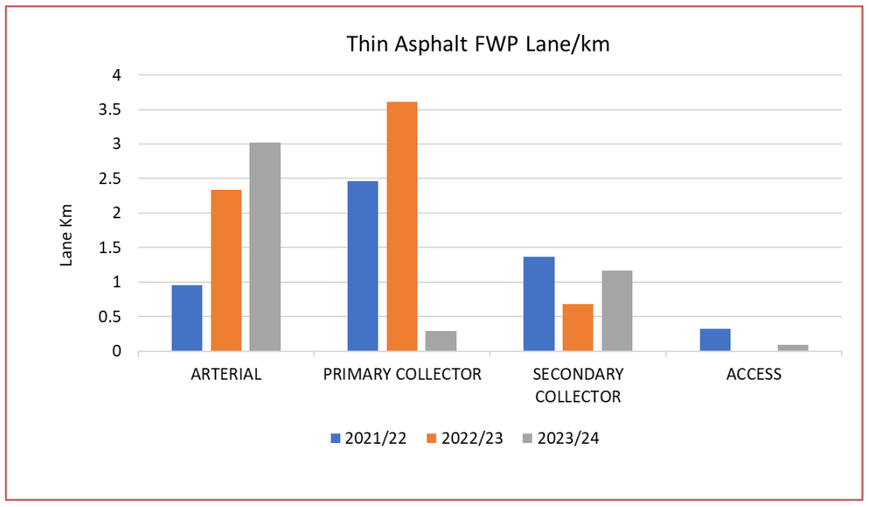




Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Cost Efficiency - Asphalt Lane/km**	Cost Efficiency	Efficiency Measure	EM	Asphalt Resurfacing Quantity - lane km	Arterial	0.96	2.33	3.02	Urban high value amenity area	**GAP** – Poor condition old urban CBD and Rural high stress corners failing. **Response** - This programme focuses on the urban high volume network. There are some isolated rural sites that are for high stress tight corners which are mostly on the roads on the east coast leading out to coastal areas.
					Primary Collector	2.46	3.61	0.29	Urban high value amenity area	
					Secondary Collector	1.36	0.68	1.17	Urban high value amenity area	
					Access	0.32		0.09	High stress rural corners	
					Low Volume	0	0	0		
					Network (Total)	5.10	6.63	4.57		

FNDC have 26km of thin asphalt on the network. Over the last few years, the focus has been on chipseal resurfacing. However, going forward there is a requirement to renew thin asphalt surfaces. This is becoming a priority in the current and future programmes to maintain the integrity of these surfaces and the underlying pavement as well as avoid costly maintenance and customer impacts. These are generally high amenity value sites in the central business district area of, Kaitaia, Kerikeri, Pihia and Kaikohe.ing

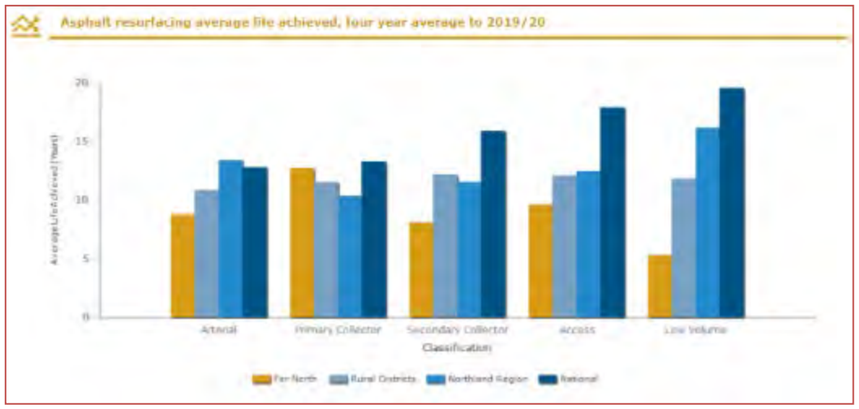
Asphalt Resurfacing – 2021-24

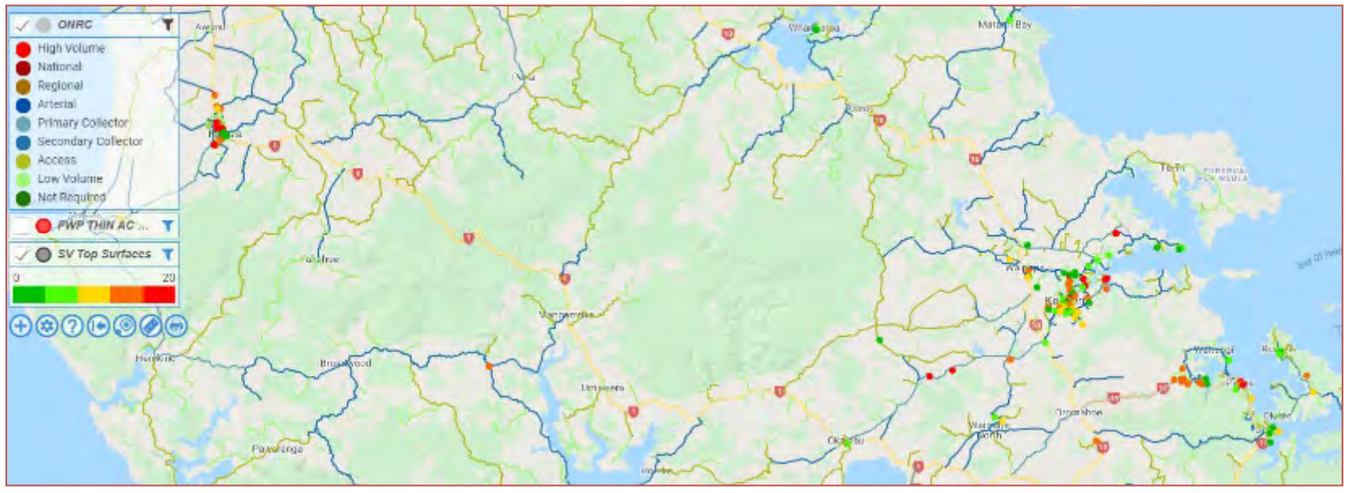


Surface Type	Length (m)
Asphaltic concrete	26279
Chipseal	869281
Grand Total	**895560**

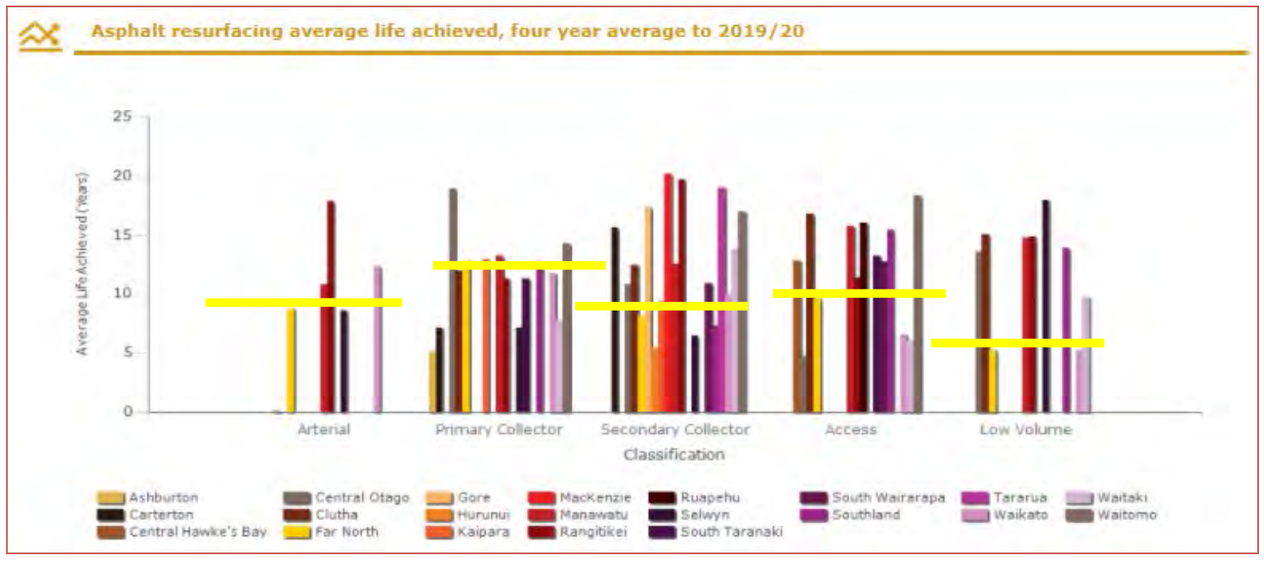
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
FNDC **Cost Efficiency - Asphalt Average Life Achieved**	Cost Efficiency	Efficiency Measure	EM	Asphalt Resurfacing - Average life achieved	Arterial	12	12	12	.	**GAP** – Emerging TAC requirement needs to be managed to ensure no impact on overall programme into the future. **Response** –Identified programme of surfacing that starts to deal with old poor condition TAC surfaces. As can be seen below, the bulk of the TAC surfaces are greater than 12 years old now. Engineer TAC out of the network where appropriate.
					Primary Collector	14	14	14	No issue identified	
					Secondary Collector	16	16	16		
					Access	17	17	17		
					Low Volume	19	19	19	Cul-de-sac heads and rural TAC corners	
					Network (Avg)	16	16	16		

Yellow bar shows the Far North DC current achievement against the peer group. Several observations can made. FNDC does not fit well with peer group for the arterial and primary networks given limited data. FNDC have very old thin AC surface on the network and therefore have not in general replaced a lot of Thin AC surfaces on the network. At this stage the programme has been validated fully over the last number of years and is growing concern from a funding point of view. Efforts have been made to engineer TAC out of the network rather than replace like for like.





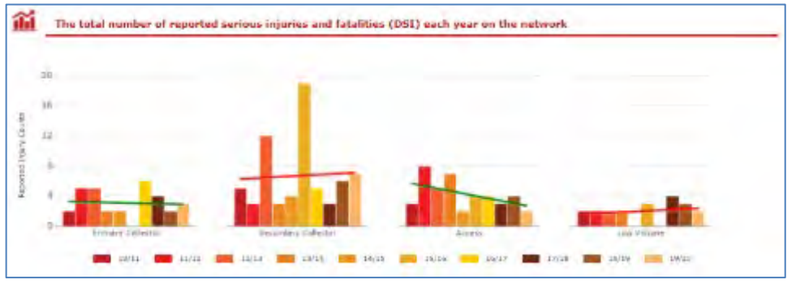
Age Profile Thin AC Surfaces



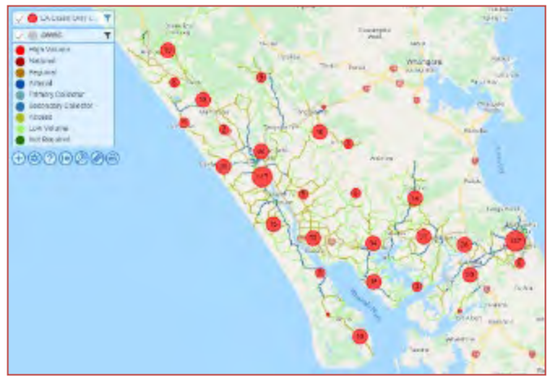
3.6.2 ONRC Customer Level of Service Analysis – Kaipara District Council (KDC)

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/Peer Group Comparison	GAP/Response
KDC **Safety - DSI Crash Trend**	Safety	Customer Outcome	OM1	DSI Crash Trend	Arterial		Decreasing Trend				**GAP –** Primary Network; Wet loss, Intersection, Night Time Loss of Control, and Vulnerable users **Response:** - Increase delineation on the network through the form of route treatments - Improve speed management - Identify intersection on network for intersection improvements - Develop Strategy in regard to Vulnerable User treatments - Identify and specify the use high quality road surface sealing chip
					Primary Collector		Decreasing Trend			Trending upward. Intersection and Vulnerable users feature heavily as underlying issue to this outcome.	
					Secondary Collector		Decreasing Trend			Trending down however wet loss control and vulnerable users need to continued investigation. Intersection.	
					Access		Decreasing Trend			Decreasing trend, however need to monitor back ground measures, Intersection, Vulnerable Users remain a consistent issue.	
					Low Volume		Decreasing Trend			Generally static trend monitor, Wet loss of control.	

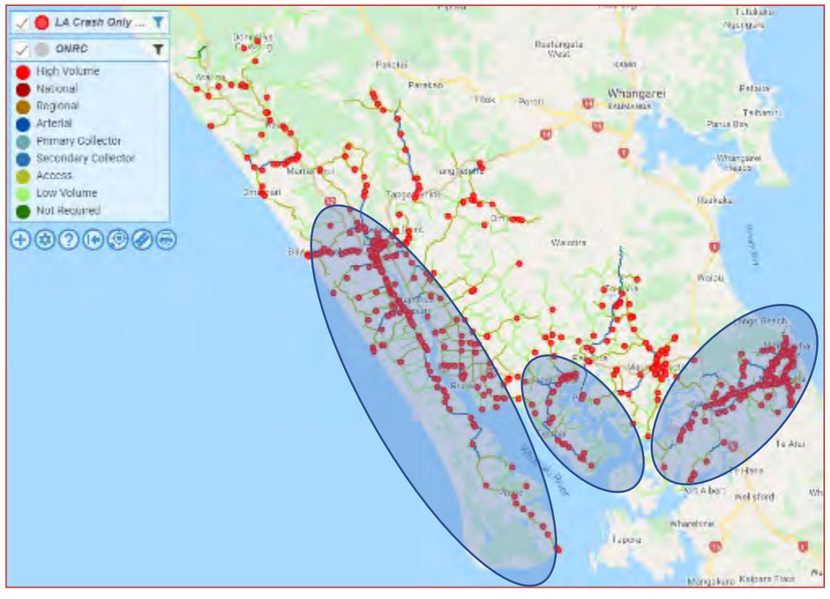
Peer group comparison shows that Kaipara District on average shows the higher increase in DSI across the Primary and Low Volume compared to the Rural Districts, Northland and Nationally. The routes that prove the most at risk remain generally unchanged over time as highlighted below; Pouto, Baylys Beach, Tinopai, Kaiwaka/Mangawhai and Mangawhai Primary routes. Investment in these routes continues with the focus on signage and delineation improvement as well as speed management. However, Intersections and Vulnerable users remain a consistent issue.

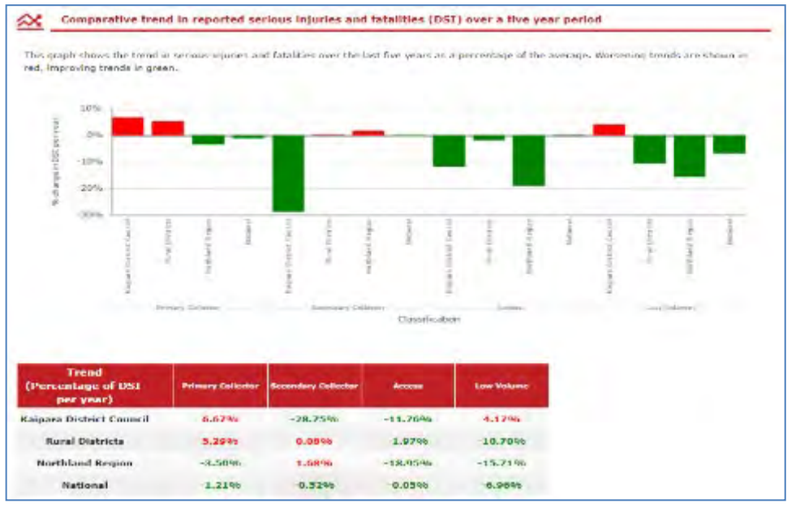


Crash Map Clustered – Minor, Serious and Fatal

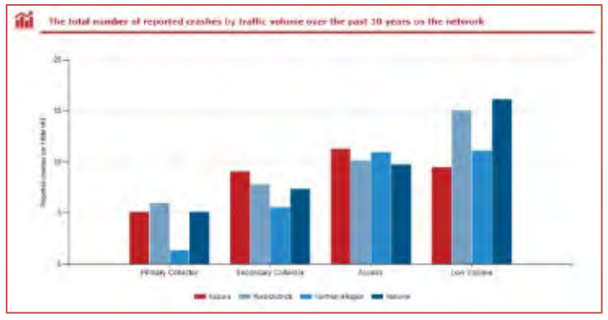


Crash Map Unclustered – Minor, Serious and Fatal



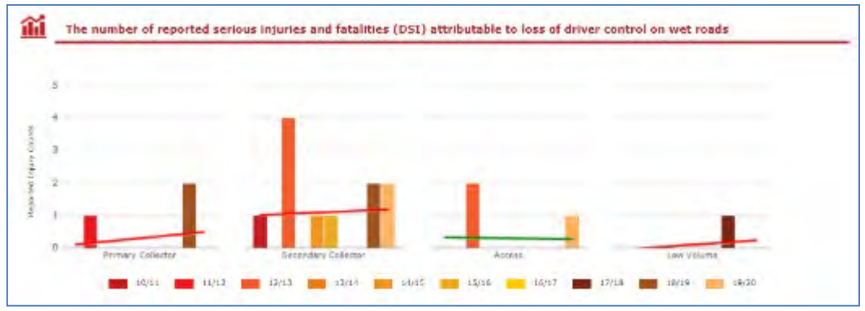


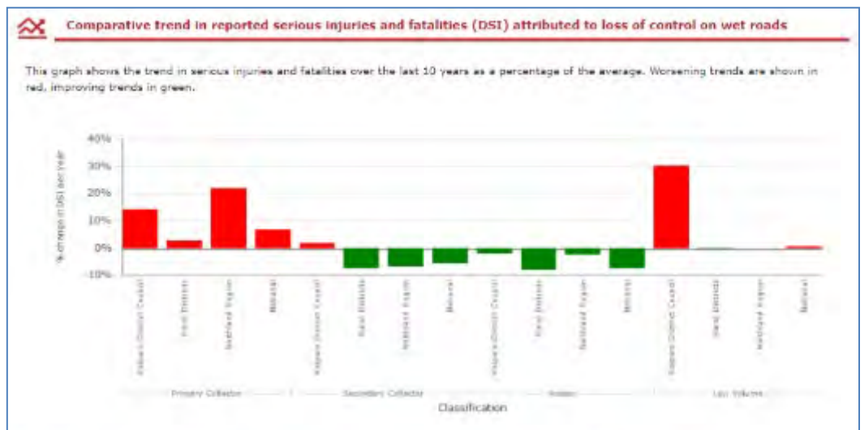
Trend (Percentage of DSI per year)	Primary Collector	Secondary Collector	Access	Low Volume
Kaipara District Council	6.67%	-28.75%	-11.76%	4.12%
Rural Districts	5.29%	0.08%	1.97%	-10.70%
Northland Region	-3.58%	1.68%	-18.05%	-15.71%
National	1.21%	0.32%	0.05%	-6.98%



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Safety - DSI Trend Wet Road Crash**	Safety	Customer Outcome	OM1	DSI Crash Trend on Wet Roads	Arterial		Decreasing Trend			The key rural high-speed routes remain a focus. Apart from the 17/18 spike the trend is static or improving.	**GAP –** High Speed Rural Primary Collector and Access network. **Response** - Continue to fund Road Safety Education Programmes - Identify and specify the use high quality road surface sealing chip. Undertake localised out of context corner improvements.
					Primary Collector		Decreasing Trend			No issues, although the data set looks incomplete for the PC network.	
					Secondary Collector		Decreasing Trend			Increasing trend on SC network, this remains a focus of surfacing programmes.	
					Access		Decreasing Trend				
					Low Volume		Decreasing Trend			Wet loss of control has spiked. This requires close monitoring	

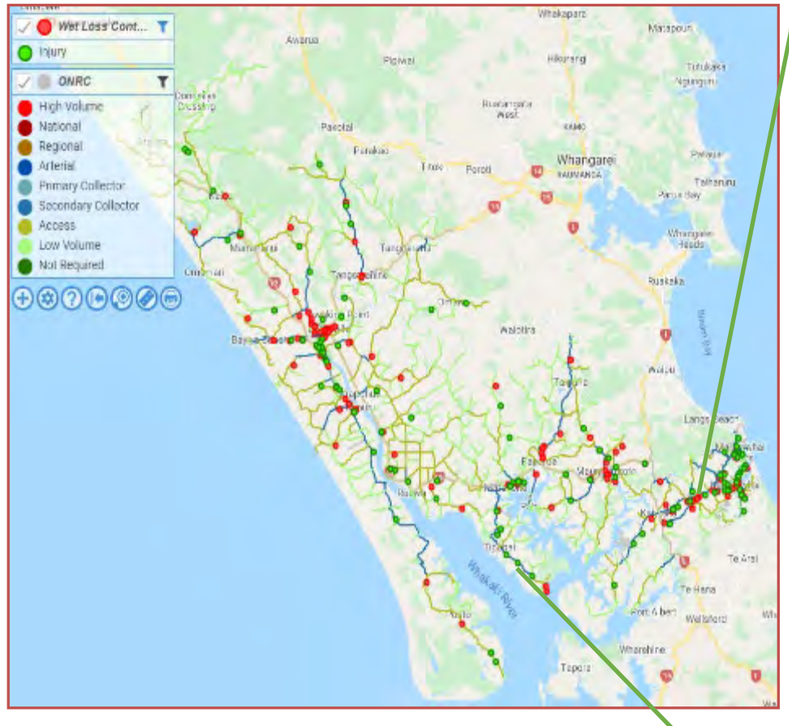
Comparative average change shows an increase on the Primary and secondary Collector network. Initiatives such as refresh of network geometry data and Corner Risk analysis is being undertaken to assist in Resurfacing investment process.



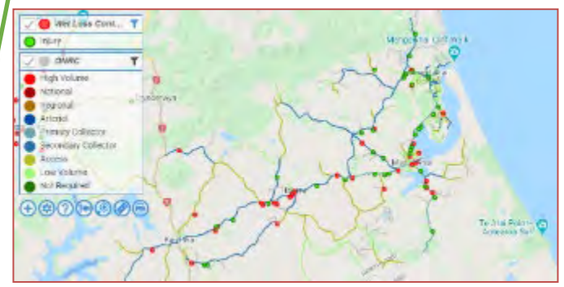


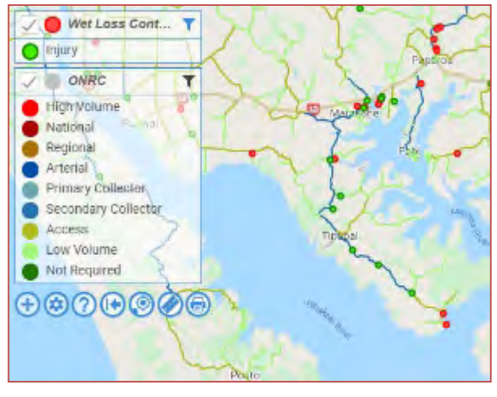
Trend (Percentage of DSI per year)	Primary Collector	Secondary Collector	Access	Low Volume
Kaipara District Council	14.14%	1.65%	-2.02%	30.30%
Rural Districts	2.71%	-7.48%	-8.05%	-0.16%
Northland Region	21.90%	-6.84%	-2.33%	0.00%
National	6.63%	-5.80%	-7.39%	0.47%

Wet Loss Control – Injury and Non-Injury



Kaiwaka Mangawhai Rd

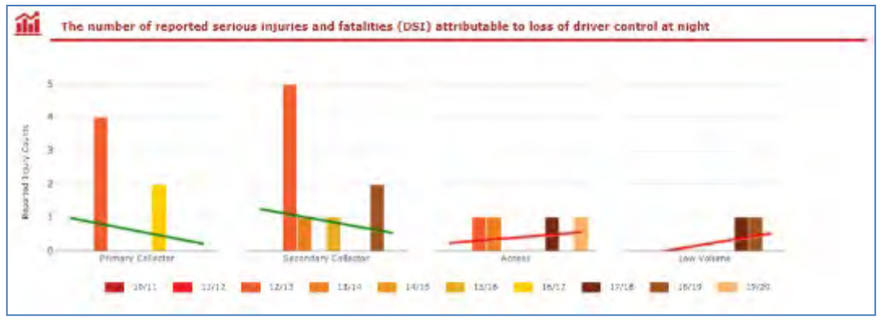


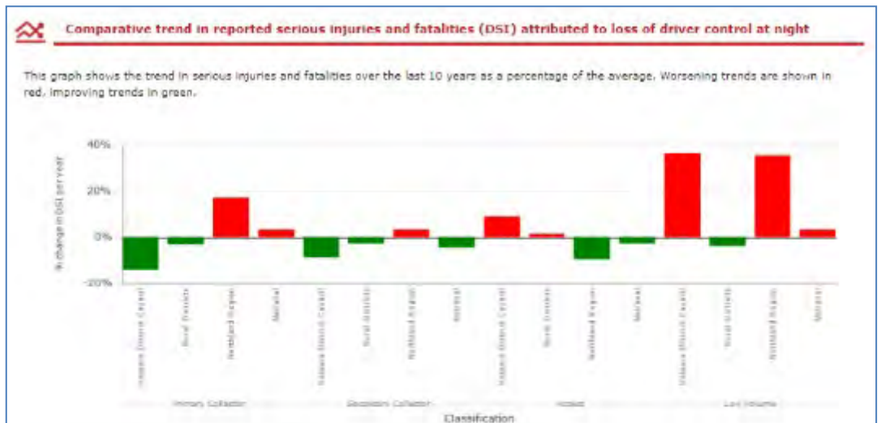


Tinopai Rd

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Safety - DSI Trend Night Time**	Safety	Technical Output	PM5	Loss of Control DSI Crash Trend Night	Arterial		Decreasing Trend				**GAP –** Access and Low volume network, road width and ability to install effective delineation without causing secondary issues i.e. Edge line install pushing vehicles to the centre of the road. **Response** - Continue to fund Road Safety Education Programmes - Increase delineation on the network through the form of route treatments - Consider widening and camber correction on high risk corners
					Primary Collector		Decreasing Trend			Improving trend over the last 10 years. However very limited dataset.	
					Secondary Collector		Decreasing Trend			Shows a decrease, again the dataset is limited.	
					Access		Decreasing Trend			Increasing trend, may require review of delineation fit for purpose	
					Low Volume		Decreasing Trend			Increase, as above.	

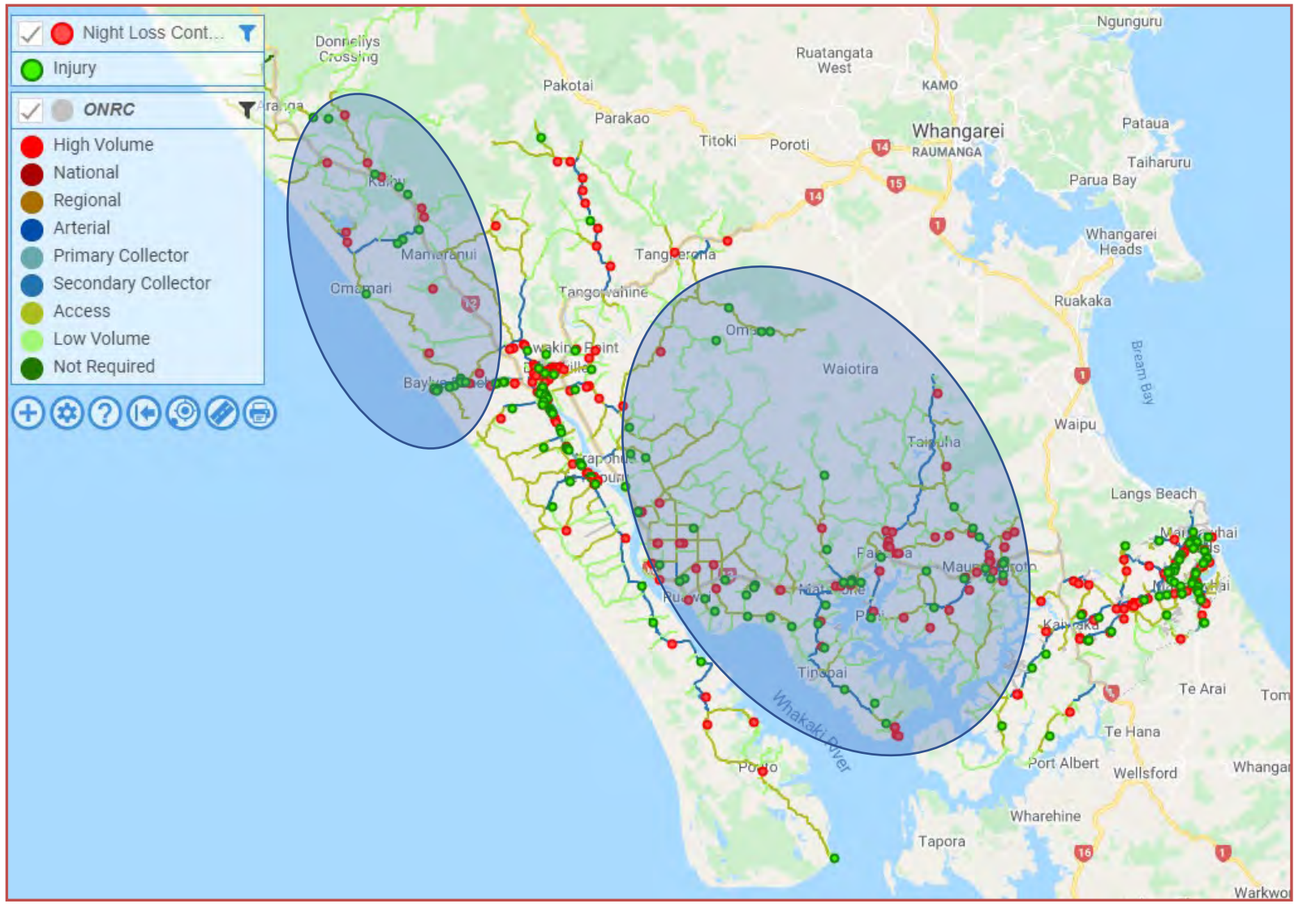
Comparative analysis indicates the Access and Low Volume network is out of step with the rural districts and nationally.





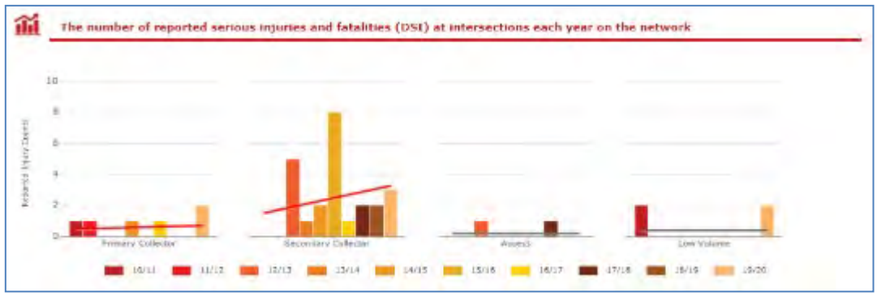
Trend (Percentage of DSI per year)	Primary Collector	Secondary Collector	Access	Low Volume
Kaipara District Council	-14.14%	-8.75%	0.00%	36.36%
Rural Districts	-3.10%	-2.61%	1.67%	-3.88%
Northland Region	17.20%	3.19%	-9.52%	35.50%
National	3.36%	-4.48%	-2.58%	3.14%

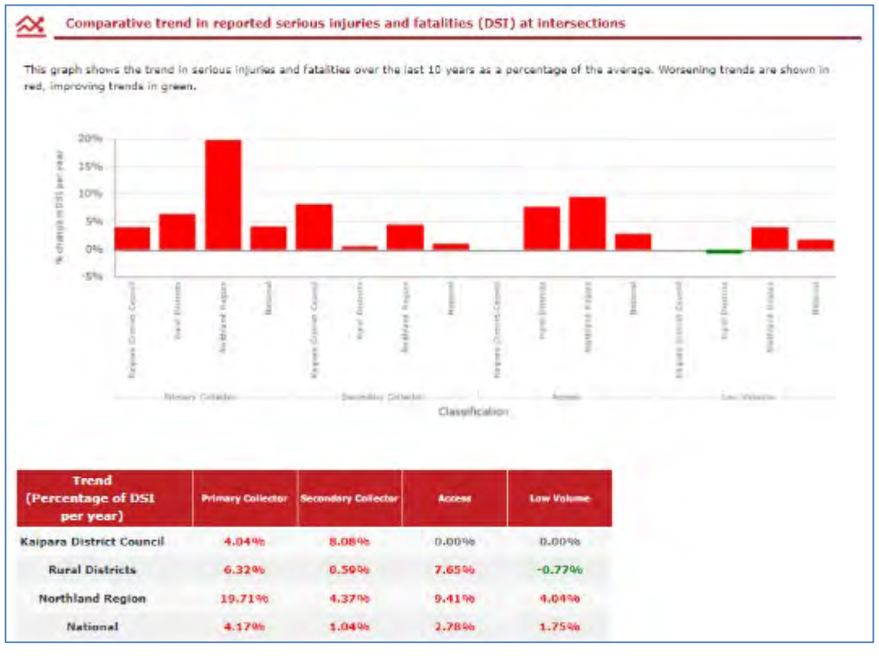
Night Loss Control – Injury and Non-Injury



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Safety - DSI at Intersections**	Safety	Technical Output	PM6	DSI Crash Trend at Intersections	Arterial		Decreasing Trend				**GAP** – Primary, Secondary increasing trends in Intersection crashes. **Response** - Continue to fund Road Safety Education Programmes - Review intersection controls/sight lines and implement intersection treatments such improvement in Sealed Unsealed junction to ensure appropriate stopping opportunity is provided.
					Primary Collector		Decreasing Trend			Limited data	
					Secondary Collector		Decreasing Trend			Increasing trend	
					Access		Decreasing Trend			Limited data set	
					Low Volume		Decreasing Trend			Limited data set	

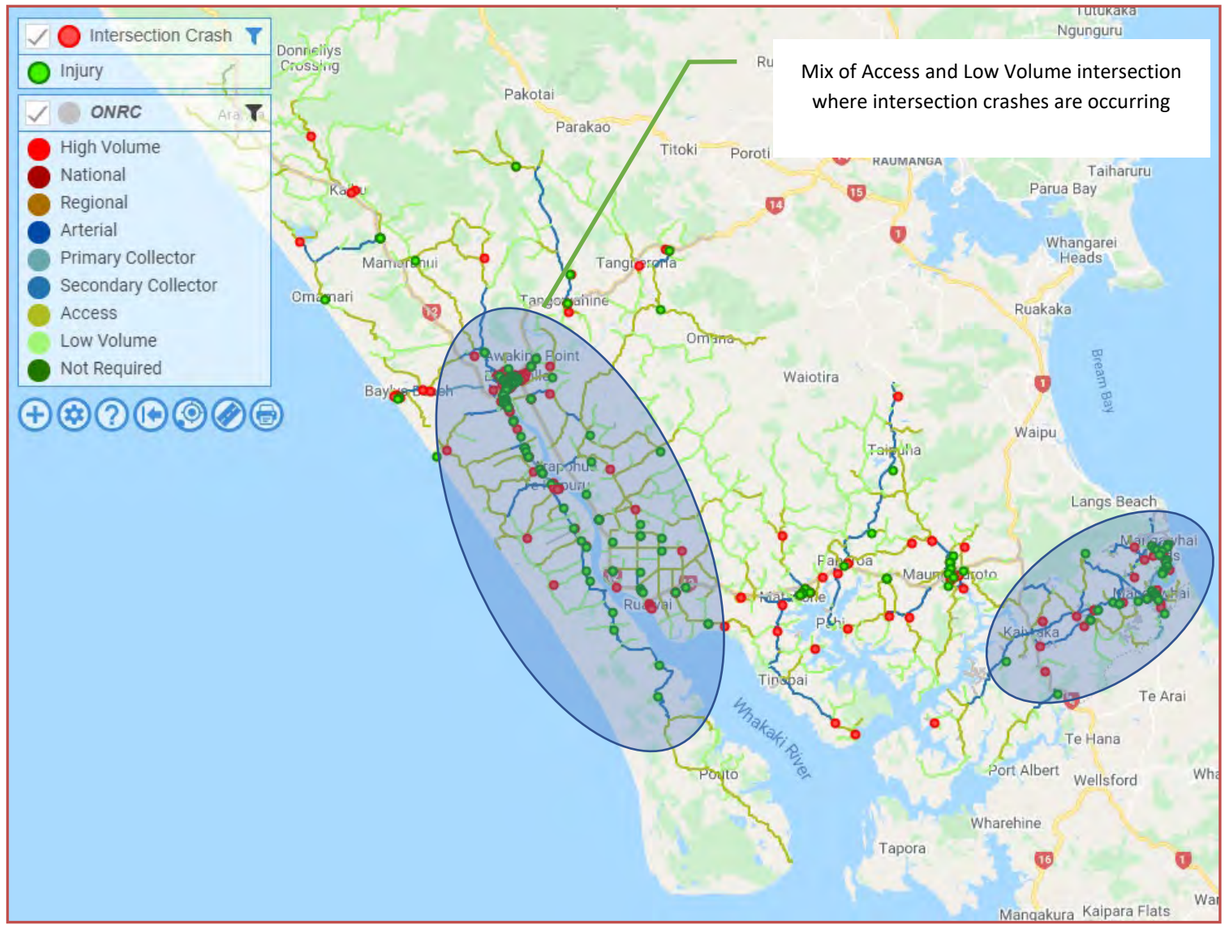
Comparative analysis would indicate the Intersection crashes remain an issue for Primary and Secondary Collector networks. Compared to rural districts KDC is lower however there has been an increase from the average for KDC. Given that the trend for increasing crashes is across Collector road classes, a programme of Intersection control review along with validating the short-unsealed approaches to sealed roads would be beneficial. Typically, Access/Low Volume roads intersecting with Secondary Collector and Primary Collectors are the most high risk sites around stopping opportunities. This trend is also present in Whangarei.





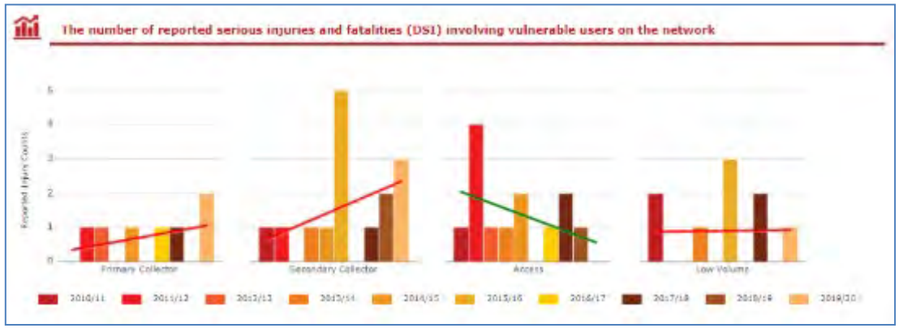
Trend (Percentage of DSI per year)	Primary Collector	Secondary Collector	Access	Low Volume
Kaipara District Council	4.04%	8.08%	0.00%	0.00%
Rural Districts	6.32%	0.59%	7.65%	-0.77%
Northland Region	19.71%	4.37%	9.41%	4.04%
National	4.17%	1.04%	2.78%	1.75%

Crash Intersection – Minor, Serious and Fatal



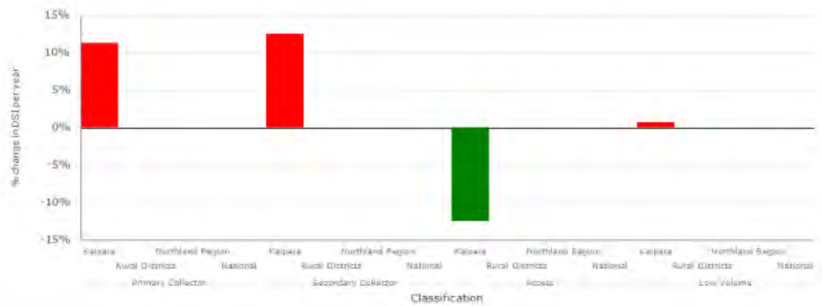
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Safety - Vulnerable Users**	Safety	Technical Output	PM9	Vulnerable users	Arterial		Decreasing Trend				**GAP** – Increase across most ONRC Motor Cyclists are heavily represented in these stats. **Response** - Continue to fund Road Safety Education Programmes - Consider the ride quality of the network as key drive to motor cyclist crashes. This is also an issue in the WhgDC network. Programme of Peak roughness to focus on improving ride quality.
					Primary Collector		Decreasing Trend			A general increasing trend, it would appear motor cyclists represent this increase.	
					Secondary Collector		Decreasing Trend			As above	
					Access		Decreasing Trend			Indicates a decrease	
					Low Volume		Decreasing Trend			Limited data to make any real conclusion	

Comparative analysis show KDC network has had an increase in the Primary and Secondary network. As noted, motor cyclist over represent the vulnerable users crashes on Secondary Collectors and Access. The Access network show an improvement, this would need to be monitored.



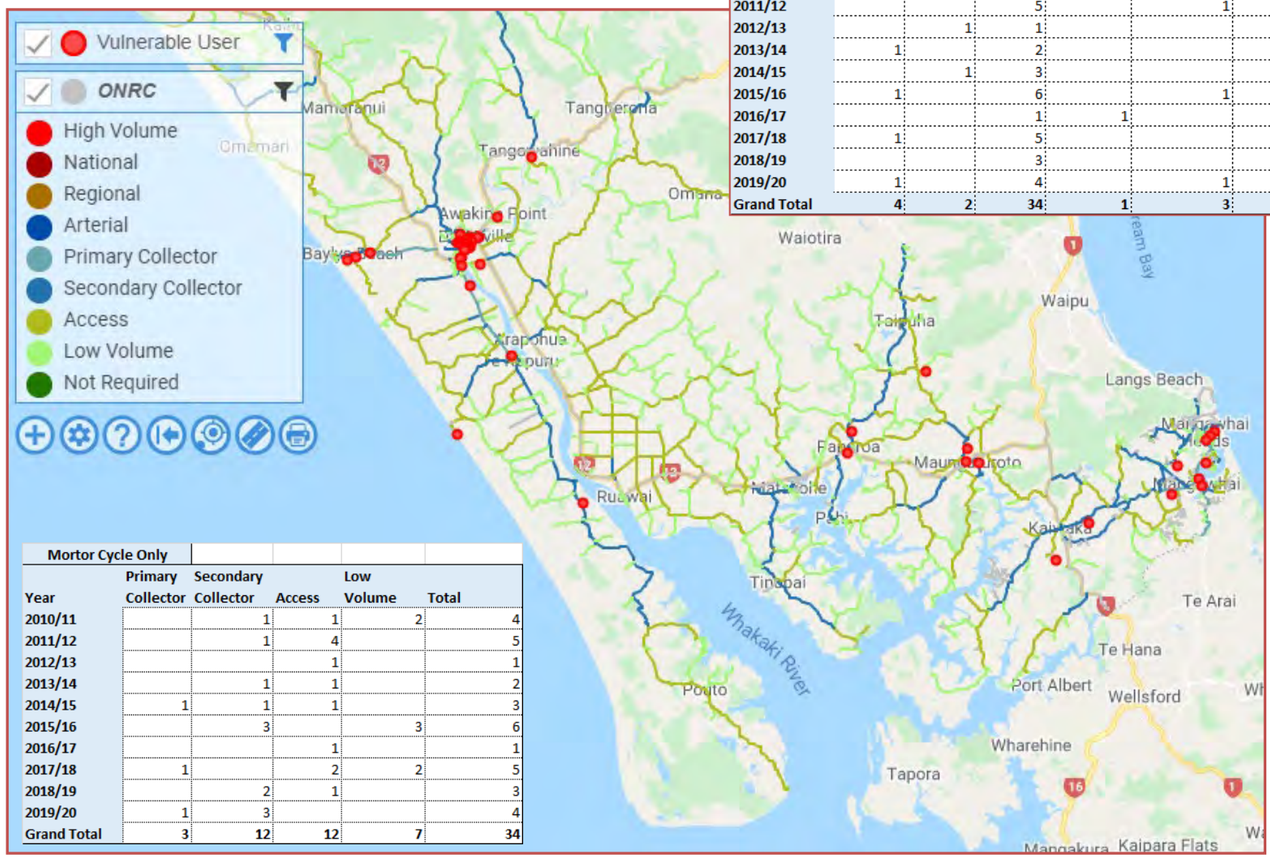
Comparative trend in reported serious injuries and fatalities (DSI) involving vulnerable users on the network

This graph shows the trend in serious injuries and fatalities over the last five years as a percentage of the average. Worsening trends are shown in red, improving trends in green.



Trend (Change in DSI per year)	Primary Collector	Secondary Collector	Access	Low Volume
Kaipara District Council	11.26%	12.53%	-12.59%	0.67%
Rural Districts	5.52%	0.43%	-1.43%	-1.12%
Northland Region	17.37%	9.83%	2.31%	-3.03%
National	4.84%	0.90%	0.74%	1.21%

Crash Vulnerable Users (Cyclist, Peds) – Minor, Serious

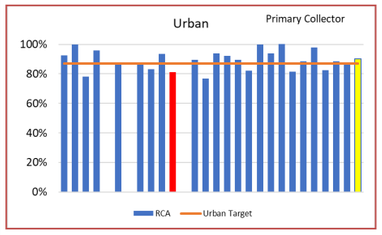


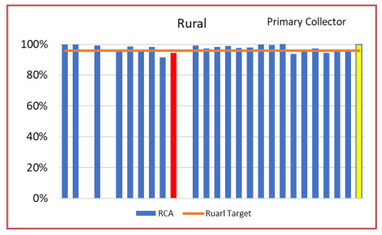
Year	Bicycle	Moped	Motor Cycle	Other Pedestrian	Pedestrian Crossing Road	Grand Total
2010/11			4			4
2011/12			5		1	6
2012/13		1	1			2
2013/14	1		2			3
2014/15		1	3			4
2015/16	1		6		1	8
2016/17			1	1		2
2017/18	1		5			6
2018/19			3			3
2019/20	1		4		1	6
Grand Total	4	2	34	1	3	44

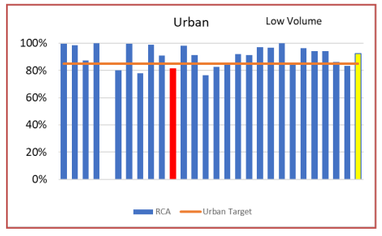
Mortor Cycle Only					
Year	Primary Collector	Secondary Collector	Access	Low Volume	Total
2010/11		1	1	2	4
2011/12		1	4		5
2012/13			1		1
2013/14		1	1		2
2014/15	1	1	1		3
2015/16		3		3	6
2016/17			1		1
2017/18	1		2	2	5
2018/19		2	1		3
2019/20	1	3			4
Grand Total	3	12	12	7	34

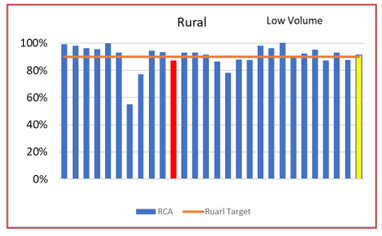
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
KDC **Amenity - Smooth Travel Sealed Roads**	Amenity	Customer Outcome	OM1, LTP	The % of Roads Classed as Smooth (STE) DIA	Arterial	Urban	N/A	N/A	N/A		**GAP** – There has been a significant increase in rough roads over the last 4 years, on average 10% increase in rough ride across the network. This equates to an extra 45km of road classed as rough over the last 4 years. There is some crash evidence (Motor Cyclists) that may be in relation to poor ride quality. **Response** - The key focus is on maintaining safe smooth ride in the high speed rural environments especially in the Primary and Secondary portion of the network, which represents 66 % of the sealed network. This will mean continued investment level in pavement rehabilitation at current levels and resilience work.
						Rural	N/A	N/A	N/A		
					Primary Collector	Urban	87	87	87	The peer group average is 90%. A target of 87% has been set against a current achievement of 81%.	
						Rural	96	96	96	Target has been set 99% against an achievement of 95%. Trend has shown a steady reduction, and this now needs to be held steady to maintain a safe ride. This target is in keeping with majority of the peer group.	
					Secondary Collector	Urban	87	87	87	Target of 87% against an achievement of 83%. This looks to now arrest further decline and maintain a reasonable Customer LoS.	
						Rural	97	97	97	Target of 97% against an achievement of 96%. As noted above.	
					Access	Urban	85	85	85	Access and Low Volume are increased slightly to continue to provide a safe smooth travel environment.	
						Rural	93	93	93		
					Low Volume	Urban	85	85	85		
						Rural	90	90	90		
					Network Average (Target >=)	**All**	**90**	**90**	**90**		

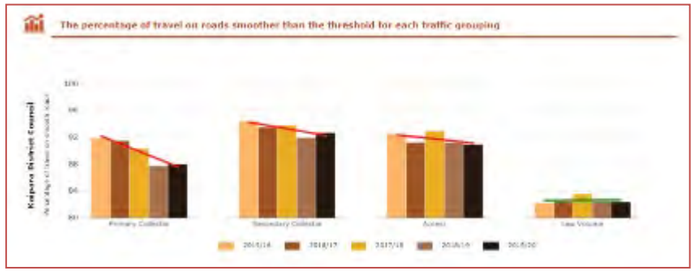
Yellow bar shows the peer group average the red bar is Kaipara DC current achievement. The Orange line is the target being set in relation to peer group average and the peer group as whole. A number of key issue can be observed; **1**. Kaipara DC features poorly against all comparative groups; **2**. Kaipara DC STE across ONRC has been reducing over the term of the last LTP for Primary and Secondary roads.

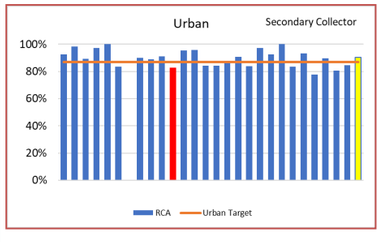


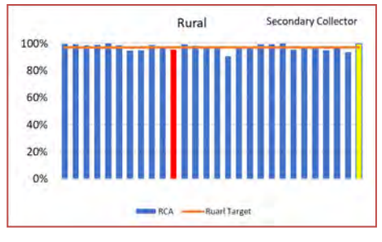


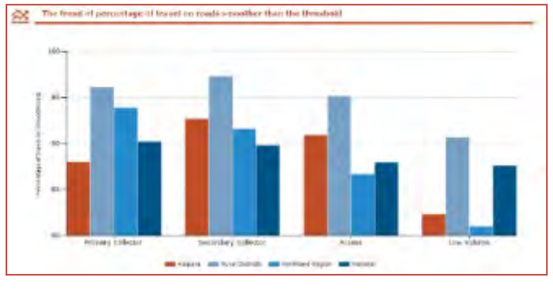


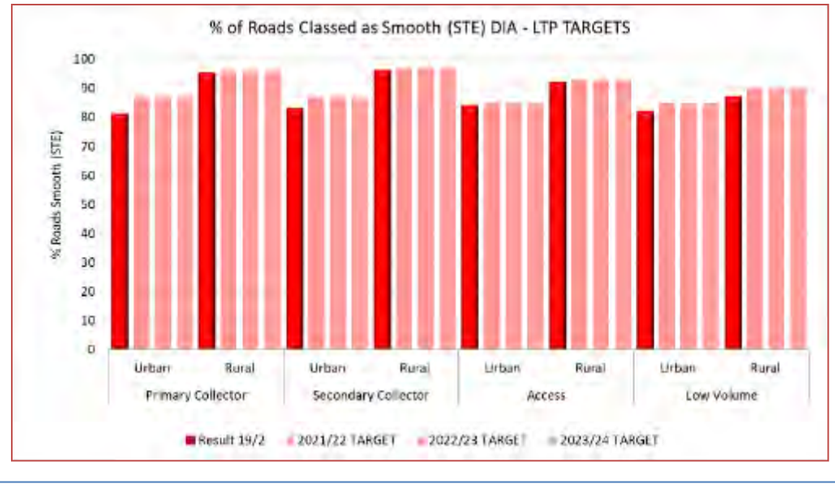


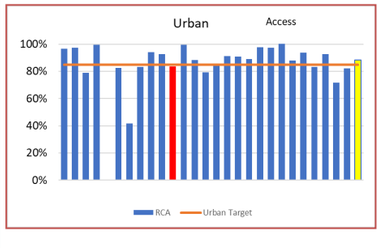


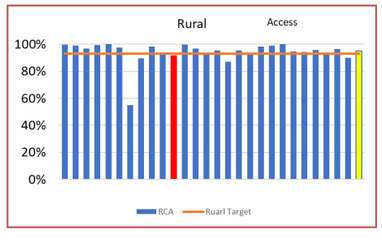






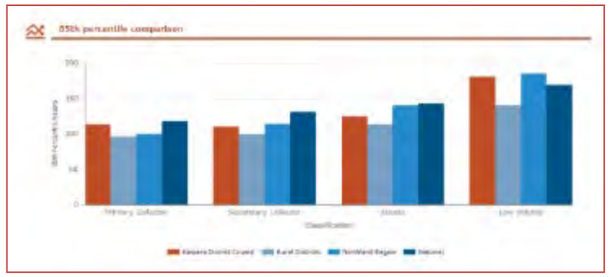


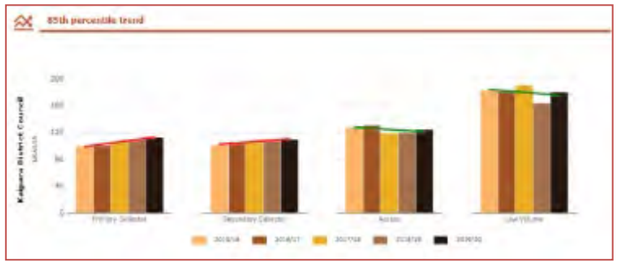


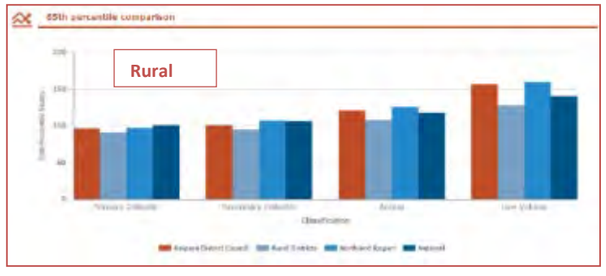


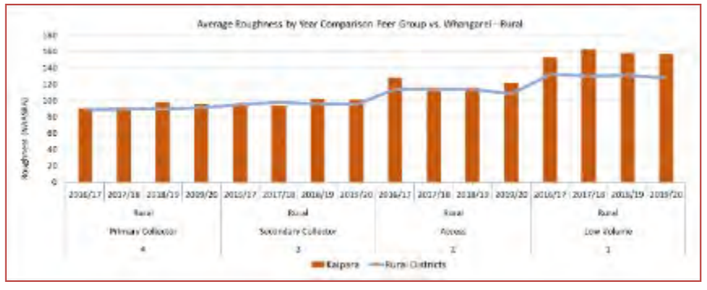
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
KDC **Amenity - Peak Roughness**	Amenity	Technical Output	PM1	Peak Roughness (85th%)/ Ride comfort	Arterial	Urban	N/A	N/A	N/A		**GAP** - KDC is above the peer group peak rough across the board. The Primary and Secondary are deteriorating in relation to peer group year on year becoming rougher. This reflects the STE outcome. Geology vulnerable to water is a related symptom to peak roughness. **Response** – Continue with Rehabilitation as set and fund along with targeted peak roughness programmes to address the issue, such as resilience, given the increasing trend in motor cycle crashes on the network.
						Rural	N/A	N/A	N/A		
					Primary Collector	Urban	120	120	120	Set at peer group. Current achievement well above peer group and deteriorating.	
						Rural	90	90	90	As Above	
					Secondary Collector	Urban	140	140	140	As Above	
						Rural	95	95	95	As above	
					Access	Urban	145	145	145	As above	
						Rural	110	110	110	As above	
					Low Volume	Urban	165	165	165	As above	
						Rural	125	125	125	As above	

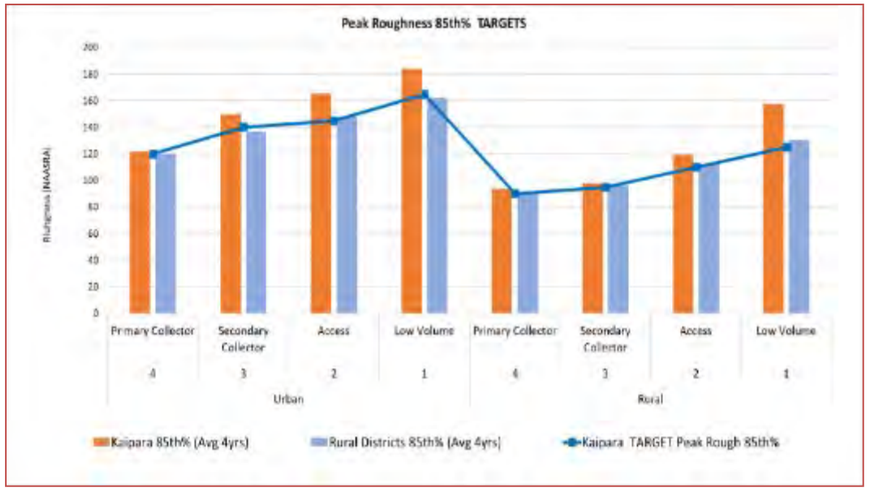
Kaipara DC peek roughness is above peer group across the board in all classes. The Primary and Secondary networks have been in state of deterioration over the last LTP period. Low Volume network has moved significantly out of step with peer group, rural.

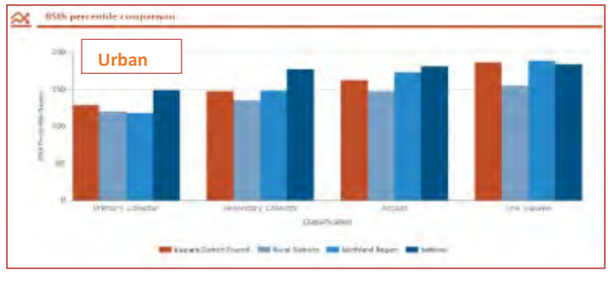


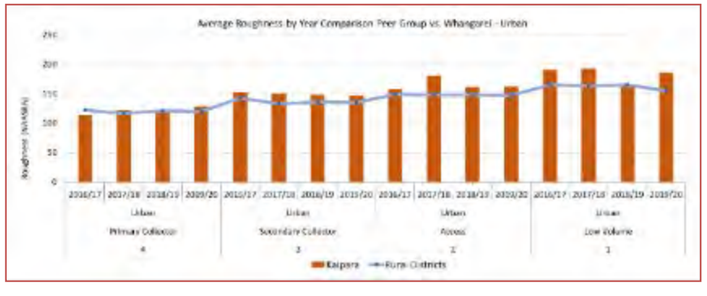












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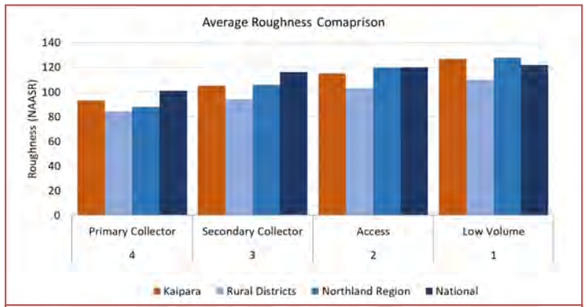
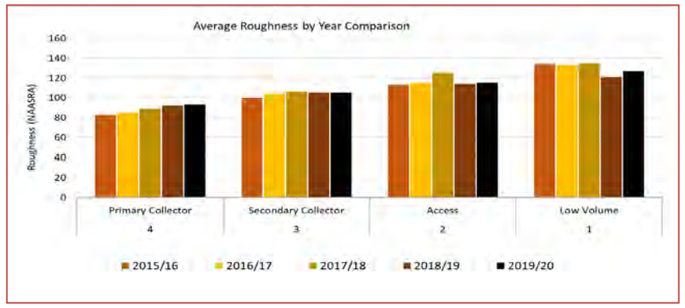
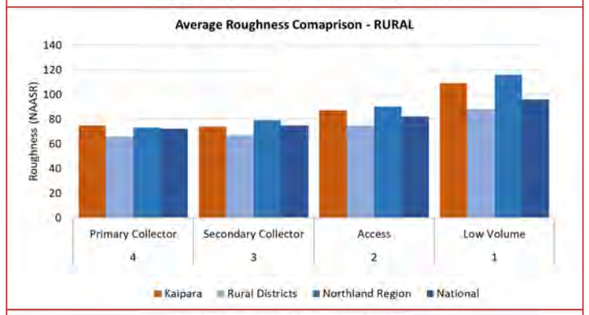
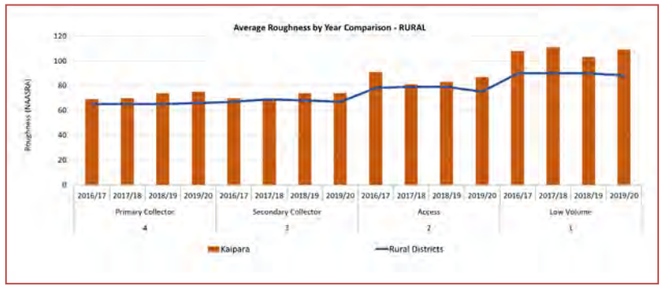
KDC **Amenity - Average Roughness**	Amenity	Customer Outcome	OM2	Average Roughness	Arterial	Urban	N/A	N/A	N/A		**GAP** – KDC network is above the peer group across all road classes. The most significant gap is on Access/Low Volume network. The trend for KDC has continued to deteriorate year on year on the Primary and Secondary Collectors. **Response** – Deliver rehab programme as developed to maintain ride comfort for the Primary and Secondary Collector network. There is adjustment required on the Access and Low Volume classes, this is naturally occurring as pavement start fail and become expensive to maintain/seal. This should have an impact on reducing DSI and peak rough/STE.
						Rural	N/A	N/A	N/A		
					Primary Collector	Urban	90	90	90	Maintain target to keep steady state	
						Rural	70	70	70	Small reduction in target to maintain steady state	
					Secondary Collector	Urban	100	100	100	KDC one of highest in peer group. Reduce target to help manage peak roughness	
						Rural	75	75	75	As above	
					Access	Urban	110	110	110	As above	
						Rural	85	85	85	As above	
					Low Volume	Urban	115	115	115	As above	
						Rural	100	100	100	As above	
					Network (Average)	**All**	**93**	**93**	**93**		

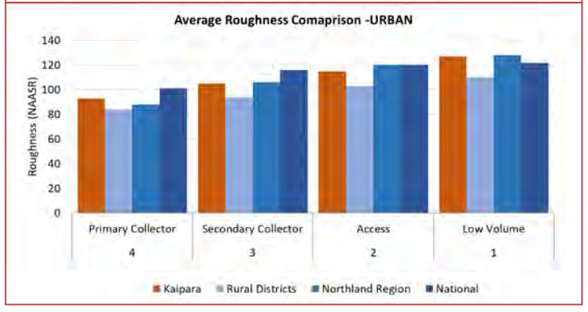
In comparison KDC has higher roughness than the peer group. This is most apparent on the Rural Access and Low Volume network. Targets are being set against peer group to help reduce the overall average roughness to support the reduction in peak roughness and improvement in ride quality for STE.

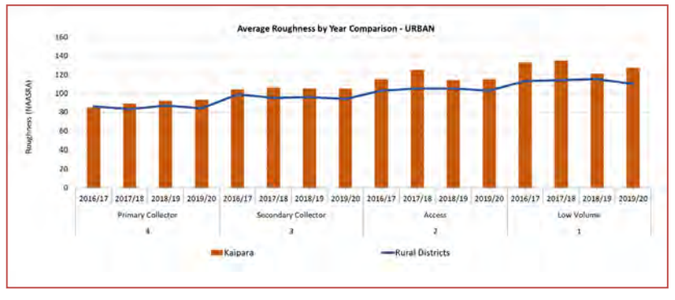


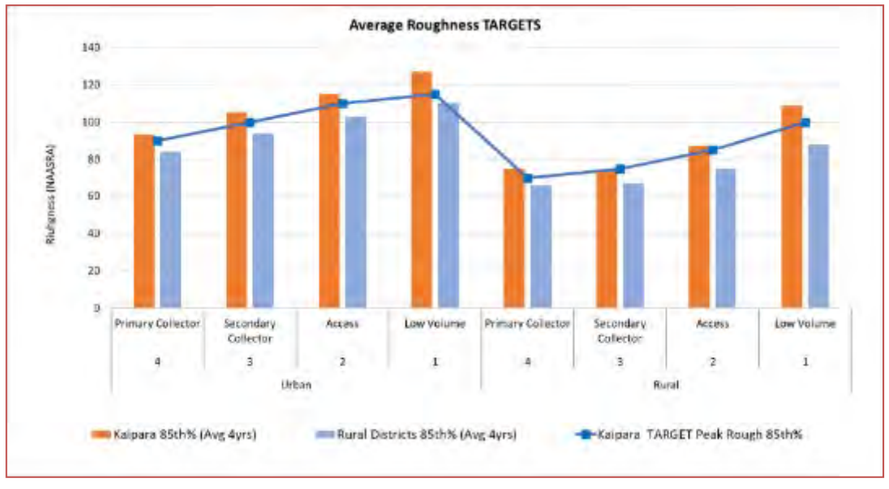








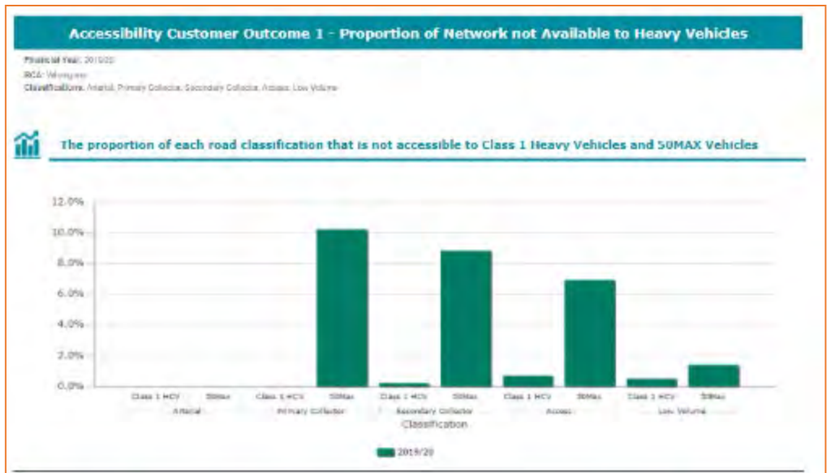




Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
KDC **Accessibility - Network not available to HCV/50max**	Accessibility	Customer Outcome	OM1	Proportion of Network not Available to HCV & 50Max	Arterial	HCV					**GAP** - Programme has been set to investigate and analyses the upgrade option of the bridges that are restricting the network. This will enable more choice for freight industry and open access to industry to travel the network more efficiently. **Response** - This programme has been completed and is now with in this plan for funding to remove restrictions on some routes.
						50Max					
					Primary Collector	HCV					
						50Max					
					Secondary Collector	HCV					
						50Max					
					Access	HCV					
						50Max					
					Low Volume	HCV					
						50Max					

No peer group comparison is available for this measure

50Max Limited Bridges



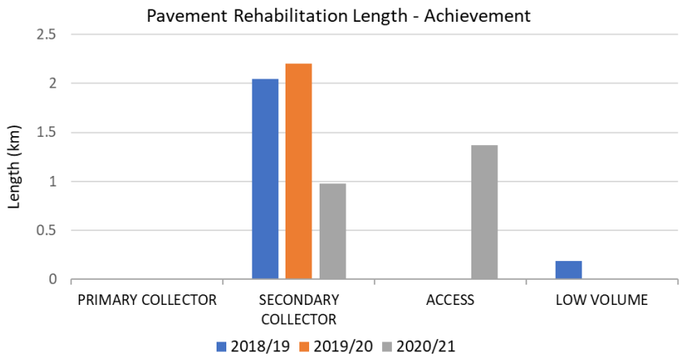
Financial Year	Arterial		Primary Collector		Secondary Collector		Access		Low Volume	
	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max
2019/20	0.0%	0.0%	0.0%	10.2%	0.2%	8.8%	0.7%	6.9%	0.5%	1.4%

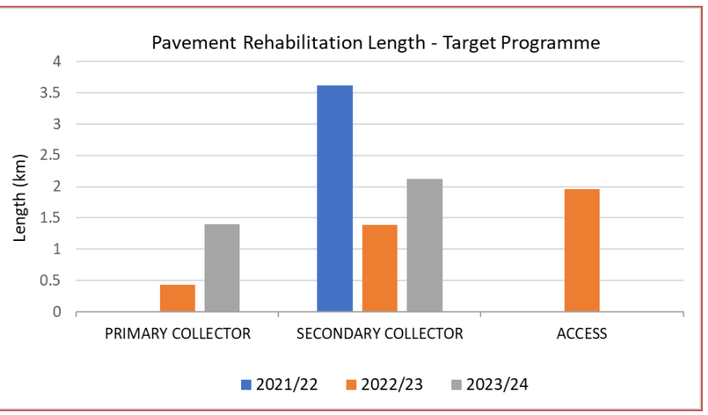
Weight Restricted Class 1 - Bridges

TBC

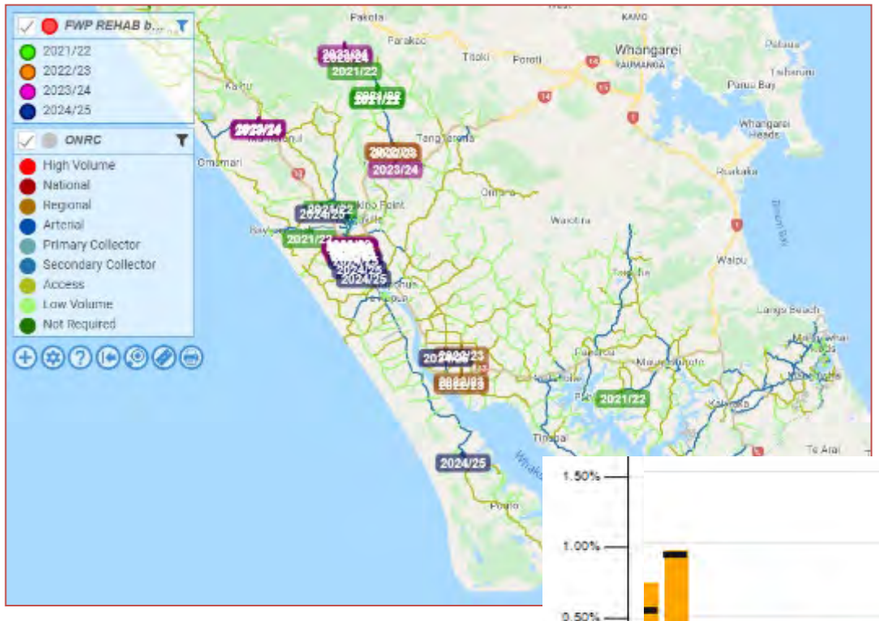
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Cost Efficiency – The percentage of the sealed local road network that is rehabilitated**	Pavement Rehabilitation - Cost Efficiency	Efficiency Measure	EM	Was REG measure. Has been removed from PMRT. Change Target to % of network **OLD** Pavement Rehabilitation length - Lane km	Arterial	N/A	N/A	N/A		This programme has been directed by several condition drivers, one of which is the customer ride comfort as set out under ONRC. Given that the network is exceeding roughness targets this is where 2021-24 programme is targeted to deliver on the customer outcome. With targeted ride issue on Primary, Secondary roads.
					Primary Collector	0.00%	0.69%	2.24%	Loaded Rural roads and urban roads in poor condition	
					Secondary Collector	1.50%	0.58%	0.88%	Rural loaded ride quality	
					Access	0.00%	1.62%	0.00%	In response to peak roughness rural	
					Low Volume	0.00%	0.0%	0.0%	No works identified	
					Network (Total)>=0.4%	0.6% (2.7km)	0.6% (2.7km)	0.5% (2.2km)	On average 2.4 km/yr next three years.	

Comparative analysis shows KDC 5 year average at about 0.85% (bottom right NZTA report). This is out of step with what is now being achieved of around 0.5% or 2.2km/yr. The difference is due to a significant reduction in rehabilitations being undertaken from 2018 onward due to a change of strategy. The rehab programme is designed to target highly loaded rural pavements to maintain current performance and keep in check the deteriorating ride quality on rural network. Further reduction in rehabilitation programme would see continued deterioration in customer outcomes. Northland sub quality construction materials and sensitive geology continue to have an impact on ride quality of the network.

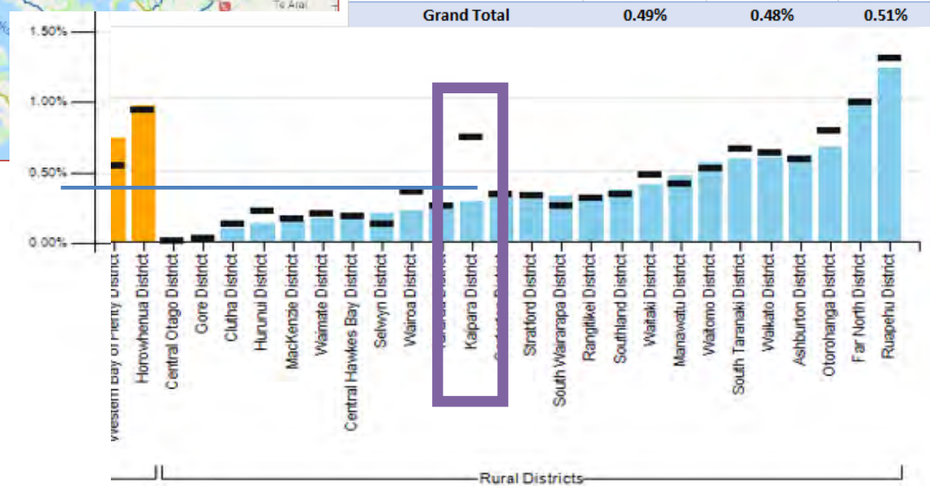




Pavement Renewal – 2021-2025

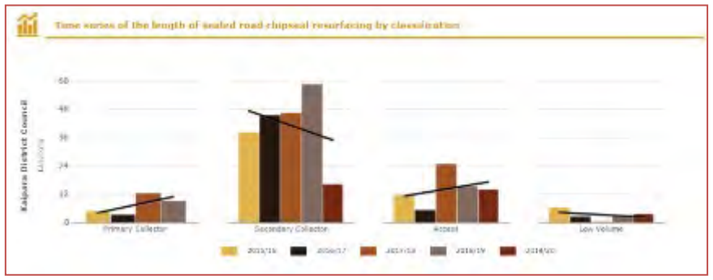


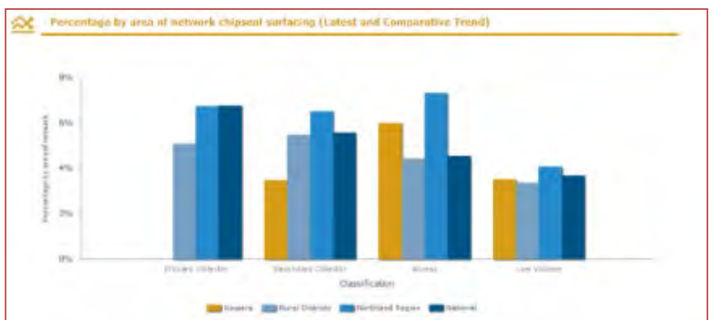
Achievement as Percentage	2018/19	2019/20	2020/21
ARTERIAL	0.0%	0.0%	0.0%
PRIMARY COLLECTOR	0.0%	0.0%	0.0%
SECONDARY COLLECTOR	0.8%	0.9%	0.4%
ACCESS	0.0%	0.0%	1.1%
LOW VOLUME	0.6%	0.0%	0.0%
Grand Total	**0.49%**	**0.48%**	**0.51%**



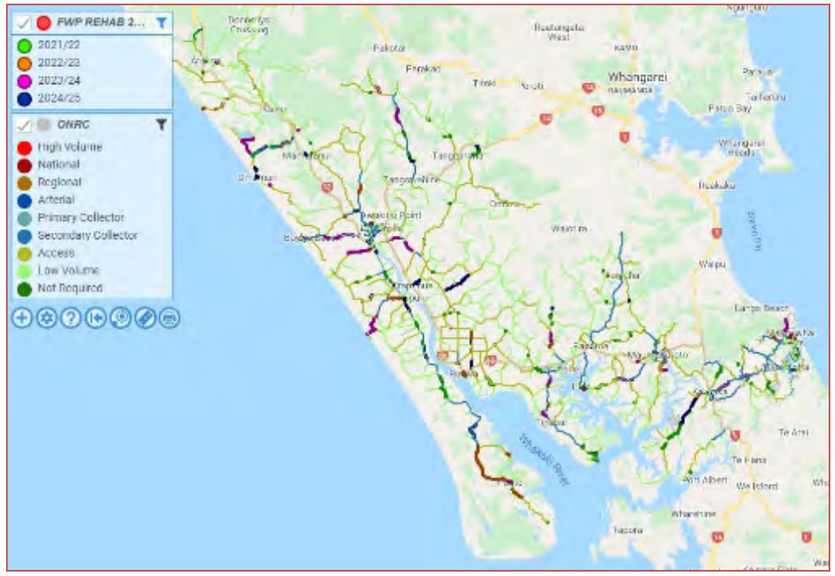
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Cost Efficiency - Chipseal Lane/km**	Chip Seal - Cost Efficiency	Efficiency Measure	EM2(a)	Chipseal Resurfacing Quantity - lane km (DIA mandatory) expressed as both Ln.km and % of sealed Network	Arterial	N/A	N/A	N/A		**GAP** – Reducing Rehab programme Access/LV network. Old First coat seals on network. **Response** - Chipseal resurfacing programme is designed in response to the pavement renewal programme. No rehab for the LV. Resurfacing will help protect these parts of the network. The programme is clearly targeted at what is needed when it is needed as given by the how the quantities swing based on ONRC and year. Is also catch up on old first seals on the network. These are vulnerable seals and if not treated have led to premature pavement failure.
					Primary Collector	1.09lnkm /1%	6.4lnkm/ 5%	11.9lnkm/ 10%	Continued programme of sealing old first coats	
					Secondary Collector	50.1lnkm/ 10%	35.5lnkm/ 7%	44.1lnkm/ 9%	Continuing catch up on first coat seals from previous plan with decreasing programme over the period of this plan.	
					Access	33.2lnkm/ 14%	49.5lnkm/ 20%	24.7lnkm/ 10%	As above	
					Low Volume	8.3lnkm/ 13%	49.6lnkm/ 9%	4.02lnkm/ 7%		
					Network (Total) =>8%	**92.6lnkm/ 10%**	**97.2lnkm/ 11%**	**84.8lnkm/ 9%**	Catch up on Second Coat seals	

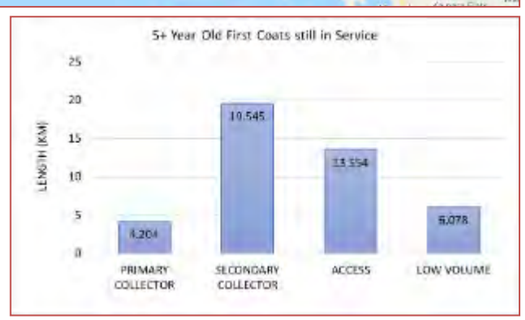
Peer group comparative for the shows that for KDC are below the peer group achievement for the Primary and Secondary Collector network. In terms of Secondary and below there has been a targeted programme of removing a significant amount of old first coat seals from the network. These old first coats have been left too long due to a constrained funding environment following the Mangawhai rating strike. It has taken time to respread the programme, target these surfaces and maintain a maintenance balance. This programme of addressing these old first coat seals continues and will be completed over the next 2 years.

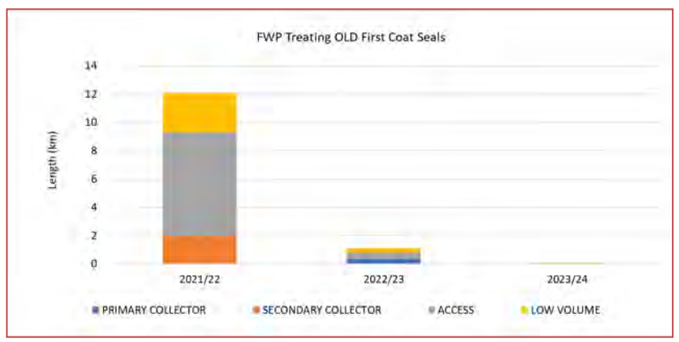




Chipseal Resurfacing – 2021-24

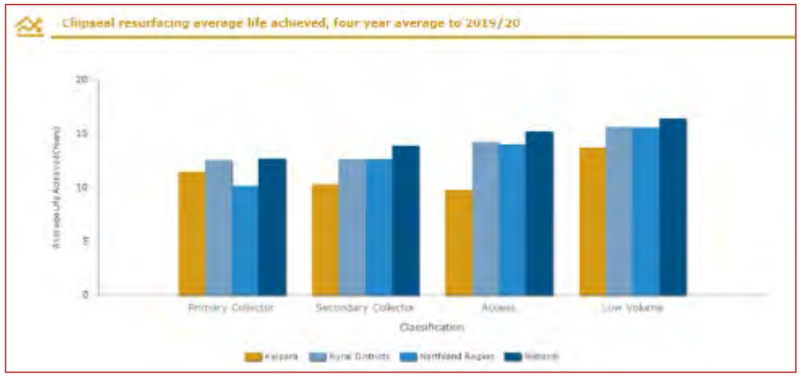


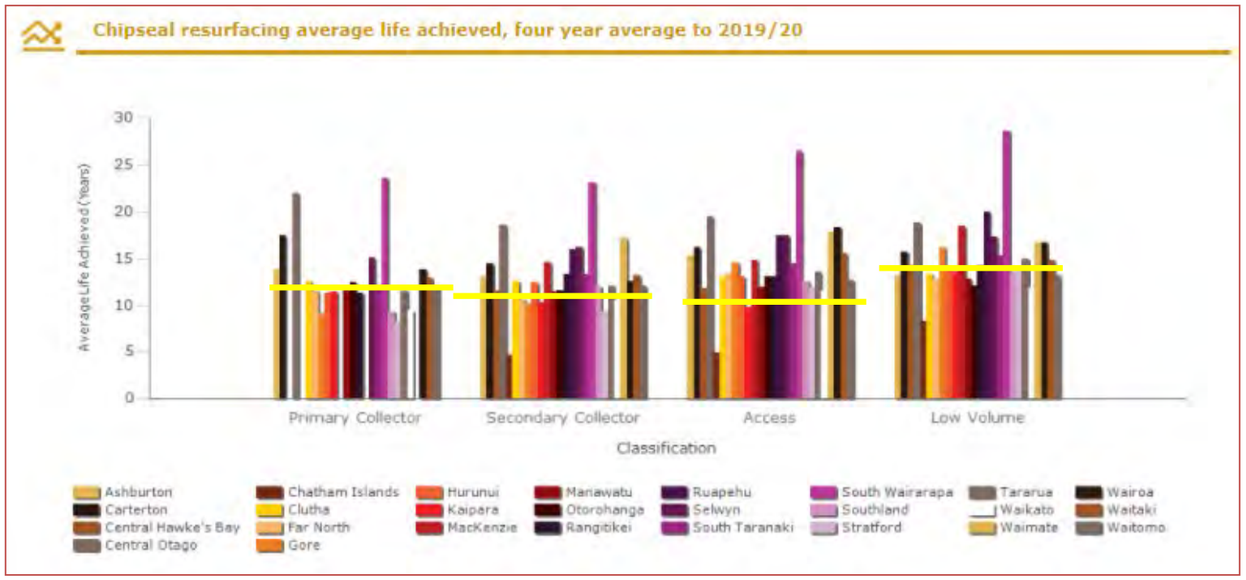


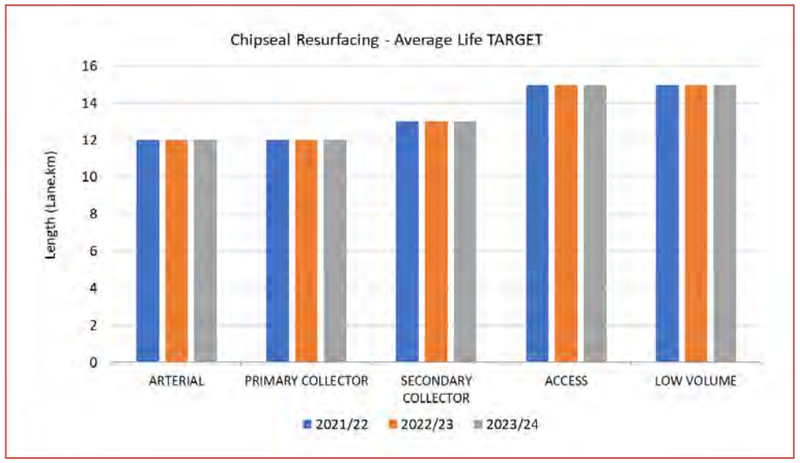


Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Cost Efficiency - Chipseal Average Life Achieved**	Cost Efficiency	Efficiency Measure	EM	Chip Seal Resurfacing - Average life achieved	Arterial	N/A	N/A	N/A		**GAP** - Continue to treat old first coats on the network. Pre-surface cost $/km starting to rise associated with preparing first coat site for second coats. **Response** - The previous plan focused on sealing vulnerable surfaces, first coats. It maybe that this issue identified 3 years ago is impacting pre-surface repair cost. This continues to be the strategy for the first year of this plan as set above. A significant programme reduction in 19/20 has also had impact on delivery.
					Primary Collector	12	12	12	Achieving average life will take time as old first coats are removed from the network.	
					Secondary Collector	13	13	13	As above	
					Access	15	15	15	As above	
					Low Volume	15	15	15	As above	
					Network (Avg)	13	13	13	As above	

Comparatively KDC compare poorly with the average life achieved, yellow bars, with lower chip seal life achieved across the all classes. This maybe due to the focus over the past 2 years on addressing short life first coat seals. There is no change to the targets however, due to issue noted under surfacing achievement the actual programme year on year will show some low average return life cycles. At the end of the end of this plan the average return cycle will be generally aligned to these targets.



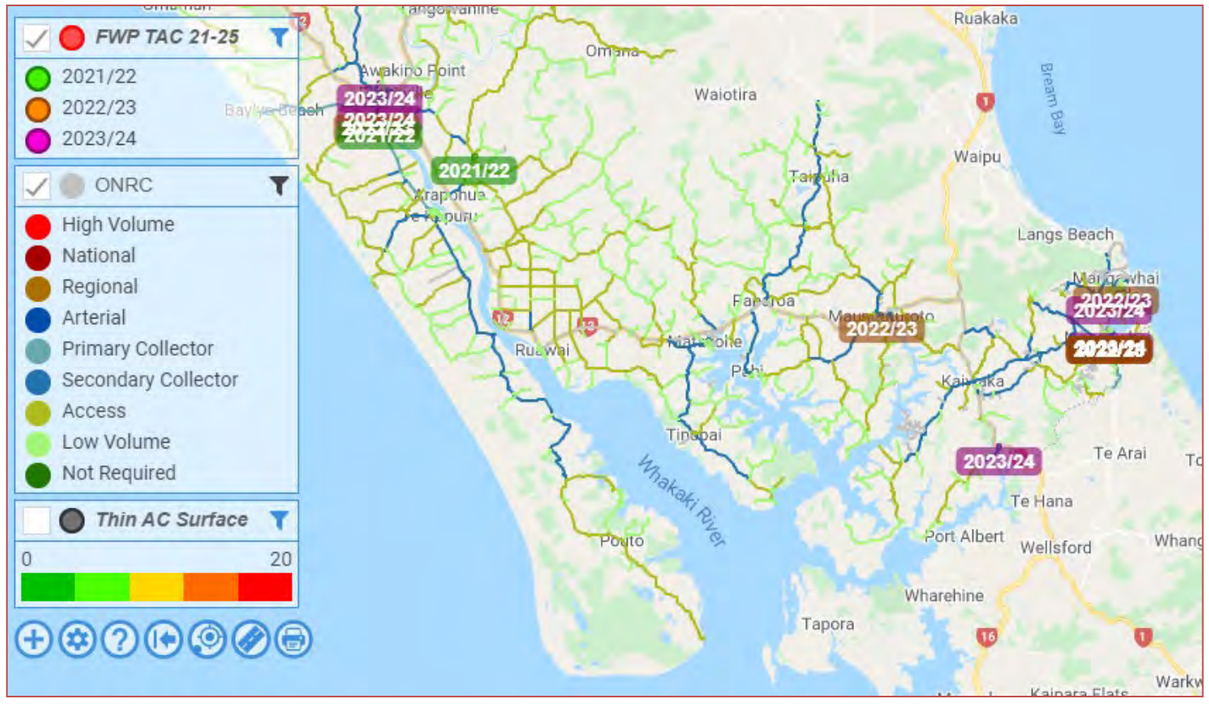


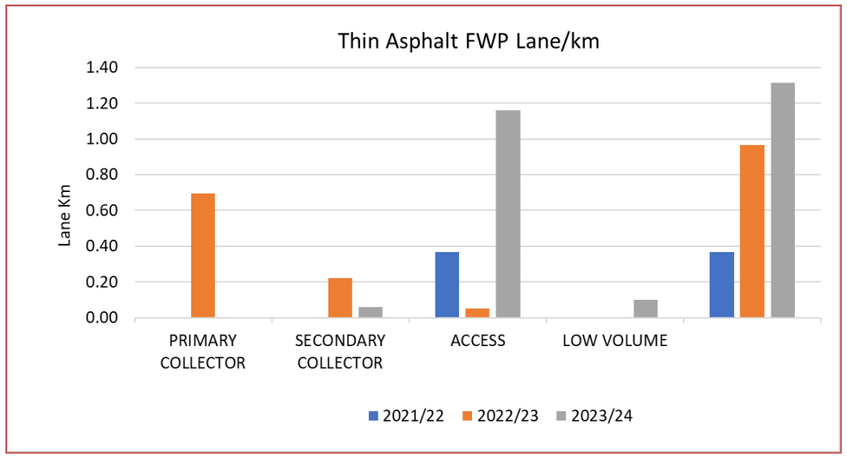


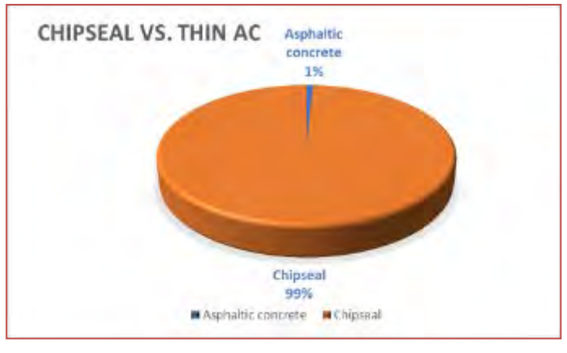
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Cost Efficiency - Asphalt Lane/km**	Cost Efficiency	Efficiency Measure	EM	Asphalt Resurfacing Quantity - lane km	Arterial					**GAP** – Poor condition old urban CBD and Rural high stress corners failing. **Response** - This programme focuses on the urban high volume network. There are some isolated rural sites that are for high stress tight corners.
					Primary Collector		0.70		Urban high value amenity area	
					Secondary Collector		0.22	0.06	Urban high value amenity area	
					Access	0.37	0.05	1.16	High stress rural corners	
					Low Volume			0.10		
					Network (Total)	0.37	0.97	1.32		

KDC have a small thin asphalt network. Over the last few years the focus has been on second coats resurfacing of first coats. However, going forward there is requirement to start to renew thin asphalt surfaces. These are generally high amenity value sites in central shopping area of Mangawhia and Dargaville, and high stress rural corners where chipseal has proven not to work in these instances, usually associated with the forestry network. The programme is very modest but is set in terms of need in locations considering factor such as, amenity value, high profile customer areas.

Asphalt Resurfacing – 2021-24



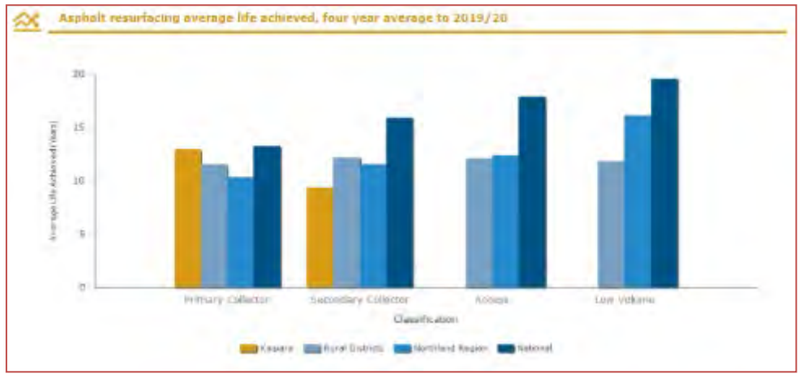


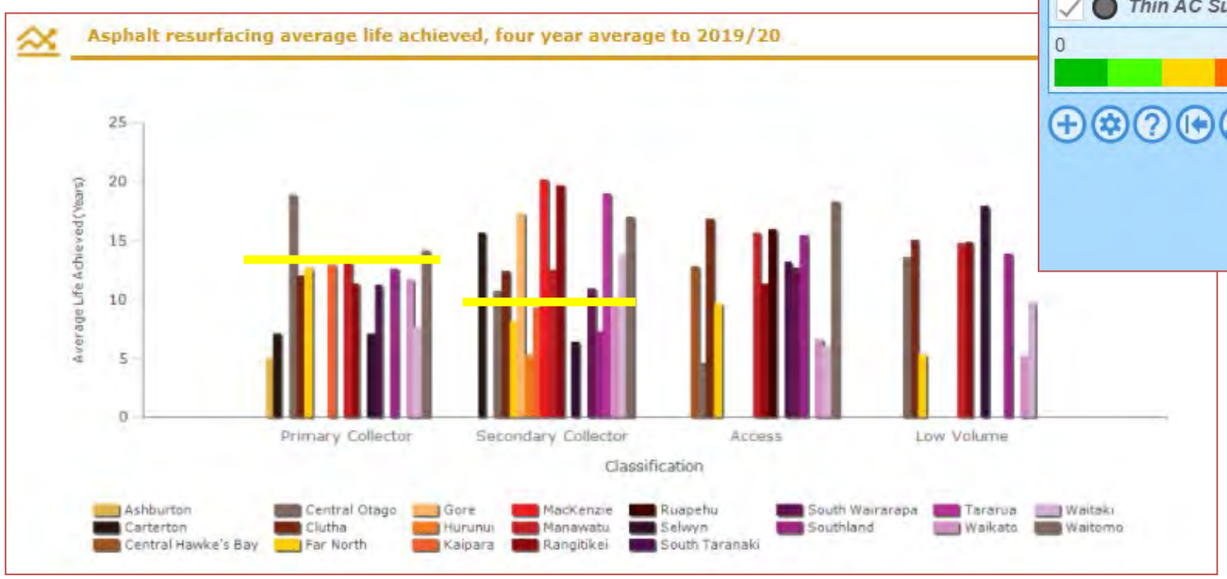


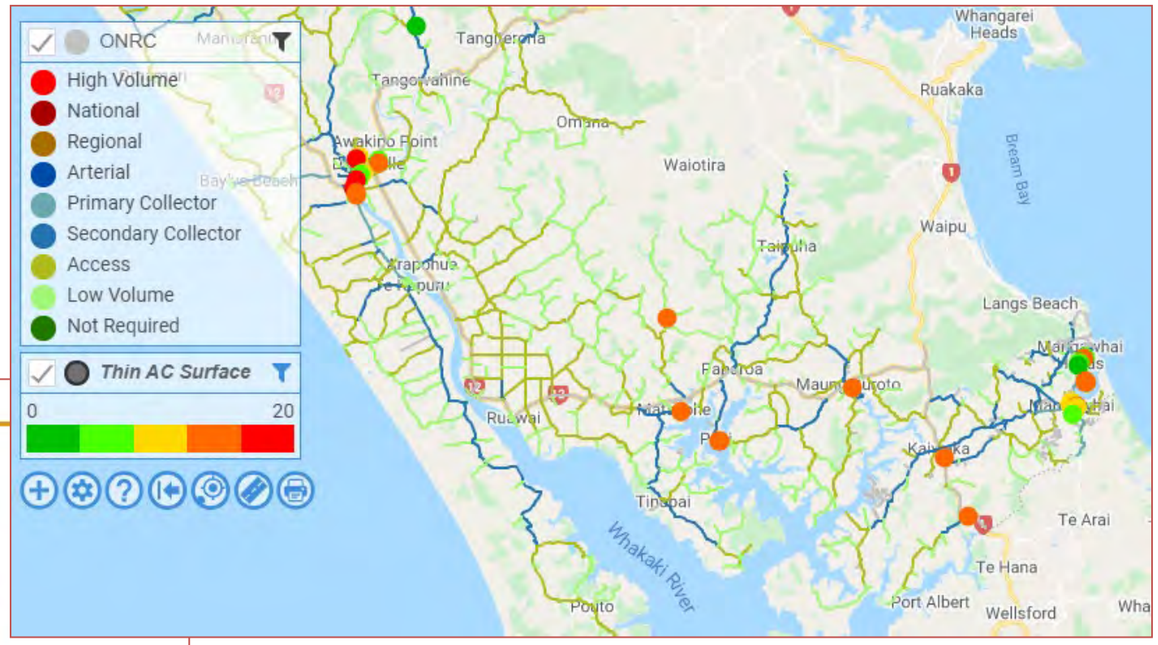
Surface Type	Length (m)
Asphaltic concrete	3890
Chipseal	458998
Grand Total	**462888**

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
KDC **Cost Efficiency - Asphalt Average Life Achieved**	Cost Efficiency	Efficiency Measure	EM	Asphalt Resurfacing - Average life achieved	Arterial	N/A	N/A	N/A	.	**GAP** – Emerging TAC requirement needs to be managed to ensure no impact on overall programme into the future. **Response** –Identified programme of surfacing that starts to deal with old poor condition TAC surfaces. As can be seen below the bulk of the TAC surfaces in in the greater than 12 years old now.
					Primary Collector	13	13	13	No issue identified	
					Secondary Collector	15	15	15		
					Access	17	17	17		
					Low Volume	17	17	17	Cul-de-sac heads and rural TAC corners	
					Network (Avg)	15	15	15		

Yellow bar shows the Kaipara DC current achievement against the peer group. Several observations can made. KDC is stretching the life of its TAC surfacing on its Primary Collectors compared to the other networks, but are achieving less life out of their Secondary Collectors. It should be noted that KDC has a very small amount of TAC surfacing (just under 4km) so the value of this data is limited.





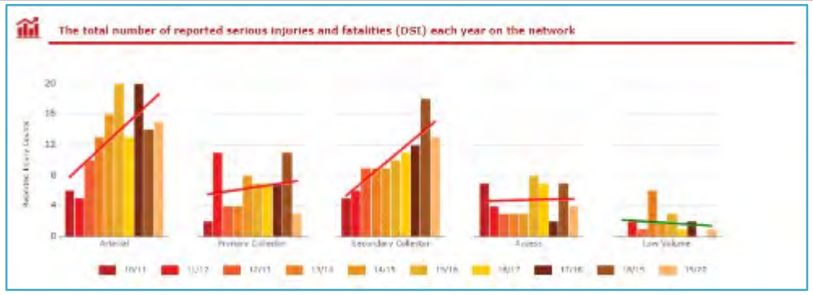


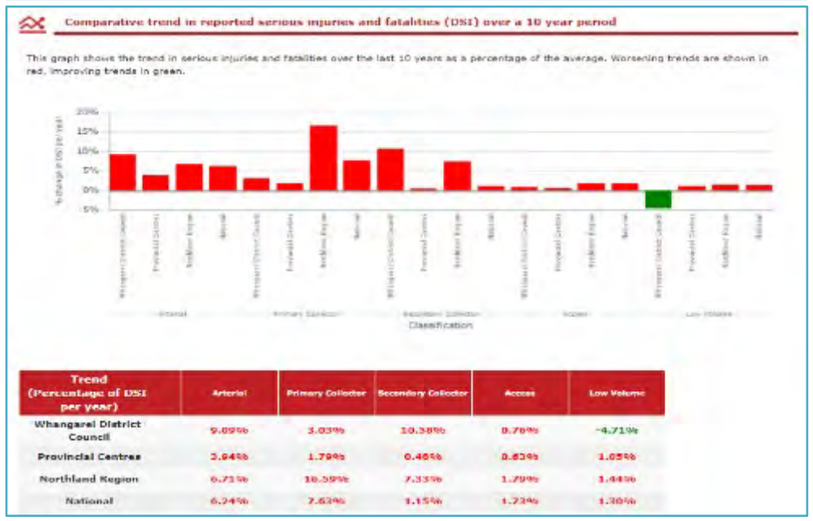
Age Profile Thin AC Surfaces

3.6.3 ONRC Customer Level of Service Analysis – Whangarei District Council (WDC)

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/Peer Group Comparison	GAP/Response
WDC **Safety - DSI Crash Trend**	Safety	Customer Outcome	OM1	DSI Crash Trend	Arterial		Decreasing Trend			There has been an upward trend of DSI crashes. On further analysis, the key drives for this trend is Intersection crashes and Vulnerable Users, Wet Loss Control feature as an issue also.	**GAP –** Arterial, Secondary Network; Intersection, Night Time Loss of Control, and Vulnerable users **Response:** - Increase delineation on the network through the form of route treatments - Improve speed management - Identify intersection on network for intersection improvements - Develop Strategy in regard to Vulnerable User treatments - Identify and specify the use high quality road surface sealing chip
					Primary Collector		Decreasing Trend			Trending upward. Intersection and Vulnerable users feature heavily as underlying issue to this outcome. .	
					Secondary Collector		Decreasing Trend			There is a significant upward trend, Intersection, Night Time Loss Control and Vulnerable users contribute to this outcome.	
					Access		Decreasing Trend			Remains static however, need to monitor back ground measures, Intersection, Vulnerable Users remain a consistent issue.	
					Low Volume		Decreasing Trend			Shows a decreasing trend re on the rise for this class of network.	

Peer group comparison shows that Whangarei District on average shows the highest increase in DSI across the Arterial, Primary and Secondary Collectors compared to the Provincial Centres, Northland and Nationally. The routes that prove the most at risk remain generally unchanged over time as highlighted below; Whangarei Heads, Pipiwai, Ngunguru, Russell and Waipu/Cove Rd routes. Investment in these routes continues with the focus on signage and delineation improvement as well as speed management. However, Intersections and Vulnerable users remain a consistent issue.

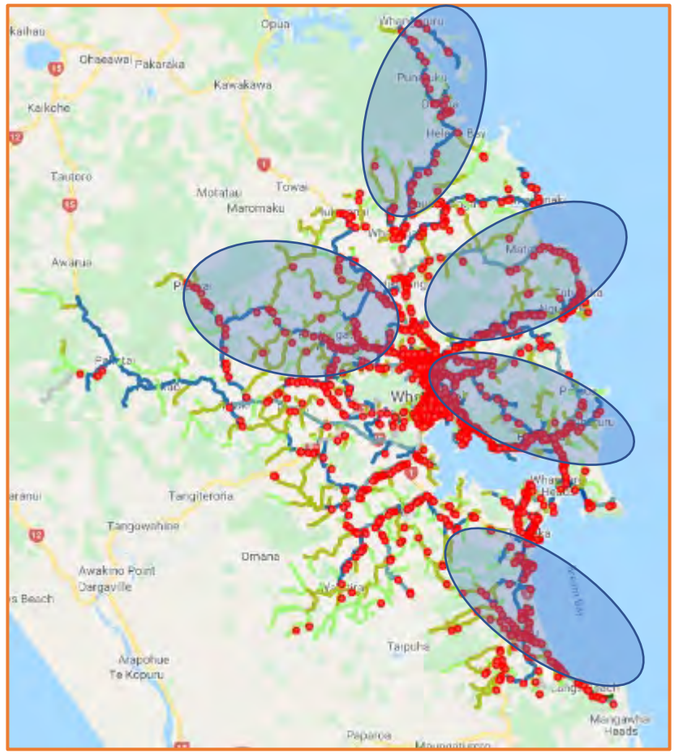




Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Whangarei District Council	9.09%	3.03%	10.38%	0.76%	-4.71%
Provincial Centres	3.94%	1.79%	0.46%	0.63%	1.65%
Northland Region	6.71%	10.59%	7.33%	1.79%	1.44%
National	6.24%	7.62%	1.15%	1.23%	1.36%

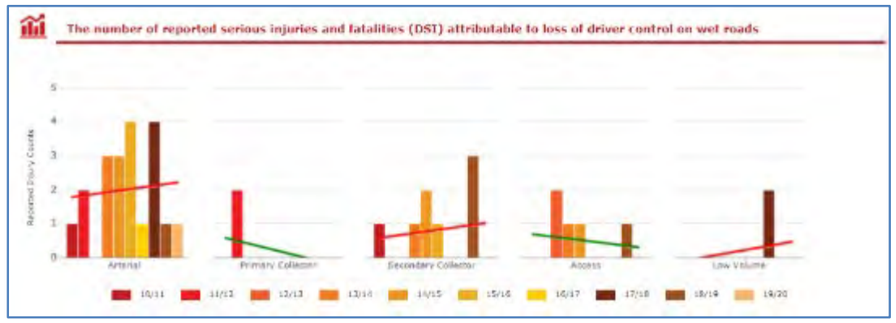
Crash Map Clustered – Minor, Serious and Fatal

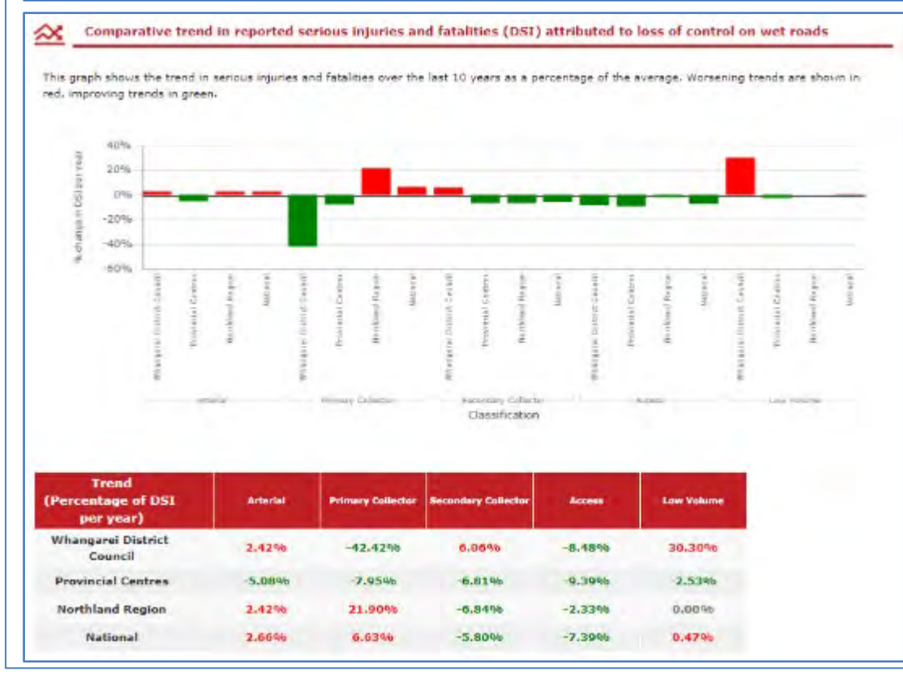
Crash Map Unclustered – Minor, Serious and Fatal



Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Safety - DSI Trend Wet Road Crash**	Safety	Customer Outcome	OM1	DSI Crash Trend on Wet Roads	Arterial		Decreasing Trend			The key rural high-speed routes remain a focus. Apart from the 17/18 spike the trend is static or improving.	**GAP –** High Speed Rural Arterial and Secondary Collector network. **Response** - Continue to fund Road Safety Education Programmes - Identify and specify the use high quality road surface sealing chip, these are on particular parts of roads such as Whangarei Heads Rd, Nugunguru Rd, Pipiwai Rd. all arterial roads.
					Primary Collector		Decreasing Trend			No issues, although the data set looks incomplete for the PC network.	
					Secondary Collector		Decreasing Trend			Increasing trend on SC network, this remains a focus of surfacing programmes.	
					Access		Decreasing Trend				
					Low Volume		Decreasing Trend				

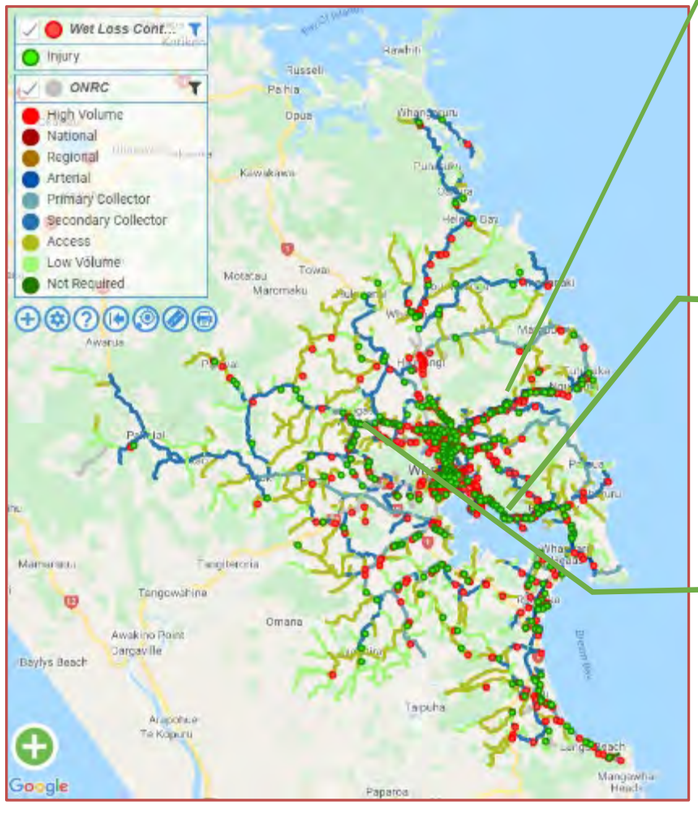
Comparative average change shows a significant improvement in the Primary Collector network indicating investment is having an impact overt the last 10years. The Arterial and Secondary Collector network remains an issue comparatively speaking. Initiatives such as refresh of network geometry data and Corner Risk is being undertaken to assist in Resurfacing investment process.

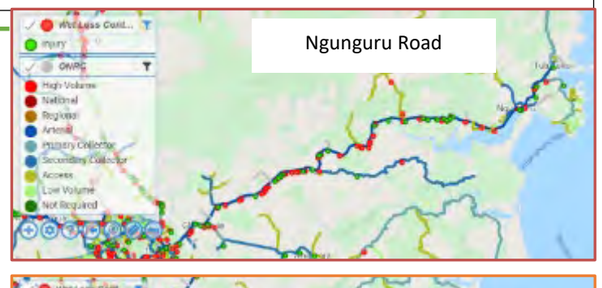


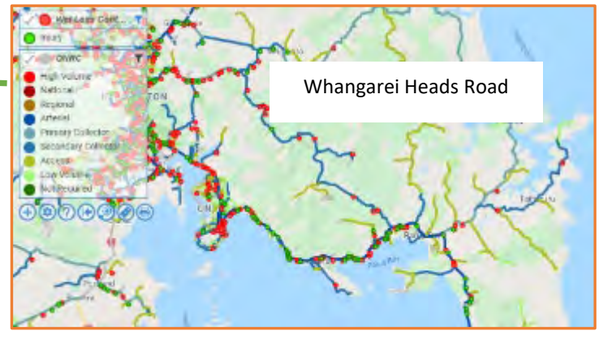


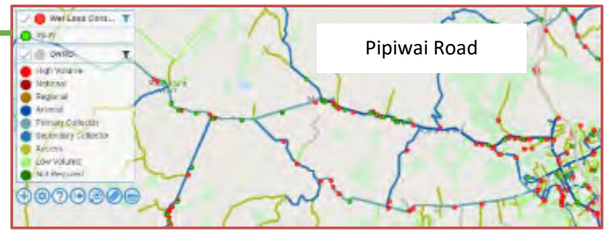
Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Whangarei District Council	2.42%	-42.42%	6.06%	-8.48%	30.30%
Provincial Centres	-5.08%	-7.95%	-6.81%	-9.39%	-2.53%
Northland Region	2.42%	21.90%	-6.84%	-2.33%	0.00%
National	2.66%	6.03%	-5.80%	-7.39%	0.47%

Wet Loss Control – Injury and Non-Injury



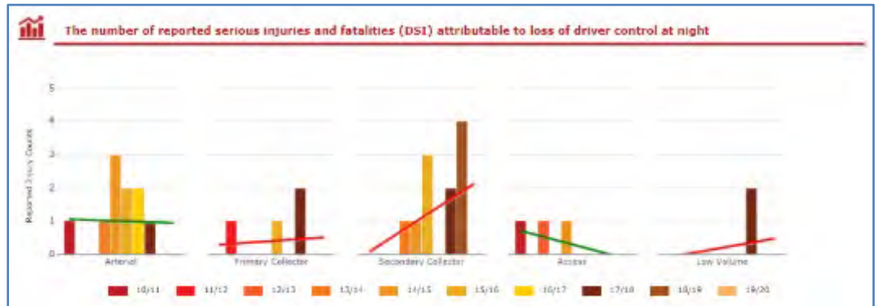


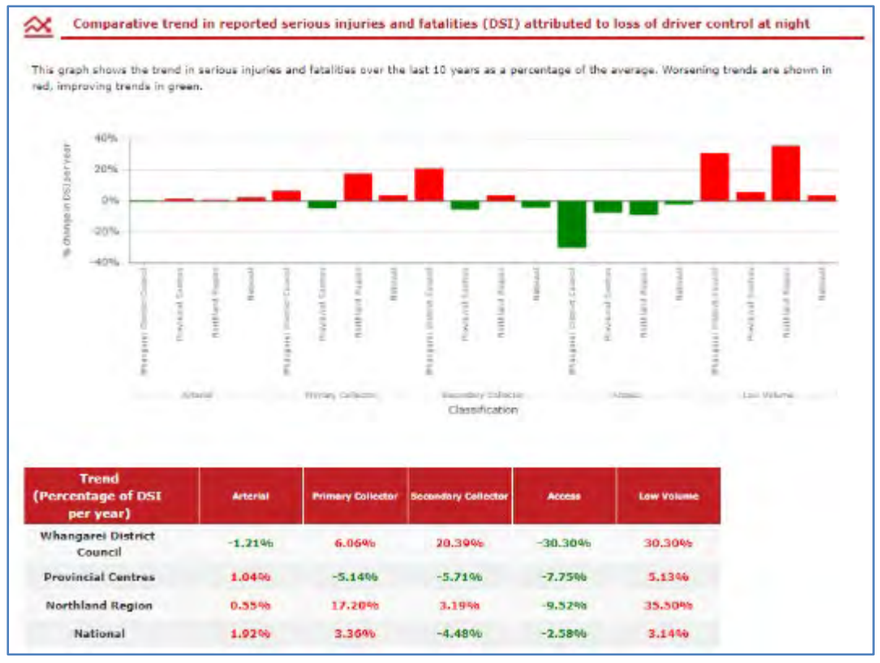




Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Safety - DSI Trend Night Time**	Safety	Technical Output	PM5	Loss of Control DSI Crash Trend Night	Arterial		Decreasing Trend			Improving trend over the last 10 years. Some hot spots in high speed rural network remain and issue.	**GAP –** Secondary Collector network, road width and ability to install effective delineation without causing secondary issues i.e. Edge line install pushing vehicles to the centre of the road. **Response** - Continue to fund Road Safety Education Programmes - Increase delineation on the network through the form of route treatments - Consider widening and camber correction on high risk corners
					Primary Collector		Decreasing Trend			No issues, although the data set looks incomplete for the PC network.	
					Secondary Collector		Decreasing Trend			Increasing trend on SC network. This remains an area of concern. Relationship is to road width and ability to install delineation on this part of the network	
					Access		Decreasing Trend				
					Low Volume		Decreasing Trend				

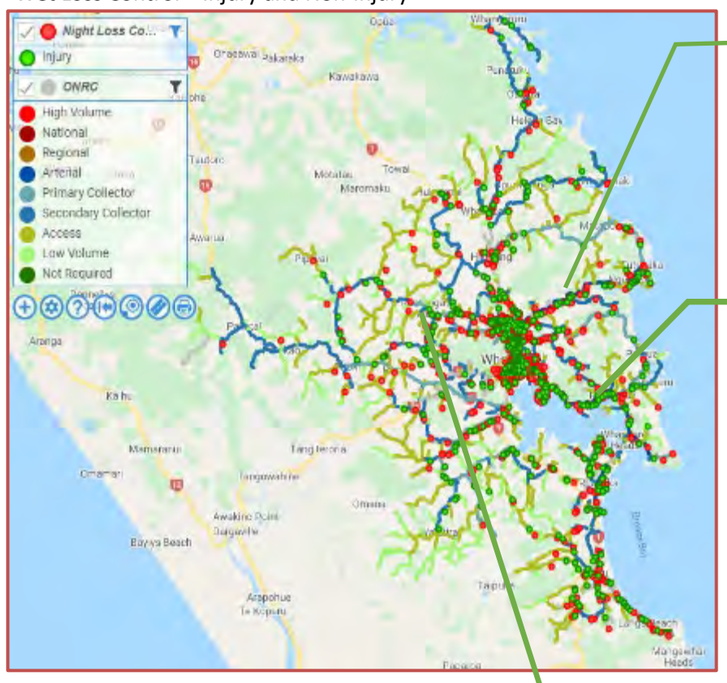
Comparative analysis indicates the Primary and Secondary Collector network is out of step with the provincial centres and nationally. Low Volume data is limited so no assessment can be made on this.



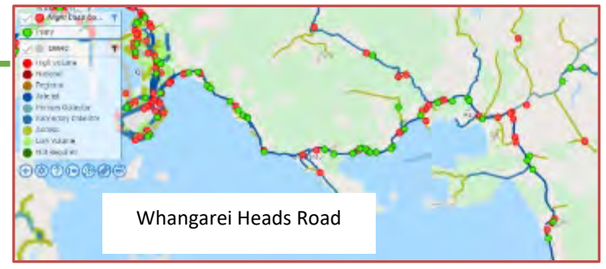


Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Whangarei District Council	-1.21%	6.06%	20.39%	-30.30%	30.30%
Provincial Centres	1.04%	-5.14%	-5.71%	-7.75%	5.13%
Northland Region	0.55%	17.20%	3.19%	-9.52%	35.50%
National	1.02%	3.36%	-4.48%	-2.58%	3.14%

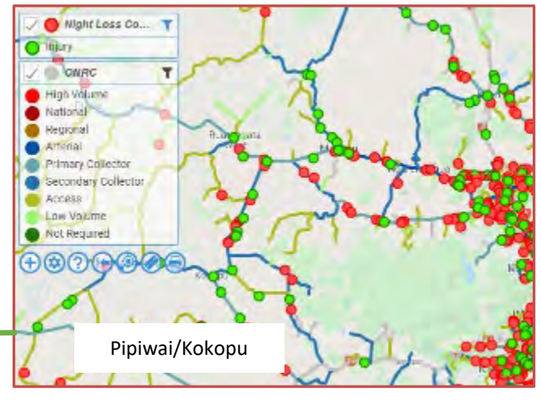
Wet Loss Control – Injury and Non-Injury



Ngunguru Road



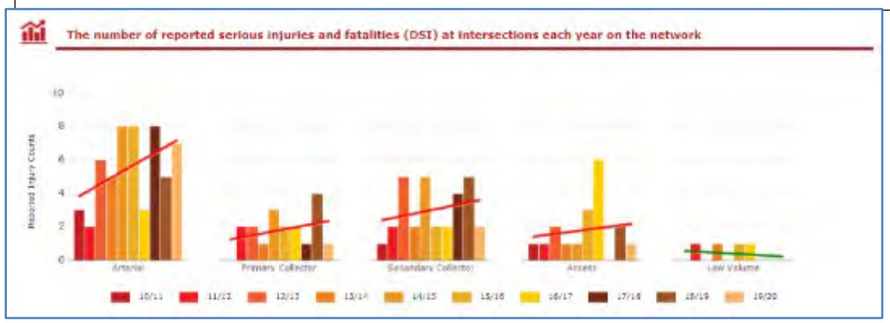
Whangarei Heads Road

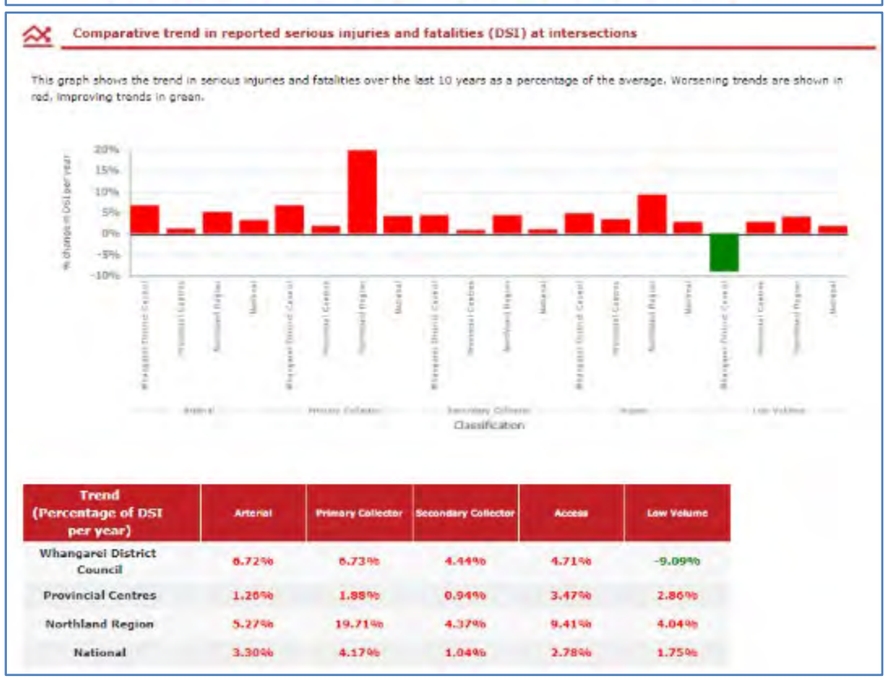


Pipiwai/Kokopu

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Safety - DSI at Intersections**	Safety	Technical Output	PM6	DSI Crash Trend at Intersections	Arterial		Decreasing Trend			As noted above intersection DSI crashes contribute to the overall upward trend.	**GAP** – Arterial, Primary, Secondary and Access show increasing trends in Intersection crashes. **Response** - Continue to fund Road Safety Education Programmes - Review intersection controls/sight lines and implement intersection treatments such improvement in Sealed Unsealed junction to ensure appropriate stopping opportunity is provided
					Primary Collector		Decreasing Trend			Increasing trend	
					Secondary Collector		Decreasing Trend			Increasing trend	
					Access		Decreasing Trend			Increasing trend	
					Low Volume		Decreasing Trend				

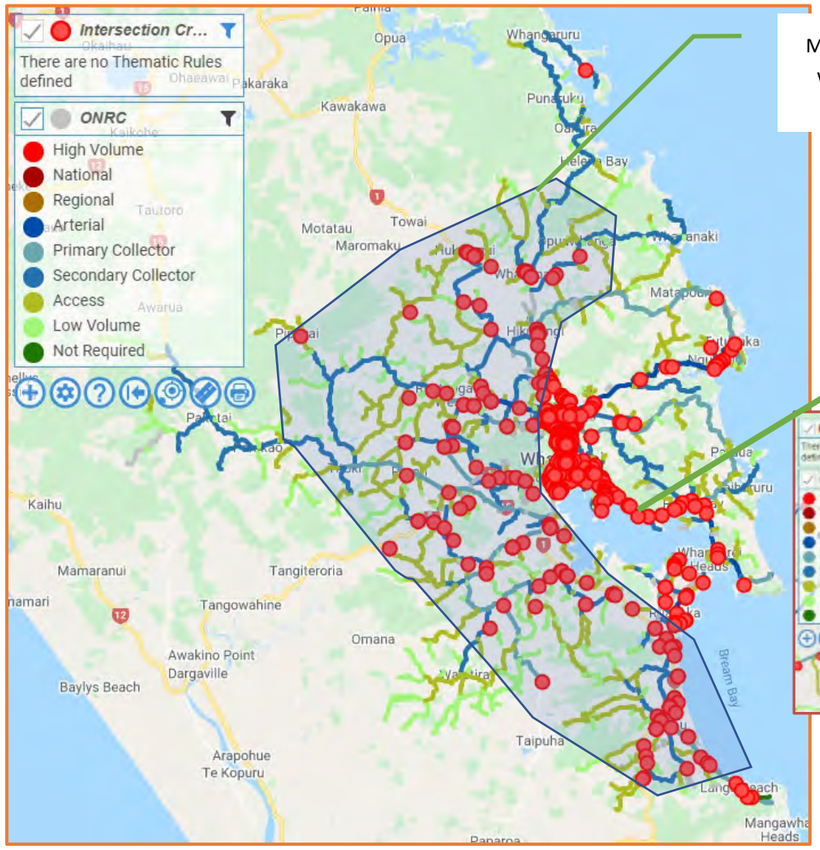
Comparative analysis would indicate the Intersection crashes remain an issue across the board. Compared to Provincial centres Whangarei District is out of step with this peer group. Given that the trend for increasing crashes is across the nearly all ONRC classes a programme of Intersection control review along with validating the short-unsealed approaches to sealed roads would be beneficial. Typically Access/Low Volume roads intersecting with Secondary Collector and Primary Collectors are the most high risk sites around stopping opportunities.





Trend (Percentage of DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Whangarei District Council	6.72%	6.73%	4.44%	4.71%	-9.09%
Provincial Centres	1.26%	1.88%	0.94%	3.47%	2.86%
Northland Region	5.27%	19.71%	4.37%	9.41%	4.04%
National	3.30%	4.17%	1.04%	2.78%	1.75%

Crash Intersection – Minor, Serious and Fatal

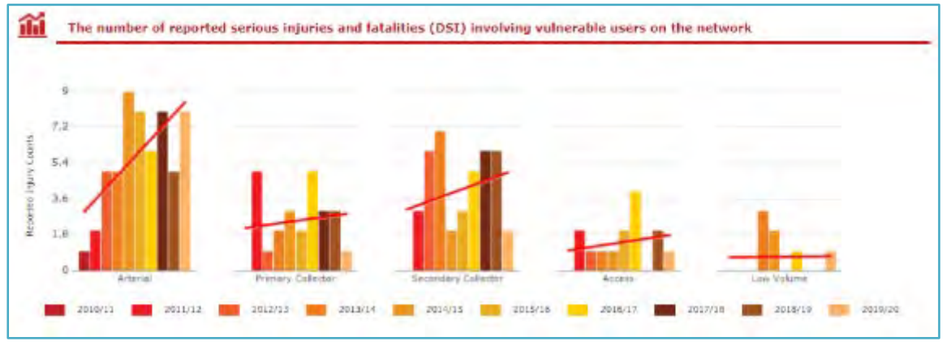


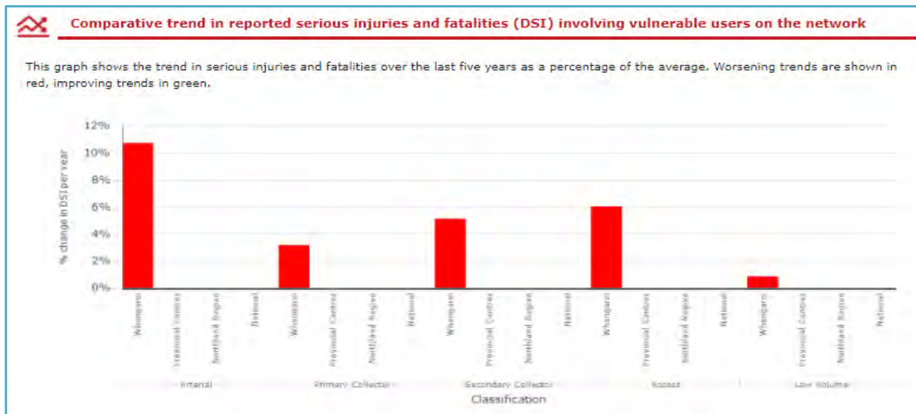
Mix of Access and Low Volume intersection where intersection crashes are occurring

Whangarei Heads Road

Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Safety - Vulnerable Users**	Safety	Technical Output	PM9	Vulnerable users	Arterial		Decreasing Trend			A general increasing trend, with significant increase 19/20.	**GAP** – Increase across ONRC Motor Cyclist Ped x-ing Roads **Response** - Continue to fund Road Safety Education Programmes - Provide alternative corridors and upgrade existing infrastructure to accommodate change in modal use, e.g. mobility scooters vs narrow paths and pedestrian use. Generally current footpaths are under width and no longer fit for purpose.
					Primary Collector		Decreasing Trend			19/20 shows a decrease would need to see this decrease remain to indicate trend downwards.	
					Secondary Collector		Decreasing Trend			As above	
					Access		Decreasing Trend			As above	
					Low Volume		Decreasing Trend			Limited data to make any real conclusion	

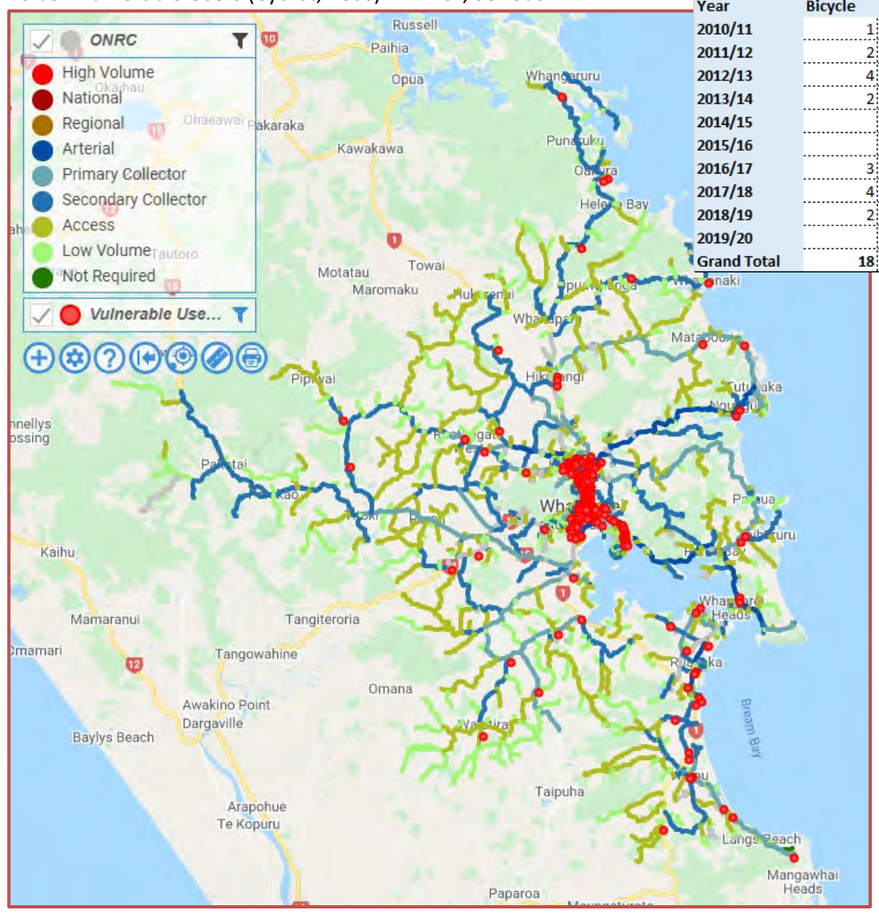
No peer group comparison is available for the Vulnerable crash trend. Even though the data from the system is not capturing all vulnerable user groups there are still issues to be addressed. Of the Vulnerable user group Motor Cyclist and Pedestrian crossing roads remain the highest at risk groups.





Trend (Change in DSI per year)	Arterial	Primary Collector	Secondary Collector	Access	Low Volume
Whangarei District Council	10.74%	3.15%	5.15%	6.06%	0.87%
Provincial Centres	3.75%	4.29%	-0.14%	1.57%	3.26%
Northland Region	8.20%	17.37%	9.83%	2.31%	-3.03%
National	4.12%	4.84%	0.90%	0.74%	1.21%

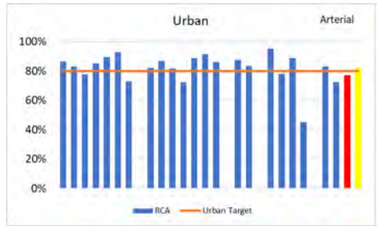
Crash Vulnerable Users (Cyclist, Peds) – Minor, Serious

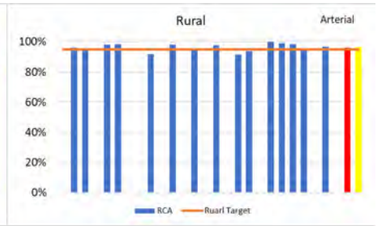


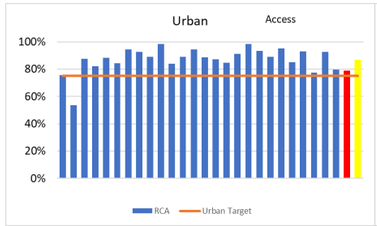
Year	Bicycle	Moped	Motor Cycle	Other Pedestrian	Pedestrian Crossing Road	Grand Total
2010/11	1					1
2011/12	2		8	1	1	12
2012/13	4		7	1	1	13
2013/14	2		10	2	4	18
2014/15		2	11	1	3	17
2015/16		1	5	5	4	15
2016/17	3	1	12	2	3	21
2017/18	4	1	8		4	17
2018/19	2		10	1	3	16
2019/20			5	1	7	13
Grand Total	18	5	76	14	30	143

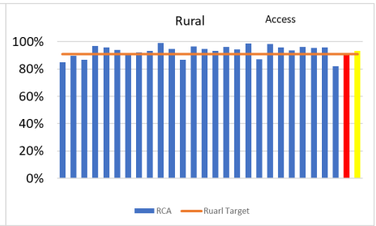
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
WDC **Amenity - Smooth Travel Sealed Roads**	Amenity	Customer Outcome	OM1, LTP	The % of Roads Classed as Smooth (STE) DIA	Arterial	Urban	80	80	80	Peer group average is 87% smooth, WDC is set at 80% for this LTP. This reflects low speed urban environment and the historic achievement.	**GAP** – No specific gap exists for STE. This is more a revision of achievement and resetting targets to reflect achievement and in some cases reduce STE according to the environment. There is some crash evidence, Motor Cycle, that may be in relation to poor ride quality. **Response** - The key focus is on maintaining safe smooth ride in the high speed rural environments especially in the Primary and Secondary portion of the network, which represents 30 % network. This will mean continued investment level in pavement rehabilitation at current levels.
						Rural	95	95	95	Based on peer group a target of 95% has been set against a current achievement of 96%. Key issue is maintaining a smooth ride in high speed environment.	
					Primary Collector	Urban	77	77	77	The peer group average is 88%. A target of 77% has been set against a current achievement of 81%. As for Arterial network Low speed environment of the network does need high STE.	
						Rural	95	95	95	Target has been set 95% against an achievement of 94%. Trend has shown a steady reduction, excluding 15/16 results, and this now needs to be held steady to maintain a safe ride. This target is in keeping with majority of the peer group.	
					Secondary Collector	Urban	77	77	77	Target of 77% against an achievement of 77%. This keeps this network in steady from Customer LoS point of view.	
						Rural	95	95	95	Rural of 95% against an achievement of 95%.	
					Access	Urban	75	75	75	Access and Low Volume have reduced for the urban network that reflects LoS for the urban Low speed environments. Rural targets have been set at current delivery, again providing a safe smooth travel environment.	
						Rural	91	91	91		
					Low Volume	Urban	75	75	75		
						Rural	90	90	90		
					Network Average (Target >=)	**All**	**85**	**85**	**85**		

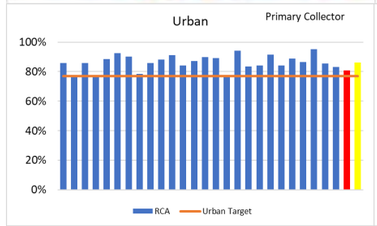
Yellow bar shows the peer group average the red bar is Whangarei DC current achievement. The Orange line is the target being set in relation to peer group average and the peer group as whole. A number of key issue can be observed; **1**. Whangarei DC features poorly against all comparative groups; **2**. In general, excluding 15/16 results, the STE across ONRC has been reducing over the term of the last LTP.

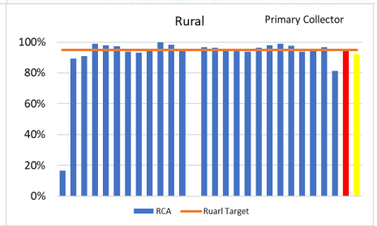


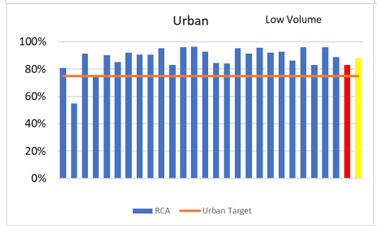


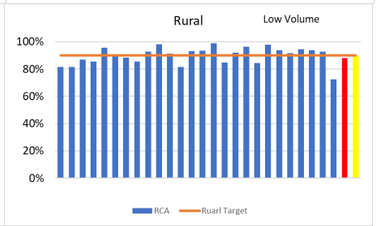


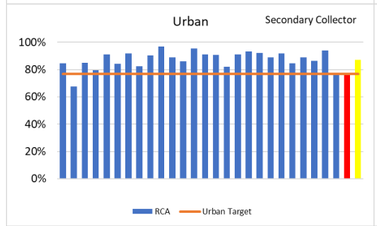


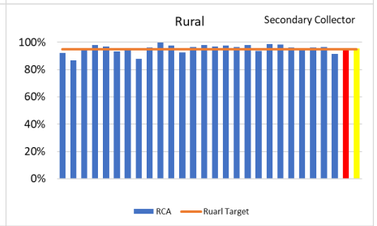


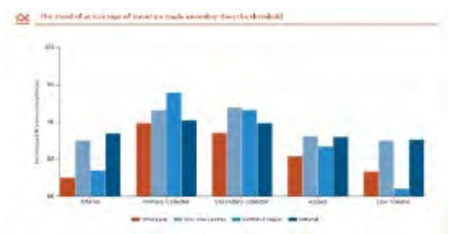


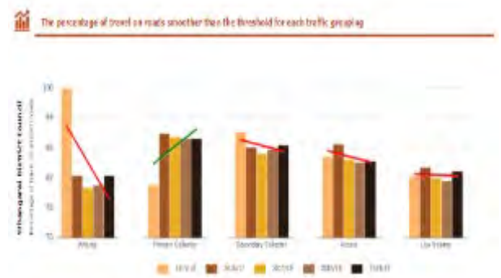


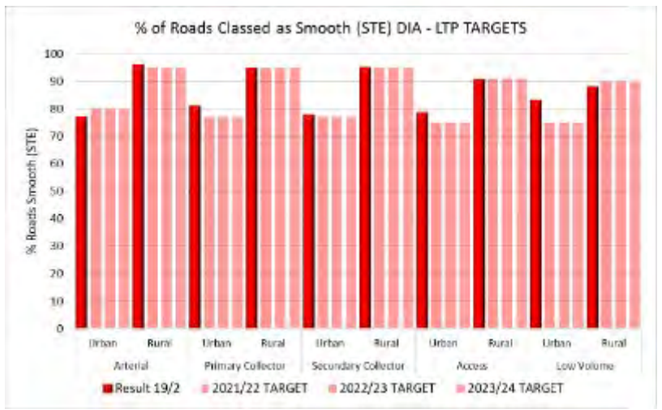






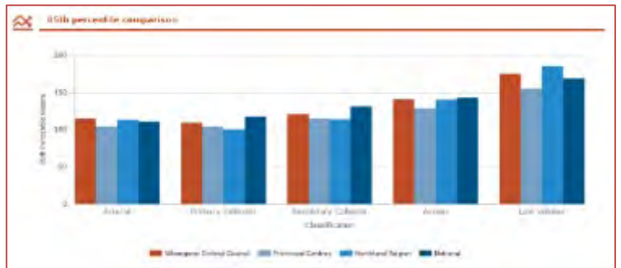


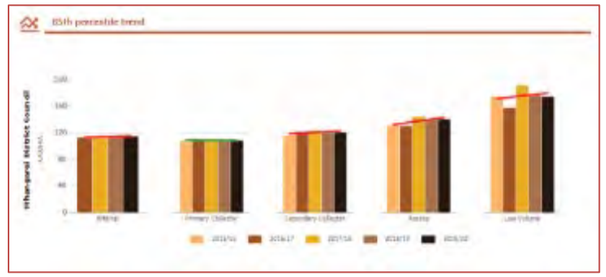


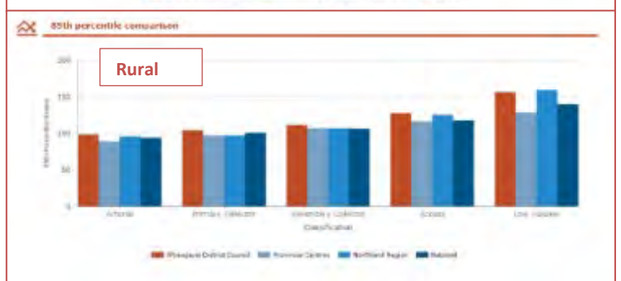


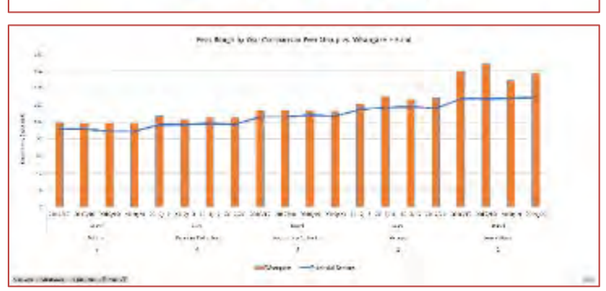
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
WDC **Amenity - Peak Roughness**	Amenity	Technical Output	PM1	Peak Roughness (85th%)/ Ride comfort	Arterial	Urban	118	118	118	Set at peer average target, Current achievement above peer group	**GAP** - WDC is above the peer group peak rough across the board. The Secondary and below classes are deteriorating in relation to peer group year on year becoming rougher. This reflects the STE outcome. Geology vulnerable to water is a related symptom to peak roughness. **Response** – Continue with Rehabilitation as set and fund the Thin Asphalt in Urban centres along with targeted peak roughness programmes to address the issue, such resilience, given the increasing trend in DSI and motor cycle crash on the network.
						Rural	90	90	90	Set at peer average target Current achievement at peer group.	
					Primary Collector	Urban	125	125	125	Set slightly above peer group.	
						Rural	98	98	98	Set slightly above peer group. Current achievement is above peer group but holding steady.	
					Secondary Collector	Urban	140	140	140	Set at peer group. Current achievement well above peer group and deteriorating	
						Rural	107	107	107	As above	
					Access	Urban	160	160	160	As above	
						Rural	115	115	115	As above	
					Low Volume	Urban	165	165	165	As above	
						Rural	140	140	140	As above	

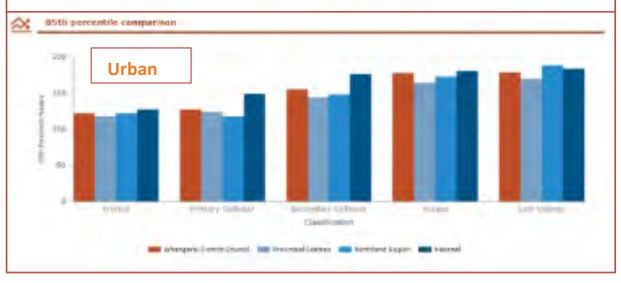
Whangarei DC peek roughness is above peer group across the board in all classes. The Arterial and Primary network have been I steady state over the last LTP period. The Secondary/Access and Low Volume network are beginning to deteriorate and move significantly out of step with peer group, rural and urban network.

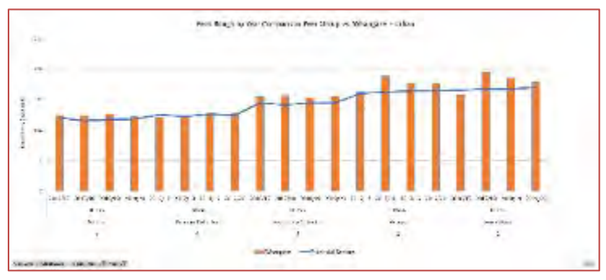


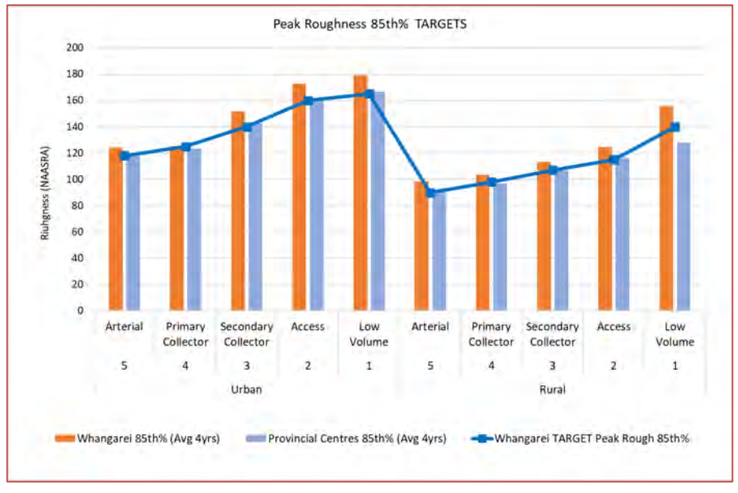












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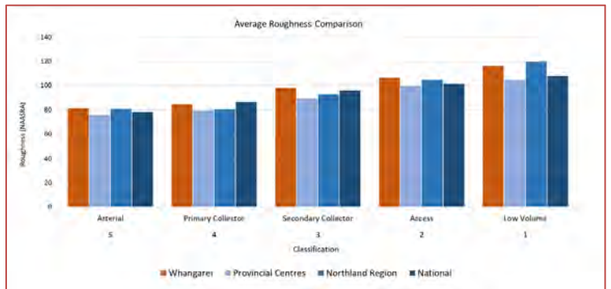
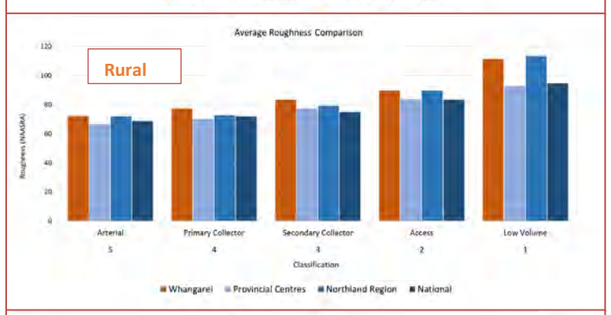
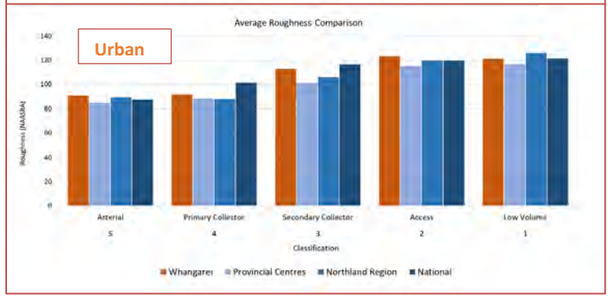
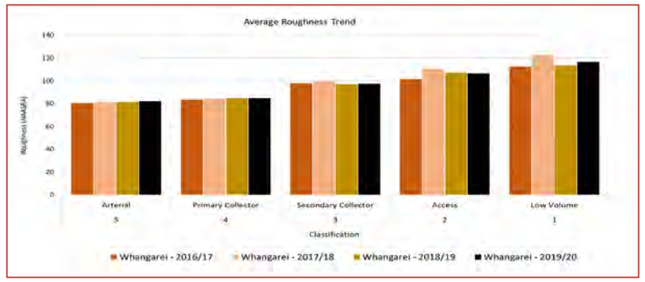
WDC **Amenity - Average Roughness**	Amenity	Customer Outcome	OM2	Average Roughness	Arterial	Urban	90	90	90	Maintain target to keep steady state	**GAP** – WDC network is above the peer group with the biggest gap on the Rural network. The most significant gap is on Access/Low Volume network. The trend for WDC has continued to deteriorate year on year on the Secondary and below network. Arterial/Primary is in a stable state but has shown small lift in deterioration which will be monitored. **Response** – Deliver rehab programme as developed to maintain ride comfort for the Arterial/Primary network. There is adjustment required on the Secondary and below classes, this is naturally occurring as pavement start fail and become expensive to maintain/seal. This should have an impact on reducing DSI and peak rough/STE.
						Rural	75	75	75	Small reduction in target to maintain steady state	
					Primary Collector	Urban	90	90	90	Performing at target hold LoS	
						Rural	75	75	75	Small reduction in target to maintain steady state	
					Secondary Collector	Urban	100	100	100	WDC one of highest in peer group. Reduce target to help manage peak roughness	
						Rural	80	80	80	As above	
					Access	Urban	115	115	115	As above	
						Rural	85	85	85	As above	
					Low Volume	Urban	115	115	115	As above	
						Rural	100	100	100	As above	
					Network (Average)	**All**	**93**	**93**	**93**		

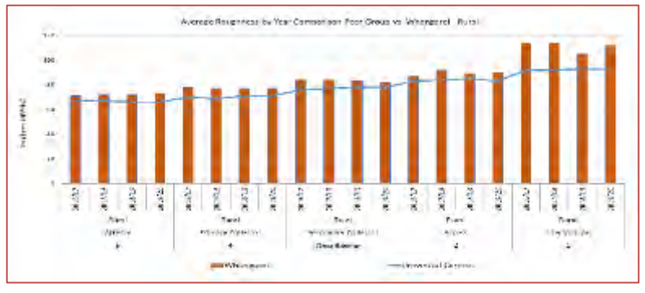
Yellow bar shows the peer group average the red bar is Whangarei DC current achievement. The Orange line is the target being set in relation to the peer group average and the peer group as whole. If the average is not well related to the peer group in general, then the target is revised to a position where Whangarei performance is set fairly for the road class in relation to its peers.

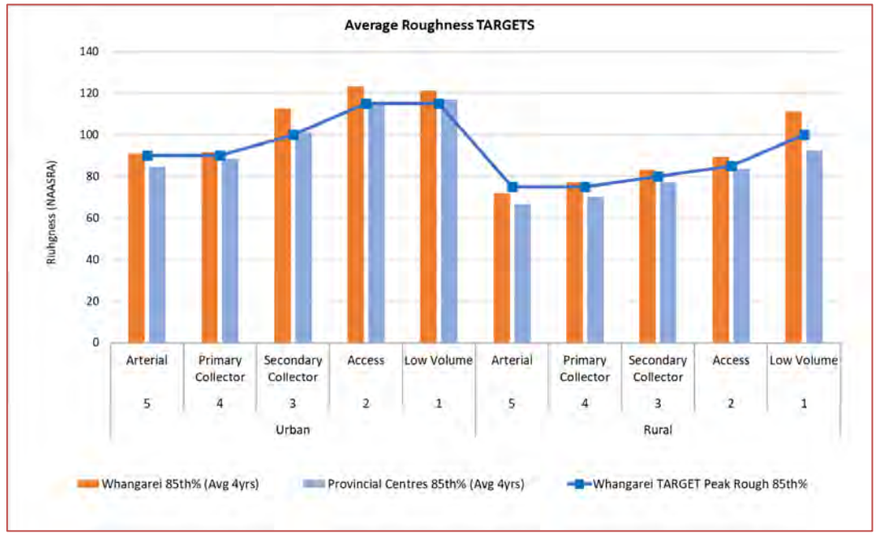






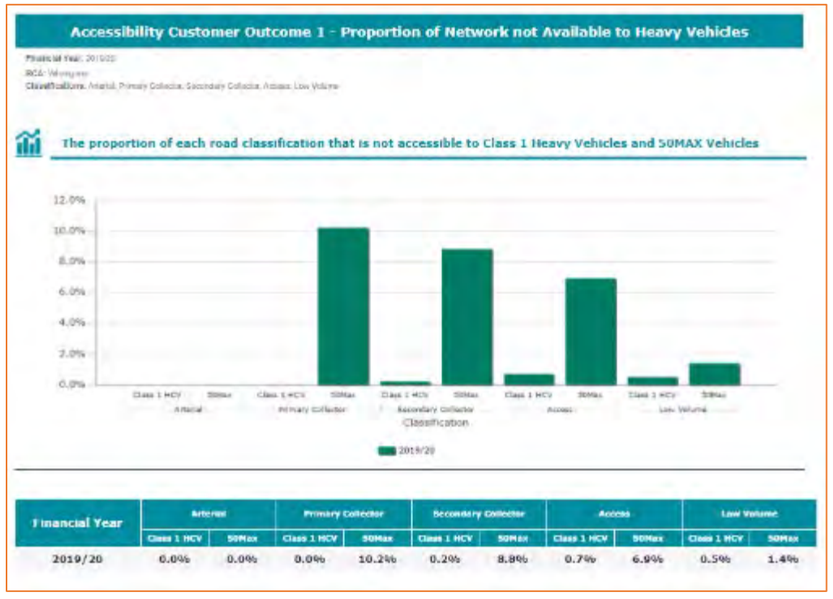






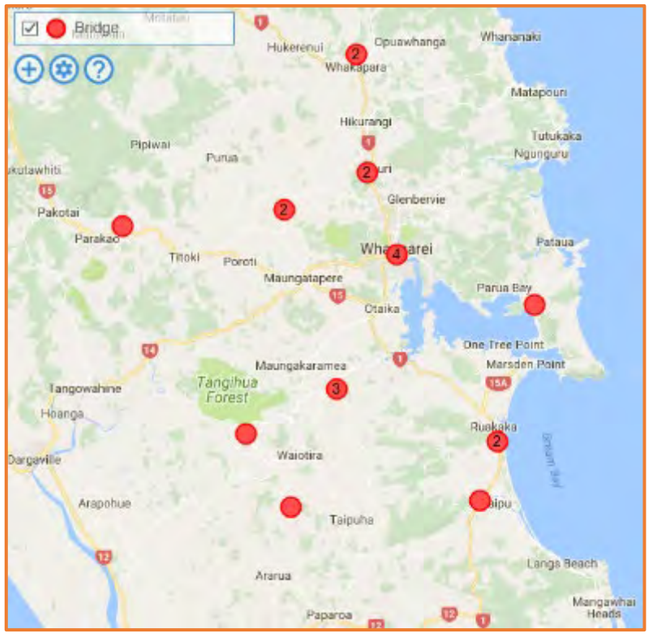
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	Urban Rural	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis / Peer Group Comparison	GAP / Response
WDC **Accessibility - Network not available to HCV/50max**	Accessibility	Customer Outcome	OM1	Proportion of Network not Available to HCV & 50Max	Arterial	HCV	0%	0%	0%		**GAP** - Programme has been set to investigate and analyses the upgrade option of the bridges that are restricting the network. This will enable more choice for freight industry and open access to industry to travel the network more efficiently. **Response** - This programme has been completed and is now with in this plan for funding to remove restrictions on some routes.
						50Max	0%	0%	0%		
					Primary Collector	HCV	0%	0%	0%		
						50Max	8%	7%	5%	8% is a significant portion of the network. This has impacts on economic capability.	
					Secondary Collector	HCV	0%	0%	0%		
						50Max	7%	6%	5%	As for Primary	
					Access	HCV	1%	1%	1%	No change	
						50Max	6%	6%	5%	Access still carries a large portion of the economic capability of the district.	
					Low Volume	HCV	1%	1%	1%		
						50Max	1%	1%	1%	No change	

No peer group comparison is available for this measure

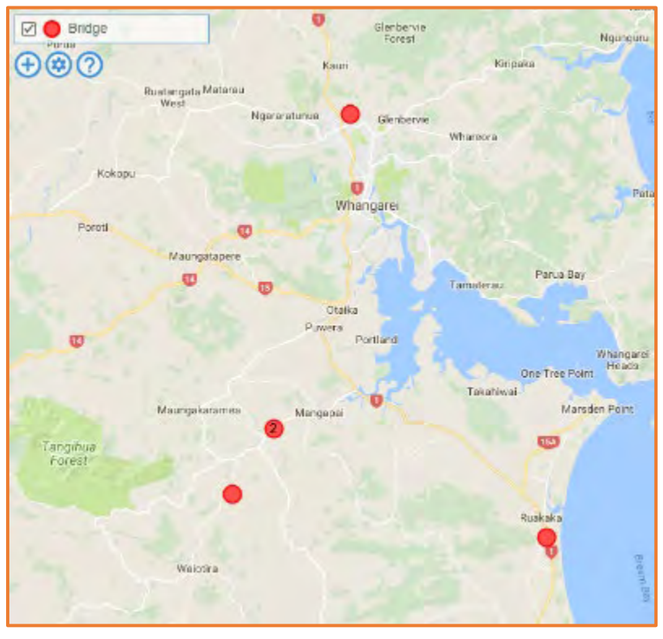


Financial Year	Arterial		Primary Collector		Secondary Collector		Access		Low Volume	
	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max	Class 1 HCV	50Max
2019/20	0.0%	0.0%	0.0%	10.2%	0.2%	8.8%	0.7%	6.9%	0.5%	1.4%

50Max Limited Bridges

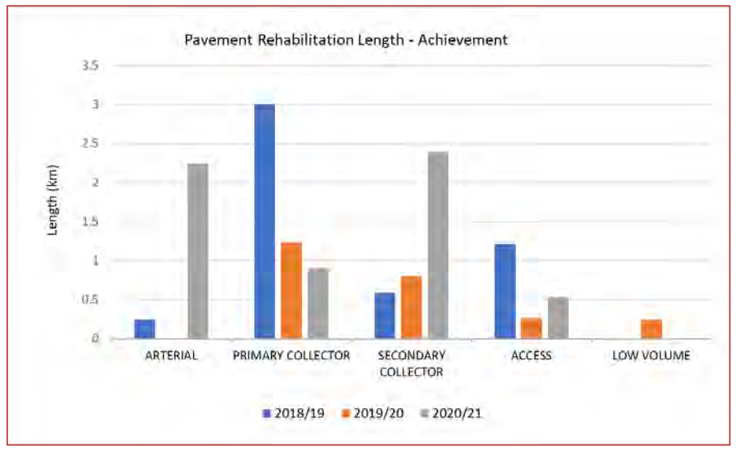


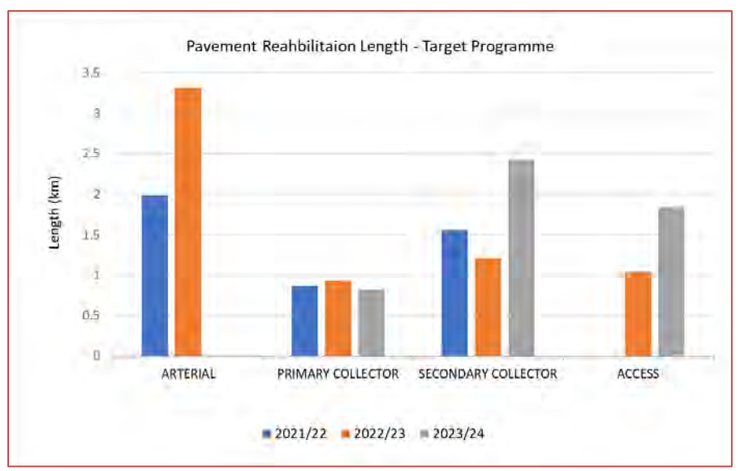
Weight Restricted Class 1 - Bridges



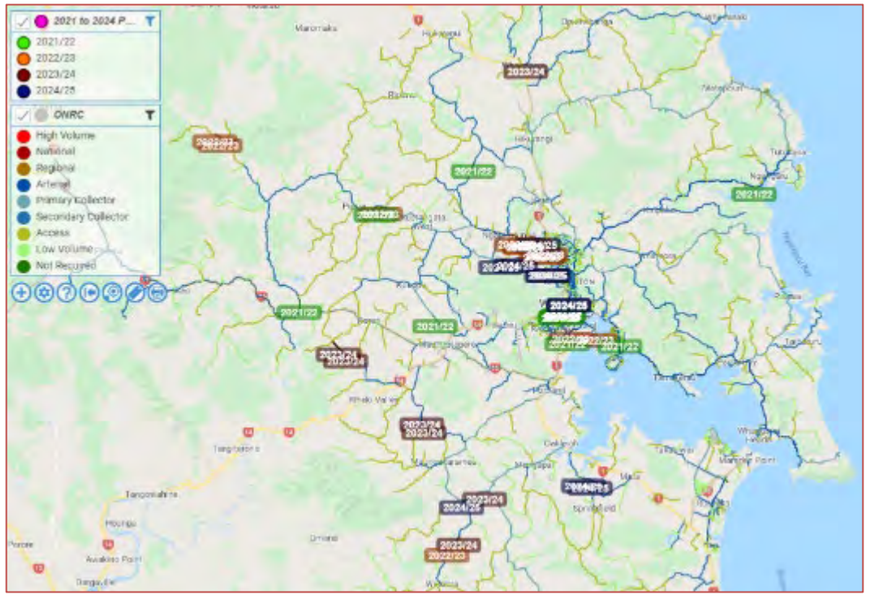
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Cost Efficiency – The percentage of the sealed local road network that is rehabilitated**	Pavement Rehabilitation - Cost Efficiency	Efficiency Measure	EM	Was REG measure. Has been removed from PMRT. Change Target to % of network **OLD** Pavement Rehabilitation length - Lane km	Arterial	1.83%	3.05%	0.00%	Generally high volume urban sites,	This programme has been directed by several condition drivers, one of which is the customer ride comfort as set out under ONRC. Given that Secondary network is exceeding roughness targets this is where 20-24 is targeted to deliver on the customer outcome. With targeted ride issue on Secondary and Access rural roads.
					Primary Collector	0.45%	0.49%	0.43%	Urban and rural	
					Secondary Collector	0.37%	0.29%	0.58%	Targets customer ride comfort as noted above	
					Access	0.00%	0.46%	0.80%	In response to peak roughness rural	
					Low Volume	0%	0%	0%		
					Network (Total)>=0.4%	0.42% (4.4km)	0.62% (6.4km)	0.48% (5km)	On average 5.3 km/yr next three years. This is a reduction on previous plan set at approx. 6km/yr.	

Comparative analysis shows WDC around 0.6% per annum over the last 5 years. This is middle to high in comparison to peer group however as evidenced through the outcomes above WDC is not performing at the same level as its peers and most cases has shown slight deterioration in these outcomes. The rehab programme is designed to target high volume urban/rural pavements to maintain current performance and keep in check the poor ride quality on rural network. Further reduction in rehabilitation programme would see continued deterioration in customer outcomes. Northland sub quality construction materials and sensitive geology continue to have an impact on these outcomes.

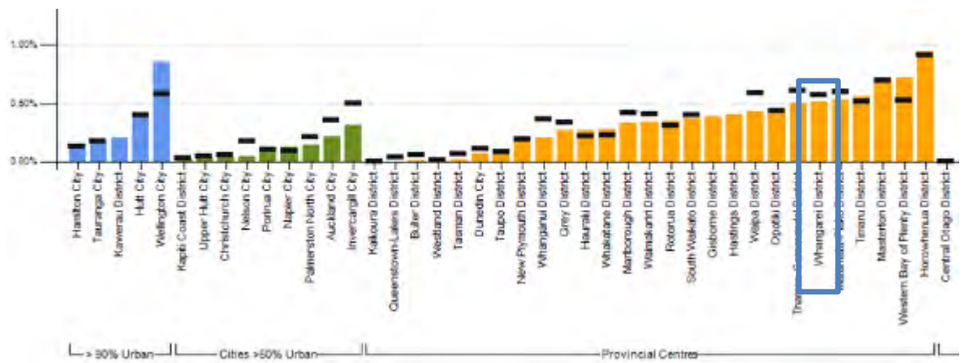




Pavement Renewal – 2021-2025

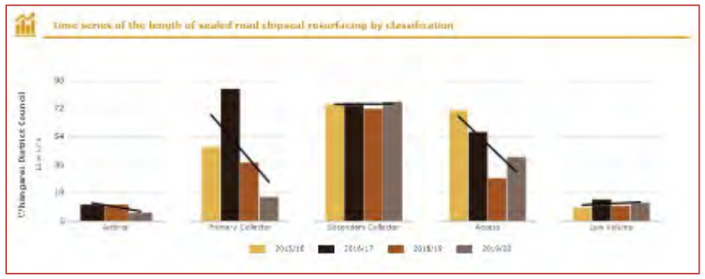


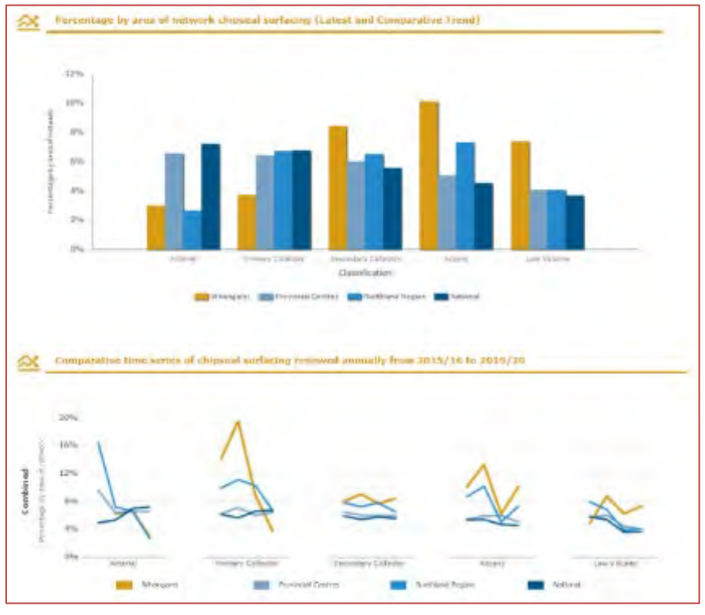
Pavement Renewal – 2020/21 Urban



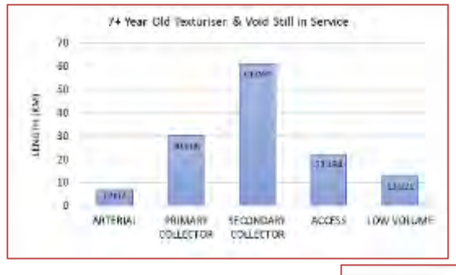
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Cost Efficiency - Chipseal Lane/km**	Chip Seal - Cost Efficiency	Efficiency Measure	EM2(a)	Chipseal Resurfacing Quantity - lane km (DIA mandatory) expressed as both Ln.km and % of sealed Network	Arterial	4.6lnkm/ 2%	18.5lnkm/ 8%	15.6lnkm/ 7%		**GAP** – Reducing Rehab programme Access/LV network. Old Void Fill/Texturising seals on network. **Response** - Chipseal resurfacing programme is designed in response to the pavement renewal programme. No rehab for the LV. Resurfacing will help protect these parts of the network but we will see a rise in pre-seal maintenance investment in the lower-class network as result of this programme. The programme is also catch up on old VFILL/TEXT seals on the network. These are vulnerable seals and if not treated have led to premature pavement failure.
					Primary Collector	40.48lnkm /10%	45.5lnkm/ 12%	42.4lnkm/ 11%	Catch up on VIFLL and TEXT seals	
					Secondary Collector	92.5lnkm/ 11%	82.5lnkm/ 10%	81.6lnkm/ 10%	Continuing catch up on VIFLL/TEXT seals from previous plan with decreasing programme over the period of this plan.	
					Access	54.4lnkm/ 12%	36.9lnkm/ 8%	31.3lnkm/ 7%		
					Low Volume	31.3lnkm/ 16%	11.1lnkm/ 6%	11.1lnkm/ 6%	Average per/annum of 180ln.km	
					Network (Total)	223.3lnkm/ 11%	194.5lnkm / 9%	182lnkm/ 9%	Catch up on VIFLL and TEXT seals	

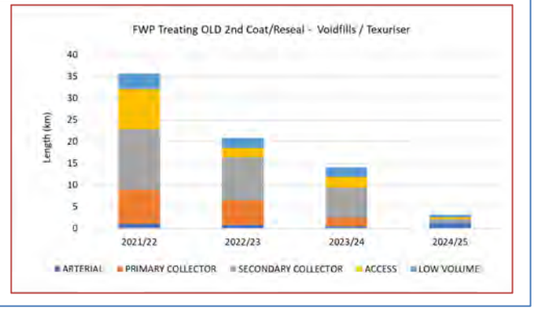
Peer group comparative for the shows that for WDC are under for the Arterial and Primary Collector network, this due to this network being predominately Thin Asphalt surface on this network. In terms of Secondary and below there has been a targeted programme of removing a significant amount of old Voidfill/Texturiser second coats and reseal from the network. These surfaces were applied in response to a very constrained financial environment during this period. It has taken time to respread the programme, target these surfaces and maintain a maintenance balance. This programme continues and will start to ease in the last year of this plan.





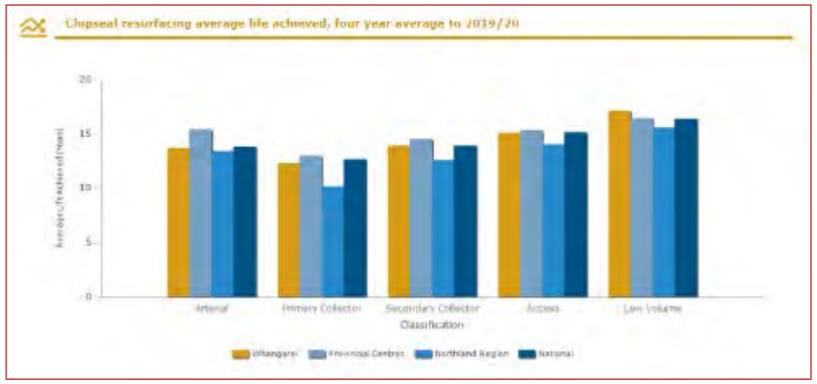
Chipseal Resurfacing – 2021-24





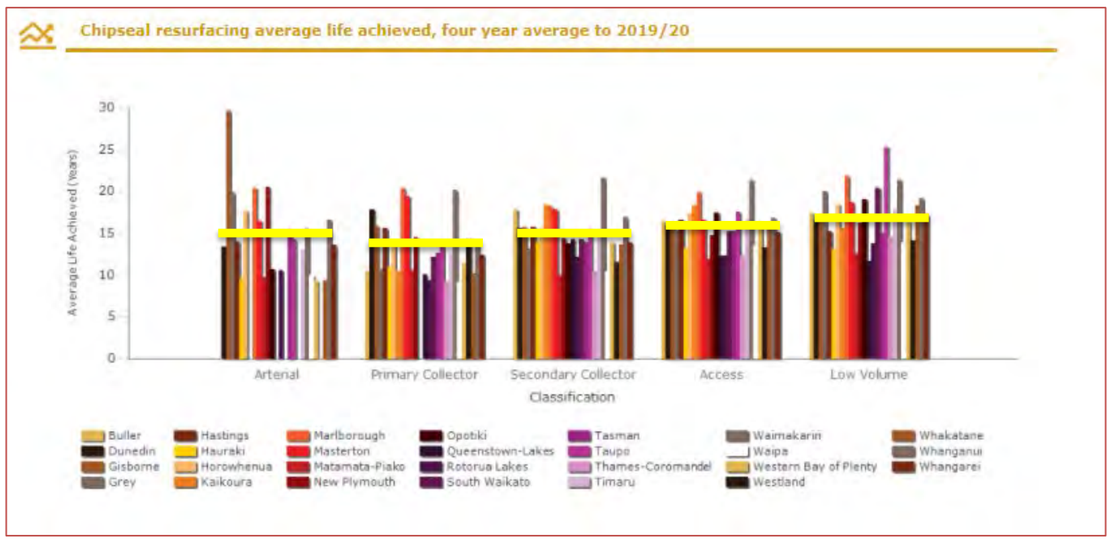
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Cost Efficiency - Chipseal Average Life Achieved**	Cost Efficiency	Efficiency Measure	EM	Chip Seal Resurfacing - Average life achieved	Arterial	12	12	12	In the top of the peer group for the longest average life	**GAP** - No significant gap apart from monitoring the rising cost of pre-surface repair in terms of extending the life of surfaces. **Response** - The previous plan focused on sealing vulnerable surfaces(void fills) and this has had the desired effect in reducing per-surface cost. This continues to be the strategy for the first year of this plan as set above.
					Primary Collector	12	12	12	No change in target network is moving toward steady state for surfacing and resulting maintenance cost	
					Secondary Collector	13	13	13	As above	
					Access	15	15	15	As above	
					Low Volume	15	15	15	As above	
					Network (Avg)	13	13	13	As above	

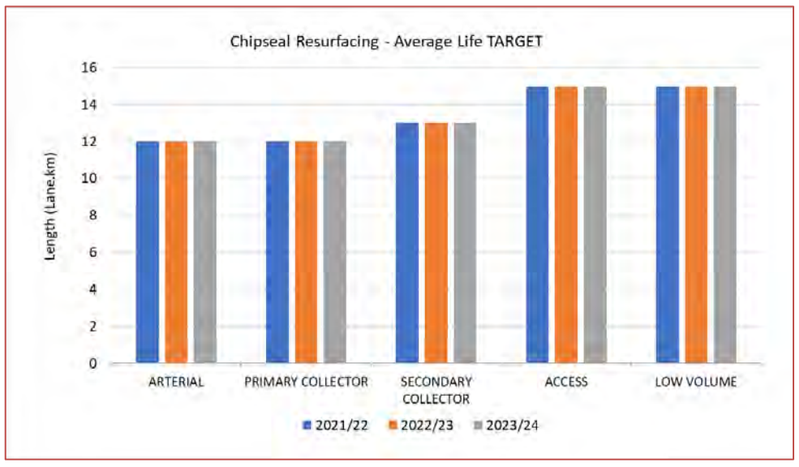
Comparatively WDC compare well with the average life achieved, yellow bars. Exceeding a large portion of the peer group in average return life of chip surfacing on the network. There is no change to the targets however, due to issue noted under surfacing achievement the actual programme year on year will show some low average return life cycles. At the end of the end of this plan the average return cycle will be generally aligned to these targets.



Chipseal Return Life Cycle of Proposed Programme

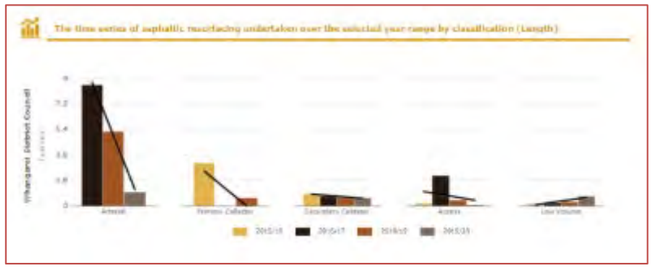
ONRC	2021/22	2022/23	2023/24	Average
ARTERIAL	48	12	14	25
PRIMARY COLLECTOR	10	9	9	9
SECONDARY COLLECTOR	9	10	10	10
ACCESS	8	12	14	11
LOW VOLUME	6	18	18	14
Average	**9**	**11**	**11**	**10**

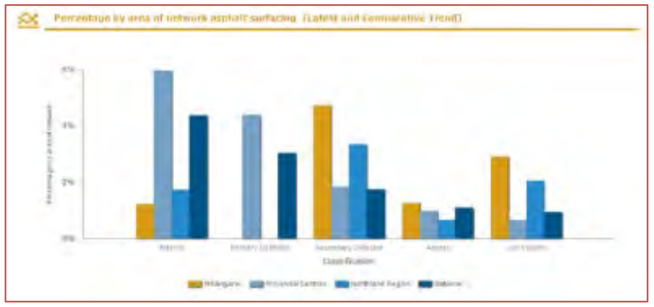


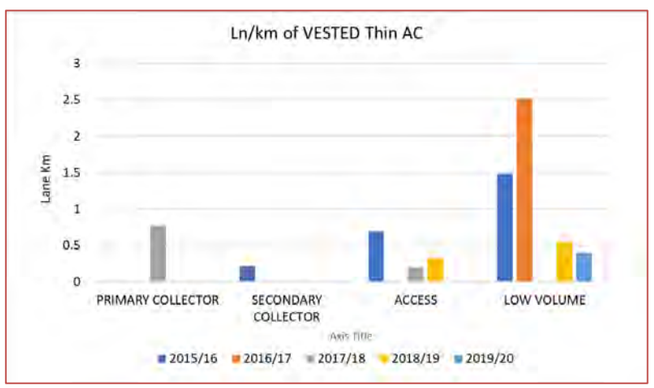


Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Cost Efficiency - Asphalt Lane/km**	Cost Efficiency	Efficiency Measure	EM	Asphalt Resurfacing Quantity - lane km	Arterial	6.13	8.62	2.89	Urban network has significant mounting programme to be worked through	**GAP** – High volume urban network in poor condition and starting require high levels of maintenance. Rural high stress corners failing. **Response** - This programme focuses on urban high volume network. There are some isolated rural sites that are for high stress tight corners which are mostly on the road on the east coast leading out to coastal areas.
					Primary Collector	2.29	0.46	0.51		
					Secondary Collector	0.49	1.88	2.22		
					Access	0.92	0.82			
					Low Volume	0.43	0.42	0.12		
					Network (Total)	10.27	12.20	5.74		

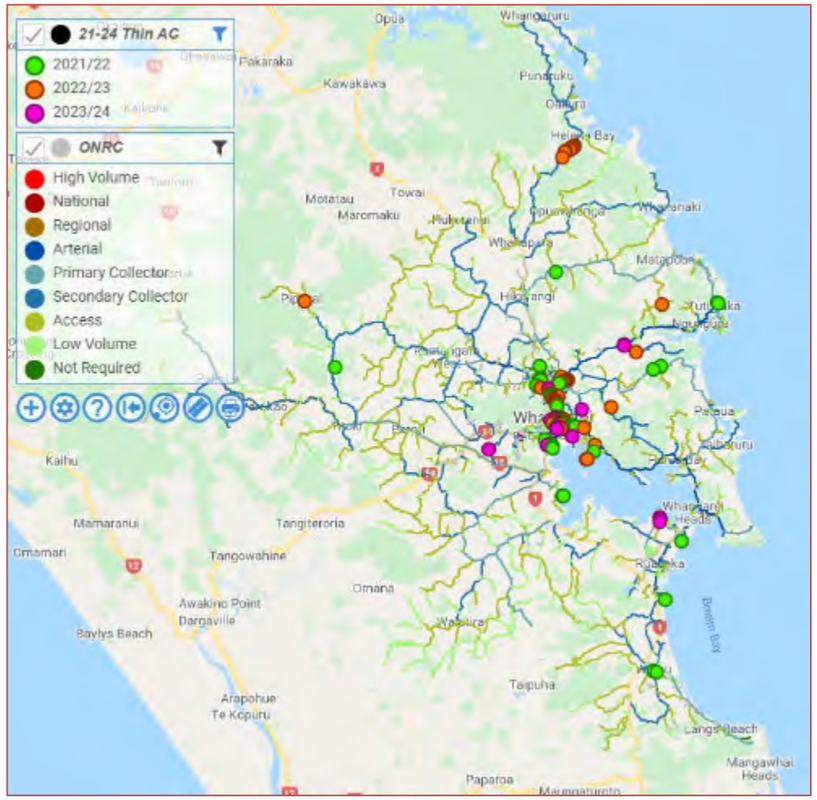
The comparative analysis does not quite tell the picture as a large portion of the thin asphalt added to the network is through subdivision development which are typically surfaced in Asphalt. This is not recognised correctly in the PMRT reports as the surface is just added to the databases as Thin Asphalt 2nd coat. This process of subdivision development grows the thin asphalt content on the Secondary, Access and Low Volume network. The bulk of the renewal undertaken as part of true renewal programme is completed on the Arterial network as shown in the top left graph.

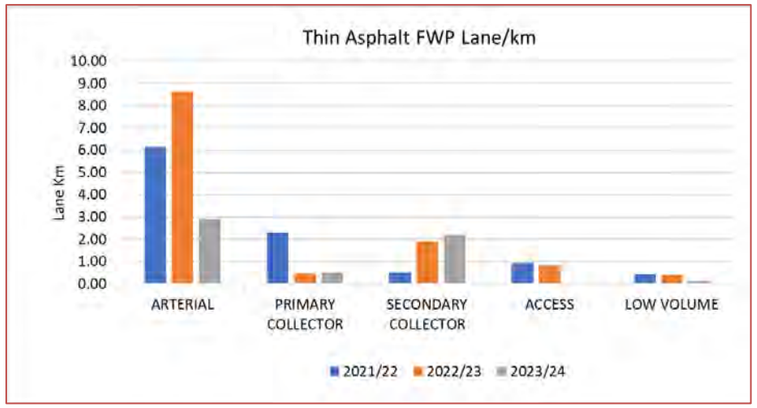




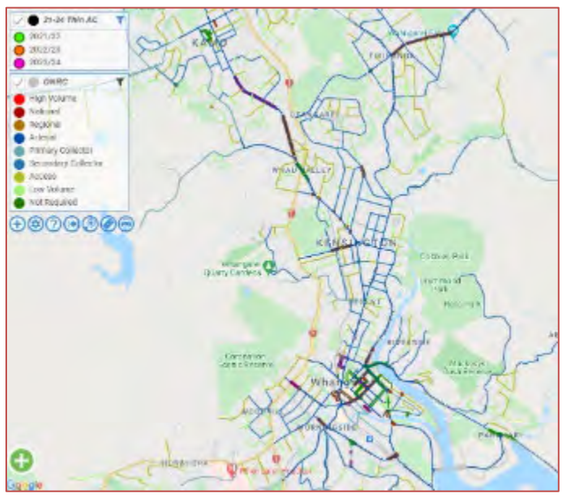


Asphalt Resurfacing – 2021-24



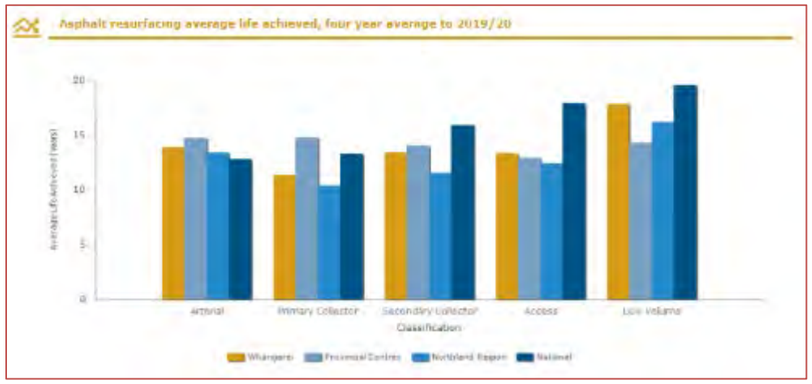


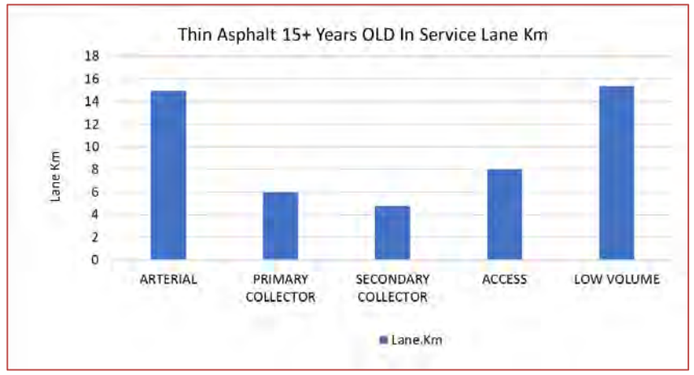
Urban Asphalt Resurfacing – 2021-24

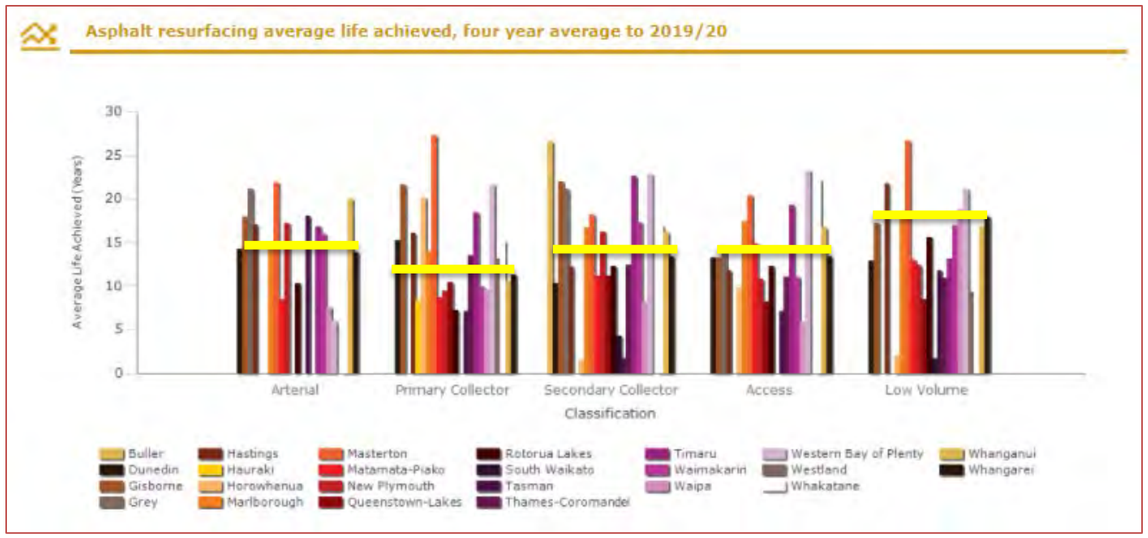


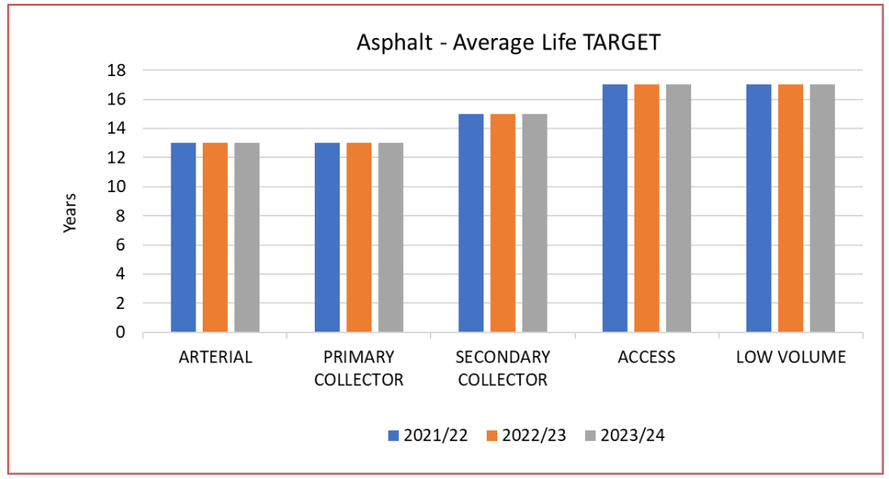
Name	CLoS	Type of Measure	Outcome Measure	Brief Description	ONRC	2021/22 TARGET	2022/23 TARGET	2023/24 TARGET	Analysis/ Peer Group Comparison	GAP/Response
WDC **Cost Efficiency - Asphalt Average Life Achieved**	Cost Efficiency	Efficiency Measure	EM	Asphalt Resurfacing - Average life achieved	Arterial	13	13	13	There are some wild variations in this peer group. For WDC these TAC surfaces are being stretched too far, particularly given that the peer group is not loaded in same way as the WDC TAC network.	**GAP** - The large majority of the TAC Arterial surfaces are showing signs of rapid deterioration. **Response** – This plan seeks to lift the TAC quantity to address the urban network and arrest the rate of deterioration occurring. However this may be too late due to funds in last plan being channelled into addressing the old VOID/TEXT on chipseal network. In general Asphalt is applied where the ADT is greater than 8,000 taking into account, stresses environment and resulting condition over time. This does mean that WDC are expecting to replace some chip seal Arterial surfaces with Asphalt at the time of pavement renewal.
					Primary Collector	13	13	13	No issue identified	
					Secondary Collector	15	15	15		
					Access	17	17	17	Peer group would appear to be intervening quite early on their TAC renewals	
					Low Volume	17	17	17	Cul-de-sac heads and rural TAC corners	
					Network (Avg)	15	15	15		

Yellow bar shows the Whangarei DC current achievement against the peer group. Several observations can made. WDC continues to stretch the life of surfacing compared to the other networks, there are number of networks in this group that do not compare well to WDC high VKT urban Arterial network, therefore the average life is not well related to the peer group in general.







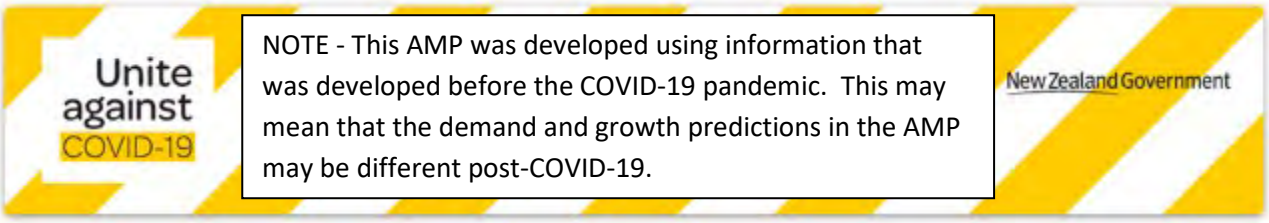


3.7 Benefits Framework

The NZTA Benefits Framework has been used to develop the following measures to track the outcomes of the transport activities on achieving the desired transport outcomes.

Problem Statement being Addressed	Transport Outcome Framework	GPS Priority	Benefit Cluster	Benefit	Benefit Measure	Baseline Data Source	Mode	Quantitative/Qualitative Measure					
								FNDC		KDC		WDC	
								2020 Baseline	2024 Target	2020 Baseline	2024 Target	2020 Baseline	2024 Target
Safety	Healthy and safe people	Safety	1. Changes in user safety	1.1 Impact on social cost of deaths and serious injuries	ONRC-1.1.3.a Safety - Customer Outcome 1: the number of fatal and serious injuries on the network	PMRT ONRC – 1.1.3a Safety - Safety Report (5 year DSI numbers)	All	**191**	Decreasing trend	**84**	Decreasing trend	**216**	Decreasing trend
Unsealed Roads	Healthy and safe people	Climate Change	3. Changes in human health	3.2 Impact of air emissions on health	Number of houses within 80m of untreated unsealed roads that are exposed to NZTA dust risk score of 12 or above (based on General Circular 16/04).	Number of houses within 80m of untreated unsealed roads that are exposed to NZTA dust risk score of 12 or above (based on General Circular 16/04).	All	TBD	Decreasing number	TBD	Decreasing number	TBD	Decreasing number
Resilience	Resilience and security	Climate Change	4. Changes in impact of unplanned disruptive events on access to social and economic opportunities	4.1 Impact on system vulnerabilities and redundancies	ONRC-5.1.0.b Resilience - Customer Outcome 2: the number of instances where road access is lost	PMRT ONRC 5.1.0.b Resilience – Total number of reported road closures from report	All	TBD	Increasing	TBD	Increasing	TBD	Increasing
Structures	Economic prosperity	Improving Freight Connections	5. Changes in transport cost	5.2 Impact on network productivity and utilisation	ONRC-5.2.0.a Accessibility – Customer outcome 1: proportion of network not available to: a. Class 1 heavy vehicles, b. 50MAX vehicles	PMRT ONRC – 5.2.0a Average % of total road network not available to 50MAX vehicles	HCV	TBD	Increasing	TBD	Increasing	TBD	Increasing
Growth and Alternative Modes	Economic prosperity	Better Travel Options	5. Changes in transport cost	5.2 Impact on network productivity and utilisation	5.2.6 Proportion of population living within travel threshold (15, 30 and 45 minutes) of key economic opportunities (including work) by different modes (walking, cycling, public transport, private motor vehicles) in the morning peak.	NZTA Benefit Storymap – proportion of population living within 15 minutes of key economic opportunities	Walking Cycling PT Private Vehicles	TBD TBD TBD TBD	Improving Improving Maintain Maintain	TBD TBD TBD TBD	Improving Improving Maintain Maintain	TBD TBD TBD TBD	Improving Improving Improving Maintain
Growth and Alternative Modes	Inclusive access	Better Travel Options	10. Changes in access to social and economic opportunities	10.2 Impact on mode choice	10.2.1 Number of pedestrians, cyclists, public transport boardings, and motor vehicles (excl. public transport) TIMES number of people per vehicle, expressed as percentages.	2018 Census – Main Means of Travel to Work data.	Walking Cycling PT **Total**	4.6% 0.4% 0.3% **5.3%**	Increase	3.7% 0.3% 0.2% **4.2%**	Increase	3.6% 0.8% 0.7% **5.1%**	Increase
Sealed Roads	Inclusive access	Value for Money	10. Changes in access to social and economic opportunities	10.1 Impact of user experience of the transport system	ONRC 10.1.5a – Amenity – Customer Outcome 1 – Smooth Travel Exposure (STE)	NZTA Annual Achievement Return – NZTA RAMM Report	All	**94%**	Decrease	**92%**	Maintain	**84%**	Increase

4 Demand and Growth



Demand and growth on the transport network is generally caused through one of the following mechanisms:

- Economic growth and increased productivity – business growth can affect traffic flows, and in particular heavy vehicle flows. This can affect road capacity and road renewal cycles.
- Population growth – increases in population will create demand for more trips and new infrastructure through subdivision development.
- Asset growth or change – this often follows business and population growth or can be from revocation of state highways or increased use of new technology, eg variable school zone signs. Growth in transport assets results in increased maintenance and renewals costs.
- Mode share change – change in mode share can create demand for new or improved infrastructure, eg increased number of cyclists could create demand for safer cycleways.
- Level of service change – changes to levels of service will change the amount of maintenance, renewals and capital funding to achieve the required service.

These demands will be discussed in the following sections.

4.1 COVID-19 Pandemic Impacts

The impacts of the COVID-19 pandemic on future growth and demand are very uncertain, particularly in the medium to long term. In May 2020, NZTA undertook an assessment of the impacts of COVID-19 on the country and for each region. For the Northland region, their assessment was as follows:

Potential Impacts to key sectors

- The key sectors in Northland's economy are reasonably well placed to recover from the pandemic, with the exception of retail trade
- International tourism makes up approximately 20% of Northland tourism spend
- The reduction in international tourism may be off-set by an increase in domestic tourism (at least in short term) due to proximity of Auckland
- The region has relatively low reliance on temporary migrant labour (1.2% of labour force, 2019), so will not be unduly impacted by reductions in immigration. Most are employed in the agriculture and horticulture sectors

Potential Impact on Communities and Employment

- Northland's economy had been lagging behind the national average pre-COVID, but the region is forecast to recover relatively well from the pandemic

- Under the Slower Recovery Scenario the region's forecast fall in employment to 2021 (relative to BAU) is -5.6%, below the national average of -6.7% and employment in the region is forecast to return to BAU levels in the latter half of this decade
- Māori and Pasifika, and youth, are likely to experience the greatest impacts, particularly those in smaller regional centres. An increase in youth not in employment, education or training (NEETs) is expected
- Recent population growth driven by net migration. With lower levels of international migration and less 'spill over' from Auckland, Northland's growth is expected to slow significantly in the short to medium-term.

Potential Impact on the Land Transport System (over the next decade)

- Expect an easing of growth in passenger transport demand over the short-term, due to slower population growth and reduced employment and discretionary trips
- No significant changes are expected in the nature, scale and location of transport demand over the medium to long-term. The 10-year outlook remains largely unchanged
- Maintaining safe and reliable connections to Auckland and to domestic tourism centres (including the Twin Coast Discovery Highway) remain important to supporting recovery
- There will be an ongoing need for transport services to support COVID recovery by improving access to employment and essential services for vulnerable communities
- There will be ongoing pressure on transport revenue as a result of the COVID lockdown.

Since this assessment was made, growth in Northland has been strong since the lockdowns, due to a buoyant housing market fuelled by ex-pat New Zealander's returning home from overseas as well as strong domestic tourism which has replaced (and possibly exceeded) the international tourism in Northland. The more recent impacts of the COVID-19 pandemic have been described earlier in Section 3.3.

4.2 GDP and Productivity (continuing economic growth and productivity)

As at 2019, the Gross Domestic Product (GDP) in the Northland Region was $7.8 billion in 2019 with a growth of 2.8% which is about the average for the past 5 years and is similar to the national average. This is shown in the following graph (source Infometrics):

Table 4-1: GDP Comparison New Zealand/Northland Region (Source: Infometrics)

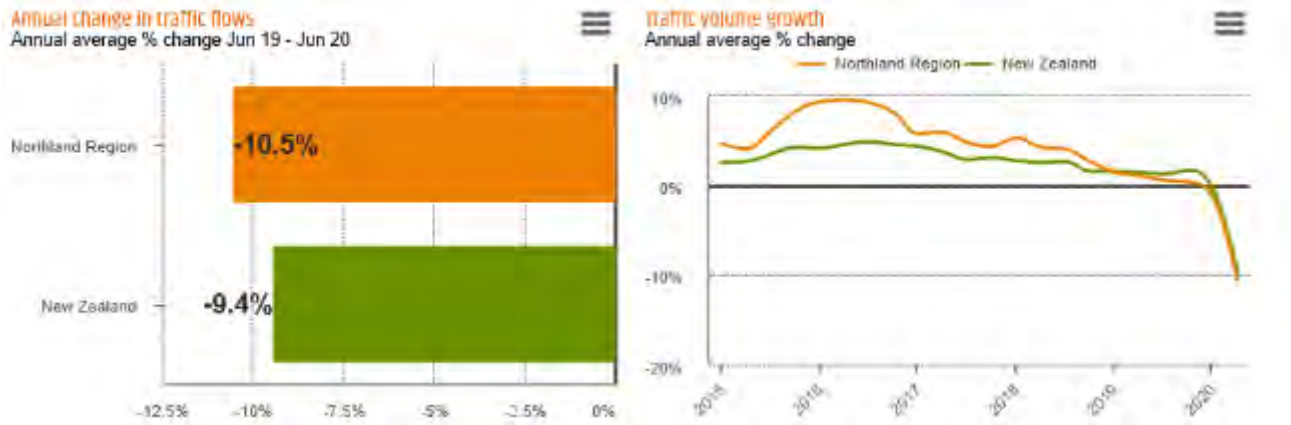
The diagram shows that GDP growth in Northland has been similar to the national average for the past six years.

As shown in the figure above, the key sectors which contribute to this regional GDP (in order of significance) are:

- Manufacturing (16.2%)
- Agriculture, Forestry and Fishing (11.4%)
- Owner-Occupied Property Operations (8.5%)
- Rental, Hiring and Real Estate Services (7.9%)

The biggest contributors to growth in GDP over the last 10 years have been Manufacturing and Agriculture, Forestry and Fishing, Health Care and Social Assistance and the Retail Trade.

Traffic Flows in Northland to June 2020 show a significant drop of 10.5% which is due to the effects of the COVID-19 Lockdown. Prior to the lockdown, traffic growth in Northland had been averaging about 5% over the past 5 years, which was about 2% higher than the national average. This is shown in the following figure (Source: Infometrics)



As at June 2020, unemployment in Northland is currently at a 10 year low and is similar to the national average, although historically the unemployment in Northland has been significantly higher (typically 2-3% higher) than the national average over the past 10 years. This is shown in the figure below (Source: Infometrics).

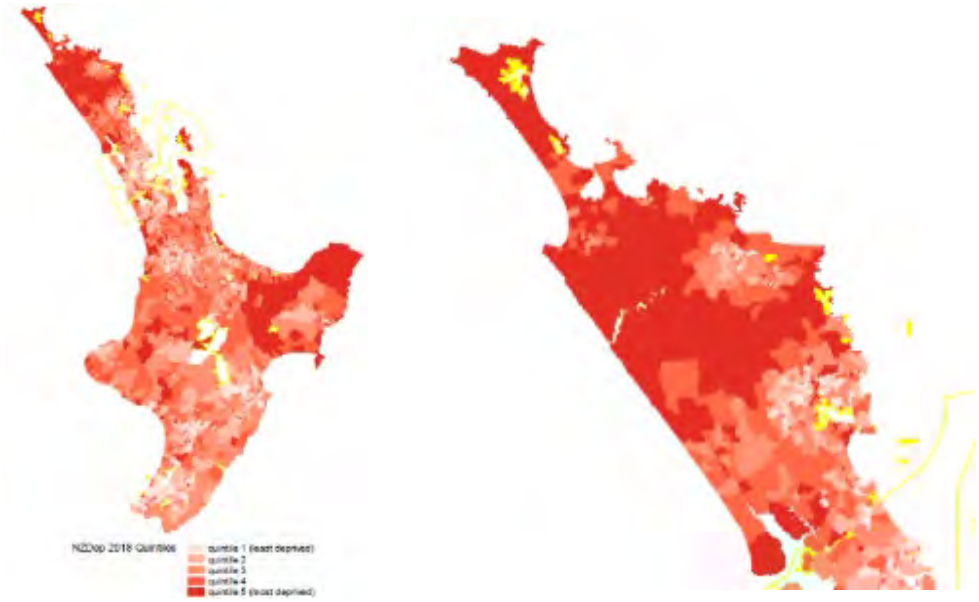
In addition, mean annual earnings in 2019 for Northland are $55,300 which is lower than the national average of $62,800.

4.3 Social Deprivation

Northland is one of the most socially deprived regions of New Zealand with only the Gisborne region having similar levels of deprivation. This is shown in the maps below from the University of Otago 2018 Interim Index of Deprivations. Of particular note are that large areas of the Far North (particularly the Aupouri Peninsular, Hokainga, Doubtless Bay and Mid North) and many areas of Kaipara (Kaihu Valley, West Coast, Pouto and Tinopai) and are in the top 20% of most deprived. Many surburbs of Whangarei City are also in highly deprived areas.

This is a result of Northland having higher rates of unemployment, lower household incomes, lower home ownership rates and poorer housing, more single parent families and lower levels of access to services than the rest of the country.

Economic growth opportunities and better access to jobs and social opportunities will help improve household incomes and reduce unemployment which will in turn lead to better home ownership rates, access to services and improve family well-being. Transport initiatives that will support growth and improve access, particularly for the transport disadvantaged (such as walking and cycling facilities and bus services), will play a part in helping to reduce the social deprivation in Northland over the long term. Growth opportunities and transport projects that can support growth are described in Section 4.6.



4.4 Freight Demand

Northland is responsible for about 6% of the national road freight, much of which is generated by its primary industries. Most of the freight movements are within the region but limited quantities are also transported to and from Auckland and to the Bay of Plenty and Canterbury. In 2017/2018, 16.6 million tonnes of freight was transported in Northland by road. Most of the freight flows in the region consist of logs and wood products, petroleum (from the Marsden Point Refinery), lime, cement and fertiliser, aggregates and dairy products. This is shown in the following graph.

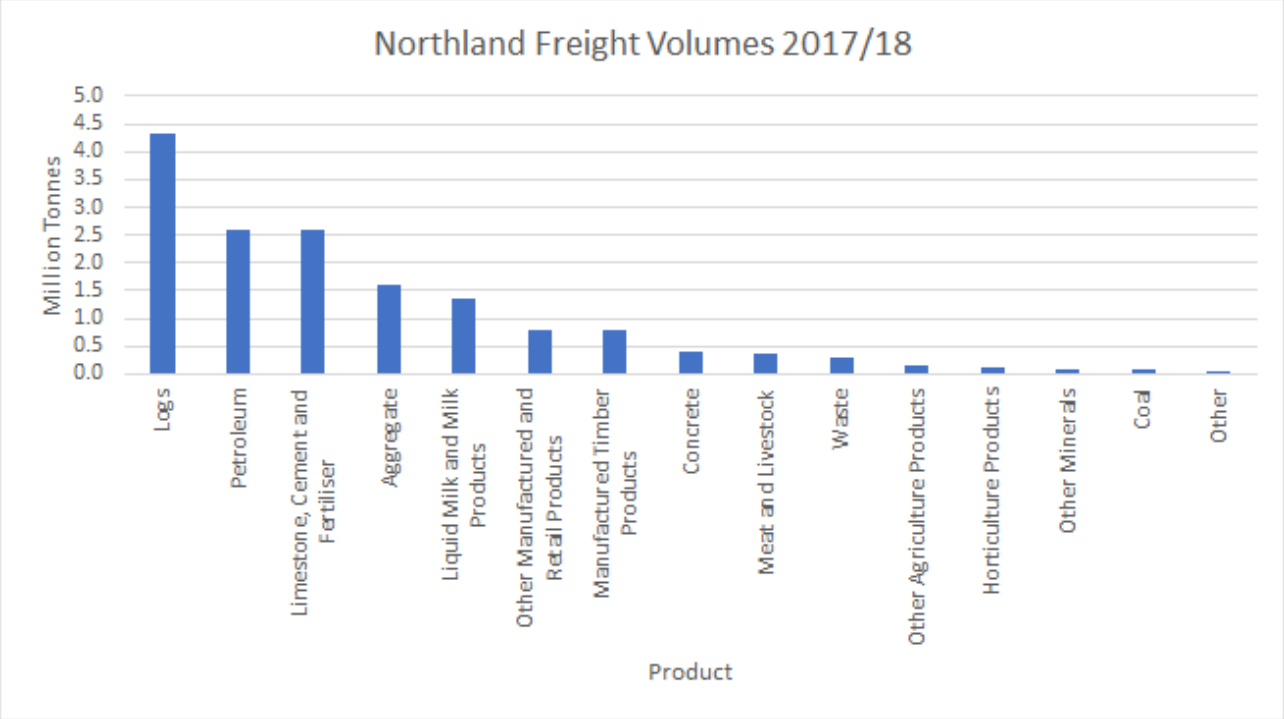


Figure 4-1: Freights Volume From Northland (Source: MOT National Freight Demand Study 2017/18)

Of the above Northland freight volumes, some are nationally significant as described in the table below:

Product	% of Total National Freight Volume
Petroleum	28.3%
Limestone, Cement and Fertiliser	25.4%
Logs	11.8%

(Source: MOT National Freight Demand Study 2017/18)

Estimated total freight to, from and within Northland has increased by almost 1.8 million tonnes between 2012 and 2017/2018. This represents steady growth of around 2 percent per annum.

According to the Ministry of Transport National Freight Demand Study 2017/18, freight in the country is expected to stay largely static over the next 30 years, with a dip around 2042/43 due to lower logging harvest. This is shown in the figure below. The study also predicts that Northland freight volumes are also expected to follow this trend and be largely static over the next 30 years. However, the recent reports recommending the potential for freight from Ports of Auckland to go through Northport at Marsden Point would see a significant increase in freight in Northland. Also the investment from the Provincial Growth Fund on tourism and water storage projects to support horticulture are likely to result in increased freight movements to support these industries. This is described in more detail in Section 4.6.3.

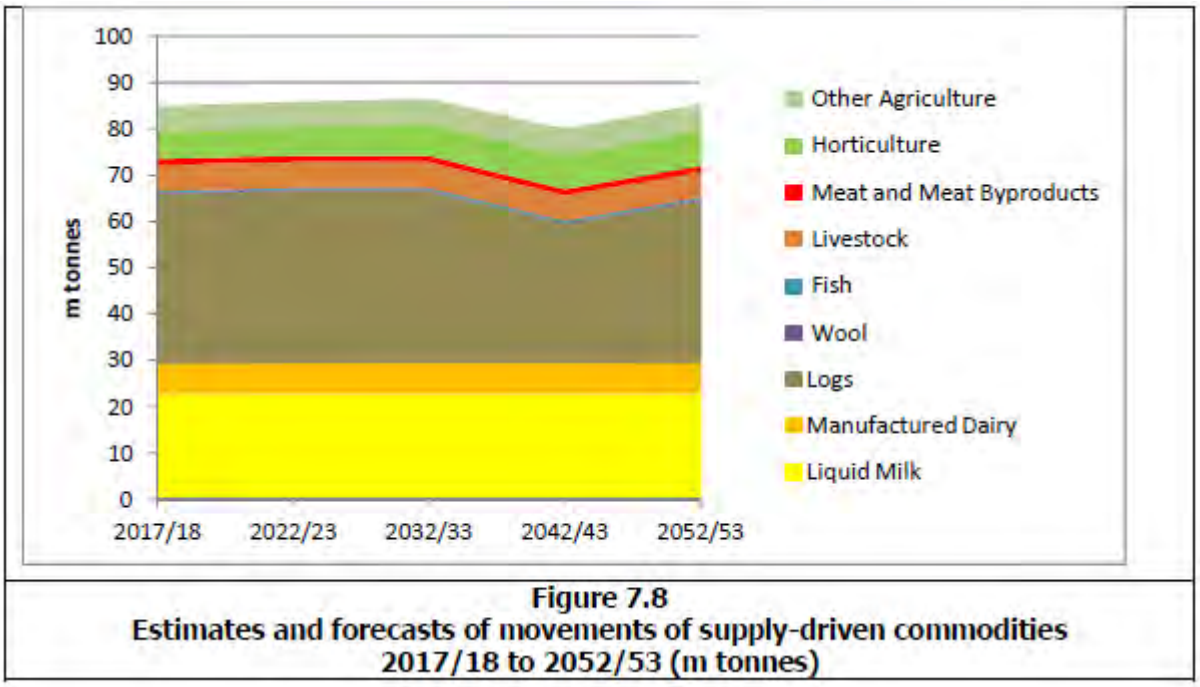


Figure 7.8
Estimates and forecasts of movements of supply-driven commodities 2017/18 to 2052/53 (m tonnes)

With a significant proportion of freight being logs, there is an increasing demand for the use of high productivity motor vehicles (HPMVs) and 50Max vehicles, which are road vehicles capable of carrying payloads of up to 62 tonnes and 50 tonnes respectively which is higher than the standard limit of 44 tonnes.

The increase in heavy vehicle flows and the use of 50Max vehicles is likely to result in increased requirements for maintenance and servicing of the road network. Low resilience and quality of roads has real effects on the efficiency of freight movements in the region. For example, Fonterra has noted that the standard of roads has impacts on the cost of maintaining their tankers – up to three times the cost experienced in other regions (Winder, 2014).

In addition, the increasing use of heavy vehicles causes dust problems on unsealed roads impacting on households, crops and water quality. The Northland Regional Council has found that, at times, dust breached national environmental standards on some roads. Communities in Northland have been quite vocal about the problem and are looking for remedies, although dust suppressants are costly.

The rail line in Northland only has limited freight flows (only 0.6% of the freight volume in 2017/18) and the standard of the line restricts rail freight growth. A reduction in rail freight has occurred over the last decade with the closure of Port Whangarei and the opening of Northport at Marsden Point, which has no rail link. The decline in rail usage over the past 15 years has seen the mothballing of the Dargaville branch line and the suspension of rail traffic on the main line north of Kauri. This has placed increased demand on road transport as the main means of freight transport in Northland. To reverse this trend, $95M of investment from the Provincial Growth Fund (PGF) in the North Auckland Rail Line was allocated in the past two years to address deficiencies in the line between Whangarei and Auckland including bridge strengthening and lowering the rail line through several tunnels to allow high-cube containers. This also includes establishing a rail freight hub at Otiria near Morewa in the Far North.

A branch line to link Marsden Point with the rail network has been proposed and considered several times in the past. The preferred route for this rail link to Marsden Point was designated in 2009 to protect it from future development. In 2020, $40M of funding was allocated through the PGF to purchase the properties on the Marsden Point Rail Link route. Until recently this link was seen as a long term option, and its viability is subject to greatly increased freight demands and the potential role of Northport to handle container freight. However, with recent reports recommending some of Ports of Auckland freight be moved to Northport, there is renewed interest in establishing this rail link.

The key port in Northland is the Marsden Point deep water port otherwise known as Northport. The port serves as the major export and import hub for forestry, fuels, dairy and fertiliser. Most of this freight comes into and out of the port by road. Port traffic has grown rapidly in recent years due mainly to the increase in forestry exports.

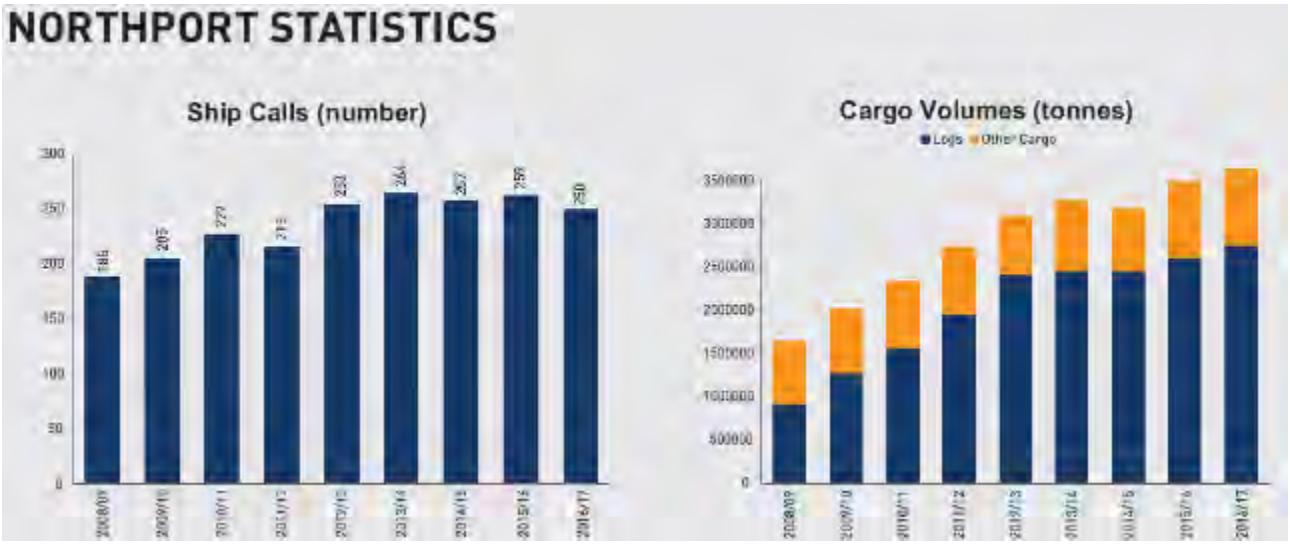


Figure 4-2: Marsden Point Export Growth (Ship Numbers and Freight Tonnages) – (Source: Marsden Maritime Holdings)

Export volumes have increased from around 1.2 million tonnes in 2004 to 3.4 million tonnes in 2017/18, an average increase of 13 percent per annum. This large increase in freight is largely due to increased log and wood product exports which make up over 75% of all exports.

In the long term, it is possible that Northport could develop as a container port and support container freight to and from Auckland as the Port of Auckland grows to capacity. A container crane has been installed at the port for this purpose. As mentioned above, there have been government reports prepared recommending that some of Ports of Auckland's freight be channelled through Northport. However, for this to succeed, road and rail links to Auckland would need to be upgraded and the Marsden Point rail link will be required.

4.5 Tourism

Ministry of Tourism forecasts of projected visitor numbers for Northland between 2009-2015 shows an increase from 4.92M visitors in 2008 to 5.23M visitors in 2015. Guest nights in Northland have increased 5.3% per annum over the past 6 years to a record high in 2019 of 1.97M as shown in the graph below (source: Statistics NZ).

Figure 4-3: Northland Annual guest Nights

Tourism spend in Northland reached a new record high in the year to June 2018 with $1.123 billion being spent in the region. This represents an increase in spend of 3.8% from the previous year (source: MBIE). Northland now has the 6th highest annual tourism spend out of the 32 regional tourism organisations (RTO's) as shown in the graph to the right (source: MBIE, Year to September 2020).

Nationally tourism spend is expected to grow by at least 28% to $50 billion by 2025. This is shown in the figure below (Source: Tourism Industry Aotearoa (TIA) 2018).

Whilst there are no regional growth forecasts, it is expected that Northland will get at least an equal share of this growth. However, the impact of COVID-19 may limit this growth based on a significant reduction of international visitors. However, approximately 80% of Northland's tourism spend is through domestic tourism that this is likely to increase while the international borders are closed through the pandemic. Therefore, the impact of COVID-19 on tourism in Northland is likely to minor. This is discussed in more detail in Section 4.1.

State Highway One is the primary access route to and from Northland's premier tourist destination of the Bay of Islands. The Twin Coast Discovery Highway is a sign posted tourist route which provides a scenic route through Northland. This tourist route is primarily located on the state highway network but also crosses onto the local road network through Mangawhai/Langs Beach/Waipu, the Tutukaka Coast and the North Hokianga area through Broadwood, Kohukohu and Rawene. There are also many tourism byways to regionally significant tourist attractions.

Tourism growth in Northland is likely to continue with new local attractions such as the Manea Footprints of Kupe Visitor Centre in Opononi, Waitangi Museum Maori Battalion upgrade, Kawakawa Visitor Centre, Hundertwasser Art Centre and Wairau Maori Art Gallery in Whangarei. In addition, more and larger cruise ships have been visiting the Bay of Islands and there is potential for these now to stop off at Marsden Point with bus tours to Whangarei. These new tourism initiatives will produce associated demands on traffic flows, pedestrian facilities and parking.

The increase of campervans and self-drive tourists in Northland and coastal areas in the region will also create demands for suitable parking, toilet facilities, rest and viewing areas. The Far North and Whangarei District Councils have established rules on where and for how long freedom campers can park. In designated camper friendly areas, carparks will need to be designed to take into account these longer and wider vehicles. While the Kaipara District Council does not have many issues with freedom campers it is still considering the need for more facilities for visitors.

Tourism is actively promoted by central government, with tourist dollars an important boost to GDP. Its influence on the network can only keep growing, so some of those dollars need to be channelled back to the infrastructure. This is currently being undertaken through the distribution of the Tourism Infrastructure Fund

(TIF) and the Provincial Growth Fund (PGF). The Provincial Growth Fund is discussed in more detail in Section 4.6.3.

4.6 Growth Opportunities

4.6.1 Tai Tokerau Regional Growth Study and Action Plan

The Tai Tokerau Regional Growth Study published in February 2015 is a whole of government study which provides a road map for the economic growth in Northland. Following the release of the study, the Tai Tokerau Economic Action Plan was first published in February 2016 and refreshed in 2019 which identifies key work areas to realise the economic growth opportunities in Northland.

The key work areas where the Northland transportation network could play a role in realising this economic growth are detailed as follows:

- Revitalise the Twin Coast Discovery Route – including improvements to SH10, SH11 and SH12, byway signage, layover improvements and two-laning bridges where required. Programme business cases (PBC) for these initiatives have been developed to determine what upgrades are necessary on the local road network that is on this route or the associated byways. These business cases are described in more detail in Section 4.6.2.
- Improvements to SH1 to improve the connection from Whangarei to Auckland and the rest of the country.
- The revitalisation of the rail line in Northland to Whangarei and Otiria, including a new freight hub at Otiria. This should see a gradual shift in freight movements from road to rail.
- Development of Northport to grow the region's main port to its full potential, which is likely to significantly increase freight movements to and from the port. In the short to medium term, these freight movements would be by road. In the long term, the development of the planned rail spur to connect the Northport to the rail network would result in a shift in freight to rail.
- Upgrades to the Bay of Islands Airport near Kerikeri, which has now been completed, will increase visitor trips to and from the airport.
- Investigating the options for the relocation of the Whangarei Airport. This is a medium/long term project which is likely to occur in the next 10-15 years and may require new or upgraded road links to the new location (sites are currently being investigated). In addition, there may be re-development opportunities for the existing airport in Onerahi which could increase traffic demands.
- Investment in upgrades to key tourism initiatives such as the Maori Battalion upgrade of the Waitangi Museum, the Manea, Kupe's Footprints visitor centre in Opononi and Hundertwasser Art Centre in Whangarei are likely to result in more visitor trips in Northland.
- Development of regional cycle trails to create a network of trails around Northland will again increase the number of visitor trips to Northland to utilise these facilities.
- Providing improved water storage in Far North and Kaipara districts to enable more high-value horticultural development.
- Re-investment in replanting forest blocks that have recently been harvested as part of the 'One Billion Trees' programme to ensure the sustainability of the forestry industry and to capture greenhouse gases.

Many of these projects have already been funded through the Provincial Growth Fund (PGF) as described in Section 4.6.3.

4.6.2 Twin Coast Discovery Route – Programme Business Cases (PBC)

The Twin Coat Discovery Route is a sign posted tourist route that traverses across Northland in a loop using SH1, SH10, SH11 and SH12 as well as several local roads as described earlier in Section 4.5.

As part of the Tai Tokerau Economic Action Plan, it was identified that the revitalisation of this route was necessary to increase visitor numbers, to encourage visitors to spend more time in Northland (to "stop, stay and spend"), to make the tourist industry less seasonal (high numbers in summer but low in winter months). This would be achieved by improving the route and providing more experiences along the way to visit.

A series of business cases were developed by NZTA with funding from the Provincial Growth Fund to achieve this goal. These business cases were focused on the following:

- SH11 & SH12 – These two business cases were focused on improving the safety, access connections and resilience as well as increasing the economic and social opportunities on SH11 and on SH12 between Rawene and Katui Rd, north of Dargaville. Key initiatives identified included SH1/SH11 roundabout at Kawakawa, SH11 Tirohanga Bridge replacement, a shared path between Paihia and Waitangi, Paihia Town Centre upgrades, improved access to the Waitangi Treaty Grounds, SH12/Rawene Rd intersection upgrade, Opononi Township improvements and safety improvement projects on both routes.
- Northland Integrated Cycling Implementation Plan – This business case assesses and prioritises tourist cycle trails across Northland to provide a connected network to build off the Twin Coast Cycle Trail (Great Ride) and other Heartland Rides that have been developed to date. The routes assessed align with those in the Northland Walking and Cycling Strategy, which is described in Section 4.12.1.
- Township Improvement Plans – Plans developed to improve the amenity, facilities, walking and cycling and place making of towns on the route. Townships that were included were Awanui, Dargaville, Horeke, Kaikohe, Kawakawa, Kohukohu, Moerewa and Rawene.
- Passing Opportunities and Rest Areas – These two business cases identified the need for additional passing opportunities and rest areas on SH11 and on SH12 between Rawene and Katui Rd, north of Dargaville. The passing opportunities would enable slower moving visitors and campervans to allow traffic to overtake safely. The rest areas would enable visitors a place to pull over to rest (and reduce the likelihood of fatigue related crashes) as well as to provide places to stop in tourist areas to improve their experience (by providing photo opportunities and improved storey telling).

- Wayfinding – This business case identified the need to improve the road signage to direct visitors along the route and to tourist destinations and facilities along the way. This would be supported by developing special purpose phone apps.

Initially the Provincial Growth Fund (PGF) was intending to fund the projects resulting from these business cases. However, due to other demands on the PGF, the funding of most of these projects is now likely to come from through the National Land Transport Fund (NLTF) with councils providing their local share.

4.6.3 Provincial Growth Fund (PGF)

The Provincial Growth Fund (PGF) was a $3 billion dollar fund created as part of a coalition agreement following the 2017 central government election. This fund has been administered by the Ministry of Business, Innovation and Employment (MBIE). Since the fund was created, $712M (as of August 2020) has been allocated to a range of projects within Northland. It is expected that this investment will result in 3,231 new jobs being created.

The breakdown of these projects by sector is shown in the figure to the right. The most significant funding allocations have been to the following areas:

PROVINCIAL GROWTH FUND TUAWHENUA

FUNDING BY SECTOR

	Approved ($m)
Rail	$221.23
Forestry	$120.78
Tourism	$85.95
Road	$71.91
Water Storage / Management	$68.96
Training Skills / Employment	$30.37
Regional Projects	$27.68
Other	$20.40
Ports	$19.70
Aquaculture	$17.00
Agriculture / Horticulture	$14.98
ICT & Digital Connectivity	$10.27
Airports	$1.75
Manufacturing / Engineering	$0.80
Waste / Recycling	$0.51
Grand Total	$712.28

- Rail ($221M) – Revitalisation of the North Auckland rail line from Whangarei to Auckland. This includes bridge strengthening and lowering the rail line through several tunnels to allow high-cube containers. This also includes establishing a rail freight hub at Otiria near Morewa in the Far North. In addition, this work includes purchasing land for the proposed rail link to Marsden Point. The result of this investment is likely to result in a minor shift in freight movements from road to rail. However, until the rail line to Northport (Marsden Point) is built any freight shift to rail is likely to be minor.
- Forestry ($121M) – Reinvestment in the Northland forestry industry to replant harvested areas, particularly on maori owned land. This is part of the One Billion Trees programme and will help ensure a sustainable forestry industry in Northland. This will result in a minor increase in road traffic during the planting phase, particularly on forestry access roads. Over the long term, it will mean that logging traffic will continue to be a significant source of road freight for the foreseeable future.
- Tourism ($86M) – Investment in the following significant tourist attractions:
  - Hundertwasser Art Centre and Wairau Maori Art Gallery in Whangarei
  - Kawakawa Visitor Centre
  - Kupe Waka Centre in Oponini (Manea – Footprints of Kupe)
  - Maori Battalion Museum in Waitangi

  As described in the Tourism section, these projects will help result in continued growth in tourism in Northland and may result in local transport issues such as additional demands on traffic flows, pedestrian facilities and parking which will need to be catered for.
- Roads ($72M) – Investment in the following significant roading projects:
  - SH10/Waipapa Road Roundabout
  - Far North Strategic Road Sealing
  - Kaipara Kick-Start

The SH10/Waipapa Road roundabout is currently under construction and will improve access from Waipapa Road onto the highway. It also includes a new link road via Klinac Lane which will connect the highway to the Waipapa commercial area to the west.

The last two projects are of particular interest for the local road network. The Far North Strategic Road sealing project will result in the sealing of 5km of Ngapipito Road (a forestry route), sealing 4.7km of Ruapekapeka Rd (a tourist route) and sealing of 6.3km of Peria Road (a state highway detour route). The Kaipara Kick-Start project will result in completing the last 20km of seal on Pouto Rd (a forestry and tourist route) as well as the investment of $8M in upgrading significant unsealed roads in the Kaipara District ($5M of which is coming from the CIP "Shovel Ready" projects as described in Section 4.6.5). These projects will result in a significant improvement of the local road network on these routes.

The seal extension projects will result in a minor decrease in unsealed road maintenance, but this will be offset over time with an increase in sealed road maintenance costs (the second coat seals are already being allowed for in the construction budgets). The unsealed strengthening work on the Kaipara roads will enable their network to be further developed towards a sustainable state (using Paige-Green compliant materials – see Section 5.5.4 for further details).

- Water Storage/Management ($69M) – This includes water storage (dams) for irrigation and drinking water in the Kaitaia, Kaikohe and Kaipara areas. As a result of these projects, it is expected that there will be an increase in horiculture and food production in these areas. This will result in more traffic flows both during the development and operation of these businesses, and in particular freight carrying crops to market.
- Other – In addition, there are other business ventures that have been supported through the PGF. These include:
  - Ngawha Innovation & Enterprise Park – development of a business park near Kaikohe utilising surplus power from the Ngawha power station expansion.
  - Oceania 560 tonne Travel Lift in Whangarei – for haul out and servicing of large boats.
  - Marsden Point Kingfish Recirculating Aquaculture System – Expansion of the kingfish hatchery in Whangarei to grow kingfish fingerlings which can then be transported to other aquaculture facilities to mature.

4.6.4 New Zealand Upgrade Programme (NZUP)

In January 2020, the government announced a $6.8 billion fund to upgrade the country's transport infrastructure. This funding was called the New Zealand Upgrade Programme (NZUP). There were four projects announced for Northland as described below:

- SH1 Whangarei to Port Marsden Highway 4-Laning
- SH10/SH11 Puketona Junction Roundabout
- SH1/SH11 Kawakawa Roundabout
- SH12/Rawene Intersection Improvements

The most significant of these is the SH1 Whangārei to Port Marsden Highway 4-laning project with an estimated value of $692M. This significant project will provide an upgraded 22km four-lane corridor that will improve transport connections between Auckland and Whangārei and is expected to save lives, get the Northland region moving and boost productivity.

The project is expected to start in late 2023 and be completed in 2028. Depending on the alignments chosen and the intersection treatment, there may be some impact on the local road network, particularly if sections of old state highway are to be taken over by WDC. The preferred alignment and intersection configurations are currently being investigated.

The two roundabout projects at Puketona and Kawakawa will help improve the safety at these major Far North junctions and will improve access on the Twin Coast Discovery Route to the Bay of Islands. The Rawene Road intersection is also located on the Twin Coast Discovery Route and will improve access to and from the Hokianga Ferry which crosses between Rawene and Kohukoku.

4.6.5 Crown Infrastructure Partners (CIP), "Shovel Ready" Projects

In April 2020, the government announced a $6.8 billion fund to upgrade infrastructure around the country. This funding was specifically targeted at projects that were "shovel ready" to stimulate the economy and provide jobs following the COVID-19 lockdowns.

There have been 27 projects announced for Northland to date (as of October 2020). Of these, the following are transport related or likely to have a significant impact on the transport network:

Far North

- Te Hiku o te Ika Revitalisation – Providing shared paths, walkways and facilities between Kaitaia, Awanui, Ahipara and Ninety Mile Beach as well as between Pukenui and Houhora. It also includes the redevelopment of the Kaitaia town centre.
- Paihia Waterfront Development – Beach replenishment, construction of a breakwater and the provision for a future shared path between Paihia and Waitangi.

Kaipara

- Kaiwaka Footbridges – The construction of footbridges in Kaiwaka to connect the residential areas around Oneriri Road and Marshall Road to the town centre and school.
- Ancient Kauri Trail – Development of a 36km cycle trail from Dargaville to Donnelly's Crossing (near the Waipoua Forest) using the old railway embankment. Also known as the Kaihu Rail Trail and is part of the Northland Integrated Cycle Network business case.

- Sealing Kaipara Roads – Part of the $8M PGF funded work to strengthen unsealed roads in Kaipara (described in Section 4.4.2).

Whangarei

- Active Modes Urban Shared Path Programme – This project includes the completion of the Raumanga Shared Path and the widening of the Port Road bridge across Limeburners Creek to 4-lanes including a shared path. Both projects are located in Whangarei City.
- Pohe Island Bike Park – The development of a bike training park on Pohe Island, Whangarei to enable children and novice riders to develop skills to safely cycle in a road environment.
- Oruku Landing Conference and Events Centre – The development of a 4-star hotel and 750 seat conference centre on the Hatea River in Whangarei. This development would also include an electric public ferry/water taxi and ferry terminal as well as a footbridge.

4.7 Population Growth

Northland was the fastest growing region in New Zealand over the past five years, with the population growing strongly by 18.1% between the 2013 and 2018 census, to a total of just over 179,000 people. This growth is expected to continue into the future with strong growth opportunities through its proximity to Auckland, potential growth in Northport, the motorway extension to Warkworth and government investment such as through the Provincial Growth Fund.

Each council has developed its own growth projections for the future are these are detailed as follows.

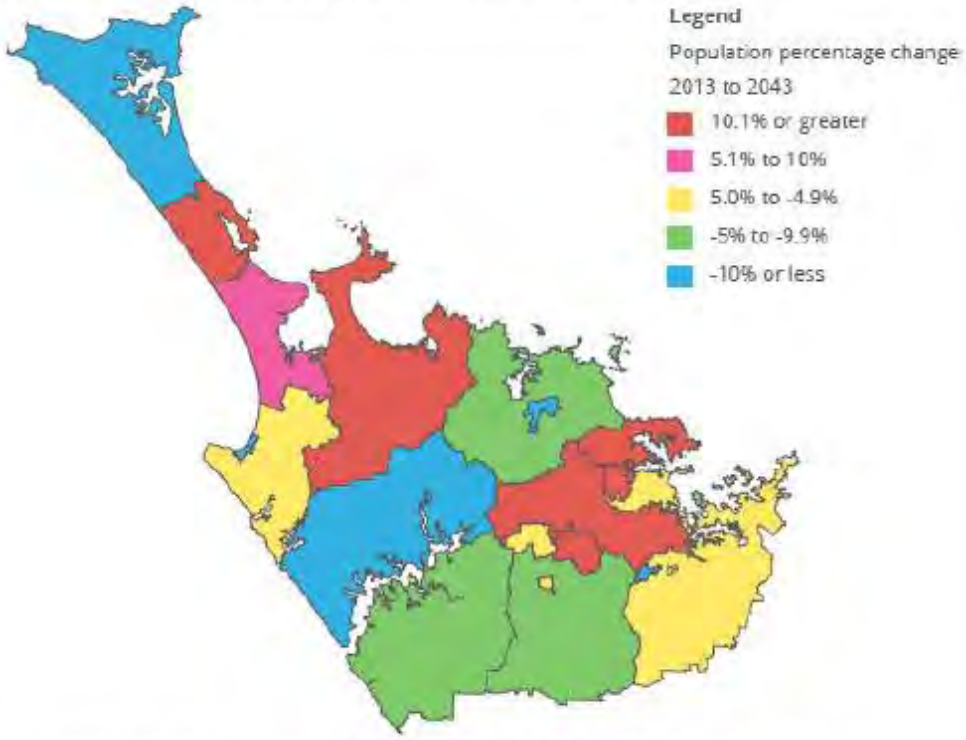
4.7.1 Far North District Growth

The usually resident population of the Far North District grew by 17.1% from the 2013 to 2018 census, reaching a population of 65,250 in 2018.

The majority of this population increase has been focused in urban areas located throughout the District, with 85% of growth occurring in and around Kerikeri. Along with Kerikeri, larger urban areas such as Paihia, Kaitaia and Kaikohe cater for around half of the population within the Far North. Most growth is expected to be focused in and around Kerikeri, followed by Mangonui, Coopers Beach and Cable Bay areas, offsetting the ongoing population decline to the north end and west of the District.

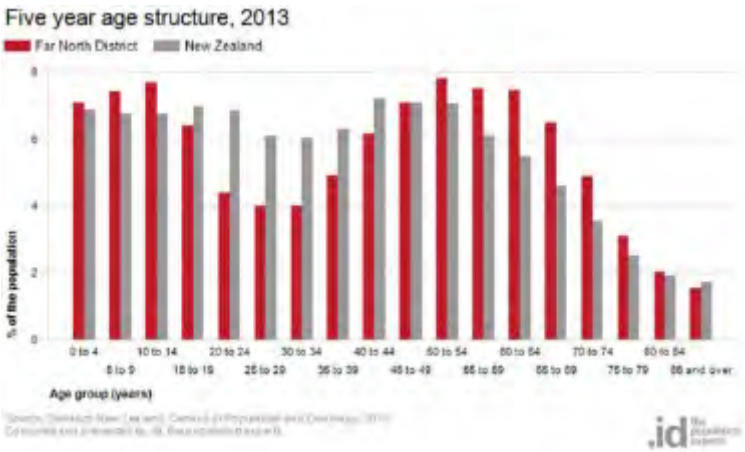
The following figure shows the projected population change between 2013 and 2043 for different areas in the Far North District.

Figure 6. Projected population change between 2013 to 2043 within Far North area units



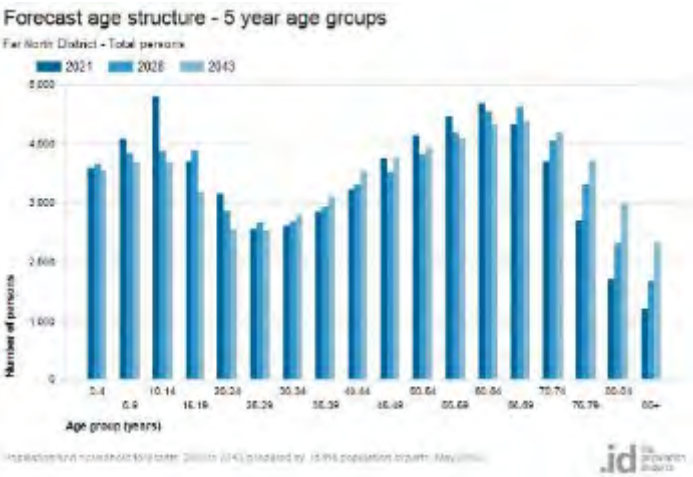
Source: Statistics New Zealand. Projections based on Statistics New Zealand median projections (2016 release)

The Far North District has a high dependency ratio (proportion of people aged under 17 and over 65 years to the working age population) of any New Zealand region indicating a low proportion of working age people as shown to the right.



Looking to the future, this trend is anticipated to be further emphasised, with the proportion of residents aged 65 years or older forecasted to have the highest population growth between 2028 and 2043. This information is shown below.

Future demographic projections indicate that "between 2021 and 2028, the age structure forecasts for Far North District indicate an 8.6% decrease in population under working age, a 16.9% increase in population of retirement age, and a 2.1% decrease in population of working age."



Furthermore, evidence indicates that the largest population increase (in terms of age group) between 2021 and 2028 will be ages 75-79, which is anticipated to grow by 600 persons and account for 5.3% of the total Far North population. By 2028, the largest 5-year age group is expected to be 65-69 years, with a total of 4,611 persons. This will result in different demands on

the transport network such as alternative transport options for those that cannot drive or demand for basic infrastructure to accommodate modes such as mobility scooters.

According to the Census 2013, the District's population comprised the following predominant ethnic groups:

- European 66%
- Maori 45%
- Pacific peoples 3.8%
- Asian 2.2%

Anecdotal evidence suggested by Far North elected members indicated that there is an increasing population returning to the Iwi and Hapu residing in the Far North. This is confirmed by Statistics NZ projections from the 2013 census which indicate that the total Maori population in the Far North is expected to grow by approximately 1.2% between the years 2018 and 2038.

4.7.2 Kaipara District Growth

The Kaipara District's population has grown strongly over the 15 years to 2019, reaching a population of 24,100 in 2019. The usually resident population of the Kaipara District grew by 20.2% from the 2013 to 2018 census, making it the fastest growing district in the country. Most of this growth occurred in the Mangawhai area.

As a consequence of COVID-19, population growth is projected to slow over 2020 and 2021 with softer net migration and a decline in employment.

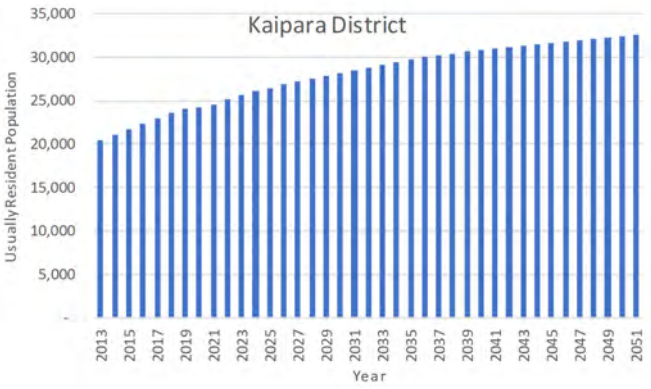
Population growth is projected to pick up from 2022 onwards, with the district growing steadily to reach a population of 32,600 in 2051 (source: Infometrics).

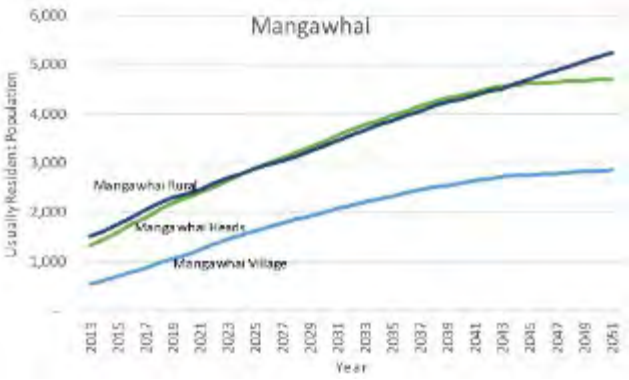
Mangawhai is projected to grow rapidly and will soon become the Kaipara District's largest centre. It was the fastest growing town in New Zealand in the past five years with 60% growth between the 2013 and 2018 census. It is attracting retirees and people who can commute back to Auckland for work.

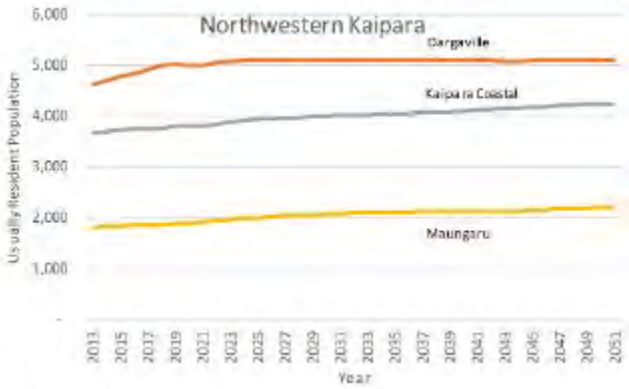
Mangawhai's 2019 population is estimated at 5,808 and is projected to reach 9,088 by 2031 and 12,796 by 2051.

By comparison, Northwest Kaipara and Dargaville is projected to grow slowly with employment growth being the key driver. Dargaville's 2019 population is estimated at 5,027 and is projected to stay largely static, reaching 5,105 by 2031 and 5,097 by 2051.

Much of Dargaville's future growth will be outside the boundary of the Dargaville area and is therefore reported as occurring in Kaipara Coastal and Maungaru.

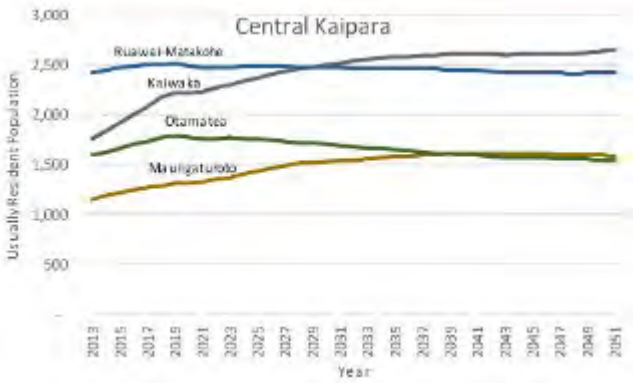






Central Kaipara will grow both because of employment growth and reducing travel times to Auckland. Most of this growth will be in Kaiwaka and Maungaturoto.

Slight population decline is projected for Otamatea and the Ruawai-Matakohe area due to less local employment and the aging population. However, the number of households in both these areas will still increase due to a trend towards smaller household size.



Kaiwaka's 2019 population is estimated at 2,217 and is projected to reach 2,524 by 2031 and 2,658 by 2051. Maungaturoto's 2019 population is estimated at 1,318 and is projected to reach 1,543 by 2031 and 1,588 by 2051.

The Kaipara District's population is projected to age rapidly over the next 30 years. The number of residents aged 65 years and over will grow from 5,600 in 2019 to 12,200 in 2051.

The population 15 to 64 years of age will grow slightly. The population under the age of 15 is projected remain steady.

Population aging in the Kaipara District is exacerbated by the popularity of parts of the district as retirement destinations, resulting in an influx of migrants in the early retirement age group.

4.7.3 Whangarei District Growth

The usually resident population of the Whangarei District grew by 18.1% from the 2013 to 2018 census, reaching a population of 90,960 in 2018.

In response to the rapid growth, the Whangarei District Council developed a new draft Growth Strategy in 2020.

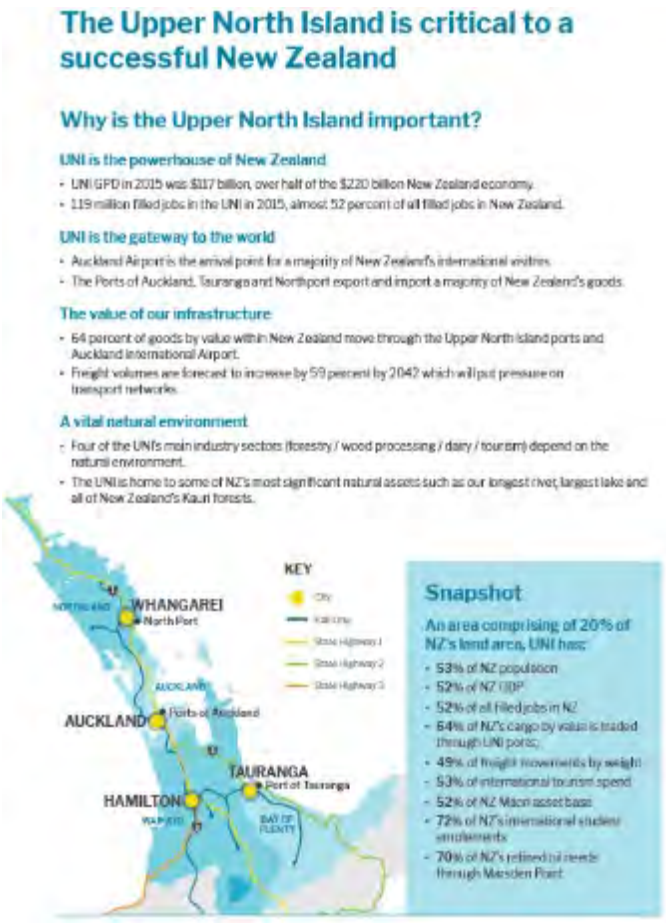
Whangarei is a hub for Northland. The District contains the only city north of Auckland as well several thriving rural and coastal communities.

Whangarei District has experience a rapid rise in population over the past 10 years. The recent population surge is largely due to fewer people leaving New Zealand, larger numbers of returning New Zealanders, and strong inter-regional migration (i.e. people moving from other places in New Zealand, particularly from Auckland).

Sustained growth is likely continue. Even if net international migration slows, inter-regional migration has been an ongoing source of growth for the District over the last 10-15 years.

Why is Whangarei a hot spot for growth?

- It is the only city in Northland and home to major businesses, services and employers
- It has a range of lifestyle choices from urban living to coastal and rural environments
- It has quality and pristine natural environments with world class beaches
- It is only a two hour drive from Auckland
- It is well connected to international and national markets through Northport and Whangarei Airport
- It has a strong cultural identity and heritage shown through Maori business, innovation and arts

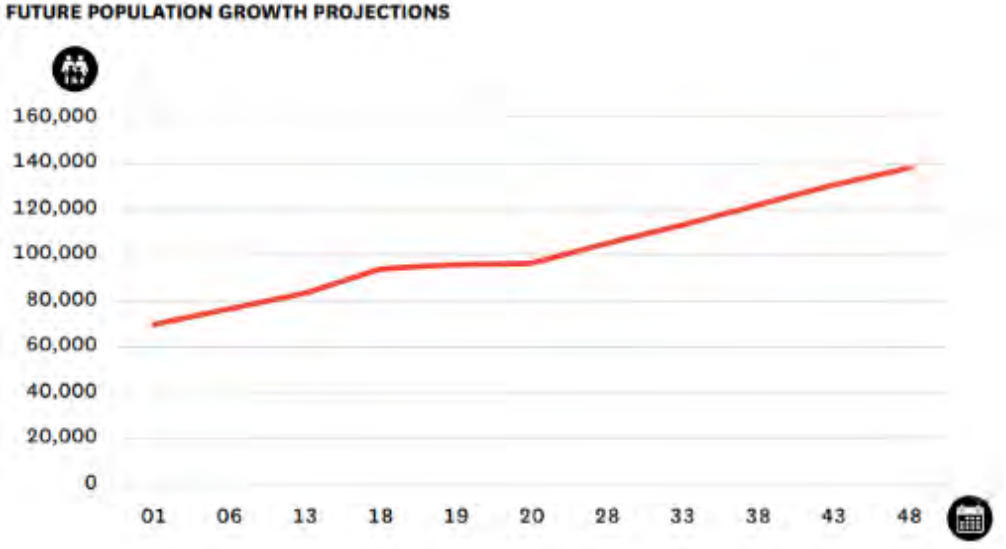


Whangarei and Northland fall within the Upper North Island of New Zealand. The Upper North Island is an economic powerhouse of New Zealand. Despite being 20 percent of New Zealand's land area, it contains over half of New Zealand's population and economic activity and includes nationally significant infrastructure. Significant growth across the Upper North Island is putting pressure on housing, infrastructure, the labour market and environment. Being part of the Upper North Island is a key driver for the growth of Whangarei, particularly through inter-regional movement of people and goods.

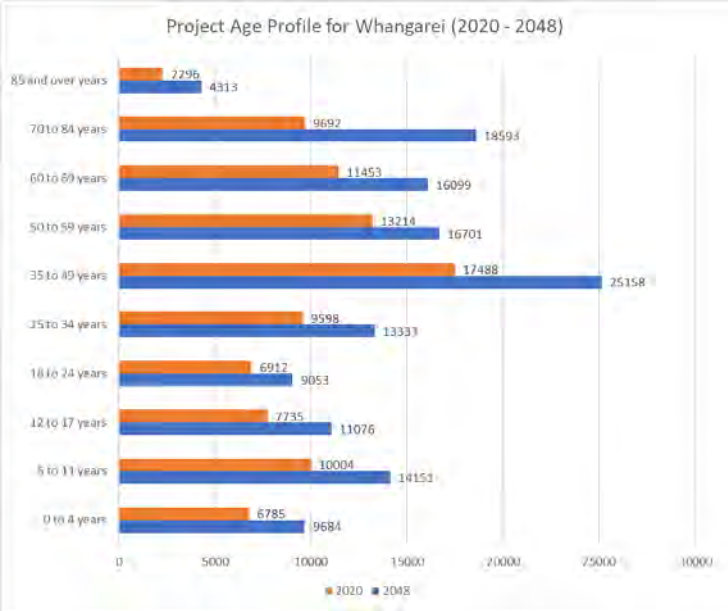
In response to the challenges of providing housing and land for business activities central government has developed a National Policy Statement on Urban Development Capacity (NPS-UDC).

Under the NPS-UDC, the urban area of Whangarei was identified as "high growth" on the basis that our population is projected to increase by over 10 percent over a 10-year period.

The Whangarei District Council has developed a growth model to predict the amount of future growth. The following graphs show an overview of the model's findings for total population and age profile. Over the period of the model, it continues to tell a story of growth, but also of a changing community with more older people as well as a growing younger cohort.



The growth model forecasts that Whangarei will grow by almost 43,000 by 2048 or by 45%, at an average growth rate of 1.6% per annum as shown above.



The model considers anticipated growth related to continued NorthPort expansion as well as longer term investment in key projects to stimulate the local economy, such as transport improvements and connections.

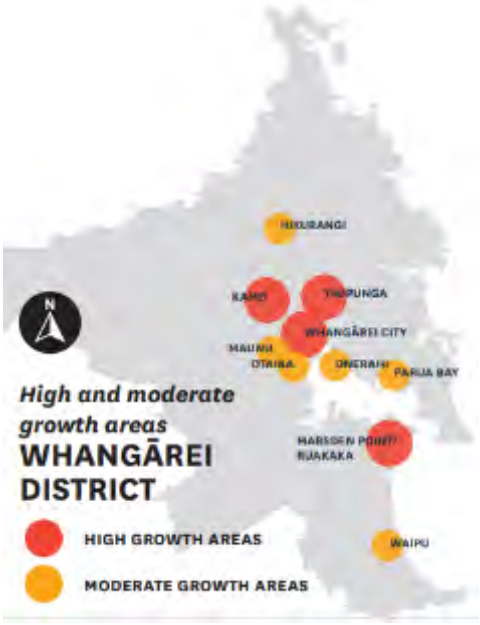
The model is informed by Stats New Zealand population data, immigration data as well as data on building consents and subdivision consents. This gives a more robust picture of future growth, compared to using just Stats New Zealand data, noting the issues that the 2018 Census has faced.

The age profile of the district is also going to change with a much greater population of elderly population over 70 years of age, although all age groups are expected to increase by 2048.

The strategy identified that growth will continue to occur in the main growth nodes that were identified in the previous Sustainable Futures 30/50 Growth Strategy developed in 2010.

These growth nodes are shown in the following figure and are summarised below:

- Around the fringe of the Whangarei City (Tikipunga, Kamo, Maunu, Onerahi, Port Nikau and Otaika)
- Hikurangi
- Parua Bay/Whangarei Heads
- Marsden Point – Ruakaka
- Waipu/Waipu Cove/Lang Beach



The strategy recognises that as the District grows increasing pressure will be placed on the transport network. Growth in traffic volumes is a reality of a growing District and we need a response that looks at ways to reduce these volumes and provide choice in the way we travel around our District.

The strategy identified three key issues with the transport network:

• The means of travel is dominated by cars, rather than public transport or active modes

• Many of the growth areas are serviced by a single arterial road.

• Topographical constraints limit alternative routes

The responses to these challenges are to:

• Ensure that the location for future development does not exacerbate existing problems

• Invest in transport improvements that can support public transport as well as private vehicles

• Build on the success of the urban cycleways to get greater coverage across the District

• Investigate alternative transport including passenger transport and light rail.

4.8 Strategic Transport Planning

4.8.1 Far North District Strategic Transport Plans

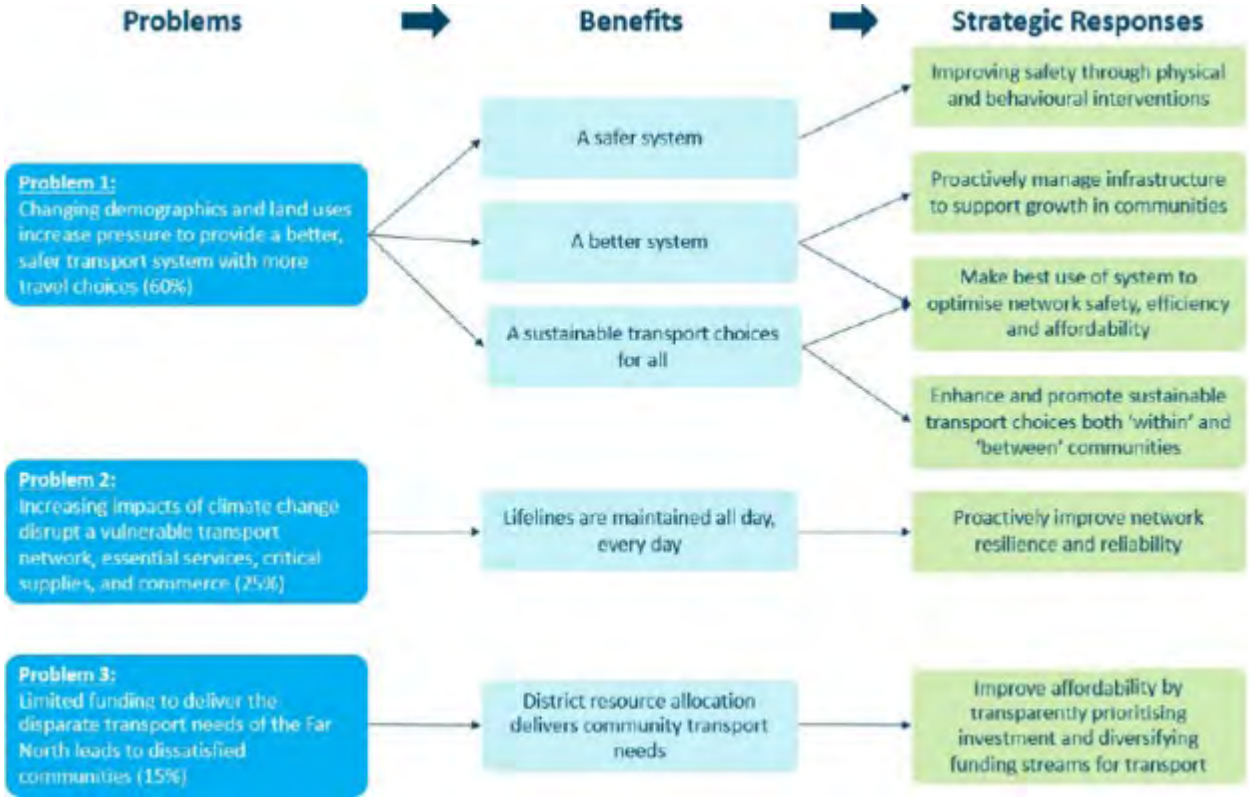
4.8.1.1 Far North District Integrated Transport Strategy

Far North District Council (FNDC) has developed an Integrated Transport Strategy (ITS) to address the key transport problems faced by the District. It is a holistic strategy that focuses on improving the "now" as well as providing direction to allow the District to respond in a consistent manner to address future challenges faced by growth, changing land use and new technology.

The Integrated Transport Strategy will focus on addressing three key problems through six strategic responses. By doing these things, the Far North will benefit from:

- A better, safer transport system with more transport choice.
- The lifelines will be maintained
- Community transport needs will be met.

The problems, benefits and strategic responses to achieve these benefits were identified through a series of workshops and an Investment Logic Mapping (ILM) exercise during the development of the strategy. These are described below:



The problem statements are:

- **Problem 1**: Changing demographics and land uses increase pressure to provide a better, safer transport system with more travel choices (60%)

- **Problem 2**: Increasing impacts of climate change disrupt a vulnerable transport network, essential services, critical supplies, and commerce (25%)
- **Problem 3**: Limited funding to deliver disparate transport needs to the Far North leads to dissatisfied communities (15%)

The Far North District Integrated Transport Strategy was finalised in 2020. The Far North District Council is currently seeking the endorsement of the strategy by the NZ Transport Agency.

4.8.1.2 Far North District Integrated Transport Plan

Following on from the development of the Integrated Transport Strategy, the Far North District Council has developed a Programme Business Case (PBC) in conjunction with key stakeholders. This business case is called the Far North District Integrated Transport Plan (ITP) and considers the case for investment to support communities and business in the Far North by providing a safer, more resilient and reliable transport system.

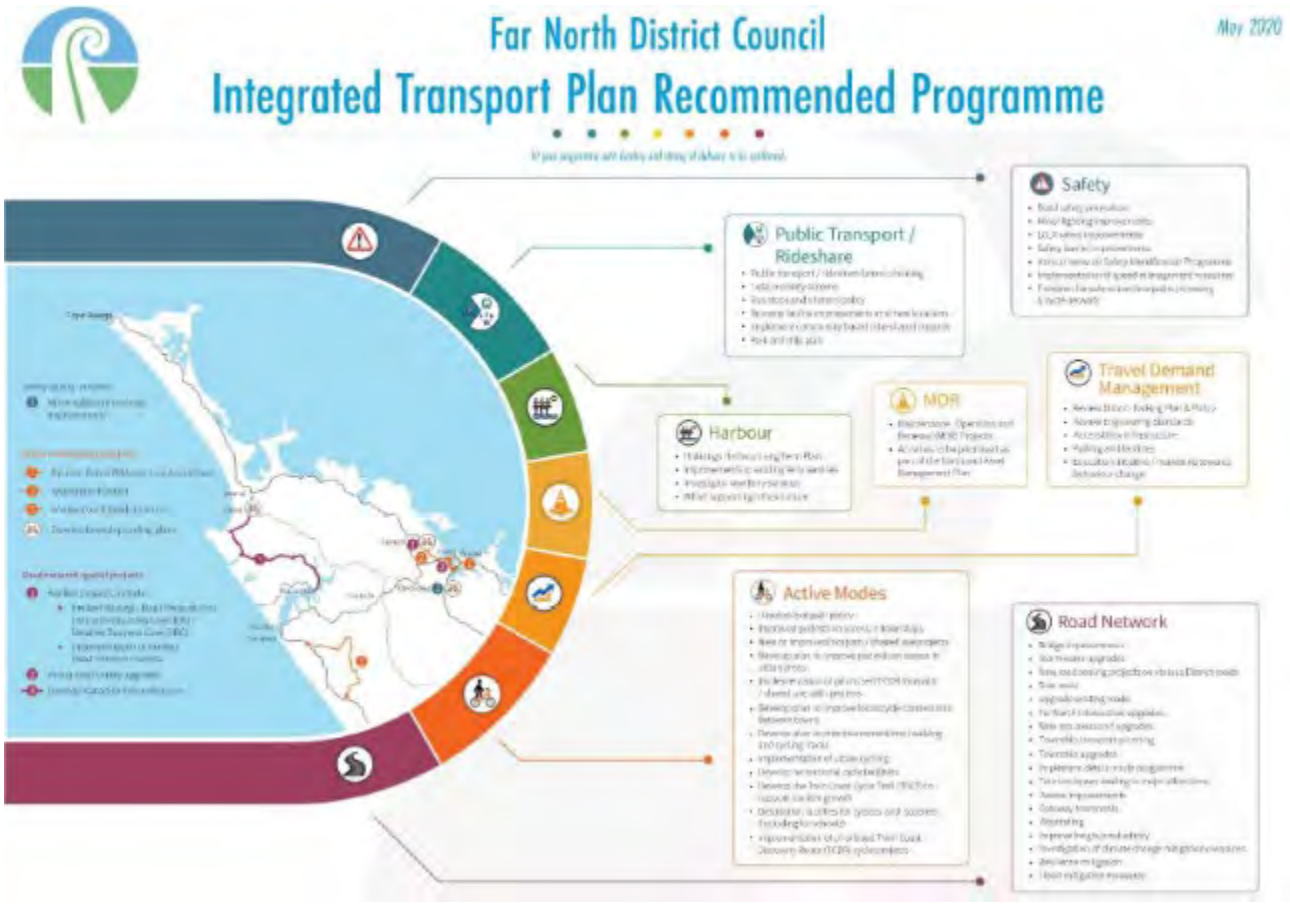
The ITP is still in draft form and is yet to be approved by Council or endorsed by the NZ Transport Agency.

This ITP PBC is intended to be a transport investment map to provide details on the type of options that will holistically provide the greatest benefits to the District. The ITP develops six action plans to deliver the outcomes identified in the ITS. These action plans are described in the diagram below.

A series of workshops were undertaken in 2020 to identify a long list of options and develop programmes to short list the options into realistic programmes of work. Multi-criteria assessments were undertaken to prioritise the individual options and the programmes.

The ITP Recommended Programme is shown in the figure below and includes 62 activities which represents an investment value of $464-$479M over a proposed 10 year implementation plan. The BCR for the programme is calculated to be 0.9.

Many activities are considered 'business as usual' for transport and focus on general maintenance, operation and renewal activities as well as physical improvements to the network such as safety, road upgrades, improved resilience and enhanced connectivity / condition of walking and cycling networks.



Key projects that were specifically identified in the preferred programme are listed below:

Safety

- Minor safety rail crossing improvements

Active Modes (Walking and Cycling)

- Opua to Paihia Walkway via Aucks Road
- Waitangi to Kerikeri
- Waoku Coach Road (to SH12)
- Develop township cycling plans (for Kaitaia, Kerikeri and Kawakawa)

Road Network

- Kerikeri projects, include:
  - Kerikeri Strategic Road Network Plan, Indicative Business Case (IBC) and Detailed Business Case (DBC)
  - Implementation of Kerikeri Road Network Projects
- Paihia town centre upgrade
- Develop Kaitaia to Kohukohu plan

The programme includes packaged transport activities (as identified above), which in some cases, are broad and overarching and are therefore supported by a list of potential individual projects to be further prioritised within this activity. This list contains specific projects / locations identified to date and its purpose is to

provide a starting point for the prioritisation of activities. It should be noted that other projects / locations can be considered within each transport activity during this process. This will retain flexibility for FNDC to respond to changes in the future. Some of these packages of projects and their benefits for each of the action plans is shown in the diagram below.

Action Plan	Benefit for the recommended programme
Road Network 	Activities in the Road Network action plan include: • Roading / infrastructure improvements • Township planning and upgrades • Access improvements • Resilience improvements and response to climate change These options address network condition, connectivity, resilience and access: • Improve the quality of the journey through infrastructure upgrades and resilience mitigation measures • Enhance connectivity of the transport network by improving access via new roads and township upgrades • Keep the road open addressing journey reliability, disruption to businesses and community severance
Safety 	Activities in the Safety action plan include: • Road Safety Promotion • Safety projects (planning and implementation options such as Annual network safety identification programme, speed management, LCLR safety improvements) • Schools These options improve safety through a safe system approach through physical safety interventions, education and safety reviews.
Travel Demand Management (TDM) 	Activities in the TDM action plan include: • Parking and facilities • General TDM projects (i.e. Review Engineering Standards, Accessibility infrastructure, Education initiatives) These options aim to integrate, implement and coordinate travel behaviour changes
Active Modes 	Activities in the Active Modes action plan include: • Pedestrian / shared paths planning and implementation activities • Cycling planning and implementation activities These options focus on improved access to walking and cycling in the district through enhancements of existing facilities and the provision of new facilities to ensure the safety of vulnerable users, improve connectivity within and between communities for regional and commuter customers and promote recreational and tourist activities.
Public Transport / Ride Share 	Activities in the Public transport / Ride share action plan include: • Total mobility scheme • Public transport / ride share future planning and implementation • Bus stops / facilities The programme recognises the importance of public transport and community transport options as well as improving public transport facilities and provision for mobility impaired users.
Harbour 	Activities in the Harbour action plan include: • Hokianga Harbour Long Term Plan • New / improved ferry services • Wharf supporting infrastructure These options enhance community access through improvement of existing ferry services, provision of new services and wharf supporting infrastructure.
Maintenance, operations & renewals 	This category captures all business as usual activities that focus on maintenance, operations and renewals. Investment in this action plan will occur on an annual basis, where activities will be further prioritised for implementation within the FNDC Activity Management Plan (2021-24).

4.8.2 Kaipara District Strategic Transport Plans

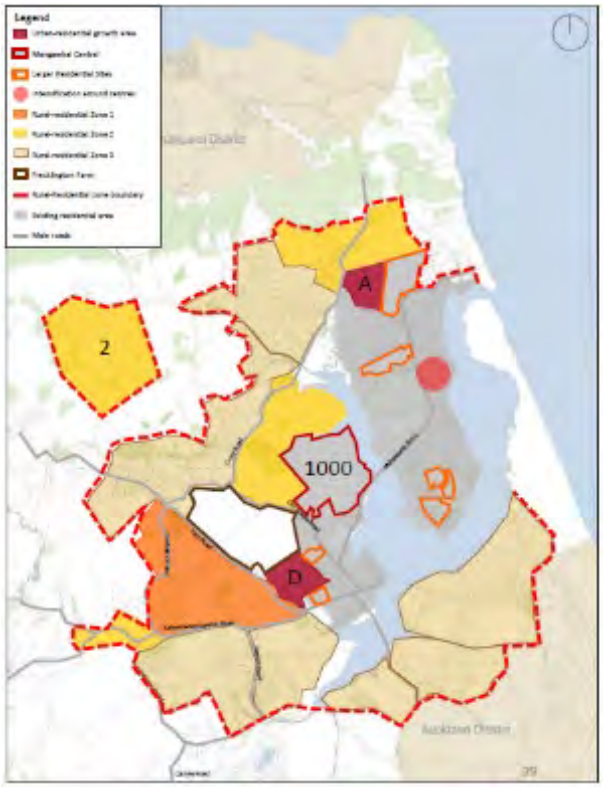
There is currently no over-arching transport strategy for the Kaipara District. However, a Network Operating Framework for the high growth Mangawhai area is currently under development.

The Kaipara District Council has recently been undertaking the development of spatial planning for several of its major townships. These plans have been developed to help plan for future growth and to identify infrastructure required to serve this growth. The spatial plans will inform the future review of the Kaipara District Plan.

Through the development of these spatial plans, the council and community have identified many transport opportunities. These are described in the following sections.

4.8.2.1 Mangawhai Spatial Plan

The Mangawhai Spatial Plan has been developed from the 2016/2017 Draft Town Plan Report and the 2017 Mangawhai Community Plan. As described in Section 4.7.2, Mangawhai has grown by 60% over the past five years and is projected to grow from its 2019 population of 5,808 to 12,796 by 2051 (almost 7% growth per annum). Mangawhai is also a holiday destination with many dwellings being used as baches. Past studies have determined that the population almost doubles during summer and over long public holiday weekends. The scale of this seasonal trend is likely to decline as baches are gradually used for permanent homes as the population grows.



To accommodate this growth, a number of options were developed with a general strategy of containing growth as much as possible around the fringe of the Mangawhai urban area. This was to prevent fragmentation of growth over the rural area through the proliferation of lifestyle blocks which has happened in the past. The preferred option is shown in the map to the right.

The spatial plan identified the following issues with the transport system serving Mangawhai:

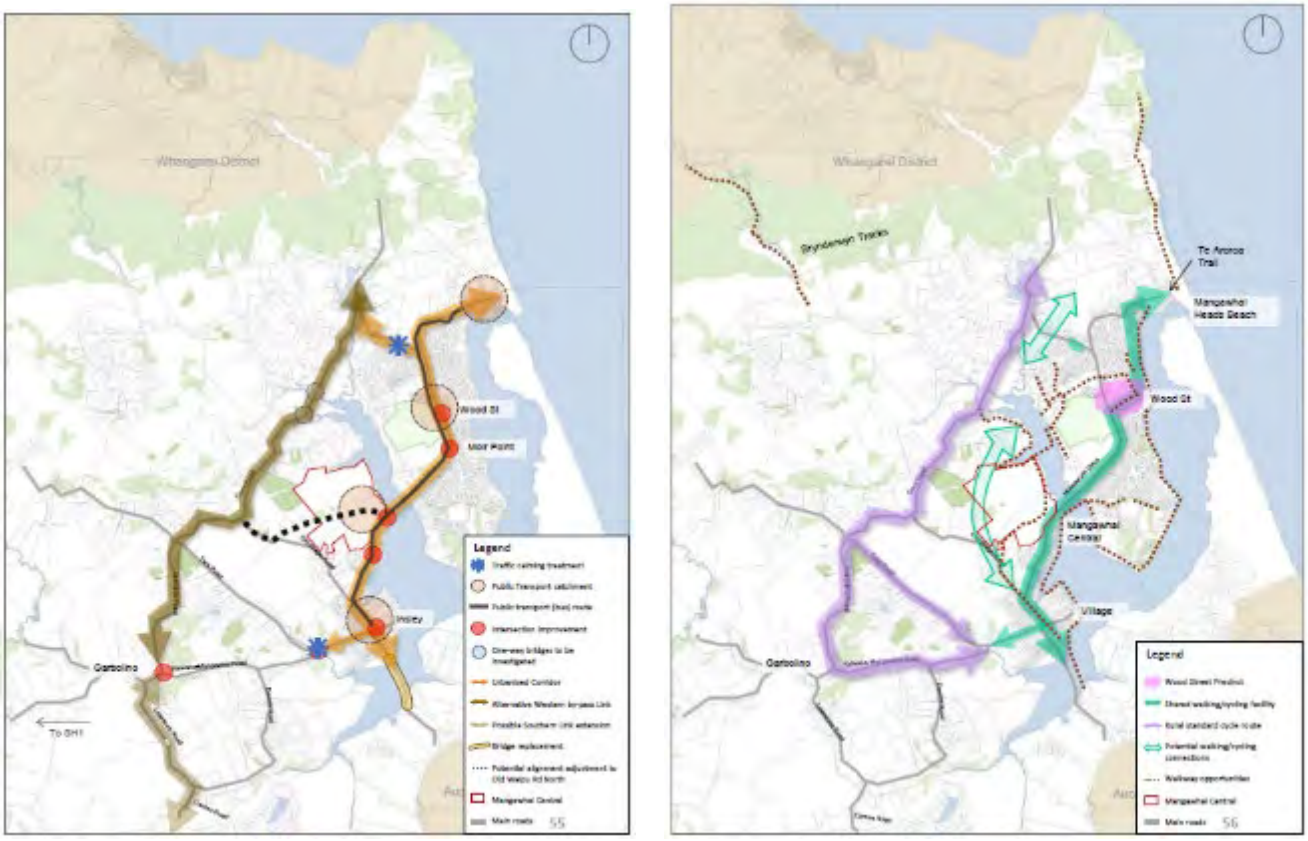
- There is a lack of public transport.
- The quality of cycle and pedestrian amenities are low.
- Wood Street Commercial Centre is regularly congested with vehicles.
- During the summer periods, access to the beach areas (and the wharf) is highly congested.
- Cove Road has capacity but intersections and the single-lane bridges will need upgrading.
- Molesworth/Insley intersection and a number of other intersections need upgrading to relieve congestion and support pedestrian movements.

The recommended options to address these issues were:

- Progress intersection upgrades at Insley St/Moir St and Moir St/Molesworth Dr.
- Plan for Insley St bridge replacement in 15-20 years (vehicle) and pedestrian access (5 yrs).
- Work with Mangawhai Central to investigate the realignment of Old Waipu Rd.
- Adopt a 'slow street' philosophy within residential areas.
- Consider traffic calming at key entries into the urban area.
- Address parking improvements in the Village.

- Investigate Cove Road as a western by-pass and upgrade of one-way bridges.
- Investigate the upgrade of Cames Rd as opportunity to detour from the south.
- Advocate for public transport to connect the centres and key destinations.
- Investigate cycling opportunities Cove Rd.
- Progress with proposed walking and cycling connections in the CMP, including walkways, trails, slow streets, and shared paths.
- Continue with initiatives in the Wood St Revitalisation Plan to facilitate a more pedestrian-friendly environment.
- Develop a strategy for Council's paper roads to become streets or pedestrian/cycling connections.
- Ensure walking and cycling connections between subdivisions through rules.

These initiatives are shown on roading map (left map) and walking and cycling map (right map) below.



4.8.2.2 Dargaville Spatial Plan

Dargaville has traditionally been the largest town in the Kaipara District although this has changed in the last few years with the rapid growth in Mangawhai. Growth in Dargaville is likely to be in the outer areas. The spatial plan provides for this growth by allowing for expansion of the residential area to the north and the provision of a new industrial area in the Awakino area to the east. This is shown in the map below.

Key moves that relate to the transport network are:

- Connecting collector roads in the north and east linking the new residential areas on Hokianga Road and Awakino Road to the new Awakino industrial area.
- Developing a network of walking and cycling paths to improve active mode connectivity in Dargaville. This would include a shared path along the waterfront with a new walking/cycle bridge across the Kaihu River adjacent to SH12. It would also include a shared path adjacent to the rail line.
- Upgrade Hokianga Road to improve its amenity and to provide a strong pedestrian and cyclist link to the town centre and river, by improving pedestrian safety, providing cycle lanes and upgrading the intersection of SH12 and Hokianga Road to improve safety and pedestrian connectivity.
- Transform SH12 into a tree-lined boulevard to slow traffic, improve amenity and local identity and to enable expansion of the town centre.
- Reorganise on-street parking to reduce the number of parallel parks to provide more perpendicular parking which will increase the total number of parks.

4.8.2.3 Kaiwaka Spatial Plan

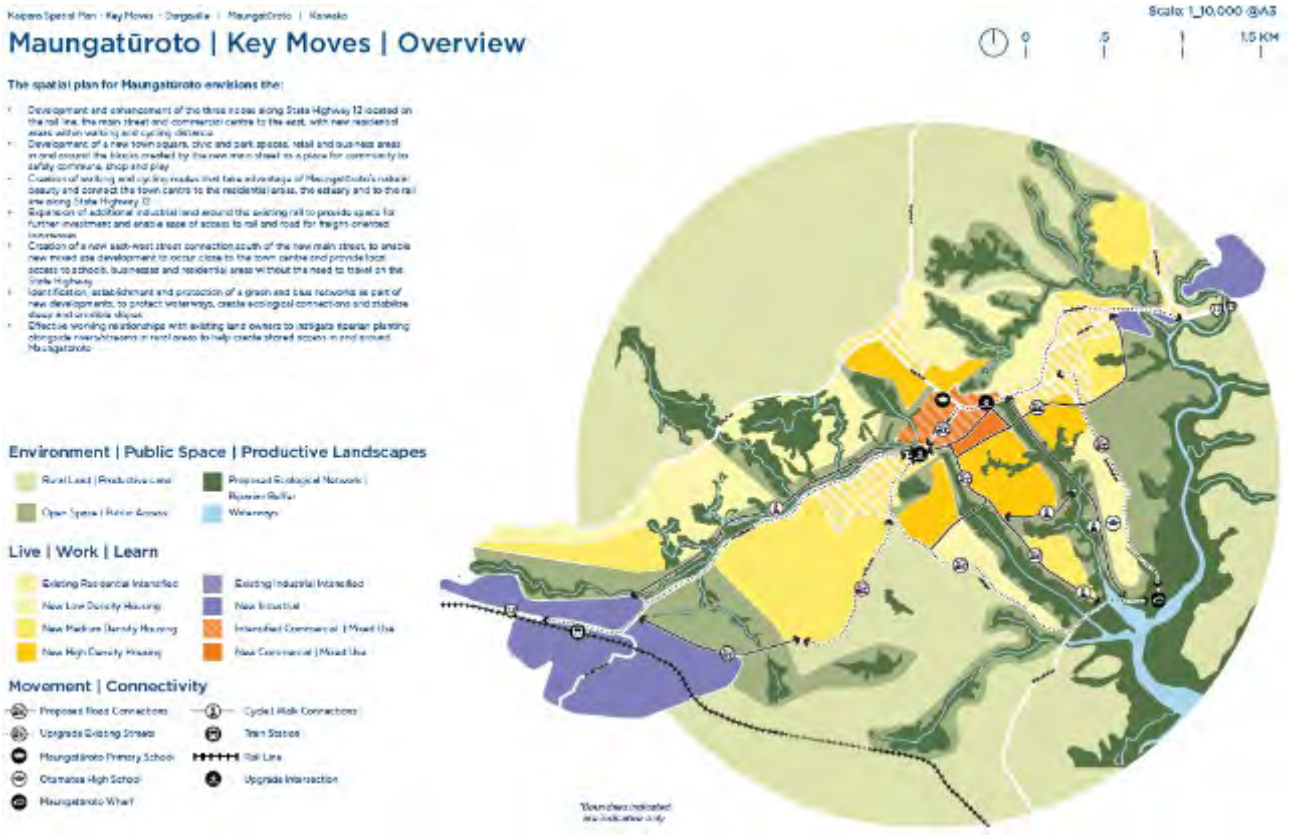
Kaiwaka is expected to grow significantly over the next 30 years due to its close proximity to Auckland, particularly with the opening of the new SH1 motorway extension in 2021, and future extension to Te Hana some 15km to the south. The Kaiwaka Spatial Plan plans for growth in all directions surrounding the existing township. It includes expansion of the commercial area, residential development to the east, south and west and development of a new industrial area to the north. This is shown in the map below.

Key moves that relate to the transport network are:

- Develop two controlled intersections on SH1 – one at Kaiwaka-Mangawhai Road and another at Hastie Lane/Settlement Road to slow traffic through the village and provide safe pedestrian crossings.
- Develop gateway treatment on SH1 on either entrance to Kaiwaka to form a sense on arrival and reinforce the slow speed environment.
- Develop a network of walking and cycle paths to improve connectivity using the blue-green network of rivers and greenspaces.
- Construct a new road link between Oneriri Road to the west and Kaiwaka-Mangawhai Road to the east using the new proposed controlled intersection on SH1.
- Upgrade existing pedestrian underpasses to improve safety and accessibility.

4.8.2.4 Maungaturoto Spatial Plan

The Maungaturoto Spatial Plan provides for growth opportunities around the main town centre and further to the west linking to the Maungaturoto Station area where the railway station is located. Additional industrial development is planned for in the to the east of Maungaturoto near the Fonterra plan and to the west in the Maungaturoto Station area. This is shown in the plan below.

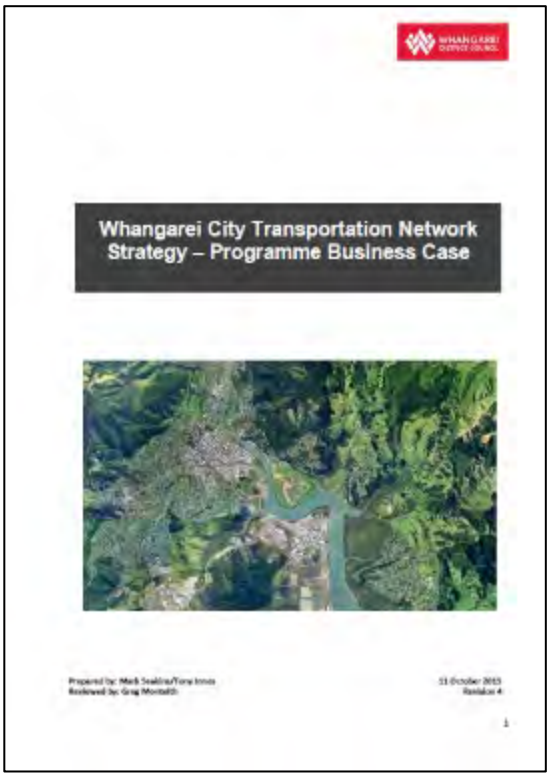


Key moves that relate to the transport network are:

- Developing a new main street to Maungaturoto to the south of SH12 to provide a more pedestrian orientated heart of the town with a new laneway to SH12.
- Develop a new east-west street network to the south of SH12, connecting the town centre with new residential areas and open space areas.
- Develop a new north-south pedestrian and cycle network from the town centre to residential areas, parks, transport hubs, schools and the estuary.
- Develop an east-west pedestrian and cycle link between Maungaturoto and Maungaturoto Station Village and from the village to Whaka Street.

4.8.3 Whangarei District Strategic Transport Plans

4.8.3.1 Whangarei Transportation Network Strategy

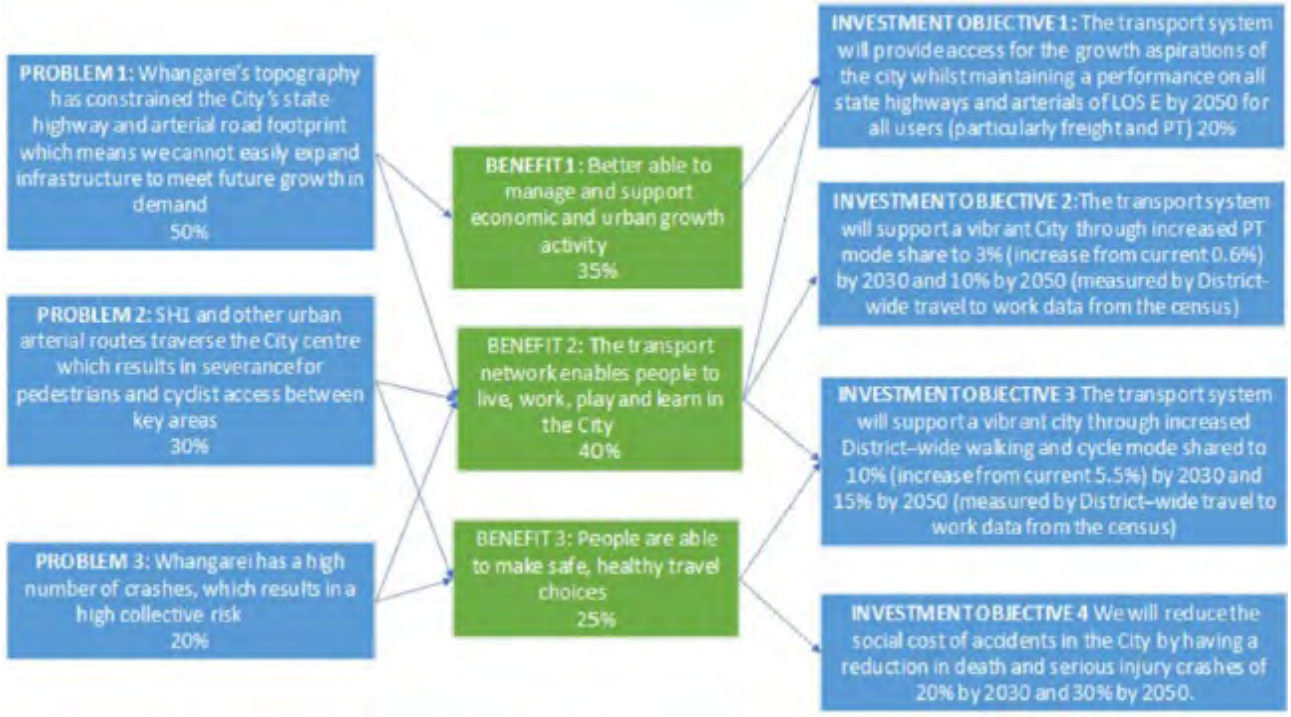


The Whangarei City Transportation Network Strategy – Programme Business Case (PBC) was developed by Council to identify a clear strategy to address capacity issues in Whangarei City. This strategy used data from the Whangarei Transportation Model and was completed in December 2018. The Whangarei model was approved by council in June 2019 and was endorsed by NZTA in December 2019.

The strategy identified that future increases in private vehicle use due to population growth is likely to create further pressure on the existing transport network given that Whangarei is a High Growth Urban Area. Uncontrolled growth in private vehicle use is likely to negatively affect access to economic and social opportunities within the city by creating significant delays on state highway and arterial routes. This indicates the need to promote and provide for other transport modes such as public transport and walking and cycling to reduce private vehicle usage and ease pressure on the transport network.

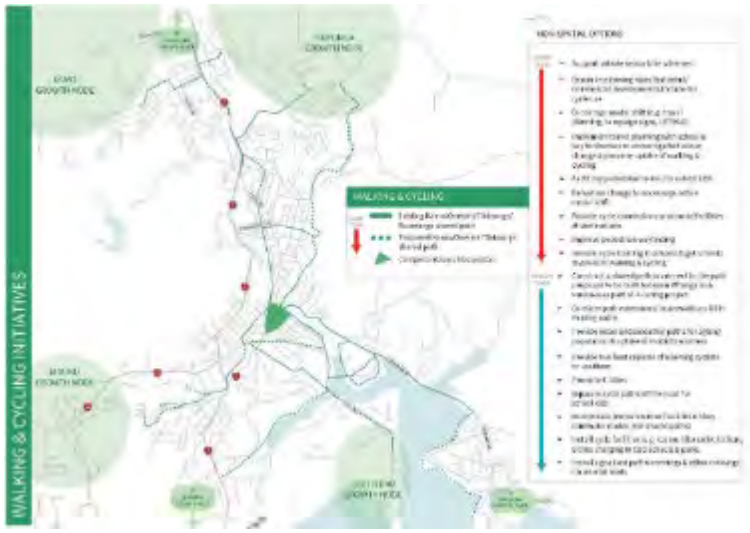
Fatal and serious injury crashes involving pedestrians or cyclists on arterial roads in Whangarei City have also been increasing steadily over the last 10 years.

A series of stakeholder workshops including Investment Logic Mapping (ILM) were undertaken during the development of this Programme Business Case. This collaborative approach has resulted in alignment in the problems, benefits and investment objectives for the network as outlined in the diagram below.



During the stakeholder workshops 138 options and alternatives were identified to address these problems and achieve the benefits, ranging from lower-cost interventions to significant capital projects. From these, seven programmes were developed and analysed using a multi-criteria assessment.

The stakeholders identified that the preferred programme should include the following:



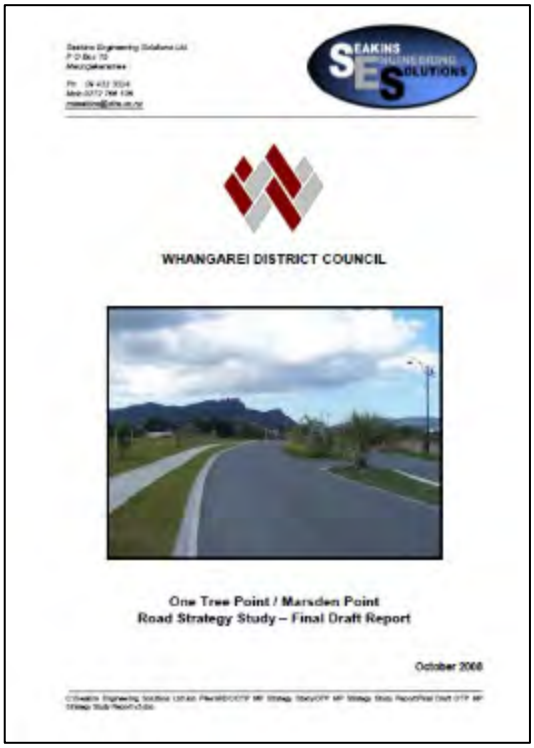
- Investment in improvements that will improve access on State Highway 1 through the city will make this key freight route more efficient and reduce transport costs for freight being taken to markets south of Whangarei such as NorthPort or Auckland.
- Investment in improved pedestrian facilities, safe crossing points and provision of pedestrian malls and shared spaces such as those proposed through the Draft Complete Streets Masterplan will improve walkability in and around the CBD which would enable economic growth to build upon the previous investment in Whangarei such as the Town Basin and Cameron Street Mall. This will reinforce the CBD as the heart of the city and will improve livability in Whangarei. It will also enable a better pedestrian connection between the CBD and the Hundertwasser Art Centre improving the ability for tourists to walk around the city which will stimulate more tourist spending on retail in the CBD.
- Investment in public transport, walking and cycling and intersection upgrades on routes serving high urban growth areas such as Kamo, Tikipunga, Whareora, Maunu, Raumanga and Port Nikau will help provide multi-modal access for growth in the city. In addition, rural commuter bus services will enable access to rural and coastal growth nodes such as Hikurangi, Parua Bay, Ruakaka and Waipu. This is important to meet the growth need of Whangarei which is a High Growth Urban Area.
- Specific areas of focus should be to improve the mode share using public transport and using active modes where there is the greatest potential for benefit gains. This will provide a wider range of transport modes that will be less reliant on private vehicle use and will provide access for the transport disadvantaged. The

public transport and walking and cycling networks should be linked to places of employment, retail centres, education and recreation as well as the hospital and airport to provide a comprehensive transport system that serves all users.

- The stakeholders also focused on investment that would have a positive effect on road safety by targeting improvements on high risk arterial roads, reducing driver frustration in congested areas and providing safe walking and cycling linkages and crossing points. This is consistent with the Safe System approach and will help reduce the increasing trend in fatal and serious injury crashes from occurring in the future.

The estimated cost of the preferred programme is $460-750M over a 30 year period with a Benefit Cost Ratio (BCR) of between 0.9 and 1.4.

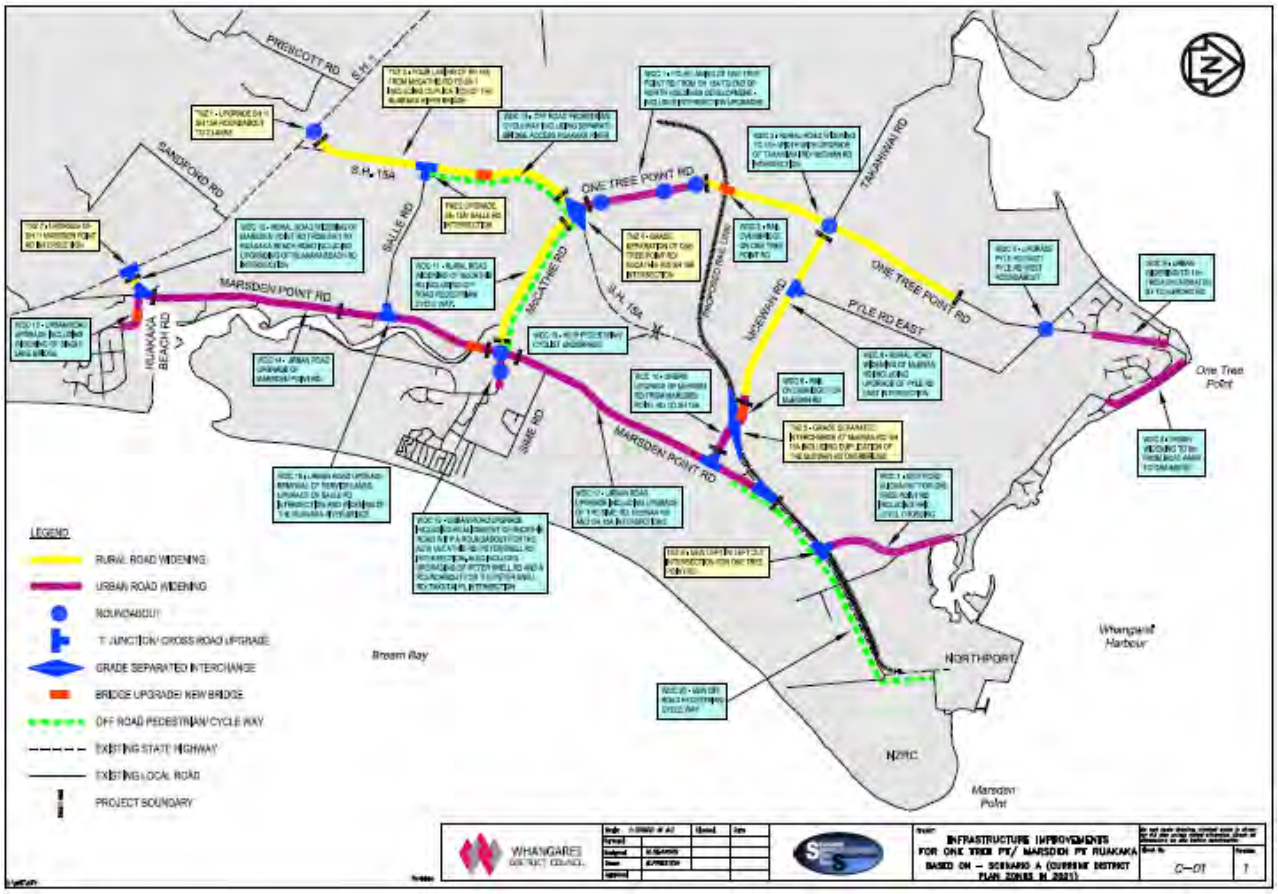
4.8.3.2 One Tree Point / Marsden Point Road Strategy Study



The Marsden Point/Ruakaka area seen rapid growth over the past 15 years due to its large areas of flat land, growth in Port Marsden and the Marsden Point Oil Refinery and its proximity to Whangarei. This area has been identified as a future satellite town of Whangarei and a structure plan has been adopted to urbanise this area. The current population of the Marsden Point/Ruakaka area is 4,300 from the 2013 census. The Whangarei Growth Strategy and 2019 Growth Model predicts that the population is to rise to approximately 12,900 by 2048.

A strategy study was prepared for this area in October 2008 to assess the transportation requirements to cater for the predicted population growth in this area. The growth model at that time expected that the population of this area would reach about 20,000 by 2021. To cater for this rapid growth a significant plan of road upgrades were predicted both on WDC roads and on the State Highways. The WDC portion of the road upgrades was estimated as having a cost between $50M – $72M.

Due to the effects of the global financial crisis in 2008, the growth has been much slower than predicted. The planned road upgrades (shown in the plan below) are now expected to be required within 2025 to 2060 period. Upgrades required in the next 10 years will mainly consist of road widening of narrow sections, or urbanisation of Marsden Point Road to reinforce the speed management programme currently being rolled-out.



4.9 Network Growth

There is also an increase in demand through growth of the transport network. To better understand the drivers of network growth, a number of factors are outlined below.

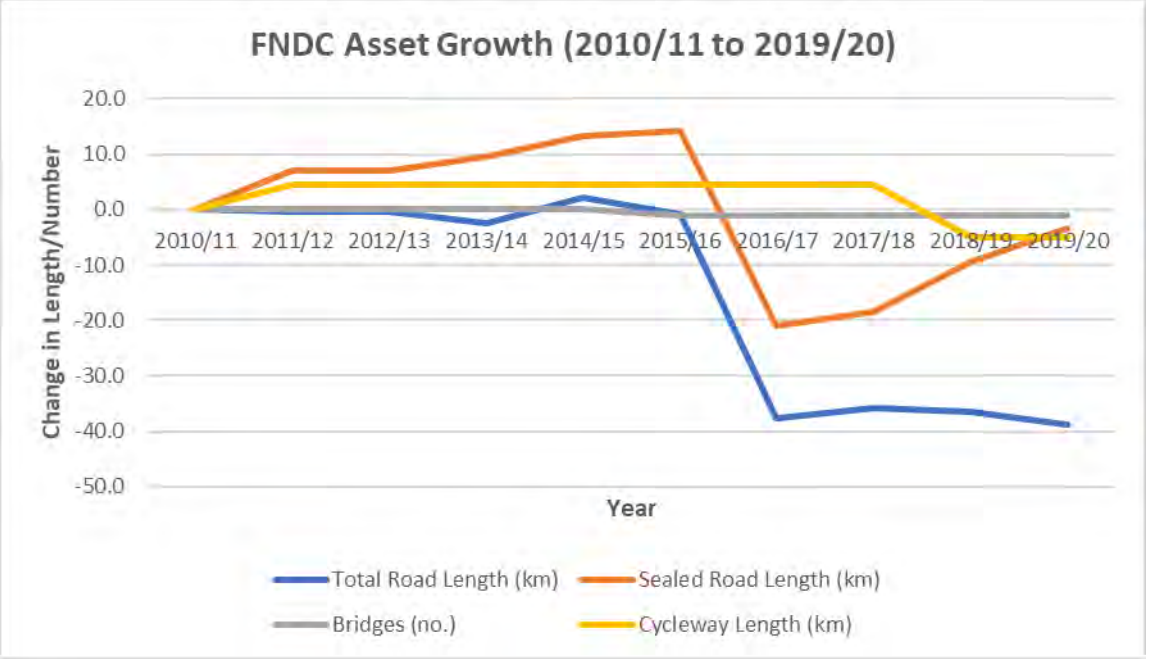
- Roads being vested to council through subdivision activities or revocation/declaration of the State Highway network (e.g. from the SH1 Kamo Bypass project or SH15 handover).
- The length of the sealed pavement network has grown through seal extension programmes.
- New roads being built to address capacity or access issues (e.g. several important new road links have been built in the past 10 years such as the Kerikeri Heritage Bypass and the Lower Hatea River Crossing in Whangarei).
- New cycleways being built (such as the Shared path network in Whangarei).
- New assets created as part of safety of other improvement works such as permanent warning signs, active signs (such as school zone signs), guardrails, streetlights, retaining walls, additional line markings or long life markings etc.

This increase in the network will result in increased maintenance/operation costs and, over time, increased renewal demands.

The network growth for each council is described as follows:

4.9.1 FNDC Network Growth

The growth in the Far North network is shown in the figure below.

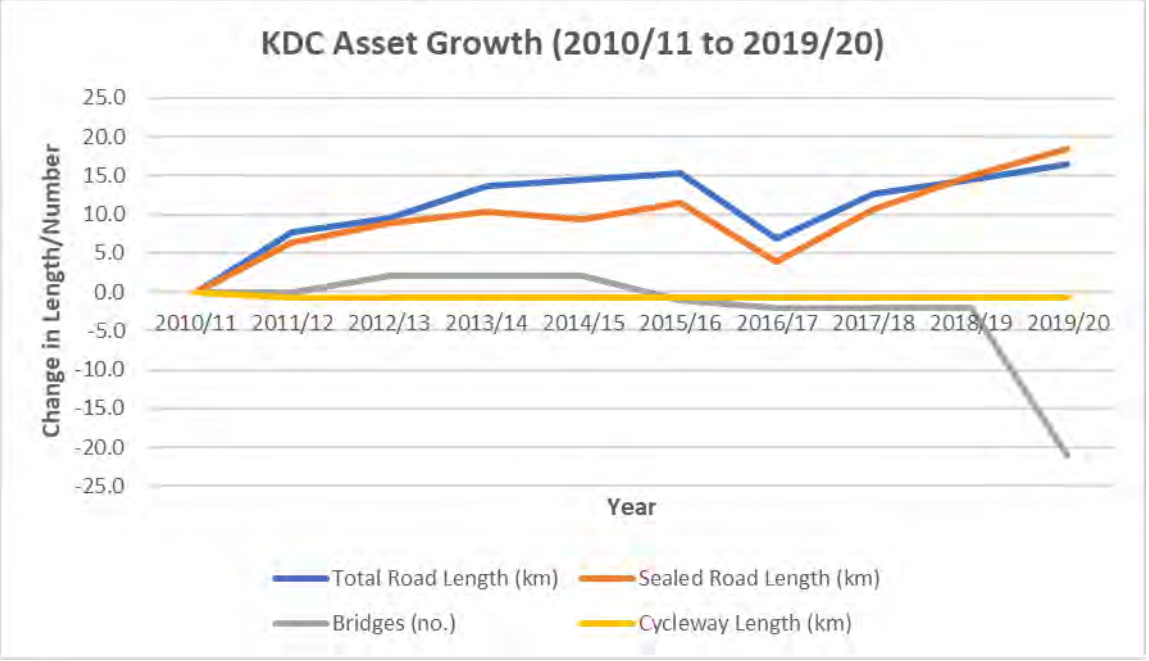


The graph shows a relatively static network length but a steady growth in the sealed road length which has increased at 0.4%/annum over the past ten years. The reduction in road length and sealed road in 2016/17 was due to the handover of nearly 40km of Mangakahia Road and Te Pua Road to NZTA (now known as SH15). The length of sealed roads has grown faster than the overall network length because of seal extensions.

Future growth in Far North's network is likely to result from continued growth in many east coast towns such as Kerikeri, Waipapa and the Doubtless Bay area. There is ongoing demand for seal extension in the Far North and the recent PGF investment will also increase the amount of sealed road network by about 16km.

4.9.2 KDC Network Growth

The growth in the Kaipara network is shown in the figure below.



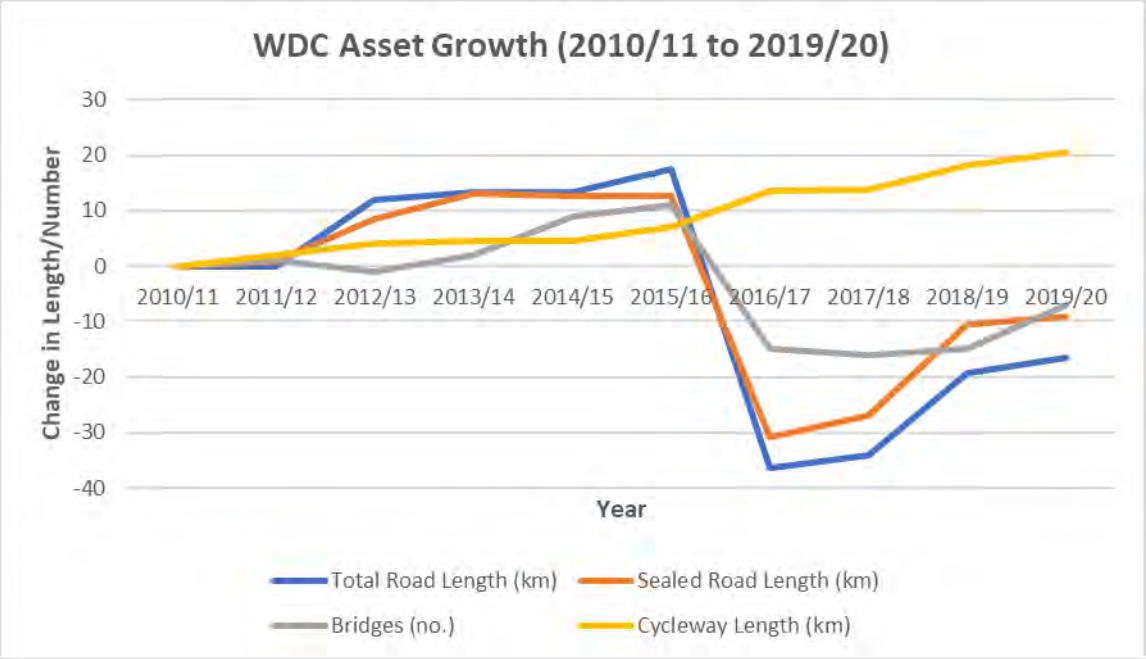
The graph shows a steady growth in the overall road network and sealed road length over the past 10 years. The network length has increased by an average of 0.2%/annum over this period which is a result of subdivision activity, particularly in Mangawhai. The sealed road network has been increasing 0.6%/annum

over the past ten years again mainly through subdivision development. The dip in total road and sealed road lengths in 2016/17 was due to a correction to remove some private road data which had previously been included. The decrease in the bridge numbers in 2019/20 was due to some large culverts being incorrectly identified as bridges, so this was a change to the data rather than an actual decrease in the number of assets.

Future growth in Kaipara's network is likely to result from continued growth in Mangawhai and Kaiwaka. The recent PGF investment to seal the remainder of Pouto Road will also result in an additional 20km of sealed road length be added to the network.

4.9.3 WDC Network Growth

The growth in the Whangarei network is shown in the figure below.



The graph shows a steady growth in the overall road network and sealed road length over the past 10 years. The network length and sealed road length has increased by an average of 0.2%/annum and 0.3%/annum respectively over this period. This is a result of subdivision activity, particularly in Ruakaka and Tikipunga, as well as new arterial roads being built in Whangarei City such as Dave Culham Dr, Porowini Ave and Punarere Dr. The reduction in total length and sealed road length in 2016/17 was due to the handover of 55km of Mangakahia Road and Otaika Valley Road to NZTA (now known as SH15). The length of sealed roads has grown faster than the overall network length because of seal extensions, such as the sealing of Wright Road.

There has also been a steady growth in the number of bridge assets (on average 0.4%/annum) and rapid growth in the cyceway length through the development of the Whangarei urban shared path network.

Future growth of the transport network will continue through subdivision activity in the growth areas around the fringe of Whangarei City and in Ruakaka and Waipu.

It is also expected that the four-laning of SH1 between Whangarei and the Port Marsden turnoff (funded through NZUP) will result in the hand over of sections of SH1 to WDC. This is due to new off-line routes potentially being developed as well as service lanes being provided to minimise the number of intersections and accessways on this route. The length and ownership of any of these roads is still to be determined through the development of this project.

4.10 Traffic Flows

Traffic data in the districts is monitored through a designed traffic counting strategy. The strategy uses catchments and series of related traffic count sites to capture and determine the traffic patterns within each catchment across the districts, refer Figure 4-4. These sites are also related to the state highway counting sites to provide an integrated traffic counting programme across the network.

This strategy classifies all traffic and can provide, speed, flow and time data as required. This counting strategy has been in place for many years for KDC and WDC and is continually revised each year to ensure the catchments and count sites are current and reflect the network traffic patterns as the network grows and changes.

Traffic estimates are derived for every road using the relationship formed between the counting sites. From this a Traffic Estimate file is produced annually and loaded into the RAMM database.

During 18-21 LTP an improvement item was identified to review the counting strategy for KDC and WDC and included FNDC in the revised strategy and development catchments. This was completed and resulted in the development of a 5 year count programme across the NTA. From this a new traffic counting contract has been tendered and is delivering on this programme as of Nov 2020 for the NTA networks.

FNDC Traffic Counting Catchment

KDC Traffic Counting Catchments

WDC Traffic Counting Catchments

Figure 4-4: Traffic Mesh Block Map FNDC, KDC, WDC

Figure 4-5 multi year growth analysis shows that WDC and KDC network continues to experience traffic growth across the networks. The FNDC strategy and programme has only just commenced this year so no analysis is available at this level.

This is in keeping with district growth figures with higher growth being experienced in some areas, especially Mangawhai, One Tree Point and Waipu. Whether this is through relocation for lifestyle reasons or work opportunities in the region with the investment in infrastructure projects, the outcome is that the networks are experiencing more traffic which has an impact on network condition and safety. This is clearly evidenced under Section 3 Setting the Scene where all NTA networks were experience deteriorating network condition and concerning safety trends.

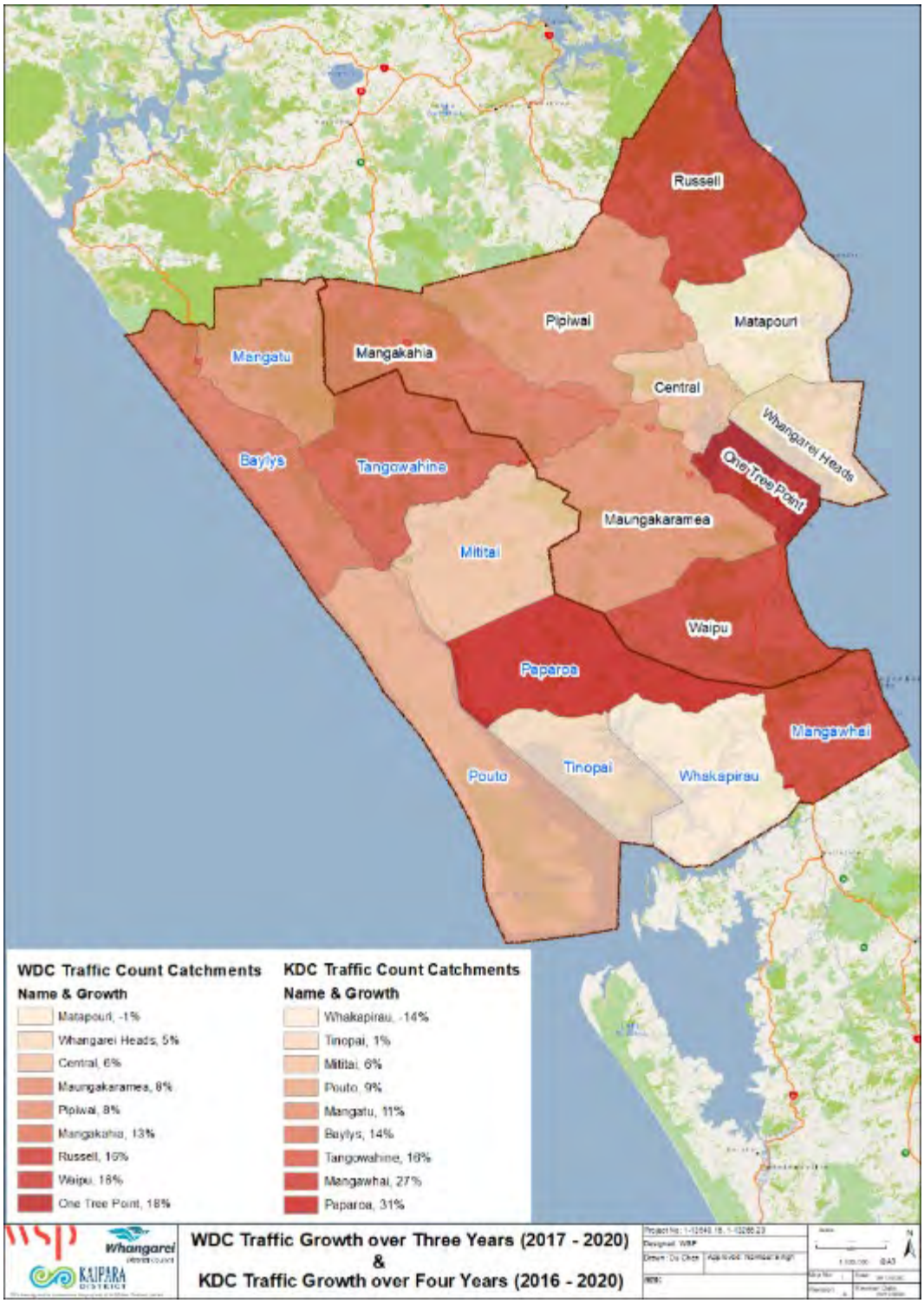
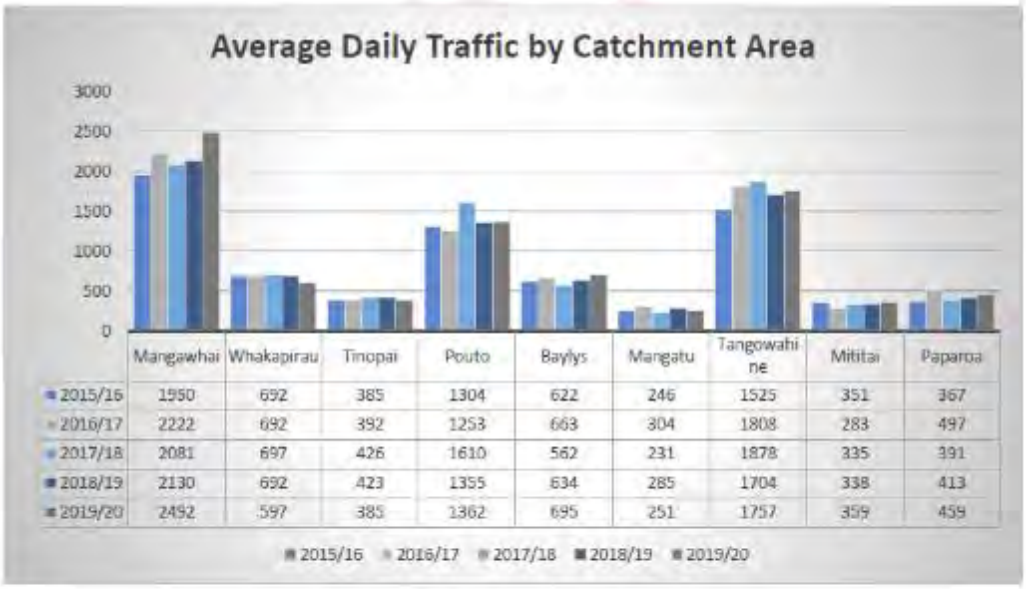


Figure 4-5: Multi Year Growth Analysis

The 2019/20 traffic growth report identified stable or increased growth in traffic across all catchments apart from, Whakapirau, Tinopai for KDC and Maungakaramea for WDC with Pipiwai and Russell areas remaining static in terms of overall growth. There was no discernible impact of COIVD on the traffic growth figures in the region.

Overall the network traffic growth for Kaipara is **12**% based on 2015/16 to 2019/2. The largest impact on this figure is the Mangawhai area which is identified as one of the fastest growing areas in the country. The traffic growth for Whangarei is **6%** between 2016/17 to 2019/20.

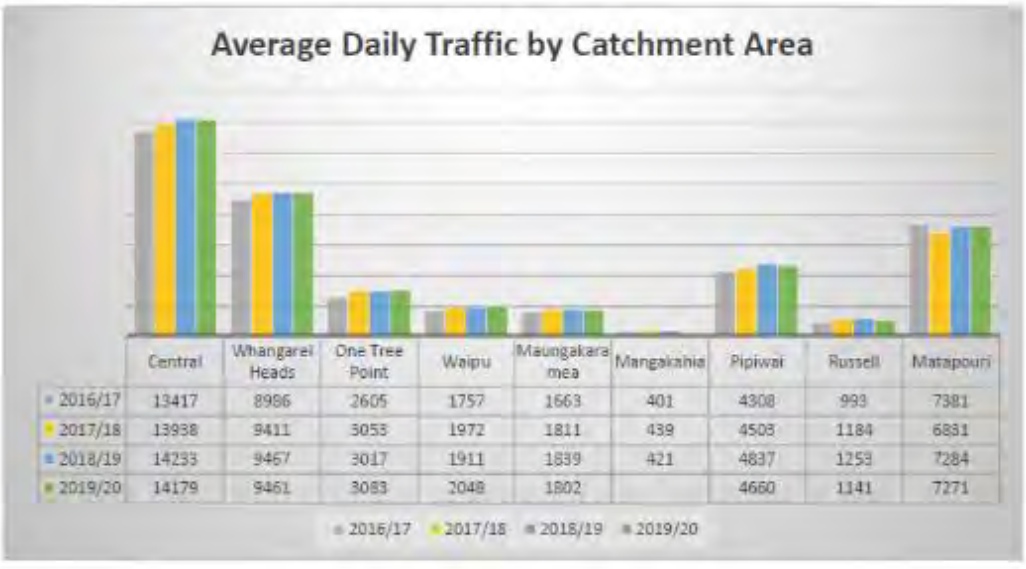


	Mangawhai	Whakapirau	Tinopai	Pouto	Baylys	Mangatu	Tangowahine	Mititai	Paparoa
2015/16	1950	692	385	1304	622	246	1525	351	367
2016/17	2222	692	392	1253	663	304	1808	283	497
2017/18	2081	697	426	1610	562	231	1878	335	391
2018/19	2130	692	423	1355	634	285	1704	338	413
2019/20	2492	597	385	1362	695	251	1757	359	459

Figure 1: ADT by Catchment Area

The ADT volumes shown above in 'Figure 1' should only be used to look at the trend in ADT within a catchment, and not be used to compare catchments, as the number of counting sites varies between catchments.

KDC Catchment Traffic Analysis (Extract from 19/20 KDC Annual Traffic Report)



	Central	Whangarei Heads	One Tree Point	Waipu	Maungakaramea	Mangakahia	Pipiwai	Russell	Matapouri
2016/17	13417	8986	2605	1757	1663	401	4308	993	7381
2017/18	13938	9411	3053	1972	1811	439	4508	1184	6831
2018/19	14233	9467	3017	1911	1839	421	4837	1253	7284
2019/20	14179	9461	3083	2048	1802		4660	1141	7271

Figure 1: *ADT by Catchment Area*

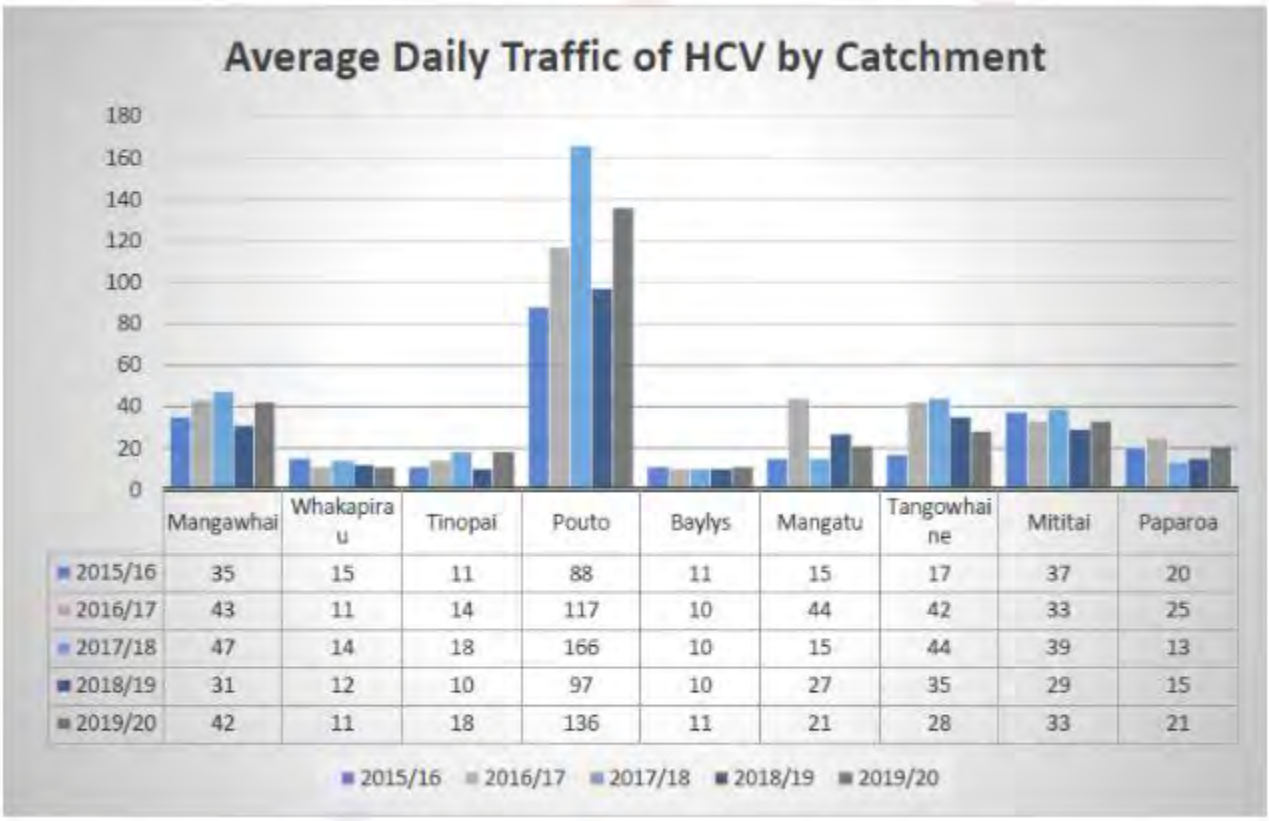
The above chart in Figure 1 should only be used to look at the trend in ADT within a catchment, and not be used to compare catchments, as the number of counting sites varies between catchments.

WDC Catchment Traffic Analysis (Extract from 19/20 WDC Annual Traffic Report)

Figure 4-6: KDC & WDC Catchment Traffic Growth Trends ADT

All traffic catchments are showing growth in Heavy Commercial Vehicles (HCV) apart from Whangarei Heads and Maungakaramea. Waipu has had spikes over the analysis period. This catchment has a close relationship with the One Tree Point catchment and this could simply be how HCVs are accessing and moving in and around these catchments.

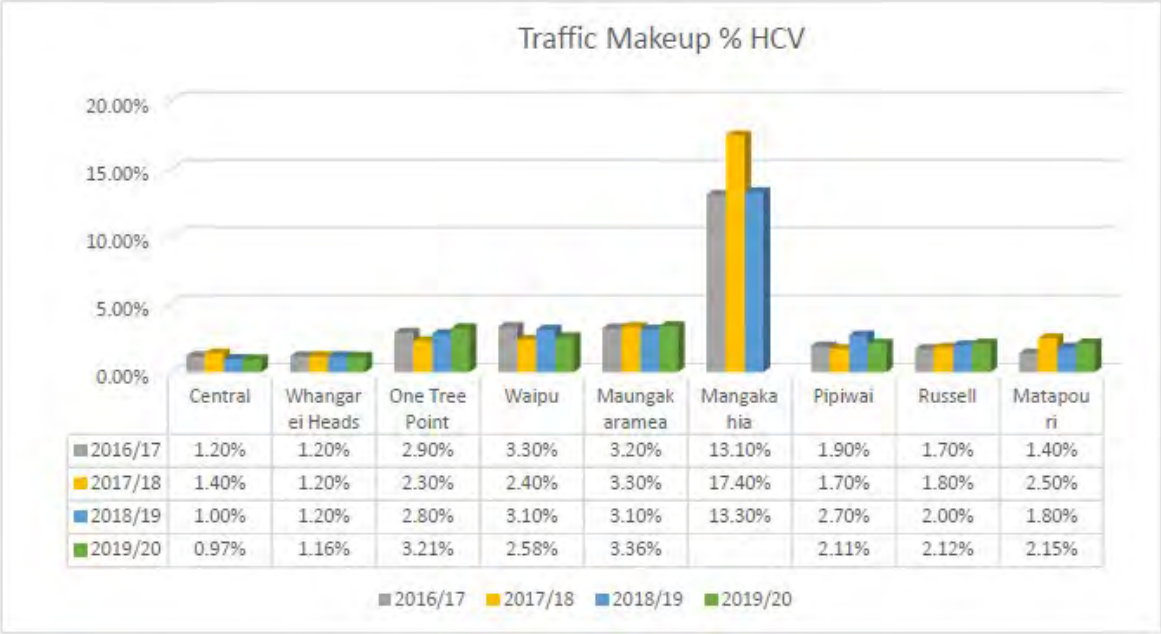
Figure 4-7a and 4-7b illustrates the averages for the ADT of HCV volumes on calibration and controlled sites in each catchment area. In general, for KDC the ADT for HCVs has increased from the 2018/19 except for Whakapirau, Mangatu and Tangowahine areas. Considerable increase is observed in Pouto catchment over the last year.



	Mangawhai	Whakapirau	Tinopai	Pouto	Baylys	Mangatu	Tangowhaine	Mititai	Paparoa
2015/16	35	15	11	88	11	15	17	37	20
2016/17	43	11	14	117	10	44	42	33	25
2017/18	47	14	18	166	10	15	44	39	13
2018/19	31	12	10	97	10	27	35	29	15
2019/20	42	11	18	136	11	21	28	33	21

Figure 4-7a: KDC HCV Catchment Analysis (Extract from 19/20 KDC Annual Traffic Report)

Figure 4-7b WDC illustrates the average percentage of HCVs for all catchment sites. Agriculture, horticulture and forestry would be obvious factors in the continued high percentages of HCVs for the Mangakahia catchment, which showed an average of 13.3% HCVs in 2018/19 count season. A decrease has been observed in %HCV in Central, Pipiwai, Waipu and Whangarei Heads catchments. While the heavy vehicles volume has been increasing in Maungakaramea, One Tree Point, Russell and Matapouri catchments over the last year.

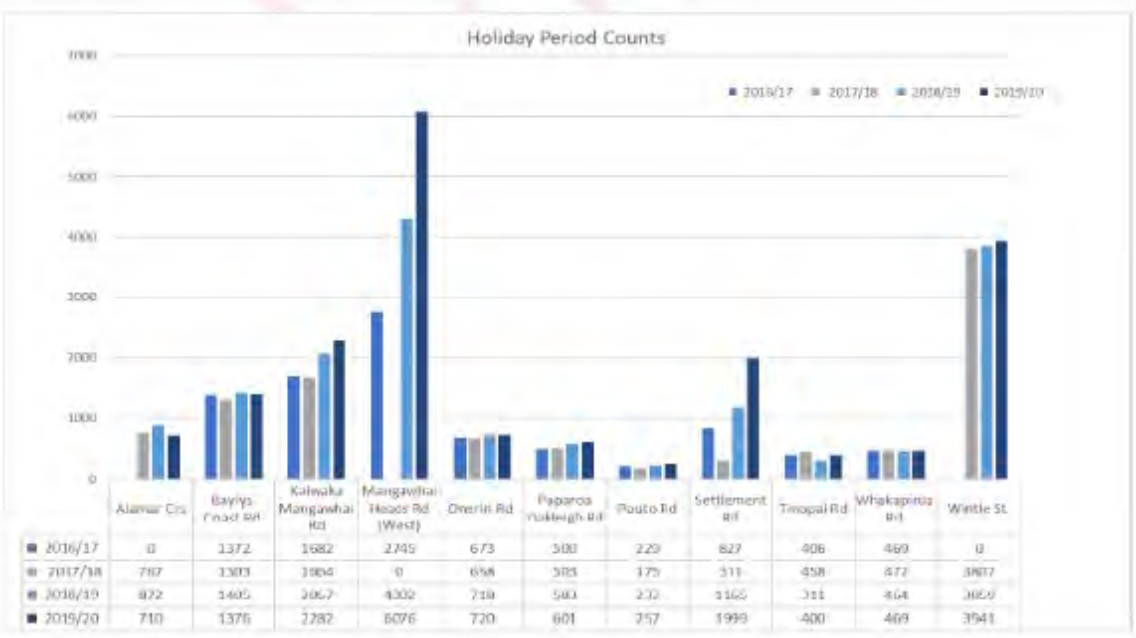


	Central	Whangarei Heads	One Tree Point	Waipu	Maungakaramea	Mangakahia	Pipiwai	Russell	Matapouri
2016/17	1.20%	1.20%	2.90%	3.30%	3.20%	13.10%	1.90%	1.70%	1.40%
2017/18	1.40%	1.20%	2.30%	2.40%	3.30%	17.40%	1.70%	1.80%	2.50%
2018/19	1.00%	1.20%	2.80%	3.10%	3.10%	13.30%	2.70%	2.00%	1.80%
2019/20	0.97%	1.16%	3.21%	2.58%	3.36%		2.11%	2.12%	2.15%

Figure 4-7b: WDC HCV Catchment Analysis (Extract from 19/20 WDC Annual Traffic Report)

Northland presents an attractive place to visit, with several popular destination that have a semi resident population visiting and staying over the holiday periods. The NTA count programme monitors these sites. This form of transient population presents a significant pressure in these areas in the form of services, and increased travel on the network.

Figure 4-8a shows the ADT trends in holiday traffic over the last four years for KDC. In general, there has been an increase in holiday traffic volumes on all sites except Alamar Cres and Baylys Coast Road. Significant growth has been observed on Mangawhai Heads Road over the last year. This aligns with current growth figures for the area indicating that Mangawhai has both a growing resident community and growing semi resident holiday community. This presents several traffic related impacts, which is trying to be addressed through capital projects and Low Cost Low Risk funding requests in the 2021/31 period. There has been a considerable growth on Settlement Road's holiday traffic as well, which is due to an increase in audience at the Northern Bass event that takes place on Settlement Road over the New Year holiday period each year.



	Alamar Cres	Baylys Coast Rd	Kaiwaka Mangawhai Rd	Mangawhai Heads Rd (West)	Oneriri Rd	Paparoa Oakleigh Rd	Pouto Rd	Settlement Rd	Tinopai Rd	Whakapirau Rd	Wintle St
2016/17	0	1372	1682	2745	673	500	229	827	406	469	0
2017/18	787	1383	1804	0	658	585	175	511	458	472	3807
2018/19	872	1405	2067	4302	719	583	232	1165	511	464	3859
2019/20	710	1376	2282	6076	720	601	257	1999	400	469	3941

Figure 4-8a: ADT Trends Holiday Traffic Sites (Extract from 19/20 KDC Annual Traffic Report)

Figure 4-8b in WDC has generally been increasing in holiday traffic volume on all sites and an overall trend of a large increased volume of traffic during the Christmas holiday period compared with normal seasonal volumes, with the exception of Whangarei Heads Road (1712m) and Ngunguru Road (572m). Both of these areas have a significant resident population and it is expected that the drop off in commuters travelling to work is largely being matched by holiday traffic which might be the reason behind the similar traffic in normal season as Christmas holiday period at these locations.

Road Name	Location (m) A	Average Daily Holiday Traffic 2016/17 B	Average Daily Holiday Traffic 2017/18 C	Average Daily Holiday Traffic 2018/19 D	Average Daily Holiday Traffic 2019/20 E	Latest Average Daily Traffic Count F	Percentage change in ADT for Holiday Traffic G
Cove Rd	4000	3446	4241	4297	5148	3511	47%
Cove Rd	10000	4447	Not Counted	Failed	4073	2552	60%
Ngunguru Rd	572	7495	7244	6130	7742	7927	-2%
Ngunguru Rd	14500	4873	4146	5013	5152	3787	36%
Russell Rd	500	2116	2012	2062	2444	1273	92%
Whananaki North Rd	9000	1061	986	1031	1143	460	148%
Whangarei Heads Rd	1712	6534	6613	Failed	6992	6965	0%
Whangarei Heads Rd	15000	3282	3101	3163	3669	3018	22%
Marua Rd	8000	Not Counted	558	595	Not Counted	306	°

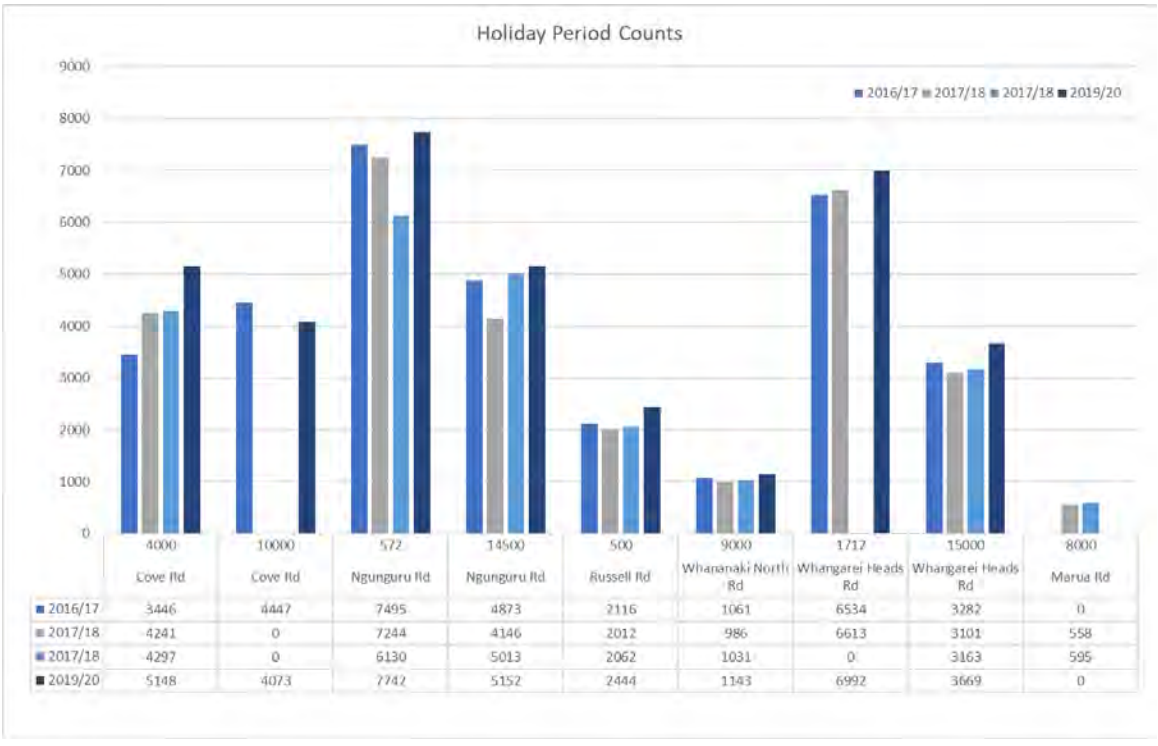


Figure 4-8b: ADT Trends Holiday Traffic Sites (Extract from 19/20 KDC Annual Traffic Report)

During the COVID-19 Level 4 lockdown, active traffic count sites recorded that traffic volumes dropped to between 20-40% of normal. This increased to 70-90% of normal during the Level 3 lockdown. Recent traffic counts indicate that traffic volumes have now bounced back and grown beyond pre-COVID levels.

4.11 Parking Strategy

The Whangarei District Council has a parking strategy to manage the many parking demands in the central city area. FNDC and KDC do not currently have parking strategies, because parking demand is lower in these more rural districts.

WDC undertook a review of its existing Parking Strategy in 2017. This review identified that there are currently sufficient car parks in the Whangarei CBD. Some parking sites are popular such as Cameron St and the Town Basin and have high occupancy rates of up to 90%, while others have occupancy rates of only 40-60%.

The intention of the parking strategy is to:

- Ensure availability of parking at desirable sites.
- Better utilise the available parking at underutilised major CBD sites
- Encourage commuter parking to shift from highly used parks, near the popular areas to the less used carparks on the CBD fringe.

The strategy also took into account the impacts of the proposed Hundertwasser Arts Centre and green space currently being constructed in the Town Basin area.

The tools to manage these car parks is to charge for previously "free" parking, increase charges at high occupancy car parks and lower charges on underutilised car parks. WDC has undertaken changes to the paid and time limited parking in the Whangarei CBD as a result of this strategy. Additional carparking has also been provided near the Town Basin at the James St (ex-Wilsons) carpark and a leased carpark on the old Toyota Site on Carruth St to replace parking removed for the new greenspace being created beside the Hundertwasser Art Centre.

Variable message board signs have also been erected at some underutilised carparks to advise the public of the number of remaining parks to encourage uptake in parking in those areas.

4.12 Walking and Cycling Strategies

There is a Northland walking and cycling strategy for the region. The Kaipara and Whangarei District Council's also have developed walking and cycling strategies. These strategies are described below.

There is currently no strategy for the Far North, although walking and cycling was a key consideration in the development of their Integrated Transport Plan, which is described in Section 4.8.1.2.

4.12.1 Northland Walking and Cycling Strategy, 2018

This strategy was developed by the Northland Regional Council in close collaboration with the district councils, Department of Conservation, Walking Access Commission and NZ Transport Agency. The aim of the document is to present a coherent overarching strategy for the development of walking and cycling in the region, drawing together district walking and cycling strategies. The document contains:

- A vision, namely: 'For Northland to be one of the world's best coastal walking and cycling destinations where the journeys and stories are as impressive and memorable as the scenery'.
- Four strategic focus areas:
  - Developing appealing and cohesive walking and cycling networks that connect Northland.
  - Growing walking and cycling participation and promoting Northland's coastal point of difference.
  - Improving community wellbeing including creating economic opportunities.
  - Ensuring walking and cycling infrastructure, and its use, is sustainable.
- Under each focus area are short term and long-term priorities for the strategy to address.
- A list of priority projects which collectively form part of a cohesive network that provides a route around Northland and connect with the Auckland region. The projects are made up of 'easy' and more challenging walking and cycling routes that will appeal to a broad range of visitors.

The projects identified in the strategy have been assessed through the PGF Northland Integrated Cycle Implementation plan which is described in Section 4.6.3.

4.12.2 Kaipara Walking and Cycling Strategy, 2017

This strategy has been prepared to provide a framework to increase walking and cycling participation in the Kaipara district. It includes initiatives to develop and expand walking and cycling networks, for both local journeys as well as long distance touring routes to support economic growth. The Strategy also identifies opportunities for the district to collaborate with key partners to jointly fund and connect key linkages and develop behaviour change initiatives to change attitudes to walking and cycling.

The vision of the Kaipara Walking and Cycling Strategy is: 'Working together to enhance walking and cycling in Kaipara'.

Council aims to work towards this vision by focusing its efforts on the following three objectives:

- Become a walking and cycling destination to support economic growth, and provide transport and lifestyle choices.
- Partner with key stakeholders and community to deliver walking and cycling projects and behaviour change initiatives.
- Develop district-wide and township walking and cycling networks that are safe, enduring and connect with nature.

The strategy has identified many projects to improve walking and cycling opportunities in the Kaipara District and the most significant of these are shown in the following maps. This includes the:

- Mangawhai Shared Path
- Kaihu Valley Rail Trail
- Waoku Coach Trail
- Dargaville riverside path (connects to Kaihu Valley Rail Trail and existing Missing Link Cycleway Heartland Ride)
- Dargaville to Maungaturoto

4.12.3 Whangarei Walking and Cycling Strategy, 2018

This strategy provides a framework for increasing participation in walking and cycling as a principle transport mode, and for recreational purposes, contributing to a healthy and vibrant community and growing economy. Many facilities for walking and cycling will also provide opportunities for mobility scooter and for small wheeled recreational vehicles, including skateboards and scooters. This Strategy updates the Walking and Cycling Strategy for Whangarei City 2012.

The vision for the strategy is: 'A walking and cycling destination that provides safe, integrated, attractive and viable networks for commuters as well as lifestyle and economic opportunities for residents and visitors.'

The goals of the walking and cycling strategy are:

- A safe connected urban walking and cycling environment
- More people walking and cycling, more often
- A destination where walking and cycling is a lifestyle
- A walking and cycling network that connects with other districts and significant locations in our district.

The projects identified in the strategy are shown in the following maps. The most significant of these are:

- Completing the shared path network in Whangarei city including the extension of the Kamo path to Kamo Village, the extension of the Raumanga path to Maunu, and the new Tikipunga shared path.

- The completion of the Bream Bay Cycle Trail and connection to the path being provided as part of the Whangarei to Port Marsden 4-laning project.
- The Whangarei to Ngunguru cycle trail
- The Whangarei Heads cycle trail

4.13 Forestry Strategy

The Northland Region has a long history of forestry-related activities. Maturing forest estates planted in the 1970s and 1980s are resulting in significant harvesting activities right across the Northland Region. Northport and six processing operations (mills and timber products) are located in Northland. In 2015, approximately 4.8 million cubic metres of harvest volume was processed and/or exported through mills and the port facilities located in the region. These volumes have been sustained for the last 5 years and current forecasts are that 4-4.5 million cubic metres of harvest will continue until 2019 when they are predicted to reduce to 3 million cubic metres per annum until 2034.

The forecast forestry harvest for Northland is shown in the figure below (source: Ministry of Primary Industries, Wood Availability Forecast – Northland 2014, Scenario 3).

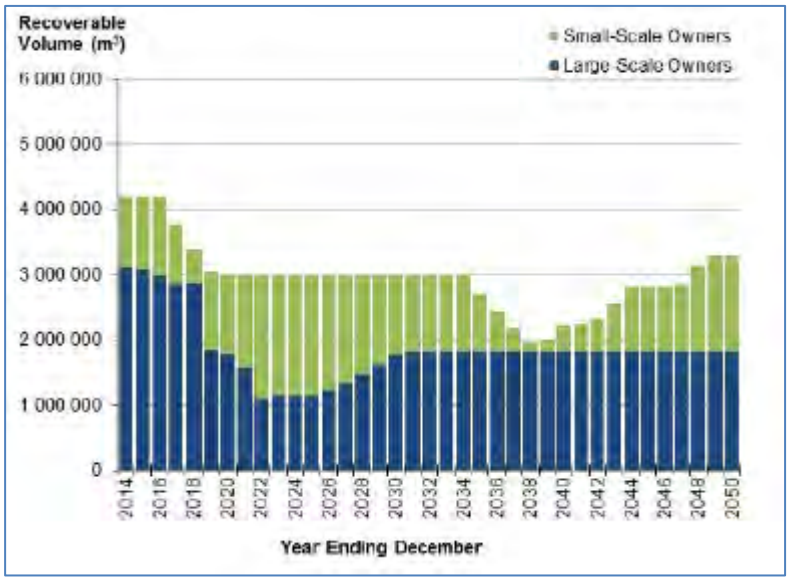


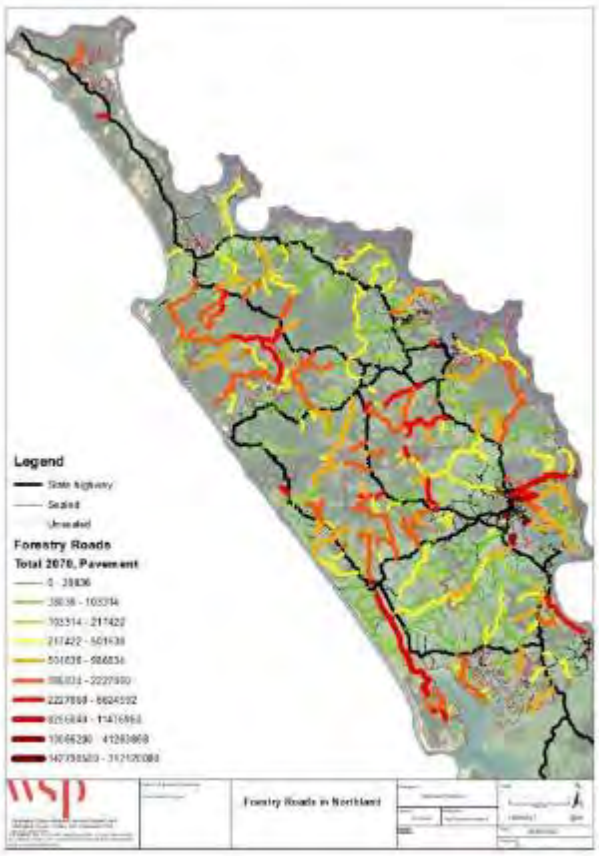
Figure 4-5: Forecast Wood Availability

During the 2013-2015 period a forestry strategy was developed by each council with an overarching strategy across the region and this resulted in additional funding being approved for each council during the 2015/2018 period to address the impacts of forestry on the local road network.

In preparation for the 2021/2051 AMP development, a new forestry strategy was developed in 2019-2020 to understand the ongoing impacts of forestry on the network and to account for this in the long term planning for each council. FORME forestry consultants were used to determine the forestry harvest from the next two harvest cycles (out to 2070) and map these onto the road network to determine the forestry loadings.

The forestry harvest data was gathered in consultation with forestry owners. Wood processors were also consulted to determine the likely harvest intentions of small woodlot owners. Over the next 5 years, the major forestry blocks will have been mostly logged out and small woodlots are likely to make up 50% of the harvest. FORME estimated that 93% of all forestry blocks harvested in Northland will be replanted which will result in a sustained long term forestry harvest cycle.

The predicted total harvest (in tonnes) to 2070 is shown on the map to the right.



The harvest information was used by WSP consultants to determine the loading impact on the affected forestry routes. This information was then incorporated into the unsealed road model and dTIMS sealed road model to determine the long-term impact on the road network and to build the required treatments into the forward works programme for each council. In this way, forestry impacts will be considered as part of the business-as-usual development of the long-term planning for reseals, rehabilitations and heavy metalling programmes going forward.

4.14 Climate Change

The world's climate is changing, and there is evidence of the effects of this: warmer temperatures, glaciers melting, significant storm events, sea levels rising and more droughts and bush fires. In 2015 the Government signed up to the Paris Agreement which set a target to limit climate change to no more than a 1.5-2.0 degree increase in average temperature over pre-industrial levels. This was based on evidence compiled by the Intergovernmental Panel on Climate Change (IPCC), that showed that the impacts of climate change could be minimized (but not removed) by achieving this target. The latest climate modelling indicates that, based on the current rate of greenhouse emissions, after 2030 we will no longer be able to meet this target, even if the world achieves a carbon-neutral state – we will have used up the available "carbon budget".

In response to this, the Northland councils have been working together on a collaborative initiative titled Climate Adaptation Tai Tokerau (CATT). CATT has resulted in a Regional Risk Assessment being completed in July 2020, and a Regional Adaptation Strategy is to be developed by October 2020. This will lead to the development of a Regional Community Adaptation Programme in June 2021 which will outline steps for engagement and implementation.

Individual council responses and initiatives are described in the following table and the text below.

Council	Declared a Climate Change Emergency?	Signatory to the LGNZ Climate Change Declaration
Far North District Council	No	Yes
Kaipara District Council	No	Yes
Whangarei District Council	Yes	Yes

FNDC's climate change planning has started with a Climate Change Roadmap adopted by the council in May 2020 – this sets out the broad goals, principles and focus areas for their climate change response. FNDC will engage with the community on the Regional Community Adaptation Programme in the 2021-2024 period with a view to implementing the resulting actions from 2024 onward. FNDC's action plan has identified the following that will need to be considered in the transport AMP:

- Climate change policies and strategies embedded in the 2021-31 LTP and Infrastructure Strategy.
- Stock take of council assets impacted by climate change and this information included spatially in asset management systems (ie RAMM) in 2021/22.
- Asset management planning systems updated based on outcome of applying Dynamic Adaptative Planning Pathways (DAPP) and financial models as part of community engagement and consultation by 2022/23 and 2023/24.
- Transport infrastructure projects will have clearly defined, community informed Climate Change adaptation outcomes 2024 and beyond.

KDC are in the process of setting up a climate change work programme that will go into their LTP activities. The climate change work programme will span mitigation and adaptation and work towards KDC's Climate Smart community outcome. KDC's strategy and planning work for climate change is:

- Adaptive Pathways – regional adaptation approach on adaptation decision-making, includes regional risk assessment.

- Climate Action Plans phased to the short, medium, long terms to transition Council to low emissions, and make them adaptive and resilient (Climate Smart).
- Emission inventories, targets, reduction pathways identified and aligned with Climate Action Plans.
- Climate Smart Policy to set procedures and processes around climate action targets, climate change related risks information, assessments, and reporting.

WDC have adopted a Corporate Sustainability Strategy in November 2018, which developed a decision-making framework to direct action to mitigate climate change and to use resources sustainably. Actions that relate to transport resulting from this strategy include:

- Promote sustainable travel options through a sustainable Green Travel Plan, including walking, cycling, ride sharing, electric vehicle and car-sharing.
- Develop a remote working policy.
- Introduce sustainable procurement practices, including sustainability and greenhouse gas emissions in the decision-making process for tenders, and considering materials with lower embedded energy.
- Encourage an approach to tenders and procurement that has non-price attributes related to reduced greenhouse gas emissions and sustainability.

In July 2019 WDC declared a climate change emergency and, as a result of this, has developed a Climate Action Plan which outlines actions to reduce greenhouse gas emissions. These are described in more detail in the Mitigation section below.

The initiatives from the three councils above will be considered as an AMP improvement plan item.

There are two main considerations for this AMP in terms of climate change. These are:

- Mitigation – The reduction of greenhouse gas emissions through the maintenance, operation and use of the transport system.
- Adaptation – The modification of the transport system to cater for the adverse effects of climate change.

These are discussed in more detail as follows:

4.14.1 Mitigation

Road transport makes the second highest contribution to the New Zealand's greenhouse gas emissions, so initiatives to reduce the emissions from the transport system are vital in achieving our climate change obligations.

Key actions to reduce transport related emissions that have been identified to date through the various council planning activities are:

- Public Transport – For the Whangarei CityLink bus service, bus priority lanes and increased bus frequency along with high all-day parking charges in the city centre will encourage a shift to public transport and reduce private vehicle use. The Whangarei CityLink bus fleet will also convert to electric vehicles over time, with 20% electric buses being planned for the next NRC bus contract. The intention is to transition to a carbon neutral public transport service.

- Active Modes – Across all three councils there is a drive to improve walking and cycling opportunities to encourage more active mode use and less reliance on private vehicles. This will include investment in new footpaths, off-road shared paths and on-road cycle lanes. The focus will be on delivering the routes identified in the Regional Walking and Cycling Strategy, the individual district Walking and Cycling Strategies and other strategies such as Whangarei's Blue Green Network.

- Electric Vehicles – Continue the roll-out of electric vehicle charging stations across Northland through the collaboration between the Councils, Top Energy, Northpower and local EV groups to provide a convenient network that will encourage uptake in electric vehicles. This is currently being funded through ChargeNet NZ and the Energy Efficiency & Conservation Authority (EECA).

- Smart City Technology – The installation of a central management system for streetlights would enable streetlight dimming saving up to 15% on power consumption.

Other initiatives to consider reductions in emissions from transport maintenance and construction activities will be developed and a strategy to identify these opportunities will be developed as an AMP improvement plan item.

4.14.2 Adaptation

Climate change is likely to result in more extreme weather events, sea level rise, higher temperatures and more susceptibility to droughts. This is going to put increasing demands on the transport network to be resilient to these changes in the future, particularly on critical routes. In particular, the likely effects will be:

- Extreme weather events – Road closures due to higher intensity rainfall events resulting in flooding and slips, scouring of drainage systems and roads, as well as stronger winds resulting in tree fall.

- Sea Level rise – Inundation of low-lying coastal areas and greater coastal erosion.

- Higher temperatures and droughts - Maintenance effects such as more bleeding of bitumen, lower ability to use stream water for maintenance and construction, more cracks opening up – making roads more susceptible to slips and faster vegetation growth.

At this stage the impacts of these effects are not well known. The NTA is currently in the process of developing a Resilience Strategy to identify points of vulnerability on critical routes, such as life line routes and access to isolated communities. This will identify slips, areas of flooding, erosion prone areas and coastal inundation on these routes and develop a prioritised programme to address these high risk areas. In 2017, the Northland Regional Council undertook inundation modelling of low-lying coastal areas and this modelling work is currently being refreshed to reflect current climate science and sea level rise predictions. The NTA will be working with the NRC to incorporate the latest flood modelling into this Resilience Strategy. The strategy and prioritised programme is expected to be finalised by December 2020, and will be included in this AMP.

4.15 Emerging Technologies and Trends

The trend towards transport choice will continue as active modes, such as walking, cycling and micromobility (scooters etc), continue to grow in popularity for both recreation and commuting. This increased demand will require an appropriate response in the design and location of shared paths, walkways and cycleways, both on and off road. The emergence of E-Bikes and E-Scooters is making cycling and micromobility a more attractive transport mode and there will be increasing demand for bike racks and charging points.

As cities grow, so does the patronage and popularity of public transport. As our urban area develops, our public transport will need to respond to avoid congestion. Technology such as detection at traffic signals to give priority to buses will also help the reliability and usability of public transport. Technology such as mobile phone apps to show where your bus is in real time are currently being considered and has already been

implemented on the Whangarei CityLink webpage. Variable Message Board signs at main bus stops are currently being considered for the Whangarei CityLink service.

Technology will influence how we move around our District. The growing number of electric vehicles will reduce environmental effects through zero noise and air emissions. This will likely reduce reverse sensitivity issues (the impacts of new activities) with neighbouring properties and improve public health and amenity. There will also be increasing demand for charging points at carparks to enable the charging of these vehicles.

Self-drive technology (otherwise known as autonomous vehicles) will enable a more efficient movement of private, public and freight vehicles, therefore making our transport system work better. This technology also has the potential to improve road user safety. However, fully autonomous vehicles are still some way off being developed and there is a reluctance from users to embrace this technology. In the short term, self-drive technology is already being used in modern vehicles to aid in the driving task, with technologies such as ABS brakes, adaptive cruise-control, self-parking and lane detection technology becoming more standard for new vehicles. Self-drive technology may require wider or additional road markings for in-car detection and additional infrastructure such as WiFi for improved GPS positioning.

These emerging technologies will be progressively incorporated into the AMP as these technologies mature and their demands are better known.

4.16 Demand Summary

As described in this section, the demands on the Northland transport network can be summarised as follows:

- The effects of the COVID-19 pandemic to date have not been as significant as originally anticipated. Growth in Northland has been strong since the lockdowns, due to a buoyant housing market fuelled by ex-pat New Zealander's returning home from overseas as well as strong domestic tourism.

- Growth in GDP in Northland was 2.8% in 2019 which is similar to the national average, and unemployment is at a 10 year low, but household incomes are less than the national average.

- Northland is one of the most socially deprived regions in the country and so supporting growth opportunities, and providing alternative transport opportunities such as walking, cycling and public transport are important.

- The freight task in Northland has grown by 2% per annum over the past 5 years to 16.6M tonnes being carried by road (in 2017/18). This is forecast to remain at these levels for the next 30 years due mainly to a drop in forestry harvest over the next few years from the current 4 million cubic metres to 3 million cubic metres. However, recent developments such as the potential for NorthPort to grow into a container port and the investment in water storage projects to support expansion of horticulture activities may increase freight movements. The recent investment in the North Auckland rail line may slowly reduce the current reliance on the road network for most freight movements (currently 99% of freight is carried by road).

- Tourism in Northland is at an all-time high with almost 2 million visitor nights and $1.12 billion being spent by Tourists in 2018. While COVID-19 has had an impact, the tourist industry is expected to continue to grow in Northland through strong domestic tourism and investment in many tourist attractions through the Provincial Growth Fund (PGF), including the revitalisation of the Twin Coast Discovery Highway. Campervans and freedom campers are also increasing.

- The population in Northland increased by 3.6% per annum between 2013 and 2018 which is an all-time high. Much of this growth occurred in the Mangawhai, Kerikeri/Waipapa and Whangarei areas. This growth is expected to continue into the future with strong growth opportunities through Northland's proximity to Auckland, potential growth in Northport, the motorway extension to Warkworth and government investment such as through the Provincial Growth Fund.

- The transport network has grown slowly over the last 10 years. There has been modest growth of between 0.3-0.6%/year in the length of sealed roads through subdivision activity and seal extensions. There has also been rapid growth in cycleways in Whangarei. This growth is likely to continue into the future with the expected business and population growth as well as new road sections being handed to WDC through the SH1 Whangarei to Ruakaka 4-laning project.

- Overall growth in traffic volumes (including State Highways) in Northland is currently high at 5%. Based on traffic count data over the past 4 years, the traffic growth on Kaipara's local roads is 12% and for Whangarei's local roads is 6%. The largest growth is the Mangawhai area which is identified as one of the fastest growing areas in the country.

- The investment in walking and cycling projects across Northland, through the implementation of the Walking and Cycling Strategies, is likely to create a mode shift and partially mitigate the growth effects on traffic demand in urban areas. In addition, the proposed upgrade to the Whangarei CityLink bus service is also likely to result in a shift to public transport in the city. These initiatives will also help mitigate transports impact on greenhouse gas emissions.

- The impacts of climate change are likely to create more extreme weather events, sea level rise and more droughts. These impacts will create further demands on the transport system, particularly increased likelihood of slips, flooding and inundation of low lying coastal roads.

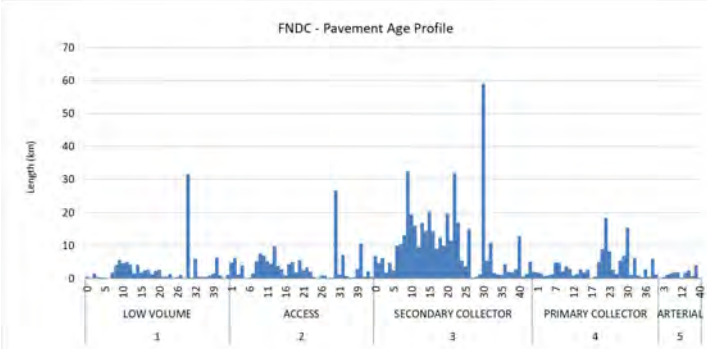
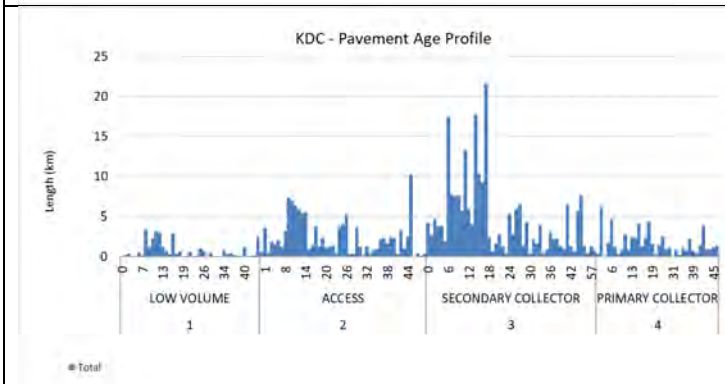
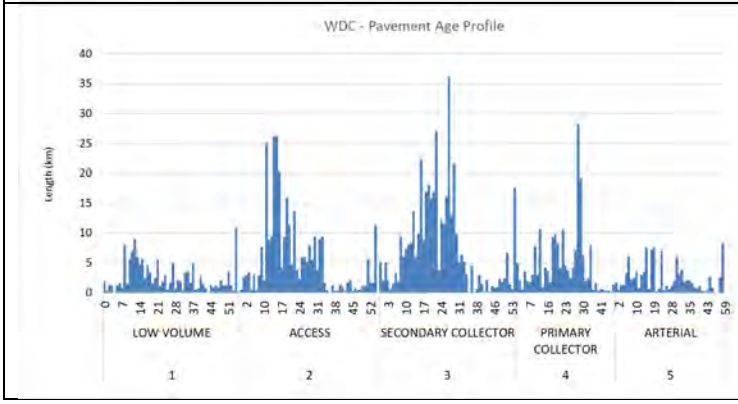
Overall, the impacts of these demands on the maintenance, operations and renewals programme is to increase the volume of traffic and freight on the network. Population growth will also result in growth of the road network through roads being vested to Council. These impacts will result in more wear and tear and a larger network which will require increasing levels of funding to maintain.

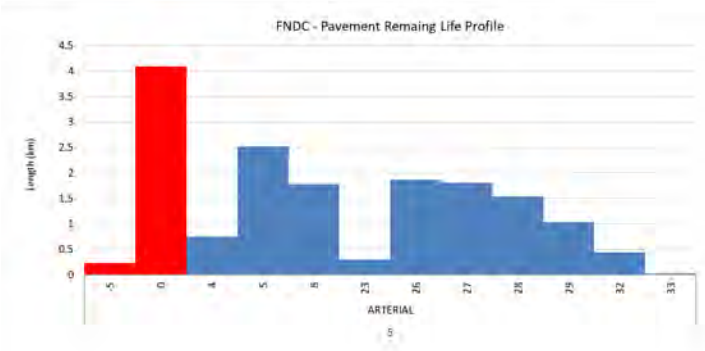
4.17 State of the Network

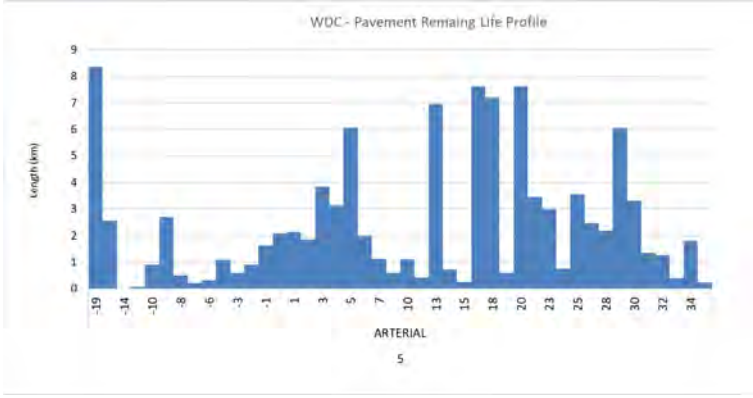
The current state of the network can summarised as follows. This include the current state of the network and predicted state based on the pavement surfacing modelling completed as part of the options assessment.

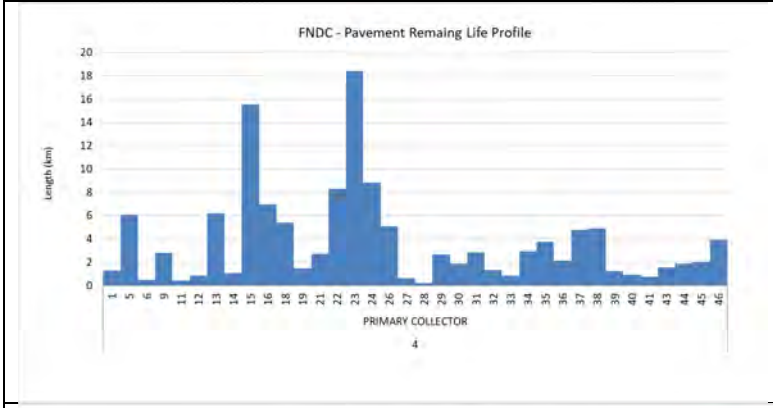
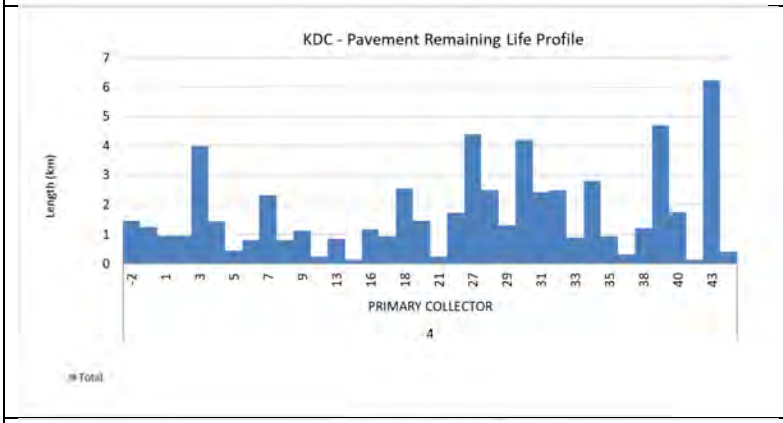
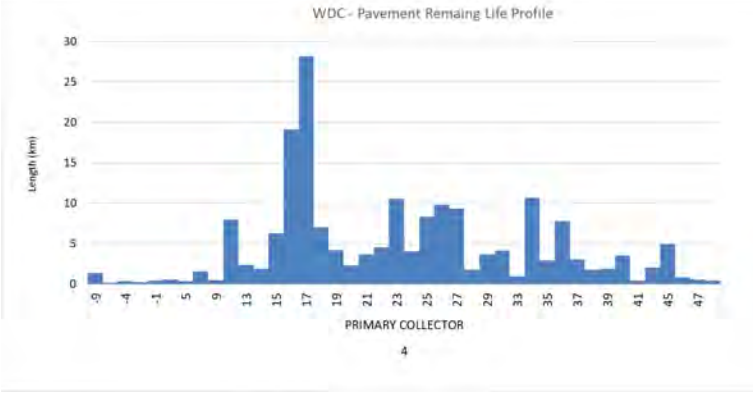
4.17.1 Pavement Profile

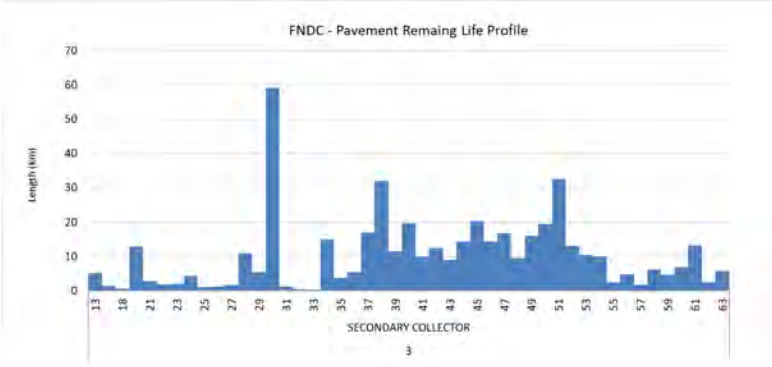
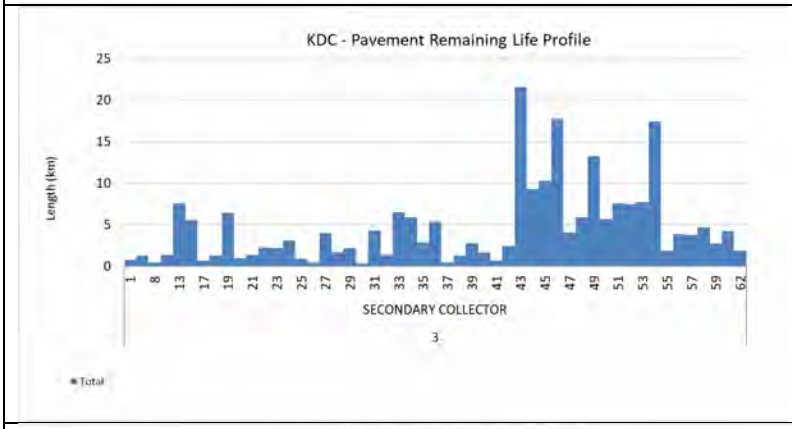
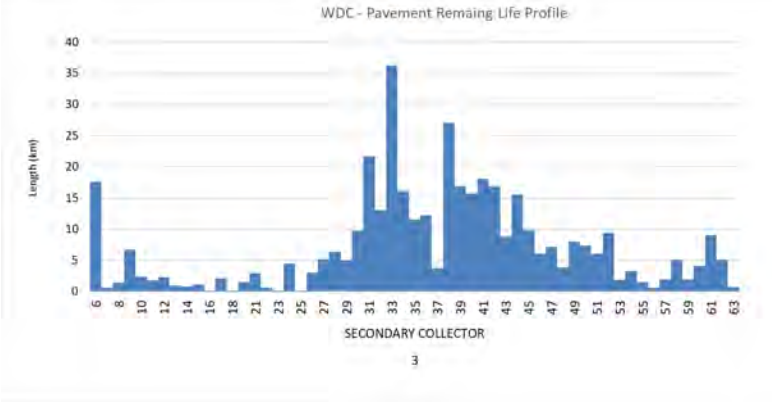
The following provides and overview of the pavement profile for the NTA networks.

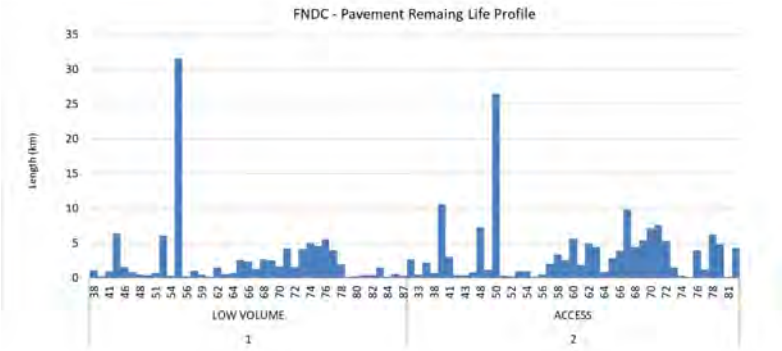
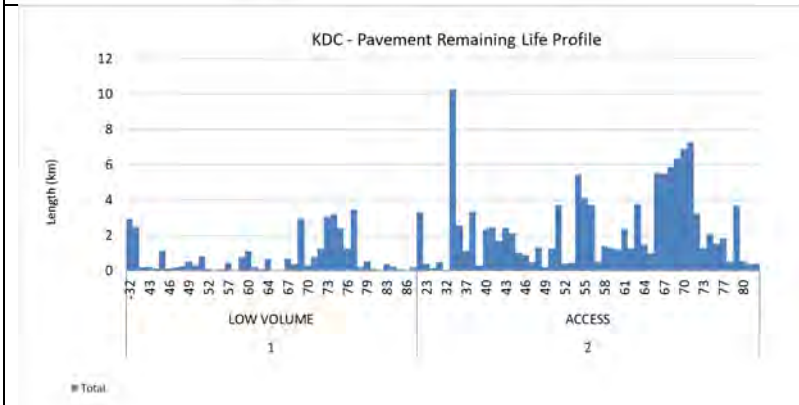
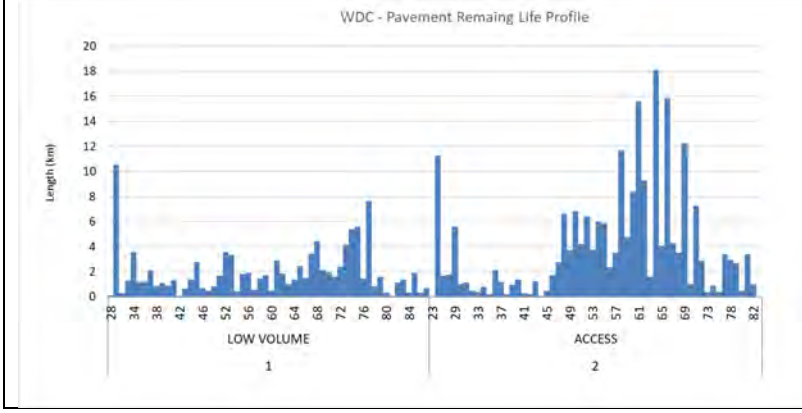
Pavement Age Profile	
	The pavement age profile shows the primary, secondary network have peaks between 20-35 years of age. These are pavements that will present priority on the network in these classes. Given the current trend on pre-seal repairs monitoring of these roads is as these carry the bulk of heavy traffic on the network.
	KDC has a relatively young pavement network. However, there is some older Primary and Secondary roads in this profile. The main issue is condition of some of these pavement and historic design practices and northland geology has led to some premature failure.
	The pavement age profile of the network shows the Arterial and Primary has a peak in 26 to 35 year old. This represents approximately 100km of the network. This is not a problem within itself but when evidenced with the current condition and levels of pre-seal expenditure this needs careful management and ongoing investment to maintain a stable network investment into the future

Remaining Pavement Life - Arterial	
	Red is pavement at the end of life or beyond. These are not any immediate issue but show a length of the network that is now in the end of zone and will need to be monitored.
KDC - No Arterial Network	N/A

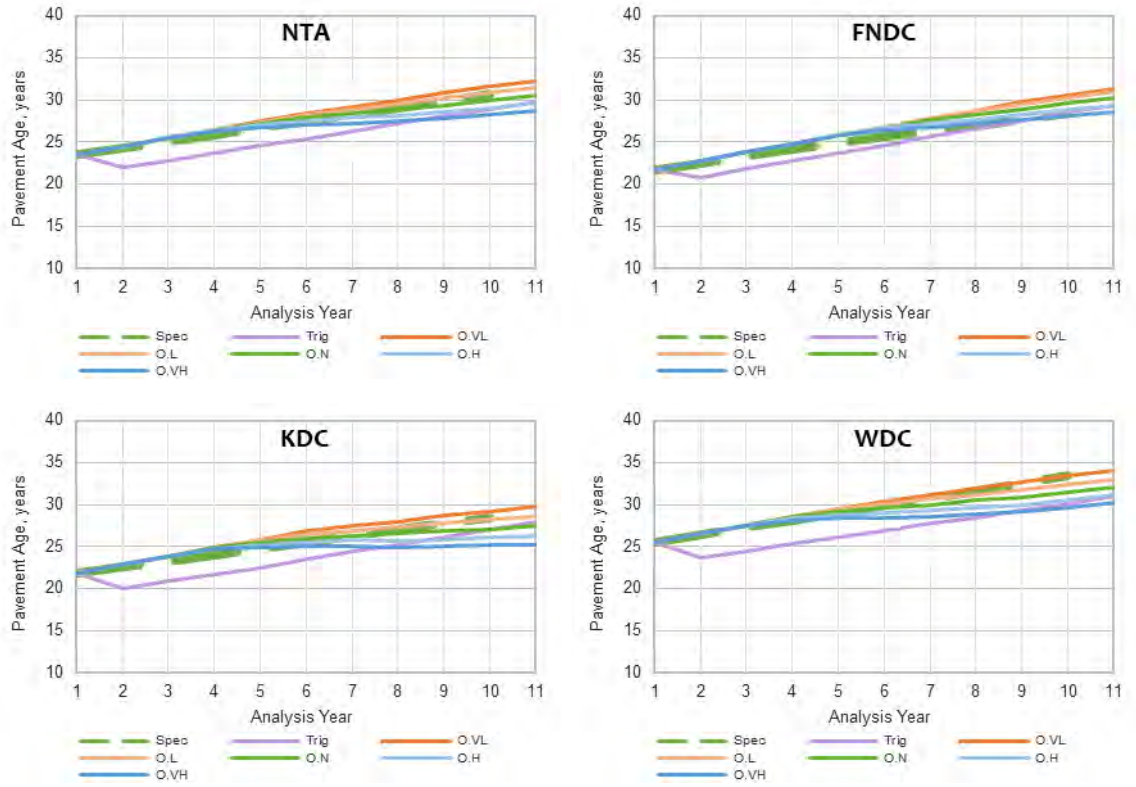
Remaining Pavement Life - Arterial	
	The remaining life plot reflects the age profile, indicating that pavements on Arterial network have exceeded their remaining life. This also indicates a growing profile approaching the end of their remain life. Year 1 of the programme focus on the Arterial network.

Remaining Pavement Life – Primary Collector	
	FNDC have a quantity of end of life pavement approaching but as noted these will be monitored. The remaining life calculation is set against the what has been observed achieved life of approximately 45years. This is 20 years beyond design life. This indicates there is a growing volume of older pavements on the network which is exceeding rehab rate of 0.6% per annum.
	KDC has a quantity of Primary collector roads approaching end of life. These are not necessarily posing and immediate issue. Ride quality is key outcome to be monitored.
	WDC remaining life plot reflects the age profile, indicating that pavements on Primary network have exceeded their remaining life. This is shown in the progamme with move towards Primary roads for rehab along with maintaining the current condition profile.

Remaining Pavement Life – Secondary Collector	
	FNDC no specific issue. The main drivers for any rehabilitation on this part of the network is low quality historic construction and poor subgrades leading to poor ride quality which becomes the focused works.
	KDC no specific issue. The main drivers for any rehabilitation on this part of the network is low quality historic construction and poor subgrades leading to poor ride quality which becomes the focused works.
	WDC Secondary is showing that there is some life left in the pavement. Programme of investment for rehab is on the Secondary network. This reflects the condition of this network which includes its inability to carry the increasing loads and geological environment of the Whangarei network. These issues have been identified through the problem statement and this investment is the resulting outcome of the programme development.

Remaining Pavement Life – Access & Low Volume	
	FNDC Access and Low Volume has no specific issue in relation to remaining pavement life. As note geology and poor historic construction are the main drivers for any pavement rehabilitation work.
	KDC Access and Low Volume has no specific issue in relation to remaining pavement life. Apart from a very old pavement that will need review. As noted geology and poor historic construction are the main drivers for any pavement rehabilitation work on this part of the network.
	The Access Vow Volume network have life remaining however Access roads that were constructed as part of large seal extension programme some 15 years ago are failing. These remain the focus of the rehab programme to ensure we keep the STE, peak rough targets in check.

Following figure shows the predicted network average pavement age. It shows the weighted average pavement age will increase, even in the case of the Trigger Model, which has an unconstrained budget. An increasing network average age is expected and demonstrates a trend similar to most road networks. Increasing pavement age indicates the pavement capacity will inevitably be consumed over a long period of time. The pavement will become less resilient to wear and less capable of absorbing deterioration that will occur if funding becomes overly constrained.



Network weighted average pavement age

The following provides summary of the pavement condition based on Pavement Integrity Index, as calculated in RAMM. This calculation uses pavement related high speed condition data collected on the network.

FNDC Pavement Conditon	LOW VOLUME	ACCESS	SECONDARY COLLECTOR	PRIMARY COLLECTOR	ARTERIAL	Total
VeryPoor	5548	3813	3029	881	428	**13699**
Poor	5532	2268	2668	1074		**11542**
Average	6995	8283	6924	955	82	**23239**
Good	13873	21646	28899	2206		**66624**
Excellent	73462	117641	437246	128014	15996	**772359**
Total	**105410**	**153651**	**478766**	**133130**	**16506**	**887463**

FNDC Pavement Condition Profile –(PII)

KDC Pavement Condition	LOW VOLUME	ACCESS	SECONDARY COLLECTOR	PRIMARY COLLECTOR	Total
VeryPoor	2344	3324	456	20	6144
Poor	1048	3908	877	152	5985
Average	2774	6617	3165	182	12738
Good	4500	14885	15628	3734	38747
Excellent	23388	94325	215272	57684	390669
Total	**34054**	**123059**	**235398**	**61772**	**454283**

KDC Pavement Condition Profile –(PII)

WDC Pavement Condition	LOW VOLUME	ACCESS	SECONDARY COLLECTOR	PRIMARY COLLECTOR	ARTERIAL	Total
VeryPoor	4685	5989	2621	406	691	**14392**
Poor	4395	7419	1834	391	356	**14395**
Average	7888	7677	9648	486	1483	**27182**
Good	11080	20467	37242	5186	2023	**75998**
Excellent	85312	186374	361601	181349	101483	**916119**
Total	**113360**	**227926**	**412946**	**187818**	**106036**	**1048086**

WDC Pavement Condition Profile –(PII)

When considering the current condition of the pavement the investment programme reflects how we will go about investing in the renewal of our pavements. Approximately over 2.0%% of the all networks is in poor to very poor condition. Considering the current investment is set to approximately 0.6% per annum being treated this needs to be monitored closely. Note that access and low volume network have larger portion of poor to very condition, this is acceptable on the basis that the resurfacing investment strategy of the network is supported.

FNDC Condition	Description	Length PII (km) 2019	% PII 2019
Very Poor	Should be on the immediate programme	13.70	1.54%
Poor	Treatment option analysis on short term programme	11.52	1.30%
Average	Detailed inspection on medium term programme	23.23	2.62%
Good	Monitor site	66.62	7.51%
Excellent		772.4	87.03%

FNDC Pavement Condition Profile

KDC Condition	Description	Length PII (km) 2019	% PII 2019
Very Poor	Should be on the immediate programme	6.14	1.35%
Poor	Treatment option analysis on short term programme	5.981	1.32%
Average	Detailed inspection on medium term programme	12.74	2.8%
Good	Monitor site	38.74	8.53%
Excellent		390.7	86.0%

KDC Pavement Condition Profile

Table 4-2: WDC Pavement Condition Profile shows the change in the pavement condition and resulting length over time for Whangarei DC. Poor and very poor has increased year on year. The significant shift in condition is reduction in Good. Considering **Figure 4-6: Change in Pavement Condition** shows that the quantity of average, poor and very poor network has grown.

WDC Condition	Description	Length PII (km) 2014	% PII 2014	Length PII (km) 2017	% PII 2017	**Length PII (km) 2019**	**% PII 2019**
Very Poor	Should be on the immediate programme	13.5	1.3%	14.8	1.4%	14.39	1.4%
Poor	Treatment option analysis on short term programme	8.1	0.8%	12.9	1.0%	14.40	1.4%
Average	Detailed inspection on medium term programme	18.5	1.7%	41.7	2.5%	27.18	2.6%
Good	Monitor site	101.7	9.5%	100.4	7.1%	76.00	7.3%
Excellent		923.6	86.7%	1569.3	88.1%	916.12	87.4%

Table 4-2: WDC Pavement Condition Profile

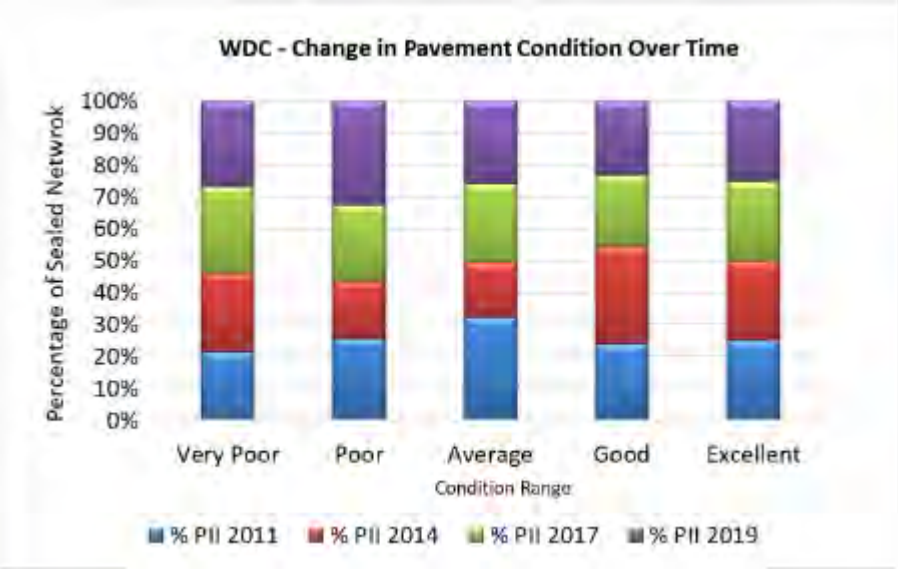


Figure 4-6: Change in Pavement Condition

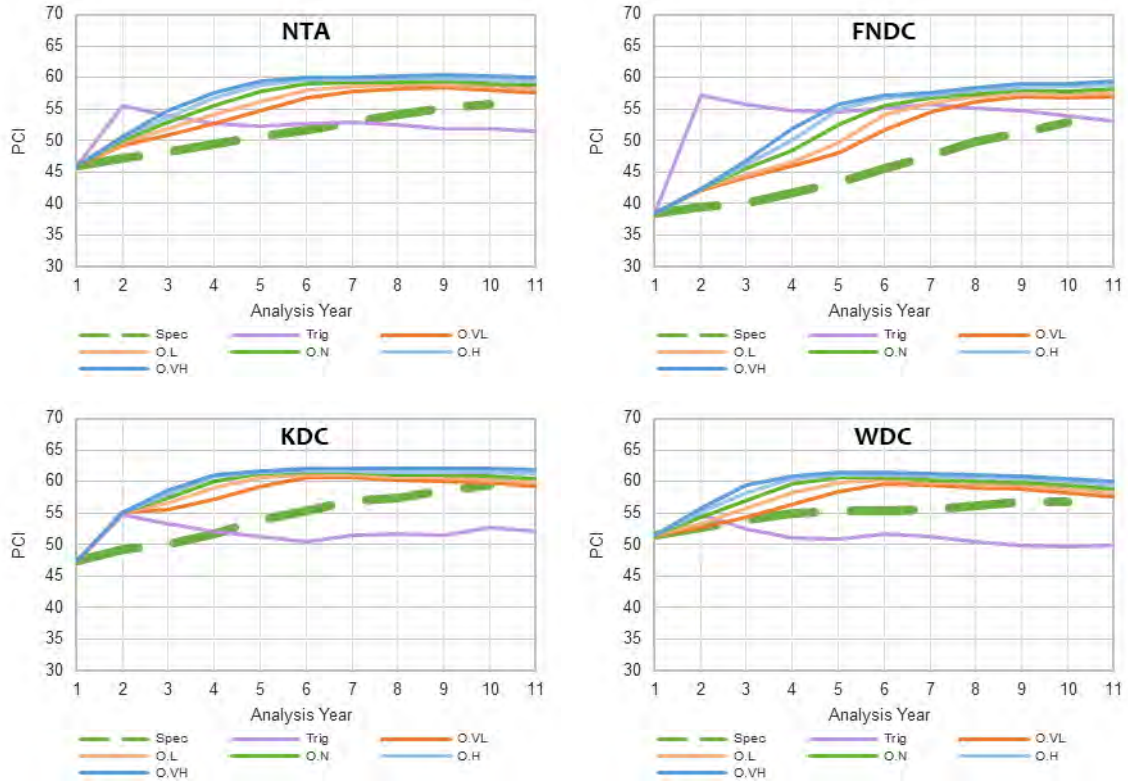
The Pavement Condition Index (PCI) is a composite index of pavement base and surface conditions. It also represents the objective function that is maximised using optimisation in the optimal model. The scale of this index is 100 (excellent) to 0 (very poor).

PCI is a function of roughness, rutting, texture and SII. The PCI is a composite index that includes SII. Therefore, some of the PCI improvement can be attributed to the SII improvement.

Figure 5-9 shows the predicted network average PCI for all budget scenarios. The greater the value the better the condition.

Figure 5-9 indicates the current network level PCI can be improved and maintained over the analysis period for all optimised scenarios. However, PCI may not be able to be maintained at the indicated levels in the long term as the networks pavement base continue to age.

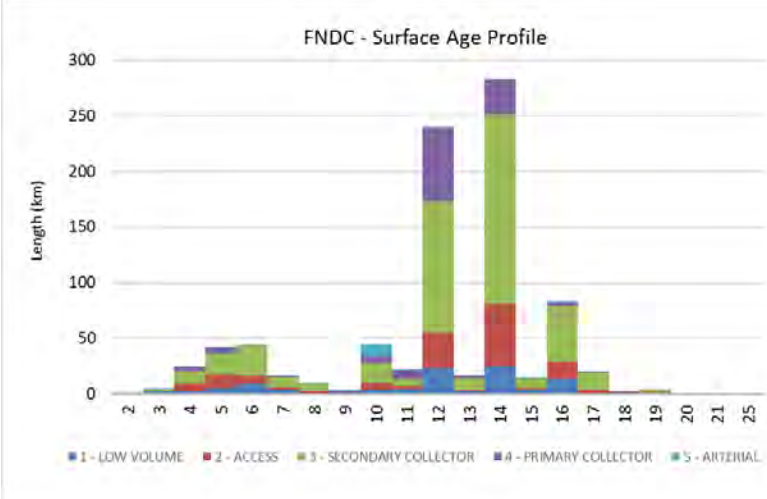
FNDC has the lowest (worst) initial PCI and has more difficulty improving and reaching a steady level like KDC and WDC have done. Therefore, it is possible to conclude that FNDC is the most constrained by funding levels of the three networks.



Network weighted average PCI

4.17.2 Surface Profile

The following is an over view of the surface profile of the NTA networks and modelling outcome.

Surface Age Profile	
	FNDC surface age profile reflects the surfacing programme. Especially in the Secondary and Primary collector parts of the network. The age profile also indicates a sporadic approach to resurfacing in the past as the profile very bumpy and compressed over distinct periods.

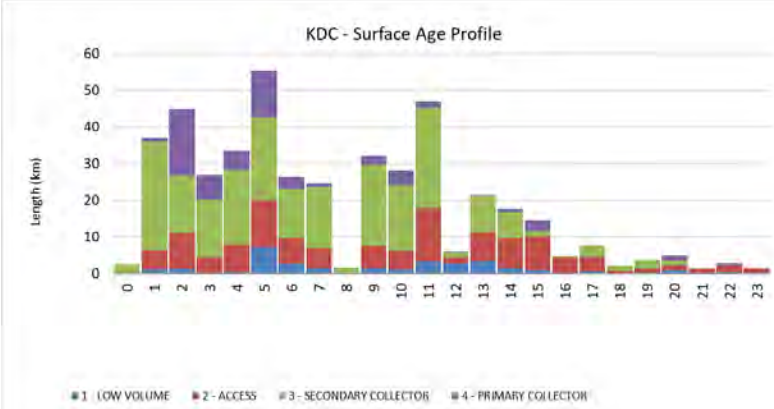
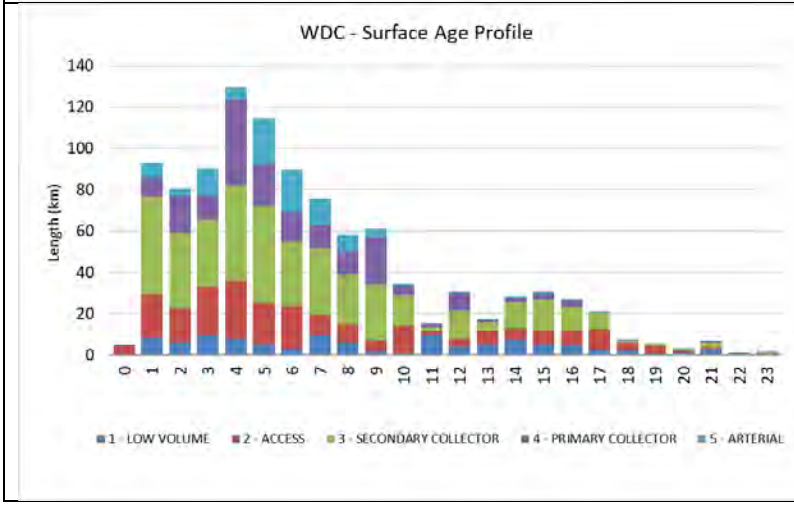
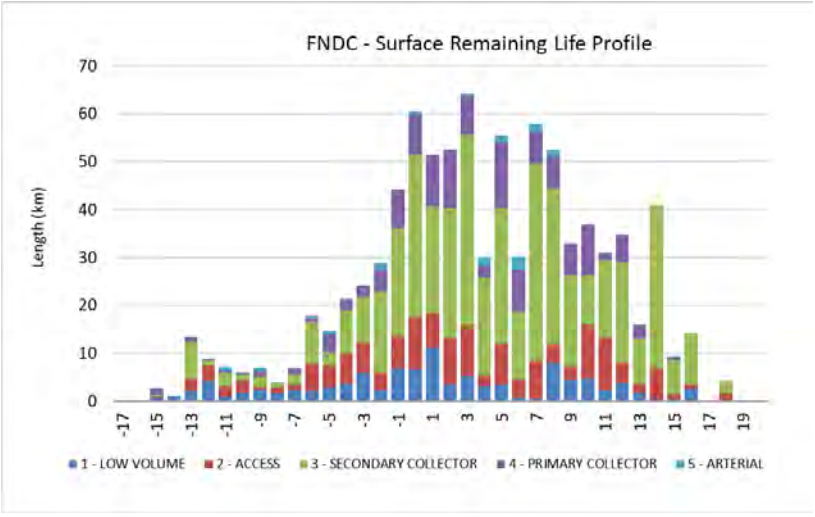
Surface Age Profile	
	KDC similar issue to FNDC but not to the came extent. This is relatively young profile but the there is a still a large quantity of first coats on the network that require resurfacing. This remains the key driver to this plan.
	WDC shows a relatively young surface age. This is due in part to the large void fill/texturiser content on the network, refer LoS Analysis surface age review. These have shorter design life and are a treatment that prepares the surface to apply a more robust longer life surface. If these surfaces are not surfaced at the right time these become a maintenance issue and require a second Void/texture seal to prepare the site again.

Figure 4-7: Surface Age Profile

This is reflected in the remaining surface life profile of the network on the network. However, there is still a number of long life seals that are excessively beyond their useful life.

Remaining Surface Life Profile	
	FNDC have a significant quantity of Primary collector network in terms of resurfacing either beyond or approaching end of life. This is where the proposed programme is targeted to reduce long-term maintenance.

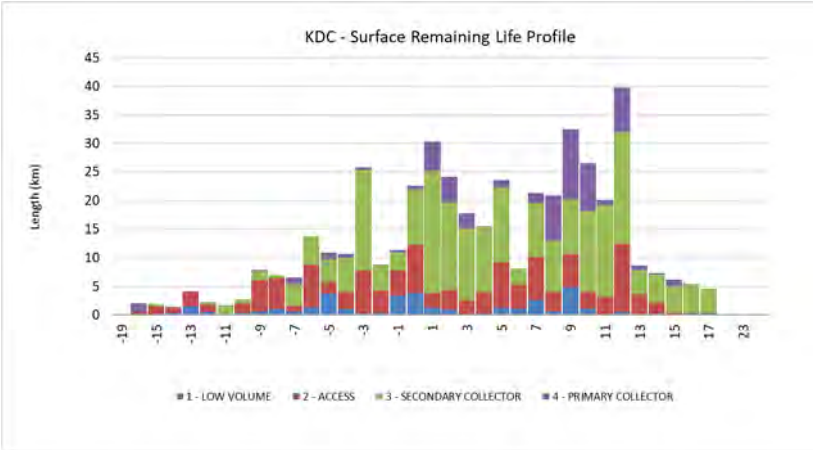
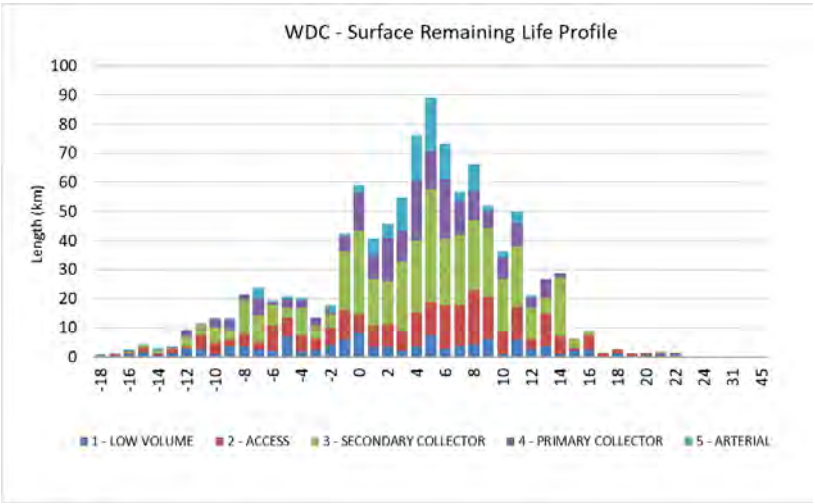
	KDC remaining surface life profile reflects the quantity of first coat seals on the network that have expired. As noted under LoS analysis this remains the target of this plan with an expectation that this will be in a steadier state by the end of the 3 year period.
	WDC have approximately 40km of long-life seal beyond useful life. This is being targeted in the programme, however, this may be stretched further to accommodate intervening on void fill and texturiser seal that are more vulnerable to deterioration after 4 years

Figure 4-8: Remaining Surface Life Profile

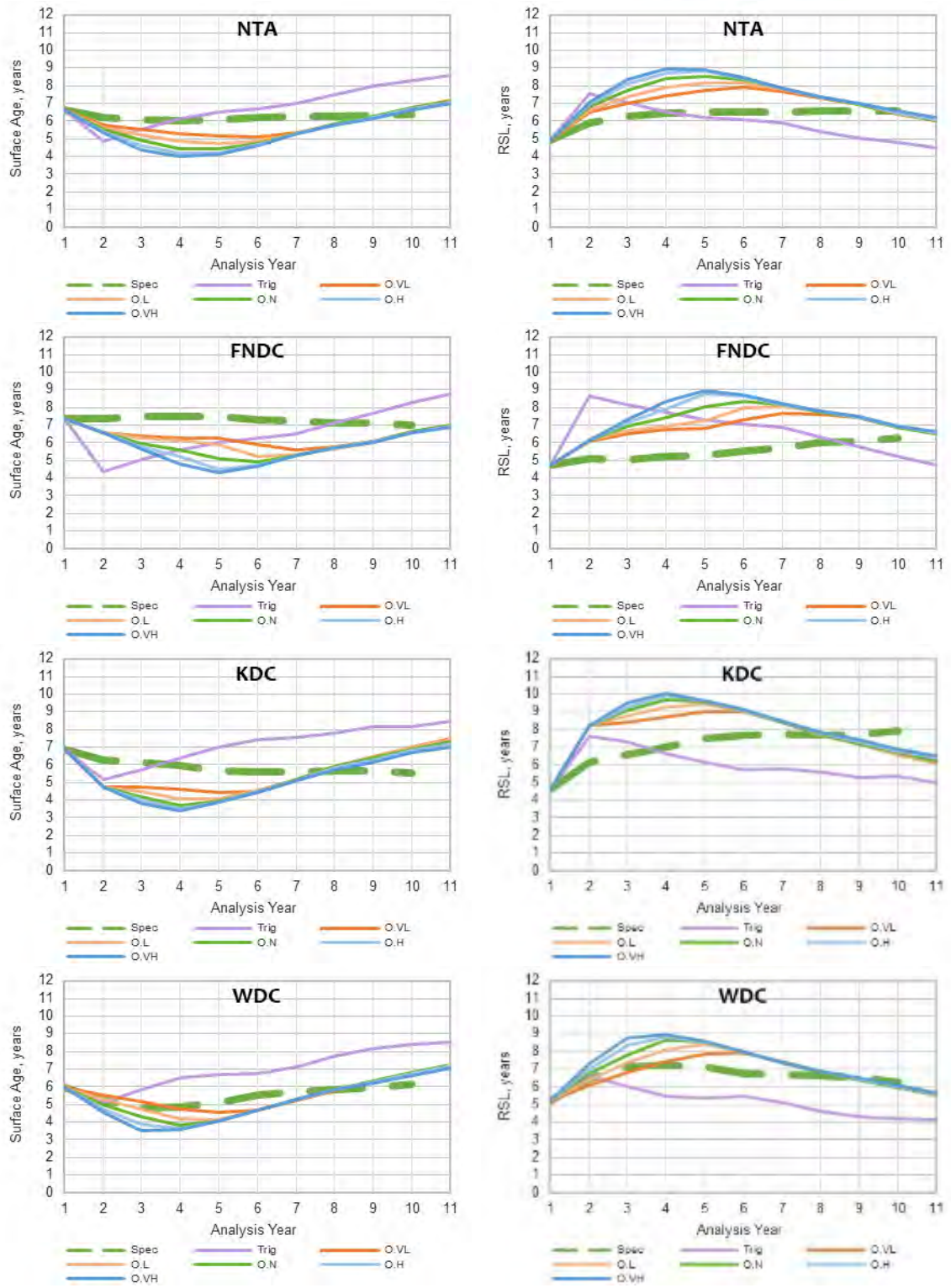
4.17.2.1 Option Assessment Surface Life Outcomes

The average seal age remains constant. The selected 'Specified" programme provides a slightly lower age profile, however this programme is yet to be fully revised down to target reseal length of approximately 90km in the first three years with expected reduction to approximately 70-80km.

The following shows the network average surface age and remaining surface life (RSL) predictions for the networks.

The Specified programme is able to improve the RSL over the long term and can maintain or slightly improve the average age for each network.

The model predicted network surface age enters a phase of cyclic fluctuation at the start of the analysis period. Each scenario (aside from Specified) completes large amounts of RSEAL treatment during the first non-committed year. The optimised scenarios continue with a focus on RSEAL treatments into the second, third, and for some scenarios, the fourth non-committed years. Each optimised scenario has a similar surface age forecast by the end of the analysis period because there is adequate funding to do RSEAL, even at low funding levels. The average chipseal age starts to level out at around 7 years by the end of the analysis period regardless of the budget scenario.



Network weighted average surface age **Network weighted average remaining surface life (RSL)**

The Surface Integrity Index (SII) is a composite index for pavement surface conditions. The scale of this index is 0 (excellent) to 100 (very poor). SII is a function of the following:

- Surface age, which is activated when the design life is expired; and
- Surface condition, which includes cracking, flushing and potholes.

Figure below shows the predicted network average SII for all budget scenarios. The smaller the value the better the condition.

The predicted average SII is improved throughout the analysis period for all optimised budget scenarios. The system is designed to prioritise resurfacing first, then with more funding available it will start undertaking rehabilitation treatments. The resurfacing treatments, especially chipseal, are priority treatments because they offer asset preservation and improvement (when required) at the most economic price.

Some of the SII improvement can be attributed to treatment of old/aged surfaces and the application of routine maintenance within the model, particularly crack repairs.

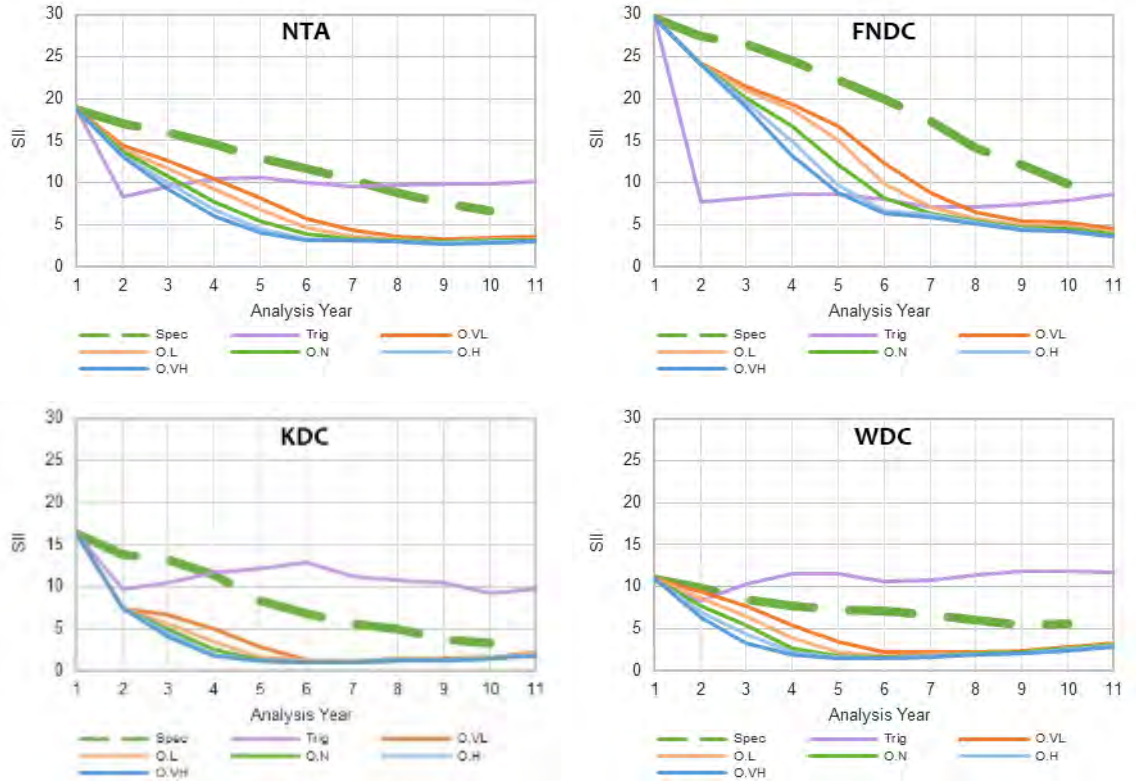


Figure 4-9: Network weighted average SII

The predicted median for the optimised scenarios is a zero value, i.e. the majority of treatment lengths have an SII of 0 (excellent) at any given time. It is normal for surfaces to have excellent or good SII for much of the life span and SII starts to deteriorate toward the end of the surface's useful life.

4.17.3 Rutting

The network average rutting profile is presented in **Figure 4-10** below. This shows that the secondary network has the highest proportion of rutting in the network. This aligns with the rehab investment profile for year one of the programme. In terms of network condition the rut profile is average to poor at 4mm across the 1037 km of network is significant.

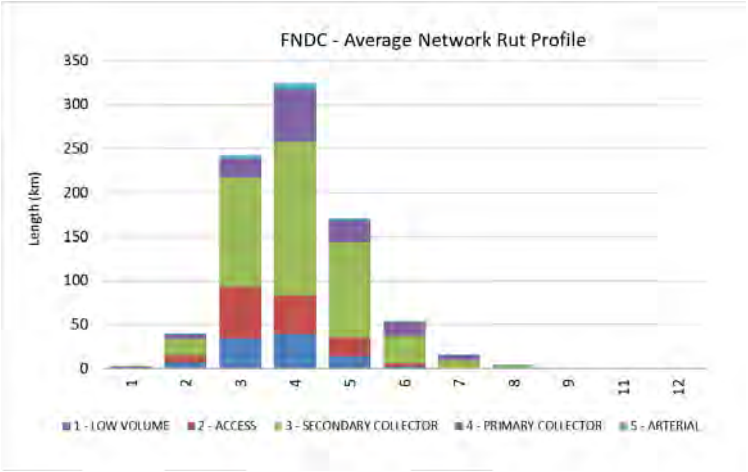
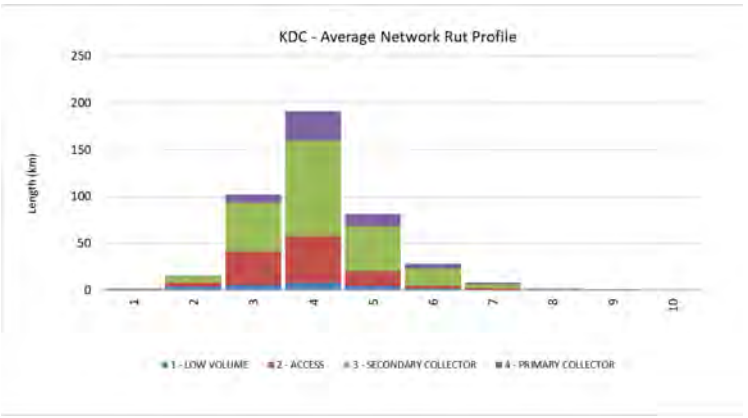
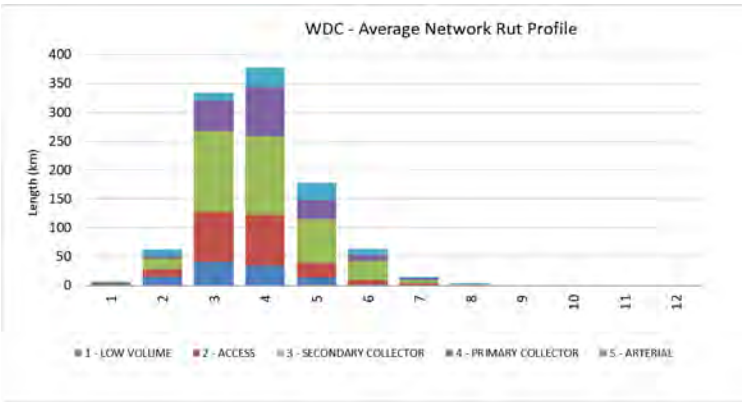
Average Network Rutting Profile (mm)	
	FNDC network average rutting profile shows that the secondary network has the highest proportion of rutting in the network. This aligns with the rehab investment profile for year one of the programme. In terms of network condition, the rut profile is average to poor at 4mm across the 879km of network is significant.
	KDC network average rutting profile shows that the secondary network has the highest proportion of rutting in the network. This aligns with the rehab investment profile for the term of this plan. In terms of network condition, the rut profile is average to poor at 4mm across the 879km of network is significant.
	WDC network average rutting profile shows that the secondary network has the highest proportion of rutting in the network. This aligns with the rehab investment profile for year one of the programme. In terms of network condition, the rut profile is average to poor at 4mm across the 1042 km of network is significant.

Figure 4-10: Average Network Rut Profile

When we consider this further and extract just the length of rutting greater than 20mm in depth **Figure 4-11**, which is reaching terminal pavement failure, this is increasing year on year for all ONRC apart from primary collector. The concerning issue is the growth rate of deep rutting on the network in 3 years of high speed data collection is in the order of 20%.

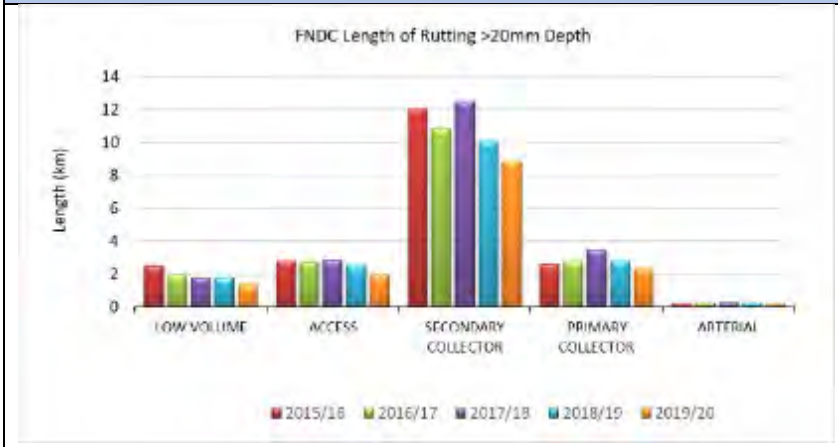
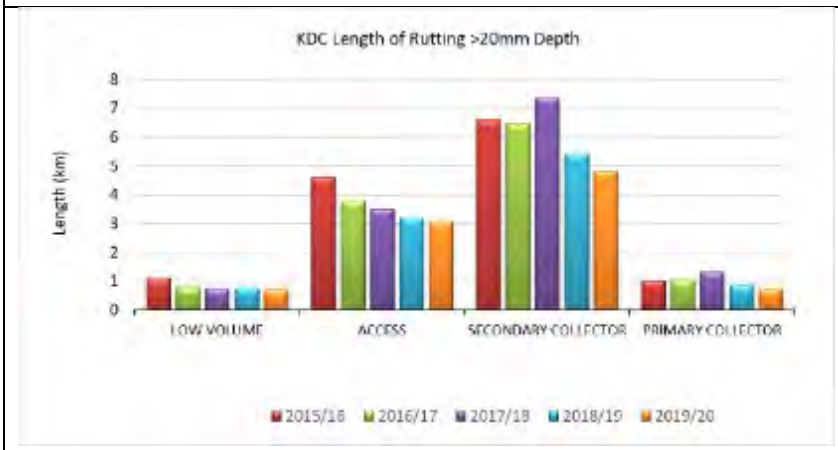
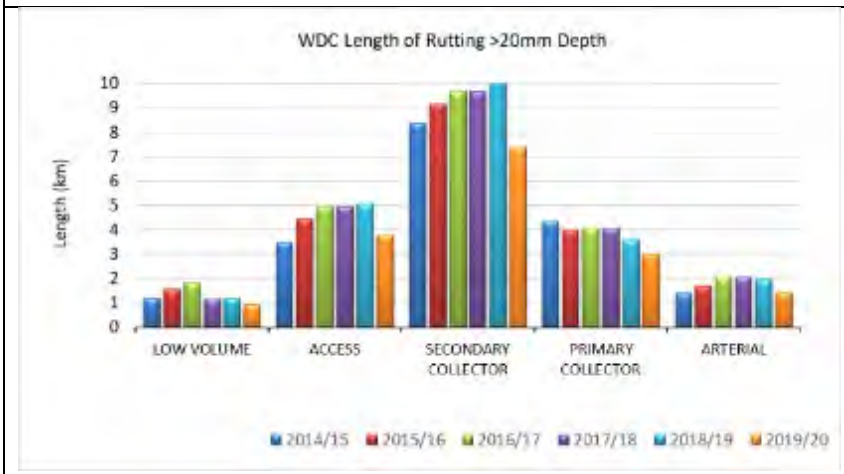
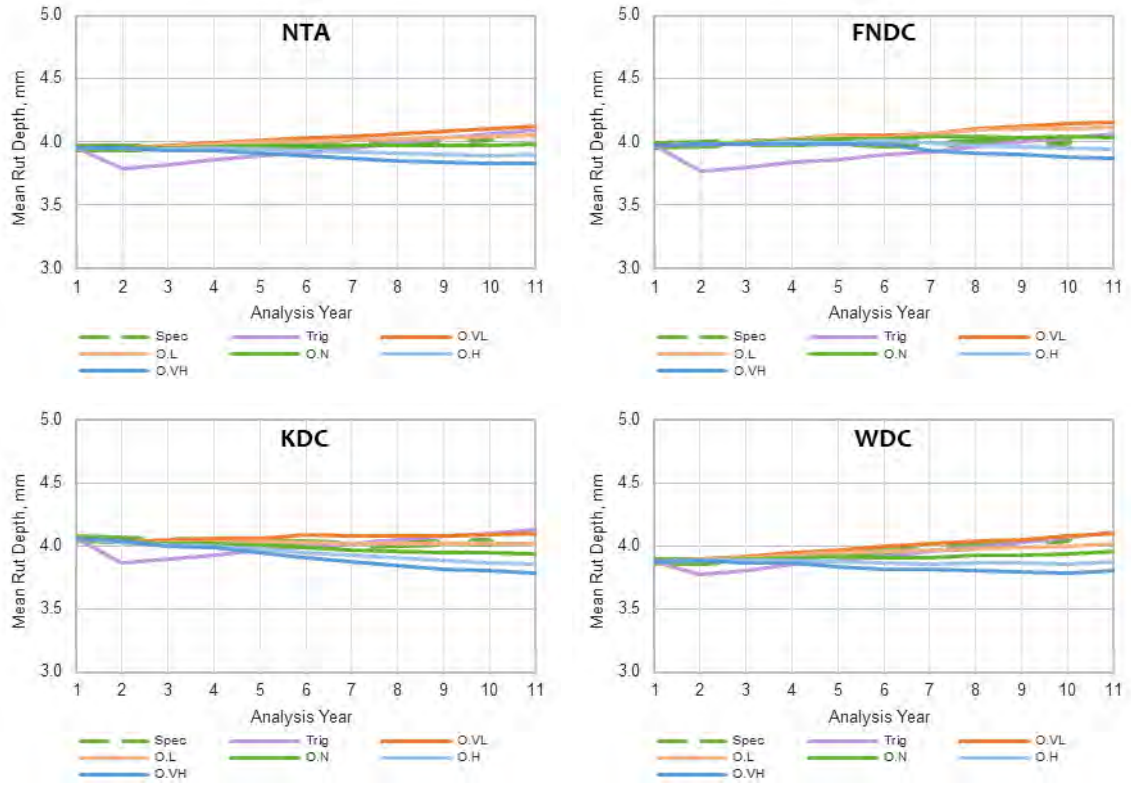
Length of Rutting >20mm	
	FNDC length of rutting greater than 20mm in depth, reaching terminal pavement failure, is generally static and declining. The last plan has manged to arrest the rutting issues. However, the length of network greater than 20mm rutting is still concerning and represent a large quantity and requires continued delivery of the this plan as proposed.
	KDC length of rutting greater than 20mm in depth, reaching terminal pavement failure, is generally declining. The last plan has manged to arrest the rutting issues and target eh rehab treatment where it is required. The length of network greater than 20mm rutting is still concerning and represent a large quantity.
	WDC length of rutting greater than 20mm in depth, reaching terminal pavement failure, was increasing year on year for all ONRC apart from primary collector. The last plan has manged to arrest the rutting issue these routes. However the length of network greater than 20mm rutting is still concerning and represent a large quantity.

Figure 4-11: Rutting >20mm in Depth

4.17.3.1 Option Assessment Rutting Outcome

The following shows the predicted network average rutting over the analysis period. Each network shows a slight improvement in rutting at the higher funding levels. The optimised normal scenario (Normal funding level) is able to maintain network average rutting at current levels. The majority of the network length is beneath the model resurfacing treatment reset thresholds, hence the average rutting would be able to increase regardless of the optimised resurfacing programme. However, the amount of rehabilitation treatments forecast does have an impact on average rutting predictions.

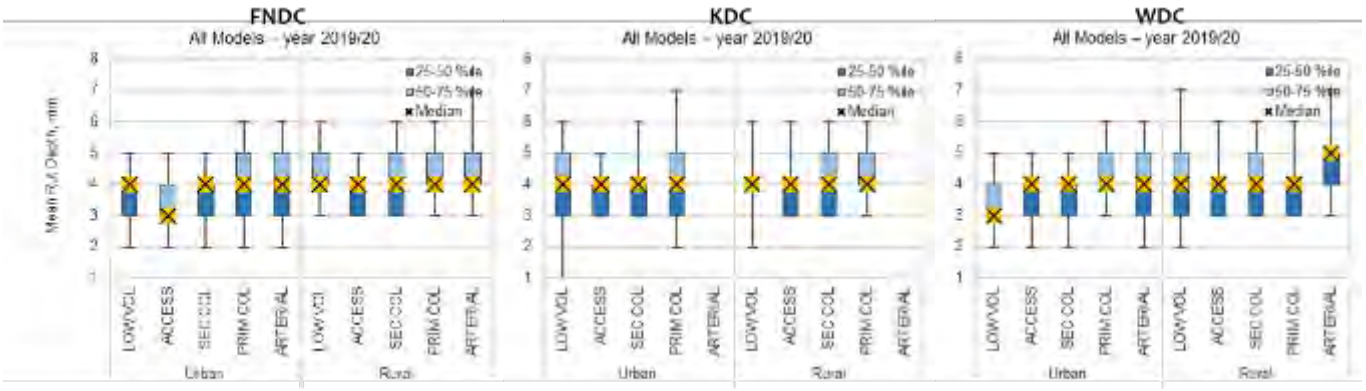


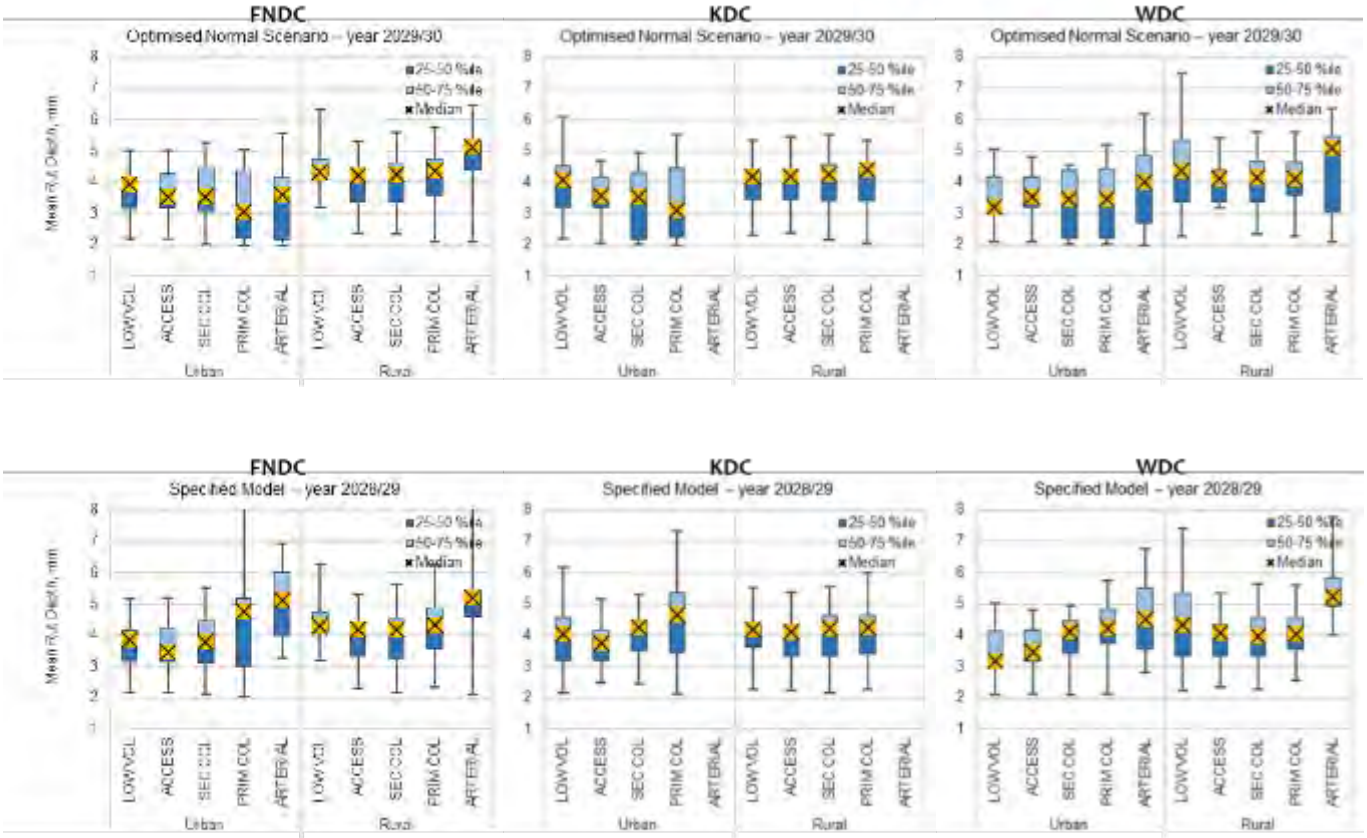
Network weighted average rutting

The following figures show the predicted median and interquartile range mean rut depth distributions for the ONRC, as at the end of year 2019/20 (and initialised for all of the models), and predicted for the end of year 2029/30 by the optimised normal scenario, and predicted for the end of year 2028/29 for the specified programme.

The optimised median values have deteriorated slightly for most rural ONRC because most current rutting values are beneath the resurfacing reset thresholds. The median values have held stable or slightly improved for the urban ONRC (which is a consequence of treatments done to target high roughness). The worst quartile, above the 75th percentile range, of rutting has been improved or has been held near steady by the Optimal Model in almost all cases.

The networks are mostly low traffic volume but with routes that cater for HCV's (forestry and quarries). The current condition of the network is generally reasonable and parts can absorb some deterioration. However, this may not be sustainable and the risk for the network is the consumption of the good condition and the ability of the pavement to absorb further deterioration, this may lead to further and increased rates of deterioration.

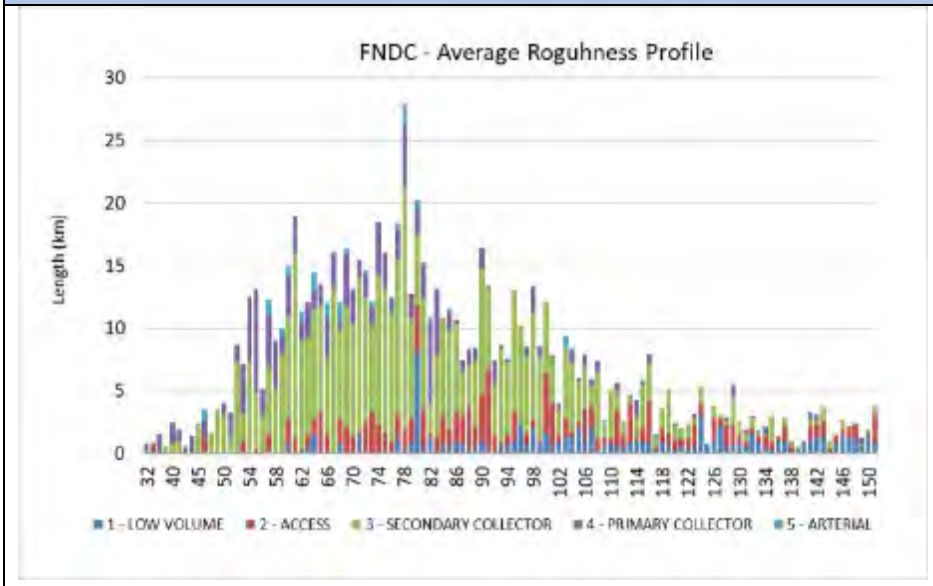




Mean rut depth distribution for ONRC; current 2019/20 and predicted for 2030/31 by the optimal model normal scenario (Normal funding)

4.17.4 Roughness

The following provides an overview of the current state of the network and the modelled option assessment for the NTA networks.

Average Roughness Profile	
	FNDC average roughness profile shows a long tail which indicates a rougher riding network. The large majority of this is Access Low Volume. However as indicate under LoS analysis STE and peak roughness remains a focus to improve ride quality, given the vulnerable user issue.

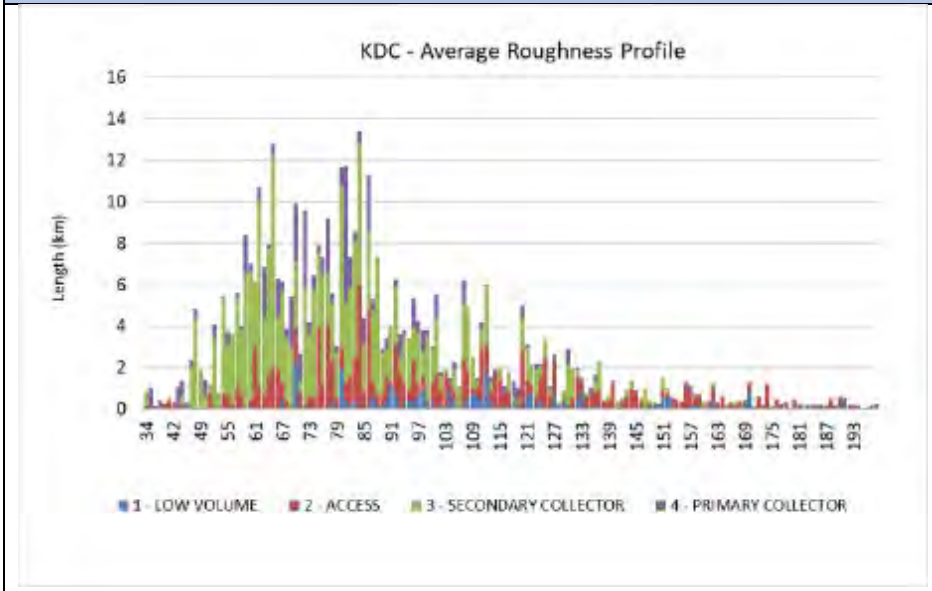
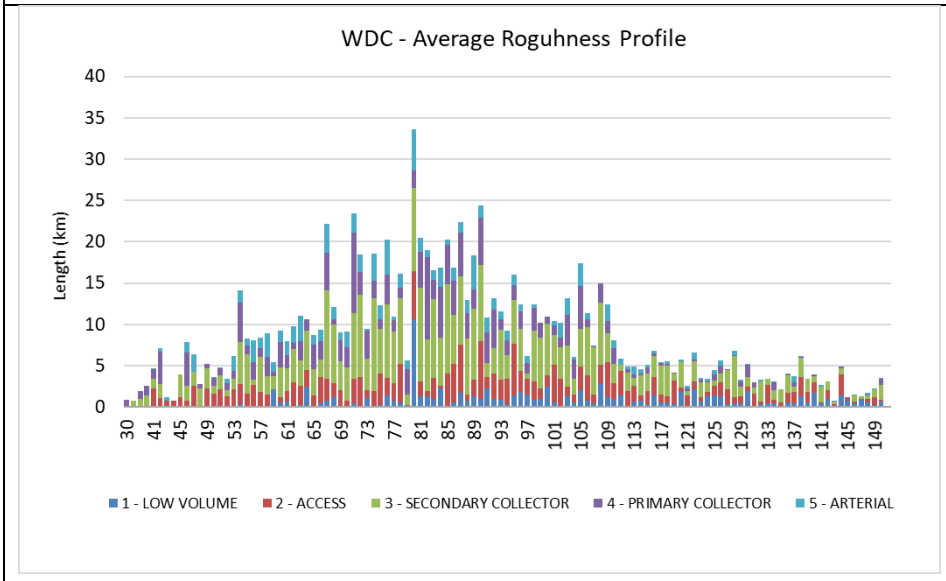
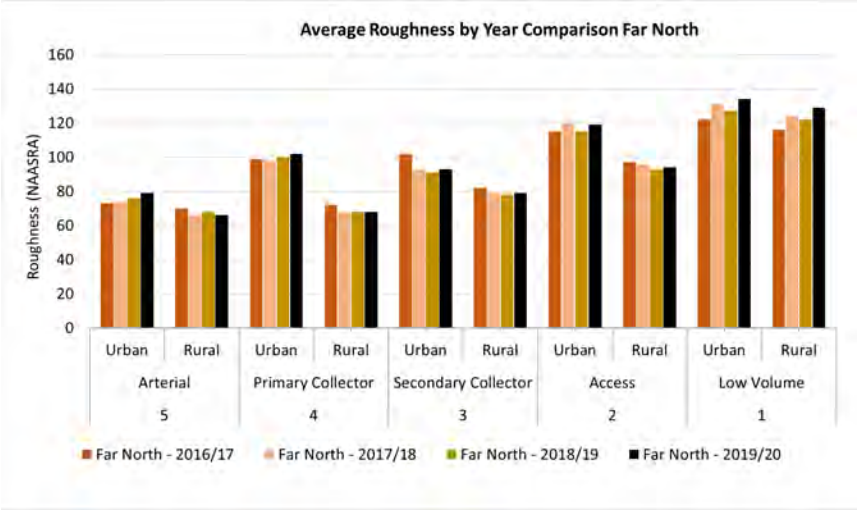
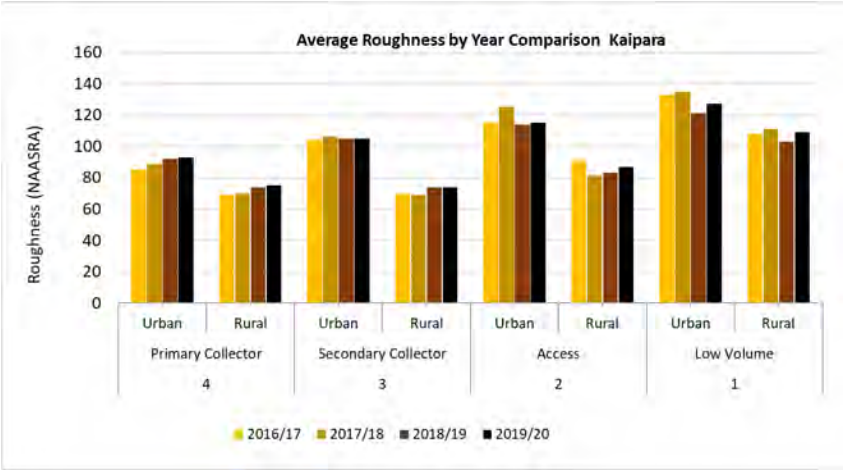
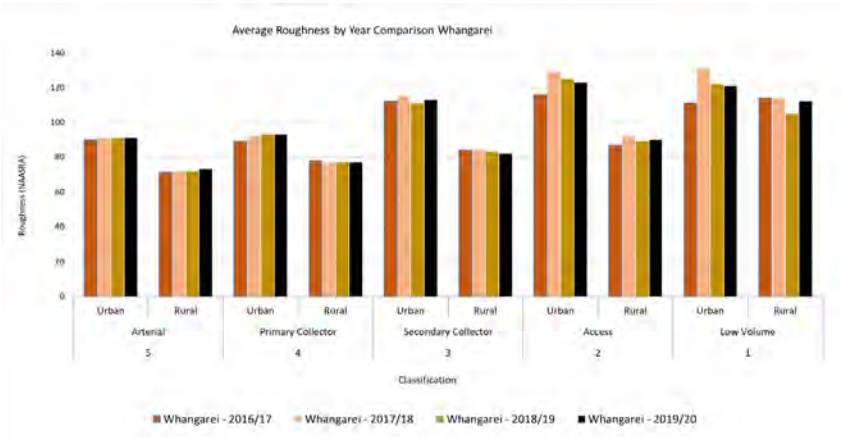
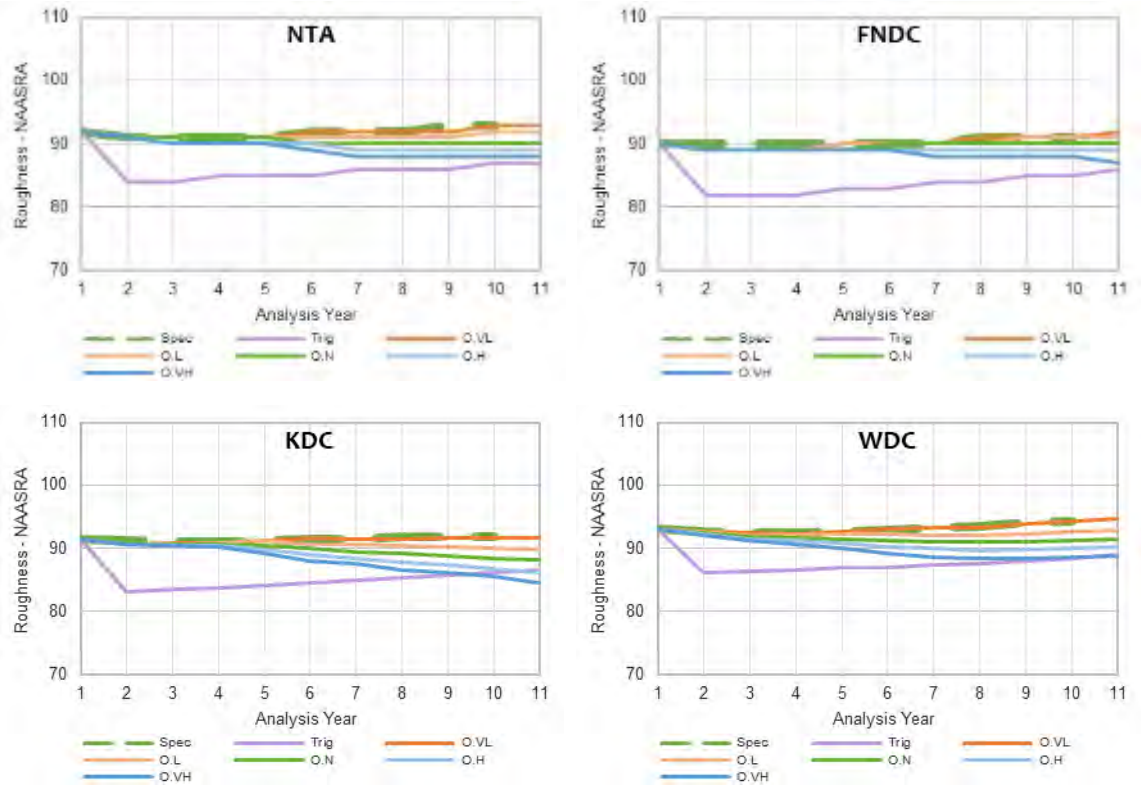
Average Roughness Profile	
	KDC average roughness profile shows a long tail which indicates a rougher riding network. The large majority of this is Access Low Volume. However as indicate under LoS analysis STE and peak roughness remains a focus to improve ride quality, given the vulnerable user issue.
	WDC average network distribution for roughness. As shown there is some high levels of roughness on the arterials, primary and secondary network.

Figure 4-12: Average Network Roughness Profile

Average Roughness Comparison Urban/Rural Year on Year	
	FNDC, as noted the Access and Low Volumes network are deteriorating. As discussed under LoS analysis is not a significant issue however, FNDC is out of step with its peer group and there are issue around ride quality on these networks.
	KDC has a general increase in roughness across all classes. Of concern is the rural network. As set out this plan looks to manage the increase and bring the KDC network back alignment with its peer group.
	WDC average roughness is trending up in the Access Low Volume rural network. Again ride quality remains a concern and being out of step with its peer group.

4.17.4.1 Option Assessment Roughness Outcomes

Figures below shows the predicted network average roughness over the analysis period. Each network shows a slight improvement in roughness at the higher funding levels. The optimised normal scenario (Normal funding level) is able to maintain network average roughness at current levels. The majority of the ONRC networks are beneath the model resurfacing treatment reset thresholds, hence the average roughness would be able to increase regardless of the optimised resurfacing programme. However, the amount of rehabilitation treatments forecast does have an impact on average roughness predictions.



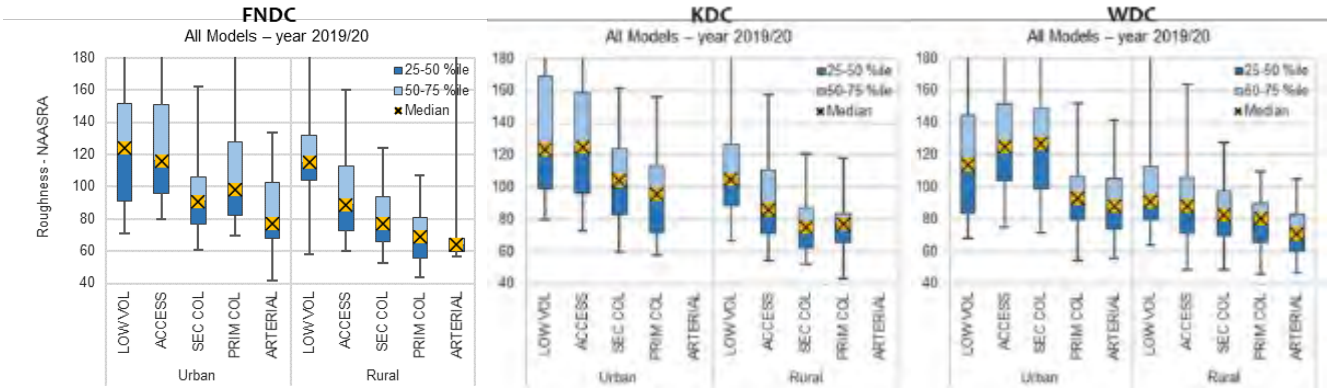
Network weighted average roughness

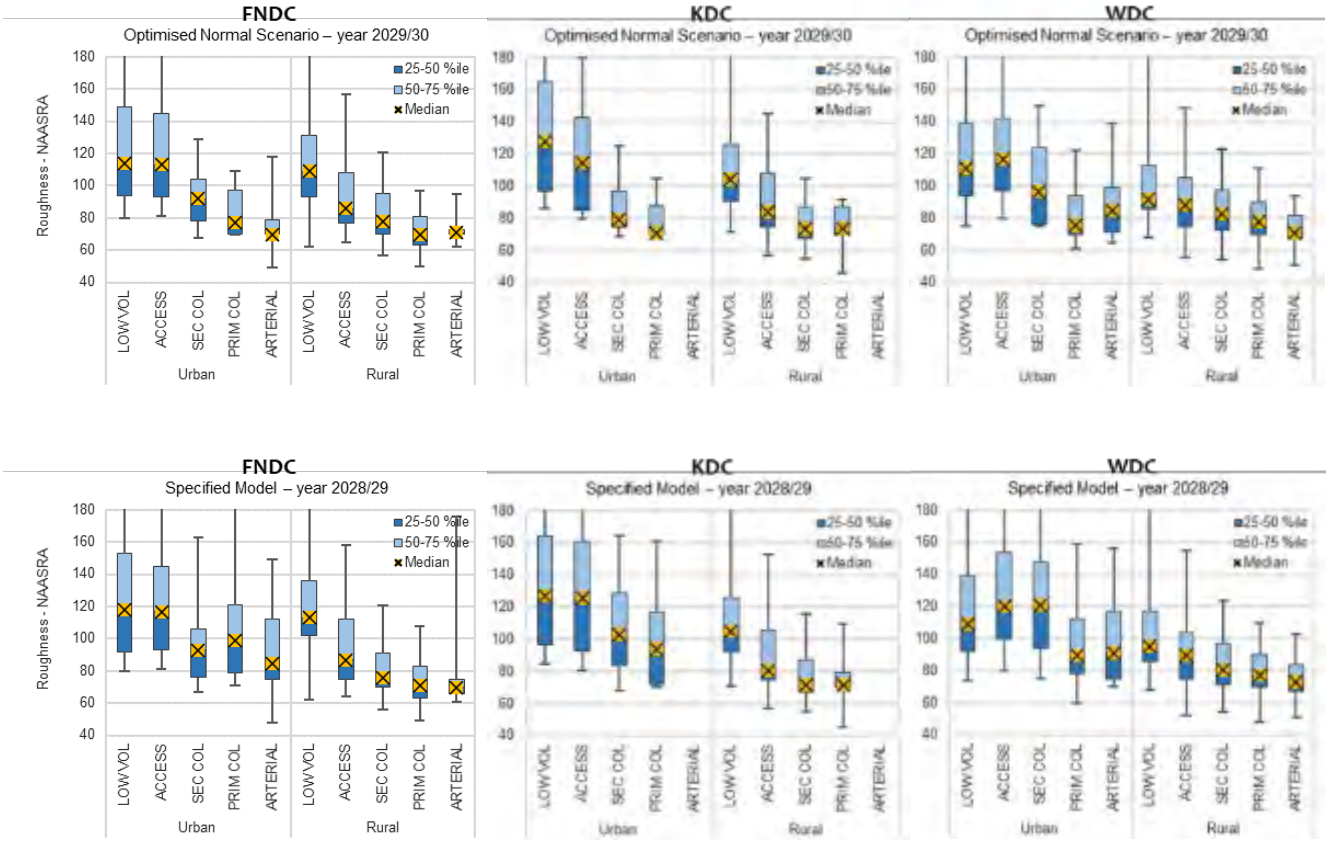
Following figures shows the predicted median and interquartile range roughness distributions for the ONRC, as at the end of year 2019/20 (and initialised for all of the models), and predicted for the end of year 2029/30 by the optimised normal scenario, and predicted for the end of year 2028/29 for the specified programme.

The median values have been maintained by the Optimal Model at current levels for the rural ONRC. This is because most current roughness values are beneath resurfacing reset thresholds and there is limited scope for roughness improvement within the model.

The median values have held stable or improved for the urban ONRC, with improvement reflecting current roughness values that are relatively high. The WDC urban secondary collector roads in particular have been improved by optimisation.

The specified programme outcomes compare favourably to the current roughness distributions. The specified programme is 'sub-optimal' within the Model and is expected to perform worse than an optimised programme at a similar funding level. The higher category urban ONRC roughness tend to perform worse than the optimised programme. However, the other ONRC categories have similar outcomes.





Roughness distribution for ONRC; current 2019/20 and predicted for 2030/31 by the optimal model normal scenario (Normal funding)

The tables above also shows the predictive model outcomes and shows an increase in network average base on the investment profile. This is also in keeping with the observed average roughness trend.

4.17.5 Options Assessment Programmes

Tables 6-1, 6-2, 6-3 following summarise the FNDC, KDC, WDC cost and length of model analysis results, the current achievement and funding levels, and the suggested programme.

Far North District Council – Options Outcome

Table 4-3: FNDC model averages, current practice, and suggested programmes

Treatment		Trigger Model	Optimised Programme					Current Practice	**Suggested**
			VH	H	N	L	VL		
			$7.8M	$6.9M	$6.0M	$5.1M	$4.2M		
RHAB	Length, km	6.7	7.9	5.8	3.5	1.7	1.0	6.5 – 12.2	5.0 – 7.0
	% of network length	0.8%	0.9%	0.7%	0.4%	0.2%	0.1%	0.7% – 1.4%	0.6% – 0.8%
	Cost, $M	2.4	3.2	2.4	1.6	0.9	0.5	2.9 – 7.5	2.2 – 3.1
2ndCoat	Length, km	9.8	8.7	7.4	6.0	4.6	4.2	(in RS)	(in RS)
	Cost, $M	0.4	0.4	0.3	0.3	0.2	0.2		
RSEAL	Length, km	46	61	62	62	63	63	59 – 68	69
RS. & 2ndC.	% of chipseal length	6.5%	8.1%	8.1%	8.0%	7.9%	7.8%	6.9% – 7.9%	8.1%
RSEAL	Cost, $M	2.2	2.8	2.8	2.9	2.9	2.9	2.7 – 3.1	3.2

TAC	Length, km	1.6	2.3	2.3	2.2	2.1	1.8	1.0 – 2.5	2.0 – 2.5
	% of asphalt length	6.4%	9.2%	9.2%	9.1%	8.6%	7.2%	4.1% – 10.0%	8.1% – 10.0%
	Cost, $M	1.1	1.4	1.5	1.4	1.4	1.2	0.6 – 1.6	1.3 – 1.6
Total	Length, km	64	80	77	74	71	69	67 – 83	76 – 79
	% of network length	7.3%	9.1%	8.8%	8.4%	8.1%	7.9%	7.6% – 9.4%	8.7% – 8.9%
	Cost, $M	6.1	7.8	7.0	6.2	5.4	4.7	6.2 – 10.2	6.7 – 7.9

A suggested programme for FNDC is based on the analysis of model outcomes to assess the long-term renewals need for the network. It is suggested the annual expenditure should be in the order of $6.7 to $7.9 million per year based on the following:

Resurfacing Renewal – Chipseal: 69 km ($3.2 million)

The range of Optimal Model average annual chipsealing (RSEAL plus 2ndCoat) is 67 to 69 km ($3.1 to $3.2 million). The Normal scenario forecast is 68 km.

The reseal quantities reached a steady level (where there is diminishing additional quantities with increased funding) at the lowest funding level.

The reseal treatment is a priority because it offers asset preservation and some improvement (when required) at the most economic price.

A suggested 69 km is 8.1% of the chipseal network length per year. This amount is more than the past 5 years achievement. A greater amount is needed to cater for sealed network expansion (at least 20 km greater length during the past five years), and ensure second coat seals are catered for, and the age-based backlog quantity does not grow and become unmanageable in the future. 69 km per year will result in a chipseal life-cycle of 12.4 years. The suggested amount of chipseal treatments is affordable at the current budget of $6 million.

Resurfacing Renewal – Asphalt: 2.0 to 2.5 km ($1.3 to $1.6 million)

The range of Optimal Model average annual asphalt surface renewal (TAC) is 1.8 km to 2.3 km ($1.2 to $1.5 million). The Normal scenario forecast is 2.2 km. The TAC quantities reached a steady level at the High scenario. There is also some additional TAC quantities forecast by the model within the rehabilitation treatments.

A suggested 2.5 km is 10% of the asphalt network length per year. This amount of asphalt treatments is required to cater for the existing asphalt surfaces that are currently at or near end of useful life. The suggested amount of asphalt treatments are only affordable at the current budget if the rehabilitation treatments are reduced to make the funding available for the additional treatment length when compared to historic achievement (about 1 km average during the last 10 years).

Rehabilitation Renewals: 5.0 to 7.0 km ($2.2 to $3.1 million)

The range of Optimal Model average annual rehabilitation (RHAB) is 1.0 to 7.9 km ($0.5 to $3.2 million). The Normal scenario forecast is 3.5 km.

The amount of RHAB treatments prioritised to the programme over a ten year period with the Normal budget is low. This is a financial constraint as the model needed to cater for resurfacing needs first for the preservation and greater good of the network.

It is not realistic to expect a network to be managed over a long period of time without the need for rehabilitation treatments.

Based on RAMM data, over the last ten years, the average annual pavement base achievement was 12.2 km (1.4% of the network). The RAMM data includes recent seal extension and new pavements completed, which will overstate the historic pavement renewal achievement. The achievement of pavement renewals is much less than what pavement age data suggests and this makes it difficult to quantify the amount of recent rehabilitation achievement.

A suggested range of 5.0 km to 7.0 km is in line with current practice, the optimised programme with higher funding and the Trigger Model outcome.

The annual cost for an allowance of 7.0 km is $3.1 million. This will result in a pavement base life-cycle of 125 years.

Kaipara District Council – Options Outcome

Table 4-4: KDC model averages, current practice, and suggested programmes

Treatment		Trigger Model	Optimised Programme					Current Practice	Suggested
			VH	H	N	L	VL		
			$4.55M	$4.025M	$3.5M	$2.975M	$2.45M		
RHAB	Length, km	4.6	7.5	6.1	4.7	3.4	2.2	3.8 – 8.7	4.0 – 5.0
	% of network length	1.0%	1.6%	1.3%	1.0%	0.7%	0.5%	0.8% – 1.9%	0.9% – 1.1%
	Cost, $M	1.6	2.6	2.2	1.7	1.3	0.8	1.4 – 3.2	1.5 – 1.8
2ndCoat	Length, km	9.8	10.1	9.2	8.2	7.5	6.8	(in RS)	(in RS)
	Cost, $M	0.5	0.5	0.5	0.4	0.4	0.3		
RSEAL	Length, km	16	28	28	29	29	29	35 – 40	36 – 37
RS. & 2ndC.	% of chipseal length	5.8%	8.4%	8.3%	8.2%	8.0%	7.9%	7.7% – 8.9%	8.0% – 8.2%
RSEAL	Cost, $M	0.8	1.4	1.4	1.4	1.4	1.4	1.7 – 2.0	1.8 – 1.8
TAC	Length, km	0.4	0.5	0.5	0.5	0.6	0.6	0.2 – 0.5	0.5
	% of asphalt length	8.5%	11.6%	11.4%	11.4%	13.2%	13.0%	4.9% – 12.7%	10.0%
	Cost, $M	0.2	0.2	0.2	0.2	0.2	0.2	0.1 – 0.2	0.2
Total	Length, km	31	46	44	42	40	39	39 – 49	41 – 43
	% of network length	6.8%	10.1%	9.7%	9.2%	8.8%	8.4%	8.6% – 10.8%	8.9% – 9.3%
	Cost, $M	3.0	4.7	4.2	3.8	3.3	2.8	3.2 – 5.4	3.5 – 3.8

A suggested programme for KDC is based on the analysis of model outcomes to assess the long-term renewals need for the network. It is suggested the annual expenditure should be in the order of $3.5 to $3.8 million per year based on the following:

Resurfacing Renewal – Chipseal: 36 to 37 km ($1.8 million)

The range of Optimal Model average annual chipsealing (RSEAL plus 2ndCoat) is 36 to 38 km ($1.8 to $1.9 million). The Normal scenario forecast is 37 km.

The reseal quantities reached a steady level (where there is diminishing additional quantities with increased funding) at the lowest funding level.

The reseal treatment is a priority because it offers asset preservation and some improvement (when required) at the most economic price.

A suggested 37 km is 8.2% of the chipseal network length per year. This amount is about the same as the past 5 years achievement. This is needed to ensure second coat seals are catered for, and the age-based backlog quantity does not grow and become unmanageable in the future. 37 km per year will result in a chipseal life-cycle of 12.2 years. The suggested amount of chipseal treatments is affordable at the current budget of $3.5 million.

Resurfacing Renewal – Asphalt: 0.5 km ($0.2 million)

The range of Optimal Model average annual asphalt surface renewal (TAC) is 0.5 km to 0.6 km ($0.2 million). The Normal scenario forecast is 0.5 km. The TAC quantities reached a steady level at the lowest funding level.

A suggested 0.5 km is 10% of the asphalt network length per year. This amount of asphalt treatments is required to cater for the existing asphalt surfaces that are currently at or near end of useful life. The suggested amount of asphalt treatments is affordable at the current budget of $3.5 million.

Rehabilitation Renewals: 4.0 to 5.0 km ($1.5 to $1.8 million)

The range of Optimal Model average annual rehabilitation (RHAB) is 2.2 to 7.5 km ($0.8 to $2.6 million). The Normal scenario forecast is 4.7 km.

The amount of RHAB treatments prioritised to the programme over a ten year period with the Normal budget is similar to the Trigger Model.

Based on RAMM data, over the last ten years, the average annual pavement base achievement was 8.7 km (1.9% of the network). The RAMM data includes recent seal extension and new pavements completed, which will overstate the historic pavement renewal achievement. The achievement of pavement renewals is much less than what pavement age data suggests and this makes it difficult to quantify the amount of recent rehabilitation achievement.

A suggested range of 5.0 km to 7.0 km is in line with current practice, the optimised programme, and the Trigger Model outcome.

The annual cost for an allowance of 5.0 km is $1.8 million. This will result in a pavement base life-cycle of 91 years.

Whangarei District – Options Outcome

Table 4-5: WDC model averages, current practice, and suggested programmes

Treatment		Trigger Model	Optimised Programme					Current Practice	Suggested
			VH	H	N	L	VL		
			$11.7M	$10.35M	$9.0M	$7.65M	$6.3M		
RHAB	Length, km	11.5	14.1	11.4	8.8	6.3	3.6	4.3 – 10.2	8.0 – 9.0
	% of network length	1.1%	1.3%	1.1%	0.8%	0.6%	0.3%	0.4% – 1.0%	0.7% – 0.8%
	Cost, $M	5.7	6.8	5.5	4.2	2.9	1.6	2.1 – 4.8	3.8 – 4.3
2ndCoat	Length, km	12.4	14.8	12.2	9.8	7.8	5.7	(in RS)	(in RS)
	Cost, $M	0.5	0.6	0.5	0.4	0.3	0.2		
RSEAL	Length, km	41	67	68	69	70	71	91 – 93	82
RS. & 2ndC.	% of chipseal length	5.3%	8.1%	8.0%	7.8%	7.7%	7.6%	9.1% – 9.2%	8.1%
RSEAL	Cost, $M	1.5	2.4	2.5	2.5	2.6	2.6	3.4 – 3.5	3.0
TAC	Length, km	3.0	5.7	5.6	5.6	5.7	5.6	3.2 – 3.4	5.0 – 5.5
	% of asphalt length	4.9%	9.4%	9.3%	9.2%	9.4%	9.3%	5.2% – 5.6%	8.2% – 9.1%
	Cost, $M	1.0	1.9	1.9	1.9	1.9	1.9	1.1	1.7 – 1.8
Total	Length, km	68	102	98	93	90	85	99 – 107	95 – 97
	% of network length	6.4%	9.5%	9.1%	8.7%	8.4%	8.0%	9.2% – 10.0%	8.9% – 9.0%
	Cost, $M	8.7	11.7	10.3	9.0	7.6	6.3	6.6 – 9.4	8.5 – 9.1

A suggested programme for WDC is based on the analysis of model outcomes to assess the long-term renewals need for the network. It is suggested the annual expenditure should be in the order of $8.5 to $9.1 million per year based on the following:

Resurfacing Renewal – Chipseal: 82 km ($3.0 million)

The range of Optimal Model average annual chipsealing (RSEAL plus 2ndCoat) is 76 to 82 km ($2.8 to $3.1 million). The Normal scenario forecast is 79 km.

The reseal quantities reached a steady level (where there is diminishing additional quantities with increased funding) at the lowest funding level.

The reseal treatment is a priority because it offers asset preservation and some improvement (when required) at the most economic price.

A suggested 82 km is 8.1% of the chipseal network length per year. This amount is slightly less than the past 5 years achievement. The past 5 years achievement included a programme of short life void fill treatments as well as reseals needed to treat earlier void fills. A large void fill seal programme is not anticipated to continue into the future. The suggested amount is needed over a longer term and will ensure ongoing second coat seals are catered for, and the age-based backlog quantity does not grow and become unmanageable in the future. 82 km per year will result in a chipseal life-cycle of 12.3 years. The suggested amount of chipseal treatments is affordable at the current budget of $9 million.

Resurfacing Renewal – Asphalt: 5.0 to 5.5 km ($1.7 to $1.8 million)

The range of Optimal Model average annual asphalt surface renewal (TAC) is 5.6 km to 5.7 km ($1.9 million). The Normal scenario forecast is 5.6 km. The TAC quantities reached a steady level at the lowest funding level.

A suggested 5.5 km is 9.1% of the asphalt network length per year. This amount of asphalt treatments is required to cater for the existing asphalt surfaces that are currently at or near end of useful life. The suggested amount of asphalt treatments is affordable at the current budget of $9 million.

Rehabilitation Renewals: 8.0 to 9.0 km ($3.8 to $4.3 million)

The range of Optimal Model average annual rehabilitation (RHAB) is 3.6 to 14.1 km ($1.6 to $6.8 million). The Normal scenario forecast is 8.8 km.

The amount of RHAB treatments prioritised to the programme over a ten year period with the High budget is similar to the Trigger Model.

Based on RAMM data, over the last ten years, the average annual pavement base achievement was 10.2 km (1.0% of the network). The RAMM data includes recent seal extension and new pavements completed.

A suggested range of 8.0 km to 9.0 km is in line with recent achievement, current practice, the optimised programme at the normal funding level, and the Trigger Model outcome.

The annual cost for an allowance of 9.0 km is $4.3 million. This will result in a pavement base life-cycle of 119 years.

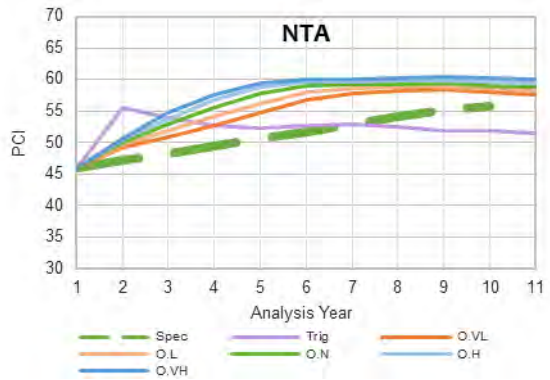
4.17.6 Programme Summary – Sealed Road Renewals

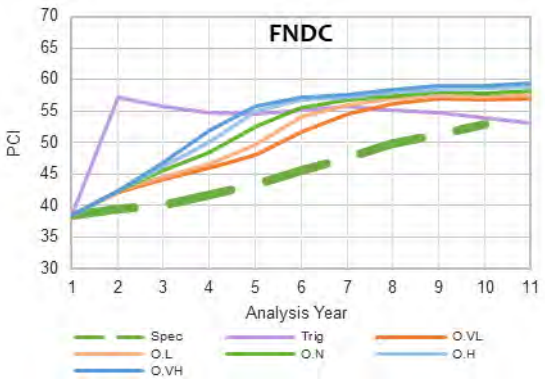
From the assessments above, the programmes developed through dTIMS analysis have been field validated and refined to match the actual need of the network and what we can afford. As a result of this field validation, we have adopted a slightly different (and generally lower) level of renewal than shown in the modelling. This is part of our optimisation process and will be further refined by our annual RAPT type process to further test and refine the programme.

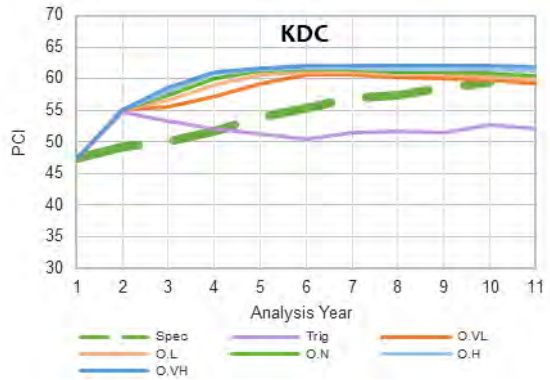
This evidenced through the model condition outcomes when testing the optimised field validated programme (specified programme) against the Optimised programmes (budget scenarios) testing different budget scenarios.

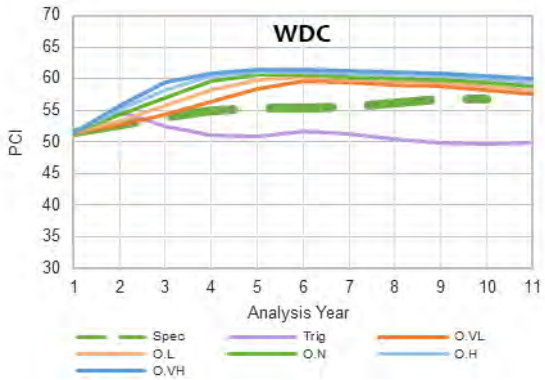
The key indicators of a balance and least whole of life investment profile can be seen through two key performance indicators. Pavement Condition Index (PCI) and Surface Integrity Index (SII).

In the case of the PCI, below, the bold dashed green line is the filed optimised specified programme which is continually field validated and challenged by experienced practitioners. This indicates that even through the higher investment models providing an increase level of service during the analysis period (10yrs), the resulting condition outcome at the end of year 10 is the same for both optimised models and specified programme. This mean the specified programme is delivering a more sustainable investment profile that recognises both Best Whole of Life Cost outcomes by recognising programme efficiencies to manage delivery costs e.g. grouping work to produce more bundle efficiency.

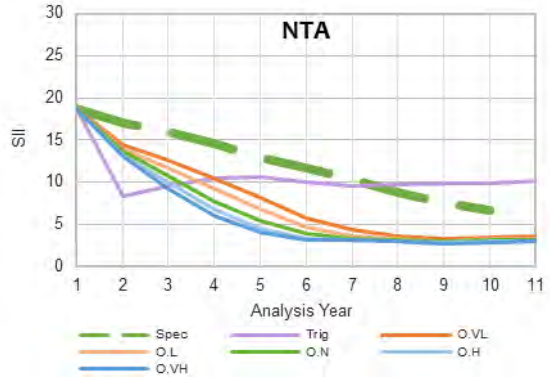


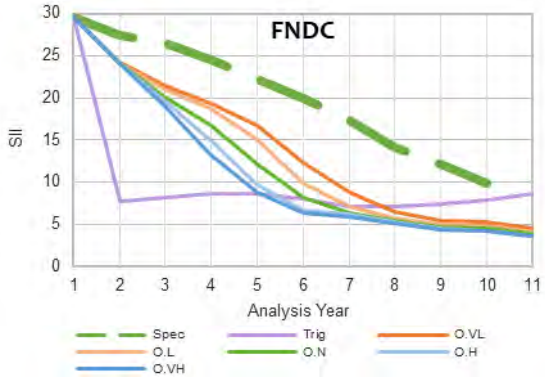


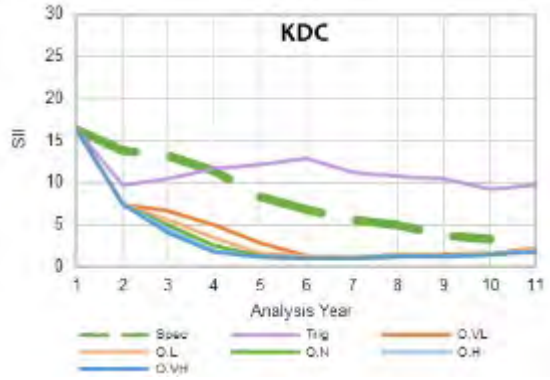


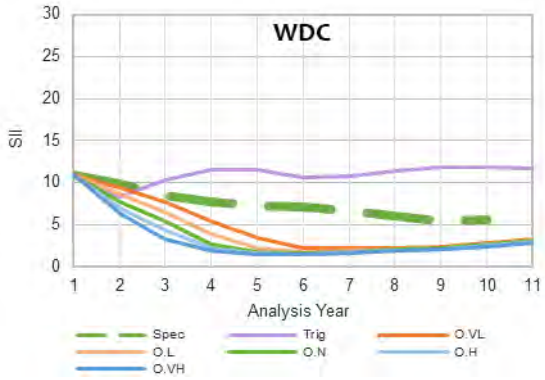


This can also be seen in the SII. Again a more stable programme approach to same outcome over he analysis period.









What also must be noted here is that each network is in a **different state of maturity**. The most mature network is the Whangarei DC network. This can be seen by comparing the condition score at year one for each network. For PCI, the Whangarei network starts slightly above 50 PCI, this would be considered average, compared to the Kaipara at 47, considered poor to average, and Far North DC at below 40, considered poor to very poor. This is true for the SII (reverse scale, less is better and 30 is very poor).

What can be seen is that from all of the forecasted specified programme outcomes is that they look to hold network in average condition, Whangarei, or bring each network into average condition (steady state service delivery) at the end of the 10 year analysis period.

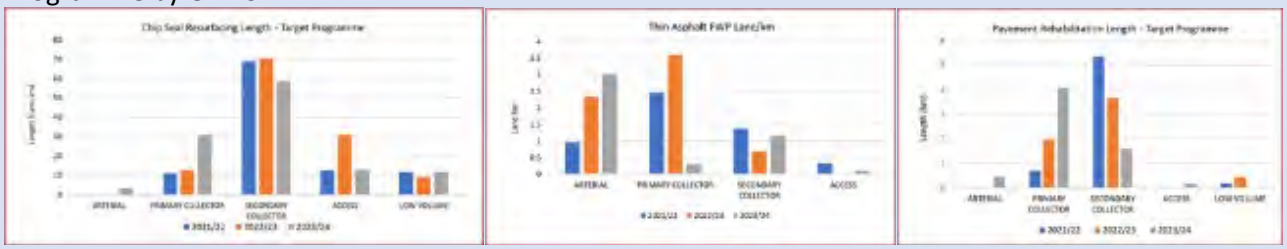
These condition states reflect the funding request across each network where the largest increase request is for FNDC with the next largest being the KDC and WDC being the lowest funding increase. For Whangarei this reflects a network in steady state, delivering the desired level of service in the key activity area now and into the future with minimal improvement.

Following this optimisation process, the current proposed programmes for the 2021/24 period are summarised as follows:

4.17.6.1 Far North District Council

Description	Chip Seal Resurfacing	Asphalt Resurfacing	Pavement Rehabilitations
Average Length Treated/year	62km	2.5km	6.4km
% Network Treated/year	7.1%	9.6%	0.7%
Average Renewal Cycle Time	14.1 years	10.4 years	137 years
Comment: Asphalt programme is high to address backlog of old TAC on urban arterials.			

Programme by ONRC:



4.17.6.2 Kaipara District Council

Description	Chip Seal Resurfacing	Asphalt Resurfacing	Pavement Rehabilitations
Average Length Treated/year	41km	0.16km	3.6km
% Network Treated/year	9.1%	0.4%	0.8%
Average Renewal Cycle Time	11.0 years	25 years	126 years
Comment: Chip seal programme is high to finish resurfacing the backlog of first coat seals. Asphalt resurfacing appears low, but is a very small programme and the figures are distorted by KDC having only 4km (1%) of asphalt on their network.			

Programme by ONRC:

4.17.6.3 Whangarei District Council

Description	Chip Seal Resurfacing	Asphalt Resurfacing	Pavement Rehabilitations
Average Length Treated/year	84.5km	5.2km	5.3km
% Network Treated/year	8.5%	8.7%	0.5%
Average Renewal Cycle Time	11.8 years	11.5 years	199 years
Comment: Chip seal resurfacing programme is slightly high while WDC finish off the resurfacing of their backlog of old void fill seals. Asphalt programme high to continue to address old asphalt surfacings on arterial roads in Whangarei city.			

Programme by ONRC:

5 Problems, Benefits, and Consequences

This section outlines the problems affecting the transportation network, and details the benefits or consequences of doing or not doing something to address these problems.

5.1 Draft Problem Statements

The problem statements from the previous AMP documents for each council were reviewed to determine commonality and whether these were still relevant. This comparison is shown in the table below:

Problem Statements from the Previous AMPs	FNDC	KDC	WDC	Relevant?
Reactive Maintenance and Renewal – "worst first" maintenance practices	✔			Yes
Freight and Forestry – Pavement wear, dust, maintenance delays and detours not suitable for 50MAX	✔			Yes - but combine
Network Geometry and Geology – low subgrade strength and prone to slips	✔			Yes - but combine
Resilience – susceptible to slips and flooding. Climate change effects	✔	✔	✔	Yes
Unsealed Pavements – vulnerable to damage, high cost and dust	✔	✔	✔	Yes
Sealed Pavements – vulnerable to damage and high cost	✔	✔	✔	Yes
Bridges – Poor condition and capacity	✔			Yes
Safety – Increasing F&S Crashes		✔	✔	Yes
Drainage – Low capacity culverts leading to scour and flooding		✔		Yes
Traffic Congestion and Growth			✔	Yes

From this comparison, the following possible changes were considered:

- It was recognised that Freight, Forestry, Network Geometry and Geology problems all affect network Resilience as well as Sealed and Unsealed Pavements. It was therefore considered desirable to incorporate these into the Resilience, Sealed and Unsealed Pavement problems.
- Drainage should be extended to include general lack of drainage maintenance, particularly of watertables.
- It was also recognised that Alternative Transport Modes should also be considered.

On the basis of this review, eight draft problems statements were determined as shown in the table below:

Issue	DRAFT Problem Statement
Sealed Road Renewals	Our sealed roads have some of the highest costs per kilometre in our peer group.
Drainage	Poor historic maintenance of drainage system has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.
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.
Unsealed Roads	Lack of asset and condition data for our unsealed roads means that we are reactive, leading to significant customer dissatisfaction and suboptimal maintenance practices, particularly on logging and other heavy vehicle routes or roads with high traffic volumes. Dust is also a significant issue on heavy vehicle routes, resulting in adverse health effects to residents and resident blockades to protest against dust in the past.
Structures	A large number of bridges and other significant structures in the Far North and Kaipara are in 'poor' or 'very poor' condition and are posted with weight and speed restrictions which results inefficient freight loads for operators such as logging companies and milk companies and in extreme cases prevents freight access to some properties. It also increases the loading on detour routes and the risk of catastrophic bridge failure. In addition, there is a bow wave of bridges that are likely to require replacement in the medium term. Lack of retaining wall asset and condition data with no inspection regime increases the risk of failure.
Traffic Growth and Congestion	Congestion in Whangarei City is increasing due to having a constrained road network, high traffic growth, traffic signals are at the limits of their capacity and high reliance on private vehicle use. Other high growth areas such as Kerikeri, Waipapa and Mangawhai are also starting to face similar issues particularly during peak holiday periods.
Alternative Transport Modes (NEW)	There is a lack of adequate and safe walking and cycling facilities and public transport services in many communities linking to places of employment, education and social opportunities. This is leading to severance, safety issues and higher levels of social deprivation.
Safety	The number of fatal and serious injury crashes on our roads are high and are trending upward. Poor driver behaviour is also significant issue with Northland being a high community at risk for crashes involving alcohol and drug impaired drivers, speeding, fatigue and lack of use of restraints.

5.2 Strategic Case – Bottom-Up Assessment

During the development of the AMP, the Roading Efficiency Group (REG) held a series of workshops to test and refine the problem statements and to determine the strategic response to address the problems. This is shown in the following tables.

Draft Problem Statement 1:
Sealed Road Renewals - Our sealed roads have some of the highest costs per kilometre in our peer group.
Current AMP - Key responses outlined in Strategic Case:
• WDC - Reduce rehabs to 6km/yr. Reduce reseals from 110km/yr to 90km/yr. Address service lids. Skid resistance seals to reduce wet road crashes. • KDC – Decrease in rehab justified through dTIMs, balanced by increase in reseals to address first coat seal backlog. • FNDC – Decrease in rehab justified through dTIMs, balanced by increase in reseal cost to target larger chip reseals. • NTA – Include reseals and rehabs in maintenance contracts to get better buying power. RAPT type assessments of programme. Increase in watertable maintenance to reduce water ingress. Sealed road MIS with visual guide to be developed and implemented.
Current Work that is being undertaken:
• Maintenance activity based on contractor led inspection and response time. Contractor responsible for determining programme. NTA audit of work proposed, programme and finished work. • Rehab/Reseal changes in programme as outlined above. • Reseals and rehabs included in maintenance contracts which is mostly avoiding issues of timing of repairs and renewals. • RAPT type assessment of programmes and targeting wet road crashes. • Whangarei targeting urban rehabs due to historic underinvestment in urban network.
Aspects of the problem not being addressed and benefits not being delivered?
• Service lid work in Whangarei not being undertaken due to Maintenance Contractor performance. • Watertable maintenance awaiting on Drainage Plan/FWP currently under development. • Urban rehabs in Whangarei are very expensive $1M/km+ due to structural AC required. • Sealed road MIS with visual guide required to ensure the right treatment at the right time. • Kaipara and Far North are incorrectly charging their internal business unit costs from maintenance activities to the individual work categories instead of WC 151. • The distribution of the new Maintenance Contract fixed costs for Kaipara and Far North is disproportionately loading the reseals and rehabilitation budgets. • Sealed pavements are considered to be largely in good condition, and rehabs could be reduced further to fund other activities. • Overall sealed road costs are still likely to be high compared to peer group.
Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?
Priority of this issue has decreased but need for cost efficiencies still exists

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	1	Can reduce programme, particularly for rehabilitations (ties to Options 4 and 5)
2 Policy approach eg, Adjust level of Service	Y	3	Could reduce frequency of inspections, but that is unlikely to make a significant difference because this is part of LS item. Rehabs and reseals not really governed by roughness Customer LOS.
3 Demand management eg, Manage use – up/down	N	N/A	Difficult to manage demands on a network wide basis
4 Funding adjustment. eg, Increase/decrease	Y	2	Can reduce budget, particularly for rehabs (ties to Options 1 and 5). For Kaipara and Far North, should charge in-house staff costs on maintenance activities to WC 151 and distribute the Maintenance Contract fixed costs more appropriately within the MOR work categories. This will reduce the costs being charged to sealed roads.
5 Risk based eg, Hold Assets longer	Y	1	Can hold pavements longer before rehabbing (ties to Options 1 and 4)

How effective are the options? (as per Multi Criteria Assessment below)
Option 1 – Reduce rehabilitation programme - Score **0.9** out of 3 **(PREFERRED)** Option 2 – Reduce inspection frequency - Score **-0.4** out of 3 Option 4 – Charge in-house costs and maintenance contract fixed costs appropriately – Score **0.5** out of 3 **(PREFERRED)**
Draft an updated problem statement (if applicable)
Sealed Roads – Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 1 Sealed Roads

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Can reduce programme, particularly for rehabs (ties to Options 4 and 5)	1
2 Policy approach eg, Adjust level of Service	Yes	Could reduce frequency of inspections, but that is unlikely to make a significant difference because part of LS price	3
3 Demand management eg, Manage use – up/down	No	Difficult to manage demands on a network wide basis	N/A
4 Funding adjustment. eg, Increase/decrease	Yes	Can reduce budget, particularly for rehabs (ties to Options 1 and 5). Reallocation of in-house business unit costs and maintenance contract fixed costs for Kaipara and Far North.	2
5 Risk based eg, Hold Assets longer	Yes	Can hold pavements longer before rehabbing (ties to Options 1 and 4)	1

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - Reduce rehabilitation programme		Option 2 - Reduce frequency of inspections		Option 4 - Reallocation of business unit and contract fixed costs	
		Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	2	0.2	-1	-0.1	1	0.1
Meets RLTP	10%	-1	-0.1	-1	-0.1	0	0
Addresses Problems	20%	2	0.4	1	0.2	2	0.4
Will realise Benefits	10%	1	0.1	0	0	0	0
Will meet Community Outcomes	10%	0	0	-2	-0.2	0	0
Will meet Customer Outcomes (CLOS)	10%	1	0.1	-1	-0.1	0	0
Provides high Performance impacts	10%	0	0	-1	-0.1	0	0
Provides high Environmental Impacts	5%	0	0	0	0	0	0
Provides Cultural Impacts	5%	0	0	0	0	0	0
How Costly	10%	2	0.2	0	0	0	0
Other 1			0		0		0
Other 2			0		0		0
Other 3			0		0		0
Other 4			0		0		0
Totals	100%		0.9		-0.4		0.5

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 2:

Drainage – Ad hoc historic maintenance of drainage system has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.

Current AMP - Key responses outlined in Strategic Case:

- WDC & FNDC - Record condition data on drainage assets through the maintenance contracts. Drainage programme to be included in the dTIMS model to prioritise the optimum programme of watertable maintenance. Develop a programme of culvert renewals through the proposed Resilience Strategy.
- KDC – Increase spend on culvert replacements to replace undersized culverts on Primary and Secondary collectors.
- NTA – Develop a programme of drainage renewals. Increase funding to prioritise watertable maintenance.

Current Work that is being undertaken:

- New Maintenance Contracts are now doing an annual culvert inspection and inlet/outlet cleaning regime.
- Inadequate drainage systems are being addressed through pavement rehabilitation projects.
- Inspections of other drainage systems such as watertables and kerb & channel are carried out on a cyclic basis, but maintenance activity is still being carried out on an ad-hoc basis.
- Annual culvert inspections – these are resulting in a programme of culvert barrel cleaning. Work being programmed to change the alignment and grade of the culvert where necessary. Some culverts are being upsized in conjunction with the realignment/regrading work.
- Grading activities on unsealed roads – are cleaning out watertables but not to specification.

Aspects of the problem not being addressed and benefits not being delivered?

- Insufficient watertable maintenance being undertaken to keep drainage system working properly. Significant backlog of watertable maintenance likely.
- Drainage Plan and FWP still being developed. MIS and maintenance guideline also being developed.
- Training of grader operators needs to ensure watertables being maintained to specification.

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

High priority – because area where big gains can be made

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	1	Increase the amount of watertable maintenance and renewals to provide a fit for purpose network of drainage systems which will reduce water ingress into pavements. In the long term, this approach is likely to result in less pavement rehabilitation and resurfacing being required.
2 Policy approach eg, Adjust level of Service	Y	2	Increase in culvert sizes, where appropriate, can result in less debris build up, flooding and outlet scour.
3 Demand management eg, Manage use – up/down	Y	3	Demand is largely dictated by weather patterns. However, demand can be partially governed by factors such as culvert placement (to align with watercourses) and appropriately located cut-outs and discharge points. This can reduce the amount of water flow on watertables.
4 Funding adjustment. eg, Increase/decrease	Y	-	Ties to Options 1, 2 and 3 above.
5 Risk based eg, Hold Assets longer	N	-	Holding drainage assets longer is inappropriate. This effectively has been the approach in the past and have resulted in the drainage systems not currently being fit for purpose.

How effective are the options? (as per Multi Criteria Assessment below)

Option 1 – Increase watertable maintenance and renewal programme - Score **1.8** out of 3 **(PREFERRED)**
Option 2 – Increase culvert sizes - Score **1.2** out of 3 **(PREFERRED)**
Option 3 – Change demand by reducing length of water running along the road – Score **0.3** out of 3

Draft an updated problem statement (if applicable)

Drainage – Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 2 Drainage

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Increase the amount of watertable maintenance and renewal to provide a fit for purpose network of drainage systems which will reduce water ingress into pavements. In the long term, this approach is likely to result in less pavement rehabilitation and resurfacing being required.	1
2 Policy approach eg, Adjust level of Service	Yes	Increase in culvert size, where appropriate, can result in less debris build up, flooding and outlet scour.	2
3 Demand management eg, Manage use – up/down	Yes	Demand is largely dictated by weather patterns. However, demand can be partially governed by factors such as culvert placement (to align with watercourses) and appropriately located cut-outs and discharge points. This can reduce the amount of water flow on watertables.	3
4 Funding adjustment. eg, Increase/decrease	Yes	Ties to Options 1, 2 and 3 above.	-
5 Risk based eg, Hold Assets longer	No	Holding drainage assets longer is inappropriate. This effectively has been the approach in the past and have resulted in the drainage systems not currently being fit for purpose.	N/A

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option					
		Option 1 - Increase watertable maintenance		Option 2 - Increase culvert size/capacity		Option 3 - Improve cutout and culvert locations	
		Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	2	0.2	2	0.2	0	0
Meets RLTP	10%	2	0.2	2	0.2	1	0.1
Addresses Problems	20%	2	0.4	1	0.2	1	0.2
Will realise Benefits	10%	2	0.2	1	0.1	1	0.1
Will meet Community Outcomes	10%	2	0.2	2	0.2	0	0
Will meet Customer Outcomes (CLOS)	10%	2	0.2	2	0.2	0	0
Provides high Performance impacts	10%	2	0.2	1	0.1	0	0
Provides high Environmental Impacts	5%	2	0.1	2	0.1	0	0
Provides Cultural Impacts	5%	0	0	0	0	0	0
How Costly	10%	1	0.1	-1	-0.1	-1	-0.1
Other 1			0		0		0
Other 2			0		0		0
Other 3			0		0		0
Other 4			0		0		0
Totals	100%		1.8		1.2		0.3

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 3:

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.

Current AMP - Key responses outlined in Strategic Case:

- NTA – Carry out a programme of resilience upgrades through the Low Cost Low Risk programme. Develop a Resilience Plan and FWP of resilience works on critical routes. Develop a Retaining Wall Plan and FWP.
- KDC – Increase in drainage renewals to replace undersized culverts on primary and secondary collector roads.

Current Work that is being undertaken:

- Historic slips and flooding issues are being progressively addressed through the Low Cost Low Risk programme. These are being prioritised to suit rehabititations (WDC approach), or based on prioritisation matrices (for KDC and FNDC). FNDC is currently investing about $1.5M/year into resilience work. WDC & KDC are investing on average about $0.5M/year into resilience work.
- Overslips are addressed when they fall onto the road.
- Culverts being inspected annually and culvert inlets and outlet cleared. These inspections are also resulting in a programme of culvert barrel cleaning. Work being programmed to change the alignment and grade of the culvert where necessary. Some culverts are being upsized in conjunction with the realignment/regrading work.
- Crack sealing of roads during dry spells being identified and undertaken on ad-hoc basis.
- Diversion of stormwater away from known slips.
- WDC has an emergency response plan.

Aspects of the problem not being addressed and benefits not being delivered?

- The current prioritisation of resilience work does not adequately take into account a corridor approach to target the most important corridors and address the resilience issue on these route. The Resilience Plan and FWP which is currently under development will target these critical corridors (eg detour routes, life line routes, arterials, isolated communities etc).
- Overslips should be managed to reduce likelihood of them impacting the road network. This could include hydroseeding and/or active regrading of slopes.
- Crack sealing needs to be a priority and carried out as a programme of work during dry spells.
- Drainage facilities installed for historic slips, such as horizontal drains and subsoils, are not be actively maintained.
- Emergency works and historic slips/flooding areas not being captured adequately in RAMM and not identifying the impact on the road network, eg time to reopen lane or road.
- Need to develop a standard NTA response plan so that there is a consistent approach to dealing with emergencies, particularly when the detour routes cross between councils and the state highways.
- Detour routes of major/critical local road routes are not identified or planned.
- The time taken to get through the FNDC council procurement process often delays work by up to 6 months meaning work is late getting to the market which affects the number of tenderers and price.

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

Yes – this is a high priority, and will increase overtime with predicted climate change impacts

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	3	Increase the programme of resilience work to reduce the risk of road closures during emergency events on the WDC and KDC networks.
2 Policy approach eg, Adjust level of Service	Y	1	Accept more frequent and longer road closures on non-critical routes, to prioritise effort on more critical routes to reduce the likelihood of closures on these routes.
3 Demand management eg, Manage use – up/down	Y	2	Develop programme of preventative maintenance such as: Culvert barrel cleaning from annual inspections and replace undersized culverts. Cyclic slip drainage maintenance to target horizontal and subsoil drains. Crack sealing of slip scarps. Hydroseeding and regrading of overslips. Proactive management of drainage systems in known flooding areas.
4 Funding adjustment. eg, Increase/decrease	Y	N/A	A funding adjustment would likely to be required with all of the other options.
5 Risk based eg, Hold Assets longer	Y	N/A	Same as Option 2.

How effective are the options? (as per Multi Criteria Assessment below)
Option 1 – Increase programme of resilience work on the WDC and KDC networks – Score **1.4** out of 3 **(PREFERRED)** Option 2 – Prioritise critical routes at the expense of lower priority routes – Score **1.65** out of 3 **(PREFERRED)** Option 3 – Preventative maintenance programme – Score **1.45** out of 3 **(PREFERRED)**
Draft an updated problem statement (if applicable)
Resilience - Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 3 Resilience

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Increase the programme of resilience work to reduce the risk of road closures during emergency events on the WDC and KDC networks.	3
2 Policy approach eg, Adjust level of Service	Yes	Accept more frequent and longer road closures on non-critical routes, to prioritise effort on more critical routes to reduce the likelihood of closures on these routes.	1
3 Demand management eg, Manage use – up/down	Yes	Develop programme of preventative maintenance such as: - Culvert barrel cleaning from annual inspections and replace undersized culverts. - Cyclic slip drainage maintenance to target horizontal and subsoil drains. - Crack sealing of slip scarps. - Hydroseeding and regrading of overslips.	2
4 Funding adjustment. eg, Increase/decrease	Yes	A funding adjustment would likely to be required with all of the other options.	N/A
5 Risk based eg, Hold Assets longer	Yes	Same as Option 2.	N/A

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - Increase programme of resilience work on the WDC and KDC		Option 2 - Prioritise critical routes at the expense of lower priority routes		Option 3 - Preventative maintenance programme	
		Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	2	0.2	3	0.3	3	0.3
Meets RLTP	10%	2	0.2	2	0.2	2	0.2
Addresses Problems	20%	2	0.4	2	0.4	2	0.4
Will realise Benefits	10%	2	0.2	2	0.2	2	0.2
Will meet Community Outcomes	10%	2	0.2	1	0.1	1	0.1
Will meet Customer Outcomes (CLOS)	10%	1	0.1	2	0.2	1	0.1
Provides high Performance impacts	10%	2	0.2	2	0.2	2	0.2
Provides high Environmental Impacts	5%	1	0.05	1	0.05	1	0.05
Provides Cultural Impacts	5%	1	0.05	0	0	0	0
How Costly	10%	-2	-0.2	0	0	-1	-0.1
Other 1			0		0		0
Other 2			0		0		0
Other 3			0		0		0
Other 4			0		0		0
Totals	100%		1.4		1.65		1.45

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 4:

Unsealed Roads - Lack of asset and condition data for our unsealed roads means that we are reactive, leading to significant customer dissatisfaction and suboptimal maintenance practices, particularly on logging and other heavy vehicle routes or roads with high traffic volumes. Dust is also a significant issue on heavy vehicle routes, resulting in adverse health effects to residents and resident blockades to protest against dust in the past.

Current AMP - Key responses outlined in Strategic Case:

- WDC – Wright Rd seal extension, increase in funding for dust suppression on forestry routes, 2km/year of unsubsidised seal extension.
- KDC – Increase in heavy metalling to build up strength and shape, balanced by decrease in maintenance.
- FNDC – Ngapipito and Pipiwai Rd seal extension, increase in funding for dust suppression, 2km/year of unsubsidised seal extension, increase in heavy metalling on forestry roads balanced by decrease in maintenance, watertabling.
- NTA – New Maintenance Contracts to bring in use of Paige-Green compliant materials and to use RoadROID or similar to capture roughness data. Development of a Centre of Excellence with Unsealed Rd FWP. Development of an Unsealed Rd MIS and visual guide.

Current Work that is being undertaken:

- Maintenance and metalling based on General All Passing (GAP) material. Grading largely on a reactive basis either identified through inspections or service requests. Heavy metalling required on a cyclic basis to replenish aggregate loss to retain pavement strength.
- Wright Rd, Ngapipito Rd and Pipiwai Rd seal extensions completed which has resulted in a drop of complaints on these routes.
- FNDC and WDC progressing unsubsidised seal extensions. FNDC have developed a complex prioritisation matrix for seal extensions.
- Dust suppression being undertaken to manage dust. WDC doing about $100-150k/year on forestry roads through unsealed maintenance. FNDC doing $500k/year unsubsidised but not sustainable.
- KDC - Trial Paige-Green compliant aggregate site on Cames Rd has reduced maintenance and dust on this route.

Aspects of the problem not being addressed and benefits not being delivered?

- Maintenance and metalling practices still based on using a GAP material which unravels, is dusty, has high gravel loss and prone to corrugations and potholes. Demand for heavy metalling is still high due to high gravel loss. Grading often reactive due to corrugations and potholes – hard to develop a programmed grading cycle because GAP material loses shape quickly and is very subject to weather. Higher levels of funding would be required to sustain this approach.
- The health effects of dust is still an issue with significant demand for dust suppression and seal extension, particularly in the Far North and Whangarei. Additional NZTA funding would be required to make dust suppression sustainable.
- Roll out of Paige-Green compliant aggregate across Northland, and particularly in the Far North still to happen. Limited Paige-Green compliant aggregate being used although this is included in the maintenance contracts.
- Training of grader operators needs to be improved so that they meet the grading specifications in the new maintenance contracts.
- RoadROID or similar not being used so no condition data being collected.
- Centre of Excellence & Unsealed FWP and MIS/visual guide still under development.
- FNDC funding for forestry road strengthening not funded by NZTA.

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

Still a high priority, but should focus on our current maintenance practice of using GAP material.

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	3	Increase GAP heavy metalling programme to provide structural pavements on heavy vehicle routes. Increase funding to sustainably provide for dust suppression on routes with matrix score of 12 or more.
2 Policy approach eg, Adjust level of Service	Y	1	Implement Paige-Green compliant wearing courses with structural pavements for High and Medium risk pavements to reduce maintenance costs, reduce dust and improve ride comfort. Low risk pavements to be maintained using current approach but using Paige-Green compliant material. Improve training of grader operators to meet the specification of the new maintenance contracts.
3 Demand management eg, Manage use – up/down	Y?	2	Difficult to change heavy vehicle demands on unsealed roads as there is normally no alternative route, particularly for forestry where the forestry is normally at the end of the road. Some potential for using alternative internal forestry roads to direct forestry traffic onto preferred routes exists. Already doing this where possible.
4 Funding adjustment. eg, Increase/decrease	Y	1,3	Increase budget to fund additional heavy metalling and dust suppression (ties to Option 1). May also require increase in funding for the roll out of Paige-Green compliant aggregate wearing courses (Option 2).
5 Risk based eg, Hold Assets longer	N	N/A	Unsealed pavements already have limited metal depths and holding the assets longer will just create a bigger issue with more maintenance required and costly intervention to reinstate pavement depth in the future.

How effective are the options? (as per Multi Criteria Assessment below)

Option 1 – Increase heavy metalling and fund dust suppression - Score **0.6** out of 3
Option 2 – Paige-Green compliant wearing courses and structural pavements. Improved training of grader operators - Score **2.05** out of 3 **(PREFERRED)**
Option 3 – Use internal forestry roads to change haul routes – Score **0.8** out of 3

Draft an updated problem statement (if applicable)

Unsealed Roads – Use of out of specification GAP aggregates on our unsealed roads is resulting in:

- adverse health impacts to residents due to dust
- high levels of community dissatisfaction due to poor road condition and
- high maintenance costs.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 4 Unsealed Roads

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Increase heavy metalling programme to provide structural pavements on heavy vehicle routes. Increase funding to provide for dust suppression.	3
2 Policy approach eg, Adjust level of Service	Yes	Implement Paige-Green complaint wearing courses on structural pavements to reduce maint costs, reduce dusts and improve ride comfort. Also improve training of grader operators to meet the specification of the new maintenance contracts.	1
3 Demand management eg, Manage use – up/down	Possibly	Difficult to change heavy vehicle demands on unsealed roads as there is normally no alternative route, particularly for forestry where the forestry is normally at the end of the road. Some potential for using alternative forestry roads to direct forestry traffic onto preferred routes exists.	2
4 Funding adjustment. eg, Increase/decrease	Yes	Increase budget to fund additional heavy metalling and dust suppression (ties to Option 1) May also require increase in funding for the roll out of Paige-Green compliant aggregate wearing courses (Option 2).	1, 3
5 Risk based eg, Hold Assets longer	No	Unsealed pavements already have limited metal depths and holding the assets longer will just create a bigger issue with more maintenance required and costly intervention to reinstate pavement depth in the future.	N/A

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - Increase existing heavy metalling		Option 2 - Paige-Green compliant wearing courses and grader operator training		Option 3 - Re-route forestry through internal roads	
		Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	1	0.1	2	0.2	1	0.1
Meets RLTP	10%	2	0.2	2	0.2	1	0.1
Addresses Problems	20%	1	0.2	3	0.6	1	0.2
Will realise Benefits	10%	1	0.1	3	0.3	1	0.1
Will meet Community Outcomes	10%	2	0.2	2	0.2	1	0.1
Will meet Customer Outcomes (CLOS)	10%	1	0.1	2	0.2	0	0
Provides high Performance impacts	10%	-1	-0.1	2	0.2	0	0
Provides high Environmental Impacts	5%	1	0.05	2	0.1	1	0.05
Provides Cultural Impacts	5%	1	0.05	1	0.05	1	0.05
How Costly	10%	-3	-0.3	0	0	1	0.1
Other 1			0		0		0
Other 2			0		0		0
Other 3			0		0		0
Other 4			0		0		0
Totals	100%		0.6		2.05		0.8

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 5:

Structures - A large number of bridges and other significant structures in the Far North and Kaipara are in 'poor' or 'very poor' condition and are posted with weight and speed restrictions which results inefficient freight loads for operators such as logging companies and milk companies and in extreme cases prevents freight access to some properties. It also increases the loading on detour routes and the risk of catastrophic bridge failure. In addition, there is a bow wave of bridges that are likely to require replacement in the medium term. Lack of retaining wall asset and condition data with no inspection regime increases the risk of failure.

Current AMP - Key responses outlined in Strategic Case:

- WDC & FNDC – Additional funding for retaining wall maintenance and renewal. Additional funding for steel arch culvert replacements (WDC issue).
- FNDC – Large increase in bridge maintenance and renewal to retain current access for freight and 50MAX routes and reduce the likelihood of structural failure.
- KDC – Increasing in maintenance funding to address increase in damage to narrow bridges from increased freight movements. Increase to catch up with damaged one lane bridge components.
- NTA – Develop programme in conjunction with NZTA for structural upgrades on detour routes. Carry out detailed assessments of 50MAX restrictive bridges. Seismic assessments of structures on key life lines, arterials and freight routes. Develop a Retaining Wall Plan and FWP. Retaining walls to be included in the annual bridge inspections.

Current Work that is being undertaken:

- Bridge inspections being undertaken, with all weight restricted and timber bridges inspected annually and other bridges inspected on a cyclic basis (2 yearly cycle for WDC and KDC and a 3 yearly cycle for FNDC).
- Bridge maintenance, renewals and replacements are identified through the bridge inspections.
- Maintenance of bridges above the deck is undertaken by the maintenance contractors. All other maintenance and renewals are competitively tendered.
- There is currently little information about the retaining wall assets.
- WDC has a large inventory of large steel pipe culverts which has progressively been concrete lined to extend their life. FNDC and KDC do not have many steel pipe culverts.
- Forestry Plan is being developed to identify future impacts of forestry on the network.
- A Retaining Wall Plan is being developed to identify the retaining wall assets and condition. This will be used to determine a FWP of retaining wall work.
- Seismic assessments of critical WDC structures is being undertaken.
- FNDC fund the Hokianga Ferry Service through structures maintenance and renewals. This includes the operating costs of the service.

Aspects of the problem not being addressed and benefits not being delivered?

- FNDC has a significant a backlog of structures renewals due to historic under investment. Many FNDC bridges are in need of replacement and renewals.
- Several critical KDC bridges have failed prematurely and need replacement due to lack of timely maintenance over the recent past due to cost cutting resulting from high council debt levels and Mangawhai rate strike.
- FNDC and KDC have a large number of weight restricted and 50Max restrictive bridges.
- FNDC also has a lack of as-built structural information about their bridges.
- The bridge inspections do not target structures on critical routes or in high risk coastal environments.
- Getting lack of tenderers for their structures work due to lack of contractor market. Also the time taken to get through the FNDC council procurement process often delays work by up to 6 months meaning work is late getting to the market which affects the number of tenderers and price.
- Retaining walls are currently not inspected and there is little asset or condition data for these assets. This increases the likelihood of deterioration and premature failure
- Strength of retaining walls is unknown – are these sufficient for the weight of current truck loads?

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

Yes – this is a priority for all councils, and particularly FNDC and KDC

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y Y	1 3	Increase programme of bridge maintenance and renewals on critical for FNDC and KDC to get on top of backlog and extend the life of these structures. Include a programme of bridge replacements targeting weight, speed and 50MAX restricted bridges on important freight routes.
2 Policy approach eg, Adjust level of Service	Y Y	2= 2=	Increase the frequency of bridge inspections to include an annual inspection of bridges of critical routes and in high risk coastal environments. Increase other FNDC bridge inspections to a 2 yearly cycle. Include retaining walls in the bridge inspections. Complete detailed structural inspection on 50MAX bridges on important freight routes. Develop a supplier panel to improve likelihood of receiving multiple tenders and competitive prices. Also look to review and change the FNDC procurement board process to reduce the time taken to let and approve tenders.
3 Demand management eg, Manage use – up/down	Y	-	Complete the Forestry Plans to better understand the demands of forestry on the network. This work is currently being undertaken – so this option has not been assessed further.

4 Funding adjustment. eg, Increase/decrease	Y	4	Change the funding of the Hokianga Ferry Service operations to WC 123 Operational Traffic Management.
5 Risk based eg, Hold Assets longer	N	-	Structures assets are in poor condition in FNDC, are deteriorating in KDC and are fit for purpose for WDC. WDC has a large inventory of large steel pipe culverts which has already extended the life of via concrete lining the bases. It is therefore not considered practical to further "sweat the asset".

How effective are the options? (as per Multi Criteria Assessment below)

Option 1a – Increase structural maintenance and renewals programmes for FNDC and KDC - Score **1.65** out of 3 **(PREFERRED)**
Option 1b – Programme of 50MAX bridge strengthening on important freight routes - Score **0.85** out of 3 **(PREFERRED)**
Option 2a – Annual bridge inspections for critical and high risk structures. Increase FNDC inspections cycle to 2 yearly. Carry out retaining wall inspections. Complete 50MAX detailed assessments on important freight routes – Score **1.2** out of 3 **(PREFERRED)**
Option 2b – Supplier panel and improved FNDC procurement processes – Score **1.6** out of 3 **(PREFERRED)**
Option 4 – FNDC Hokianga Ferry service operations charged to WC123 – Score **0.3** out of 3

Draft an updated problem statement (if applicable)

Structures – Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 5 Structures

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	1a - Yes	Increase programme of bridge maintenance and renewals on citical routes for FNDC and KDC to get on top of backlog and extend the life of these structures.	1
	1b - Yes	Include a programme of bridge replacements targeting weight, speed and 50MAX restricted bridges on important freight routes.	3
2 Policy approach eg, Adjust level of Service	Yes	Increase the frequency of bridge inspections to include an annual inspection of bridges of critical routes and in high risk coastal environments. Increase other FNDC bridge inspections to a 2 yearly cycle. Include retaining walls in the bridge inspections. Complete detailed structural inspection on 50MAX bridges on important freight routes.	2=
	Yes	Develop a supplier panel to improve likelihood of receiving multiple tenders and competitive prices. Also change the FNDC procurement board process to reduce the time taken to let and approve tenders.	2=
3 Demand management eg, Manage use – up/down	Yes	Complete the Forestry Plans to better understand the demands of forestry on the network. This work is already being undertaken - so this option hasn't been assessed further.	N/A
4 Funding adjustment. eg, Increase/decrease	Yes	Change the funding of the Hokianga Ferry Service operations to WC 123 Operational Traffic Management.	4
5 Risk based eg, Hold Assets longer	No	Structures assets are in poor condition in FNDC, are deteriorating in KDC and are fit for purpose for WDC. WDC has a large inventory of large steel pipe culverts which has already extended the life of via concrete lining the bases. It is therefore not considered practical to further "sweat the asset".	N/A

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1a - Increase Maint & Renewal		Option 1b - 50Max Strengthening		Option 2 - Increase frequency of inspections		Option 2b - Supplier Panel & Improved FNDC Procurement Process		Option 4 - FNDC Hokianga Ferry Service Operations Charged to WC123	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	1	0.1	1	0.1	2	0.2	2	0.2	0	0
Meets RLTP	10%	2	0.2	2	0.2	2	0.2	1	0.1	0	0
Addresses Problems	20%	2	0.4	1	0.2	1	0.2	2	0.4	1	0.2
Will realise Benefits	10%	2	0.2	1	0.1	1	0.1	2	0.2	0	0
Will meet Community Outcomes	10%	2	0.2	1	0.1	0	0	1	0.1	0	0
Will meet Customer Outcomes (CLOS)	10%	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1
Provides high Performance impacts	10%	2	0.2	1	0.1	2	0.2	3	0.3	0	0
Provides high Environmental Impacts	5%	1	0.05	1	0.05	0	0	0	0	0	0
Provides Cultural Impacts	5%	0	0	0	0	0	0	0	0	0	0
How Costly	10%	1	0.1	-1	-0.1	2	0.2	2	0.2	0	0
Other 1			0		0		0		0		0
Other 2			0		0		0		0		0
Other 3			0		0		0		0		0
Other 4			0		0		0		0		0
Totals	100%		1.65		0.85		1.2		1.6		0.3

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 6:

Traffic Congestion and Growth - Congestion in Whangarei City is increasing due to having a constrained road network, high traffic growth, traffic signals are at the limits of their capacity and high reliance on private vehicle use. Other high growth areas such as Kerikeri, Waipapa and Mangawhai are also starting to face similar issues particularly during peak holiday periods.

Current AMP - Key responses outlined in Strategic Case:

- WDC – Implementation of the Whangarei City Transportation Network Strategy PBC. Specifically this includes:
  - Carry out corridor management plans of key arterial routes.
  - Improve traffic signal reliability and operation by providing Fibre/WiFi Connection, CCTV Coverage, Remote Operation and Improved Detection Technology.
  - Carry out a programme of Signal Detector Renewals and SCATS Computer Replacement to ensure that the traffic signals are operating efficiently and will reduce the risk of the SCATS computer failing.
  - Consider the feasibility of carrying out signal and bridge operations through a Northland transport operations centre (similar to ATOC).
  - Travel planning to encourage mode shift to walking, cycling and public transport and will help reduce congestion.
  - Upgrade the Tarewa/Porowini and Maunu/Porowini intersections to address rapid growth on Porowini Ave
  - Construct a new roundabout at SH1/Springs Flat to help address growth in Tikipunga.
- FNDC – Carry out an Integrated Transport Strategy and Plan to identify projects in the Kerikeri/Waipapa area to address summer congestion.
- KDC – Carry out a Transport Strategy for Mangawhai to build on the work undertaken through the Mangawhai Community Plan. This will confirm the projects in Mangawhai area to address summer congestion. Upgrade the intersections at Moir/Insley and Moir/Molesworth.

Current Work that is being undertaken:

- WDC - Tarewa/Porowini intersection has been completed and Maunu/Porowini intersection nearing completion. Corridor management plans have been replaced by a detailed Inner CBD transport model which is being finalised and will identify short and long term actions to reduce congestion in the CBD. Signal upgrades including improved communications are being progressively rolled out.
- FNDC – Nearing the completion of the Integrated Transport Strategy and Plan.
- KDC – Starting work on developing a Network Operating Framework for Mangawhai (agreed approach with NZTA). The intersections at Moir/Insley and Moir/Molesworth are planned to be upgraded in 2020/21.

Aspects of the problem not being addressed and benefits not being delivered?

- Congestion is still building in Whangarei during the morning and evening peaks. This is increasing due to high growth in the city and lack of use of alternative transport modes. Uptake in walking and cycling is improving but is currently limited by the shared path network still being completed. Public transport is not seen as a viable mode by many commuters because it isn't frequent enough (30 minutes frequency in peak periods), it gets stuck in the same queues as private vehicles and costs more than all-day parking in the CBD (eg no time or cost advantage in taking public transport).
- Kerikeri, Waipapa and Mangawhai growth areas becoming more congested at peak holiday periods. Mangawhai was one of the highest growth regions in NZ in the past 5 years.

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

Yes – higher priority now with growth effects over the past 5 years.

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	2	Increased programme of intersection improvements to address pinch points. Widening of arterial road links to 4-lanes in Whanagrei in line with transport strategy to provide bus priority lanes. Bypass of Kerikeri town centre in line with Far North ITP. Upgrade Garbalino and Cove Rd routes to provide improved access to Mangawhai Centre and SH detour route in line with Mangawhai NOF.
2 Policy approach eg, Adjust level of Service	Y	3	Allow levels of service to decline and accept more congestion during peak periods, to help drive mode shift.
3 Demand management eg, Manage use – up/down	Y	1	Develop network of shared paths and provide improved bus services during peak periods to encourage mode shift.
4 Funding adjustment. eg, Increase/decrease	Y	-	In conjunction with Options 1 – 3.
5 Risk based eg, Hold Assets longer	N	-	Not applicable.

How effective are the options? (as per Multi Criteria Assessment below)
Option 1 – Intersection and road upgrades including bus priority lanes, new link roads – Score **1.5** out of 3. **(PREFERRED)** Option 2 – Allow more congestion to drive mode shift – Score **-1.0** out of 3. Option 3 – Network of shared paths and improved bus services – Score **1.65** out of 3. **(PREFERRED)**
Draft an updated problem statement (if applicable)
NOTE – Suggest that we use same problem statement for Problems 6 & 7, because the problems and solutions are interlinked. **Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 6 Traffic Congestion and Growth

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Increased programme of intersection improvements to address pinch points. Widening of arterial road links to 4-lanes in Whanagrei in line with transport strategy to provide bus priority lanes. Bypass of Kerikeri town centre in line with Far North ITP. Upgrade Garbalino and Cove Rd routes to provide improved access to Mangawhai Centre and SH detour route in line with Mangawhai NOF	2
2 Policy approach eg, Adjust level of Service	Yes	Allow levels of service to decline and accept more congestion during peak periods, to help drive mode shift.	3
3 Demand management eg, Manage use – up/down	Yes	Develop network of shared paths and provide improved bus services during peak periods to encourage mode shift.	1
4 Funding adjustment. eg, Increase/decrease	Yes	In conjunction with Options 1 – 3.	-
5 Risk based eg, Hold Assets longer	No	Not applicable.	-

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - Intersection upgrades, road upgrades including bus priority lanes and new road links		Option 2 - Allow congestion to increase, to help drive mode shift		Option 3 - Network of shared paths and improved public transport services to promote mode shift	
		Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	2	0.2	2	0.2	3	0.3
Meets RLTP	10%	3	0.3	-2	-0.2	2	0.2
Addresses Problems	20%	2	0.4	-1	-0.2	3	0.6
Will realise Benefits	10%	2	0.2	-1	-0.1	2	0.2
Will meet Community Outcomes	10%	3	0.3	-3	-0.3	2	0.2
Will meet Customer Outcomes (CLOS)	10%	2	0.2	-2	-0.2	2	0.2
Provides high Performance impacts	10%	1	0.1	-3	-0.3	1	0.1
Provides high Environmental Impacts	5%	1	0.05	-2	-0.1	2	0.1
Provides Cultural Impacts	5%	1	0.05	-2	-0.1	1	0.05
How Costly	10%	-3	-0.3	3	0.3	-3	-0.3
Other 1			0		0		0
Other 2			0		0		0
Other 3			0		0		0
Other 4			0		0		0
Totals	100%		1.5		-1.0		1.65

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 7:

Alternative Transport Modes (NEW) - There is a lack of adequate and safe walking and cycling facilities and public transport services in many communities linking to places of employment, education and social opportunities. This is leading to severance, safety issues and higher levels of social deprivation.

Current AMP - Key responses outlined in Strategic Case:

- WDC – Implement the Whangarei City Transportation Strategy PBC. Specifically the following activities were to be implemented through the AMP:
  - Improved traffic signal detection technology will further improve efficiency during pedestrian phases and by providing priority for public transport vehicles.
  - Complete the shared path network. Construct a bike training facility on Pohe Island.
  - Travel planning to encourage mode shift to walking, cycling and public transport and will help reduce congestion.
  - Provide Bike Skills training to improve cyclist confidence and safety.
  - Increase parking charges in the CBD.
- FNDC - Development of Heartland Rides will provide cycling facilities aimed at visitors and tourists and is supported by the Twin Coast Discovery Highway.
- KDC – Construct a shared path and coastal walkway in Mangawhai. Develop the Kaihu Valley Rail Trail and other heartland rides connecting townships. Construct walking and cycling networks in Dargaville, Kaiwaka, Maungaturoto and Ruawai. Development of a ferry service in the Kaipara Harbour.
- NTA - Carry out regular footpath condition rating and develop a footpath hierarchy and prioritisation tool for determining footpath renewals. Pedestrian crossing upgrades to improve the safety of pedestrians crossing busy roads.

Current Work that is being undertaken:

- Kamo Shared Path being built in Whangarei which is encouraging school children to walk and cycle to school.
- Footpath condition rating undertaken, footpath hierarchy developed and prioritisation tool developed for determining footpath renewals. Footpaths now subsidised by NZTA and are receiving more focus.
- New footpaths being built through the Low Cost Low Risk programme.
- Pedestrian crossing upgrades are being undertaken in high risk areas.
- CityLink bus service in Whangarei.
- Busabout Kaitaia, Far North Link, Mid North Link and Hokianga Link and Bream Bay Link providing some public bus services to the wider region.

Aspects of the problem not being addressed and benefits not being delivered?

- In Whangarei, uptake in walking and cycling is improving but is currently limited by the shared path network still being completed. Public transport is not seen as a viable mode by many commuters because it isn't frequent enough (30 minutes frequency in peak periods), it gets stuck in the same queues as private vehicles and costs more than all-day parking in the CBD (eg no time or cost advantage in taking public transport).
- While there are several bus services outside of Whangarei which service many towns and villages, these services are often have very limited services (some are one, two or three trips per week) due to lack of demand. There are still other towns and villages that have no public bus service (such as Dargaville, Ruawai, Maungaturoto, Hikurangi, Ngunguru, Maungatepere and Parua Bay).
- Footpaths in urban areas are often incomplete or too narrow for the demands of an aging population (such as mobility scooters).
- Apart from Heartland Rides for tourists, there is a lack of cycling facilities outside of Whangarei.

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

Yes - priority is increasing through rapid growth and aging population requiring better paths and bus services.

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	2	Complete the shared path network in Whangarei and provide walking and cycling opportunities in Kerikeri/Waipapa and Mangawhai.
2 Policy approach eg, Adjust level of Service	Y	1	Increase frequency of bus services in conjunction with the development of bus priority lanes in Whangarei. Expand rural bus services to connect to all rural towns and increase services in line with demand.
	Y	4	Widen footpaths to meet current standards when undertaking renewals or new paths.
3 Demand management eg, Manage use – up/down	Y	3	Carry out travel planning with schools and business and develop a promotional tool such as New Plymouth's LetsGo programme to encourage mode shift to active modes and public transport. All-day commuter parking charges to be increased to support mode shift where alternative modes exist.
4 Funding adjustment. eg, Increase/decrease	Y	-	In conjunction with Options 1 – 3.
5 Risk based eg, Hold Assets longer	N	-	Not applicable.

How effective are the options? (as per Multi Criteria Assessment below)
Option 1 – Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai – Score **1.55** out of 3. **(PREFERRED)**
Option 2a – Increase bus frequency in Whangarei and expand rural services – Score **1.75** out of 3. **(PREFERRED)**
Option 2b – Widen footpaths in conjunction with footpath renewals – Score **0.75** out of 3. **(PREFERRED)**
Option 3 – Travel planning and mode shift promotion. Increase all-day parking charges – Score **1.55** out of 3. **(PREFERRED)**
Draft an updated problem statement (if applicable)
NOTE – Suggest that we use same problem statement for Problems 6 & 7, because the problems and solutions are interlinked.
Growth and Alternative Transport - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 7 Alternative Transport Modes

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Complete the shared path network in Whangarei and provide walking and cycling opportunities in Kerikeri/Waipapa and Mangawhai.	2
2 Policy approach eg, Adjust level of Service	Yes	Increase frequency of bus services in conjunction with the development of bus priority lanes in Whangarei. Expand rural bus services to connect to all rural towns and increase services in line with demand.	1
	Yes	Widen footpaths when undertaking renewals or new paths.	4
3 Demand management eg, Manage use – up/down	Yes	Carry out travel planning with schools and business and develop a promotional tool such as New Plymouth's LetsGo programme to encourage mode shift to active modes and public transport. All-day commuter parking charges to be increased to support mode shift where alternative modes exist.	3
4 Funding adjustment. eg, Increase/decrease	Yes	In conjunction with Options 1 – 3.	-
5 Risk based eg, Hold Assets longer	No	Not applicable.	-

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - Shared Path Networks in Whangrei, Kerikeri/ Waipapa and Mangawhai		Option 2a - Increase Bus frequencies in Whangarei. Expanded Rural Bus Services.		Option 2b - Widen Footpaths in Conjunction with Renewals		Option 3 - Travel Planning and Mode Shift Promotional Programme. Increase All-day Parking	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	3	0.3	3	0.3	1	0.1	3	0.3
Meets RLTP	10%	2	0.2	3	0.3	1	0.1	1	0.1
Addresses Problems	20%	2	0.4	2	0.4	1	0.2	2	0.4
Will realise Benefits	10%	2	0.2	2	0.2	1	0.1	2	0.2
Will meet Community Outcomes	10%	3	0.3	2	0.2	1	0.1	1	0.1
Will meet Customer Outcomes (CLOS)	10%	2	0.2	2	0.2	0	0	1	0.1
Provides high Performance impacts	10%	1	0.1	2	0.2	2	0.2	3	0.3
Provides high Environmental Impacts	5%	2	0.1	1	0.05	0	0	2	0.1
Provides Cultural Impacts	5%	1	0.05	2	0.1	1	0.05	1	0.05
How Costly	10%	-3	-0.3	-2	-0.2	-1	-0.1	-1	-0.1
Other 1			0		0		0		0
Other 2			0		0		0		0
Other 3			0		0		0		0
Other 4			0		0		0		0
Totals	100%		1.55		1.75		0.75		1.55

Scale of impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Draft Problem Statement 8:

Safety - The number of fatal and serious injury crashes on our roads are high and are trending upward. Poor driver behaviour is also a significant issue with Northland being a high community at risk for crashes involving alcohol and drug impaired drivers, speeding, fatigue and lack of use of restraints.

Current AMP - Key responses outlined in Strategic Case:

- WDC – Increase annual safety programme from $1M to $2M.
- WDC & KDC - Development of a REAP type model for Road Safety Promotion.
- FNDC – Has a $1M/year programme of which half is allocated to Associated Improvements. Enhanced Road Safety Promotion using in-house resources.
- KDC – Increase in road markings and sight lines to signage. Targeted public road safety programme focussed on seat belt, drug and alcohol, speed and young drivers.
- NTA – Increase in safe pedestrian crossing upgrades and intersection works. Boom mulching of roadside vegetation to clear sightlines. Edgelines on all Secondary Collector and above roads as well as tourist routes. Delineation and hazard protection on HRRR routes and CRS sites. Programme of speed management reviews. LED light upgrades on arterial road routes to bring lighting up to the required standard. Develop programme of skid resistance seals/water cutting.

Current Work that is being undertaken:

- Road safety generally undertaken through the Low Cost Low Risk programme. Programmes are developed based on High Risk Rural Road (HRRR) and High Risk Intersection criteria using the Abley SafetyNet tool. Also includes pedestrian safety and traffic calming.
- Speed management programme being slowly rolled out, but not enough budget for physical interventions on site to make speeds "self explaining".
- Active school zone signs being installed in WDC and KDC. None yet in FNDC, although these will be installed through the speed management programme.
- Skid resistance being considered in the development of the reseal programme.
- Line marking – struggling to achieve even an annual remark of the network due to the cost of line marking increasing 2-4 fold in the new maintenance contracts.
- Boom mulching of roadside vegetation to keep sightlines clear.
- WDC carry out 3 yearly crash reduction studies to identify problem areas. FNDC and KDC do not have a regular crash reduction study programme.
- Road Safety Promotion undertaken through RoadSafe Northland and Far North REAP. Review of Road Safety Promotion has been undertaken across the Northland councils.
- Trying to get Standard Safety Interventions undertaken through BOOST programme.

Aspects of the problem not being addressed and benefits not being delivered?

- Safety programme now generally targeting the high risk areas that are likely to lead to the greatest safety outcomes. However, budgets limitations are restricting what can actually be achieved on an annual basis for all three councils. In particular, FNDC only has a budget of $500,000/annum for safety projects plus another $500,000 for safety works through Associated Improvements. This makes it difficult to carry out interventions in a timely manner.
- Safety funding in Whangarei has not always been dedicated for safety work, and has often been used to support other capital projects (such as Kamo Shared Path).
- Additional edgelines on all secondary collectors, detour, tourist and freight routes not being undertaken due to high cost of line marking through new maintenance contracts.
- Road Safety Promotion is not being driven as hard as it could be due to lack of in-house council resource. Funding constraints are also a limitation for both WDC and KDC, due to difficulties getting local share.

Is the Problem Statement still relevant? If "No" what are the deficiencies? If "Yes" has priority changed?

Yes – the problem is still a high priority.

If Problem is not being addressed by the current work, what is the strategic response?

Strategic response	Y/N	Rank	Detail
1 Programme adjustment eg, Remove/reduce projects/activities	Y	2	Increase safety programmes focussed on high risk rural roads, vulnerable road user safety and speed management to enable more timely interventions by increasing the available safety budget (ties to Option 4). This may be achieved through rebalancing of the LCLR programme.
2 Policy approach eg, Adjust level of Service	Y	3	Increase programme of delineation improvements. This will enable a full annual line mark as well as providing adequate edgelines, curve warning signage, RRPMs and edge marker posts on arterials and collectors, detour, tourist and freight routes. Long Life and Audible Tactile Profile (ATP) markings should be installed on high risk sites.
3 Demand management eg, Manage use – up/down	Y	1	Enhance the road safety promotion activity by actively driving this through dedicated NTA resource to get the best outcome, targeting the risk areas identified in the NZTA Communities at Risk Register.
4 Funding adjustment. eg, Increase/decrease	Y	-	Increase funding for both the Low Cost Low Risk Safety Programme (particularly for FNDC) and for Road Safety Promotion (for WDC and KDC) to enable better more timely interventions. Ties to Option 1.
5 Risk based eg, Hold Assets longer	N/A	-	Already taking a risk based approach to target the highest safety risks first (using Abley SafetyNet and other tools).

How effective are the options? (as per Multi Criteria Assessment below)
Option 1 – Increase safety programme - Score **1.6** out of 3 **(PREFERRED)** Option 2 – Additional delineation - Score **1.4** out of 3 **(PREFERRED)** Option 3 – Enhanced Road Safety Promotions with active in-house management – Score **1.6** out of 3 **(PREFERRED)**
Draft an updated problem statement (if applicable)
Safety – Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for FNDC and WDC. FNDC and KDC also have higher Collective Risks than their peer group.

Strategic Case Multi Criteria Option Analysis, RCA: NTA

Problem No: 8 Safety

Short list up to 3 options from the following - Can we make-----

Option	Yes/No	Reason	Rank
1 Programme adjustment eg, Remove/reduce projects/activities	Yes	Increase safety programmes focussed on high risk rural roads, vulnerable road user safety and speed management to enable more timely interventions by increasing the available safety budget (ties to Option 4). This may be achieved through rebalancing of the LCLR programme.	2
2 Policy approach eg, Adjust level of Service	Yes	Increase programme of delineation improvements. This will enable a full annual line mark as well as providing adequate edgelines, curve warning signage, RRPMs and edge marker posts on arterials and collectors, detour, tourist and freight routes. Long Life and Audible Tactile Profile (ATP) markings should be installed on high risk sites	3
3 Demand management eg, Manage use – up/down	Yes	Enhance the road safety promotion activity by actively driving this through dedicated NTA resource to get the best outcome, targeting the risk areas identified in the NZTA Communities at Risk Register.	1
4 Funding adjustment. eg, Increase/decrease	Yes	Increase funding for both the Low Cost Low Risk Safety Programme (particularly for FNDC) and for Road Safety Promotion (for WDC and KDC) to enable better more timely interventions.	-
5 Risk based eg, Hold Assets longer	No	Already taking a risk based approach to target the highest safety risks first (using Abley SafetyNet and other tools).	N/A

Criteria/Drivers to consider	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - Increase Safety Programme		Option 2 - Additional Delineation		Option 3 - Enhanced Road Safety Promotions with active in-house management	
		Raw	Score	Raw	Score	Raw	Score
Meets GPS	10%	3	0.3	2	0.2	3	0.3
Meets RLTP	10%	3	0.3	2	0.2	2	0.2
Addresses Problems	20%	2	0.4	2	0.4	2	0.4
Will realise Benefits	10%	2	0.2	2	0.2	2	0.2
Will meet Community Outcomes	10%	2	0.2	2	0.2	1	0.1
Will meet Customer Outcomes (CLOS)	10%	2	0.2	1	0.1	2	0.2
Provides high Performance impacts	10%	2	0.2	2	0.2	2	0.2
Provides high Environmental Impacts	5%	0	0	0	0	0	0
Provides Cultural Impacts	5%	0	0	0	0	2	0.1
How Costly	10%	-2	-0.2	-1	-0.1	-1	-0.1
Other 1			0		0		0
Other 2			0		0		0
Other 3			0		0		0
Other 4			0		0		0
Totals	100%		1.6		1.4		1.6

Scale of impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

5.3 Strategic Case Summary (Line of Sight in Action)

Based on the assessment of the problem statements and the strategic responses undertaken in the previous section, a summary of the results and the affected work categories are shown in the table below:

Issue	Problem Statement	Benefits	Trend	Strategic Response	Activity/Work Category
Sealed Roads	Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.	• Reduce whole of life costs of the sealed road network • Improve surfacing and pavement life achievement rates • Improve ride quality by reducing roughness	Static	**Programme Adjustment** • Reduce programme – particularly rehabilitations **Funding Adjustment** • Charge in-house costs and maintenance contract fixed costs appropriately	Sealed Road Maintenance and Renewals (WC 111, 212, 214)
Drainage	Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.	• Improve pavement and surfacing life by reducing water ingress • Reduce flooding and slips	Static	**Programme Adjustment** • Increase watertable maintenance and renewal programme **Policy Approach** • Increase culvert sizes	Drainage Maintenance and Renewals (WC 113, 213)
Resilience	Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.	• Improve resilience of the network • Reduce unplanned road closures • Reduce long term emergency work costs	Static	**Programme Adjustment** • Increase programme of resilience work on the WDC and KDC networks **Policy Approach** • Prioritise critical routes at the expense of lower priority routes **Demand Management** • Preventative maintenance programme	Low Cost Low Risk Improvements (WC 341)
Unsealed Roads	Use of out of specification GAP aggregates on our unsealed roads is resulting in: • adverse health impacts to residents due to dust • high levels of community dissatisfaction due to poor road condition and • high maintenance costs.	• Reduce the effects of dust on the community • Improve the condition of the unsealed road network • Reduce whole of life maintenance costs of the unsealed road network	Static	**Policy Approach** • Paige-Green compliant wearing courses and structural pavements. • Improved training of grader operators	Unsealed Road Maintenance and Renewals (WC 112, 211)
Structures	Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.	• Provide adequate maintenance and renewals to keep the structures in a fit-for-purpose condition • Prolong the life of structures • Reduce restrictions to freight on the network	Worsening	**Programme Adjustment** • Increase structural maintenance and renewals programmes for FNDC and KDC • Programme of 50MAX bridge strengthening on important freight routes **Policy Approach** • Improve frequency of bridge inspections and carry out retaining wall inspections • Complete 50MAX detailed assessments on important freight routes. • Supplier panel and improved FNDC procurement processes	Structures Maintenance and Component Replacement (WC 114, 215)
Growth and Alternative Transport	Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	• Reduce congestion at bottle necks • Provide for growth in a sustainable manner • Provide or improve access to alternative transport modes • Improve access to employment, education and social opportunities • Reduce community severance and social deprivation • Improve health benefits through active modes	Worsening	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	Low Cost Low Risk Improvements (WC 341) Road Improvements (WC 324) Walking & Cycling (WC 452) Public Transport (WC 511, 531) Parking
Safety	Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for FNDC and WDC. FNDC and KDC also have higher Collective Risks than their peer group.	• Reduce death and serious injuries on the network • Reduce run off road crashes • Provide forgiving roadsides • Reduce crashes involving poor driver behaviour (eg alcohol impairment, lack of use of restraints etc)	Static	**Programme Adjustment** • Increase safety programme **Policy Approach** • Additional delineation **Demand Management** • Enhanced Road Safety Promotions with active in-house management.	Low Cost Low Risk Improvements (WC 341) Traffic services (WC 122, 222) Road Safety Promotion (WC 432)

5.4 Final Problem Statements

Based on an assessment of the stakeholder engagement workshops, customer surveys and knowledge of the network, problem statements for the seven key issues affecting the Far North, Kaipara and Whangarei transport networks have been developed as follows:

Issue	Problem Statement
Sealed Roads	Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.
Drainage	Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.
Resilience	Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.
Unsealed Roads	Use of out of specification GAP aggregates on our unsealed roads is resulting in: • adverse health impacts to residents due to dust • high levels of community dissatisfaction due to poor road condition and • high maintenance costs.
Structures	Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.
Growth and Alternative Transport	Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.
Safety	Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for FNDC and WDC. FNDC and KDC also have higher Collective Risks than their peer group.

Table 5-1: Problem Statements

These issues are described in more detail in the following sections.

5.5 Key Issues

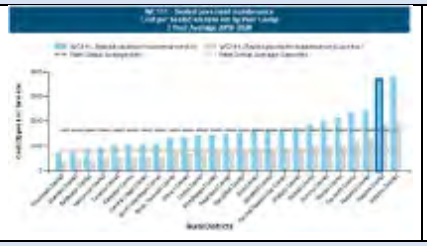
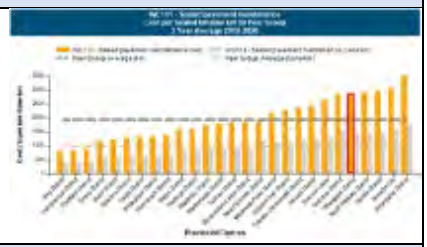
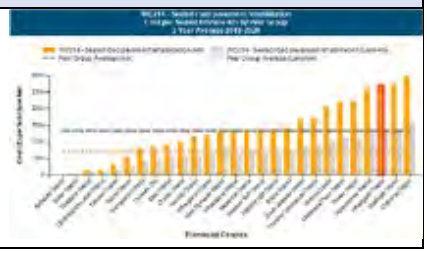
5.5.1 Sealed Roads

5.5.1.1 Problem Statement

Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group. .

5.5.1.2 Problem Description

All three councils have a seal road cost that is at the top end of their peer group. This is demonstrated in the NZTA cost comparison graphs for the last three years (2017-2020) for each sealed road work category below:

FNDC	KDC	WDC
WC 111 Sealed Road Maintenance		
		
WC 212 Sealed Road Resurfacing		
		
WC 214 Sealed Road Pavement Rehabilitation		
		

There are several environmental factors in Northland that contribute to the high costs and these are described below.

Due to the generally poor geology of Northland, pavement subgrades are often weak and very susceptible to moisture. This can result in rutting and shove failures which means that maintenance and renewals are often required earlier than other parts of the country. It also requires new pavements to be thicker and more expensive to carry the traffic loading and more extensive drainage provisions to avoid water ingress leading to premature failure.

The geology of Northland also means that there are relatively few sources of quality aggregate suitable for road maintenance and construction activities in the region. There are few quarries that can produce aggregate to the NZTA M/4 specification and because of this the cost of producing this M/4 material is high. For this reason, most basecourses within the Northland region are constructed using inferior GAP40 aggregate which is then either lime or cement stabilized to bind up the fines. Only a few quarries (Puketona Quarry, Winstones and Atlas Quarry at Piroa) are suitable for sealing chip. This can lead to long cartage runs to truck in metal and hence increased costs for constructing and maintaining roads.

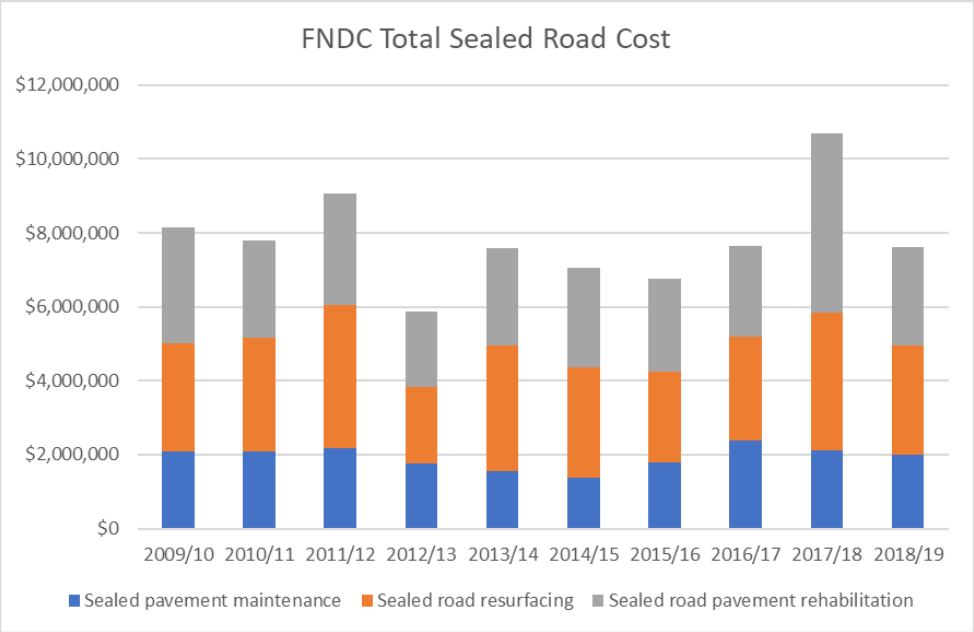
In addition, there is only one asphalt plant in Northland (located in Whangarei) and the next nearest is in Auckland (Silverdale). This again leads to higher costs due to lack of competition and cartage distances, particularly for the Far North.

Freight and forestry traffic results in significantly higher maintenance demands on the Northland road network, particularly due to long lengths of haulage on local roads for the Far North and Kaipara Districts. It is creating significant additional maintenance costs on the network, including premature failure of pavements. This is likely to increase in the future with larger, heavier trucks being used (50 Max, HPMV). As described in the Demand section, freight demand is predicted to grow by almost 40% between 2012 and 2042. This will result in increasing levels of pavement wear and deterioration over time.

A Forestry Plan and forward works programme (FWP) is currently being developed to identify the demands and needs of this network. This will help ensure that adequate long term investment on forestry routes to maintain these in a fit for purpose condition.

For the above reasons, the sealed road costs in Northland are always expected to be in the upper half or third of its peer group.

As well as the above, lack of investment in the sealed road network in the past is influencing the current asset management decisions and costs. This is shown in the 10 year sealed road cost graphs below.



The Far North District sealed road costs are shown in the graph above. This shows a reduced spend on the sealed network between 2012/13 and 2015/16. This was due to FNDC reducing the funding for sealed roads due to a tight economic climate following the global financial crisis.

The amount of reseals on sealed roads has previously been driven by a council KPI that required a minimum of 9% of reseals to be completed per annum. In the past two years, dTIMS has been used to determine the forward works programmes and this will result in a better optimised reseal programme. In the medium term, a sustainable reseal programme of a 12-13 year cycle is being targeted.

There was a spike in resurfacing and rehabilitation costs in 2017/18 as a result of additional NZTA investment in a strengthening programme on the forestry road network. While this was a one-off catch up in forestry work, there needs to be an ongoing programme of work on forestry routes to keep these in a fit-for-purpose state.

The Far North District has a backlog of expensive thin asphalt surfacing to address due to cracking of some of its more important routes such as Commerce Street and North Ave in (Kaitaia), Kerikeri Road and the

Kerikeri Heritage Bypass. This will be a focus area for 2021/24 to replace these surfacings and ensure that these pavements are kept waterproof.

FNDC charges its in-house business unit costs for all of its maintenance activities to the maintenance work categories. This cost should be charged to WC 151 Network and Asset Management. In addition, a large portion of the contract management fixed costs from the new maintenance contracts is being charged to sealed roads. This funding should be spread more equitably among the maintenance work categories. These changes will be made for the 2021/24 period and will help reduce the costs of the sealed road network.

The sealed road costs for the Kaipara District are shown in the graph above. This shows a lean period of spending between 2011/12 to 2013/14 during the Kaipara rates strike, when residents in Mangawhai and some across the District refused to pay their rates in protest against the cost over-run from the Mangawhai Sewerage Scheme. This left a significant hole in the Kaipara sealed road programme, which was later recovered by additional investment in the 2014/15 – 2016/17 period.

In the last two years, there has been a rebalancing of the renewals programme to substantially reduce the rehabilitation programme and reinvest this money into resurfacing to reduce a significant backlog of single coat seals on the network. This also coincides with the implementation of dTIMS modelling for the Kaipara network to optimise the sealed road programme.

As for FNDC, KDC charges its in-house business unit costs for all of its maintenance activities to the maintenance work categories. This cost should be charged to WC 151 Network and Asset Management. This change will be made for the 2021/24 period and will help reduce the costs of the sealed road network.

The sealed road costs for the Whangarei District are shown in the graph above. During the 2015/18 period there was an increase in pavement rehabilitation to recover from historically low rates of rehabilitation in the preceeding years. These low rates were primarily due to renewal funding being diverted by council to fund emergency works and lack of local share caused by council accounting for property sales which did not occur.

In addition, pre-reseal costs rose substantially from 2009/10 to 2015/16 as a result of reseals being at historically low levels (60km/year or an 18 year average cycle). The focus on additional reseal funding from 2015/16 is now resulting in a downward trend in maintenance costs. Resurfacing levels are currently high to try and address a backlog in old void fill seals, but should be able to drop back to a more sustainable 12-13 year average cycle in the 2021/24 period.

A significant focus has been given to the Whangarei City urban network over the past 4 years and this has contributed to the high renewal costs through thin asphaltic (TAC) surfacings and expensive structural asphaltic concrete (SAC) pavements. Further investment in the urban network will be required in the future, but alternative cheaper solutions should be considered to both extend the life and carry out renewals wherever possible.

5.5.1.3 Key Issues and Actions

- Pavement costs in Northland are likely to be higher than other areas due to poor geology which results in softer subgrades requiring thicker pavements, fewer good quality quarry sources which increase material cartage costs and a significant amount of forestry and freight on the local road network. Many pavements are thin and susceptible to changes in heavy vehicle traffic and water ingress.
- An adequate level of pavement rehabilitation and chip seal surfacing needs to be sustained in the long term to preserve the pavement condition and to reduce long term maintenance costs. Lack of investment in renewals in the past is resulting in a current period of catch up to address backlogs.
- Investment in thin asphaltic surfacing is required in FNDC and WDC to address a backlog of overdue surfaces which are heavily cracked. This will help preserve water proofing and avoid premature failure on major arterial routes resulting in very expensive rehabilitation treatments.
- Urban rehabilitations in Whangarei City are mostly using expensive structural asphaltic concrete (SAC) pavements which is driving up sealed road costs.

- FNDC and KDC are charging their in-house business unit costs to maintenance work categories rather than to WC 151. FNDC is also disproportionately charging the contract management fixed costs from the new maintenance contracts to the sealed road network.

5.5.1.4 Benefits

- Continuation of an adequate programme of pavement renewals will enable the sealed pavement to be maintained in a fit for purpose condition while optimising the long-term maintenance costs.
- Continuation of the forestry road programme will enable the forestry network to be maintained in a fit for purpose condition to allow safe and efficient cartage of logs to Northport, sawmills and processing plants located within the region. This will help ensure that the economic benefits from the forestry activity are sustainable in the long term.
- Maintaining other freight routes to a higher standard will make these roads better able to cope with the increasing freight loads over time, reduce continual disruptive maintenance patching and more resilient to adverse weather events.
- Further investment to replace pavements with thin asphalt surfacing will help preserve the pavements in the urban area which are very expensive to rehabilitate.
- Alternative solutions should be investigated for urban rehabilitations in Whangarei City to reduce the reliance on high cost structural asphaltic concrete (SAC) pavements.
- Changing how the FNDC and KDC are charging their in-house business unit costs for maintenance activities and FNDC's distribution of the maintenance contract management charges will reduce the cost of the sealed road network.

5.5.1.5 Consequences

- Not continuing the current programme will see a worsening of pavement condition (eg more potholes and failures) and an increase in long-term maintenance costs.
- Without carrying out effective maintenance and renewals of freight and forestry routes will result in a worsening condition, more maintenance and costs, slower travel times and potential safety issues.
- Without addressing the poor condition thin asphaltic (TAC) surfacings in the Far North and Whangarei Districts, these surfaces will allow water ingress and premature (and expensive) pavement failure.
- Continuing with expensive structural asphaltic concrete (SAC) pavements in Whangarei City will keep sealed road costs high.
- Continuing the current charging of in-house business unit costs for maintenance activities and charging of maintenance contract management costs will continue to increase the cost of the sealed road network for FNDC and KDC.

5.5.2 Drainage

5.5.2.1 Problem Statement

Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.

5.5.2.2 Problem Description

Until recently drainage maintenance and renewals on the local road network in Northland has been undertaken in a piece-meal manner as and when funding allows. The focus to date has been largely reactive, addressing drainage when culverts become blocked or flooding is identified through members of the public or inspection. Drainage renewals are also undertaken on roads being rehabilitated.

The new maintenance contracts for each council that commenced in 2018 include annual culvert inspections. This has gone a long way to helping keep culverts clear of debris and to identify programmes to clean the culvert barrels.

A big concern has been the lack of adequate focus and investment of the roadside watertables which make up about 90% of the drainage system. Watertables ensure that water is channelled away from the pavement to reduce the likelihood that it will either soak into the pavement or soften the subgrade causing premature failure. They also prevent water from scouring out the road or ponding on the carriageway through having a high lip. Watertables often become blocked due to vegetation growth, sediment build up or minor overslips filling up the watertable. Watertables on unsealed roads are a particular issue through grader operations pushing gravel into the drains or creating a high lip which prevents water from draining off the pavement.

Some examples of inadequate watertables are shown below:

KDC currently undertakes a 9 yearly cycle of watertable clearing on its unsealed road network, but no regular programme on its sealed road network. FNDC and WDC have no regular cycle of watertable clearing and this is undertaken on an ad-hoc basis as problem areas are identified.

The NTA is nearing the completion of a Drainage Plan and Maintenance Intervention Strategy. This needs to be rolled out to the NTA maintenance teams and maintenance contractors to ensure that the right interventions are undertaken at the right time.

A key part of this plan is the development of a forward works programme for drainage works and in particular watertable maintenance. This programme will identify the highest risk drainage needs on the council networks, which will mean that these works will be able to undertaken in a proactive manner and be timed to precede pavement renewals such as resurfacings, rehabilitations or heavy metalling which will extend the life of the pavements and reduce overall spend on the network.

Adequate drainage funding is required to ensure that these drainage renewals are able to be undertaken in a timely fashion to maximise the benefits of this work.

5.5.2.3 Key Issues and Actions

- The maintenance and renewals of drainage systems in the past has been inadequate to control water flows to keep pavements free of water ingress and to prevent flooding and scour of roads, particularly on the unsealed network.
- Culverts are now being inspected annually and this is addressing culvert blockages, however there is no adequate programme to address blocked watertables which make up 90% of the drainage network.
- The NTA Drainage Plan and Maintenance Intervention Strategy is being finalised which should enable proactive treatment of high risk areas. This needs to be rolled out to the NTA maintenance teams and maintenance contractors to ensure that the right interventions are undertaken at the right time.
- The current amount of drainage investment is inadequate to address the forward works programme identified by the Drainage Plan.

5.5.2.4 Benefits

- The roll out of the Drainage Plan and Maintenance Intervention Strategy should result in more focus to identify inadequate watertables in areas that are high risk for water ingress, flooding and scour.
- Adequate funding of the Drainage Plan's forward works programme will enable proactive treatment of these high risk areas which should prolong the life of the pavement and surfacings and will reduce the amount of water flooding across roads.

5.5.2.5 Consequences

- Without the roll out of the Drainage Plan and Maintenance Intervention Strategy, maintenance teams and crews will continue to identify watertable issues only when they cause pavement failures or flooding problems.

- Without the provision of adequate funding to fund the Drainage Plan's forward works programme, watertables will carry-on being maintained in an ad-hoc manner which will continue to allow water into pavements causing premature failure and additional pavement costs.

5.5.3 Resilience

5.5.3.1 Problem Statement

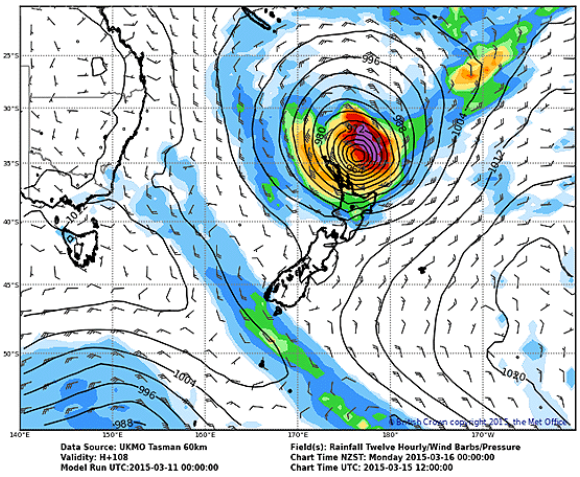
Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.

5.5.3.2 Problem Description

Northland's road network has been subject to many slips over the years due to its weak predominantly clayey soils and high rainfall events. 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. Flooding is also an issue on roads in river valleys or flat coastal plains and will only worsen as a result of climate change, particularly in low-lying coastal areas that my face inundation through sea level rise.

Security of access is a key issue for Northland because there is no warehousing and so often essential supplies are freighted up multiple times a week to stock shelves etc. There are also several products produced in Northland which require same day delivery, such as fresh cut flowers and some live aquaculture, which require secure access. Also when a flood event occurs, it normally affects the whole region putting many key routes at risk of slips and flooding at the same time. This was demonstrated clearly during the July 2014 floods where the Far North was effectively cut off from the rest of the country for almost two weeks resulting in severe shortages of food and fuel.

The following figures show a typical tropical cyclone (Cyclone Wilma) and the impact such events on the road network. The image on the right shows the location of each slip, flooding, scour or tree fall during a major event. As shown, the effect is normally wide-spread across the region and severely limits access both during the event and for months and sometimes years afterwards.



The following figure shows the known slips on the local road network in Northland on critical routes (rated high or very high on the criticality assessment). As part of a Resilience Strategy undertaken by the NTA, 1,000km of critical routes were inspected and 1,150 slips identified on these routes. This is an average of one slip every kilometre. The figure show that much of the network is subject to slips which pose a threat to closure of these critical routes, particularly with the growing risk of more intense storms and cyclones.

The State Highway network in Northland forms the key means of access within the Northland region, and beyond. This was recognized in the Northland Lifelines Group Infrastructure Resilience Plan. This plan

identified that the State Highway networks were critical life-lines that provide access for people and emergency vehicles as well as for food and fuel to Northland communities. The Resilience Plan identified the top 5 risks for the transport network as:

- Flooding
- Land instability
- Tsunami/Surge
- High Winds
- Chemical Spills

In addition to these top 5 risks, State Highway closure due to a vehicle accident is a very real risk. Maps from the Northland Lifelines Group Infrastructure Resilience Plan are included in Section 11.3.

Because of the criticality of these highways, bypass routes have been agreed should an emergency event require the highway to be closed. Major State Highway diversion routes are Ruapekapeka Road, Mangapai Road, Paparoa Road, Cove Road, Kaiwaka Mangawhai Road and Tomarata Road. These diversion roads were used during the July 2014 storm events when SH1 was closed at Towai and the Brynderwyns.

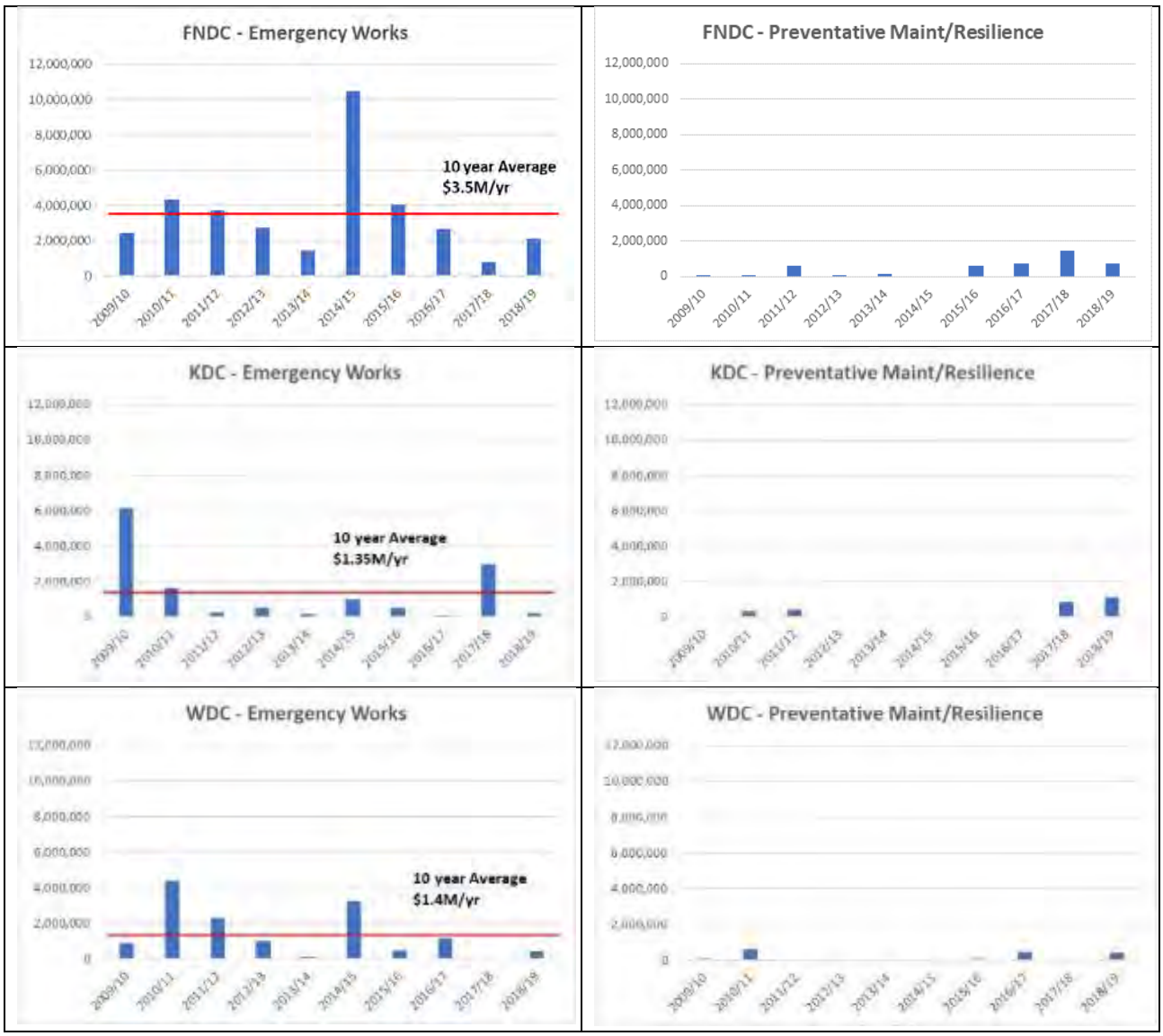
These routes are not designed to carry highway loading and can deteriorate rapidly when diversion traffic uses these roads for extended periods. In addition, often when a State Highway is closed due to storm damage, the local diversion roads are often also flooded or damaged, and this can create safety risks for traffic detoured onto these routes.

One of the key issues identified by the freight industry is having suitable detours for main freight routes, particularly SH1 which is the main freight route to Auckland. Most of these routes are not yet fit for purpose to carry state highway and freight traffic due to being slip and flood prone, having one-lane bridges, tight corners which cannot be negotiated by heavy vehicles without crossing the centreline and bridges incapable of carrying 50Max or HPMV loads. Currently there are nominated detour routes where 50Max and HPMV trucks need to park up until the state highway is cleared because the detour route is not capable of carrying these loads. Even road closures for emergency events such as a vehicle crash, can result in significant delay and disruption for heavy vehicles due to these issues with the detour routes.

For the local road network, there are no identified detour routes for key arterials (such as Riverside Drive, Whangarei Heads Road, Pouto Road) which carry equivalent amounts of traffic to the SH network and are critical for the safe and efficient operation of the network. There is also no programme of slip repairs or flood prevention on key arterials, tourist routes such as the Twin Coast Discovery Highway and associated byways, or for roads that form the only vehicle access to isolated coastal communities.

The NTA is currently developing a Resilience Plan to identify critical routes and the threats to these routes through slips, flooding or coastal inundation. A key part of this plan is to develop a forward works programme to carry out treatment on these critical routes in a planned manner. This should focus effort on addressing the highest need areas first which will result in the biggest gains to improving the security of the network and reduce unplanned road closures over time.

The scale of emergency events on the network during storm events is shown in the figures below. This demonstrates that emergency events have averaged $3.5M/year for FNDC, and $1.3-1.4M/year for KDC and WDC over the last 10 years. It also shows that investment in planned preventative maintenance and resilience improvements has been very small compared to reactive emergency works spend.



As described in Section 4.13, climate change is likely to result in more extreme weather events, sea level rise, higher temperatures and more susceptibility to droughts. This is going to put increasing demands on the transport network to be resilient to these changes in the future, particularly on critical routes. In particular, the likely effects will be:

- Extreme weather events – Road closures due to higher intensity rainfall events resulting in flooding and slips, as well as stronger winds resulting in tree fall.
- Sea Level rise – Inundation of low-lying coastal areas and greater coastal erosion.
- Higher temperatures and droughts - Maintenance effects such as more bleeding of bitumen, lower ability to use stream water for maintenance and construction, more cracks opening up – making roads more susceptible to slips, faster vegetation growth.

The Resilience Plan will take these effects into account to enable the transport network to adapt to the changes of climate change.

5.5.3.3 Key issues and actions:

- Detour routes for state highway and main arterials to be identified and made fit for purpose.
- Through the Resilience Plan, develop a prioritised programme of slip repairs and flood mitigation required on key arterial routes, tourist routes and on roads that form the only vehicle access to isolated communities.
- Climate change is likely to worsen slips and flooding in the future as well as causing inundation of low lying coastal areas.

5.5.3.4 Benefits

- Addressing slips and flood mitigation in a proactive manner will reduce the likelihood of catastrophic failure and will reduce ongoing maintenance costs. This will minimise delay and disruption on key arterials, tourist routes and will provide security of access for isolated coastal communities. It will help ensure that access for essential supplies such as food and fuel can be maintained. The proactive treatment of known slips and flood susceptible areas will also help mitigate the increased intensity of storm events in the future that are expected to occur due to the effects of climate change.
- Providing fit for purpose detour routes for the state highway network and key local arterials would enable traffic and freight flows to negotiate the detour efficiently and safely.
- Considering the impacts of climate change in low-lying coastal areas will help planning of new roads and coastal protection in these areas. This will help future proof the road network from potential sea level rise.

5.5.3.5 Consequences

- Without a proactive resilience programme, historic slips and flood susceptible areas will continue to be at risk of premature failure or flooding and will require ongoing maintenance to repair during storm events. Access on key supply routes and to isolated coastal communities may be cut-off during significant storm events which may result in shortages of essential supplies such as food and fuel. Also access on key tourist routes could be blocked resulting in tourists unfamiliar with the area being sent down back roads and getting lost leading to potential safety concerns.
- Detour routes will continue to be below the required standard for state highway and arterial traffic flows and will be a major constraint for 50Max and HMPV freight movements when detours are in place resulting in delays, safety concerns and increased freight costs.
- Slips and flooding will become more of an issue in the future with climate change likely to result in more significant rainfall events. It is also likely to result in inundation of low-lying coastal communities.

5.5.4 Unsealed Roads

5.5.4.1 Problem Statement

Use of out of specification GAP aggregates on our unsealed roads is resulting in:

- adverse health impacts to residents due to dust
- high levels of community dissatisfaction due to poor road condition and
- high maintenance costs.

5.5.4.2 Problem Description

The unsealed road network in Northland is one of the longest of any region in the Country. The proportion of the road network that is unsealed is also high. This means that the unsealed road network plays a significant part in providing access to remote communities and to productive land. A large proportion of forestry, agriculture and dairy land is served by unsealed roads. Most primary production trips start on an unsealed road.

Because Northland's economy is support by significant forestry, agriculture and dairy industries, the amount of heavy vehicle traffic using the unsealed road network is comparatively high. This results in a high level of traffic loading on unsealed freight routes. The loading on these freight routes has increased over the last decade, particularly with the rapid increase in logging activity as forestry blocks have been harvested. This has placed increasing demands on the unsealed road network. As described in the Demand section, freight demand is predicted to grow by almost 40% between 2012 and 2042. This will result in increasing levels of pavement wear and deterioration over time.

From the customer satisfaction surveys, there is a high level of dissatisfaction with the unsealed road network. The main reason for dissatisfaction was a perceived lack of maintenance and potholes, corrugations and being out of shape. The customer generally wants a smooth road, so managing potholes and corrugations is important in achieving a reasonable level of customer satisfaction.

The current maintenance regime is reactive resulting in work being undertaken in summer in dry conditions which requires expensive wet, roll and grade maintenance to adequately compact the road. Lack of adequate geometry and cross fall is also an issue which can accelerate the generation of pothole and corrugations. Restoring adequate shape is often not manageable under the current heavy metalling and grading regime due to lack of pavement thickness.

There is also ongoing pressure from residents on unsealed heavy vehicle routes to seal their roads or frontages. This is to reduce the impacts of dust on resident's health and to improve road safety. In particular, in January 2017 residents blocked logging trucks on two locations on Pipiwai Road over a two week period to force councils to address dust on forestry roads in the area.

As a result of these blockades, the Far North and Whangarei councils have implemented programmes of dust suppression on forestry roads over dry summer months to try to address dust issues. In addition, both councils have undertaken subsidised seal extensions on significant forestry and freight routes – for WDC on Wright Road, McCardle Road and for FNDC on Pipiwai Road and Ngapipito Road. Further subsidised funding is being sought by FNDC for sealing sections of Koropewa Road and Church Road. These projects have been justified on the basis of having a high or medium-high dust risk in accordance with the Dust Risk Matrix from NZTA's General Circular 16/04. Both the Far North and Whangarei councils are also undertaking programmes of unsubsidised seal extensions on other roads. The Kaipara District Council is not currently using dust suppression or carrying out sealing to mitigate dust impacts.

The Northland Transportation Alliance has undertaken an assessment of its highest risk roads for dust using the Dust Risk Matrix from NZTA's General Circular 16/04. Extracts from this assessment for each council are shown below.

Far North District Council – NZTA General Circular 16/04 Assessment

		RAMM DATA			NZTA DMI (General Circular 16/04)											
Road Name	Location	Road ID	Start	End	16/04 SCORE HCV 5 day AADT	16/04 SCORE HCV Speed	16/04 SCORE LDV 5 day AADT	16/04 SCORE Speed of LDVs (Est)	16/4 SCORE Houses / km (80m from road)	16/04 SCORE sensitive locations/ km schools, marae, or hospitals	16/04 SCORE Ecological Areas / km	16/04 SCORE Horicul-tural areas / km	16/04 SCORE Location of roadway	16/04 SCORE Frequency of rain days (>5mm)	16/04 SCORE Longevity of logging route use	SCORE NZTA Circular 16/04 OVERALL
Beach Road	DOVES BAY	3103	0	188	5	2	2	2	5	0	0	0	1	2	0	19
Quarry Road	AWANUI	2209	0	720	5	2	2	2	5	0	0	0	1	2	0	19
West Coast Road	KOHUKOHU	2543	25,619	26,214	4	2	1	2	5	1	0	0	1	1	2	19
Koropewa Road		1872	0	1,692	4	2	2	2	5	0	0	1	1	1	0	18
Waterfront Road	HOUHORA	2529	456	1,386	5	2	2	2	4	0	0	0	1	2	0	18
TOTARA SCHOOL ROAD	TOTARA NO	3122	0	472	5	2	2	2	4	1	0	0	1	1	0	18
Arawhata Road		3057	285	1,329	4	2	1	2	5	0	0	0	1	2	0	17
Clough Road		1607	506	806	4	2	2	2	2	0	2	0	1	2	0	17
Purerua Road		2205	9,893	10,198	4	2	2	2	2	0	2	0	1	2	0	17
Te Tii Road		2431	0	150	4	2	1	2	5	0	0	0	1	2	0	17
Aurere Beach Road		1510	0	543	3	2	1	2	5	0	0	0	1	2	0	16
Church Road	KAITAIA	1596	13,104	13,851	5	2	1	2	3	0	0	0	1	2	0	16
Church Road	KAITAIA	1596	13,937	15,041	5	2	1	2	3	0	0	0	1	2	0	16
Doel Road	WAIPAPAKA	1642	0	282	2	2	0	2	5	0	2	0	1	2	0	16
Kaimaumau Road		1838	8,580	9,933	4	2	1	2	4	0	0	0	1	2	0	16
Kerikeri Inlet Road		1795	8,911	9,820	5	1	2	1	4	0	0	0	1	2	0	16
Mcfarlane Street	NORTH	3043	0	199	5	1	2	0	5	0	0	0	1	2	0	16
Oturu Road		2113	2,058	2,430	4	2	1	2	3	1	0	0	1	2	0	16
Wireless Road		2585	2,123	2,423	5	2	2	2	2	0	0	0	1	2	0	16
Quarry Road	AWANUI	2210	4,844	5,531	4	2	2	2	3	0	0	0	1	2	0	16
West Coast Road	KOHUKOHU	2543	36,639	37,253	4	2	1	2	3	0	0	0	1	1	2	16

Kaipara District Council – NZTA General Circular 16/04 Assessment

TLA	Road	Route Position Start	Route Position End	Length	Houses within 80m of Road	Houses/km	Traffic Volume	Volume of HCV/day	Overall Score	Indicative Strategy (Not yet approved by Council) - Subject to meeting General Circular 16/04 criteria	Indicative Funding Source
KDC	Kellys Bay Road	6,011	6,467	456	4	9	80	7	16	No strategy identified	
KDC	Pouto Road	42,505	65,014	23,308	15	1	207	64	16	No strategy identified	
KDC	Black Swamp Road	597	1,919	1,322	8	6	583	47	15	No strategy identified	
KDC	Pebblebrook Road	30	1,259	1,231	22	18	56	4	15	No strategy identified	
KDC	Avoca Road	478	10,674	10,195	11	1	105	15	14	No strategy identified	
KDC	Buckesteffe Road	3,587	13,476	9,889	18	2	105	7	13	No strategy identified	
KDC	Kaiaru Wood Road	468	3,971	3,503	8	2	110	8	13	No strategy identified	
KDC	Kaihupani Valley Road	55	14,429	14,374	8	1	55	13	13	No strategy identified	
KDC	Rahuta Road	61	6,267	6,166	27	6	105	15	13	No strategy identified	
KDC	Wairua Road	12,302	27,225	14,903	30	2	75	11	13	No strategy identified	
KDC	Babylon Coast Road	273	17,417	17,144	13	1	110	8	12	No strategy identified	
KDC	Houto Road	290	5,016	4,726	10	2	30	4	12	No strategy identified	
KDC	Kellys Bay Road (Nth)	0	6,011	6,011	2	0	105	9	12	No strategy identified	
KDC	Maeroero Road	55	3,125	3,070	9	3	157	16	12	No strategy identified	
KDC	Middleton Road	0	1,235	1,235	5	4	54	5	12	No strategy identified	
KDC	Mititai Road	12,335	22,371	10,036	13	1	240	41	12	No strategy identified	
KDC	Nichols Road	0	2,856	2,856	7	2	46	5	12	No strategy identified	
KDC	Schick Road	34	1,693	1,659	4	2	50	3	12	No strategy identified	
KDC	Tangowahine Valley Road	17,508	24,139	6,631	10	1	135	19	12	No strategy identified	
KDC	Te Kowhai Road	4,170	11,221	7,049	20	3	190	21	12	No strategy identified	
KDC	Waipara Road	0	1,323	1,323	1	1	46	19	12	No strategy identified	

Whangarei District Council – NZTA General Circular 16/04 Assessment

TLA	Road	Route Position Start	Route Position End	Length	Houses within 80m of Road	Houses/km	Traffic Volume	Volume of HCV/day	Overall Score	Indicative Strategy (Not yet approved by Council) - Subject to meeting General Circular 16/04 criteria	Indicative Funding Source
WDC	Brooks Road	0	3,600	3,600	29	8	200	14	15	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Massey Road	0	3,200	3,200	29	9	200	16	15	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Millbrook Road	2,893	9,100	6,207	16	3	237	20	14	House frontage seals through MOR	WDC/NZTA
WDC	Opouteke Road	4,220	7,900	3,680	6	2	214	101	14	Dust supression for remainder of this logging cycle	Forestry
WDC	Ormandy Road	5,431	6,791	1,360	23	17	90	10	14	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Prescott Road	1,700	5,100	3,400	20	6	120	10	14	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Pyle Road East	1,800	2,645	845	10	12	90	7	14	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Attwood Road	0	3,052	3,052	14	5	100	7	13	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Helmsdale Road	4,626	7,630	3,004	12	4	170	20	13	House frontage seals through MOR	WDC/NZTA
WDC	Jobe Road	26	1,970	1,944	14	7	100	11	13	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Karaka Road	22	1,900	1,878	4	2	120	48	13	House frontage seals through MOR	WDC/NZTA
WDC	Lamb Road	34	1,200	1,166	7	6	100	10	13	House frontage seals through MOR	WDC/NZTA
WDC	Mountain View Road	414	1,132	718	9	13	60	4	13	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Ody Road	233	4,045	3,812	10	3	150	15	13	House frontage seals through MOR	WDC/NZTA
WDC	Owhiwa Road	6,809	9,007	2,198	11	5	250	25	13	House frontage seals through MOR	WDC/NZTA
WDC	Sandford Road	180	971	791	5	6	80	6	13	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Patutahi Road	56	2,064	2,008	3	1	60	15	12	House frontage seals through MOR	WDC/NZTA
WDC	Kerr Road	21	3,423	3,402	17	5	150	5	12	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Knight Road	4,200	7,590	3,390	10	3	120	8	12	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Main Road	945	1,355	410	1	2	150	15	12	House frontage seals through MOR	WDC/NZTA
WDC	Pigs Head Road	117	5,562	5,445	16	3	117	11	12	House frontage seals through MOR	WDC/NZTA
WDC	Takahiwai Road	3,615	4,962	1,347	11	8	50	4	12	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner
WDC	Waiotoi Road	1,407	2,483	1,076	8	7	150	8	12	Ratepayer subsidised seal extension (100% local share)	WDC/Landowner

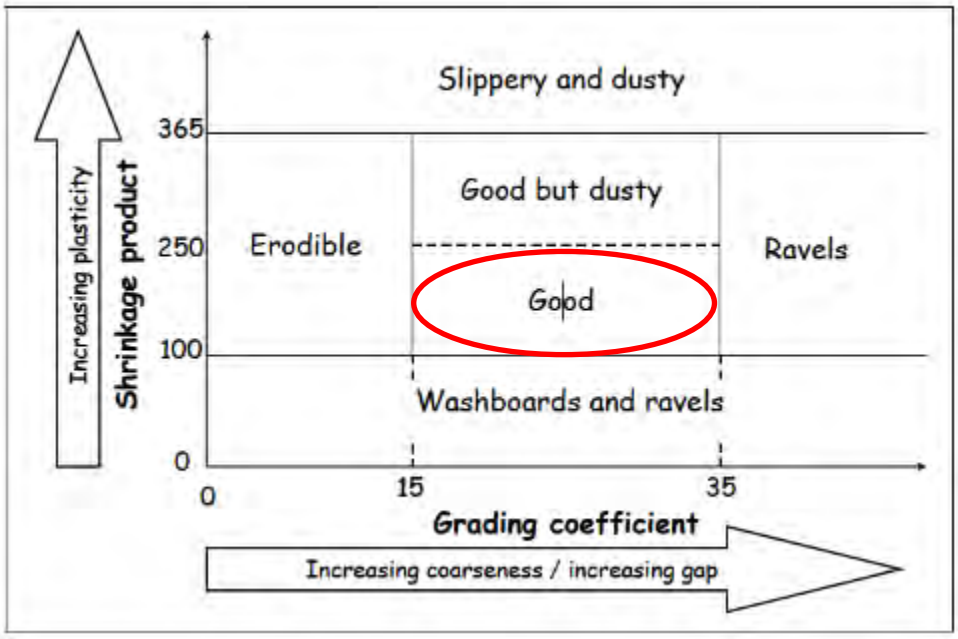
The number of dwellings exposed to a medium dust risk score of 10 or more is 1,918 for FNDC, 334 for KDC and 441 for WDC. Most of these dwellings are on forestry or other freight routes. This indicates that there is likely to be a significant exposure to health effects of PM_{10} dust to people living on these routes.

The unsealed roads in Northland have been maintained for many years using a General All-Passing (GAP) type material which is readily sourced from the local quarries. This material is permeable and allows water into the pavement surface. Because of this, the unsealed road surfaces are prone to pot-holing if the pavement shape is not sufficient to shed surface water (a cross fall of 6% or more). As described above, it is often difficult to achieve the correct cross-fall due to lack of metal depth.

The GAP material also is quite granular and lacks cohesive material to bind it into a tight surface, which results in the gravel moving around on the surface (like marbles). This makes the surface prone to corrugations forming during dry periods. It also means that significant dust is produced through the particles moving and grinding against each other, particularly under heavy vehicle traffic. Gravel loss is another significant issue because the loose stones on the surface are flicked off the road as vehicles pass. Over time this results in the pavement thickness wearing away until eventually clay patches of the subgrade are exposed and heavy vehicles "punch" through the surface. The aggregate that is flicked off the road often fills up the side drains creating on-going drainage issues. An example of a logging truck on a typical GAP type material pavement is shown below.

The GAP material was probably fit for purpose when traffic volumes, and in particular heavy vehicle volumes, were less. However, with growth in the region and increasing freight demands, this material is becoming more unsustainable on routes carrying freight or high traffic volumes. In particular, the recent recognition that dust is a health hazard to residents has elevated the needs for dust control on freight routes. Because of the above reasons, there are increasing demands for more and more maintenance of the unsealed network, including pothole patching, grading, metalling and dust suppression. It is also resulting in more desire for expensive seal extensions.

The new maintenance contracts that were awarded across Northland in 2018 are strongly focussed on changing to a more sustainable blended material using the South African Paige-Green chart (see image below) which has been adopted by Austroads. This material includes more cohesive clay material and results in a tightly bound surface which is more resistant to potholing, corrugations, ravelling and dust generation.



However, to date there has been limited use of this material on the network. This appears mainly due to a lack of roll-out of this new material through the maintenance teams and contractors. It is also due to lack of available funding within the maintenance contracts to use this wholesale across the region. It may also be due to potential commercial reasons as there is little incentive for the maintenance contractors to change their current approach, because it generates more work.

For the roads where the Paige-Green compliant material has been used, such as Cames Road in Mangawhai, there has been an improvement of the road condition and less maintenance required. There has also been less dust generated, and the dust that is formed settles more quickly than for GAP pavements. An example of a pavement using Paige-Green compliant material is shown below.

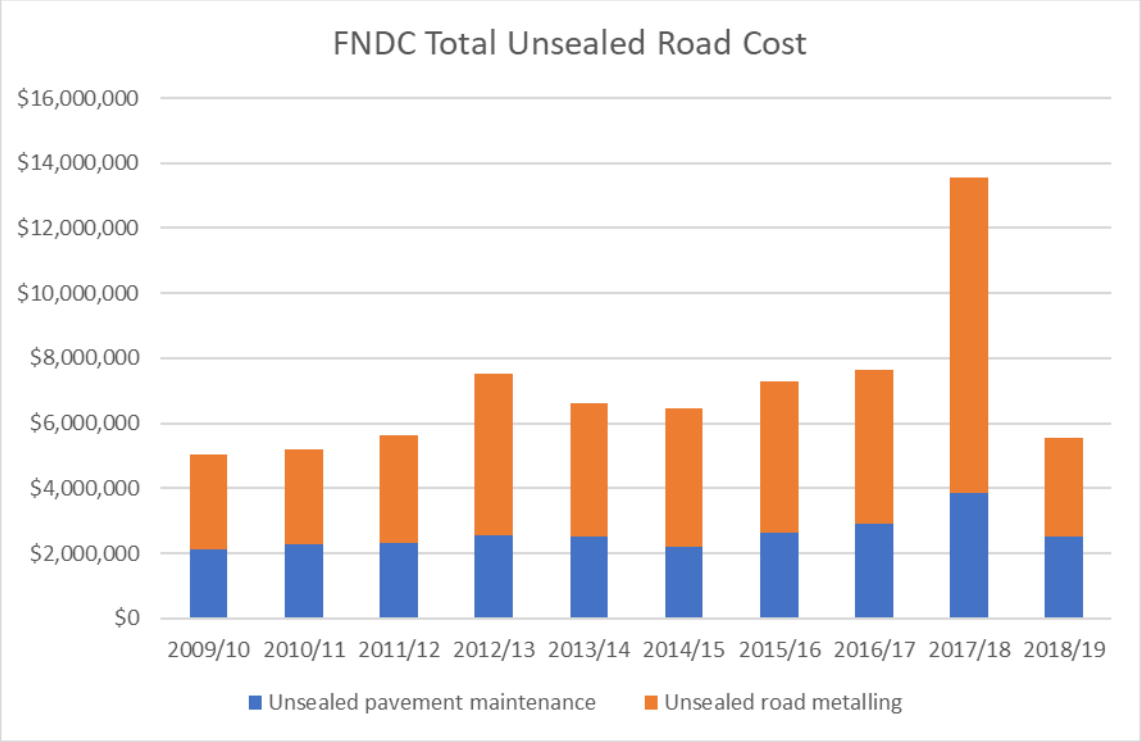
The Northland Transportation Alliance has been developing a centre of excellence for unsealed roads. Key initiatives of the centre of excellence is the development of an unsealed demand-based prioritisation tool, a unsealed cost model and forward works programme. This work is based on transitioning from the current GAP materials to having Paige-Green compliant wearing courses on medium and high demand roads. Pavement strengthening to provide sufficient pavement depth for these roads would also be required. Low demand roads would continue to be maintained as normal but would have Paige-Green materials applied whenever any make up material is required.

Over time, this approach is likely to result better pavement condition, improved road user satisfaction and lower maintenance costs. Although it is not a “silver bullet” treatment, the use of Paige-Green complaint material is also likely to reduce dust impacts to local residents. This may reduce or eliminate the need for costly dust suppression, particularly on low and medium demand roads. High demand routes which are subject to forestry or other freight movements, may still require dust suppression to control dust, but with fewer applications per annum. Unsealed roads that are subject to high, long term forestry or freight volumes may be considered for house frontage sealing or seal extension to reduce long term maintenance costs and to mitigate dust impacts to residents.

There is not much information on the amount of pavement depth or condition of the unsealed road network. The limited testing that has been undertaken indicates that there is very little pavement depth on most of the unsealed road network due to the historic amount of re-metalling achieved being insufficient to match the gravel loss of the GAP materials. It is expected that further investment is needed on the unsealed road network to restore pavement strength that has been consumed through metal loss. Test pit data should be gathered whenever metalling operations are being undertaken to determine the appropriate level of metalling required. This will help determine existing pavement depths which will enable appropriate amounts of Paige-Green compliant materials being used to provide the required shape and pavement strength. The use of new technology such as RoadRoid has been be included in the new maintenance contracts and this should be enforced so that a data on the unsealed road roughness can be determined which will enable a proactive grading programme to be developed rather than reacting to customer complaints.

Further development of houses on unsealed roads is leading to more people being exposed to dust and more pressure for dust mitigation and road sealing. The Whangarei District Council has recently approved a plan change which would limit future rural development on unsealed roads and would help limit further dwellings being exposed to road dust. The planning rules in the Far North and Kaipara districts should also be reviewed and rules developed to either limit the development of houses on unsealed roads or to require new dwellings to be located well back (ideally greater than 80m) from unsealed road frontages.

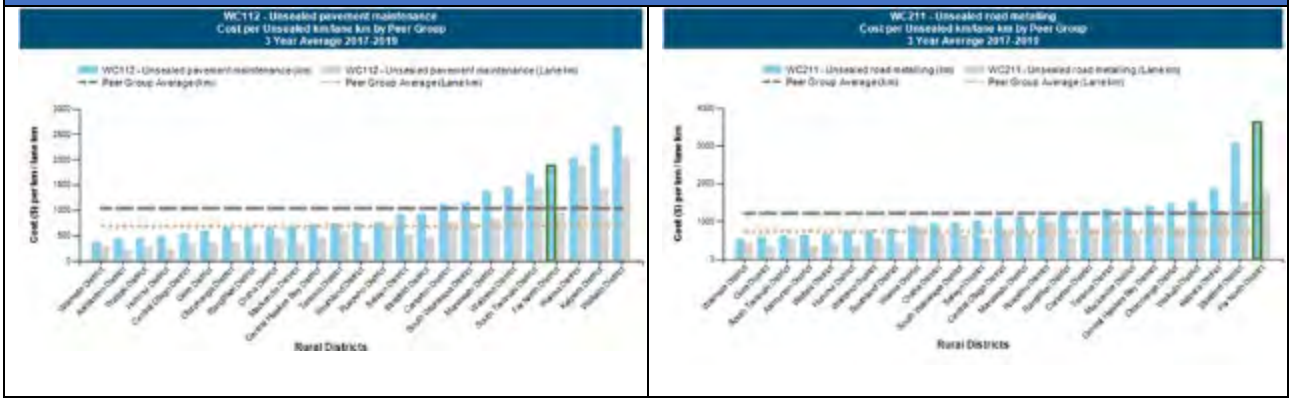
The cost to maintain the unsealed road network for each council is shown in the graphs below.



The graph for FNDC shows that the spend on the unsealed road network in the Far North has progressively increased over the past 10 years as demand and costs increase. In 2017/18 there is a significant spike through the additional NZTA investment in the forestry road strengthening programme and the Ngapipito and Pipiwai Road sealing. This resulted in a short term reduction in spend in the following years (2018/19 and 2020/21). However, this effect is expected to be short lived as the gravel loss on these forestry routes is high and will require increasing levels of investment over time.

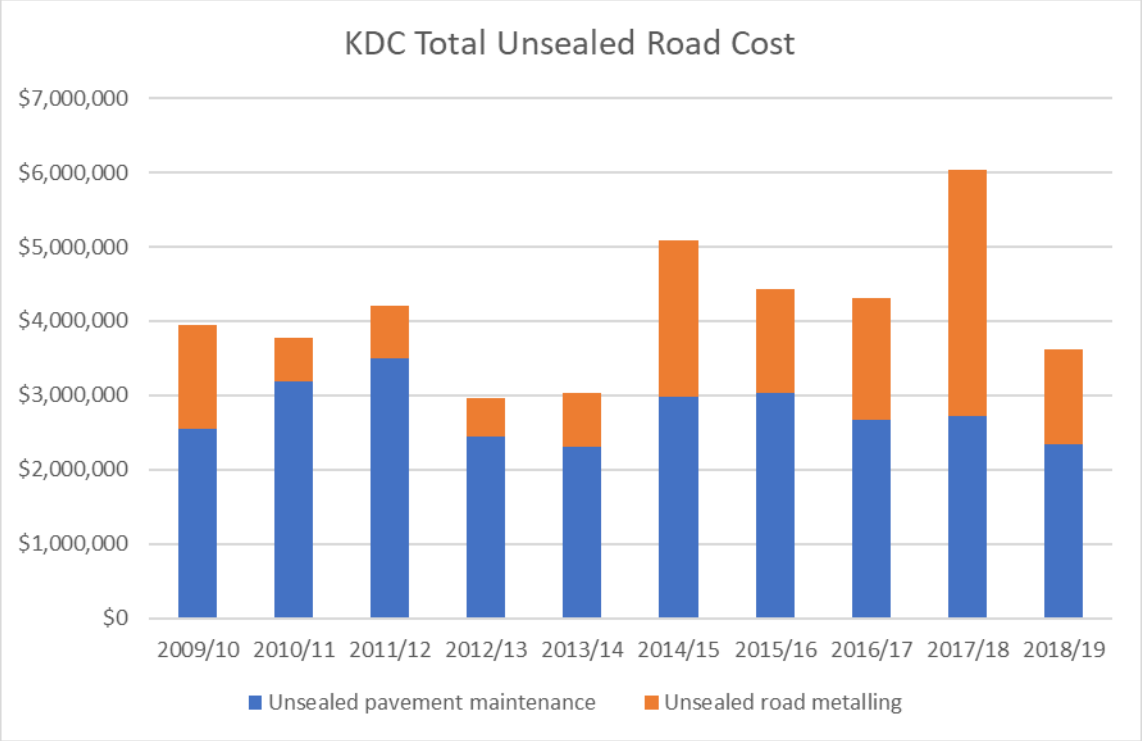
In the last three years, Far North has one of the highest total unsealed cost in their peer group as shown in the figures below.

FNDC Unsealed Road Cost – 3 Year Peer Group Comparison



In addition to this, FNDC is currently spending $500,000/annum on unsubsidised dust suppression and another $4M/year on seal extensions, of which $1M/annum is being targeted through the Low Cost Low Risk programme with the rest being unsubsidised. Most of this work is being undertaken due to pressure from the community due to health concerns due to dust and general dissatisfaction with the unsealed road network. This demonstrates that the current approach to unsealed roads is not sustainable in the Far North.

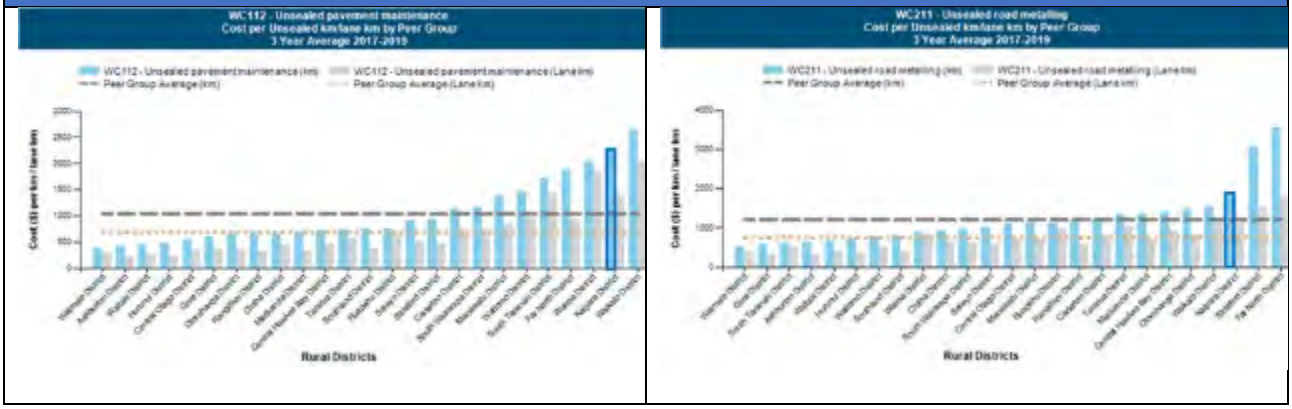
The spend on Kaipara's unsealed road network over the past 10 years is shown in the graph below.



This shows that there was a step change in funding of KDC's unsealed network in the period between 2014/15 and 2017/18 which was the recovery from the impacts of the Mangawhai rates strike and also included additional investment in the sealed road network through the NZTA forestry strengthening programme.

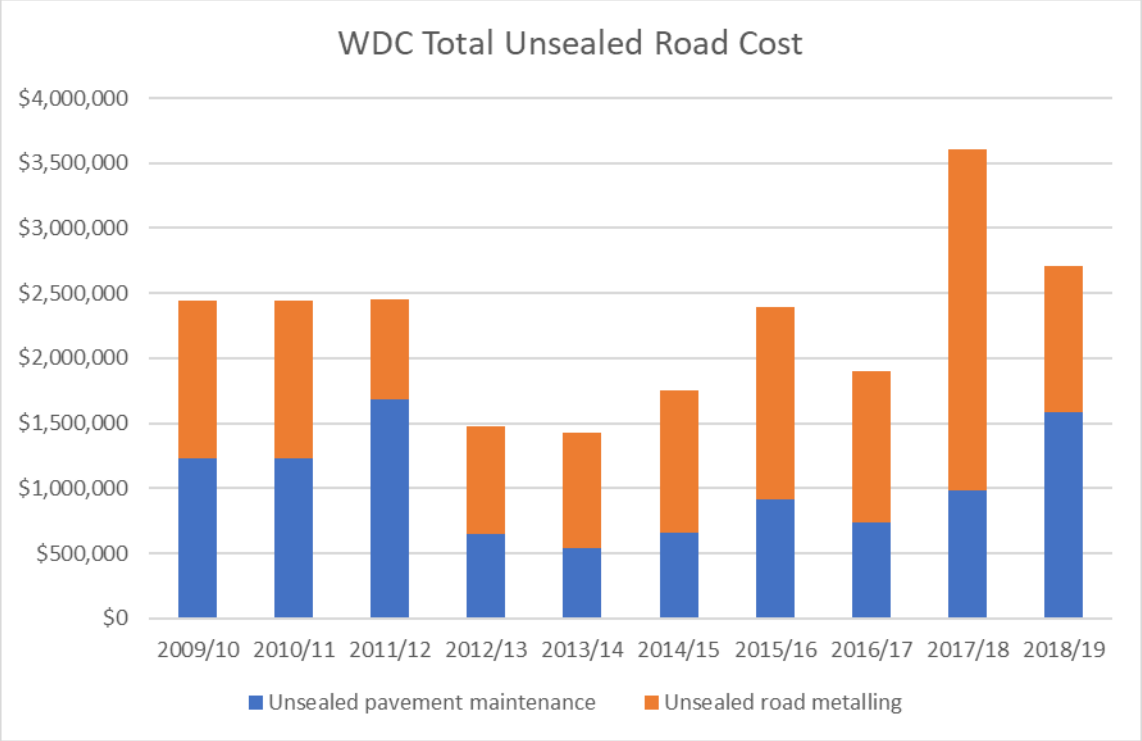
The spend on Kaipara's unsealed network over the past three years, shown in the following graphs, indicates that Kaipara is one of the most expensive in its peer group.

KDC Unsealed Road Cost – 3 Year Peer Group Comparison



However, Kaipara is not investing in dust suppression or seal extensions, although it is noted that through the PGF Kaipara Kickstart project, the sealing of the remaining 20km of Pouto Road will be completed. Over the past three or four years, Kaipara has been focusing on utilising blended materials and this has lead to the roll out of Paige-Green compliant wearing courses to improve road condition, reduce maintenance costs and help control dust. The impacts of this investment are starting to be realised in reduced complaints and maintenance costs on these routes.

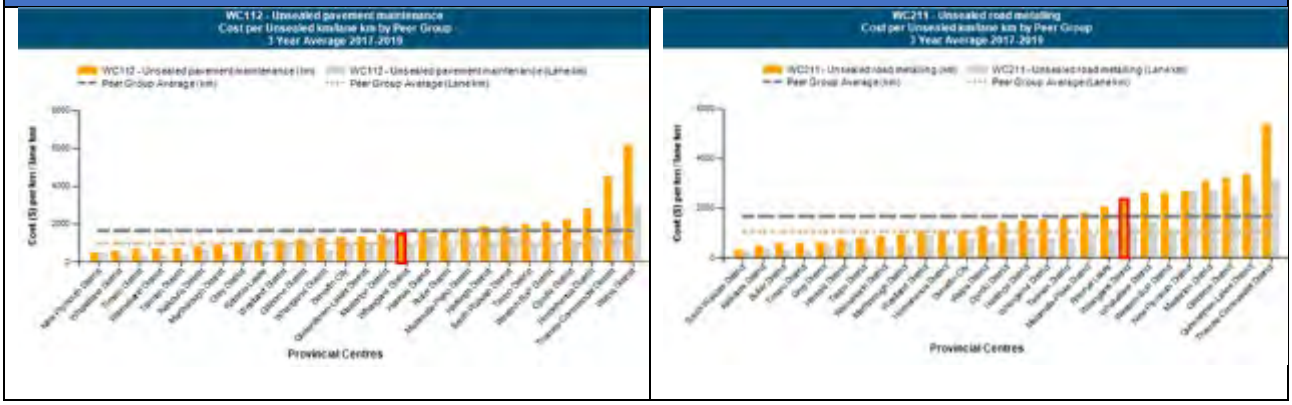
The spend on Whangarei's unsealed road network over the past 10 years is shown in the graph below.



There are two spikes in this graph, one in 2015/16 and more notably one in 2017/18. This is due to the investment in the Wright/McCardle seal extensions which were funded through WC 211 Unsealed Road Metalling. The spend in 2018/19 was increased to address a historic under investment in maintenance and metalling of the unsealed network and is considered a more sustainable level of funding.

The spend on Whangarei's unsealed network over the past three years, shown in the following graphs, indicates that Whangarei is near the average of its peer group.

WDC Unsealed Road Cost – 3 Year Peer Group Comparison



In addition, WDC is spending $1M/year on seal extensions, but this was increased to $3M for the 2019/20 financial year. Most of this work is being funded as unsubsidised seal extensions.

The overall investment into Whangarei's unsealed road network over the past three years is probably too low, given the spend for the other two councils and Northland's poor subgrade conditions and heavy vehicle volumes.

As part of the development of the Unsealed Road Centre of Excellence, a normative cost model has been developed to determine a sustainable cost profile for the unsealed road networks. As described in the Demand section, this model is based on using Paige-Green compliant materials on Medium and High demand roads in conjunction with appropriate strengthening. It is based on industry research into gravel loss to determine appropriate frequencies of between 5 and 7 years for reapplication of the wearing course and structural pavement lives of between 10 and 20 years depending on the demand. The results of this model indicate that the required sustainable funding levels are as per the table below:

KDC treatment	$/km	total prgm cost	$/yr req	
do min/routine maintenance	$ 15,000	$ 10,001,610	$ 1,365,445	
100mm PAV	$ 35,000	$ 11,377,170	$ 811,052	
100mm WC	$ 22,500	$ 10,222,425	$ 1,658,955	
rehab	$ 55,000	$ 7,109,740	$ 763,548	
			$ 4,599,000	$ 13,796,999

FNDC treatment	$/km	total prgm cost	$/yr req	
do min/routine maintenance	$ 15,000	$ 13,560,960	$ 3,019,113	
100mm PAV	$ 35,000	$ 9,338,665	$ 753,226	
100mm WC	$ 22,500	$ 16,656,053	$ 2,748,028	
rehab	$ 55,000	$ 26,039,750	$ 2,734,623	
			$ 9,254,989	$ 27,764,968

WDC treatment	$/km	total prgm cost	$/yr req	
do min/routine maintenance	$ 15,000	$ 5,802,345	$ 1,320,117	
100mm PAV	$ 35,000	$ 7,741,825	$ 576,122	
100mm WC	$ 22,500	$ 6,878,903	$ 1,140,970	
rehab	$ 55,000	$ 4,649,370	$ 524,937	
			$ 3,562,146	$ 10,686,439

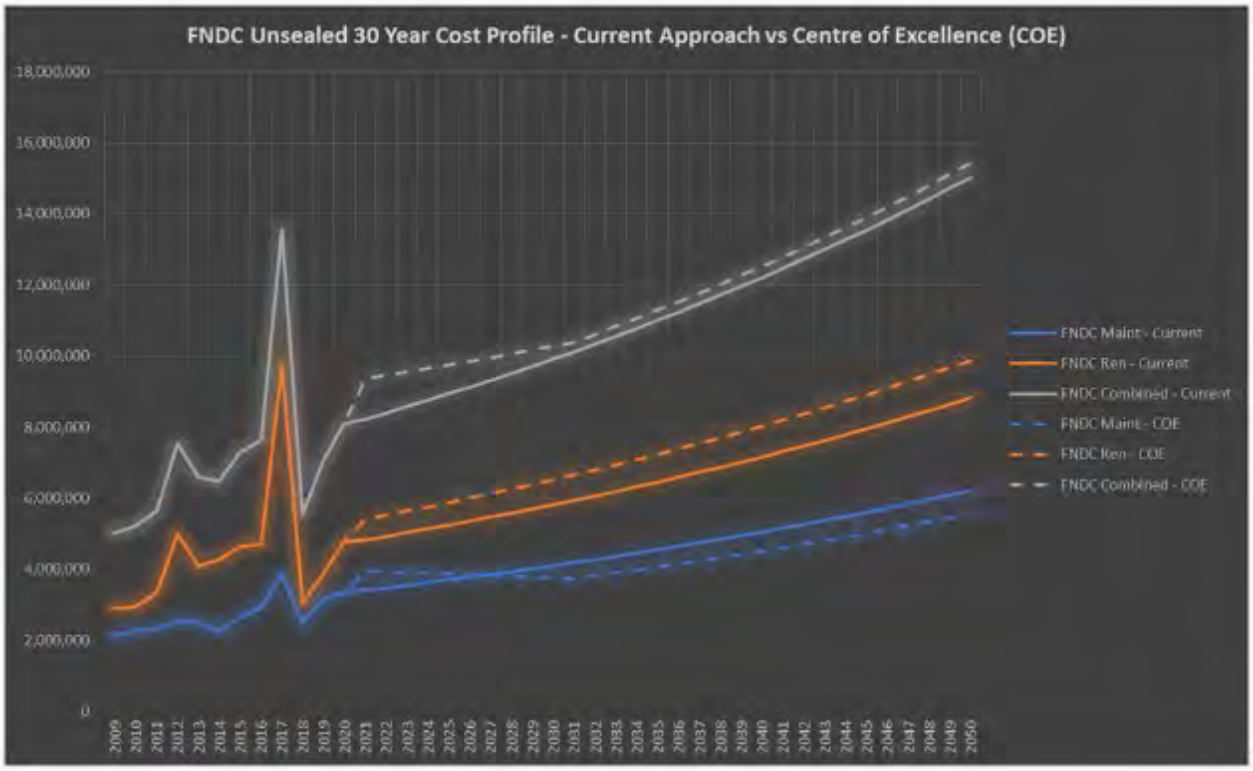
This indicates that sustainable funding levels for unsealed roads are:

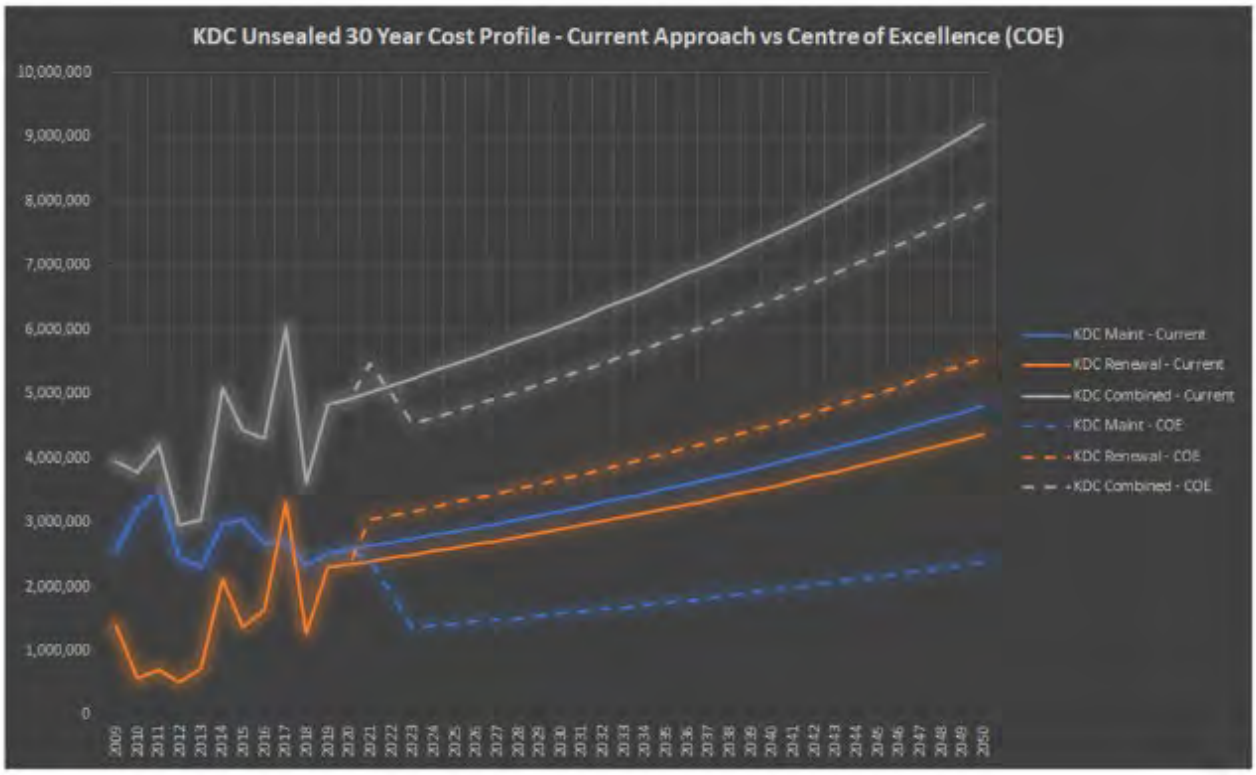
Budget Amounts	FNDC	KDC	WDC
Current Unsealed Road Budget (2018/21) – WC112 and 211	$5.7M/year	$4.1M/year	$3.0M/year
Sustainable Model Results	$9.25M/year	$4.6M/year	$3.6M/year
Difference	**+$3.55M/year**	**+$0.5M/year**	**+$0.6M/year**

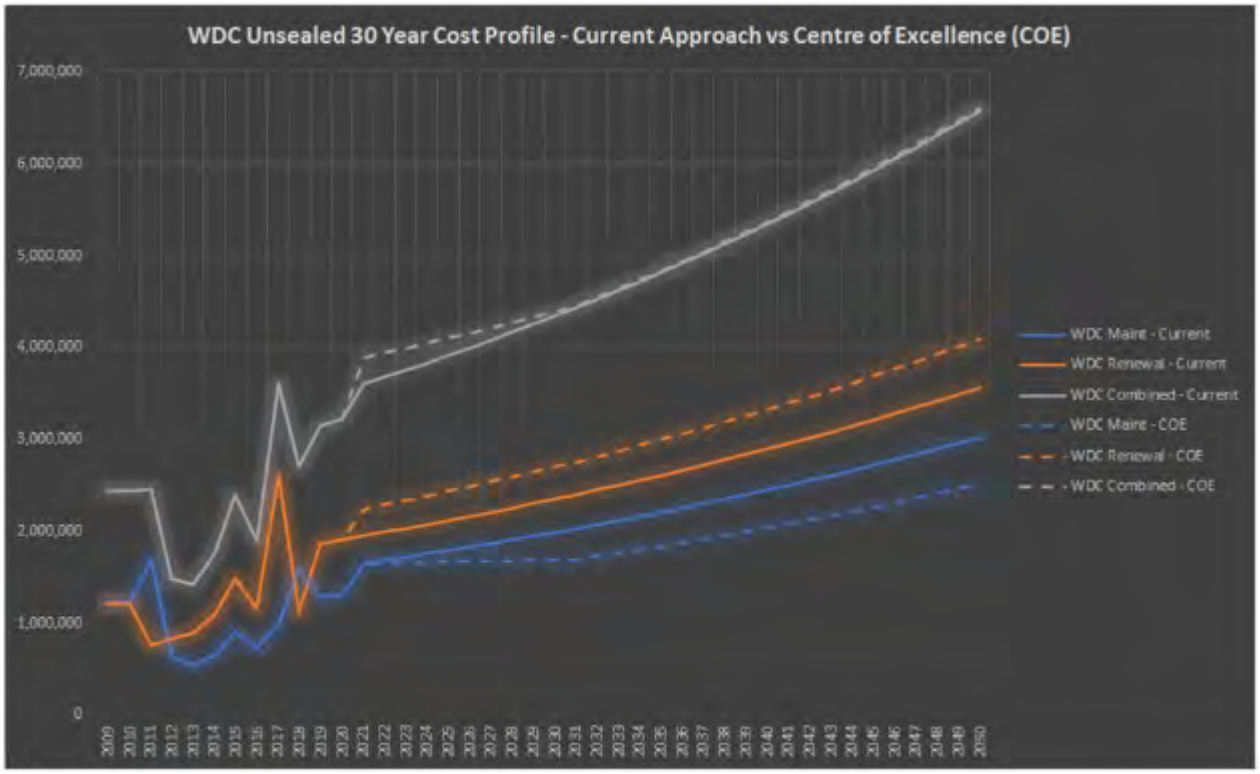
This indicates that Kaipara's and Whangarei's unsealed road budgets will need a minor increase to achieve a sustainable state, whereas a significant increase is required to Far North's budgets to reach a sustainable programme. This is mainly due to the higher number of high demand unsealed forestry roads in the Far North District.

There will be a period of transition while the Paige-Green compliant material is rolled out where costs will be higher until the benefits of this investment are realised through reduced maintenance and metalling costs. It is expected that the majority of the medium and high demand roads can be addressed over a ten year period (three 3 year NLTP periods). During this 10 year period, the unsealed maintenance costs will

drop progressively to these sustainable levels. The graphs below show the unsealed road costs over a 30 year timeframe for both the current approach (solid lines) and the Centre of Excellence approach using Paige-Green complaint materials (dashed lines).







These graphs indicate that in the long-term the FNDC and WDC unsealed road costs will be almost the same as the current approach. KDC's unsealed road costs will be significantly less than the current approach, due to the investment already made in rolling out Paige-Green compliant materials and the acceleration of the roll-out through the PGF funded unsealed road strengthening programme.

5.5.4.3 Key Issues and Actions

- The use of General All-Passing (GAP) materials is resulting in the unsealed road network being prone to potholing, corrugations, gravel loss and dust which is leading to high levels of customer dissatisfaction, and health concerns and maintenance costs.
- Dust has become a significant concern for resident's health, particularly on freight routes, which is driving significant demand for dust suppression and sealing of roads in the Far North and Whangarei districts.
- The roll out of the use of Paige-Green compliant materials is expected to address a lot of these issues. The focus will be on providing a wearing course of Paige-Green compliant material on high and medium demand roads. Additional pavement strengthening will also be required on these routes to provide the required strength and shape. Additional funding would be required to enable this roll out to be properly implemented.
- For low demand unsealed roads, Paige-Green compliant materials should be used whenever undertaking metalling of these routes.
- Gather information on pavement depth and condition on unsealed roads to determine re-metalling programmes and to develop a proactive programme of works rather than reacting to customer complaints.

- Testing of road metal sources is recommended and potential blending of aggregates may be required to develop Paige-Green compliant materials.

- The use of dust coat seals or dust suppression in front of houses should only be considered when Paige-Green compliant materials have been applied and excessive dust is still an issue. However, it should be recognised that dust could still be an issue on unsealed road with high demand, such as long-term heavy vehicle routes.

- Limit further residential development on unsealed roads or require dwellings on unsealed roads to be set back well away from unsealed roads (ideally greater than 80m) through relevant provision in the council district plans.

5.5.4.4 Benefits

- The roll out of Paige-Green compliant materials will result is less potholing, corrugations, gravel loss and dust, which will improve resident satisfaction, reduce dust and reduce maintenance costs. It should also help reduce the demand for expensive dust suppression and road sealing. In the long-term, the use of Paige-Green compliant materials should result in an optimal and sustainable unsealed road network.

- Further information on pavement depth and condition will enable a proactive programme of re-metalling and grading to be adopted.

- On high demand routes with Paige-Green materials that are still subject to excessive dust, mitigation such as dust suppression will help reduce health issues of residents inhaling fine dust particles (PM_{10}) and road safety issues of dust blinding oncoming drivers.

- Limiting residential development on unsealed roads or ensuring new dwellings on unsealed roads are well setback will help avoid further demand for sealing roads and dust issues affecting local residents.

5.5.4.5 Consequences

- The continued use of GAP materials will result in ongoing dissatisfaction issues with the unsealed road network due to potholing, corrugations, gravel loss and dust. It will also continue the high maintenance cost of the unsealed network and continue to drive demand for expensive dust suppression and sealing.

- Continuing to maintain the unsealed network without knowing the pavement depth or condition will retain the current reactive approach to customer complaints which is likely to be suboptimal and result in more customer dissatisfaction.

- On high demand routes with Paige-Green materials that are still subject to excessive dust, without addressing this dust issue, health impacts of fine dust particles on local residents will continue and crashes involving drivers becoming blinded by dust may occur. Pressure from local residents including road blocks may also continue.

- If rural subdivisions on unsealed roads are allowed to continue or if dwelling are allowed to be built close to unsealed road frontages, there will be more demand for expensive seal extensions and more issues associated with dust.

5.5.5 Structures

5.5.5.1 Problem Statement

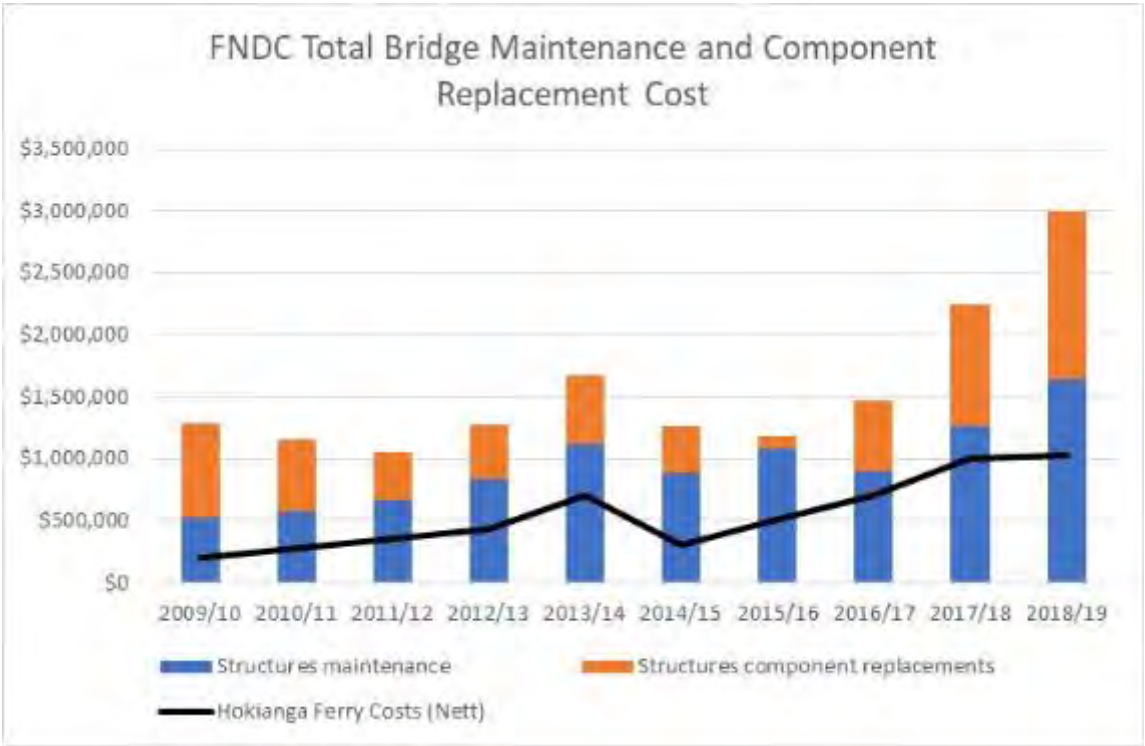
Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.

5.5.5.2 Problem Description

Far North District

There has been an under investment in the FNDC bridge stock for many years and this is resulting in many bridges (24) having weight and speed restrictions which limits access for normal 44 tonne trucks. There are 62 bridges (9%) that have deteriorated to poor or very poor condition and another 151 bridges (21%) that have significant scour. This is driving a larger demand for expensive bridge replacements and scour protection to avoid catastrophic bridge failure. The Far North also has 69 timber decked bridges which are subject to deck failure if trucks wander from the centre of the span.

The spend on the FNDC structures over the past 10 years is summarised in the figure below. It should be noted that a substantial part of the structures maintenance for FNDC is used to fund the maintenance and operations of the Hokianga Ferry service. If this funding was removed from the figure below it would show that until 2017/18 there has been a sustained period of underinvestment in structures.

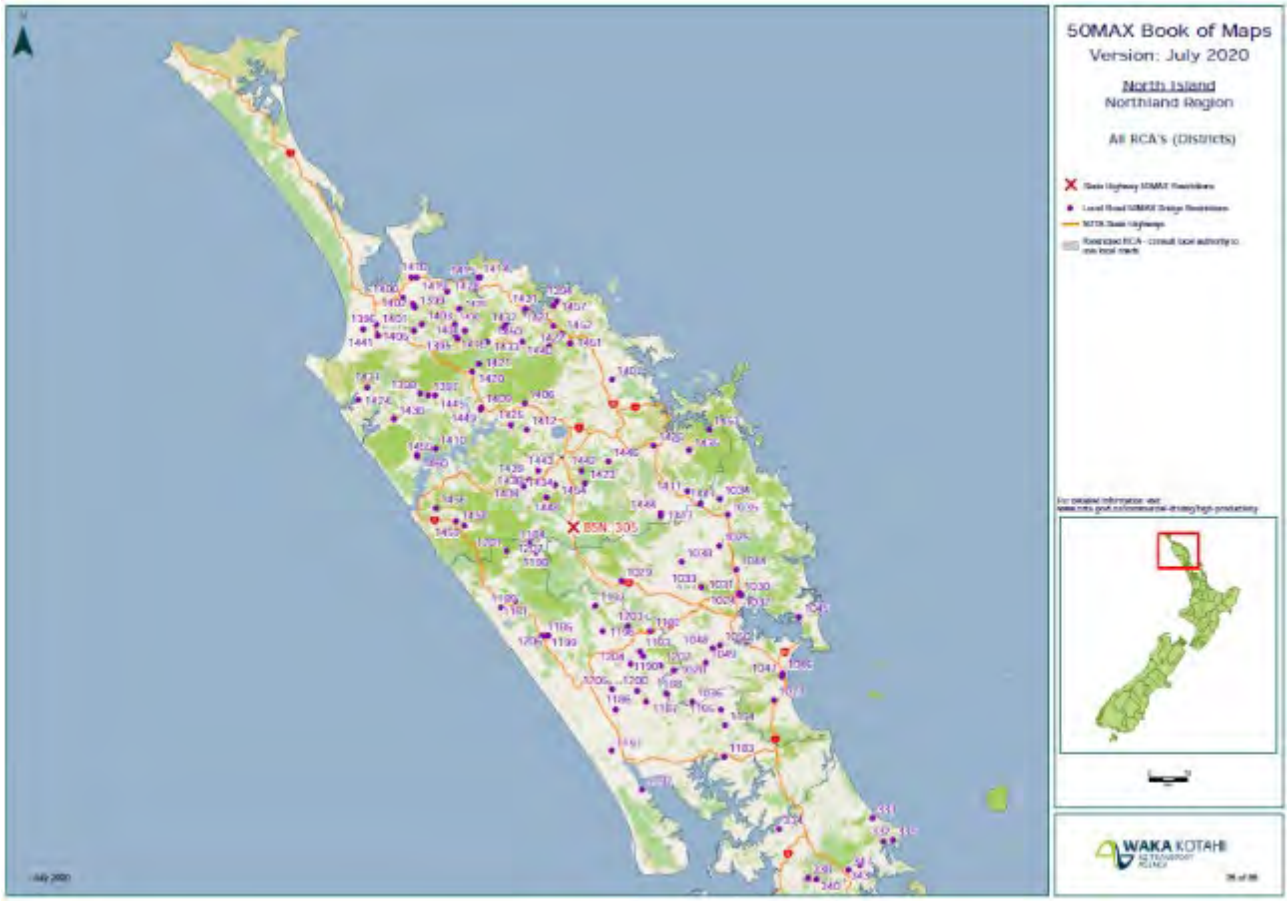


The maintenance and operation of the Hokianga Ferry service has often used up most of the available structures maintenance budget which has meant that bridge repairs have often been deferred leading to more expensive repairs or even full bridge replacements. The Hokianga Ferry service has just been retendered and the net annual maintenance and operational costs of the service (after revenue has been deducted) are $1.2M/year. This is almost 75% of the current structures maintenance budget.

A funding increase for FNDC's structures maintenance and component replacement in the 2018/2021 period has enabled FNDC to start to catch up on deferred maintenance, but the increase in the Hokianga Ferry service will require further investment to ensure that their structures do not deteriorate further.

There are also a large number of bridges (66) that are restrictive for 50MAX vehicles which limits the use of these vehicles on the FNDC network with resulting loss of efficiency. This compares to 27 restrictive bridges for KDC and 20 for WDC. The current 50MAX restrictive bridges in Northland are shown in the figure below.

FNDC has by far and away the highest number of 50MAX restrictive bridges in the country for any district. Work is currently underway on carrying out detailed structural assessments on several of these bridges on critical routes. This work should be continued to identify bridges that can be removed from the register and a programme of strengthening work be undertaken to remove restrictions on critical freight routes.

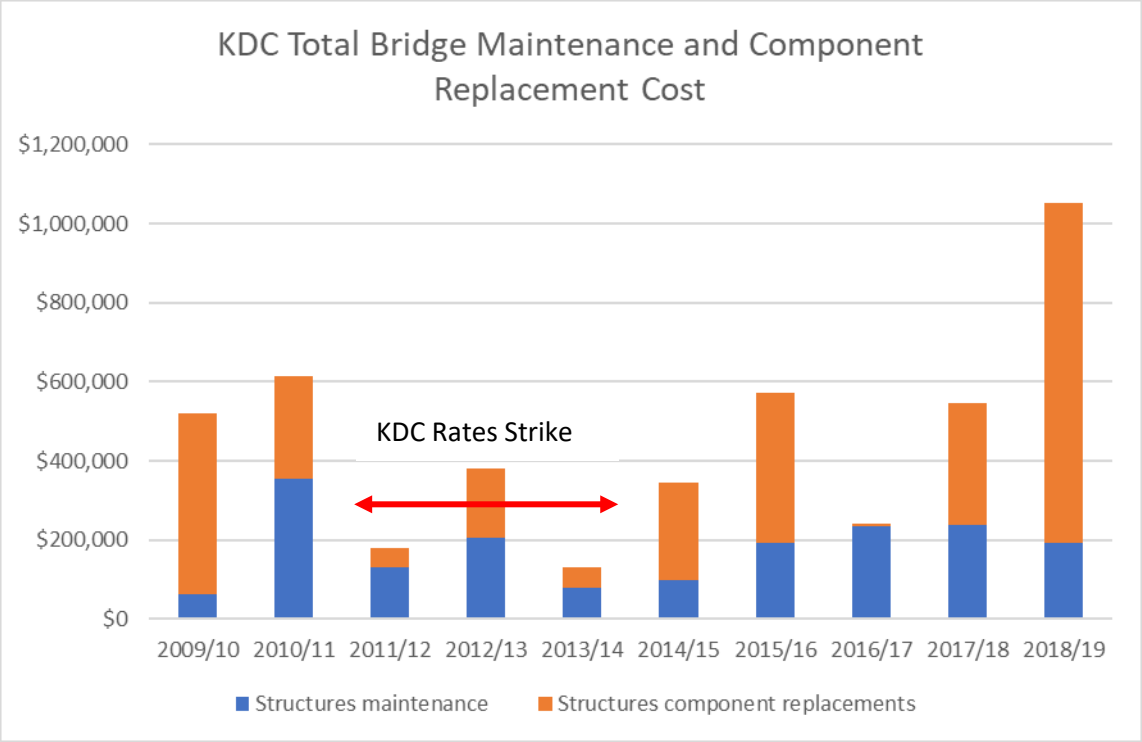


It is also often hard to get contractors to price structural work in the Far North due to long travel distances as most contractors who undertake these works are based in Whangarei. This has results in some tenders only receiving one or no tenders, which often delays works and results in higher prices due to lack of competition. Options to package work or create a supplier panel are being considered to make work in the Far North more attractive to tenderers to increase competition.

Kaipara District

For the Kaipara District, due to the effects of the rates strike in Kaipara between 2011/12 to 2013/14 in protest against the cost blowout for the Mangawhai Sewerage Scheme, there was a significant drop in the level of investment in bridge maintenance and renewals. This left a large hole in the bridge maintenance

and component replacement programme which has resulted in several key structures deteriorating rapidly. This is shown in the figure below.



Two key structures have now deteriorated to the point that they require very expensive repairs to extend the life of the structure. This includes the Tomarata Road Bridge, which has recently been repaired and strengthened at a cost of $2.45M (some of this cost is included in the 2018/19 financial year which is the reason for the spike in funding in the figure shown above). The second structure is the Kaiwaka Mangawhai Road bridge. Both these bridges are on arterial routes which also serve as SH1 detours routes and are key access roads to the rapidly growing township of Mangawhai.

Bridge Inspections

This has identified the need for more frequent bridge inspections for structures that are on critical routes or in coastal areas. These structures should also be inspected annually due to greater consequences if they fail and also the risk of rapid deterioration in the marine environment. In addition, FNDC currently undertake a rolling 3 year bridge inspection programme and this should be changed to two-yearly to be in line with KDC's and WDC's inspection programmes. This will help identify maintenance issues on FNDC bridges early enough to avoid more expensive bridge renewals.

Retaining Walls

The NTA is also developing a Retaining Wall forward works programme and carrying out a large scale inspection of retaining walls on critical routes for the first time. This work is still underway but is identifying a need for retaining wall strengthening and replacement. It is intended that retaining wall inspections will be included as part of the annual bridge inspection programme.

5.5.5.3 Key Issues and Actions

- There has been inadequate investment in the FNDC bridge stock for many years which has resulted in many structures having weight and speed restrictions.

- The Hokianga Ferry service is also funded from the FNDC's structures maintenance budget and this currently uses up 75% of this budget which leaves little funding left to carry out repair work on other structures. The Hokianga Ferry service has just been retendered and the costs have increased to $1.2M/year further putting pressure on this budget.
- FNDC has 66 bridges which are 50MAX restrictive which is significantly higher than any other district in the country. This limits the productivity gains that could be achieved by the use of these vehicles. The detailed assessments of these bridges should be continued to identify bridges that can be removed from the register and a programme of strengthening work be undertaken to remove restrictions on critical freight routes
- Far North bridge tenders often have one or no tenderers which delays work and drives up prices due to lack of competition.
- Kaipara had a period of low investment in its bridge stock due to the effects of the rates strike and this has resulted in expensive renewal work on two of its critical structures.
- All bridges on critical routes and in coastal areas should be inspected annually. Bridge inspections for FNDC should be change to two yearly to match the other two districts. Retaining walls should also be included in the annual inspection.
- A retaining wall forward works plan is being developed for the first time and this is identifying demand for retaining wall renewals and replacement.

5.5.5.4 Benefits

- The provision of adequate funding for structures maintenance and component replacement for FNDC and KDC will avoid expensive bridge repairs or replacements in the future. It will also help avoid the further weight restrictions being required. This investment should also account for the increasing costs of the Hokianga Ferry service.
- The removal of bridges from the 50MAX restriction register will enable more use of these higher productivity vehicles, will reduce freight costs and improve opportunities for investment.
- The packaging of structures work across the region, or use of supplier panels will likely result in more competition and reduce tender prices.
- Carrying out annual inspections of critical and coastal structures, more frequent bridge inspections for FNDC and retaining walls inspections, will enable maintenance work to be identified in a timely manner and potentially reduce more expensive repairs in the future.

5.5.5.5 Consequences

- Keeping funding at current levels is likely to lead to further deterioration of the FNDC and KDC bridge stock. This is particularly the case for the Far North due to the increase in funding required to service the Hokianga Ferry.
- Without removing bridges from the 50MAX restriction register will result in Far North freight costs being higher than other areas which will reduce opportunities for investment.
- Without packaging structures work across the region, or the use of supplier panels, the current lack of competition and high tender prices for Far North structural work is likely to continue.

- Keeping the current bridge inspection regime may allow bridges to deteriorate before repairs are identified. Retaining walls will also deteriorate and potentially fail during storm events if inspections are not undertaken.

5.5.6 Growth and Alternative Transport

5.5.6.1 Problem Statement

Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

5.5.6.2 Problem Description

There has been rapid population growth in Northland in the past five years and this has put pressure on the transport network, particularly in high growth areas such as Whangarei, Kerikeri/Waipapa and Mangawhai. The growth rates between the 2013 census and 2018 census for these areas and the wider Northland region are shown in the table below:

Census	Whangarei	Kerikeri/Waipapa	Mangawhai	Northland
2013 Population	76,995	6,729	3,144	151,692
2018 Population	90,960	8,034	5,031	179,076
Change	**+13,965**	**+1,305**	**+1,887**	**+27,384**
5 Year Growth Rate	**+18.1%**	**+19.4%**	**+60.0%**	**+18.1%**
Annual Growth Rate	**+3.6%**	**+3.9%**	**+12.0%**	**+3.6%**

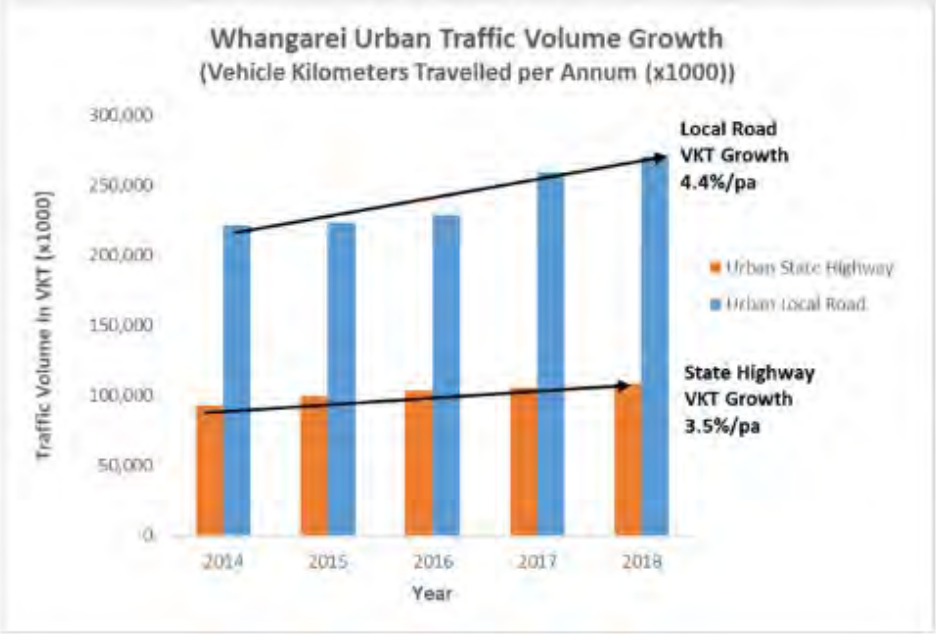
By comparison, the average growth across the country was 2.1% between 2013 and 2018. This indicates that Northland, Whangarei and Kerikeri/Waipapa was growing about 70% faster than the national average, and Mangawhai was growing about 6 times (600%) faster.

Whangarei City

Whangarei City is the capital of Northland and the only city north of Auckland. It has a population of 56,000 people and is a regional service center and commercial hub for Northland. It has the only regional Hospital in Northland and a regionally significant airport. The overall population of the wider Whangarei District is 90,960 people.

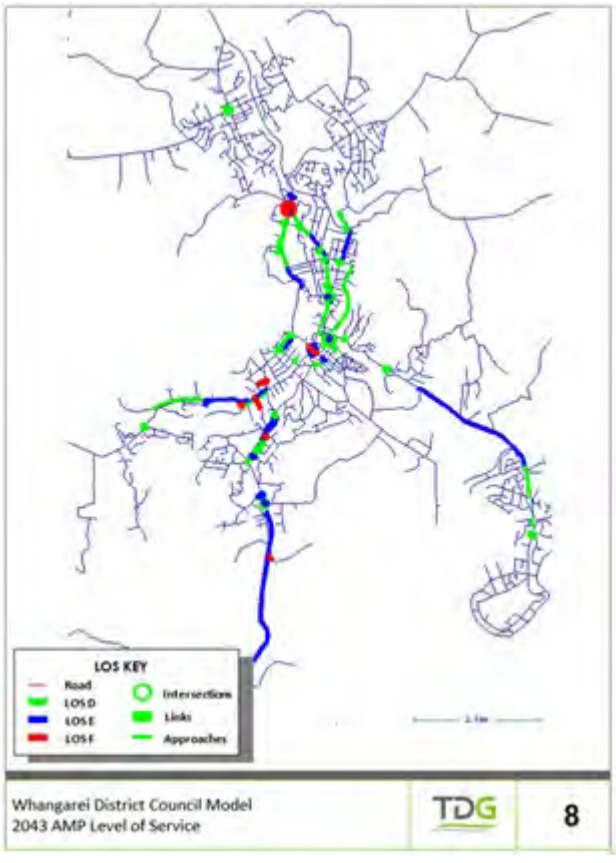
Whangarei City is the primary access link for traffic from further north (Far North) along SH1 heading south to Northport at Marsden Point or to Auckland and beyond. SH1 is also a major freight route carrying almost 1,600 heavy vehicle movements per day through Whangarei.

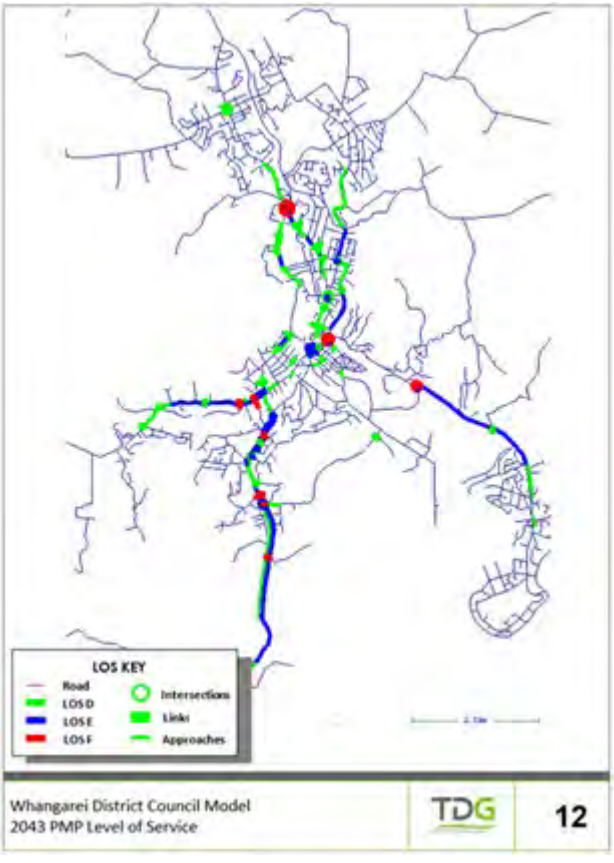
Growth in traffic volumes in Whangarei has increased rapidly over the past 5 years as shown in the figure below. This indicates that the average growth in Vehicle Kilometers Travelled (VKT) has grown by 4.4% per annum on urban local roads and by 3.5% per annum on the urban State Highways in Whangarei. This growth is expected to be due to the rebound from the global financial crisis, high immigration levels and rural shift from Auckland due to house affordability and lifestyle choice. This high level of growth is expected to continue for several years to come.



Whangarei has a high number of commuter and student trips to the central city area and these trips are concentrated onto a few major arterial routes due to all trips into the city centre being funneled into a 1km wide gap between the surrounding hills. This creates more queuing and delays on the road network than would be expected for a city of this size. The key issue identified is the current heavy reliance on private vehicles for travel and how this is negatively affecting access to social and economic opportunities due to queuing and delays on the few arterial routes in the city.

Modelling undertaken using Whangarei's Transportation Model indicates that many routes and intersections in Whangarei City will be congested by 2043 as shown on the following level of service plots.



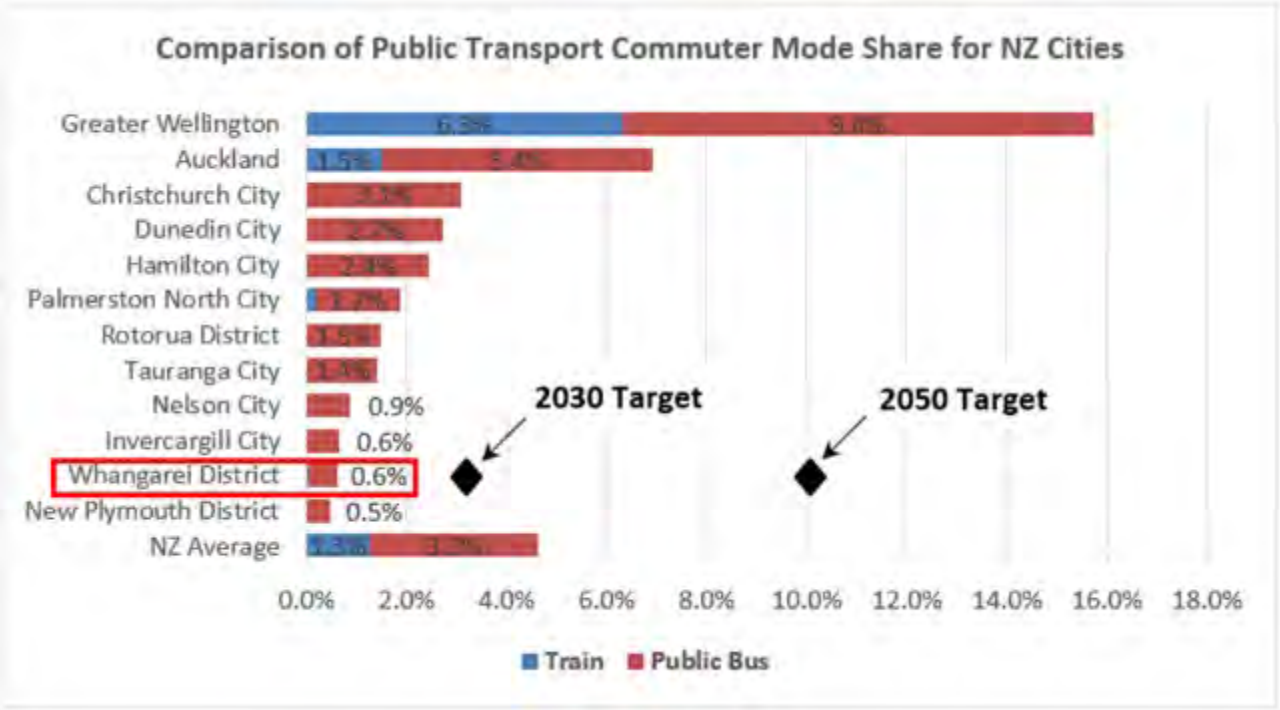


Improvement of alternative transport modes such as public transport and walking and cycling would have a positive impact on these LOS predictions. Current barriers to public transport use such as the poor main bus terminal at Rose St, lack of dedicated bus priority lanes, lack of rural commuter services, lack of bus shelters and seating at bus stops and frequency of service at peak times would need to be improved to encourage more people to use this service. Likewise, current walking and cycle shared paths would need to be connected to the end destination and more safe crossing points provided on arterial roads to encourage more people to walk and cycle.

It should be noted that these LOS predictions were based on the current Transportation Model which is based on the 2014 growth model which assumed population growth at 1% per annum. However, population growth is currently at 3.6% per annum which is nearly four times the 2014 growth model prediction and will increase queuing and delays more rapidly than shown in these LOS plots.

The focus going forward should be on implementing projects and services that maximize the use of existing road space rather than provide extra capacity. The intention is to try and reduce or eliminate the effects of future growth on the network by increasing use of other modes such as public transport and walking/cycling as well as increasing occupancy rates of private vehicles and reallocating existing road space including removal of parking on some arterial roads. This will improve accessibility while providing a more mode-neutral transport system.

Public transport in Whangarei is provided through the CityLink bus service which has been operating since 2000. The bus service is predominately used mostly by commuters who do not have access to a private vehicle, school students and gold card users. The 2013 census indicated that public transport use in the Whangarei District had a commuter mode share of just 0.6% as shown in the figure below. This is considerably less that other New Zealand cities and is significantly less than the national average. This indicates that there is significant room to improve patronage on the existing service.

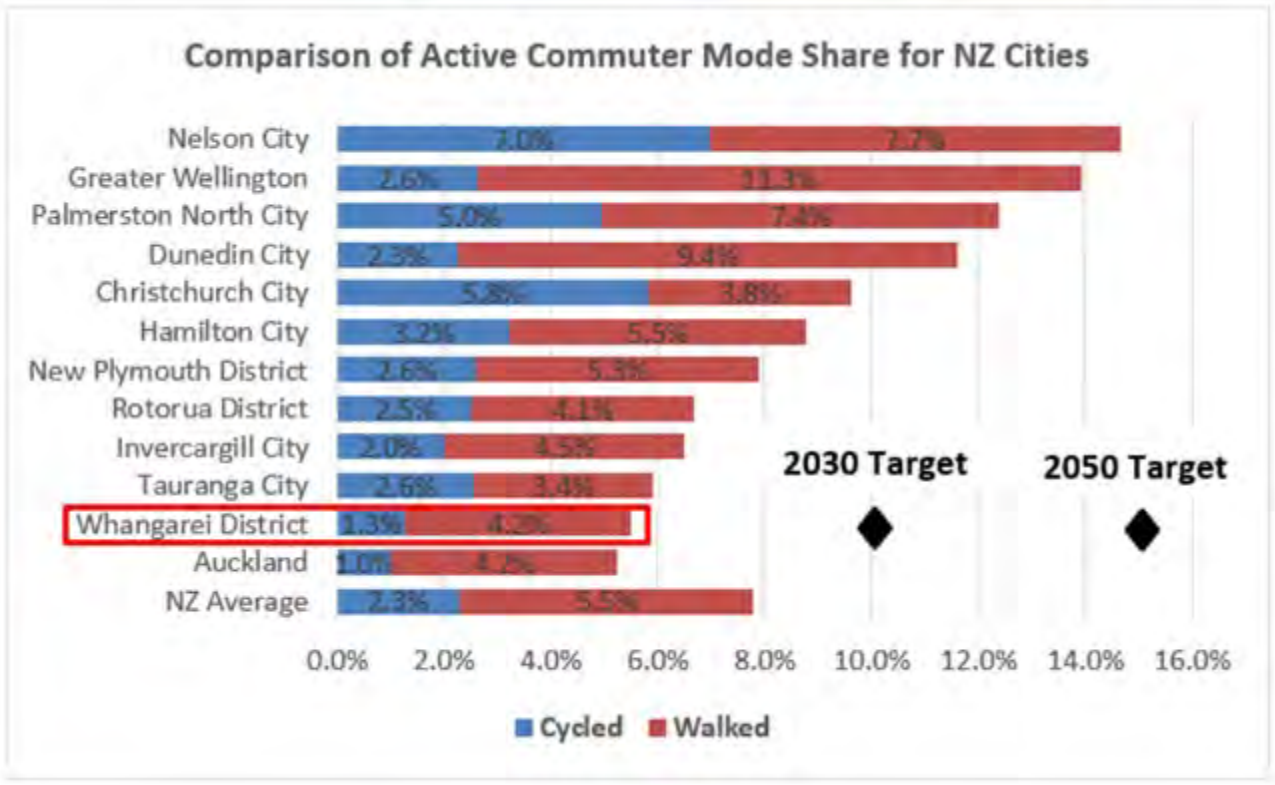


The CityLink service currently only caters for trips within the city and there is no commuter bus service for approximately a third of the population that live in the many rural towns and villages that are located within the wider District. Because of this, rural commuter trips are predominantly made by private vehicle.

The targets from the Whangarei City Transportation Network Strategy PBC are for mode shares of 3% by 2030 and 10% by 2050. This represents an aspirational but realistic target of a 5-fold increase in public transport use by 2030 and 17-fold increase by 2050. This would be achieved by initially providing inbound bus priority lanes on the key bus routes into the city by removing parking and increasing the frequency of buses on these routes. This would give bus passengers a time advantage over taking their car by allowing them to "jump the queue". Over time road widening to 4-lanes on arterial routes would enable transit lanes (ie T2 or T3 lanes) to be installed. The price of all-day commuter parking also needs to be increased to be at least the same as a return bus fare, so that there is a price advantage in taking the bus.

State highways and major arterial roads cut through the main CBD and residential areas on Whanagrei. These roads are often wide (4-lanes) with significant traffic flows and create a barrier for pedestrians and cyclists to cross. In addition, cycling in Whangarei City has been perceived as dangerous due to a lack of suitable cyclist facilities or even road shoulder for cyclists to use, which forces cyclists into the live traffic lane. This has resulted in Whangarei having a lower active mode share that other similar sized cities across the country.

This is shown in the figure below which indicates that Whangarei's active commuter mode share is one of the lowest when compared to New Zealand cities and is also less than the national average (Source: Census 2013). The figure also shows the 2030 and 2050 target mode share for active modes from the Whangarei City Transportation Network Strategy PBC.



Significant progress has been made in developing a shared path network in Whangarei that is starting to see growth in active modes in the city. However, further work is required to complete this network and link it to destinations such as employment areas, schools and recreational areas.

Kerikeri/Waipapa

Kerikeri is Northland's largest town and has been growing for many years. Waipapa is located only a few kilometers from Kerikeri and has a large retail area with light industrial land and "big-box" type retailers such as The Warehouse. Kerikeri is also a tourist and holiday destination with attractions like the Kerikeri stone store.

The steady growth in Kerikeri has been creating congestion in the one-way system through the town centre. This congestion worsens during summer holiday periods when there is an influx of visitors.

The Kerikeri and Waipapa area has a shoppers bus service, the Mid North Link, that runs two routes and operates three days a week. There are footpath networks in Kerikeri and in Waipapa, but there is a lack of links between the two areas, and out of the main Kerikeri town centre there are insufficient safe crossing points across the arterial roads, particularly on SH10 and the semi-urban section of Kerikeri Road. There are also no formal cycling links either within or between Kerikeri and Waipapa. Lack of alternative transport modes, means that most trips are dependant on private vehicles which increases the congestion through the Kerikeri town centre.

The council has undertaken the development of an Integrated Transport Strategy and Integrated Transport Plan. This has identified the need for the development of a Kerikeri/Waipapa Strategy Road Network plan to determine the transport needs, including potential options to address the congestion through the town centre. Lack of walking and cycling links were also identified as issues for the Kerikeri/Waipapa area.

Mangawhai

Mangawhai has been one of the fastest growing towns in the country over the past five years with an annual population growth rate of 60%. This growth is only likely to continue in the future due to the motorway extension to Warkworth opening in 2021 and future motorway extension to Te Hana. An example of this growth is the Mangawhai Centre development which includes a town centre, shopping precinct and 600 dwellings.

Mangawhai is also a significant summer holiday destination, and the population swells to approximately three times its normal size during holiday periods. Over these holiday periods there is significant traffic congestion at the key intersections in the Mangawhai Village, in the Wood St shopping area at the Mangawhai Heads and other local streets that serve the boat ramps and beach accesses.

Mangawhai has a one-day a week Bream Bay Link bus service that provides access for shoppers going to Whangarei. A summer bus service was trialled in Mangawhai over the 2019/20 summer and this may be continued in future years. There is only a narrow gravel path connecting the Mangawhai Village to the Mangawhai Heads and this results in a low number of people walking and cycling in Mangawhai. Because of limited alternative transport options, there is a high reliance on private vehicles being used to travel within Mangawhai which exacerbates the congestion during summer holiday periods.

A Network Operating Framework is currently being developed for Mangawhai and its surrounding rural area. Although still under development, this study has identified that there is a need to develop separate networks for different modes to minimise conflicts.

A business case for providing a shared path between the Mangawhai Village and Mangawhai Heads has also been developed for funding. This business case includes upgrading of the two key intersections in the Mangawhai Village (Insley/Moir and Moir/Molesworth).

Alternative Transport in Other Rural Areas

There is also a general lack of alternative transport modes in many rural communities such as footpaths, cycle links or bus services. Many communities are located on a state highway or main arterial road which severs the community and often has limited safe crossing points. Vehicle speeds through some of these townships can also be high due to the predominantly rural nature of the area.

Often these communities are in low socio-economic areas, where there may be no or limited access to a private vehicle (transport disadvantaged). This places higher reliance on alternative transport modes. The lack of facilities and services to enable safe walking/cycling and access to public transport restricts access to places of employment, education and social opportunities. This leads to increases feelings of community severance, safety issues and higher levels of social deprivation.

5.5.6.3 Key Issues & Actions

- The constrained road network in Whangarei City and high dependence on private vehicle use results in higher traffic volumes on its arterial road network and is resulting in congestion in the commuter peaks. The high traffic growth rate in Whangarei is expected to continue for the near future due to high population, freight and tourism growth.
- There is also low uptake in public transport and walking and cycling in Whangarei City which is increasing the reliance on private vehicles.
- The Kerikeri/Waipapa area has grown rapidly for many years and the road network is under pressure from increasing traffic flows. These traffic flows increase in summer due to an influx of visitors and tourists. There are few bus services, cycle paths or pedestrian links between Kerikeri and Waipapa and this increases private vehicle use.
- Mangawhai is one of the fasted growing towns in the country and is a summer holiday destination which swells the population by up to 3 times normal. During summer holiday periods, there is congestion in several areas. Mangawhai also has few bus services, cycle paths or pedestrian links between Mangawhai Village and Mangawhai Heads, which again increases the reliance on private vehicle use.
- Rural towns are often located on State Highways or other arterial routes which result in severance of the community. There are also few bus services and cycleways linking these communities which reduce access to employment, education and social opportunities.
- Traffic congestion at known problem areas should be addressed.
- Improvements to the public transport and walking and cycling infrastructure should be made to encourage mode shift from private vehicle use. This should be supported by education and promotion campaigns.

5.5.6.4 Benefits

- Addressing capacity issues at known problem areas identified through the Whangarei City Transportation Network Strategy PBC will minimise delays to freight and improve access during peak periods.
- Improving the attractiveness of the bus service and infrastructure in Whangarei will encourage higher passenger numbers and would reduce private vehicle use and congestion. Rural bus services would reduce rural commuter traffic on key arterials servicing the city.
- Providing cycleway connections in Whangarei with good infrastructure and supported by travel plans to schools, parks and businesses will encourage cycle use and maximise the full potential of the current cycleway network.
- Developing and implementing the Kerikeri/Waipapa Strategic Road Network and the Mangawhai Network Operating Framework would remove current pinch points in these areas, would cater for long term growth and would provide pedestrian and cyclist links which will reduce reliance on private vehicles and improve active mode use.
- Improved walking and cycling connections in rural towns and the potential for rural bus services will provide transport choice to the transport disadvantaged in these communities, which will reduce severance, improve safety and lower social deprivation.

5.5.6.5 Consequences

- Without addressing capacity issues at know problem areas in Whangarei, there will continue to cause delays to freight and frustration to road users due to lack of access on these arterial routes. These delays will continue to grow as the city increases in population.
- Without change to improve the current bus service in Whangarei, public transport will have limited impact on reducing private vehicle use and congestion in Whangarei.
- Without adequate cycleway connections in Whangarei, potential cyclists 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.
- Without developing and implementing the Kerikeri/Waipapa Strategic Road Network and the Mangawhai Network Operating Framework congestion in peak holiday periods will continue, growth will continue to exacerbate existing pinch points, and there will be a continued high reliance on private vehicle use due to lack of alternative transport choices.
- Without improving walking and cycling links and bus services to rural towns, these communities will continue to suffer from community severance, safety issues and lack of access to employment, education and social opportunities which will result in continuing high levels of social deprvation.

5.5.7 Safety

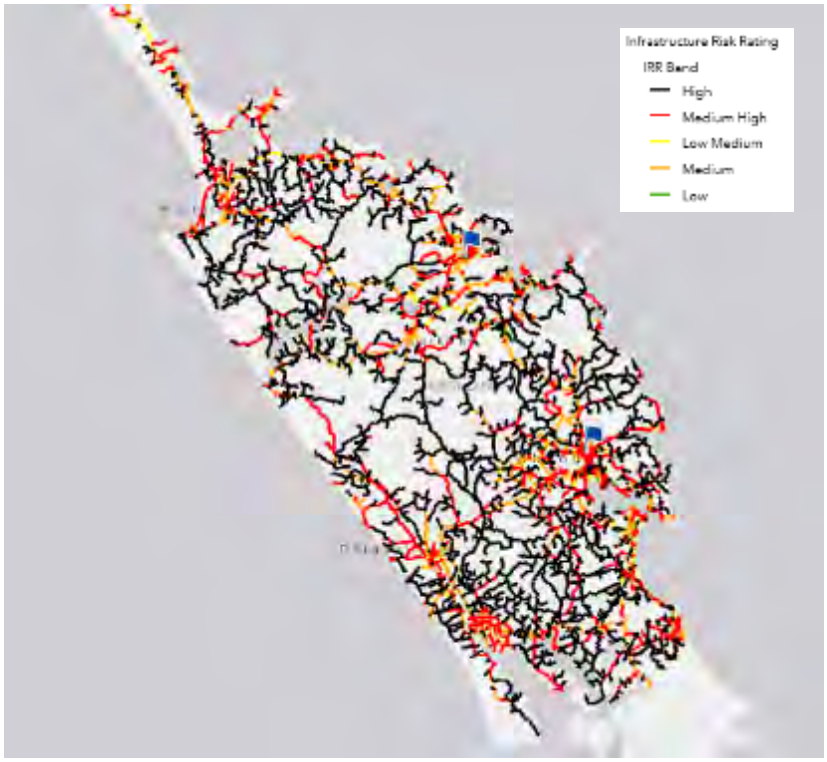
5.5.7.1 Problem Statement

Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all FNDC and WDC. FNDC and KDC also have higher Collective Risks than their peer group.

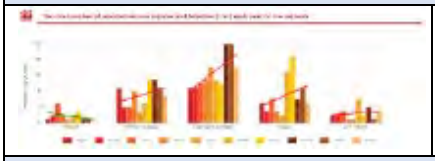
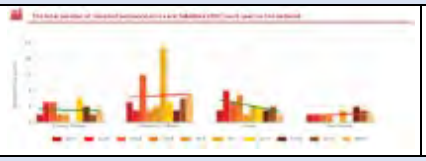
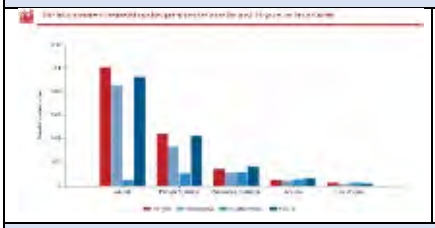
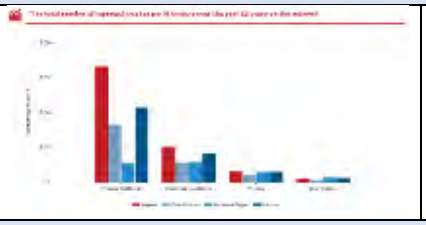
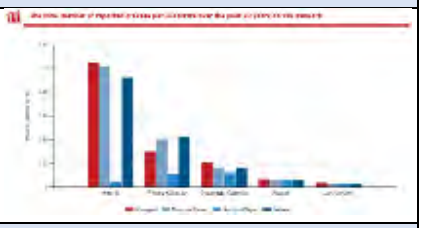
5.5.7.2 Problem Description

The road network in Northland is often narrow and winding due to the rolling topography. Roads generally have little or no shoulders and hazardous roadsides with trees, ditches and service poles in close proximity to the road edge. This means that the roads are often demanding to drive on, with little room for error which increases the likelihood of a crash and if a vehicle leaves the road the consequence of a high severity crash is increased.

The Infrastructural Risk Rating for most of Northland's road network is High or Medium-High which indicates that the road network has a high level of crash risk. This is shown on the following map of Northland (Source: Abley SafetyNet: MegaMap).



Fatal and serious injury crashes on the local road network have generally been increasing over the last 10 years in the Far North and Whangarei districts. The Collective Risk in the Far North and Kaipara Districts are also higher than their peer group. Each district has several road classes that have a higher Personal Risk than their peer group. This is shown in the following graphs.

FNDC	KDC	WDC
Death and Serious Injury Crashes (per year)		
		
Collective Risk		
		
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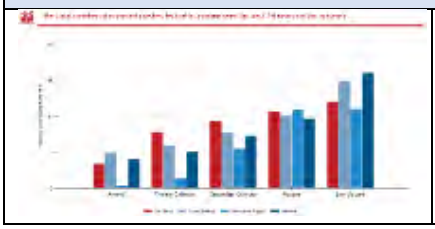	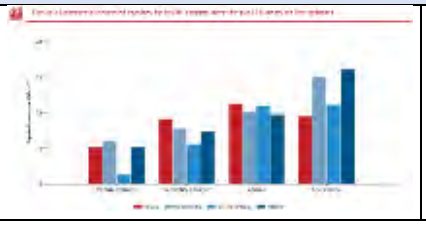	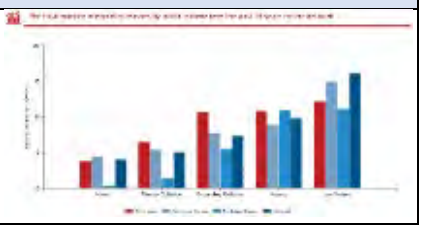

These trends are likely to continue in the future due to growth demands increasing traffic and freight flows unless significant investment in improving safety is made.

The 'fatal five' sources of crashes in the Northland Region are young drivers, speed, alcohol and/or drugs, rural loss of controls/head-ons and intersections. These types of crashes are over-represented in Northland.

The NZTA Communities at Risk Register for 2019 identifies that Northland is a high risk for death and serious casualties. When broken into the individual districts, the Far North and Kaipara Districts are also high risk and Whangarei District a medium risk for death and serious casualties. This is shown in the following extract from the register.

All deaths and serious casualties

2019 Register

PERSONAL RISK DSI/100MVKT	Ranking Territorial Authority	Standard Deviation	COLLECTIVE RISK 5yr AVG DSI
14	Wairoa District		17
12	Waitomo District		25
11	Kaipara District		30
10	Far North District		77
10	Buller District		20
10	Gisborne District		38
9	Opotiki District		13
9	Masterton District		16
9	Horowhenua District		33
9	Dunedin City		82
9	Stratford District	1 STDEV	10
9	Auckland Rural North		83
9	Kawerau District		3
9	Clutha District		29
9	South Wairarapa District		10
8	Otorohanga District		9
8	Manawatu District		36
8	South Waikato District		30
8	Whangarei District		73
8	Auckland Rural South	0.5 STDEV	64
8	Matamata-Piako District		46
8	Whanganui District		24
8	Tararua District		22
7	Waimate District		12

PERSONAL RISK DSI/100MVKT	Road Safety Regions	COLLECTIVE RISK 5yr AVG DSI
10	NORTHLAND	181
6	AUCKLAND	652
7	WAIKATO	381
7	BAY OF PLENTY	172
8	TARANAKI	76
8	MANAWATŪ-WHANGANUI	188
10	GISBORNE	38
8	HAWKE'S BAY	112
6	WELLINGTON	204
6	TASMAN NELSON MARLBOROUGH	94
8	WEST COAST	47
6	CANTERBURY	361
7	OTAGO	195
7	SOUTHLAND	86
6	NATIONAL	2789

A breakdown of specific issues identified in the Communities at Risk Register is provided in the table below.

Communities at Risk Register 2019 Issue	FNDC	KDC	WDC	Northland
All Deaths and Serious Casualty	High	High	Medium	High
Young Drivers (of light vehicles aged 16-24 yrs)	High	High	Medium	High
Alcohol and/or Drugs	High	Medium	Medium	High
Speed (too fast for conditions)	High	High		High
Urban Intersections		Medium		
Rural Intersections				
All Intersections				
Rural Road Loss of Control and/or Head On	High	High	Medium	High
Motorcyclist Involved		High		Medium
Cyclist Involved				
Pedestrian Involved	High		High	Medium
Distraction (crash factor: attention diverted)				
Fatigue		Medium		Medium
Older Road Users (aged 75yrs or older)				
Restraints (seatbelts not worn)	High	High		High

Many of these High and Medium risk areas are driver behaviour or driver skill issues such as speed, alcohol/drugs, young drivers, rural road loss of control/head on and lack of seat belts worn. Continued education campaigns supported by police enforcement are required to help address these risk areas. The implementation of speed management through NZTA's Speed Management Guide will also help address speed as a factor in crashes.

High risk rural roads and intersections should be targeted for route treatment and intersection upgrade to help reduce crash rates in these high risk areas. In particular, loss of control on bends in rural areas should continue to be targeted.

Vulnerable road users such as pedestrians, cyclists and motorcyclists are at greater risk of injury in a crash and need to be catered for. The area of immediate focus is for pedestrian safety in Whangarei City where additional safe crossing points are required on major arterial roads which was raised as a major problem in

the Whangarei City Transportation Network Strategy ILM. Pedestrian safety is also a high risk in the Far North with most pedestrian crashes occurring in and around the rural towns in the district.

Following the release of the Safer Journeys 2016-2020 Action Plan, a Northland Road Safety Action Plan 2016/17 was been developed, which targets the following areas:

- High Risk Rural Roads – to target interventions on the five highest risk rural roads and five highest risk rural intersections in each district.
- Alcohol – target police enforcement and community based programmes in areas with high alcohol/drug related crashes.
- Motorcycles – apply NZTA Safer Journeys for Motorcycling countermeasures on high risk motorcycle routes.
- Speed – apply the NZTA Speed Management Guide principles and countermeasures on high risk roads.
- Young Drivers – increase driver education to identified communities to help young drivers attain their full licence.

The Northland Road Safety Action Plan is in the process of being updated to reflect the new Road to Zero strategy. In the meantime, these areas should be given extra focus in the development of the road safety programmes.

5.5.7.3 Key issues and actions:

- Prioritise treatments for high risk rural roads and high risk intersections.
- Target road safety promotion to address the issues identified in the Communities at Risk register and focus areas from the Northland Road Safety Action Plan.
- Ensuring that roads are widened to adequate widths and traversable shoulders provided when roads are rehabilitated, particularly for arterial/collector roads, freight routes and tourist routes.
- Provide speed management techniques in accordance with the new speed management guidelines.
- Providing safe and convenient crossing points and routes for pedestrians and cyclists, particularly for Whangarei City and Far North rural towns and travel planning to encourage use of these routes.

5.5.7.4 Benefits

- Providing treatments on high risk rural roads and high risk intersections will target investment on the areas with the highest safety risk and have the greatest opportunity to reduce crash rates.
- The continuation of the road safety promotion programme will help reduce high risk areas identified in the Communities at Risk register.
- Over time, the widening and improving of the general road network through the pavement rehabilitation programme will provide more road space before a vehicle encroaches on the unsealed shoulder and will provide more space for cyclists and pedestrians. It will also provide a more forgiving road network when people make mistakes.
- Speed management may also have significant impact on road safety, particularly in rural areas where the road network does not safely provide for an open road speed.

- Provision of safe walking and cycling routes and travel planning to encourage use of these routes will reduce crashes involving vulnerable active road users. In particular, safe crossing points in Whangarei City are required.

It should be noted, that the investment in the above safety measures will incrementally increase the maintenance, operations and renewals costs overtime due to the ongoing costs of maintaining and servicing new facilities and widened pavements.

5.5.7.5 Consequences

Without adequate investment into road safety measures, the increasing trend in fatal and serious injury crashes on the Northland local road network is likely to continue. This is contrary to the objectives of the GPS and the Road to Zero strategy which is to have "A New Zealand where no one is killed or seriously injured in road crashes".

5.6 Minor Issues

5.6.1 Increase in Maintenance Costs through the New Maintenance Contracts

5.6.1.1 Problem

The new maintenance contracts that started in July 2018, have resulted in significantly higher contract management costs (ie the contractor's allowance for their own management costs) than in the previous contracts. For WDC these costs have increased from approximately $800,000/annum to $2,250,000/annum and for KDC these have increased from $800,000/annum to $1,100,000/annum. For FNDC these costs have increased from $2,200,000/annum to $3,300,000/annum.

These increases in contract management are currently being spread through the maintenance, operations and renewals work categories and is placing a significant burden on these work categories, because these contract management fees are monthly payment items that are effectively committed spend which limits the amount of discretionary ordered work that is being undertaken.

In addition, the pavement marking costs have increased significantly, with increases in rates of between double and four-times the previous contract rates. This has placed a significant burden on the traffic services budget, and is resulting in each council struggling to achieve even one annual remark of the pavement markings per year.

Increasing the MOR budget to allow for these contract management and at least one annual line mark per annum will reduce pressure on the overall maintenance programme.

5.6.1.2 Benefits

By providing an increase in the MOR budget to cover the contract management costs, this will reduce overall pressure on the programme which will enable more funding to be used for ordered work which will help keep the network in a fit-for-purpose condition. Providing sufficient funding for at least one annual line remark, will help ensure that the nighttime delineation is kept to a reasonable level.

5.6.1.3 Consequences

Without increasing the MOR funding to address the increase in contract management costs, funding will be diverted from actual physical work being delivered on the ground which will see a deterioration in the current asset condition over time.

Without increasing the traffic services budget to allow for at least one annual line remark per annum, there will be a deterioration in the line marking on the network which is likely to result in more nighttime crashes occurring.

5.6.2 Road Work Delays and Communication

5.6.2.1 Problem

One of the key themes during the stakeholder engagement workshops was lack of communication of road works and the delays these cause to motorists, freight operators and bus users. While people understand that road works need to be undertaken, it is often the lack of notification of these works that is frustrating, particularly when they are late to work or an appointment due to delays at unexpected road work sites. Often the directly affected residents at notified upcoming of maintenance works but not generally the

wider public unless the work is a significant capital project. Better use of electronic media such as Facebook, Twitter and the AA Roadwatch or NZTA portal should be considered to notify the travelling public in real time where road works sites are and any diversions that may be in place.

5.6.2.2 Benefits

By providing better communication to the travelling public, they will be able to make informed decisions as to their routes to avoid unexpected delays.

5.6.2.3 Consequences

Without changes to the way Council communicates about road works, unexpected road works will continue to cause delay and frustration, particularly on key commuter, freight and public transport routes.

5.6.3 Catering for Tourists

5.6.3.1 Problem

The number of tourists and visitors to the Whangarei District are growing and will continue to grow in the future with developments such as the Hundertwasser Art Centre and revitalisation of the Twin Coast Discovery Route, both identified in the Tai Tokerau Economic Action Plan, coming on stream. The Stakeholder Engagement Workshops identifies that a lack of tourist facilities such as toilets, rest/viewing areas etc may reduce the experience of visitors on the Twin Coast Discovery Route and its byways. In addition, aesthetic faults such as litter and graffiti as well as lack of adequate directional signage are also likely to reduce visitor experience.

5.6.3.2 Benefits

Providing better facilities, reducing aesthetic faults and improving signage on tourist routes and byways will help promote Northland as a good place to visit, and help grow tourism Northland. This will help grow the local economy and provide more job opportunities.

5.6.3.3 Consequences

Not addressing these issues, may result in the Twin Coast Discovery Route and it associated byways continuing to stagnate and the potential benefit of tourism in Northland not being fully realised.

5.6.4 Industry Resourcing

5.6.4.1 Problem

Lack of adequate resourcing is a major issue for the transport industry in Northland, as is likely to be the case for other provincial areas of the country. This extends right through the supply chain from Council's ability to hire staff, to a having enough consultants to provide technical support and to having enough quality contractors to provide a good competitive market and achieve quality outcomes. These problems are due to difficulty in attracting quality staff due to lower pay rates and perceived lack of services in Northland. Whilst the resourcing issues are not necessarily resulting in less work being achieved, it may mean that the work may cost more because of lack of competition or may not be done to the same quality. The recent development of the Northland Transport Alliance is expected to help address some of these issues in the medium to long term by improving the region's buying power.

5.6.4.2 Benefits

Improving resourcing would result in better quality staff making better decisions, shorter lead times for professional services and more competition in the contracting market with better quality outcomes.

5.6.4.3 Consequences

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.

5.6.5 FNDC Procurement Board

5.6.5.1 Problem

The FNDC has a procurement board which controls the procurement process from approval of the procurement plan through to the award of contracts. The procurement board has been implemented as a result of issues with procurement process in the past. This process can take between three to six months to get the procurement plans approved and contracts awarded which can delay work commencing and put pressure on achieving the annual programme. This has been demonstrated by difficulties in delivering the three year Low Cost Low Risk programme during the 2018/21 period with most projects being delayed until Year 3 of the programme.

5.6.5.2 Benefits

Changing the FNDC procurement process would make it easier to deliver the FNDC programme.

5.6.5.3 Consequences

Without addressing the FNDC procurement process, it will take additional time to get projects awarded which may make it difficult to deliver the FNDC's programme.

5.6.6 Te Matau a Pohe and Kotuitui Whitinga Bridge Operation

5.6.6.1 Problem

The operation of the WDC Te Matau a Pohe lifting road bridge and Kotuitui Whitinga swing foot/cycle bridge is via a manned control room on site. WDC is keen on operating this bridge remotely to reduce costs. However, issues with CCTV coverage, night-time visibility and expansion need to be overcome before a remote operation can be considered.

5.6.6.2 Benefits

Providing a remote operation for the Te Matau a Pohe/Kotuitui Whitinga bridges would reduce ongoing operating costs.

5.6.6.3 Consequences

Continuing the current manned operation for the Te Matau a Pohe/Kotuitui Whitinga bridges will result in high ongoing operating costs.

PART B – PROGRAMME BUSINESS CASE

6 Options, Assessment and Alternatives

6.1 Option Identification (Root Cause Analysis)

Following the identification of the problem statements identified in Section 5, a root cause analysis was undertaken to identify the underlying causes of these problems. The root cause analysis was undertaken using the "5 Whys" type methodology in accordance with NZTA's Business Case Approach Practice Note No.3 – Root Cause Analysis in Business Case Development.

This process was undertaken through a series of workshops with the NTA Assets Team and NZTA local representative to determine the underlying causes of the identified problems. This was a bit of a deep dive into the myriad of issues that affect the transport network and a multitude of root causes were identified for each problem statement.

For each root cause, a possible solution (option or alternative) was identified to try and address this cause. These solutions ranged from high level interventions such as changing council policies and developing strategies to low level interventions such improving grader operator training.

The following tables include the results of the root cause analysis and the possible solutions to address the problem statements.

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Root Cause Analysis - SEALED ROADS

Our sealed road costs are some of the highest per km in our peer group

WHY?

Maintenance costs are higher than the peer group average	Reseal costs are higher than the peer group average	Rehabilitation costs are higher than the peer group average

WHY?

A significant portion of the maintenance costs are being driven by reseal programme	FNDC and KDC fixed maintenance costs are high	WDC carried out a lot of expensive AC mill and fill repairs in the past	KDC and FNDC have shorter reseal lives than their peers, resulting in higher life cycle costs for their roads			WDC currently have a significant thin asphalitic surfacing (TAC) programme	Higher historic length of sealed network being rehabilitated	Material cost are high compared to other peer group councils (particularly South Island councils)	There is a lack of competition in tender markets driving the costs up, particularly in the last 3 years for KDC and WDC	WDC is undertaking a programme of expensive urban rehabilitations in Whangarei City	Thicker pavements are used in Northland to carry the required loading

WHY?

Higher levels of repairs are undertaken on sections to be resurfaced	FNDC and KDC are charging in-house staff costs and over allocating maintenance contract fixed costs to sealed roads	AC mill and fills were often being used in the past where repairs are being done late in the season. They are also used for surfacing repairs on AC surfaces	FNDC target of 9% reseals/year was driving the programme	KDC have been playing catch up with a backlog of first coat seals work		WDC have been playing catch up with an historic backlog of TAC work in Whangarei City	FNDC: Due to unstable seal layers; KDC and WDC: Due to catch up in rehabilitations	Long aggregate cartage distances add to the costs of aggregate materials	There is a lack of contractors willing to undertake small rehabilitation contracts	High cost structural asphaltic concrete (SAC) treatments are being used due to high loadings, thin pavements, existing kerblines and shallow services.	We have generally weaker subgrades than most of the peer group

WHY?

Over-conservative design of repairs on reseal sections to protect the investment of the reseal	Inappropriate charging of in-house staff costs and maintenance contract fixed costs	There were difficulties in the past in getting the maintenance contractor to carry out timely repairs. WDC also has a lot of old AC surfacing on its urban network in Whangarei City which requires repairs.	The target is a historic Long Term Plan (LTP) performance measure	Reseals of first coat seals required on significant number of subdivision roads vested to council	Treatment of first coat seals were deferred in the past due to historic impact of rate strikes and debt reduction	Many TAC surfaces are well beyond the end of their useful lives and are now in poor condition	FNDC: Unstable seal layers caused by target of 9% reseals/year; KDC: Catch up due to 2015/18 rates strike recovery; WDC: Due to rehab reinvestment in 2015/18.	Lack of suitable local quarry sources	A tight contracting market with plenty of work on	SAC is relatively low risk to install and has less impact to traffic and residents/businesses than other options as it can installed at night	Northland has poor geology that becomes soft when wet

WHY?

Inadequate process to determine adequate levels of pre-reseal repairs	Inadequate process and training to ensure in-house staff and fixed cost are charged appropriately	Late repairs were often due to the impacts of emergency works on the programme, or through lack of resourcing by the maintenance contractor. Historic under investment of renewals in Whangarei City has meant low investment in TAC resurfacing in the past and more repairs required.	The target was based on RAMM average useful life rather than actual current demand	Council policy does not require developers to carry out reseals of first coat seals (ie second coat seals)	Reprioritisation of funds due to historic lack of local share	Historic under investment of renewals in Whangarei City has meant low investment in TAC resurfacing in the past	FNDC: Historic overinvestment in reseals; KDC and WDC: Historic underinvestment in rehabilitations	Few quarries are open due to difficultly in securing/retaining consents and few sources of suitable rock available. Commercial arrangements between quarries and contractors also can restrict economic access.	Buoyant local construction market fuelled by large State Highway projects and subdivision developments	SAC is an 'easy' to install but expensive option due to only one AC plant located in Northland	Water ingress into pavements softens subgrades which results in premature failure of pavements and thicker pavements required when carrying out rehabilitations

PROPOSED SOLUTIONS

Develop and Implement Sealed Road Maintenance Intervention Strategy (MIS). Provide adequate training to maintenance staff and contractors to ensure its implementation.	**Implement process and training to standardise charging across the NTA. Charge in-house staff maintenance costs to WC151. Reallocate maintenance contract fixed costs to better spread these across the relevant work categories.**	**Continue to programme timely maintenance repairs through the new maintenance contracts. Avoid late season repairs wherever possible. Continue to optimise TAC resurfacing programme through dTIMS and RAPT type process.**	**Change FNDC LTP Performance Measure so that it reflects the optimised reseal programme**	**Change council policies to require developers to fund second coat seals of development roads before vesting to Council. Also apply same policy to unsubsidised seal extensions.**	**Continue to optimise resurfacing and rehabilitation programmes through dTIMS and site validation/RAPT type process. Continue to focus on large chip reseals. Rehabilitations have already reduced to more sustainable levels in 2018/2021 period, but consider further lowering.**		**Undertake an assessment of available and potential quarry sources. The output of this assessment should be to determine suitable local quarry sources to reduce the costs of cartage and to determine potential ownership arrangements**	**Continue to carry out rehabilitations through the new maintenance contracts to make use of lower "locked in" rates. Where this is not desirable, consider creating a supplier panel to reduce barriers for contractors by prequalifying them**	**Consider alternative design solutions for highly trafficked urban road sections, weighing up the cost of the treatment, the risk of premature failure and the impact on the community**	**Improve drainage systems to avoid water ingress into pavements**

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Root Cause Analysis - DRAINAGE

Our drainage systems are increasing the susceptibility of pavements to water ingress and the likelihood of slips

WHY?

Watertables are often inadequate which allows water to get into pavements and cause premature failure of pavements and flooding/scour with consequential safety concerns	Culverts are often blocked causing flooding and potential washouts/slips

WHY?

Watertables on unsealed roads are often blocked or filled up with aggregate	Watertables on sealed roads are often blocked with debris or vegetation	There are many locations where a watertable has never been provided	Debris, sediment and vegetation build up in culverts	Structural failure or misalignment of the culvert	In some places high stormwater flows in the roadside drains causes shoulder scour and blocks culverts inlets

WHY?

Watertables and cut outs are not being adequately cleared in accordance with the contract as part of grading operations	Watertables being cleaned on an ad-hoc basis	Difficultly in establishing watertables due to high roadside cuttings, proximity of services or urban grassed verges etc	Inadequate cleaning of culverts in the past	Some culverts have poor alignments or are undersized resulting in blockages	Some culverts fail under heavy vehicle loads which results in blockage	Some old culverts become disjointed reducing the waterway capacity and allowing tomos (holes) to form	Insufficient culverts and cut outs to discharge stormwater flows

WHY?

Grading not being undertaken in accordance with the new maintenance contract specifications	Historic lack of watertable maintenance has meant that it is difficult to get back to a proper maintenance regime	No programme of watertable cleaning established	Providing watertables in these areas would be costly (high cut batters), lack of space or be resisted by the community (eg grass verges)	Culvert cleaning driven by inspections but most inspections were undertaken by driver overs in the past which would struggle to identify blockages.	Culverts not always laid on self cleaning alignments or to the correct size due to site/cost constraints	Culverts not always laid at the correct depth (cover) for the pipe class (strength)	Old butt end pipes used in the past which are not socketed together	Difficult to provide new discharge points due to many landowners not wanting to accept storm flows

WHY?

Inadequate training of grader operators and NTA maintenance staff of requirements of new maintenance contracts	Lack of historic drainage funding due to other priorities	There is insufficient data about watertable condition to enable a programme to be developed	The need for the proper drainage is being over-ridden by other other competing issues	Specific inspection of culvert inlets/outlets and barrels only undertaken on an ad-hoc basis in the past	Legacy of culverts not always properly designed in the past		Butt end pipes were commonly used in the past	Stormwater discharged onto properties can reduce the usability and value of the land.

PROPOSED SOLUTIONS

Provide adequate training to grader operators and NTA maintenance supervisors. Enforce the contract specification through NTA auditing processes	**Develop the Drainage Plan and FWP to determine adequate budgets to reinstate and maintain watertables going forward. This is likely to require additional drainage funding to get back to a sustainable drainage routine. However, this is proven to lead to long term pavement maintenance and renewals savings.**	**Continue to gather condition data and develop a FWP for watertable maintenance as part of the Drainage Plan**	**Provide watertables or other suitable drainage systems such as subsoil drains in these areas**	**Continue to carry out an annual programme of culvert inspections through the new maintenance contracts. Continue to carry out inlet and outlet cleaning. High risk culverts should also be inspected before major rain events.**	**Culverts sizing, class and alignment should be based on hydraulic and structural design in high risk areas. Sufficient funding for culvert replacement to rectify culvert alignment or size issues should be provided based on FWP through maintenance inspections.**		**Disjointed culverts should be programmed for treatment, either through pipe lining or replacement.**	**Continue to work with landowners wherever possible to develop new culvert locations and cut outs where necessary to manage stormwater flows**

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Root Cause Analysis - RESILIENCE

Our roads are susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.

WHY?

Poor geology and soil conditions in Northland result in slips	Northland has over a thousand active slips	When an unplanned closure occurs there is often no suitable detour routes			Climate change is predicted to worse weather impacts		

WHY?

Soils in many locations are prone to slips even on gentle slopes	There is a historic legacy of active slips	State Highway detour routes are often not fit for purpose for taking these traffic flows, particularly heavy vehicles	Critical local roads do not have dedicated detour routes established	Northland have many isolated communities	Climate change is likely to cause more droughts which will impact on the road network	Climate change is likely to cause higher intensity storms which will impact on the road network	Climate change is likely to cause sea level rise which will impact on the road network

WHY?

Many areas have Northland Allochthon (as known as Onerahi Chaos)	Insufficient investment in the past to address active slips	The alignment and width of local roads is not designed to take state highway traffic	Lack of planning of local road detour routes	Historic development of the road network has often provided only one route to communities	Droughts open up cracks in pavements which makes these more susceptible to slips	Storms are more likely to overwhelm the drainage systems	There is likely to be inundation of low lying coastal areas

WHY?

Northland Allochthon is a very weak and moisture sensitive soil	Slip repairs were not prioritised in the past	Local roads are designed for local road traffic flows	Focus has been on providing State Highway detours	Many communities are located on the coastal fringe with one access road	Cracks in the pavement surface allow water in which can soften the underlying soil and increase the pavement weight, increasing the likelihood of slips	Drainage systems often have not been designed. Where these have been designed, they have been designed for historic stormwater flows	Access to many communities is via low lying coastal areas

WHY?

Poor drainage systems allow water to saturate and soften Northland Allochthon resulting in slips	Other more pressing demands due to limited funding and funding policies at the time	Insufficient funding to provide a higher level of service (alignment and width) on these detour routes.	Lack of determination of critical routes and recognition of the need to consider detours of these routes	Northlands historic access was by sea and many of these communities are located on peninsulars or harbours where access is difficult to provide by road	Northland's soils are sensitive to moisture and slip prone when saturated	Stormwater design is typically based on historic rainfall rates.	Road network not designed for predicted sea level rise

PROPOSED SOLUTIONS

Improve drainage systems to control storm flows in areas that are a high risk for slips	**Continue to allocate funding to resilience works to get on top of historic slips on high priority routes**	**Continue to discuss with NZTA opportunities for State Highway funding of detour routes to lift these to a fit for purpose standard. Develop a strategic approach to detour routes through the Resilience Strategy**	**Continue to develop critical route map and Resilience Strategy to prioritise resilience works on these routes and to consider local road detours of these routes where possible**	**Strengthen routes to isolated communities to reduce the risk of unplanned closures. This is being considered and prioritised through the Resilience Strategy**	**Carry out a programme of crack sealing during dry summers**	**Upgrade critical culverts in at risk areas to cater for predicted storm flows. Carry out stormwater designs for critical culverts allowing for increased stormwater flows due to climate change**	**Consider options to Raise/Protect/Retreat roads in low lying coastal areas. Utilise the NZTA risk matrix in NZTA Knowledge Base and Resilience Strategy being developed to assess the appropriate treatment.**

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Root Cause Analysis - UNSEALED ROADS

Our unsealed roads have high levels of customer dissatisfaction, high maintenance costs and significant health concerns due to dust affecting residents

WHY?

Road conditions are poor due to potholes, corrugations and pavement failure	Unsealed road costs are higher than the peer group average	Dust generation on gravel roads is high which affects residents health and agricultural production of adjoining properties

WHY?

Poor road shape allows water into the surface	Grading and maintenance is often seen as ad-hoc and reactive		There is insufficient metal depth	High rate of heavy metalling		Expensive wet, roll and grade treatments in summer	Use of costly dust suppressants	There is a high volume of heavy vehicles which generate higher amounts of dust			Northland has long dry summer periods that allow more dust to be generated	Houses are located close to unsealed roads which makes people more susceptible to dust impacts	

WHY?

Grading is not providing the correct pavement cross fall to shed water	The maintenance is only undertaken when someone complains	There are no maintenance programmes or grading cycles established	Potholes form rapidly in wet conditions making grading cycles difficult to establish	High levels of gravel loss has resulted in pavements having reduced thickness		Topography such as steep grades require more aggregate	Corrugations forming over dry summer months	To control dust generation in dry summer months	Heavy vehicles stir up more dust on loose metal roads		There are high levels of primary production in Northland such as forestry and agriculture which generate heavy vehicle flows on unsealed roads	Northland has a subtropical climate with low rainfall during summer	Locating houses close to the road reduces the costs of providing driveway access and power/ telephone services	The councils planning rules allow rural dwellings to be constructed close to unsealed roads	

WHY?

Grading not being undertaken in accordance with the maintenance specifications	There is insufficient aggregate or poor subgrade shape on many roads which means that the grader operator cannot achieve the correct crossfall		Customers often want the unsealed road kept to a high standard and so may raise service requests even when an adequate level of service is being provided	There is insufficient asset and condition data to develop maintenance programmes and grading cycles	The pavement surface is loose which results in water ingress causing potholes	The pavement surface is loose which results in high gravel loss	Steep grades result in loss of traction or scouring of the road surface during heavy rain	The pavement surface is loose which results in corrugations forming	The pavement surface is loose which results in higher levels of dust generation		Heavy vehicles create a vortex that "sucks" dust from the road and vehicle tyres	Forestry and agriculture is often located on land that is less productive which is normally accessed via unsealed roads	Northland's climate combined with the influences of climate change are resulting in longer drier summers	Rural areas on unsealed roads are normally in areas of high social deprivation which drives a need for cheaper housing	The councils may not have properly considered the impacts of dust when setting these rules.

WHY?

Lack of enforcement of maintenance contract and grader operator training	Grading operations have pushed aggregate into drains and have widened the road which means there is less metal depth	Legacy issue of insufficient road metalling and poor subgrade formation (built off old "goat tracks"	Lack of customer understanding of the provided level of service	There are no defined processes to collect asset and condition data	Use of out-of-specification unbound GAP aggregates with no tightly bound wearing course							Vehicle speed and aerodynamic shape influences dust generation	These roads are normally unsealed as they do not justify sealing due to low overall traffic volumes	Northland has had 6 droughts in the last 10 years which restricts the ability to use water for dust suppressants or wet, roll and grade treatments	Northland has one of the highest rates of social deprivation in the country	The health effects of dust were not previously well understood.

PROPOSED SOLUTIONS

Enforce the maintenance contract grading specification. Provide training for NTA maintenance staff and grader operators		**Provide sufficient funding to enable appropriate aggregate depths and shaping of subgrade on high risk routes in line with unsealed road FWP**	**Educate the public on the level of service being provided. Back this up with a proactive programme of grading to ensure the correct level of service is maintained**	**NTA to develop methods and processes to collect asset and condition data through the maintenance contract. Continue to develop the unsealed road MIS and FWP**	**Enforce the maintenance contract to provide tightly bound Paige-Green specification compliant wearing courses. Determine appropriate material sources and blends to provide Paige-Green specification compliant material. Provide adequate guidance and training in the supply, construction and maintenance of Paige-Green specification compliant materials.**							**Consider setting temporary speed limits on dusty roads. Consider discussions with the heavy vehicle operators to use vehicle skirts to limit dust discharge.**	**Consider sealing only where there is sufficient traffic to warrant it. Gather and analyse forestry and agriculture heavy vehicle demands to better plan for their impacts (eg Forestry Plan currently underway). Develop a 3 year/10 year programme for seal extension**	**Develop water storage in rural areas to enable water-based treatments during drought events**	**Consider advocating for making council planning rules require houses on unsealed roads to be at least 80m from the road edge. This needs to be weighed up against the need for low cost rural housing. Where houses are still allowed to be in close proximity to unsealed roads, appropriate rules should be developed to minimise the impacts of dust such as the requirement for shelter belts to be planted on the road frontage etc.**	

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Root Cause Analysis - STRUCTURES

A large number of structures in FNDC and KDC are prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive replacement.

WHY?

Many bridges in FNDC are in poor condition and are vulnerable	Heavy vehicles are putting more demands on the bridge stock	Bridge maintenance not being undertaken soon enough to avoid expensive renewals/replacements	Retaining wall maintenance and renewal is undertaken on an Ad-hoc basis

WHY?

FNDC has a large number of timber decked bridges (68) which are vulnerable to damage	FNDC has a large number (24) of speed and weight restricted bridges at the end of their life. There are also many other structures that are in poor condition.	Delays in timely renewal and replacement work	Heavy vehicles (particularly logging trucks) are overloading bridges	Heavy vehicle loads are increasing due to the change to 50Max loading	Defects not being identified early enough	Budget constraints affecting the amount of bridge maintenance undertaken	There is no programme of retaining wall maintenance or renewals

WHY?

Timber bridges have greater risk from wheel loading (point loads)	The load carrying capacity of these bridges has reduced due to deterioration of the structure	FNDC has difficulty in procuring renewal and replacement work. Prices that are received are higher than expected.	Bridge renewals or replacements not undertaken in time to cope with forestry loads coming on stream	FNDC has a large number of 50Max restrictive bridges (70) and there is increasing demand for these bridges to take 50Max loads, particularly on forestry routes	Inspections undertaken on a cyclic basis - timber & weight restricted bridges yearly, other bridges: FNDC 3 yearly, KDC & WDC 2 yearly	There has been a historic lack of suitable KDC budget for bridge maintenance	FNDC's bridge maintenance budget is insufficient to carry out the required bridge maintenance and fund the Hokianga Ferry service	There is insufficient information on retaining wall condition to develop a programme of works

WHY?

Truck wheelpaths tracking off the supporting beams and onto the cantilevered deck	Insufficient bridge renewals and replacements undertaken in the past	Difficulty in getting bridge designs completed in a timely manner	Difficulty in getting competitive prices for bridge renewal and replacement programmes due to lack of specialist bridging contractors (often one Whangarei based contractor pricing the work)	Insufficient knowledge of when forestry loadings are coming on stream	50Max is more efficient to haul freight, particularly on long haul routes from the Far North District	Many FNDC bridges have very little bridge information, and so have been conservatively assessed as being 50Max restrictive.	Inspection cycle insufficient to identify defects on critical life line bridges and structures in high risk areas (eg coastal)	KDC's spend on bridge maintenance was reduced during the 2012/15 period as a result of the rates strike, which has resulted in critical maintenance on some key bridges being delayed	The Hokianga Ferry service maintenance and operations costs have been increasing which has limited the amount of bridge maintenance work that can be funded.	Retaining walls are not regularly inspected

WHY?

Wider and heavier trucks with wider swept paths	Lack of programme of bridge renewals to justify investment in timely bridge renewals to retain the structural integrity	Lack of specialist bridging consultant resource in Northland	Insufficient work in the Far North to justify more specialist bridging contractors. One specialist bridge contractor no longer considered acceptable to use. This is exacerbated by the FNDC procurement board process which can take up to 6 months to get approvals.	Lack of a long term strategy to identify and address forestry loads	Less trucks are required to carry the same load of freight	The 50Max bridge screening was undertaken based on existing bridge data, with no detailed analysis to confirm whether or not these bridges could take 50Max loads. FNDC has a lack of historic geological and structural data (due to lack of as-built records)	The impacts of life line bridges deteriorating are more significant to network access. Bridges in high risk environments are likely to deteriorate more quickly.	Bridge maintenance in KDC was deferred due to other competing demand for very limited budgets during the rates strike.	Increases in ferry operating costs such as labour and fuel costs have been increasing, but this has not been matched by a similar increase in the bridge maintenance budget. The recent ferry service tender has also resulted in a large increase in costs.	No process has been established to carry out annual retaining wall inspections. Retaining walls are often not recorded in the RAMM database.

PROPOSED SOLUTIONS

Realign bridge approaches where possible and position kerbs to channel trucks along the main structural beams wherever possible.	**Develop a long term strategy and FWP for bridge renewals. Provide an adequate level of FNDC bridge renewal funding to preserve the structural integrity and reduce the need for expensive bridge replacement wherever possible.**	**Continue to work on releasing a NTA professional services contract to secure sufficient specialist bridge design resource in Northland.**	**Consider creating a supplier panel to encourage more competition by reducing barriers for contractors by prequalifying them. Continue to work on simplifying the FNDC procurement approval process.**	**Continue to develop and update the Forestry Plan and FWP**	**Continue to carry out detailed assessments of 50Max restrictive bridges to determine whether these can be removed. Where necessary, provide adequate funding for 50Max bridge strengthening on critical freight routes. Support initiatives to revitalise the Northland rail network to reduce long-haul freight cartage by road.**	**Change bridge inspection cycle to yearly for critical bridges and bridges in high risk areas (eg coastal, or age). Change FNDC default cycle to two yearly. Make sure process of checking on defects repaired is robust to ensure repairs are undertaken and that the quality of repairs is to the correct standard.**	**Continue to provide an adequate level of KDC bridge maintenance funding to ensure that the maintenance requirements of bridges can be met**	**Increase the FNDC bridge maintenance programme to reflect the required level of bridge maintenance and the new Hokianga Ferry operating costs. By providing an adequate level of bridge maintenance funding this should see a reduction over time of bridge renewal work**	**Include inspections of retaining walls on critical routes in the annual bridge inspection programme. Continue to collect retaining wall RAMM data as part of the development of the retaining wall plan. Continue the development of the retaining wall plan and FWP**

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Root Cause Analysis - GROWTH & ALTERNATIVE MODES

Congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Many communities have restricted access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

WHY?

The road network does not have sufficient capacity to cope with the peak demands	Rural towns and communities have a lack of transport choice, which is particularly a constraint for the transport disadvantaged who do not have access to a private vehicle.

WHY?

Many intersections and road sections on key routes are old and are reaching the limits of what they were designed for	Lack of alternative modes available

WHY?

Increase in the number of private vehicles	Walking and cycling unsafe due to conflicts with higher vehicle speeds	Limited or no public transport available

WHY?

Rapid population growth in the outer suburbs, and rural towns of Whangarei over the past 5-10 years	Rapid population growth in Kerikeri/Waipapa and Mangawhai over the past 5-10 years, combined with summer holiday traffic	Lack of suitable alternative transport modes	Lack of safe, connected walking and cycling paths	Limited shoulder or berm for walking and cycling	Insufficient population to support bus services

WHY?

Lack of available land in the central area of Whangarei City has resulted in growth of the outlying areas	Overflow population from Auckland due to sustained period of record immigration into NZ	Kerikeri and Mangawhai are summer holiday destinations	Whangarei's City Link bus service is not convenient or attractive for most commuters				Walking and cycling paths in Whangarei, Kerikeri/Waipapa and Mangawhai are either incomplete, non-existent or unsafe			Footpaths in rural towns and communities are either incomplete, non-existent or unsafe	There are few safe cycleways between rural towns and communities	Narrow rural roads designed primarily for vehicles	Traditional bus services often not feasible due to lack of passengers and high cost of service

WHY?

The Whangarei City centre is constrained by the surrounding hills and Hatea River	Lack of available capacity in Auckland resulting in housing shortages	Peak holiday traffic is significantly higher than normal traffic flows	The buses get caught in the same traffic queues as private vehicles	The buses are not frequent enough (most peak services are 30 minutes apart)	All-day parking is cheap ($2/day) compared to bus fares (currently $2/trip each way)	There are no suitable services for commuters in rural areas	Whangarei shared path network to be completed and there is no on-road cycleway network	There is no cycleway network for Kerikeri/Waipapa or Mangawhai	The footpath network has missing and has unsafe crossing points. There are also many narrow sections that are unsuitable for mobility scooters and wheel chairs, which is likely to become more of an issue with an aging population.	Lack of focus and investment on rural cyclepaths in the past. Heavy reliance on private vehicle use between rural communities.	Lack of available funding to widen roads sufficiently to provide for safe shoulders/berms for walking and cycling	Passengers in rural areas with high levels of social deprivation cannot afford high bus fares

PROPOSED SOLUTIONS

Implement the City Centre Plan and Complete Streets Masterplan to encourage more inner city living in Whangarei	**Upgrade intersections and road links as they reach capacity to remove pinch points on the network. Improve detection and operation of signalised intersections in Whangarei. Develop and implement the Kerikeri/Waipapa Strategic Road Network. Implement the improvements from the Mangawhai Network Operating Framework.**	**Implement travel demand management to reduce summer peak traffic in Kerikeri and Mangwhai. This could include summer bus services (such as the Mangawhai seasonal service trialled in 2019/20).**	**Provide bus priority lanes on key bus routes to enable buses to "beat the queue" and to get a time advantage over private vehicles.**	**Increase the frequency of the bus services to reduce the time that users are waiting for the bus. This should be implemented in conjunction with the bus priority lanes. Implement travel planning campaigns such as New Plymouth's LetsGo to promote bus use**	**Increase the parking fees for all-day parking so that these are at least as expensive as a return bus fare (price advantage). Implement travel planning campaigns such as New Plymouth's LetsGo to promote bus use**	**Provide rural bus services suitable for commuters in Whangarei's outlying towns and villages**	**Develop and implement a Principal Cycleway Network Plan for on-road cyclelanes in Whangarei. Continue the development of the shared path network including completing the Kamo, Raumanga and Onerahi paths, as well as extending to Maunu and Tikipunga and linking through the city centre. Implement travel planning campaigns such as New Plymouth's LetsGo to promote active mode use**	**Develop and implement a Principal Cycleway Network Plan for on-road cyclelanes in Kerikeri/Waipapa. Also consider shared path network linking Kerikeri to Waipapa. Implement the planned Mangawhai Shared Path network. Complete missing sections of footpath to complete pedestrian networks. Implement travel planning campaigns such as New Plymouth's LetsGo to promote active mode use**	**Complete missing sections of footpath to provide pedestrian networks linking residential areas with schools, places of employment and recreation etc. Widen footpaths that are too narrow for mobility scooters. Consider increasing the minimum footpath width in the council engineering standards to 1.6m. Provide safe pedestrian crossing points across busy roads. Construct footpath linkages identified through the PGF funded Township Improvement Plans and Council Spatial Plans.**	**Construct the rural cycleways (ie Heartland Rides) identified in the Regional Walking and Cycling Strategy and the PGF funded Northland Integrated Cycling Plan. Develop a network of safe rural cycleways linking rural towns and communities. Construct cycleways identified through the PGF funded Township Improvement Plans and Council Spatial Plans.**	**Where suitable, provide additional shoulder or berm width on rural roads to enable safer walking and cycling opportunities.**	**Provide lower cost shuttle bus type services where feasible between rural towns. Support the development of low-cost ride share services to provide access to communities where bus services are not feasible.**

Root Cause Analysis - SAFETY

The FNDC and KDC networks have higher Collective Crash Risks than their peer group average. Northland is a High Community at Risk for Death and Serious Injury Crashes. The Death and Serious Injury crash rates are increasing for all three Northland councils.

WHY?

The road network is often narrow, winding and has unforgiving road sides						Driver speeds are often unsafe for the road environment (FNDC and KDC are High Risk for excessive speed on the Communities at Risk Register)			Pedestrian safety in Northland is poor (FNDC and WDC are High Risk for Pedestrian crashes on the Communities at Risk Register)			Poor driver behaviour contributes to many crashes in Northland						Unsafe vehicles are a contributing factor in many crashes and often result in high severity crashes				
WHY?																								
Historically the local road network was often not designed and so has a poor alignment and width (ie based on the old "goat tracks")	There are numerous roadside hazards on our roadsides and Northland has a high rate of run off road crashes (FNDC and KDC are High Risk and WDC is Medium Risk for Rural Run-off Road and Head On Crashes on the Communities at Risk Register).					Roads are not self explaining resulting in unsafe speeds		Speed limits are often inappropriate for the road environment	Pedestrians are often in conflict with vehicles			Alcohol and drug impairment is a significant issue (FNDC is a High Risk for alcohol/ drugs on the Communities at Risk Register)	There is a lack of use of restraints (ie seat belts) (FNDC and KDC are High Risk for restraints on the Communities at Risk Register)	Young drivers are over-represented in crashes (FNDC and KDC are High Risk for young driver crashes on the Communities at Risk Register)	Drivers often speed and carry out poor overtaking manoeuvres (FNDC and KDC are High Risk for crashes involving excessive speed on the Communities at Risk Register)	Drivers are often fatigued resulting in crashes (KDC is a Medium Risk for crashes involving fatigue on the Communities at Risk Register)	There are many unwarranted vehicles, particularly in the Far North District were a culture of not having a warrant or registration is normal and acceptable	Most vehicles in Northland do not have high safety ratings, which results in higher severity crashes
WHY?																								
The alignment was based on following Northland's rolling topography	Trees and service poles are often located close to road edges	Deep roadside drains at located against the road edge in some areas	Steep roadside batters are located against the road edge in many places	Guardrails, bridge rails and sight rails are often not to current standards	There are a higher rate of loss of control crashes at night (FNDC has an increasing rate of night time loss of control DSI crashes on Arterial and Primary Collectors Roads)	There are many out of context curves which are not in keeping with the general speed environment	There are roads with insufficient skid resistance for the road environment, particular on curves (FNDC has a generally increasing rate of wet rural road loss of control DSI crashes)	Most speed limits are based on 50km/h and 100km/h standard speeds which are often inappropriate	There is a lack of safe footpaths in rural areas linking communities to places of employment, education, recreation and social services	There is a lack of safe crossing points on busy urban roads (WDC has an increasing trend of vulnerable road user DSI crashes on urban arterials)	Insufficient drug and alcohol enforcement	Laziness, people thinking they are "bullet proof", and lack of understanding of consequences. Also lower socio-economic area, so less likely to be able to afford car seats for children	There are many unlicensed drivers, particularly in the Far North District	Driver impatience and arrogance (thinking they are "bullet proof"), being late for appointment/work	Lack of alertness and concentration	People cannot afford (cost) or do not want (culture) to keep their vehicles maintained and warranted.	We have an older vehicle fleet in Northland
WHY?																								
Following the topography was the least expensive option with the available resources and was fit for purpose for the vehicles at the time.	Self seeded trees, and shelter belts allowed to grow within road reserve. Service poles allowed to be placed on outside of bends.	Land drainage systems often use roadside drains, particularly in the Kaipara District (eg Ruawai) and some parts of FNDC (eg Awanui) and WDC (eg Hikurangi and Ruakaka)	Rolling topography means that there are many unprotected and steep cut and fill batters	These barrier systems have insufficient length of need, unsafe and obsolete end terminals. Sight rails are a hazard because they are too high which results in the top rail acting as a spear.	There is insufficient delineation of curves at night, particular in FNDC	The roads are often based on historic alignments which have not been designed which results in excess speeds entering many curves	The reseal programmes do not always pick up roads which have insufficient skid resistance. There is also very little warning to drivers that the road surface has inadequate skid resistance	100km/h not often appropriate for Northland's narrow, winding rural roads. 50km/h is not appropriate for urban areas with numerous vulnerable road user conflicts	Footpaths have mainly been provided in urban areas	Safe crossing points such as zebra crossings, raised platforms and mid-block signals are an impediment to traffic flow	Lack of adequate police presence and only ad-hoc alcohol and drug roadside testing undertaken	Education programme not sufficient to get message through without back up from police enforcement. Costs of providing car seats is often prohibitive	Insufficient driver licence testing stations in Northland. Cost of obtaining a license is also a barrier.	Inadequate knowledge of the consequences of speeding and poor overtaking.	Long travel distances, which are often monotonous, particularly on the long Kaipara straights between Dargaville and Brynderwyn	Lower socio-economic area which limits the ability to keep vehicle maintained. Difficulty in accessing vehicle testing stations and mechanics due to large dispersed rural area.	Northland is a lower socio-economic area, which means that people often can only afford cheaper, older vehicles
WHY?																								
Lack of historic investment in Northland's total road network	Inadequate clearing of roadside trees and acceptance of poor placement of service poles in the past	Easy to provide land drainage using the road reserve as this is a public space.	Lack of historic investment has resulted in most cut and fill batters being unprotected	These barrier systems are often old and based on obsolete standards	Lack of coordinated delineation improvement on Far North roads	Insufficient curve warning signage	Identification of roads with skid resistance issues is mostly reactive, using wet road crashes that have occurred as a trigger	High speeds reduce the survivability of crashes, particularly where there are road side hazards and vulnerable road users	Higher demand for urban foot paths due to greater population density, but speeds less so risk of a high severity crash is less. Lack of Walking & Cycling strategy in the Far North	Car-centric view prioritises traffic flow over pedestrian safety	The "booze bus" is not being used in Northland due to the vehicle being too slow to use in the Far North and insufficient officers with appropriate licences	Lack of adequate police enforcement, particularly in the Far North District.	Testing stations were centralised by the government a few years ago, making these less accessible. The Far North is a lower socio-economic area, and people often cannot afford the cost of a licence	Lack of suitable local education programme focused on speed. Lack of suitable passing opportunities results in poor choices being made	There are few suitable rest stops with services, for drivers to rest and refresh themselves	Lack of knowledge of why a properly maintained vehicle is vital for safety	Lack of knowledge why a more expensive, but safer vehicle should be considered
PROPOSED SOLUTIONS																								
Consider minor alignment improvements either in conjunction with road rehabilitations or as standalone safety projects on High Risk Rural Road (HRRR) routes. Identify problem areas through HRRR studies and crash reduction studies.	Provide Audible Tactile Profile (ATP) markings on edgelines on High Risk Rural Road (HRRR) routes. Remove roadside trees where possible and relocate or protect service poles on the outsides of bends on high risk routes. Identify problem areas through HRRR studies and crash reduction studies	Provide Audible Tactile Profile (ATP) markings on edgelines on High Risk Rural Road (HRRR) routes. Relocate land drainage system into private property on HRRR routes wherever possible. Ensure future land drainage is undertaken on private land. Identify problem areas through HRRR studies and crash reduction studies	Provide Audible Tactile Profile (ATP) markings on edgelines on High Risk Rural Road (HRRR) routes. Provide adequate treatment or protection of hazardous cut and fill batters on high risk routes. Identify problem areas through HRRR studies and crash reduction studies.	Consider an upgrade programme for old, obsolete guardrails and bridge rails to bring these to standard on High Risk Rural Road (HRRR) routes or possibly in conjunction with rehabilitations on other significant routes. Provide compliant sightrails (half eye-height). Identify problem areas through HRRR studies and crash reduction studies.	Develop corridor curve warning and marking upgrades on High Risk Rural Roads (HRRR), through HRRR studies and crash reduction studies.	Complete the assessment of out of context curves. Sign out of context curves. Where signage has already been provided and crashes are still occurring, consider curve realignment. Identify problem areas through HRRR studies and crash reduction studies	Carry out targeted skid resistance testing on at risk curves on High Risk Rural Road (HRRR) routes. Sign curves with inadequate skid resistance. Complete the risk assessment of wet road curves for WDC and roll this out for FNDC and KDC using best practice and apply appropriate surfacing treatment during the reseal cycle. Use NZTA intervention methodology for local roads.	Continue to progress the speed management programme (including school zone signs) to provide speed limits appropriate for the road environment on High Risk Rural Road (HRRR) routes or urban areas	Develop a Walking and Cycling strategy for the Far North. Prioritise new footpath projects based on safety risk, particularly where there are greater potential for higher severity crashes such as rural areas which have greater vehicle speeds.	Place more focus on safe pedestrian and cyclist crossing points. Prioritise safe crossing points such as mid-block crossings, zebra crossings and raised platforms in urban areas with significant pedestrian demand.	Support the new impairment vehicles for the Far North and Kaipara/Whangarei, with adequate police officers to run these on a weekly basis. Continue road safety campaigns to educate on alcohol and drug impaired driving. Consider potential mobility options (eg Uber type service or pub courtesy vans) to help avoid impaired driving.	Continue road safety campaigns to educate on the use of restraints, backed up with adequate police enforcement. NTA to provide resource to better supervise road safety promotion activities to focus on achieving better outcomes. Consider advocating for schemes for government funded car seats for lower socio-economic families	Continue providing a subsidised driver licence scheme through the road safety promotion programme. Continue with development/roll out of mobile driver licence testing station. NTA to provide resource to better supervise road safety promotion activities to focus on achieving better outcomes.	Enhance the current road safety programme for speeding, to get better impact. NTA to provide resource to better supervise road safety promotion activities to focus on achieving better outcomes. Advocate for more passing opportunities on State Highways where appropriate. Provide adequate pull off opportunities on high risk corridors where warranted	Develop safe rest areas at suitable locations with services such as toilets and refreshments in conjunction with the Twin Coast Discovery Route Rest Area business case	Promote the importance of vehicle maintenance through the road safety promotion programme. Advocate for schemes for government funded mobile mechanics and vehicle testing stations in conjunction with road safety promotion highlighting the risks of having a poor maintained vehicle	Promote safer, but affordable vehicles through the road safety promotion programme. Through Council procurement of vehicles target higher safety ratings

6.2 Option Development

The following tables were developed by the Roading Efficiency Group as part of a top-down assessment of options to address the identified problems. They summarise the responses in the existing AMP, the effectiveness of the existing programme and the proposed options which have been determined from the root cause analysis which should be considered as part of the option assessment.

Statement Problem 1	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Sealed Roads – Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.	• WDC - Reduce rehabs to 6km/yr. Reduce reseals from 110km/yr to 90km/yr. Address service lids. Skid resistance seals to reduce wet road crashes. • KDC – Decrease in rehab justified through dTIMs, balanced by increase in reseals to address first coat seal backlog. • FNDC – Decrease in rehab justified through dTIMs, balanced by increase in reseal cost to target larger chip reseals. • NTA – Include reseals and rehabs in maintenance contracts to get better buying power. RAPT type assessments of programme. Increase in watertable maintenance to reduce water ingress. Sealed road MIS with visual guide to be developed and implemented.	• Sealed road activity having a good effect on asset preservation, but costs are high affecting the value for money. • It should be noted that Northland has poor subgrade conditions, which means that costs will be higher than in other parts of the country. • Key issues from Root Cause Analysis: o Cost of pre-seal repairs high o FNDC and KDC in-house staff costs charged to Maintenance activities o WDC historically carrying out a lot of "mill and fill" repairs o FNDC LTP target driving reseal programme which is creating unstable seal layers o Second coat seals for subdivisions and unsubsidised seal extensions o WDC are playing catch up with backlog of urban rehabs and TAC. o WDC using expensive SAC for urban rehabs o KDC are playing catch up with backlog of first coat seals o Few quarry sources driving up costs o Water ingress into pavements	• Develop and Implement Sealed Road Maintenance Intervention Strategy (MIS). • Provide adequate training to maintenance staff and contractors to ensure MIS implementation. • Implement process and training to standardise charging across the NTA. • Change FNDC LTP Performance Measure for reseals. • Change council policies to require developers to fund second coat seals of development roads before vesting to Council. Also apply same policy to unsubsidised seal extensions. • Consider lowering amount of rehab further as justified through dTIMS and field validation. • Investigate new quarry sources to reduce cartage. Also investigate ownership arrangements of existing quarries. • Investigate alternative designs for urban rehabs to reduce use of expensive SAC where possible. • Improve drainage systems to reduce water ingress into pavements

Statement Problem 2	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Drainage – Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.	• WDC & FNDC - Record condition data on drainage assets through the maintenance contracts. Drainage programme to be included in the dTIMS model to prioritise the optimum programme of watertable maintenance. Develop a programme of culvert renewals through the proposed Resilience Strategy. • KDC – Increase spend on culvert replacements to replace undersized culverts on Primary and Secondary collectors. • NTA – Develop a programme of drainage renewals. Increase funding to prioritise watertable maintenance.	• Current drainage activity is insufficient to properly maintain the drainage system and is resulting in localised flooding and water ingress into pavements. • Drainage maintenance (particularly watertable maintenance) could be used as a COVID-19 stimulus. • Key issues from Root Cause Analysis: o Watertables and cutouts not be cleared by the grader operations. o Historic lack of investment in watertable maintenance. o Lack of condition data for watertables o Some areas have no drainage systems provided, eg urban grass berms o Blockage of culverts causing slips, washouts or flooding. o Culvert size inadequate, not at self cleaning slope or insufficient cover in many areas o Disjointing of old butt end pipes causes tomos to form o Scouring of watertables due to high stormwater flows in roadside drains.	• Provide adequate training to grader operators and NTA maintenance staff to avoid watertables being filled with gravel. • Provide drainage FWP and MIS. This is likely to require additional funding, particularly for watertable maintenance. • Develop processes and collect watertable condition data. • Provide subsoil drains for areas with no surface water drainage • Ensure that high risk culverts are inspected and cleaned before heavy rain events • Ensure that culverts are properly designed so that they have sufficient waterway, are at self-cleaning slopes and have sufficient cover. • Treat disjointed or butt end pipe culverts • Provide additional culverts or cut outs to reduce high flows in roadside drains

Statement Problem 3	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Resilience - Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.	• NTA – Carry out a programme of resilience upgrades through the Low Cost Low Risk programme. Develop a Resilience Plan and FWP of resilience works on critical routes. Develop a Retaining Wall Plan and FWP. • KDC – Increase in drainage renewals to replace undersized culverts on primary and secondary collector roads.	• Drainage activity is insufficient to properly maintain the drainage system and is resulting in localised flooding and slips. • Bridge activity in FNDC and, to a lesser extent, KDC is struggling to keep detour routes viable for HCVs, particularly 50Max vehicles. • Resilience improvements (through LCLR) are starting to address historic slips. • Key issues from Root Cause Analysis: o Drainage systems allowing water to saturate Northland's poor soils resulting in slips and ground creep. o Historic underinvestment in slip repairs has resulted in a large backlog, particularly in FNDC and KDC. o Detour routes not often in a fit for purpose condition for SH traffic flows. o Critical routes not identified or protected. o Pavement cracks open up in summer, making them more susceptible to slips. o Culverts not designed for current storm flows. o Sea level rise likely to affected low lying access to communities	• Improve drainage systems where there is a high risk of slips. • Prioritise investment in resilience improvements. • Develop a strategic approach to managing the resilience of detour routes. Discuss with NZTA opportunities for State Highway funding of SH detour routes on local roads. • Continue the development of the Resilience Strategy and FWP, targeting critical routes. • Strengthen the resilience of routes serving isolated communities. • Carry out a programme of crack sealing in summer to target high risk areas. • Upgrade culverts sizes in areas that are high risk for slips or flooding. • Consider options to raise/protect/retreat roads that are subject to coastal inundation.

Statement Problem 4	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Unsealed Roads – Use of out of specification GAP aggregates on our unsealed roads is resulting in: • adverse health impacts to residents due to dust • high levels of community dissatisfaction due to poor road condition and • high maintenance costs.	• WDC – Wright Rd seal extension, increase in funding for dust suppression on forestry routes, 2km/year of unsubsidised seal extension. • KDC – Increase in heavy metalling to build up strength and shape, balanced by decrease in maintenance. • FNDC – Ngapipito and Pipiwai Rd seal extension, increase in funding for dust suppression, 2km/year of unsubsidised seal extension, increase in heavy metalling on forestry roads balanced by decrease in maintenance, watertabling. • NTA – New Maintenance Contracts to bring in use of Paige-Green compliant materials and to use RoadROID or similar to capture roughness data. Development of a Centre of Excellence with Unsealed Rd FWP. Development of an Unsealed Rd MIS and visual guide.	• Unsealed road activity is not sustainable, with high gravel loss, corrugations, potholes and dust, which is diving high customer dissatisfaction. • Dust suppression and sealing of roads is effective but expensive. • Unsealed road maintenance and renewal could be used as a COVID-19 stimulus. • Key issues from Root Cause Analysis: o Legacy issue of insufficient metal on unsealed roads o Grader operators not achieving the correct cross-fall or pushing metal into drains o Customer expectations are too high o Lack of condition data o Using out-of-specification GAP type materials with no tightly bound wearing course o Trucks creating significant dust on HCV routes. Likely to get worse with more droughts, which also is likely to restrict waterbased dust suppression treatments. Houses located closer than 80m to roads due to council policies. High levels of social deprivation also means houses are more likely to be on sealed roads and closer to the road because cheaper.	• Complete the unsealed road strategy, FWP and MIS. • Enforce the new maintenance contract grading specification. • Provide training to grader operators and maintenance staff • Provide sufficient metal depths on key routes. • Educate the public on the level of service being provided. • Carry out a proactive programme of grading based on condition data. • Develop methods to gather and analyse condition data on unsealed roads. • Enforce the new maintenance contract specifications to provide Paige-Green compliant wearing courses. Back this up with adequate training for contractor and NTA staff. • Determine sources and blends to provide Paige-Green compliant material. • Temporary speed limits for dusty HCV routes. Consider advocating for HCV skirts to reduce dust. • Sealing should only to be considered where dust or traffic warrants it. Develop long term seal extension FWP. • Consider water storage in rural areas for dust suppression • Advocate for changing council house set back requirements on unsealed roads.

Statement Problem 5	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Structures – Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.	• WDC & FNDC – Additional funding for retaining wall maintenance and renewal. Additional funding for steel arch culvert replacements (WDC issue). • FNDC – Large increase in bridge maintenance and renewal to retain current access for freight and 50MAX routes and reduce the likelihood of structural failure. • KDC – Increasing in maintenance funding to address increase in damage to narrow bridges from increased freight movements. Increase to catch up with damaged one lane bridge components. • NTA – Develop programme in conjunction with NZTA for structural upgrades on detour routes. Carry out detailed assessments of 50MAX restrictive bridges. Seismic assessments of structures on key life lines, arterials and freight routes. Develop a Retaining Wall Plan and FWP. Retaining walls to be included in the annual bridge inspections.	• Bridge maintenance and component replacement for FNDC and, to a lesser extent KDC, is not enough to keep the asset in a stable condition. • Bridge replacements are slowly replacing the aging and poor condition bridge stock. • Key issues from Root Cause Analysis: o FNDC has a large number of timber decked bridges which are vulnerable to damage o Insufficient in bridge renewals in the past has left FNDC with a backlog of poor condition bridges, many with restrictions. o Lack of specialist bridging consultants and contractors, particularly in the Far North. FNDC procurement board also a constraint o Bridge strengthening/replacement not carried out in time for forestry harvest. o 50MAX bridge restrictions are affecting productivity of HCV routes. o Bridge inspections not frequent enough on critical and high risk structures (eg coastal) o Bridge maintenance budgets insufficient to stop costly renewals and replacements o FNDC Hokianga Ferry service cost increases have reduced available budget for bridge maintenance o Retaining walls not being inspected.	• Realign bridge approaches and move in kerbs on timber decked bridges to concentrate loads on the main structural beams • Develop a long term bridge strategy and FWP • Provide sufficient level of bridge maintenance and component replacement funding for FNDC and KDC, including adequate allowance for the FNDC Hokianga Ferry Service • Develop a professional service contract for the NTA to secure bridging design services • Develop a supplier panel to pre-qualify contractor for bridging (and other) works. • Simplify the FNDC procurement process. • Complete the Forestry Plan to proactively address structural constraints on forestry routes before logging commences • Continue to carry out detailed 50MAX assessments • Advocate for rail revitalisation to reduce road freight haulage distances • Reduce inspection frequency for FNDC and for all councils on critical and high risk structures • Carry out annual inspections of retaining walls and develop a retaining wall FWP

Statement Problem 6	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Growth and Alternative Transport - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	• WDC – Implementation of the Whangarei City Transportation Network Strategy PBC. Specifically this includes: o Carry out corridor management plans of key arterial routes. o Improve traffic signal reliability and operation by providing Fibre/WiFi Connection, CCTV Coverage, Remote Operation and Improved Detection Technology. o Carry out a programme of Signal Detector Renewals and SCATS Computer Replacement to ensure that the traffic signals are operating efficiently and will reduce the risk of the SCATS computer failing. o Consider the feasibility of carrying out signal and bridge operations through a Northland transport operations centre (similar to ATOC). o Travel planning to encourage mode shift to walking, cycling and public transport and will help reduce congestion. o Upgrade the Tarewa/Porowini and Maunu/Porowini intersections to address rapid growth on Porowini Ave o Construct a new roundabout at SH1/Springs Flat to help address growth in Tikipunga. o Improved traffic signal detection technology will further improve efficiency during pedestrian phases and by providing priority for public transport vehicles.	• Traffic signals MOR are keeping signals in a relatively stable condition, but is not keeping up with demand. • Footpath and cycleway maintenance is keeping these paths in a relatively stable condition. There are a lot of renewals required. • Traffic signal improvements and new footpaths undertaken through the Low Cost Low Risk programme are starting to improve traffic flows and pedestrian linkages. • Footpath maintenance and renewals are potential COVID-19 stimulus works. • Key issues from Root Cause Analysis: o Rapid growth in Whangarei is causing congestion during workday peaks. o Rapid growth in Kerikeri/Waipapa and Mangawhai combined with summer holiday traffic is causing congestion. o The bus service in Whangarei is inconvenient for most commuters (stuck in same queue, 30 min frequency during peaks, all-day parking cheaper than return bus fare, lack of rural services). This places more reliance on private vehicle use.	• Implement the City Centre Plan and Complete Streets Masterplan to encourage more inner city living in Whangarei. • Upgrade intersections and road links as they reach capacity to remove pinch points on the network. • Improve detection and operation of signalised intersections in Whangarei. • Develop and implement the Kerikeri/Waipapa Strategic Road Network. • Implement the improvements from the Mangawhai Network Operating Framework. • Implement travel demand management to reduce summer peak traffic in Kerikeri and Mangwhai. This could include summer bus services (such as the Mangawhai seasonal service trialled in 2019/20). • Provide bus priority lanes on key bus routes to enable buses to "beat the queue" and to get a time advantage over private vehicles. • Increase the frequency of the bus services to reduce the time that users are waiting for the bus. This should be implemented in conjunction with the bus priority lanes. • Increase the parking fees for all-day parking so that these are at least as expensive as a return bus fare (price advantage). • Provide rural bus services suitable for commuters in Whangarei's outlying towns and villages. • Develop and implement a Principal Cycleway Network Plan for on-road cyclelanes in Whangarei. • Continue the development of the shared path network including completing the Kamo, Raumanga and Onerahi paths, as well as extending to Maunu and Tikipunga and linking through the city centre.

Statement Problem 6 (continued)	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Growth and Alternative Transport - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	o Complete the shared path network. Construct a bike training facility on Pohe Island. o Travel planning to encourage mode shift to walking, cycling and public transport and will help reduce congestion. o Provide Bike Skills training to improve cyclist confidence and safety. o Increase parking charges in the CBD. • FNDC – Carry out an Integrated Transport Strategy and Plan to identify projects in the Kerikeri/Waipapa area to address summer congestion. Development of Heartland Rides will provide cycling facilities aimed at visitors and tourists and is supported by the Twin Coast Discovery Highway. • KDC – Carry out a Transport Strategy for Mangawhai to build on the work undertaken through the Mangawhai Community Plan. This will confirm the projects in Mangawhai area to address summer congestion. Upgrade the intersections at Moir/Insley and Moir/Molesworth. Construct a shared path and coastal walkway in Mangawhai. Develop the Kaihu Valley Rail Trail and other heartland rides connecting townships. Construct walking and cycling networks in Dargaville, Kaiwaka, Maungaturoto and Ruawai. Development of a ferry service in the Kaipara Harbour. • NTA - Carry out regular footpath condition rating and develop a footpath hierarchy and prioritisation tool for determining footpath renewals. Pedestrian crossing upgrades to improve the safety of pedestrians crossing busy roads.	o The shared path network in Whangarei is incomplete and not fully connected. o There is no safe path for pedestrians or cyclists linking Kerikeri to Waipapa, or Mangahwai Heads to the Mangawhai Village. o The footpath network is incomplete, narrow in places and has unsafe crossing points in many areas. o There are few safe facilities for cyclists to travel between towns and communities in rural area, placing more reliance on private vehicle use. o Road shoulders and berms are often narrow in rural areas making it unsafe for cyclists and pedestrians. o Lack of public transport in rural areas across Northland.	• Develop and implement a Principal Cycleway Network Plan for on-road cyclelanes in Kerikeri/Waipapa. • Also consider shared path network linking Kerikeri to Waipapa. • Implement the planned Mangawhai Shared Path network. • Implement travel planning campaigns such as New Plymouth's LetsGo to promote walking and cycling and bus use. • Complete missing sections of footpath to provide pedestrian networks linking residential areas with schools, places of employment and recreation etc. • Widen footpaths that are too narrow for mobility scooters. • Consider increasing the minimum footpath width in the council engineering standards to 1.6m. • Provide safe pedestrian crossing points across busy roads. • Construct footpath linkages and cycleways identified through the PGF funded Township Improvement Plans and Council Spatial Plans. • Construct the rural cycleways (ie Heartland Rides) identified in the Regional Walking and Cycling Strategy and the PGF funded Northland Integrated Cycling Plan. • Develop a network of safe rural cycleways linking rural towns and communities. • Where suitable, provide additional shoulder or berm width on rural roads to enable safer walking and cycling opportunities. • Provide lower cost shuttle bus type services where feasible between rural towns. • Support the development of low-cost ride share services to provide access to communities where bus services are not feasible.

Statement Problem 7	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Safety – Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for FNDC and WDC. FNDC and KDC also have higher Collective Risks than their peer group.	• WDC – Increase annual safety programme from $1M to $2M. • WDC & KDC - Development of a REAP type model for Road Safety Promotion. • FNDC – Has a $1M/year programme of which half is allocated to Associated Improvements. Enhanced Road Safety Promotion using in-house resources. • KDC – Increase in road markings and sight lines to signage. Targeted public road safety programme focussed on seat belt, drug and alcohol, speed and young drivers. • NTA – Increase in safe pedestrian crossing upgrades and intersection works. Boom mulching of roadside vegetation to clear sightlines. Edgelines on all Secondary Collector and above roads as well as tourist routes. Delineation and hazard protection on HRRR routes and CRS sites. Programme of speed management reviews. LED light upgrades on arterial road routes to bring lighting up to the required standard. Develop programme of skid resistance seals/water cutting.	• Environmental maintenance such as keeping sightlines clear is having a positive impact on safety. • Maintenance and renewals of sealed and unsealed roads, traffic services and operational traffic management are keeping safety outcomes relatively stable. • Road safety promotion is having a positive impact on communities, but Northland is still a High Community at Risk for DSI. For FNDC this programme is expensive. • Safety improvements through the Low Cost Low Risk programme are resulting in positive safety outcomes. • Key issues from Root Cause Analysis: o Northlands roads are often winding, narrow and have unforgiving roadsides. o Poor historic road alignments. o High rate of run-off roads with high severity due to numerous roadside hazards including trees, deep drains, poorly located service poles and inadequate barriers. o Insufficient nighttime delineation and signage. o Numerous out of context curves. o There is a lack of skid resistance in some areas. o Speed limits are often not suitable for the speed environment.	• Minor alignment improvements on HRRR in conjunction with rehabilitations or as standalone projects. • Identify high risk areas through HRRR studies and crash reduction studies. • Provide audible tactile profile markings (ATP) on HRRR routes. • Remove hazardous trees and protect or remove hazardous service poles. • Relocate deep drains onto private land where possible and ensure future land drainage systems are on private lane. • Provide adequate protection of hazardous cut and fill batters. • Treat unsafe guardrails and sightrails. • Develop corridor curve warning signage and delineation upgrades on HRRR routes. • Complete the identification of out of context curves and carry out signage upgrades on these curves. • Carry out targeted assessment of skid resistance on at risk curves on HRRR routes. Temporarily sign curves with insufficient skid resistance. • Complete the risk assessment of high risk curves for skid resistance issues and apply appropriate surfacing treatments. • Continue the speed management programme to provide appropriate speed limits for the speed environment on HRRR routes and urban areas. • Prioritise new pedestrian facilities and crossings where there is a high pedestrian demand or risk.

Statement Problem 7 (continued)	Key Responses In existing AMP	Summary of effectiveness of existing programme	Proposed Programme Business Case adjustments (from Root Cause Analysis)
Safety – Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.		o Lack of safe footpaths and crossing points for pedestrians. o Alcohol and drug impairment is a significant issue, particularly in FNDC. o There is a lack in use of restraints in FNDC and KDC. o Young drivers are over-represented in crashes, particularly in FNDC and KDC. o Drivers often speed and carry out unsafe overtaking manoeuvres, particularly in FNDC and KDC. o Drivers are often fatigued, particularly in KDC. o There are many unwarranted vehicles, particularly in FNDC. o Older vehicle fleet in Northland which generally has a lower safety rating.	• Support the new dedicated impairment vehicles for FNDC and KDC/WDC with sufficient police resource to run these on a weekly basis. • Consider supporting mobility options for pubs/bars such as Uber or courtesy vans etc. • NTA to provide dedicated in-house coordination of road safety promotion activities. • Continue road safety promotion activities targeting alcohol/drugs, impairment, young drivers and fatigue. • Strengthen the road safety promotion campaigns for speed. • Consider advocating for central government funding of children car seat restraints. • Continue with the development and roll-out of a mobile driver licencing testing station. • Advocate for more passing lanes on State Highways and pull off areas on high risk rural arterials in appropriate areas. • Develop safe rest areas in conjunction with the Twin Coast Discovery Route business case. • Carry out education campaigns on the need for vehicle safety maintenance through road safety promotion. • Advocate for government funded mobile mechanics and vehicle testing stations. • Promote safer, but affordable, vehicles through the road safety promotion activity. • Develop policies for councils to purchase vehicles with high safety ratings.

6.3 Option Assessment

The following sections analyse options for addressing the problems and issues identified in the Strategic Case. These options have been identified through the Root Cause Assessment in Section 6.1.

For the assessment of the data, peer group analysis and option assessment, a five point "traffic light" rating system has been used as shown in the following table.

This rating system is based on a qualitative assessment of the LOS and cost comparison data.

Performance Rating	Symbol	For LOS this means:	For Costs & Achievement this means:	Trend Rating	Symbol	For LOS this means:
Very Good		Much Better than Peer Group Average	Much Less than Peer Group Average	Improving Trend		Positive Change towards a Very Good rating
Good		Better than Peer Group Average	Less than Peer Group Average	Worsening Trend		Negative Change away from a Very Good rating
Average/Moderate		Similar to the Peer Group Average	Similar to the Peer Group Average	Static Trend		No Change
Poor		Worse than Peer Group Average	Higher than Peer Group Average			
Very Poor		Much Worse than Peer Group Average	Much Higher than Peer Group Average			
No Data		No Data	No Data			

For the analysis of options, a qualitative assessment of the effectiveness and impact on LOS has been made. The cost impact of the options has also been considered and an assessment of the 30 year Net Present Value (NPV) costs has also been made to determine the relative whole of life costs of each option.

We have also shown the relative change in the annual average budget (for the current 2018/21 period) required to fund the option

6.4 Sealed Roads

Work Categories: **111 Sealed Pavement Maintenance, 212 Sealed Road Resurfacing, 214 Sealed Road Pavement Rehabilitation & (Associated activities: 113 Routine Drainage Maintenance & 213 Drainage Renewals)**

6.4.1 Links to Strategic Case

Problem Statement: **Sealed Roads** - Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.

Benefits of Addressing Problem: A fit for purpose Level of Service for our sealed roads that is suitable for the traffic demands, particularly freight, while optimising the long-term maintenance costs. Over time our narrow pavement widths will be widened.

Consequences of Not Addressing the Problem: Our sealed roads will deteriorate under increasing traffic and freight demand leading to a reduced level of service, reduced resilience during wet weather events, increased road hazards (pot holes etc) and increased maintenance costs.

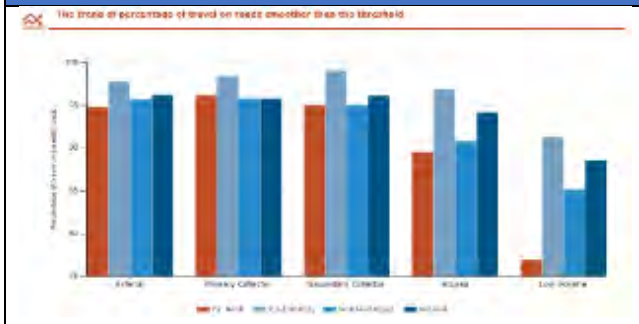
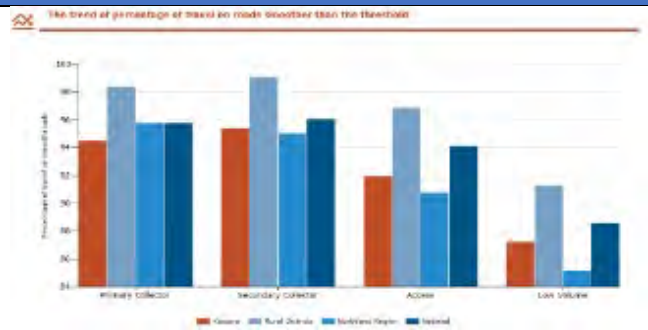
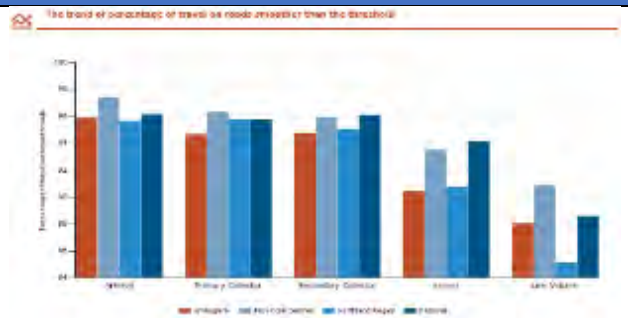
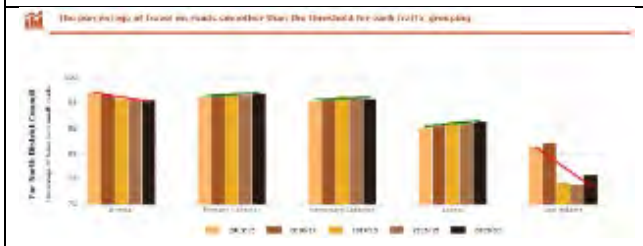
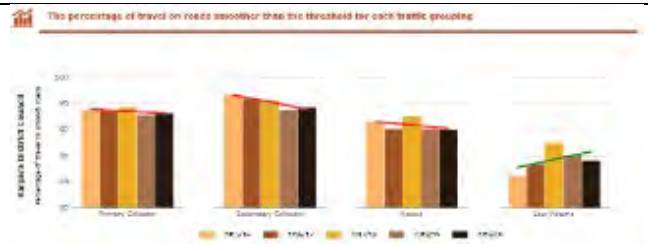
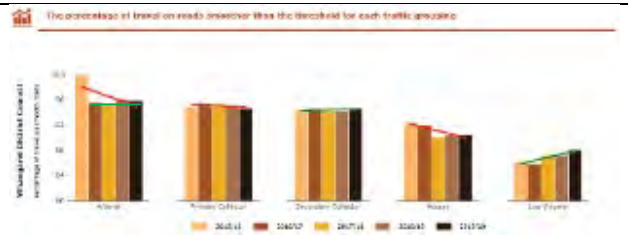
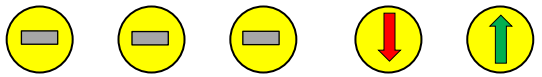
6.4.2 Levels of Service

ONRC Customer Outcomes:
ONRC Amenity CO1 – Smooth Travel Exposure (STE) – roughness of the road
ONRC Amenity CO2 – Peak roughness

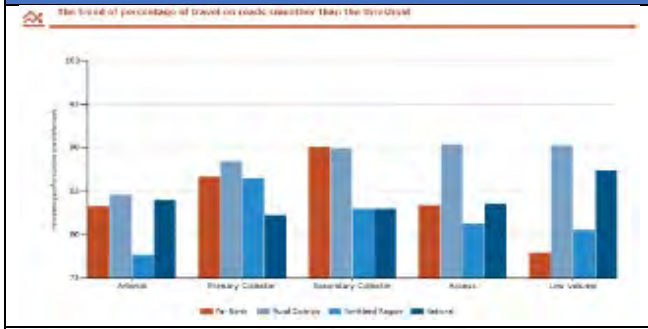
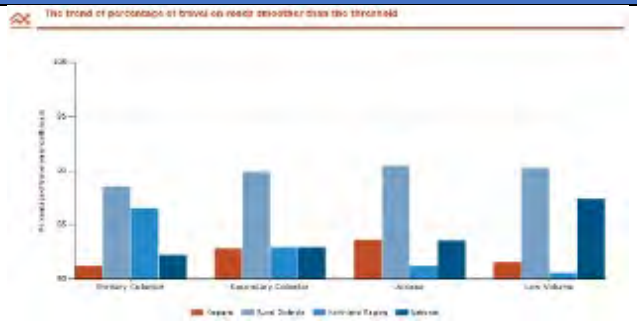
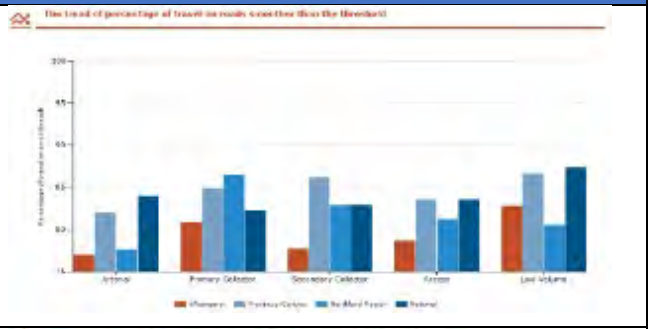
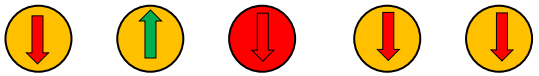
Customer Levels of Service:
ONRC Amenity TO1 – Roughness of the road (median and average)
ONRC Safety TO4 – Loss of Control on wet roads
ONRC Safety TO7 – Hazardous faults (NO DATA AVAILABLE)
ONRC Cost Efficiency 1 – Pavement rehabilitation
ONRC Cost Efficiency 2 – Chipseal resurfacing
ONRC Cost Efficiency 3 – Asphalt resurfacing
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.1.5 – Percentage of the sealed local network that is resurfaced (Current measure - DIA)
LTP 1.1.6 – Percentage of the sealed road network that is rehabilitated (Current measure)
LTP 1.1.X – Yr 1, 5, 10, 30 Condition distributions are maintained within the set condition envelope (New measure)

6.4.3 Evidence and Gap Analysis

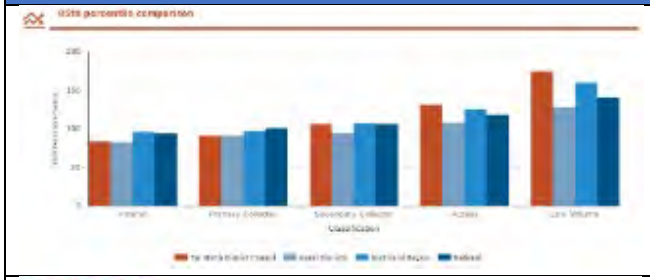
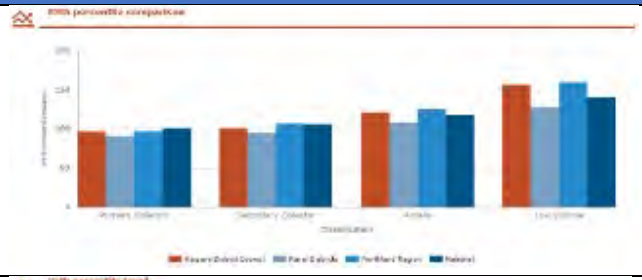
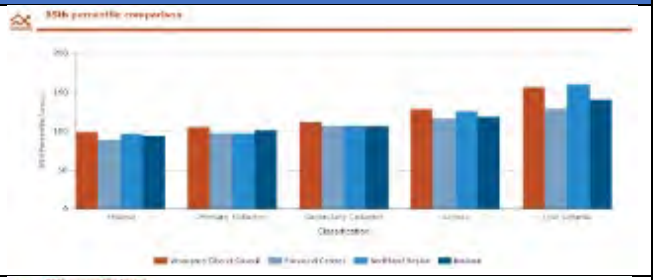
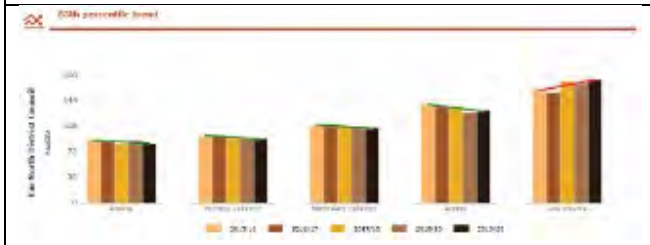
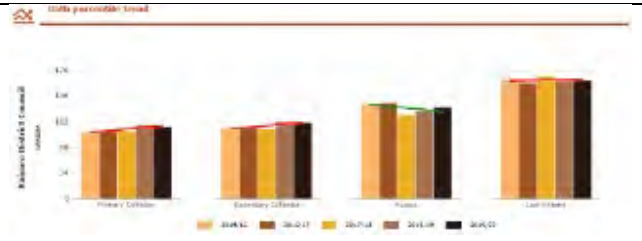
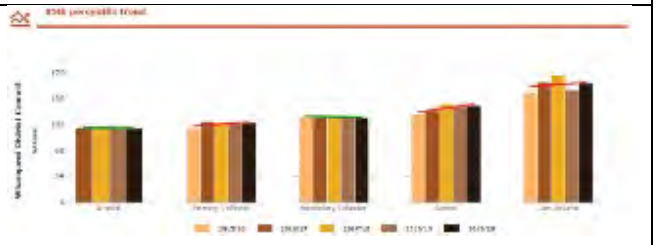
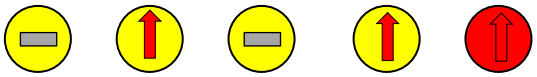
ONRC Amenity CO1 – Smooth Travel Exposure (STE) (and trend) – Rural Roads

FNDC	KDC	WDC
		
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume 	Primary Collector, Secondary Collector, Access, Low Volume 	Arterial, Primary Collector, Secondary Collector, Access, Low Volume 
FNDC Rural STE – The FNDC rural sealed network is slighter rougher than the peer group for its Arterial, Primary and Secondary Collectors, but is significantly rougher for its Access and Low Volume roads. There is a slight worsening trend for Arterial roads and a significant worsening trend for Low Volume roads. The other road classes are showing a slightly improving trend.	**KDC Rural STE** – The KDC rural sealed network is slightly rougher than its peer group for its Primary and Secondary Collectors. The Access and Low Volume roads are much rougher than the peer group. There is a worsening trend for the Secondary Collector and Access roads. The Low Volume roads have been showing a slightly improving trend. The Primary Collector roads have been largely static over the past four years.	**WDC Rural STE** – The WDC rural sealed network is slightly rougher than its peer group for all road classes. The Access roads are showing a worsening trend and Low Volume roads are showing an improving trend. All the other road classes are largely static. Note - There was an error with the 2015/16 Arterial road data and this has been excluded from the trend analysis.

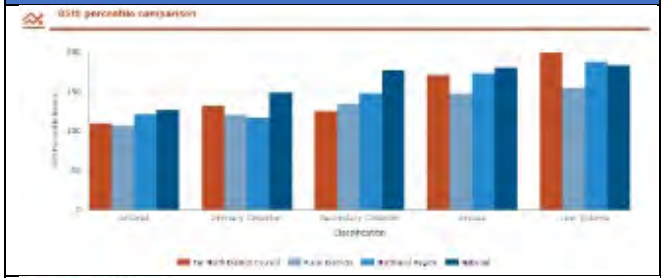
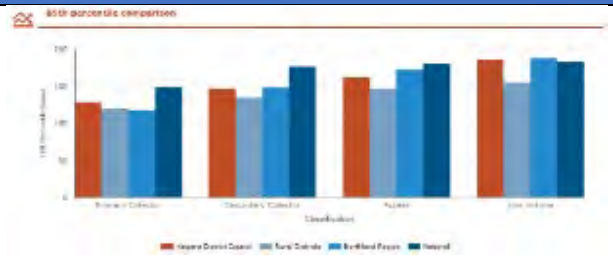
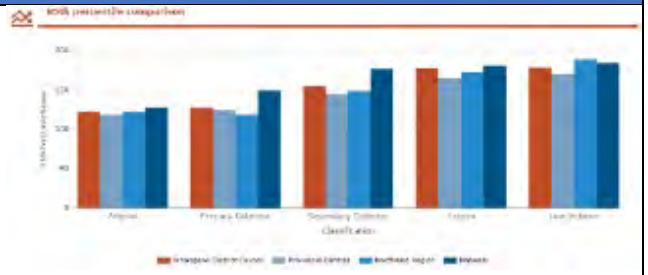
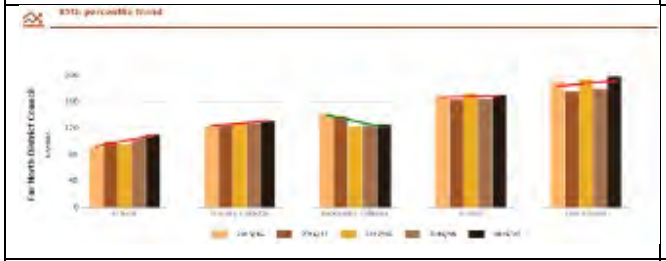
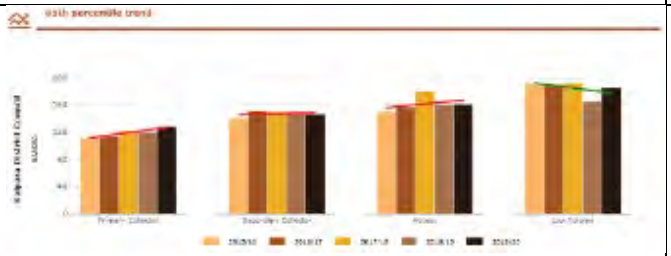
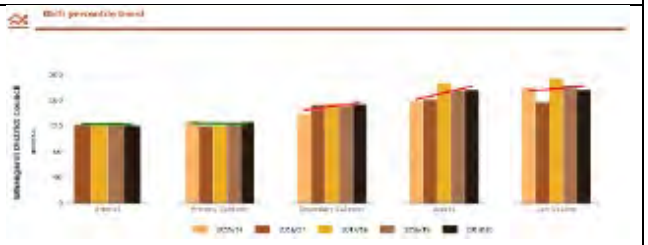
ONRC Amenity CO1 – Smooth Travel Exposure (STE) (and trend) – Urban Roads

FNDC	KDC	WDC
		
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
FNDC Urban STE – The FNDC urban sealed road network is slightly rougher that its peer group for its Arterial and Primary Collector roads. The Secondary Collectors are equal to the peer group average and the Access and Low Volume are significantly worse. There is a worsening trend for the Arterial, Access and Low Volume roads. The Primary Collectors are largely static and the Secondary Collectors are showing an improving trend.	**KDC Urban STE** – The KDC urban sealed network has a consistently worse roughness than the peer group average across all of the road classes. Low Volumes roads are significantly worse. There is also a worsening trend for all road classes, with the Primary and Secondary Collectors and Access roads showing a rapid decline in smooth travel exposure.	**WDC Urban STE** - The WDC urban sealed network has a consistently worse roughness than the peer group average across all of the road classes. Secondary Collector roads are significantly worse. There is also a worsening trend for all road classes, apart from Primary Collector roads. Secondary Collectors and Access roads are showing a rapid decline in smooth travel exposure. Note - There was an error with the 2015/16 Arterial road data and this has been excluded from the trend analysis.

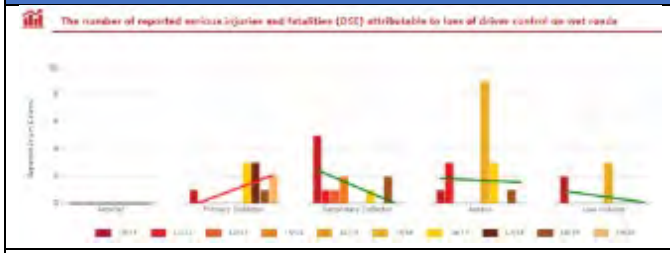
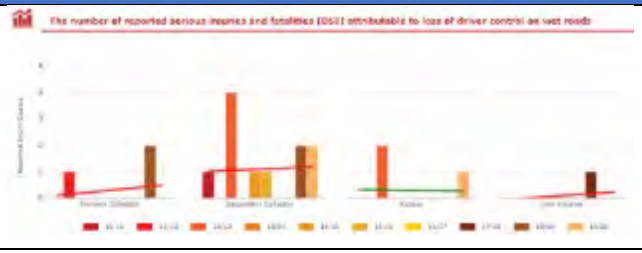
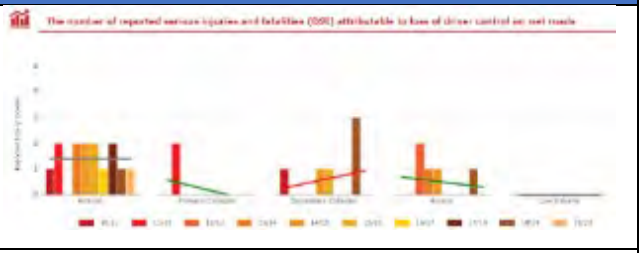
ONRC Amenity CO2 – Peak Roughness (and trend) – Rural Roads

FNDC	KDC	WDC
		
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
FNDC Rural Peak Roughness – Peak roughness on FNDC's rural sealed roads is equal to or slightly higher than its peer group average for its Arterial, Primary and Secondary Collector roads. It is significantly higher for its Access and Low Volume roads. There is an improving trend for all road classes, apart from FNDC's Low Volume roads which are showing a worsening trend.	**KDC Rural Peak Roughness** – Peak roughness on KDC's rural sealed roads is slightly higher than its peer group average for all road classes, apart from Low Volume roads which are significantly higher. There is a worsening trend for all road classes, apart from Access which is showing an improving trend.	**WDC Rural Peak Roughness** - Peak roughness on WDC's rural sealed roads is slightly higher than its peer group average for all road classes, apart from Low Volume roads which are significantly higher. There is a worsening trend for the Primary Collector, Access and Low Volume roads. The peak roughness on Arterial and Secondary Collector roads has been largely static.

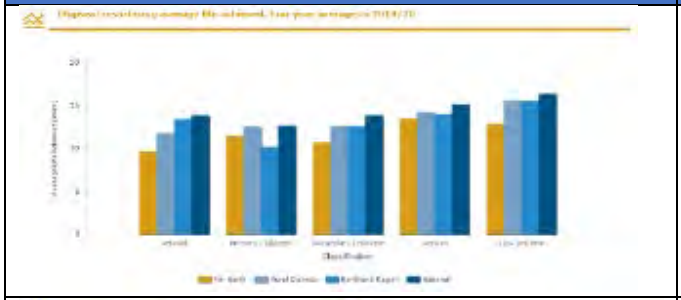
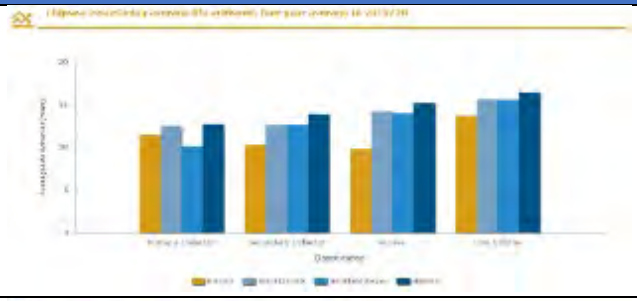
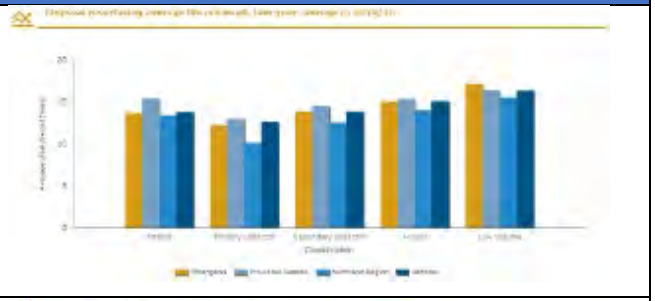
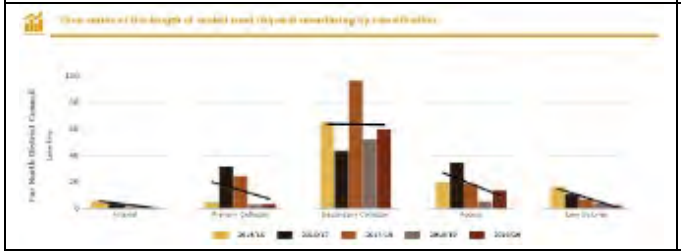
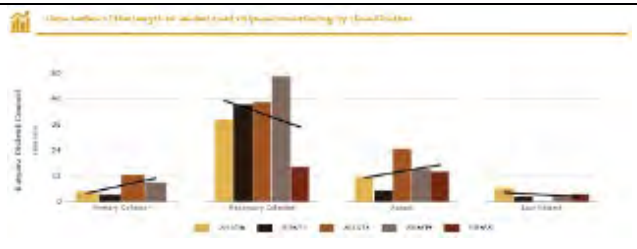
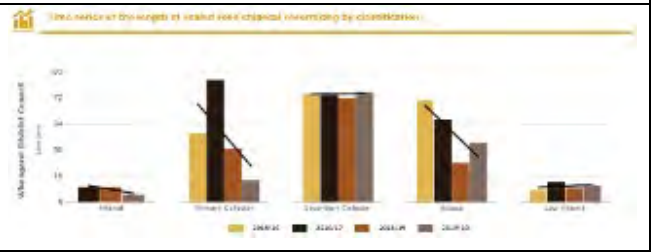
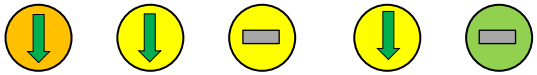
ONRC Amenity CO2 – Peak Roughness (and trend) – Urban Roads

FNDC	KDC	WDC
		
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume 	Primary Collector, Secondary Collector, Access, Low Volume 	Arterial, Primary Collector, Secondary Collector, Access, Low Volume 
FNDC Urban Peak Roughness – The peak roughness for FNDC's urban sealed roads is slightly lower than the peer group average for their Arterial and Secondary Collectors, and slightly higher for their Primary Collectors. However, the Access and Low Volume roads have significantly higher peak roughness. The trend in peak roughness is worsening for its Arterial, Primary Collector and Low Volume roads, but is improving or static for the other road classes.	**KDC Urban Peak Roughness** - The peak roughness for KDC's urban sealed roads is slightly higher than their peer group average for their Primary and Secondary Collector roads. However, the Access and Low Volume roads have significantly higher peak roughness. The trend in peak roughness is worsening for all of its road classes apart from Low Volume roads which are showing an improving trend.	**WDC Urban Peak Roughness** - The peak roughness for WDC's urban sealed roads is about the same or slightly higher than their peer group average for all of their road classes, apart from Access roads which have much higher peak roughness. The trend in peak roughness is worsening for its Secondary Collector, Access and Low Volume roads. The peak roughness for its Arterial and Primary has largely been static.

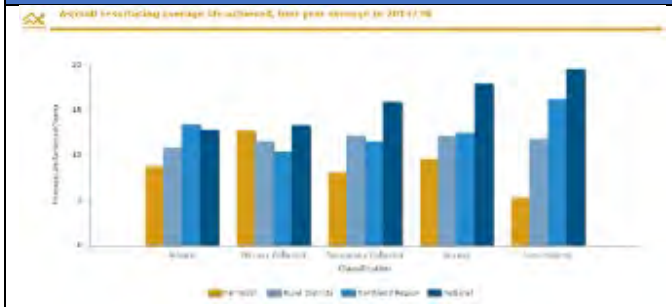
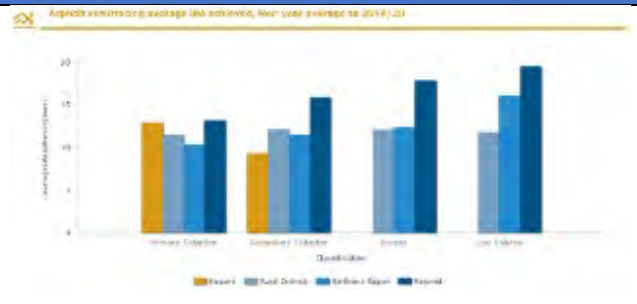
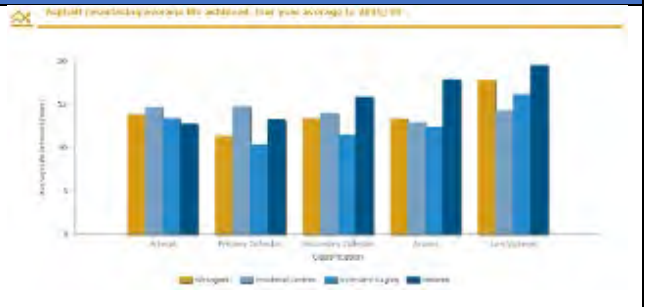
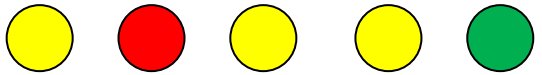
ONRC Safety TO4 –Loss of Driver Control on Wet Roads – Rural roads (top graph) & Urban roads (bottom graph)

FNDC	KDC	WDC
		
Arterial: ▬ / Primary Collector: ↑ / Secondary Collector: ↓ / Access: ↓ / Low Volume: ↓	Primary Collector: ↑ / Secondary Collector: ↑ / Access: ↓ / Low Volume: ▬	Arterial: ▬ / Primary Collector: ↓ / Secondary Collector: ↑ / Access: ↓ / Low Volume: ▬
		
Arterial: ▬ / Primary Collector: ↑ / Secondary Collector: ▬ / Access: ↑ / Low Volume: ▬	Primary Collector: ▬ / Secondary Collector: ▬ / Access: ▬ / Low Volume: ▬	Arterial: ↑ / Primary Collector: ▬ / Secondary Collector: ↓ / Access: ▬ / Low Volume: ↑
FNDC Wet Road DSI – It should be noted that there is very little data for wet road crashes for rural roads and almost none for urban roads for FNDC. This makes it difficult to determine any issues or trends. However, it appears that there may be an increasing trend on its rural Primary Collector roads and a decreasing trend on its rural Secondary Collector and Access roads.	**KDC Wet Road DSI** - It should be noted that there is very little data for wet road crashes for rural roads and none for urban roads for KDC. This makes it difficult to determine any issues or trends. From the limited data available there could be an increasing trend on rural Primary and Secondary Collector roads.	**WDC Wet Road DSI** - It should be noted that there is very little data for wet road crashes for rural and urban roads for WDC. This makes it difficult to determine any issues or trends. However, it appears that there could be an increasing trend on its urban Arterial roads and an increasing trend on its rural Secondary Collector roads.

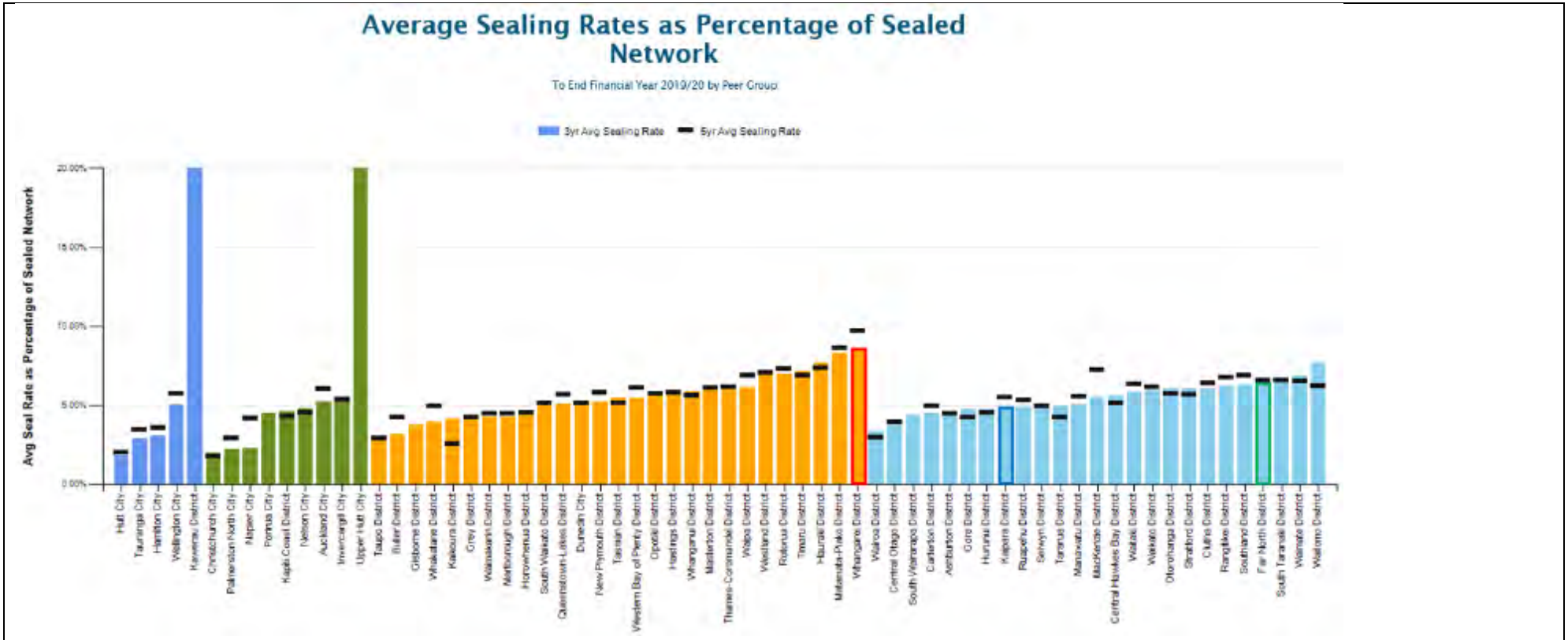
ONRC Cost Efficiency 2d – Chipseal Resurfacing - Life Achieved (top graph) and Chipseal Length (bottom graph)

FNDC	KDC	WDC
		
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
FNDC Chipseal Surfacing Life Achieved – Overall FNDC is achieving less life from its chipseals than its peer group average. The trend is generally improving, apart from the Secondary Collector roads. This is likely to be due to the legacy of high rates of reseals to meet a Long Term Plan KPI. In 2017/18 there was also a larger number of reseals undertaken on Secondary Collectors as part of the additional Forestry Strengthening funding from NZTA.	**KDC Chipseal Surfacing Life Achieved** – KDC is achieving shorter chipseal lives than its peer group average. The trend is also worsening for its Primary Collectors and Access roads. The increasing trend on Secondary Collector roads was reversed in 2019/20. This is likely to be as a result of more focus on resurfacing over the past two years, to achieve a better balance between reseals and rehabilitations. This greater focus on reseals is try and get on top of a backlog of first coat seals requiring resurfacing.	**WDC Chipseal Surfacing Life Achieved** – WDC is generally matching the chipseal life achieved by its peer group average, although Arterial roads are achieving less life. The trend is generally stable or improving for most road classes. WDC has been investing more in reseals over the past 3-4 years, and it appears that their sealed road network is nearing a stable condition. However, it is noted that there is a still a backlog of old void fill seals which are programmed to be treated in 2020/21.

ONRC Cost Efficiency 3d – Asphalt Resurfacing - Life Achieved

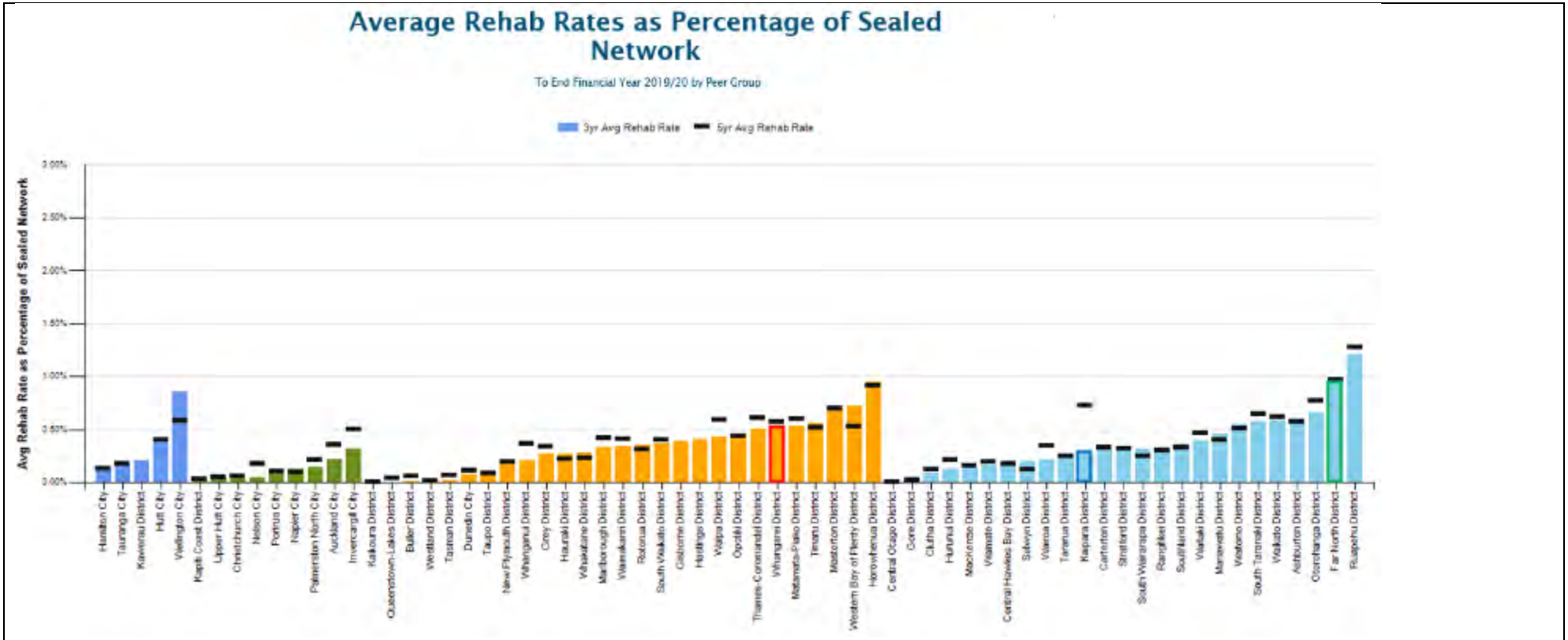
FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
FNDC Asphalt Surfacing Life Achieved – Overall FNDC is achieving significantly less life from its asphalt surfacings than its peer group average, particularly on its Secondary Collector and Low Volume roads. The exception to this is the Primary Collector roads which are achieving slightly longer lives than the peer group average. This is due to a very small quantity of AC that has failed early (1km/annum) on urban roads either in high stress areas or having insufficient pavement strength to prevent premature fatigue failure of the asphalt. The life achieved for asphalt surfacings is expected to increase substantially with the current focus on addressing a backlog of 12-20 years old surfaces on major urban arterials in Kaitaia and Kerikeri. The total proportion of asphalt surfacing in the Far North is about 4% (26km) of the sealed road network.	**KDC Asphalt Surfacing Life Achieved** – KDC is achieving longer chipseal lives on its Primary Collectors, but shorter lives than its peer group average on its Secondary Collectors. It should also be noted that there is only a small amount of asphalt surfacing in KDC (about 4.2km or 1% of the sealed road network) and so this measure is very subject to variation due to the small sample size.	**WDC Asphalt Surfacing Life Achieved** – WDC is generally matching the asphalt life achieved by its peer group average, and achieving much higher life for its Low Volume roads. However, the Primary Collector roads are achieving significantly less life than the peer group. Generally this is a good result. However, the lower life of the asphalt on Primary Collector roads is a concern. There is a backlog of asphalt surfacing that needs to be renewed in Whangarei City, primarily on urban arterials. This is will be a focus area over the next 3-5 years. The total proportion of asphalt surfacing in Whangarei is about 7% of the sealed road network.

NZTA Peer Group Charts – 3 year Sealing Rates



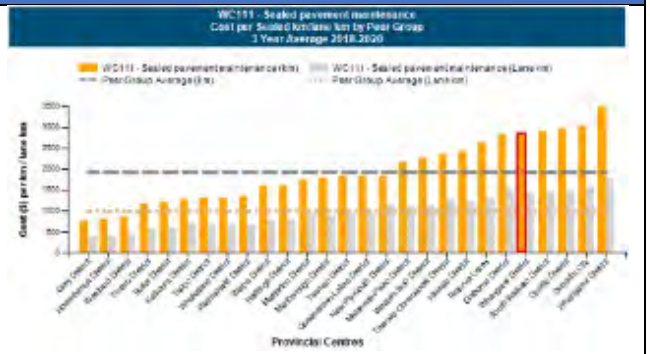
FNDC	KDC	WDC
FNDC Sealing Rate – The sealing rate in the Far North is towards the top of their peer group. This high rate of resurfacing is due largely to a historic Long Term Plan KPI that specifies a target resealing rate of 9%. For the last two years, resurfacing has been optimised through dTIMS and this should see a reduction over time to a relatively sustainable target of 12-13 year cycle (8% sealing rate).	**KDC Sealing Rate** – KDC's sealing rate is below average for its peer group. There is currently a backlog of first coat seals that KDC is resealing due to the historic funding constraints caused by the Kaipara rates strike. This is currently increasing the amount of reseals, and this should stabilise to a relatively sustainable target of 12-13 year cycle (8% sealing rate) from 2021 onward.	**WDC Sealing Rate** – WDC's sealing rate is the highest in its peer group. This is primarily due to a catch up in resurfacing that has been ongoing for the last 5 years. In 2020/21 WDC is aiming to get on top of its legacy of old void fill seals. This should enable Whangarei to lower its reseal programme to a more sustainable target of a 12-13 year reseal cycle (8% sealing rate) from 2021 onward.

NZTA Peer Group Charts – 3 year Rehabilitation Rates



FNDC	KDC	WDC
FNDC Rehabilitation Rate – FNDC has the second highest rehabilitation rate in its peer group. This has mainly been due to early failure of "cheap" seal extensions built in the late 1990's, unstable surfacings through high historic sealing rates and poor optimisation of the programme. The rehabilitation programme is now optimised through dTIMs, field validation and a RAPT type process and should see this rate drop over time.	**KDC Rehabilitation Rate** – KDC's rehabilitation rate is lower than the peer group average, and is considered appropriate and sustainable with more focus on reseals. This rate is less than half of the 5 year average, due to a significant period of catch up in rehabilitations in 2014/15 and 2015/16 following the Kaipara rates strike. The rehabilitation programme is now optimised through dTIMs, field validation and a RAPT type process.	**WDC Rehabilitation Rate** – WDC is in the top third of its peer group and the rehabilitation rate has decreased in the last 3 years. This is primarily due to a catch up in backlog of rehabilitations during the 2015/18 period. Whangarei is now targeting a programme of about 6km of rehabilitation per annum (0.6%) which is considered sustainable. The rehabilitation programme is optimised through dTIMs, field validation and a RAPT type process.

NZTA Peer Group Charts – 3yr Cost/km WC 111 - Sealed Pavement Maintenance

FNDC	KDC	WDC
		
		
FNDC Sealed Pavement Maintenance Cost – FNDC's sealed pavement maintenance cost is the fourth highest in its peer group. Pre-reseal costs are high as a result of a high reseal rate driven by a Long Term Plan KPI. These costs should start to drop in line with a reduced resurfacing programme. There are also drainage deficiencies on the sealed road network that are driving up maintenance costs. Improving watertable drainage will be a focus area for the 2021/24 period.	**KDC Sealed Pavement Maintenance Cost** – KDC has the second highest sealed pavement maintenance cost in their peer group. This is likely to be as a result of high pre-reseal repairs due to the current catch up in resurfacing to address old first coat seals on the network. It is expected that these maintenance costs will decrease over time as a result of the reseal programme getting on top of this backlog.	**WDC Sealed Pavement Maintenance Cost** – The WDC sealed pavement maintenance cost is in the upper third of their peer group. As for the other councils, WDC is just about completed a higher resurfacing programme to address old void fill seals and this has resulted in higher pre-reseal maintenance costs. This will decrease from 2021 onwards and will see a gradual decline in maintenance costs as the benefits of this resurfacing work are realised.
NORTHLAND - It should be recognised that Northland has poor clayey subsoils, subtropical climate (high rainfall), significant forestry demands on its local road network and lack of access to good quality pavement materials leading to long cartage distances. For these reasons, it is likely that the sealed pavement maintenance costs for FNDC, KDC and WDC will always be in the upper half or third of the peer group.		

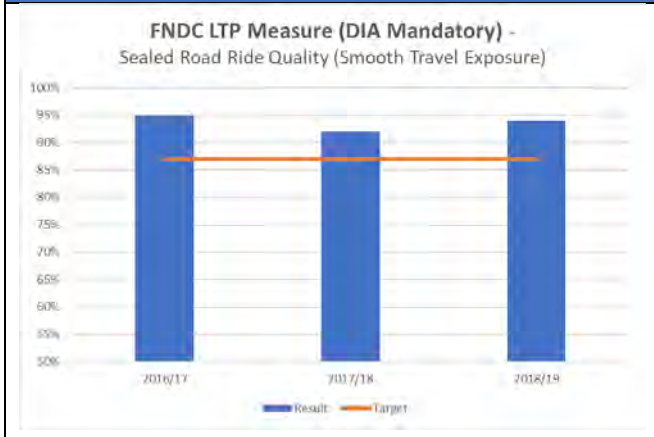
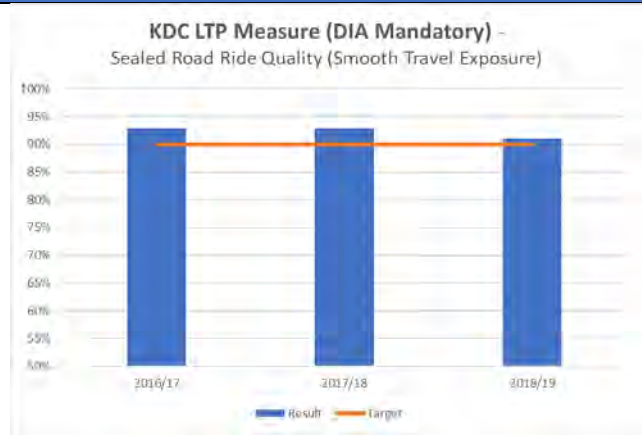
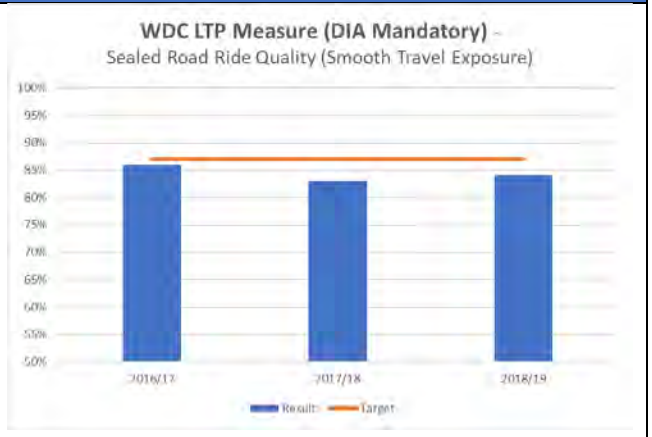
NZTA Peer Group Charts – 3yr Cost/km WC 212 - Sealed Road Resurfacing

FNDC	KDC	WDC
		
FNDC Sealed Road Resurfacing Cost – FNDC's sealed road resurfacing cost is the second highest in its peer group. As described previously, the FNDC have had a high historic rate of reseals driven by a Long Term Plan KPI. In addition, there was an increase in resurfacing in 2017/18 as a result of NZTA funded forestry strengthening work. The resealing costs are expected to increase in the short term to address the backlog of Thin AC surfacing. These costs are being kept as low as possible through an optimised programme based on dTIMS modelling backed up by field validation and RAPT type process and this should see reseal costs reduce from 2024 onward.	**KDC Sealed Road Resurfacing Cost** – KDC has the highest sealed road resurfacing cost in their peer group. As described previously, this is due to the current catch up in resurfacing to address old first coat seals on the network. There was also a large spike in reseals in 2018/19 as part of the recovery from the Kaipara rates strike. The resealing costs are expected to reduce going forward as a result of the seal road condition reaching a relatively stable condition and being based on an optimised programme based on dTIMS modelling backed up by field validation and RAPT type process.	**WDC Sealed Road Resurfacing Cost** – WDC has the second highest sealed road resurfacing cost in their peer group. This is due in part to a higher resurfacing programme to address old void fill seals. As described above, this will decrease from 2021 onwards. However, WDC also has a large backlog of asphalt surfacing in Whangarei City which is in poor condition. This is currently driving up the resurfacing costs and will need to be increased going forward to avoid more expensive urban rehabilitations. The resealing costs are expected to stay high for a 3 year period while these asphalt surfacings are renewed. It will then drop to a more sustainable level.
NORTHLAND - It should be recognised that Northland has poor clayey subsoils, subtropical climate (high rainfall), significant forestry demands on its local road network and lack of access to good quality pavement materials leading to long cartage distances. For these reasons, it is likely that the sealed road resurfacing costs for FNDC, KDC and WDC will always be in the upper half or third of the peer group.		

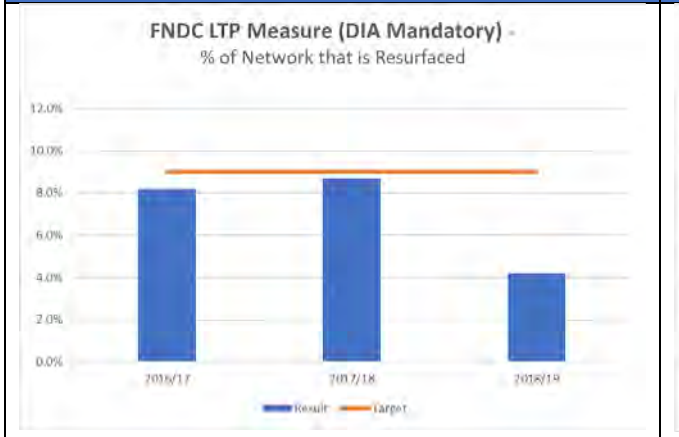
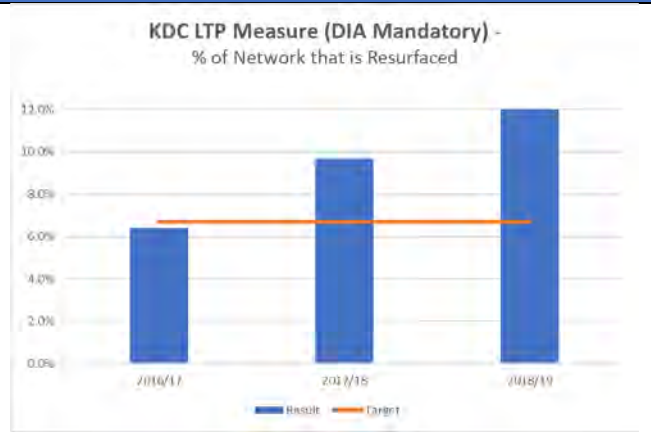
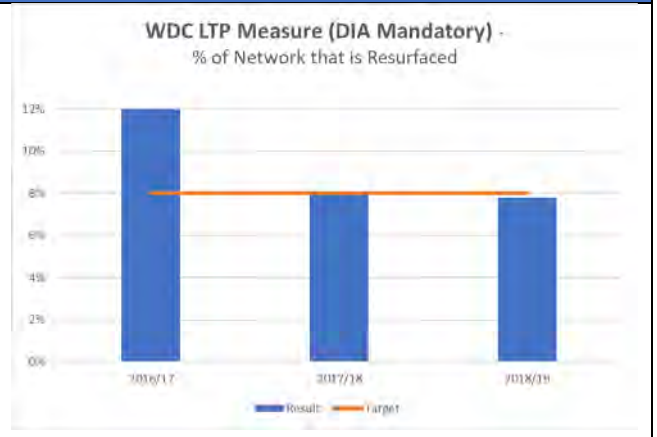
NZTA Peer Group Charts – 3yr Cost/km WC 214 - Sealed Road Pavement Rehabilitation

FNDC	KDC	WDC
		
		
FNDC Sealed Road Pavement Rehabilitation Cost – FNDC's sealed road rehabilitation cost is the second highest in its peer group. As described previously, FNDC has been carrying a high rate of rehabilitations. This has mainly been due to early failure of "cheap" seal extensions built in the late 1990's, unstable surfacings through high historic sealing rates and poor optimisation of the programme. The rehabilitation programme is now optimised through dTIMs, field validation and a RAPT type process and should see these costs drop to more sustainable levels over time.	**KDC Sealed Road Pavement Rehabilitation Cost** – The KDC sealed road rehabilitation cost is near the average of their peer group. This data includes a spike of rehabilitations that were undertaken in 2016/17 as part of the recovery from the Kaipara rates strike and this is distorting this result. KDC has been carrying out approximately 2km of rehabilitation per annum for the last 2 years based on dTIMs, field validation and RAPT type process. This should continue into the future and will see KDC's rehabilitation cost drop to about the peer group average.	**WDC Sealed Road Pavement Rehabilitation Cost** – WDC has the third highest sealed road rehabilitation cost in their peer group. This is due to a higher rate of rehabilitations being undertaken in the 2015/18 period to recover from historic underinvestment in renewals. WDC has also been targeting expensive urban rehabilitations using structural AC in Whangarei City to improve the poor condition of the urban network. The rehabilitation costs have been reducing over the last 3 years and are expected to reach a sustainable level of about 6km/year based on dTIMs, field validation and RAPT type process.
NORTHLAND - It should be recognised that Northland has poor clayey subsoils, subtropical climate (high rainfall), significant forestry demands on its local road network and lack of access to good quality pavement materials leading to long cartage distances. For these reasons, it is likely that the sealed road pavement rehabilitation costs for FNDC, KDC and WDC will always be in the upper half or third of the peer group.		

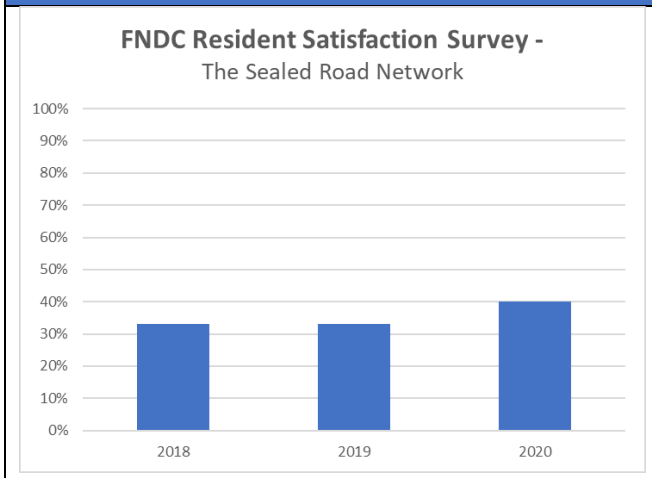
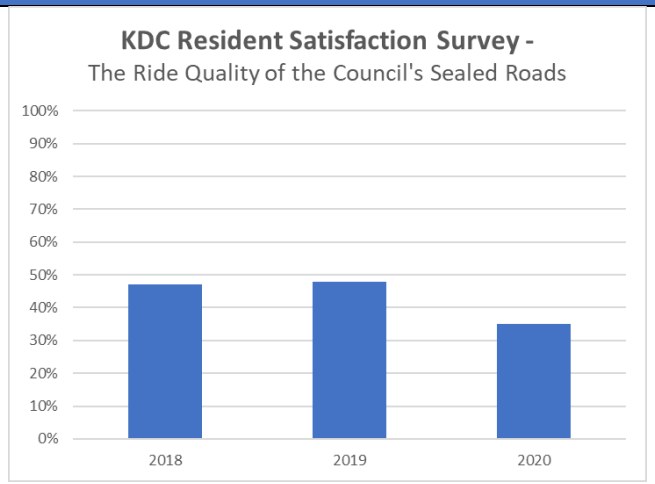
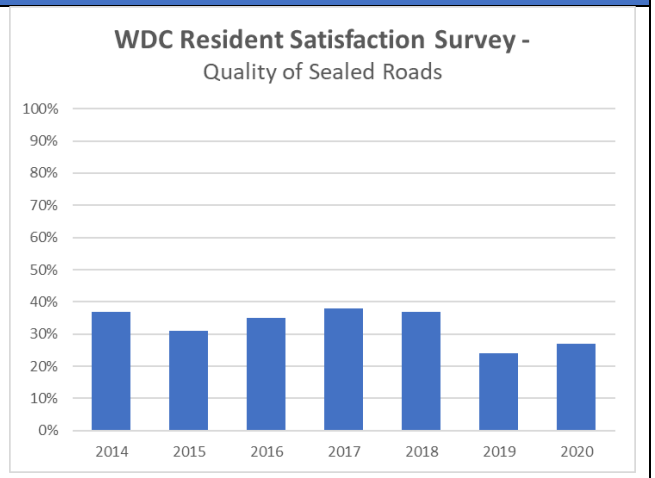
LTP Measure – Average Ride Quality of the Sealed Road Network, Measured by Smooth Travel Exposure (DIA)

FNDC	KDC	WDC
		
		
FNDC Sealed Road Ride Quality (STE) – FNDC's sealed road ride quality as measured by Smooth Travel Exposure (STE) is higher than their target of 87%. On face value, this would indicate that FNDC's roads are being kept in a smooth condition. However, as shown in the ONRC Amenity CO1 data, the Smooth Travel Exposure is less than the peer group for most road classes which indicates that further work is required to address roughness on the network. This also indicates that the FNDC STE target of 87% is probably set too low and should be increased to closer to the peer group average.	**KDC Sealed Road Ride Quality (STE)** – KDC's sealed road ride quality as measured by Smooth Travel Exposure (STE) is higher than their target of 90%. As for FNDC, on face value this would appear to be a good result. However, as shown in the ONRC Amenity CO1 data, the Smooth Travel Exposure is less than the peer group for all road classes which indicates that further work is required to address roughness on the network. This also indicates that the KDC STE target of 90% is probably too low and should be increased to closer to the peer group average.	**WDC Sealed Road Ride Quality (STE)** – KDC's sealed road ride quality as measured by Smooth Travel Exposure (STE) is lower than their target of 87%. This is primarily due to the condition of the urban road network. As shown in the ONRC Amenity CO1 data, the Smooth Travel Exposure is also less than the peer group for all road classes. This indicates that there is still a need to continue to address roughness on the network, particularly in the urban area.

LTP Measure – Percentage of the Sealed Road Network that is Resurfaced (DIA)

FNDC	KDC	WDC
		
		
FNDC Percentage of Network Resurfaced – FNDC's rate of resurfacing has reduced significantly from near the target of 9% to just over 4% in the 2018/19 period. This reduction is likely to be due to better optimisation of the resurfacing programme through the use of dTIMs and greater focus on urban thin AC replacement. As has been noted, the target of 9% is too high. The long term goal is to target a 12-13 reseal cycle which would equate to about an 8% reseal rate. The focus going forward will be on trying to get on top of a backlog of TAC reseals on urban arterials.	**KDC Percentage of Network Resurfaced** – The KDC sealed road reseal rate has been higher than the target of 6.7% for the past two years. This is mainly due to KDC trying to get on top of a historic backlog of first coat seals requiring a second coat. Based on dTIMs modelling, the optimal long term reseal cycle should be about 12-13 years which equates to about an 8% reseal rate.	**WDC Percentage of Network Resurfaced** – WDC's reseal rate has dropped from about 12% in 2016/17 to near the target of 8% for the past two years. As mentioned earlier, in 2020/21 there will be an increase while WDC try to get on top of its legacy of old void fill seals. The reseal rate should then decrease to a sustainable reseal cycle of 12-13 years which equates to about an 8% reseal rate.

Resident Satisfaction Survey – Satisfaction with Sealed Roads

FNDC	KDC	WDC
		
		
FNDC Satisfaction with Sealed Roads – The percentage of residents who are satisfied with FNDC's sealed road network is about 40% and this has increased over the last year. However, this satisfaction rate is still much lower than most other council services and is considered to be a poor result. This may be due in part to the new maintenance regimes being implemented through the new maintenance contracts. It is also likely to reflect the dry drought conditions for most of summer 2020 which would have reduced the number of defects on the network.	**KDC Satisfaction with Sealed Roads** – The KDC satisfaction scores are based on people who scored 6 or more out of 10 for satisfaction (10 being the highest), whereas the other two councils counted scores of 7 or more as being satisfied. This means that the KDC results should in general be slightly higher than the other councils. The KDC satisfaction rate for their sealed roads is at about 35% which is much lower than the previous two years. This satisfaction rate is also much lower than most other council services and is a poor result. It is also lower than would be expected due to the dry summer drought conditions experienced in 2020. This low rate is likely to be due to the condition of the network which has increasing levels of roughness.	**WDC Satisfaction with Sealed Roads** – The percentage satisfied with WDC's sealed roads is currently 27% which is lower than the average of about 35% over the past 7 years. This satisfaction rate is also much lower than most other council services and is a poor result. This is likely to be due to WDC doing less reseal and rehabilitation of its sealed roads over the past two years, when compared to the 2015/18 period. This is resulting in more defects on the network and increasing roughness.

SUMMARY

FNDC	KDC	WDC
Roughness and Smooth Travel Exposure – The FNDC network is generally rougher and has less smooth travel exposure than its peer group particularly for the Access and Low Volume roads. **Wet Road Crashes** – There is very little wet road crash history for the FNDC network, but there could be a decreasing trend in rural Access road crashes. **Seal Life Achieved** – FNDC is generally achieving less life for its chip seals and asphalt than its peer group, although there is an improving trend for its chip seals. FNDC has a backlog of old asphalt surfacings which are overdue for replacement. **Sealing and Rehabilitation Rates** – FNDC has a high reseal rate and the second highest rehabilitation rate in its peer group. The reseal rate is likely to stabilise at about 8%/annum and the rehabilitation rate is likely to trend down due to the use of dTIMS and RAPT type process. **Sealed Road Costs** – FNDC has the second highest sealed resurfacing and rehabilitation costs in its peer group. The amount of reseals was being driven by a council KPI target that was too high. The high rehabilitation cost has been caused by failure of old "cheap" seal extensions and pavements with unstable seal layers. **Resident Satisfaction** – The satisfaction with FNDC's sealed roads is 40% which is considered low, but this has increased from their score for the previous two years.	**Roughness and Smooth Travel Exposure** – The KDC network is rougher and has less smooth travel exposure than its peer group particularly for the Access and Low Volume road and on its urban road network. **Wet Road Crashes** - There is very little wet road crash history for the KDC network, but there could be an increasing trend in rural Secondary Collector road crashes. **Seal Life Achieved** – KDC is generally achieving less life for its chip seals than its peer group, and the trend is improving for some road classes but worse for others. KDC is achieving about the peer group average overall for its asphalt surfacing. KDC is currently addressing a backlog of old first coat seals. **Sealing and Rehabilitation Rates** – KDC has a low reseal rate and low/average rehabilitation rate in its peer group. The reseal rate is likely to increase to about 8%/annum which is considered sustainable. **Sealed Road Costs** – KDC has the second highest sealed maintenance and highest resurfacing costs in its peer group. This is likely to be due to a recent focus on getting on top of a backlog of overdue first cost seals. It's rehabilitation cost is near the peer group average. **Resident Satisfaction** – The satisfaction with KDC's sealed roads is 35% which is considered low and is much lower than the previous two years of between 45-50%.	**Roughness and Smooth Travel Exposure** – The WDC network is rougher and has less smooth travel exposure than its peer group particularly on its urban road network due to uneven service covers.. **Wet Road Crashes** - There is very little wet road crash history for the WDC network, but there could be an increasing trend in rural Secondary Collector road crashes and a decreasing trend of Arterial road crashes. **Seal Life Achieved** – WDC is generally achieving the same life for its chip seals and asphalt than its peer group, and the trend for chips seals is stable or improving. WDC is currently addressing a backlog of old void fills and old asphaltic surfacing. **Sealing and Rehabilitation Rates** – WDC has the highest reseal rate in its peer group and the rehabilitation rate is in the top third of its peer group. The sealing rate is likely to drop to 8%/annum and rehabilitation rate stabilise at 0.6%/annum. **Sealed Road Costs** – WDC has the second highest resurfacing costs in its peer group. This is due to catching up on a backlog of old void fill seals. It has the third highest rehabilitation cost in its peer group due to a focus on expensive urban arterials. **Resident Satisfaction** – The satisfaction with WDC's sealed roads is 27% which is considered very low and this has dropped down from 35% over the past two years.

6.4.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for sealed pavements:

Option	Description
Option 1 - Optimise Rehabs and Reseals	Consider lowering amount of rehabilitation and or reseal as justified through dTIMS and field validation. Change FNDC LTP Performance Measure for reseals to match the optimal programme.
Option 2 - Skid resistance risk assessments and appropriate surfacings	Carry out targeted assessment of skid resistance on at risk curves on HRRR routes. Complete the risk assessment of high risk curves for skid resistance issues and apply appropriate surfacing treatments.
Option 3 - Implement MIS with training	Develop and Implement Sealed Road Maintenance Intervention Strategy (MIS). Provide adequate training to maintenance staff and contractors to ensure MIS implementation.
Option 4 - Respread costs appropriately	Implement process and training to standardise charging across the NTA. Respread FNDC and KDC fixed maintenance costs and charge their in-house maintenance costs to WC 151.
Option 5 - Subdivisions and unsubsidised sea extensions to include Second coat seals	Change council policies to require developers to fund second coat seals of development roads before vesting to Council. Also apply same policy to unsubsidised seal extensions.
Option 6 - Alternative designs for urban rehabilitations	Investigate alternative designs for urban rehabilitations to reduce use of expensive SAC where possible.
Option 7 - Alternative quarry sources and/or ownership models	Investigate new quarry sources to reduce cartage. Also investigate ownership arrangements of existing quarries

6.4.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Sealed Roads	**Sealed Roads** - Larger renewal programmes to address historic backlogs, expensive urban rehabilitations in Whangarei and inappropriate allocation of in-house costs and maintenance contract fixed costs in Kaipara and Far North are resulting in our sealed roads having some of the highest costs per kilometre in our peer group.	**Programme Adjustment** • Reduce programme – particularly rehabilitations **Funding Adjustment** • Charge in-house costs and maintenance contract fixed costs appropriately	**Programme Adjustment** **Risk – Hold Assets Longer & LOS Adjustment** • Option 1 - Optimise Rehabilitations and Reseals **Route Management** • Option 2- Skid resistance risk assessments and appropriate surfacings **Improve Systems and Capability** • Option 3 - Implement MIS with training **Managing Demand** • Option 5 - Subdivisions and unsubsidised seal extensions to include Second coat seals **Alternative Approaches – Different Solutions/Technologies** • Option 6 - Alternative designs for urban rehabilitations **Funding Adjustment** **Blending Work Categories Differently** • Option 4 - Respread costs appropriately. **Supply Chain Improvements** • Option 7 - Alternative quarry sources and/or ownership models	1 2 3 5 6 4 7	1.3 0.8 0.8 0.6 0.45 0.5 0.6	**Yes** **Yes** **Yes** **Yes** **Yes** **Yes** No

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Optimise Rehabilitations and Reseals
- Option 2- Skid resistance risk assessments and appropriate surfacings
- Option 3 - Implement MIS with training
- Option 4 - Respread costs appropriately.
- Option 5 - Subdivisions and unsubsidised seal extensions to include Second coat seals
- Option 6 - Alternative designs for urban rehabilitations

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Sealed Roads (WC 111, 212, 214)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments	Yes	1	Change FNDC LTP Performance Measure for reseals (in conjunction with Option 1)
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently	Yes	4	Implement process and training to standardise charging across the NTA. Respread FNDC and KDC fixed maintenance costs and charge their in-house maintenance costs to WC 151.
❑ **Risk** - Hold Assets longer	Yes	1	Consider lowering amount of rehab and or reseal as justified through dTIMS and field validation
❑ Managing **demand**	Yes	5	Change council policies to require developers to fund second coat seals of development roads before vesting to Council. Also apply same policy to unsubsidised seal extensions.
❑ **Route** Management	Yes	2	Carry out targeted assessment of skid resistance on at risk curves on HRRR routes. Complete the risk assessment of high risk curves for skid resistance issues and apply appropriate surfacing treatments.
❑ Alternative approaches – different **solutions/technology**	Yes	6	Investigate alternative designs for urban rehabs to reduce use of expensive SAC where possible
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements	Yes	7	Investigate new quarry sources to reduce cartage. Also investigate ownership arrangements of existing quarries
❑ Improve **systems and capability**	Yes	3	Develop and Implement Sealed Road Maintenance Intervention Strategy (MIS). Provide adequate training to maintenance staff and contractors to ensure MIS implementation.

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Optimise Rehabs and Reseals		Option 2 - Skid resistance risk assessments and appropriate surfacings		Option 3 - Implement MIS with training		Option 4 - Respread costs appropriately		Option 5 - Subdivisions and unsubsidised sea ext to incl Second coat seals		Option 6 - Alternative designs for urban rehabs		Option 7 - Alternative quarry sources and/or ownership models	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	2	0.2	1	0.1	0	0	0	0	-1	-0.1	0	0
Problem solving effectiveness	10%	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1	2	0.2	1	0.1
Benefits realised	10%	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1
Good Environmental impacts	5%	0	0	0	0	0	0	0	0	0	0	-1	-0.05	2	0.1
Value for Money	10%	3	0.3	2	0.2	2	0.2	1	0.1	1	0.1	2	0.2	0	0
Closing Customer and Technical LoS gaps and impacts	10%	0	0	2	0.2	0	0	0	0	0	0	0	0	0	0
Closing ONRC Performance gaps	10%	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0	-1	-0.1	0	0
Total Cost of Ownership (whole of life Costs)	10%	2	0.2	-1	-0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1
Life Cycle Management	10%	1	0.1	0	0	1	0.1	0	0	1	0.1	0	0	1	0.1
COVID-19 Recovery	5%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
etc.			0		0		0		0		0		0		0
Totals	**100%**		**1.3**		**0.8**		**0.8**		**0.5**		**0.6**		**0.45**		**0.6**

6.4.6 Financial Impact

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

6.4.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
111	Sealed Pavement Maintenance	+$250,000/yr due to higher contract management costs and LS costs (eg pothole patching) through new maintenance contracts	+$250,000/yr
212	Sealed Road Resurfacing	+$1,400,000/yr to fund a new programme of TAC resurfacing to address an urgent backlog of urban arterial TAC surfaces.	+$1,400,000/yr
214	Sealed Road Pavement Rehabilitation	+$300,000/yr to achieve a rehabilitation programme of 6.4km/year or 0.7% of the network per annum.	+$300,000/yr
113	Routine Drainage Maintenance	+$300,000/yr to fund additional drainage maintenance as identified in the NTA Drainage Strategy.	+$300,000/yr

6.4.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
111	Sealed Pavement Maintenance	+$230,000/yr due to increased contract management costs and LS costs (eg pothole patching) through new maintenance contracts	+$230,000/yr
212	Sealed Road Resurfacing	-$180,000/yr due to reduction from transfer of contract management costs to the Maintenance and Operations work categories.	-$180,000/yr
214	Sealed Road Pavement Rehabilitation	+$400,000/yr to achieve a rehabilitation programme of 3.6km/year or 0.8% of the network per annum.	No change
113	Routine Drainage Maintenance	+$250,000/yr to fund additional drainage maintenance as identified in the NTA Drainage Strategy.	+$250,000/yr
	Unsubsidised	+$500,000 to carry out second coat seals of the PGF funded Pouto Road seal extensions	+$500,000

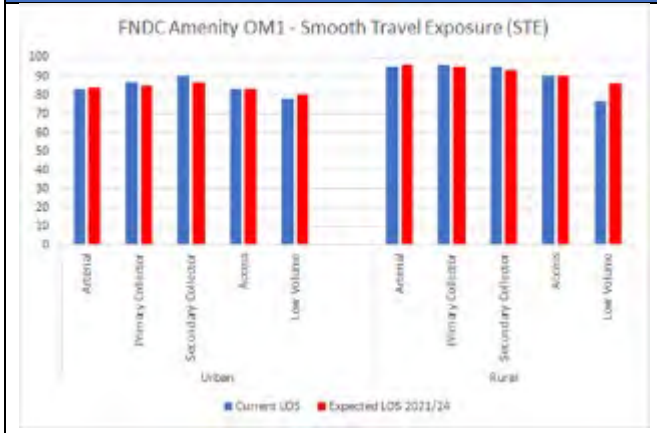
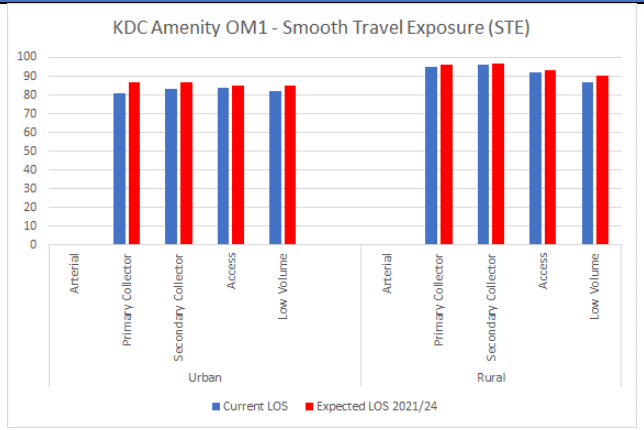
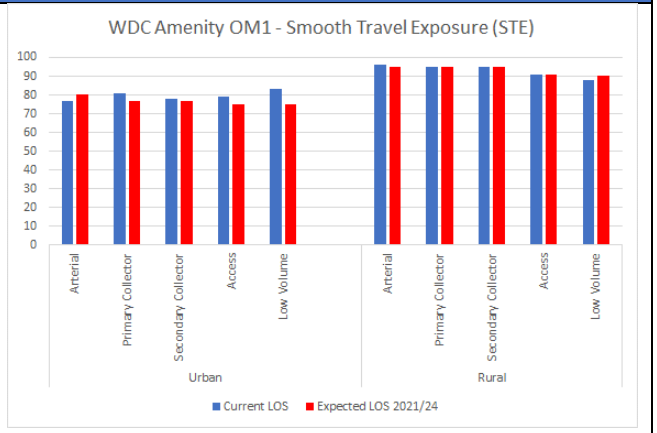
6.4.6.3 Whangarei District Council

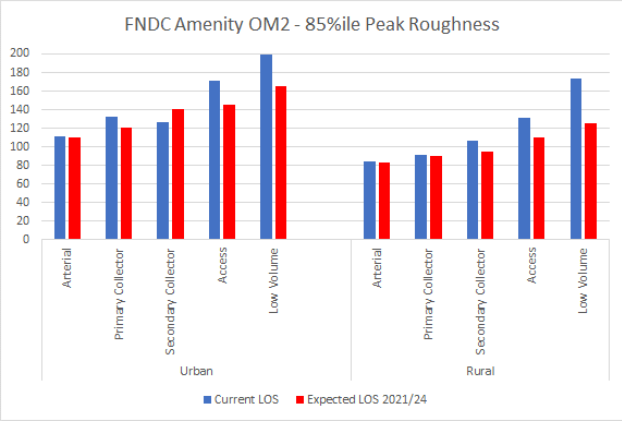
W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
111	Sealed Pavement Maintenance	+$200,000/yr due to increased contract management costs and LS costs (eg pothole patching) through new maintenance contracts	-$250,000/yr
212	Sealed Road Resurfacing	+$200,000/yr due to increased contract rates for chip resurfacing +$250,000/yr for an increase in the TAC programme to target poor condition sections or urban arterials	+$350,000/yr

		-$100,000/yr reduction in high skid resistance (SCRIM) seals or watercutting due to wet road loss of control crashes static or declining in Whangarei	
214	Sealed Road Pavement Rehabilitation	-$140,000/yr due to lower rural road rehab rates through new maintenance contracts. Targeting 5.3km/yr or 0.5% of the network per annum.	-$140,000/yr
113	Routine Drainage Maintenance	+$100,000/yr to carry out additional watertable maintenance as identified in the NTA Drainage Strategy.	+$100,000/yr

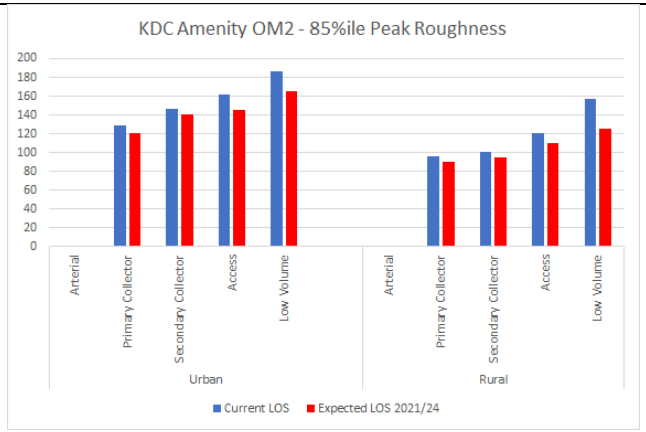
6.4.7 Level of Service Impact

The following table shows the expected Level of Service impact of the options selected:

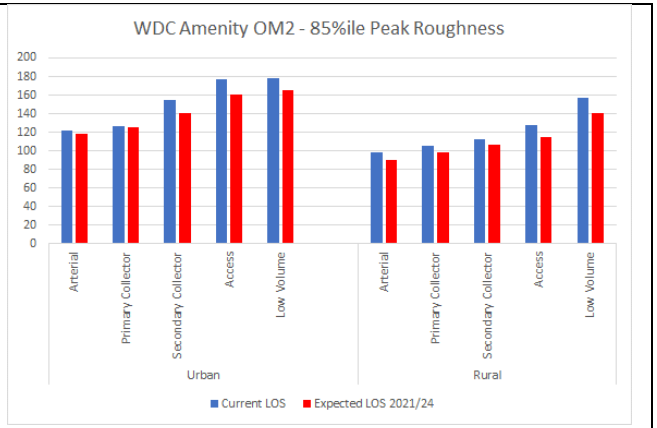
FNDC	KDC	WDC
		
AMENITY – We expect smooth travel exposure to stay largely static for most FNDC roads, except for Low Volume roads which is likely to improve. This improvement on Low Volume roads will be achieved by addressing high peak roughness on this network. The focus is on keeping high speed rural roads smooth.	**AMENITY** – We expect smooth travel exposure to improve for KDC roads, across all road classes. This gain will be achieved by addressing high peak roughness on this network, with a particular focus on keeping high speed rural roads smooth.	**AMENITY** – We expect smooth travel exposure to stay largely static for most WDC rural roads, and a decrease for most urban roads apart from urban Arterials. This reflects a continuing focus on renewing urban Arterials and keeping high speed rural roads smooth.



AMENITY – We expect a decrease in peak roughness for FNDC on both urban and rural roads, particularly on the Access and Low Volume network which is much worse than the peer group average. This is due to better targeting of the highest roughness areas when undertaking maintenance and renewals activities, and TAC renewals in urban areas.



AMENITY – Expect a decrease in peak roughness for KDC on both urban and rural roads, for all road classes. This is due to better targeting of the highest roughness areas when undertaking maintenance and renewal activities.



AMENITY – We expect a decrease in peak roughness for WDC on both urban and rural roads, across all road classes. This is due to better targeting of the highest roughness areas when undertaking maintenance and renewal activities, continued focus on TAC in urban areas and the smoothing of uneven service covers.

These expected gains in level of service will improve customer ride comfort and safety on our network.

6.4.8 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Investigate alternative seal designs such as: Emulsion seals to reduce the health and safety risk to workers; Fibredek-type seals to extend the life of cracked surfaces; the use of plastic in asphalt mix design; and seal rejuvenation techniques to extend the seal life.

6.5 Unsealed Roads

Work Categories: **112 Unsealed Pavement Maintenance, 211 Unsealed Road Metalling & 325 Seal Extension (Associated activities: 113 Routine Drainage Maintenance & 213 Drainage Renewals)**

6.5.1 Links to Strategic Case

Problem Statement: **Unsealed Roads** - Use of out of specification GAP aggregates on our unsealed roads is resulting in:

- adverse health impacts to residents due to dust
- high levels of community dissatisfaction due to poor road condition and
- high maintenance costs.

Benefits of Addressing Problem: A fit for purpose Level of Service for our unsealed roads that improves customer satisfaction, while optimising the long-term maintenance costs. Road dust on unsealed freight routes will be controlled to minimise health impacts to residents.

Consequences of Not Addressing the Problem: Our customers will continue to be dissatisfied with our condition and maintenance practices on unsealed roads, with continued dust issues on heavy vehicle routes and ongoing high maintenance costs.

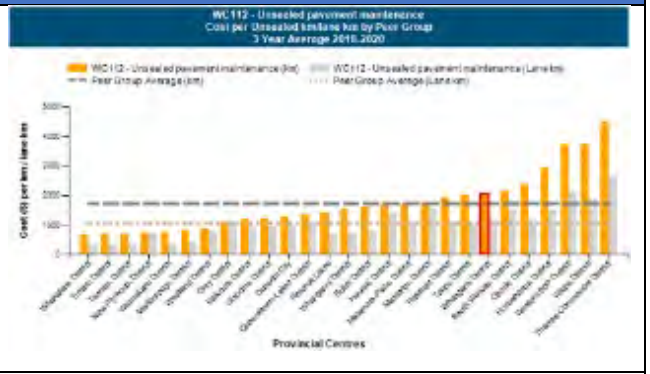
6.5.2 Levels of Service

ONRC Customer Outcomes: None

Customer Levels of Service: **ONRC Safety TO7 –** Hazardous faults (NO DATA AVAILABLE)
ONRC Cost Efficiency 4 – Unsealed road metalling (NO DATA AVAILABLE)
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.1.7 – Average quality of ride on the unsealed local network (Current measure)
Dust Risk – Dwellings exposed to Medium dust risk (as determined by NZTA General Circular 16/04) (Current measure)

6.5.3 Evidence and Gap Analysis

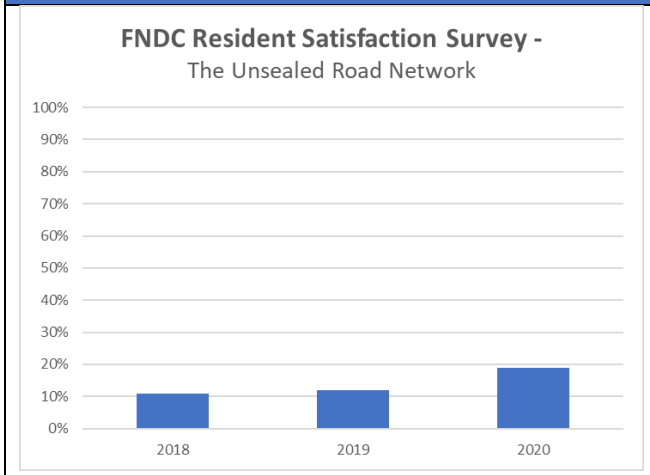
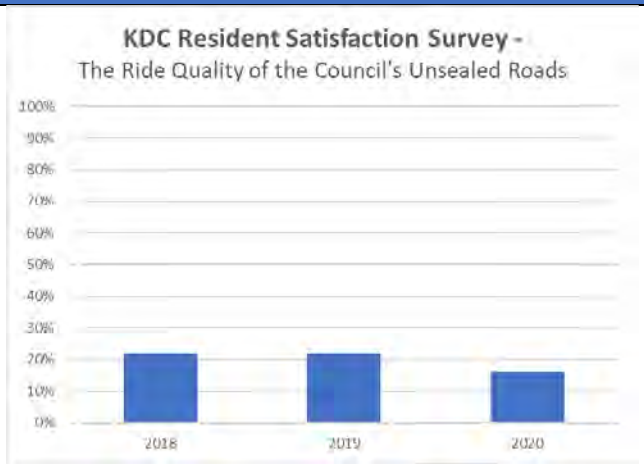
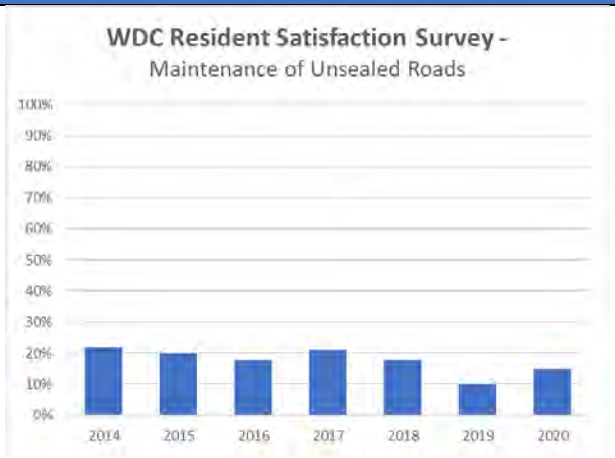
NZTA Peer Group Charts – 3yr Cost/km WC 112 - Unsealed Pavement Maintenance

FNDC	KDC	WDC
		
		
FNDC Unsealed Pavement Maintenance Cost – FNDC's unsealed pavement maintenance cost is in the top third of its peer group. The high maintenance cost is primarily due to the use of out-of-specification granular pavement materials which are prone to corrugations and potholing. There is also a lack of metal depth and poor watertables which requires spot metaling and digout repairs. An increase in unsealed maintenance was undertaken in 2017/18 through the NZTA funded forestry road strengthening programme.	**KDC Unsealed Pavement Maintenance Cost** – KDC has the third highest unsealed pavement maintenance costs in their peer group. As for FNDC, the high maintenance cost for KDC is due to the use of out-of-specification granular pavement materials which are prone to corrugations and potholing. There is also a lack of metal depth and poor watertables which requires spot metaling and digout repairs.	**WDC Unsealed Pavement Maintenance Cost** – The WDC unsealed pavement maintenance cost is near the average for their peer group. The WDC has underinvested in its unsealed road network for many years and is starting to address this issue over the past two years with additional heavy metalling. This under investment has resulted in lack of metal depth, which is driving up maintenance costs. As for the other councils, Whangarei also suffers from the use of out-of-specification granular materials and poor watertables.
NORTHLAND - It should be recognised that Northland has poor clayey subsoils, subtropical climate (high rainfall), significant forestry demands on its local road network and lack of access to good quality pavement materials leading to long cartage distances. For these reasons, it is likely that the unsealed pavement maintenance costs for FNDC, KDC and WDC will always be in the upper half or third of the peer group.		

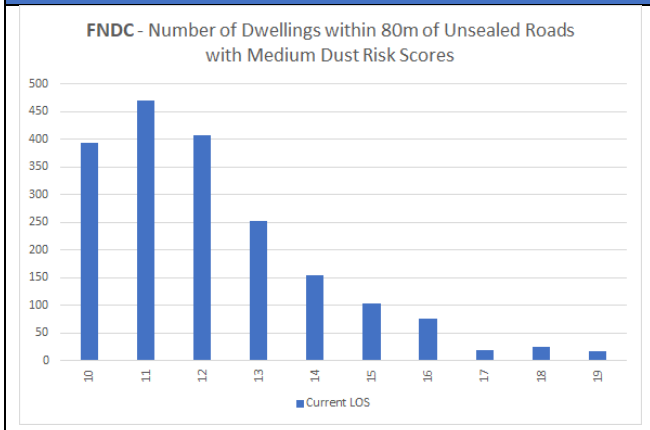
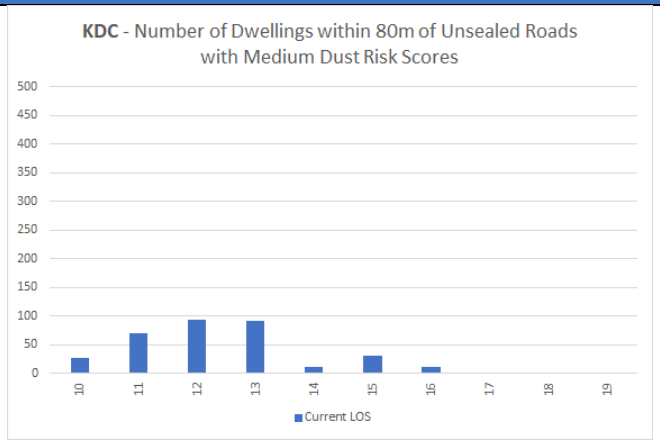
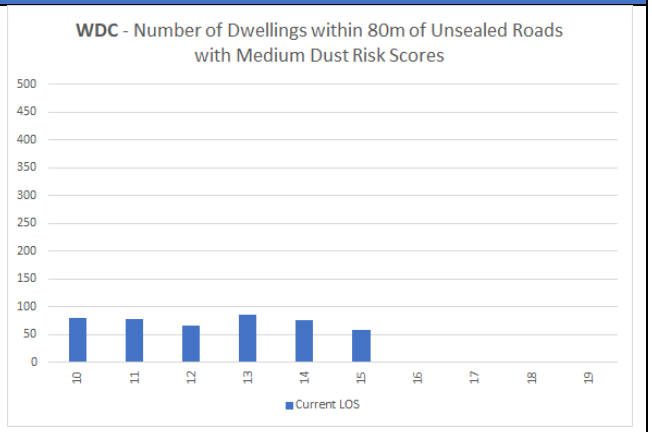
NZTA Peer Group Charts – 3yr Cost/km WC 211 - Unsealed Road Metalling

FNDC	KDC	WDC
		
		
FNDC Unsealed Road Metalling Cost – FNDC's unsealed road metalling cost is the highest in its peer group. This was partially caused by a spike in heavy metalling undertaken in 2017/18 as part of the NZTA funded Forestry Road Strengthening programme. As described above, the high cost is due to the use of out-of-specification granular materials which unravel more readily and result in significant levels of gravel loss requiring higher levels of metalling. There will be a transition to Paige-Green compliant materials and wearing courses which should reduce the overall costs of maintaining the unsealed road network.	**KDC Unsealed Road Metalling Cost** – KDC has the third highest unsealed road metalling cost in their peer group. This was partially caused by a spike in unsealed maintenance undertaken in 2017/18 as part of the recovery from the Kaipara rates strike. As for FNDC, the high cost is due to the use of out-of-specification granular materials which unravel more readily and result in significant levels of gravel loss requiring higher levels of metalling. There will be a transition to Paige-Green compliant materials and wearing courses which should reduce the overall costs of maintaining the unsealed road network.	**WDC Unsealed Road Metalling Cost** – WDC's unsealed road metalling cost is in the top third of their peer group. This reflects a higher spend in the past two years on heavy metalling to try and recover from historic underinvestment in the unsealed road network. As for the other councils, this cost is due to the use of out-of-specification granular materials which unravel more readily and result in significant levels of gravel loss requiring higher levels of metalling. There will be a transition to Paige-Green compliant materials and wearing courses which should reduce the overall costs of maintaining the unsealed road network.
NORTHLAND - It should be recognised that Northland has poor clayey subsoils, subtropical climate (high rainfall), significant forestry demands on its local road network and lack of access to good quality pavement materials leading to long cartage distances. For these reasons, it is likely that the unsealed road metalling costs for FNDC, KDC and WDC will always be in the upper half or third of the peer group.		

Resident Satisfaction Survey – Unsealed Roads

FNDC	KDC	WDC
		
FNDC Satisfaction with Unsealed Roads – The satisfaction with FNDC's unsealed roads is currently 19% and this is higher than the previous two years. However, this is very low compared to the satisfaction of other council services and is a very poor result. This indicates the high level of dissatisfaction with the unsealed road network due to poor condition (potholes, corrugations etc) and dust. With the proposed transition to Paige-Green compliant materials and wearing courses, this should result in an improvement in the satisfaction with unsealed roads through improved condition, less maintenance needs and reduced dust.	**KDC Satisfaction with Unsealed Roads** – The satisfaction with KDC's unsealed roads is currently 16% and this is lower than the previous two years. This result is very low compared to the satisfaction of other council services and is a very poor result. The decrease in result in 2020 is interesting given that KDC has been using blended materials to improve the condition of its unsealed roads. As for FNDC, this indicates the high level of dissatisfaction with the unsealed road network due to poor condition (potholes, corrugations etc) and dust. With the proposed transition to Paige-Green compliant materials and wearing courses, this should result in an improvement in the satisfaction with unsealed roads through improved condition, less maintenance needs and reduced dust.	**WDC Satisfaction with Unsealed Roads** – The satisfaction with WDC's unsealed roads is currently 15% and this has been trending down for a number of years. This is very low compared to the satisfaction of other council services and is a very poor result. As for the other councils, this indicates the high level of dissatisfaction with the unsealed road network due to poor condition (potholes, corrugations etc) and dust. With the proposed transition to Paige-Green compliant materials and wearing courses, this should result in an improvement in the satisfaction with unsealed roads through improved condition, less maintenance needs and reduced dust.

Dust Risk – NZTA General Circular 16/04 Dust Matrix Scores

FNDC	KDC	WDC
		
		
FNDC Dust Risk – Far North has 1,918 dwellings exposed to a medium dust risk (score of 10 or more on the General Circular 16/04 matrix). This is substantially more exposure than for the other two councils. Many of these dwellings are on forestry or other freight routes. This indicates that there is likely to be a substantial exposure to health effects of PM_{10} dust to people living on these routes. Because of this high exposure to dust, there is substantial public pressure to address this issue. As a result, FNDC has been applying a significant amount of unsubsidised dust suppression and is also carry out seal extensions. The proposed transition to Paige-Green wearing courses, this should result a reduction to exposure to dust by providing a more tightly bound surface.	**KDC Dust Risk** – Kaipara has 334 dwellings exposed to a medium dust risk (score of 10 or more on the General Circular 16/04 matrix). Most of these dwellings are on forestry or other freight routes. This indicates that there is likely to be an exposure to health effects of PM_{10} dust to people living on these routes. Over the past 3-4 years, KDC has been trialling Paige-Green complaint wearing courses, and this is showing a reduction on dust generation on roads with this treatment. This has been accelerated by the PGF investment in Kaipara's unsealed road network. It is proposed to continue the roll-out of Paige-Green wearing courses, and this should result in a further reduction to exposure across the network.	**WDC Dust Risk** – Whangarei has 441 dwellings exposed to a medium dust risk (score of 10 or more on the General Circular 16/04 matrix). Approximately half of these dwellings are on forestry routes. This indicates that there is likely to be an exposure to health effects of PM_{10} dust to people living on these routes. Because of this exposure to dust, there has been public pressure to address this issue. As a result, WDC has been applying a dust suppression on forestry routes and is also carry out seal extensions on high risk routes. The proposed transition to Paige-Green wearing courses, this should result a reduction to exposure to dust by providing a more tightly bound surface.

SUMMARY

FNDC	KDC	WDC
FNDC Summary - The cost to maintain Far North's unsealed roads is high and they have the highest heavy metalling cost in their peer group. This is a reflection of the significant amount of FNDC's unsealed network which is subject to heavy vehicle traffic, and in particular logging trucks. The resident satisfaction with the unsealed road network is low due which is likely to be due to variable conditions (potholes and corrugations), that are subject to substantial change due to weather effects. There are also over 1,900 dwellings located on roads with a medium dust risk. This is a significant number of residents exposed to dust risk and is driving pressure from the public for dust suppression and seal extensions. This indicates that further effort is required to improve the unsealed road network.	**KDC Summary** – The cost to maintain Kaipara's unsealed roads is the third highest in their peer group. This is likely to be due to their investment in more expensive Paige-Green complaint wearing courses over the past 3-4 years. This investment is likely to result in less maintenance being required due to having a tightly bound surface and should see the maintenance costs decrease over time. The resident satisfaction with the unsealed road network is low but is expected to increase with the continued roll-out of Paige-Green complaint wearing courses. There are also over 300 dwellings located on roads with a medium dust risk. This indicates that continuing the wearing course roll-out will also help reduce dust effects to local residents.	**WDC Summary** - The cost to maintain Whangarei's unsealed roads is just above the peer group average, which seems low given Whangarei's poor subgrade conditions, freight demands and dust issues. The resident satisfaction with the unsealed road network is low due which is likely to be due to variable conditions (potholes and corrugations), that are subject to substantial change due to weather effects. There are also over 400 dwellings located on roads with a medium dust risk. This indicates that further effort is required to improve the unsealed road network.

6.5.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for unsealed pavements:

Option	Description
Option 1 - Complete the Centre of Excellence, FWP and MIS	Complete the unsealed Centre of Excellence road strategy, develop an unsealed road Forward Works Programme and Maintenance Intervention Strategy.
Option 2 - Enforce Paige-Green compliant materials with training	Enforce the new maintenance contract specifications to provide Paige-Green compliant wearing courses. Back this up with adequate training for contractor and NTA staff. Determine sources and blends to provide Paige-Green compliant material.

Option	Description
Option 3 - Improve grading with operator training and pro-active operations based on condition	Provide training to grader operators and maintenance staff. Enforce the new maintenance contract grading specification. Develop methods to gather and analyse condition data on unsealed roads. Carry out a proactive programme of grading based on condition data
Option 4 - Provide sufficient pavement thickness based on the FWP	Provide sufficient metal depths on key routes, such as forestry and other freight routes, through the forward works programme. This should ensure that these routes have sufficient strength throughout the life of the pavement.
Option 5 - Educating the public on the appropriate level of service	Education campaigns to educate the public on the appropriate level of service being provided. This should help the public understand what the appropriate condition of their unsealed road should. This will help mitigate complaints and requests for maintenance.
Option 6 - Dust mitigation and control measures	Temporary speed limits for dusty HCV routes. Consider advocating for HCV skirts to reduce dust. Consider water storage in rural areas for dust suppression. Advocate for changing council house set back requirements on unsealed roads
Option 7 - House frontage sealing on dusty roads	Sealing of house frontages on roads with long term exposure to dust. This should only to be considered where dust or traffic warrants it.

6.5.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Unsealed Roads	**Unsealed Roads** - Use of out of specification GAP aggregates on our unsealed roads is resulting in: • adverse health impacts to residents due to dust • high levels of community dissatisfaction due to poor road condition and • high maintenance costs.	**Policy Approach** • Paige-Green compliant wearing courses and structural pavements. • Improved training of grader operators	**Policy Approach** **Improve Systems and Capability** • Option 1 - Complete the Centre of Excellence, FWP and MIS **Alternative Approaches – Different Solutions/Technologies** • Option 2 - Enforce Paige-Green compliant materials with training **Improve Systems and Capability, Using Assets Differently & Intervention Response Timing Change** • Option 3 - Improve grading with operator training and pro-active operations based on condition **Route Management** • Option 4 - Provide sufficient pavement thickness based on the FWP. **Managing Demand** • Option 5 - Educating the public on the appropriate level of service • Option 7 - House frontage sealing on dusty roads **Extended Temporary Management and Managing Demand** • Option 6 - Dust mitigation and control measures.	1 2 3 4 5 7 6	1.35 2.15 1.5 1.0 0.9 0.15 0.35	**Yes** **Yes** **Yes** **Yes** **Yes** No **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Complete the Centre of Excellence, FWP and MIS
- Option 2 - Enforce Paige-Green compliant materials with training
- Option 3 - Improve grading with operator training and pro-active operations based on condition
- Option 4 - Provide sufficient pavement thickness based on the FWP
- Option 5 - Educating the public on the appropriate level of service
- Option 6 - Dust mitigation and control measures – dust suppression only to be used where Paige-Green compliant materials are insufficient to control dust

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"Moving Northland Forward"

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Unsealed Roads (WC 112, 211)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change	Yes	3	Carry out a proactive programme of grading based on condition data
❑ **LoS** adjustments			
❑ Use existing assets **differently**	Yes	3	Enforce the new maintenance contract grading specification
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	A - 5 B - 7 C - 6	A - Educate the public on the level of service being provided. B - Sealing should only to be considered where dust or traffic warrants it. C - Advocate for changing council house set back requirements on unsealed roads
❑ **Route** Management	Yes	4	Provide sufficient metal depths on key routes through the FWP.
❑ Alternative approaches – different **solutions/technology**	Yes	2	Enforce the new maintenance contract specifications to provide Paige-Green compliant wearing courses. Back this up with adequate training for contractor and NTA staff. Determine sources and blends to provide Paige-Green compliant material
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management	Yes	A - 6 B - 6 C - 6	A - Temporary speed limits for dusty HCV routes. B - Consider advocating for HCV skirts to reduce dust. C - Consider water storage in rural areas for dust suppression
❑ **Supply chain** improvements			
❑ Improve **systems and capability**	Yes	A - 1 B - 3 C - 3	A - Complete the unsealed road strategy, FWP and MIS. B - Provide training to grader operators and maintenance staff. C - Develop methods to gather and analyse condition data on unsealed roads

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Complete the Centre of Excellence, FWP and MIS		Option 2 - Enforce Paige-Green compliant materials with training		Option 3 - Improve grading with operator training and pro-active operations based on condition		Option 4 - Provide sufficient pavement thickness based on the FWP		Option 5 - Educating the public on the appropriate level of service		Option 6 - Dust mitigation and control measures		Option 7 - House frontage sealing on dusty roads	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	2	0.2	2	0.2	2	0.2	2	0.2	1	0.1	3	0.3
Problem solving effectiveness	10%	2	0.2	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1
Benefits realised	10%	2	0.2	2	0.2	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1
Good Environmental impacts	5%	0	0	2	0.1	1	0.05	-1	-0.05	0	0	2	0.1	3	0.15
Value for Money	10%	3	0.3	3	0.3	3	0.3	1	0.1	2	0.2	-1	-0.1	-2	-0.2
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	2	0.2	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1
Closing ONRC Performance gaps	10%	1	0.1	2	0.2	1	0.1	0	0	1	0.1	0	0	-1	-0.1
Asset preservation and sustainability	10%	1	0.1	3	0.3	2	0.2	1	0.1	0	0	0	0	0	0
Total Cost of Ownership (whole of life Costs)	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	-1	-0.1	-2	-0.2
Life Cycle Management	10%	1	0.1	2	0.2	1	0.1	1	0.1	0	0	0	0	-1	-0.1
COVID-19 Recovery	5%	1	0.05	1	0.05	1	0.05	1	0.05	0	0	1	0.05	0	0
etc.			0		0		0		0		0		0		0
Totals	100%		1.35		2.15		1.5		1.0		0.9		0.35		0.15

6.5.6 Financial Impact

The following tables shows the financial impact for each council of the options selected and contract cost changes (note some of the costs have been rounded off):

6.5.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
112	Unsealed Pavement Maintenance	+$475,000/yr due to higher contract management costs and LS grading costs through new maintenance contracts +$640,000/yr for an increase in routine metalling costs using Paige-Green compliant materials +$200,000/yr for dust suppression of roads with a Dust Risk Score of 12 or more -$180,000/yr due to transfer of in-house staff costs to WC151	+$1,135,000/yr
211	Unsealed Road Metalling	+$2,500,000/yr to fund the roll-out of a programme of Paige-Green complaint wearing courses and metal strengthening on high risk routes.	+$2,500,000/yr
341	Low Cost Low Risk Improvements	$3,000,000 to continue the programme of dust sealing of unsealed roads that have long term heavy vehicle volumes resulting in health impacts of local residents due to dust (ie Dust Risk score of 15 or more on the General Circular 16/04 matrix) $3,000,000 for a new programme of traction seals to address unsealed roads that have high maintenance costs due to steep grades and geometry. $900,000 for a new programme of bridge approach seals to reduce maintenance costs and improve safety on the approaches to bridges on unsealed roads.	+$3,900,000
325	Seal Extension	None programmed – No change	No Change
	Unsubsidised	$6,320,000 to continue the programme of unsubsidised seal extensions on high demand routes $1,500,000 to continue the programme of unsubsidised dust suppression on dusty roads	+$1,320,000

6.5.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
112	Unsealed Pavement Maintenance	-$550,000/yr due to savings from the roll out of the Paige-Green compliant wearing courses which has been accelerated by the $8M investment from the PGF.	-$550,000/yr
211	Unsealed Road Metalling	+$1,200,000/yr to continue the roll-out of a programme of Paige-Green complaint wearing courses and metal strengthening on high risk routes.	+$1,200,000/yr
341	Low Cost/Low Risk Improvements	None programmed – No change	No Change

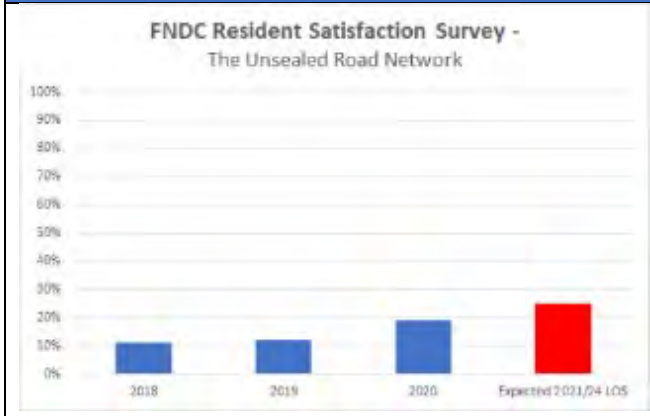
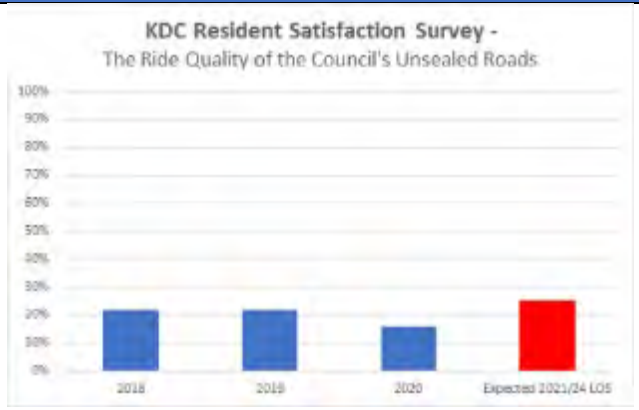
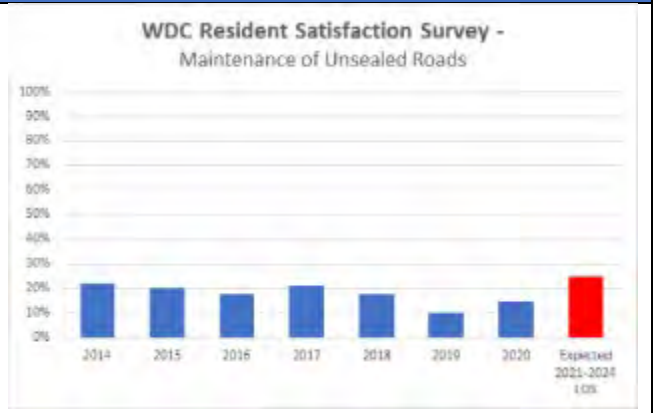
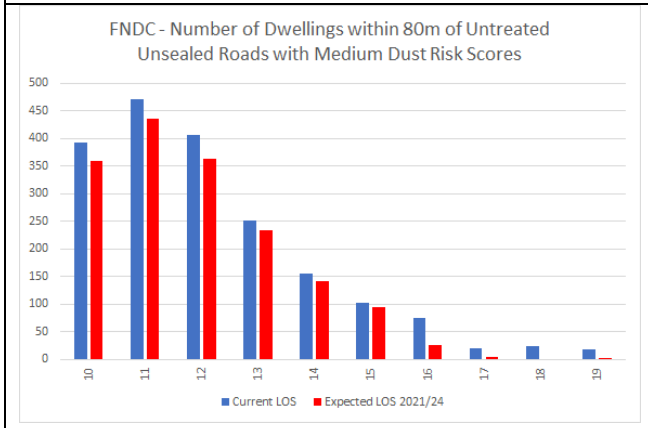
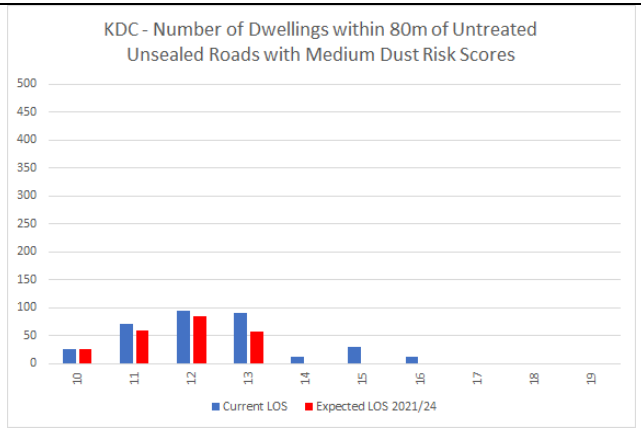
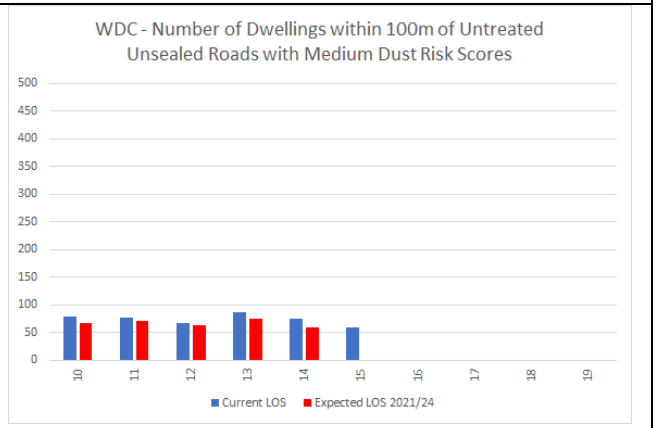
325	Seal Extension	None programmed – No change	No Change
	Unsubsidised	$4,003,000 (PGF funded) for the continuation of the unsealed road strengthening and improvement as part of the Kaipara Kick Start programme $6,000,000 (PGF funded) for the continuation of the Pouto Road Seal Extension (Stages 1 and 2) as part of the Kaipara Kick Start programme.	+$4,673,000

6.5.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
112	Unsealed Pavement Maintenance	No change	No Change
211	Unsealed Road Metalling	+$1,000,000/yr to continue the roll-out of a programme of Paige-Green complaint wearing courses and metal strengthening on high risk routes.	+$1,000,000/yr
341	Low Cost Low Risk Improvements	$970,000for a programme of bridge approach seals, traction seals and intersection safety seals.	-$1,030,000
325	Seal Extension	None programmed – No change	No Change
	Unsubsidised	$8,728,000 to continue the programme of unsubsidised seal extensions on high demand routes	+$6,678,000

6.5.7 Level of Service Impact

The following table shows the expected Level of Service impact of the options selected:

FNDC	KDC	WDC
		
RESIDENT SATISFACTION – We expect an increase in resident satisfaction to 25% during the 2021/24 period, because Council will be seen to be taking proactive treatment of the condition on the highest priority unsealed roads. The dust suppression programme and continuation of its seal extension programme will also improve satisfaction.	**RESIDENT SATISFACTION** – We expect an increase in resident satisfaction to 25% during the 2021/24 period, through proactive treatment of the condition of its highest priority unsealed roads which will also have a positive impact on dust effects.	**RESIDENT SATISFACTION** – We expect an increase in resident satisfaction to 25% during the 2021/24 period, through proactive treatment of the condition on the highest priority unsealed roads. The dust suppression programme and continuation of its seal extension programme will also improve satisfaction.
		

PUBLIC HEALTH – We expect to reduce the number of dwellings with a medium dust risk score by almost 15% by carrying out Paige Green compliant wearing courses on forestry roads and undertaking the proposed subsidised and unsubsidised seal extension programmes.	**PUBLIC HEALTH** – We expect to reduce the number of dwellings with a medium dust risk score by almost 30% by carrying out Paige Green compliant wearing courses on forestry roads and through the PGF funded unsealed road strengthening programme.	**PUBLIC HEALTH** – We expect to reduce the number of dwellings with a medium dust risk score by almost 25% by carrying out Paige Green compliant wearing courses on forestry roads and undertaking the proposed subsidised and unsubsidised seal extension programmes.

Overall it is expected that there will be an improvement in the condition of the unsealed road network, a decrease in the number of dwellings affected by PM_{10} dust and there will be an increase in the level of satisfaction of the Council's unsealed road network.

6.5.8 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Air monitoring of adjoining unsealed sections with and without Paige-Green compliant material to determine the reduction in PM_{10} dust emissions.
- Change unsealed Lump Sum items for pothole patching and grading in Maintenance Contracts to measure and value items to realise the savings through the Unsealed Centre of Excellence.
- Improve unsealed road data collection including implementing regular roughness monitoring through RoadROID or similar, and visual dust assessment tool that can determine likely PM_{10} dust emissions.

6.6 Drainage

Work Categories: **113 Routine Drainage Maintenance, 213 Drainage Renewals & 341 Low Cost/Low Risk Improvements**

6.6.1 Links to Strategic Case

Problem Statement: **Drainage** - Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.

Benefits of Addressing Problem: A fit for purpose drainage system which minimises water ingress into pavements thus extending pavement life and reduces the likelihood of flooding and slips during heavy rain events.

Consequences of Not Addressing the Problem: Pavements will continue to failure prematurely due to water ingress. Slips and flooding will continue to cause resilience issues on our roads during heavy rain events resulting in road closures that often affect freight, tourist and detour routes, key lifelines and isolated communities.

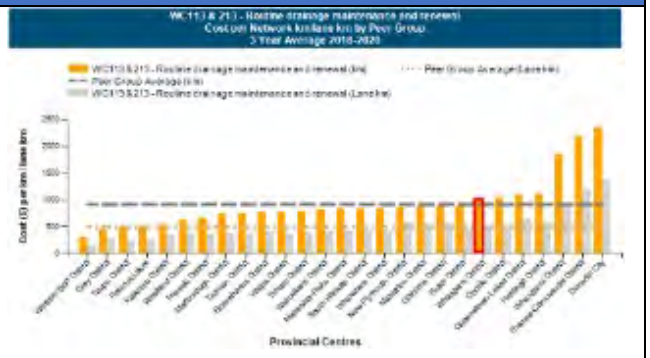
6.6.2 Levels of Service

ONRC Customer Outcomes:
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)

Customer Levels of Service:
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.1.X – Decreasing trend in resilience related faults on key routes (New measure) (NO DATA AVAILABLE)

6.6.3 Evidence and Gap Analysis

NZTA Peer Group Charts – 3yr Cost/km WC 113 & 213 Routine Drainage Maintenance and Drainage Renewals

FNDC	KDC	WDC
		
		
FNDC Drainage Maintenance and Renewals Cost – FNDC's drainage cost is in the top third of its peer group. This was partially caused by a spike in heavy watertabling undertaken in 2017/18 as part of the NZTA funded Forestry Road Strengthening programme. This level of drainage maintenance and renewal is probably reasonable given Far North's poor moisture sensitive soils and high levels of rainfall. A focus area going forward will be to carry out a cyclic programme of watertable maintenance to reduce water ingress into pavements. This should result in lower sealed and unsealed pavement maintenance costs in the future.	**KDC Drainage Maintenance and Renewals Cost** – The KDC drainage cost is near the average for their peer group. This is low given that Kaipara has poor moisture sensitive soils and high levels of rainfall. This reflects a lack of focus on drainage maintenance in the past. Kaipara is currently achieving a 9 year cycle of watertable maintenance, whereas a 5 year cycle is considered optimum. A focus area going forward will be to carry out a cyclic programme of watertable maintenance to reduce water ingress into pavements. This should result in lower sealed and unsealed pavement maintenance costs in the future.	**WDC Drainage Maintenance and Renewals Cost** – The WDC drainage cost is near the average for their peer group. As for KDC, this is low given that Whangarei has poor moisture sensitive soils and high levels of rainfall. This reflects a lack of focus on drainage maintenance in the past. A focus area going forward will be to carry out a cyclic programme of watertable maintenance to reduce water ingress into pavements. This should result in lower sealed and unsealed pavement maintenance costs in the future.

SUMMARY

FNDC	KDC	WDC
FNDC Summary - The cost to maintain Far North's drainage system is in the top third of their peer group. This is to be expected due to Far North's moisture sensitive soils and frequent high intensity rainfall events.	**KDC Summary** - The cost to maintain Kaipara's drainage system is about the same as the peer group average, which is lower than expected due to Kaipara's moisture sensitive soils and frequent high intensity rainfall events.	**WDC Summary** - The cost to maintain Whangarei's drainage system is about the same as the peer group average, which is lower than expected due to Whangarei's moisture sensitive soils and frequent high intensity rainfall events.

6.6.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for drainage:

Option	Description
Option 1 - Provide drainage FWP and MIS	Provide drainage Forward Works Programme and Maintenance Intervention Strategy with appropriate training of these systems with maintenance staff.
Option 2 - Improve watertable maintenance to avoid water ingress into pavements	Improve drainage systems to reduce water ingress into pavements. This is likely to require additional funding, particularly for watertable maintenance. Develop processes and collect watertable condition data.
Option 3 - Improve grading with operator training to avoid watertables being filled with gravel	Provide adequate training to grader operators and NTA maintenance staff to avoid watertables being filled with gravel. Also to train grader drivers to cut watertables when undertaking grading operations. Provide subsoil drains for areas with no surface water drainage.
Option 4 - Maintenance of drainage system where there is a high risk of flooding or slips	Ensure that high risk culverts are inspected and cleaned before heavy rain events. Improve drainage systems where there is a high risk of slips.
Option 5 - Culverts to be properly designed. Replace culverts that are too flat, disjointed or have inadequate cover	Ensure that culverts are properly designed so that they have sufficient waterway, are at self-cleaning slopes and have sufficient cover. Treat disjointed or butt end pipe culverts.
Option 6 - Provide additional culverts or cut-outs to reduce watertable flows.	Provide additional culverts or cut outs to reduce high flows in roadside drains which will reduce the likelihood of watertable scour and overtopping the drainage system.

6.6.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Drainage	**Drainage** - Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.	**Programme Adjustment** • Increase watertable maintenance and renewal programme **Policy Approach** • Increase culvert sizes	**Programme Adjustments** **Maintenance and Renewal Adjustments & Improve Systems and Capability** • Option 2 - Improve watertable maintenance to avoid water ingress into pavements **Route Management** • Option 5 - Culverts to be properly designed. Replace culverts that are too flat, disjointed or have inadequate cover **Managing Demand** • Option 6 - Provide additional culverts or cut-outs to reduce watertable flows. **Policy Approach** **Improve Systems and Capability** • Option 1 - Provide drainage FWP and MIS **LOS Adjustments & Improve Systems and Capability** • Option 3 - Improve grading with operator training to avoid watertables being filled with gravel **Risk** • Option 4 - Maintenance of drainage system where there is a high risk of flooding or slips.	2 5 6 1 3 4	1.85 0.85 0.45 1.05 1.05 1.3	**Yes** **Yes** **Yes** **Yes** **Yes** **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Provide drainage FWP and MIS
- Option 2 - Improve watertable maintenance to avoid water ingress into pavements
- Option 3 - Improve grading with operator training to avoid watertables being filled with gravel

- Option 4 - Maintenance of drainage system where there is a high risk of flooding or slips
- Option 5 - Culverts to be properly designed. Replace culverts that are too flat, disjointed or have inadequate cover
- Option 6 - Provide additional culverts or cut-outs to reduce watertable flows.

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Drainage (WC 113, 213)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments	Yes	3	Provide subsoil drains for areas with no surface water drainage
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer	Yes	4	Ensure that high risk culverts are inspected and cleaned before heavy rain events. Improve drainage systems where there is a high risk of slips
❑ Managing **demand**	Yes	6	Provide additional culverts or cut outs to reduce high flows in roadside drains
❑ **Route** Management	Yes	5	Ensure that culverts are properly designed so that they have sufficient waterway, are at self-cleaning slopes and have sufficient cover. Treat disjointed or butt end pipe culverts
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments	Yes	2	Improve drainage systems to reduce water ingress into pavements. This is likely to require additional funding, particularly for watertable maintenance
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**	Yes	A - 1 B - 3 C - 2	A - Provide drainage FWP and MIS. B - Provide adequate training to grader operators and NTA maintenance staff to avoid watertables being filled with gravel. C - Develop processes and collect watertable condition data

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Provide drainage FWP and MIS		Option 2 - Improve watertable maintenance to avoid water ingress into pavements		Option 3 - Improve grading with operator training to avoid watertables being filled with gravel		Option 4 - Maintenance of drainage system where there is a high risk of flooding or slips		Option 5 - Culverts to be properly designed. Replace culverts that are too flat, disjointed or have inadequate cover		Option 6 - Provide additional culverts or cut-outs to reduce watertable flows.		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	0	0	1	0.1	0	0	2	0.2	1	0.1	-1	-0.1		0
Problem solving effectiveness	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1		0
Benefits realised	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	0	0		0
Good Environmental impacts	5%	1	0.05	1	0.05	1	0.05	1	0.05	1	0.05	1	0.05		0
Value for Money	10%	3	0.3	3	0.3	3	0.3	3	0.3	0	0	1	0.1		0
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	2	0.2	0	0	1	0.1	1	0.1	0	0		0
Closing ONRC Performance gaps	10%	1	0.1	2	0.2	1	0.1	1	0.1	0	0	0	0		0
Asset preservation and sustainability	10%	1	0.1	2	0.2	2	0.2	1	0.1	2	0.2	1	0.1		0
Total Cost of Ownership (whole of life Costs)	10%	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1		0
Life Cycle Management	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1		0
COVID-19 Recovery	5%	0	0	2	0.1	0	0	0	0	0	0	0	0		0
etc.			0		0		0		0		0		0		0
Totals	**100%**		**1.05**		**1.85**		**1.05**		**1.3**		**0.85**		**0.45**		**0**

6.6.6 Financial Impact

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

6.6.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
113	Routine Drainage Maintenance	+$300,000/yr to fund additional drainage maintenance as identified in the NTA Drainage Strategy.	+$300,000/yr
213	Drainage Renewals	No change	No Change
341	Low Cost Low Risk Improvements	None programmed – No change	No Change

6.6.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
113	Routine Drainage Maintenance	+$250,000/yr to fund additional drainage maintenance as identified in the NTA Drainage Strategy.	+$250,000/yr
213	Drainage Renewals	-$20,000/yr due to transfer of contract management costs to Maintenance and Operations work categories	-$20,000/yr
341	Low Cost Low Risk Improvements	$250,000 for a new programme of drainage upgrades	+$250,000

6.6.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
113	Routine Drainage Maintenance	+$100,000/yr to carry out additional watertable maintenance as identified in the NTA Drainage Strategy.	+$100,000/yr
213	Drainage Renewals	+$100,000/yr for kerb and channel replacement to address poor condition kerbing in Whangarei city +$225,000/yr due to increase in contract management costs through the new maintenance contracts	+$325,000/yr
341	Low Cost Low Risk Improvements	None programmed – No change	No Change

6.6.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- None identified.

6.7 Structures

Work Categories: **114 Structures Maintenance, 215 Structural Component Replacement, 216 Bridge and Structures Renewal, 341 Low Cost/Low Risk Improvements & 322 Replacement of Bridges and Other Structures**

6.7.1 Links to Strategic Case

Problem Statement: **Structures** - Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.

Benefits of Addressing Problem: A fit for purpose bridge and retaining wall asset that provide access for freight and high productivity vehicles (50Max and HPMV) on arterial, freight and detour routes.

Consequences of Not Addressing the Problem: Our structures will deteriorate over time leading to further restrictions to freight and increasing risk of bridge or retaining wall failure resulting in safety issues and complete loss of access.

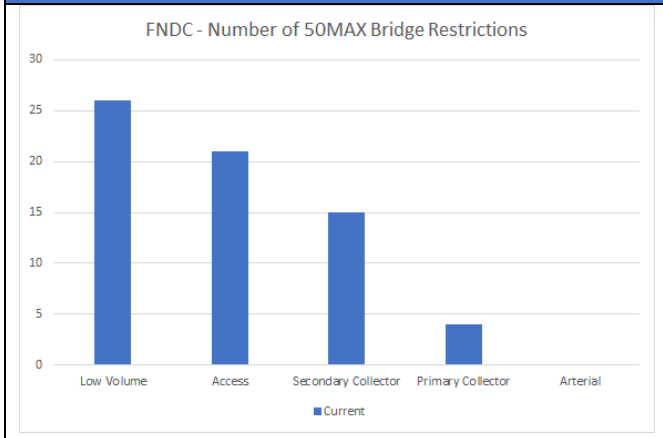
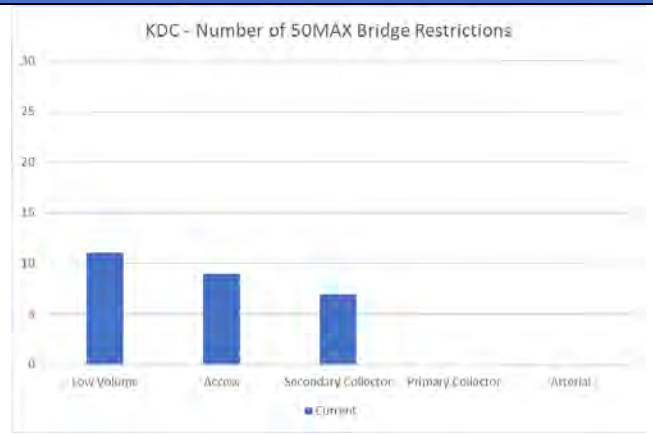
6.7.2 Levels of Service

ONRC Customer Outcomes:
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

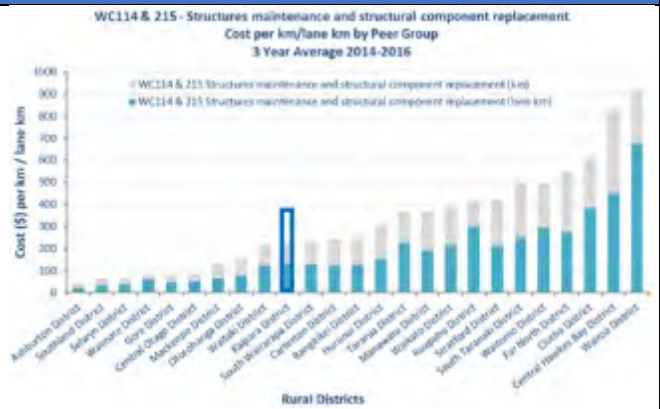
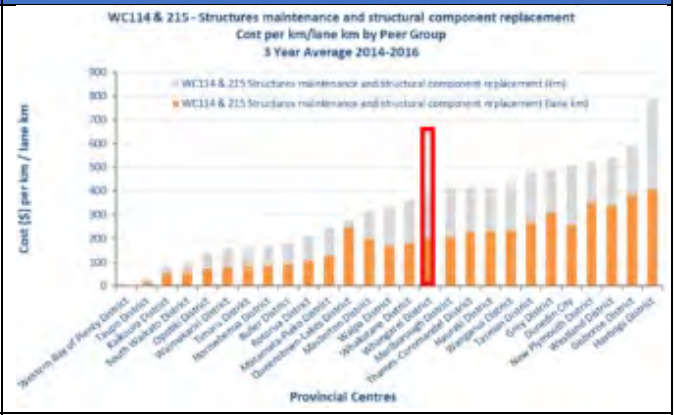
Customer Levels of Service:
ONRC Safety TO1 – Permanent hazards (NO DATA AVAILABLE)
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.1.X – Decreasing trend in resilience related faults on key routes (New measure) (NO DATA AVAILABLE)

6.7.3 Evidence and Gap Analysis

Number of 50MAX Restrictions

FNDC	KDC	WDC
		
		
FNDC Number of 50MAX Restrictions – FNDC has 66 bridges which have 50MAX restrictions which is the highest amount in the country. Far North also have 24 bridges which have restrictions for standard Class 1 (44 tonne) vehicles. Most of the 50MAX bridge restrictions are on the Secondary Collector or lower road classes. However, many of these routes provide the only access to forestry blocks which limits the ability to cart the harvest from these blocks using more efficient 50MAX logging trucks. Given the long cartage distances to Northport or local sawmills, this substantially adds to the harvest cost.	**KDC Number of 50MAX Restrictions** – KDC has 27 bridges which have 50MAX restrictions. Kaipara also have 9 bridges which have restrictions for standard Class 1 (44 tonne) vehicles. All of Kaipara's 50MAX bridge restrictions are on the Secondary Collector or lower road classes. However, many of these routes provide the only access to forestry blocks or are located on dairy routes which limits the ability to cart the product from these areas using more efficient 50MAX vehicles. Given the long cartage distances involved, this substantially adds to the cost of getting the product to its destination (eg Northport, sawmill or dairy factory).	**WDC Number of 50MAX Restrictions** – WDC has 20 bridges which have 50MAX restrictions. Whangarei also have 8 bridges which have restrictions for standard Class 1 (44 tonne) vehicles. Although Whangarei has fewer 50MAX restrictive bridges than FNDC and KDC, several of these bridges are located on Arterial and Primary Collector routes with significant heavy vehicle flows Several of the 50MAX restrictive bridges are located on forestry, dairy or quarry routes which limits the ability to cart the product using more efficient 50MAX vehicles.

NZTA Peer Group Charts – 3yr Cost/km WC 114 & 215 Structures Maintenance and Structural Component Replacement

FNDC	KDC	WDC
		
FNDC Structures Maintenance and Component Replacement Cost – FNDC's structures maintenance and component replacement cost is likely to be near the highest in its peer group. This includes the costs to operate and maintain the Hokianga Ferry service. This is a significant cost and makes up approximately two thirds of FNDC structures maintenance costs and distorts this result. This is a reflection of the current state of the Far North bridging stock which is in poor condition and deteriorating. The cost of structures maintenance and renewals has been increasing over the past three years to start to address this issue.	**KDC Structures Maintenance and Component Replacement Cost** – The KDC structures maintenance and component replacement cost is likely to be near the average for their peer group. KDC have been running their bridge maintenance and component replacements at a sustained low level for over 5 years as a result of the Kaipara rates strike. This is now starting to result in premature failure of critical structures such as the Tomarata Road bridge and Kaiwaka-Mangawhai Road bridge. The cost of the Tomarata Road Bridge repairs are in the order of $2.4M and demonstrate the risk of underinvesting in structures maintenance and renewals.	**WDC Structures Maintenance and Component Replacement Cost** – WDC's structures maintenance and component replacement cost is likely to be near the highest in their peer group. This includes the maintenance costs of the Whangarei opening bridges, which require significant electrical and hydraulic maintenance to keep functioning. These costs makes up approximately half of the WDC structures maintenance costs. WDC will need to carry out an increasing amount of structural component replacement work to hold its aging bridge stock, due to its focus on the past 5 years on replacing its old and failing steel pipe ("Armco") culverts.

NOTE – NZTA do not produce comparative graphs for WC 114 Structures Maintenance and WC 215 Structures Component Replacement. This graph was based on the 2014-2016 comparative data provided by NZTA, and has been updated to reflect the only the 2017-2019 data for FNDC, KDC and WDC and not the wider peer group.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – FNDC has the highest number of 50MAX restrictive bridges in the country (66) and also has a high number of Class 1 restrictive bridges (24). This significantly affects the cartage costs for product from the Far North. The cost to maintain Far North's structures is likely to be near the top of their peer group. This is mainly due to the cost of maintaining and operating the Hokianga Ferry service which significantly affects these costs. It is also a reflection of Far North's bridge stock which is in poor condition and deteriorating, so has been requiring higher levels of maintenance and renewal cost to try and hold the asset.	**KDC Summary** - KDC has twenty seven 50MAX restrictive bridges in the country and also has nine Class 1 restrictive bridges. This affects the cartage costs for product from the Kaipara district. The cost to maintain Kaipara's structures is likely to be near the average for their peer group. This is due to KDC funding their bridge maintenance and renewals at a sustained low level for over 5 years as a result of the Kaipara rates strike. This is now starting to result in premature failure of critical structures such as the Tomarata Road bridge and Kaiwaka-Mangawhai Road bridge.	**WDC Summary** - WDC has twenty 50MAX restrictive bridges in the country and also has eight Class 1 restrictive bridges. This affects the cartage costs for product from Whangarei, particularly on the Arterial and Primary Collector routes. The cost to maintain Whangarei's structures is likely to be near the top of its peer group. These costs include the maintenance of the opening bridges in Whangarei which make up about half the structures maintenance costs. Whangarei will need an increasing amount of bridge maintenance to hold its aging bridge stock due to its current focus on replacing a bow wave of old large "armco" culverts.

6.7.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for structures:

Option	Description
Option 1 - Develop long term bridge strategy and FWP in conjunction with Forestry Plan. Detailed 50MAX assessments to reduce restrictions.	Develop a long term bridge strategy and FWP. Complete the Forestry Plan to proactively address structural constraints on forestry routes before logging commences. Continue to carry out detailed 50MAX assessments.
Option 2 - Increase number of bridge inspections and carry out retaining wall inspections.	Reduce inspection frequency for FNDC and for all councils on critical and high risk structures. Carry out annual inspections of retaining walls and develop a retaining wall FWP.
Option 3 - Provide sufficient bridge maintenance and renewal funding for FNDC and KDC, to avoid expensive bridge replacement	Develop a professional service contract for the NTA to secure bridging design services. Develop a supplier panel to pre-qualify contractor for bridging (and other) works. Simplify the FNDC procurement process.

Option	Description
Option 4 - Secure professional services for bridge design, supplier panel for bridge contractors. Simplify FNDC procurement process	Provide sufficient level of bridge maintenance and component replacement funding for FNDC and KDC, including adequate allowance for the FNDC Hokianga Ferry Service.
Option 5 - Realign bridge approaches and reduce kerb widths on timber decked bridges	Realign bridge approaches and move in kerbs on timber decked bridges to concentrate loads on the main structural beams.
Option 6 - Advocate for rail revitalisation to reduce freight haul distances	Advocate for rail revitalisation to reduce road freight haulage distances

6.7.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Structures	**Structures** - Lack of historic maintenance and renewals of structures in FNDC and KDC is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge replacement.	**Programme Adjustment** • Increase structural maintenance and renewals programmes for FNDC and KDC • Programme of 50MAX bridge strengthening on important freight routes **Policy Approach** • Improve frequency of bridge inspections and carry out retaining wall inspections • Complete 50MAX detailed assessments on important freight routes. • Supplier panel and improved FNDC procurement processes	**Programme Adjustments** **Maintenance and Renewal Adjustments & Improve Systems and Capability** • Option 3 - Provide sufficient bridge maintenance and renewal funding for FNDC and KDC, to avoid expensive bridge replacement. **Route Management** • Option 5 - Realign bridge approaches and reduce kerb widths on timber decked bridges **Policy Approach** **Improve Systems and Capability & Managing Demand** • Option 1 - Develop long term bridge strategy and FWP in conjunction with Forestry Plan. Detailed 50MAX assessments to reduce restrictions. **Risk** • Option 2 - Increase number of bridge inspections and carry out retaining wall inspections. **Supply Chain Improvements** • Option 4 - Secure professional services for bridge design, supplier panel for bridge contractors. Simplify FNDC procurement process. **Managing Demand** • Option 6 - Advocate for rail revitalisation to reduce freight haul distances.	3 5 1 2 4 6	1.4 0.2 1.6 1.5 0.9 0.25	**Yes** No **Yes** **Yes** **Yes** No

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Develop long term bridge strategy and FWP in conjunction with Forestry Plan. Detailed 50MAX assessments to reduce restrictions
- Option 2 - Increase number of bridge inspections and carry out retaining wall inspections.
- Option 3 - Provide sufficient bridge maintenance and renewal funding for FNDC and KDC, to avoid expensive bridge replacement.
- Option 4 - Secure professional services for bridge design, supplier panel for bridge contractors. Simplify FNDC procurement process.

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Structures (WC 114, 215)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer	Yes	2	Reduce inspection frequency for FNDC and for all councils on critical and high risk structures. Carry out annual inspections of retaining walls and develop a retaining wall FWP
❑ Managing **demand**	Yes	A - 1 B - 6	A - Complete the Forestry Plan to proactively address structural constraints on forestry routes before logging commences. Continue to carry out detailed 50MAX assessments. B - Advocate for rail revitalisation to reduce road freight haulage distances
❑ **Route** Management	Yes	5	Realign bridge approaches and move in kerbs on timber decked bridges to concentrate loads on the main structural beams
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments	Yes	4	Provide sufficient level of bridge maintenance and component replacement funding for FNDC and KDC, including adequate allowance for the FNDC Hokianga Ferry Service
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements	Yes	3	Develop a professional service contract for the NTA to secure bridging design services. Develop a supplier panel to pre-qualify contractor for bridging (and other) works. Simplify the FNDC procurement process
❑ Improve **systems and capability**	Yes	1	Develop a long term bridge strategy and FWP

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Develop long term bridge strategy and FWP in conjunction with Forestry Plan. Detailed 50MAX assessments to reduce restrictions.		Option 2 - Increase number of bridge inspections and carry out retaining wall inspections.		Option 3 - Provide sufficient bridge maintenance and renewal funding for FNDC and KDC, to avoid expensive bridge replacement		Option 4 - Secure professional services for bridge design, supplier panel for bridge contractors. Simplify FNDC procurement process		Option 5 - Realign bridge approaches and reduce kerb widths on timber decked bridges		Option 6 - Advocate for rail revitalisation to reduce freight haul distances		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	1	0.1	2	0.2	1	0.1	0	0	2	0.2		0
Problem solving effectiveness	10%	2	0.2	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1		0
Benefits realised	10%	2	0.2	1	0.1	2	0.2	1	0.1	0	0	1	0.1		0
Good Environmental impacts	5%	0	0	0	0	0	0	0	0	0	0	1	0.05		0
Value for Money	10%	3	0.3	3	0.3	1	0.1	3	0.3	-1	-0.1	-2	-0.2		0
Closing Customer and Technical LoS gaps and impacts	10%	2	0.2	1	0.1	2	0.2	0	0	0	0	0	0		0
Closing ONRC Performance gaps	10%	2	0.2	2	0.2	1	0.1	1	0.1	0	0	0	0		0
Asset preservation and sustainability	10%	2	0.2	3	0.3	2	0.2	0	0	1	0.1	1	0.1		0
Total Cost of Ownership (whole of life Costs)	10%	1	0.1	2	0.2	1	0.1	1	0.1	0	0	-2	-0.2		0
Life Cycle Management	10%	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1		0
COVID-19 Recovery	5%	0	0	0	0	0	0	0	0	0	0	0	0		0
etc.			0		0		0		0		0		0		0
Totals	100%		1.6		1.5		1.4		0.9		0.2		0.25		0

6.7.6 Financial Impact

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

6.7.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
114	Structures Maintenance	+$690,000/yr due to an increase in the new Hokianga Ferry operations contract costs +$75,000/yr for additional bridge maintenance -$60,000/yr due to transfer of in-house staff costs to WC 151	+$705,000/yr
215	Structural Component Replacement	+$50,000/yr for additional bridge component replacement +$125,000/yr for a new programme of retaining wall renewals.	+$250,000/yr
216	Bridge and Structures Renewal (NEW)	+$950,000/yr due to transfer from WC 341 Low Cost/Low Risk Improvements +$250,000/yr for additional large diameter culvert replacements +$250,000/yr for a new programme of retaining wall replacements	+$1,450,000/yr
341	Low Cost/Low Risk Improvements	-$950,000/yr due to transfer to new WC 216 Bridge and Structures Renewal +$200,000/yr for 50MAX bridge strengthening upgrades.	-$750,000/yr
322	Replacement of Bridge & Other Structures	None programmed – No change.	No Change

6.7.6.2 Kaipara District Council

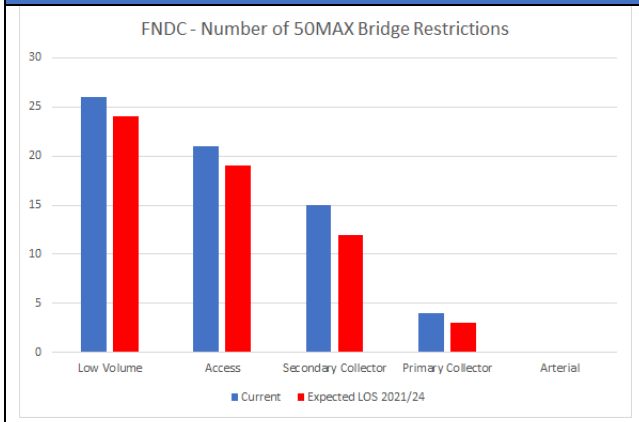
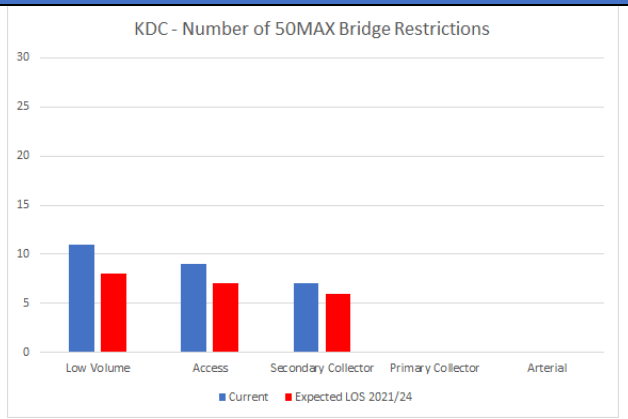
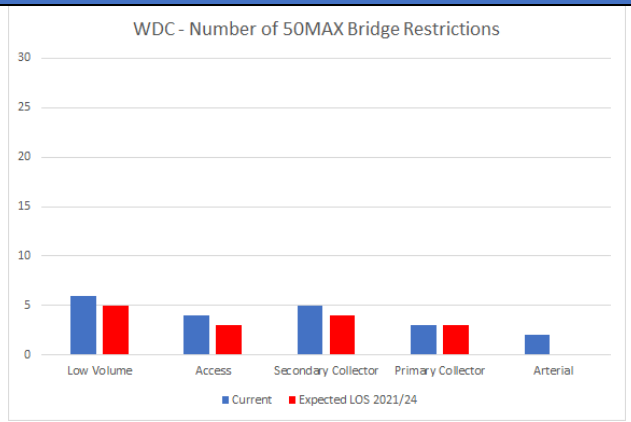
W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
114	Structures Maintenance	No change	No change
215	Structural Component Replacement	-$280,000/yr due to 2018/21 having higher programme to address the $2.5M Tomarata Bridge repairs	-$280,000/yr
216	Bridge and Structures Renewal (NEW)	+$870,000/yr due to transfer from WC 341 Low Cost/Low Risk Improvements +$150,000/yr for additional bridge replacement costs and a new programme of retaining wall replacements	+$1,020,000/yr
341	Low Cost/Low Risk Improvements	-$870,000/yr due to transfer to new WC 216 Bridge and Structures Renewal	-$870,000/yr
322	Replacement of Bridge & Other Structures	None programmed – No change.	No Change

6.7.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
114	Structures Maintenance	+$75,000/yr due to increase in contract management costs from new maintenance contracts +$50,000/yr due to additional retaining wall maintenance	+$125,000/yr
215	Structural Component Replacement	+$400,000/yr for additional bridge component replacement to extend the life of the aging asset +$100,000/yr for a new programme of retaining wall renewals.	+$500,000/yr
216	Bridge and Structures Renewal (NEW)	+$380,000/yr due to transfer from WC 341 Low Cost/Low Risk Improvements +$1,200,000/yr for additional large diameter culvert replacements to address bow wave of heavily corroded structures +$350,000/yr for a new programme of retaining wall replacements	+$1,930,000/yr
341	Low Cost/Low Risk Improvements	-$380,000/yr due to transfer to new WC 216 Bridge and Structures Renewal +$500,000/yr for 50MAX bridge strengthening	+$120,000/yr
322	Replacement of Bridge & Other Structures	None programmed – No change.	No Change

6.7.7 Level of Service Impact

The following table shows the expected Level of Service impact of the options selected:

FNDC	KDC	WDC
		
ACCESSIBILITY – We expect that the number of 50MAX restrictive bridges on the FNDC network will reduce by eight through investment in bridge strengthening and replacement as well as detailed bridge assessments.	**ACCESSIBILITY** – We expect that the number of 50MAX restrictive bridges on the KDC network will reduce by six through investment in bridge strengthening and replacement as well as detailed bridge assessments.	**ACCESSIBILITY** – We expect that the number of 50MAX restrictive bridges on the WDC network will reduce by five through investment in bridge strengthening and replacement as well as detailed bridge assessments. This includes both the two bridges on the Arterial Road network.

6.7.8 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Continue to carry out full assessment on key bridges that have current 50Max restrictions to determine whether these restrictions are necessary.
- Seismic assessments to be carried out on structures on key life lines, arterials and freight routes. Develop a programme of remedial work as required.
- Bridge and retaining wall asset data to be broken into their component parts in RAMM. Bridge and retaining wall condition, maintenance dispatches (including photos) and repairs to be stored in RAMM.

6.8 Environmental

Work Categories: **121 Environmental Maintenance & 221 Environmental Renewals & 341 Low Cost/Low Risk Improvements**

6.8.1 Links to Strategic Case

Problem Statement: **Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.

Benefits of Addressing Problem: Sightlines and road side tree hazards will be minimised improving road safety.

Consequences of Not Addressing the Problem: Sightlines will become blocked and tree hazards in the road corridor increased resulting in increased risk of fatal and serious injuries.

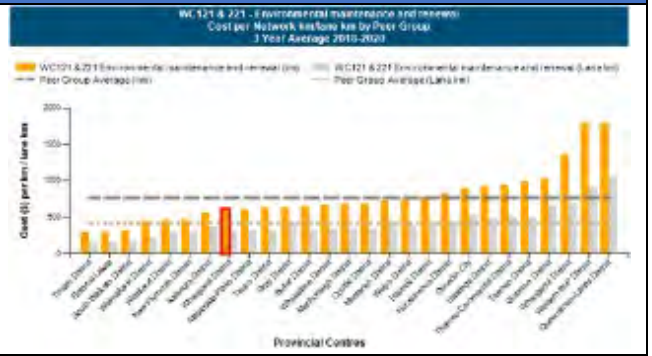
6.8.2 Levels of Service

ONRC Customer Outcomes: None

Customer Levels of Service:
ONRC Safety TO3 – Sight Distances (NO DATA AVAILABLE)
ONRC Safety TO10 – Roadside Obstructions (NO DATA AVAILABLE)
ONRC Amenity TO2 – Aesthetic Faults (NO DATA AVAILABLE)
ONRC Cost Efficiency 5 – Overall network cost

6.8.3 Evidence and Gap Analysis

NZTA Peer Group Charts – 3yr Cost/km WC 121 & 221 Environmental Maintenance and Renewals

FNDC	KDC	WDC
		
		
FNDC Environmental Maintenance and Renewal Cost – FNDC's environmental maintenance and renewal cost is near the average of its peer group. This is lower than expected given Northland's rapid vegetation growth due to warm climate and high rainfall which increases the demand for envelope clearing and roadside mowing.	**KDC Environmental Maintenance and Renewal Cost** – The KDC environmental maintenance and renewal cost is lower than their peer group average. As for FNDC, this is lower than expected given Northland's rapid vegetation growth due to warm climate and high rainfall which increases the demand for envelope clearing and roadside spraying.	**WDC Environmental Maintenance and Renewal Cost** – The WDC environmental maintenance and renewal cost is lower than their peer group average. As for the other councils, this is lower than expected given Northland's rapid vegetation growth due to warm climate and high rainfall which increases the demand for envelope clearing and roadside spraying.

6.8.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for environmental maintenance:

Option	Description
Option 1 - Remove hazardous trees on HRRR routes	Remove hazardous trees on high risk rural roads (HRRR) to make roadsides more forgiving and reduce death and serious injuries.
Option 2 - Replace roadside mowing with spraying in FNDC.	Replace roadside berm mowing with spraying in the Far North to reduce the costs of vegetation control.

6.8.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Environmental	**Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.	**Programme Adjustment** • Increase safety programme **Policy Approach** • Additional delineation **Demand Management** • Enhanced Road Safety Promotions with active in-house management.	**Programme Adjustments** **Route Management** • Option 1 - Remove hazardous trees on HRRR routes **Policy Approach** **Alternative Approaches – Different Solutions/Technology** • Option 2 - Replace roadside mowing with spraying in FNDC	1 2	0.85 0.7	**Yes** **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Remove hazardous trees on HRRR routes
- Option 2 - Replace roadside mowing with spraying in FNDC

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Environmental (WC 121, 221)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**			
❑ **Route** Management	Yes	1	Remove hazardous trees
❑ Alternative approaches – different **solutions/technology**	Yes	2	Replace roadside mowing with spraying in the Far North.
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Criteria	Weighting (Importance) (Total to 100%)	How good is this option					
		Option 1 - Remove hazardous trees on HRRR routes		Option 2 - Replace roadside mowing with spraying in FNDC		Option 3	
		Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	2	0.2	0	0		0
Problem solving effectiveness	10%	2	0.2	0	0		0
Benefits realised	10%	2	0.2	0	0		0
Good Environmental impacts	5%	-1	-0.05	-2	-0.1		0
Value for Money	10%	1	0.1	3	0.3		0
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	0	0		0
Closing ONRC Performance gaps	10%	0	0	1	0.1		0
Asset preservation and sustainability	10%	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	2	0.2		0
Life Cycle Management	10%	0	0	2	0.2		0
COVID-19 Recovery	5%	2	0.1	0	0		0
etc.			0		0		0
Totals	**100%**		**0.85**		**0.7**		**0**

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

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6.8.6 Financial Impact

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

6.8.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
121	Environmental Maintenance	+$510,000/yr due to increase in contract management costs from the new maintenance contracts +$200,000/yr due to increase in cyclic vegetation control costs through new maintenance contracts -$45,000/yr due to in-house staff costs being charged to WC 151	+$665,000/yr
221	Environmental Renewals	None programmed – No change.	No Change
341	Low Cost Low Risk Improvements	$1,000,000 for the installation of two new stock effluent disposal facilities as identified in the FNDC Integrated Transport Plan	+$1,000,000

6.8.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
121	Environmental Maintenance	No change	No Change
221	Environmental Renewals	None programmed – No change.	No Change
341	Low Cost Low Risk Improvements	None programmed – No change	No Change

6.8.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
121	Environmental Maintenance	-$25,000/yr to match current expenditure	-$25,000/yr
221	Environmental Renewals	None programmed – No change.	No Change
341	Low Cost Low Risk Improvements	None programmed – No change	No Change

6.8.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Investigate and develop a programme of sediment control measures for roadside drainage systems and maintenance practices to minimise sediment runoff into harbour catchments (particularly the Kaipara Harbour).
- Climate Change - Carry out a stock take of assets likely to impacted by climate change and include in RAMM and carry out Dynamic Adaptive Planning Pathway (DAPP) on these assets to determine adaptation strategies. This could be done as part of the Resilience Strategy.
- Climate Change - Develop a strategy to identify and implement initiatives that reduce the greenhouse gas emissions from transport related maintenance and construction activities.

6.9 Traffic Services

Work Categories: **122 Network Services Maintenance (was Traffic Services Maintenance) & 222 Traffic Services Renewals & 341 Low Cost/Low Risk Improvements**

6.9.1 Links to Strategic Case

Problem Statement: **Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.

Benefits of Addressing Problem: Delineation will be improved reducing the likelihood of loss of control crashes. Streetlights will provide adequate lighting levels that provide more confidence for people to walk and cycle after dark.

Consequences of Not Addressing the Problem: Loss of control crashes will continue, increasing the risk of fatal and serious injury. Less people walking and cycling at night which will limit the number of commuters taking active modes, particularly in winter when the days are shorter.

6.9.2 Levels of Service

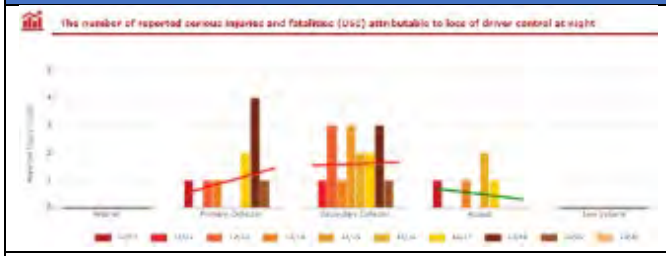
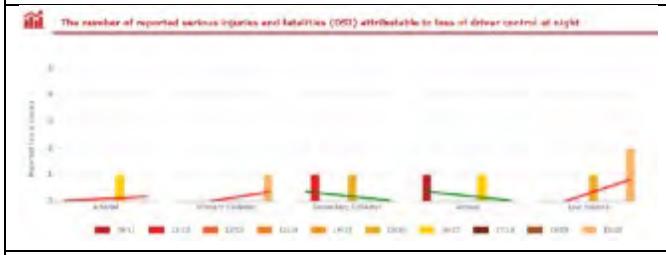
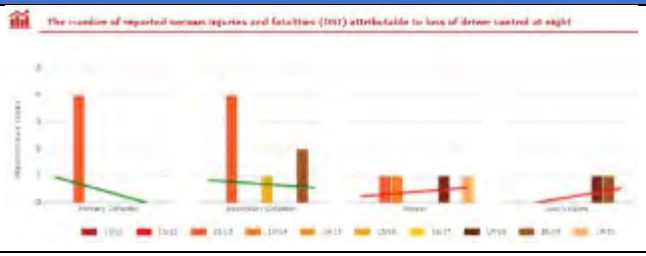
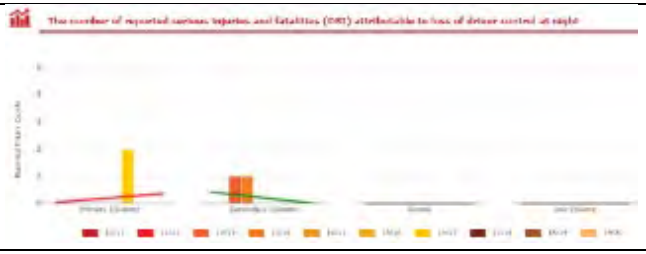
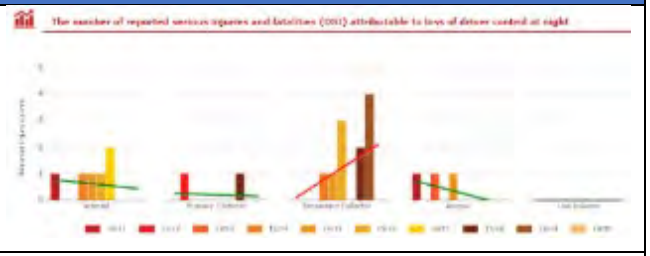
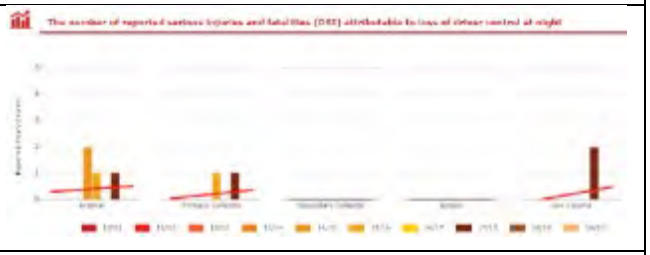
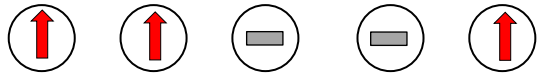
ONRC Customer Outcomes: None

Customer Levels of Service:

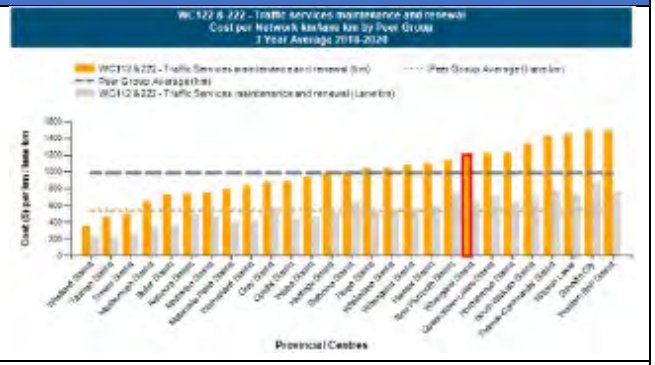
ONRC Safety TO1 – Permanent Hazards (NO DATA AVAILABLE)
ONRC Safety TO5 – Loss of driver control at night
ONRC Accessibility TO1 – Accessibility (guide signage) (NO DATA AVAILABLE)
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.2.4 – Residents satisfaction with lighting in urban area (Current measure)

6.9.3 Evidence and Gap Analysis

ONRC Safety TO5 –Loss of Driver Control at Night – Rural roads (top graph) & Urban roads (bottom graph)

FNDC	KDC	WDC
 Arterial Primary Collector Secondary Collector Access Low Volume   Arterial Primary Collector Secondary Collector Access Low Volume 	 Primary Collector Secondary Collector Access Low Volume   Primary Collector Secondary Collector Access Low Volume 	 Arterial Primary Collector Secondary Collector Access Low Volume   Arterial Primary Collector Secondary Collector Access Low Volume 
FNDC Loss of Driver Control at Night DSI – It should be noted that there is very little data for nighttime crashes for rural roads and almost none for urban roads on the FNDC network. This makes it difficult to determine any issues or trends. However, it appears that there may be an increasing trend in nightime crashes on rural Primary and Secondary Collector roads.	**KDC Loss of Driver Control at Night DSI** - It should be noted that there is almost no data for nighttime crashes on the KDC network. This makes it difficult to determine any issues or trends. From the limited data available, there may be a decreasing trend in nightime crashes on the rural Secondary Collector roads.	**WDC Loss of Driver Control at Night DSI** - It should be noted that there is very little data for nighttime crashes on the WDC network. This makes it difficult to determine any issues or trends. However, it appears that there could be an increasing trend on its rural Secondary Collector and urban Arterial roads.

NZTA Peer Group Charts – 3yr Cost/km WC 122 & 222 Traffic Services Maintenance and Renewals

FNDC	KDC	WDC
		
		
FNDC Traffic Services Maintenance and Renewal Cost – FNDC's traffic services maintenance and renewal cost is the second highest in its peer group. This is mainly due to the high cost of line marking due to the establishment costs from Whangarei as well as high streetlight power costs. The new maintenance contracts have resulted in line marking costs tripling for FNDC and this will further increase the cost on traffic services to achieve an annual line mark. The savings from the LED streetlight conversion programme will partially offset the increase in marking costs. Further savings from the LED streetlight conversion are possible if FNDC can negotiate a more reasonable power charge with their power authority (Top Energy).	**KDC Traffic Services Maintenance and Renewal Cost** – The KDC traffic services maintenance and renewal cost is near the average for their peer group. As for FNDC, the new maintenance contracts have resulted in line marking costs doubling for KDC and this will further increase the cost on traffic services to achieve an annual line mark into the future. The savings from the LED streetlight conversion programme will partially offset the increase in marking costs.	**WDC Traffic Services Maintenance and Renewal Cost** – WDC traffic services maintenance and renewal cost is in the top third of their peer group. The cost for traffic services has increase in the past two years to enable WDC to achieve a full annual line remark. As for the other councils, the new maintenance contracts have resulted in line marking costs doubling for WDC and this will further increase the cost on traffic services to achieve an annual line mark. The savings from the LED streetlight conversion programme will partially offset the increase in marking costs.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – There maybe an increasing trend of loss of control crashes at night on FNDC's rural Primary and Secondary Collectors. FNDC's traffic services costs are the second highest in its peer group. This is mainly due to the high cost of line marking and this has tripled in the new maintenance contracts which will further increase these costs in the future. The streetlight power charges from their power authority are also high for FNDC.	**KDC Summary** – From the limited loss of control at night crash data available, there may be a decreasing trend in nightime crashes on KDC's rural Secondary Collector roads. The KDC traffic services costs are near the average for their peer group. However, the new maintenance contracts have resulted in line marking costs doubling for KDC and this will further increase the cost on traffic services to achieve an annual line mark into the future.	**WDC Summary** - It appears that there could be an increasing trend of loss of control crashes at night on WDC's rural Secondary Collector and urban Arterial roads. WDC traffic services costs are in the top third of their peer group. These costs have increased in the past two years to enable WDC to achieve a full annual line remark. As for the other councils, the new maintenance contracts have resulted in line marking costs doubling for WDC and this will further increase the cost on traffic services to achieve an annual line mark.

6.9.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for traffic services:

Option	Description
Option 1 - Temporary signing curves with insufficient skid resistance	Temporarily sign curves with insufficient skid resistance to warn motorists of the hazard. This would be a temporary measure until a permanent treatment such as watercutting or a reseal is undertaken.
Option 2 - Increase funding to allow for a full annual remark also consider Long Life markings	Increase funding to account for substantial cost increase for line marking (x 2-4 increase) in new maintenance contract to enable a full line mark once per year.
Option 3 - Change power authority pricing structure for FNDC's streetlights	Change the power authority pricing structure for FNDC's streetlights to reduce the cost of this service. The Far North is currently paying about double the amount per light for power than what KDC and WDC pay.

6.9.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Traffic Services	**Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.	**Programme Adjustment** • Increase safety programme **Policy Approach** • Additional delineation **Demand Management** • Enhanced Road Safety Promotions with active in-house management.	**Programme Adjustments** **Extended Temporary Management** • Option 1 - Temporary signing curves with insufficient skid resistance **Policy Approach** **Managing Demand** • Option 2 - Increase funding to allow for a full annual remark also consider Long Life markings **Supply Chain Improvements** • Option 3 - Change power authority pricing structure for FNDC's streetlights	1 2 3	0.9 0.9 0.8	**Yes** **Yes** **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Temporary signing curves with insufficient skid resistance
- Option 2 - Increase funding to allow for a full annual remark also consider Long Life markings
- Option 3 - Change power authority pricing structure for FNDC's streetlights

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Traffic Services (WC 122, 222)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	2	Increase funding to account for substantial cost increase for line marking (x 2-4 increase) in new maintenance contract to enable a full line mark once per year.
❑ **Route** Management			
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management	Yes	1	Temporarily sign curves with insufficient skid resistance
❑ **Supply chain** improvements	Yes	3	Change the power authority pricing structure for FNDC's streetlights
❑ Improve **systems and capability**			

Criteria	Weighting (Importance) (Total to 100%)	How good is this option					
		Option 1 - Temporary signing curves with insufficient skid resistance		Option 2 - Increase funding to allow for a full annual remark also consider Long Life markings		Option 3 - Change power authority pricing structure for FNDC's streetlights	
		Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	2	0.2	1	0.1
Problem solving effectiveness	10%	2	0.2	2	0.2	0	0
Benefits realised	10%	2	0.2	2	0.2	0	0
Good Environmental impacts	5%	0	0	0	0	0	0
Value for Money	10%	3	0.3	2	0.2	3	0.3
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	2	0.2	0	0
Closing ONRC Performance gaps	10%	0	0	0	0	2	0.2
Asset preservation and sustainability	10%	0	0	0	0	0	0
Total Cost of Ownership (whole of life Costs)	10%	0	0	-1	-0.1	2	0.2
Life Cycle Management	10%	0	0	0	0	0	0
COVID-19 Recovery	5%	0	0	0	0	0	0
etc.			0		0		0
Totals	**100%**		**0.9**		**0.9**		**0.8**

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

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6.9.6 Financial Impact

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

6.9.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
122	Network Services Maintenance (was Traffic Services Maintenance)	+$840,000/yr to do a full line mark of the network per annum. Increase is due to significantly higher line marking rates in the new maintenance contracts -$35,000/yr for in-house staff costs now being charged to WC 151. -$40,000/yr due to lower streetlight power costs due to change in power supplier rates	+$765,000/yr
222	Traffic Services Renewals	-$65,000/yr due to the contract management costs now being transferred to Maintenance and Operations work categories	-$65,000/yr
341	Low Cost/Low Risk Improvements	$3,300,000 in 2021/22 to complete the infill lighting on V-Category roads, plus $550,000 in 2022/23 and 2023/24 to carry out lighting upgrades in crash areas and other townships	$4,400,000

6.9.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
122	Network Services Maintenance (was Traffic Services Maintenance)	+$250,000/yr to do a full line mark of the network per annum. Increase is due to significantly higher line marking rates in the new maintenance contracts +$60,000/yr for new streetlight maintenance contract costs -$20,000/yr for in-house staff costs now being charged to WC 151.	+$290,000/yr
222	Traffic Services Renewals	+$20,000/yr for new streetlight contract renewals	+$20,000/yr
341	Low Cost/Low Risk Improvements	$1,000,000 in 2021/22 to carry out infill lighting on V-Category roads.	$1,000,000

6.9.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
122	Network Services Maintenance (was Traffic Services Maintenance)	+$90,000/yr to do a full line mark of the network per annum. Increase is due to higher line marking rates in the new maintenance contracts	+$90,000/yr
222	Traffic Services Renewals	No change	No Change
341	Low Cost/Low Risk Improvements	$3,800,000 to complete the infill lighting on V-Category roads and to install a Central Management System (CMS) to control/dim the streetlights	$3,800,000

6.9.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Develop forward works programme of high priority "black" areas resulting from the lux mapping survey (HISLAT survey) of the P-Category (local road) lights.
- Undertake an assessment of long-life markings to determine where and when these should be used.
- Undertake cyclic night-time inspections with safety engineers to determine improvements to signs, markings, RRPMs and edge marker posts.
- Carry out an audit of existing guardrails to determine their condition and compliance with current safety standards.

6.10 Operational Traffic Management

Work Categories: **123 Network Operations (was Operational Traffic Management), 222 Traffic Services Renewals & 341 Low Cost/Low Risk Improvements**

6.10.1 Links to Strategic Case

Problem Statement: **Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Benefits of Addressing Problem: Upgrading the traffic signals will result in more efficient movement of traffic reducing congestion. The provision of cameras at each site will allow issues to be addressed more quickly and enable ATOC support potentially reducing operating costs.

Providing a remote operation for the Te Matau a Pohe/Kotuitui Whitinga bridges would reduce ongoing operating costs.

Consequences of Not Addressing the Problem: Inconsistent levels of service from our traffic signals will continue, leading to delays and driver frustration. Signal issues will need to be solved on site which leads to longer response times to resolve issues.

Continuing the manned operation of the Te Matau a Pohe/Kotuitui Whitinga bridges will result in high ongoing operating costs.

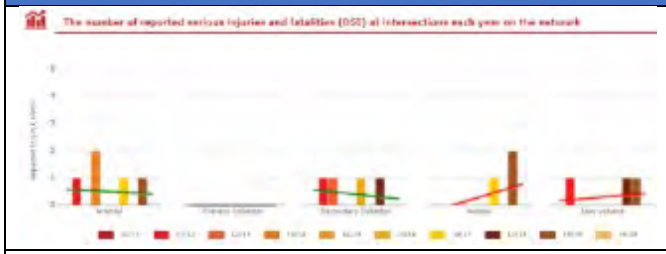
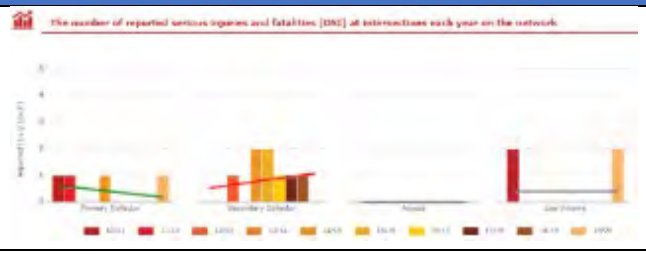
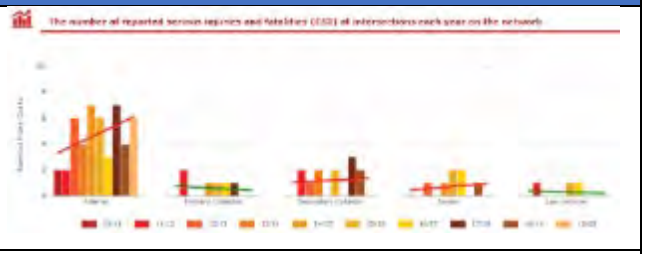
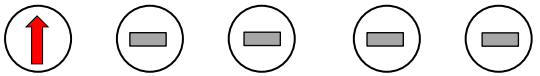
6.10.2 Levels of Service

ONRC Customer Outcomes: **ONRC Travel Time Reliability CO1** – Throughput at indicator sites (NO DATA AVAILABLE)

Customer Levels of Service: **ONRC Safety TO6** – Intersections
ONRC Cost Efficiency 5 – Overall network cost

6.10.3 Evidence and Gap Analysis

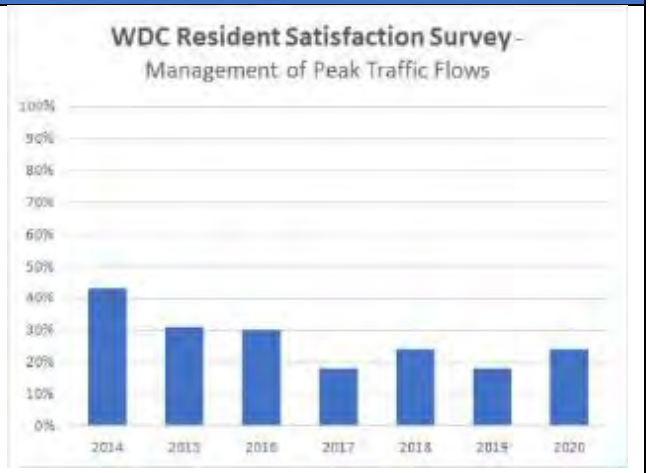
ONRC Safety TO6 – Intersection – Urban roads

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
FNDC Intersection DSI – It should be noted that there is very little data for intersection crashes for urban roads on the FNDC network. This makes it difficult to determine any issues or trends. However, it appears that there may be an increasing trend in urban intersection crashes on the Access and Low Volume roads. However, this is likely to be addressed though other work activities because FNDC does not currently carry out any activity though WC 123 and is unlikely to implement traffic signals of any of its urban intersections for the foreseeable future.	**KDC Intersection DSI** - It should be noted that there is very little data for urban intersection crashes on the KDC network. This makes it difficult to determine any issues or trends. From the limited data available, there may be a slight increasing trend on urban Secondary Collector roads. However, this is likely to be addressed though other work activities because KDC does not currently carry out any activity though WC 123 and is unlikely to implement traffic signals of any of its urban intersections for the foreseeable future.	**WDC Intersection DSI** – It should be noted that there is little data for intersection crashes on many road classes for the WDC network. This makes it difficult to determine any issues or trends. It appears that there could be an increasing trend of intersection crashes on WDC's urban Arterial roads.

NZTA Peer Group Charts – 3yr Cost/km WC 123 Operational Traffic Management

FNDC	KDC	WDC
		
		
FNDC Operational Traffic Management Cost – FNDC does not have any operational traffic management cost.	**KDC Operational Traffic Management Cost** – KDC does not have any operational traffic management cost.	**WDC Operational Traffic Management Cost** – WDC has the highest operational traffic management cost in their peer group. This is not surprising as it spends $270,000 on average per annum on operating the Te Matau a Pohe bascule bridge. If this amount was removed, Whangarei's cost/km would be similar to Dunedin's. Whangarei also operates 26 traffic signals and 49 active school zone signs.

Resident Satisfaction – Management of Peak Traffic Flows

FNDC	KDC	WDC
		
		
FNDC Satisfaction with Peak Traffic Flows – FNDC does not measure the satisfaction with peak traffic flows.	**KDC Satisfaction with Peak Traffic Flows** – KDC does not measure the satisfaction with peak traffic flows.	**WDC Satisfaction with Peak Traffic Flows** – Resident satisfaction with Whangarei's morning and evening peak traffic flows has decreased significantly in the 7 years from over 40% to 24%. This is a poor result. The main reason for high dissatisfaction with the traffic flows is likely to be due to the effects of the ongoing construction works on SH1 at Tarewa Road and Loop Road and also at the Porowini/Maunu intersection. It also a reflection of the rapid growth in traffic flows in Whangarei as a result of high population growth in the city over the past five years.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – From the limited crash data, it appears that there may be an increasing trend in urban intersection crashes on FNDC's Access and Low Volume roads. However, this is likely to be addressed though other work activities because FNDC does not currently carry out any activity though WC 123 and is unlikely to implement traffic signals of any of its urban intersections for the foreseeable future.	**KDC Summary** – From the limited data available, there may be a slight increasing trend on KDC's urban Secondary Collector roads. However, this is likely to be addressed through other work activities because KDC does not currently carry out any activity though WC 123 and is unlikely to implement traffic signals of any of its urban intersections for the foreseeable future.	**WDC Summary** - It appears that there could be an increasing trend of intersection crashes on WDC's urban Arterial roads. WDC has the highest operational traffic management costs in their peer group. This is not surprising as it spends $270,000/year operating the Te Matau a Pohe bascule bridge. If this amount was removed, Whangarei's cost/km would be similar to Dunedin's. WDC also operates 26 sets of traffic signals and 49 active school zone signs. Satisfaction with peak traffic flows in Whangarei is low and this is likely to be influenced by major construction projects in and around the city. It also reflects the rapid growth in the district over the past five years.

6.10.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for operational traffic management:

Option	Description
Option 1 - Improve detection and operation of signals in Whangarei	Improve detection and operation of signalised intersections in Whangarei to optimise their performance and reduce congestion. This would include CCTV cameras at key sites and improved signal phasings.
Option 2 - Remote operation of the opening bridges in Whangarei	Remote operation of the Te Matau a Pohe and Kotuitui Whitinga opening bridges in Whangarei to reduce the cost of service which currently requires an operator to be based on site.

6.10.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Operational Traffic Management	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Policy Approach** **Alternative Approaches – Different Solutions/Technology** • Option 2 - Remote operation of the opening bridges in Whangarei **Demand Management** **LOS Adjustments** • Option 1 - Improve detection and operation of signals in Whangarei	1 2	1.05 0.8	**Yes** **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Improve detection and operation of signals in Whangarei
- Option 2 - Remote operation of the opening bridges in Whangarei

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Operational Traffic Mgt (WC 123)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments	Yes	1	Improve detection and operation of signalised intersections in Whangarei.
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**			
❑ **Route** Management			
❑ Alternative approaches – different **solutions/technology**	Yes	2	Remote operation of the Te Matau a Pohe and Kotuitui Whitinga opening bridges in Whangarei.
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Criteria	Weighting (Importance) (Total to 100%)	How good is this option					
		Option 1 - Improve detection and operation of signals in Whangarei		Option 2 - Remote operation of the opening bridges in Whangarei		Option 3	
		Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	2	0.2	1	0.1		0
Problem solving effectiveness	10%	2	0.2	0	0		0
Benefits realised	10%	2	0.2	0	0		0
Good Environmental impacts	5%	1	0.05	0	0		0
Value for Money	10%	2	0.2	3	0.3		0
Closing Customer and Technical LoS gaps and impacts	10%	2	0.2	0	0		0
Closing ONRC Performance gaps	10%	0	0	2	0.2		0
Asset preservation and sustainability	10%	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	2	0.2		0
Life Cycle Management	10%	0	0	0	0		0
COVID-19 Recovery	5%	0	0	0	0		0
etc.			0		0		0
Totals	**100%**		**1.05**		**0.8**		**0**

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

REG THE ROAD EFFICIENCY GROUP

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6.10.6 Financial Impact

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

6.10.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
123	Network Operations (was Operational Traffic Management)	No programme – No change	No Change
222	Traffic Services Renewals	No programme – No change	No Change
341	Low Cost/Low Risk Improvements	No programme – No change	No Change

6.10.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
123	Network Operations (was Operational Traffic Management)	+$40,000/yr - New programme to maintain and operate KDC's school zone signs	+$40,000/yr
222	Traffic Services Renewals	No programme – No change	No Change
341	Low Cost/Low Risk Improvements	No programme – No change	No Change

6.10.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
123	Network Operations (was Operational Traffic Management)	No change	No Change
222	Traffic Services Renewals	+$100,000/yr for additional traffic signal renewals to improve detection and operation of signals to ensure these are as efficient as possible.	+$100,000/yr
341	Low Cost/Low Risk Improvements	$2,000,000 to continue to upgrade traffic signals to provide CCTV cameras, fibre connection, WiFi backup and central management to better control the signals $200,000 to upgrade the Te Matau a Pohe Comms system to enable it to be remotely operated.	$2,200,000

6.10.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Determine the feasibility of carrying out signal and bridge operations remotely through a Northland regional control centre (similar to ATOC) including assessment of ongoing operating costs.
- Determine a suitable central management system for streetlight control and other “smart” technologies.

6.11 Walking & Cycling

Work Categories: **124 Cycleway Maintenance, 125 Footpath Maintenance, 224 Cycleway Renewal, 225 Footpath Renewal, 341 Low Cost/Low Risk Improvements, 451 Walking Facilities & 452 Cycling Facilities**

6.11.1 Links to Strategic Case

Problem Statement: **Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Benefits of Addressing Problem: Providing and maintaining cycleways and footpath with strong connections and in a fit for purpose condition will encourage active mode use and reduce private vehicle dependency.

Consequences of Not Addressing the Problem: Without good pedestrian and cyclist facilities, there will be lower active mode use and more dependence on private vehicles.

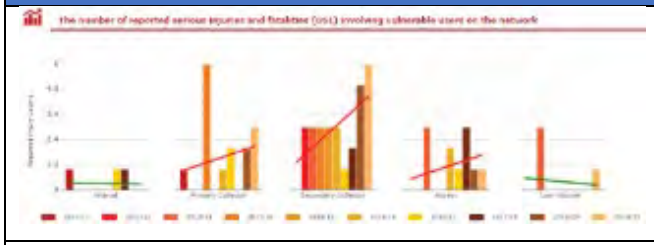
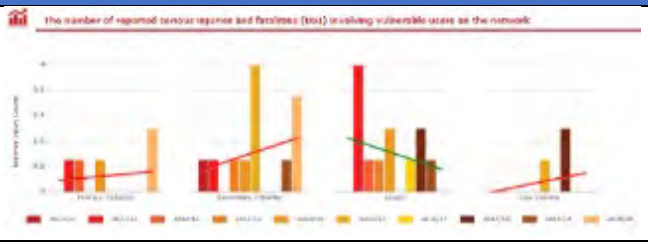
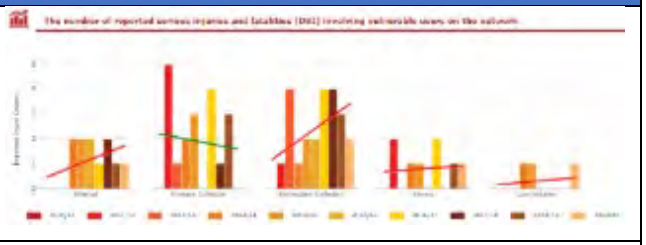
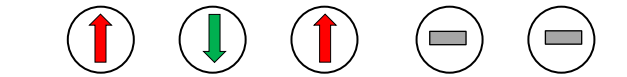
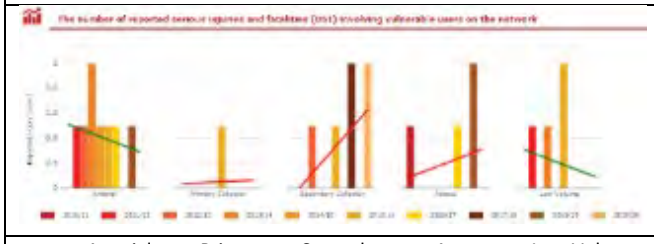
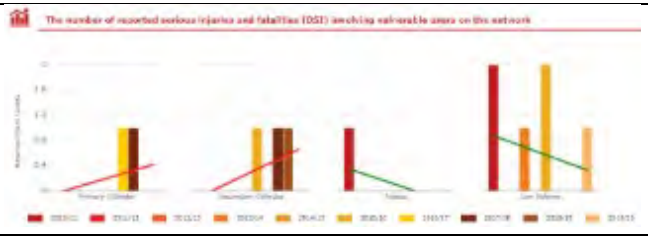
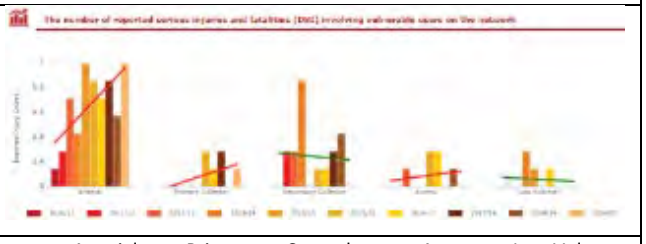
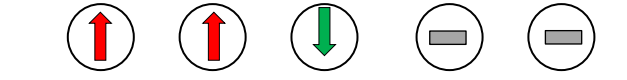
6.11.2 Levels of Service

ONRC Customer Outcomes: None

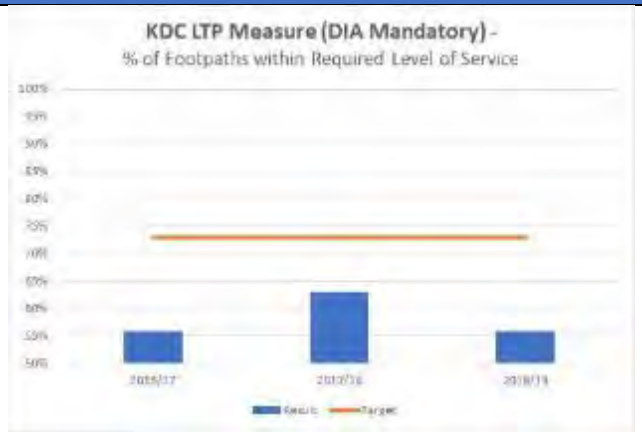
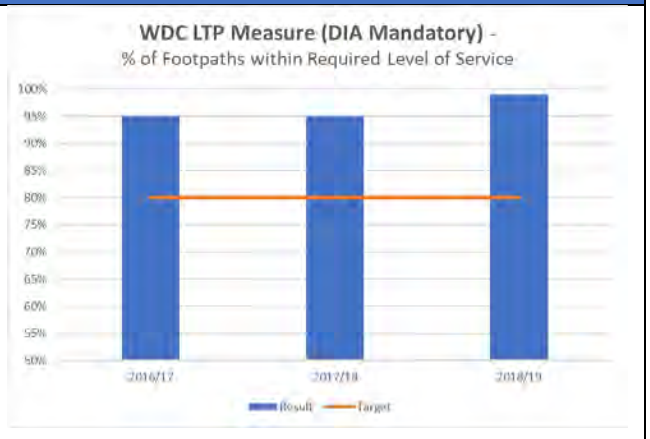
Customer Levels of Service:
ONRC Safety TO8 – Cycle Path Faults (NO DATA AVAILABLE)
ONRC Safety TO9 – Vulnerable Users
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.2.1 – Percentage of footpaths in territorial authority that meet LOS standards (Current measure-DIA)
LTP 1.2.2 – Resident satisfaction with footpaths in urban area (Current measure)
LTP 1.2.3 – Length of walking and cycling network built each year (Current measure)

6.11.3 Evidence and Gap Analysis

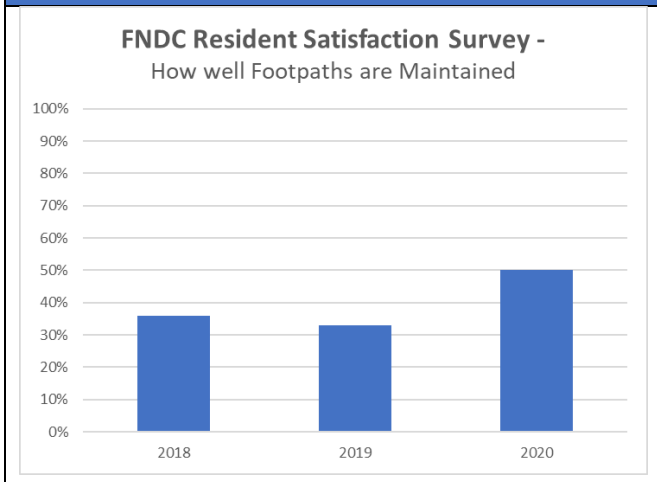
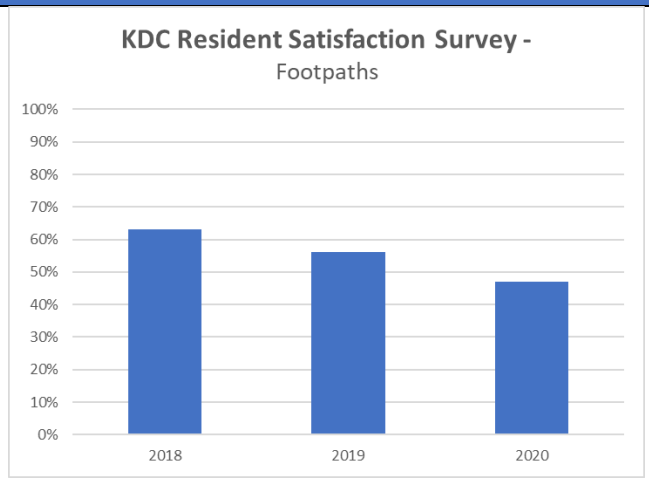
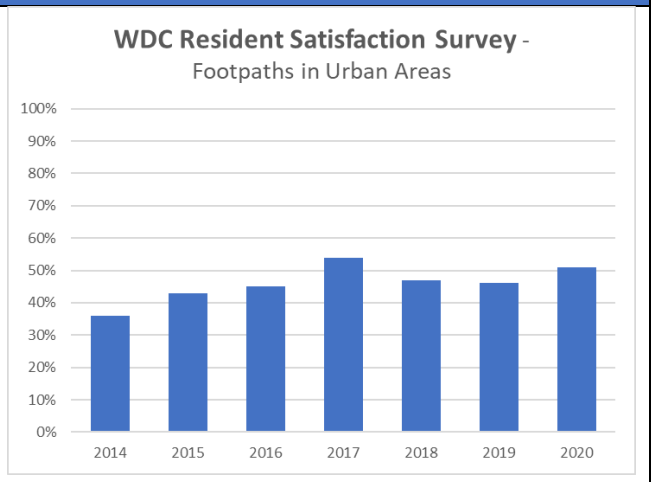
ONRC Safety TO9 – Vulnerable Users – Rural roads (top graph) & Urban roads (bottom graph)

FNDC	KDC	WDC
		
		
		
		
FNDC Vulnerable User DSI – It should be noted that there is little data for vulnerable user crashes for rural roads and almost none for urban roads on the FNDC network. This makes it difficult to determine any issues or trends. It appears that there may be an increasing trend in vulnerable user crashes on rural Primary and Secondary Collectors and Access roads as well as urban Secondary Collector and Access roads. As 70% of these vulnerable user crashes involved motorcycles or mopeds, these trends are unlikely to relate to pedestrians and cyclists.	**KDC Vulnerable User DSI** - It should be noted that there is very little data for vulnerable user crashes on the KDC network. This makes it difficult to determine any issues or trends. It appears that there may be an increasing trend in crashes on rural and urban Secondary Collector roads. However, as 80% of these vulnerable user crashes involved motorcycles or mopeds, these trends are unlikely to relate to pedestrians and cyclists.	**WDC Vulnerable User DSI** - It should be noted that there is little data for many roads on the WDC network. This makes it difficult to determine any issues or trends. It appears that there could be an increasing trend in vulnerable user crashes on its rural Secondary Collector and urban Arterial and Primary Collector roads. However, as 60% of these vulnerable user crashes involved motorcycles or mopeds, only the urban Arterial and Primary Collector trends are likely to relate to pedestrians and cyclists.

LTP Measure – Percentage of Footpaths meeting Required Level of Service (DIA)

FNDC	KDC	WDC
		
		
FNDC Footpaths meeting Required Level of Service – FNDC started to track this measure in 2018/19, but has only identified a benchmark which to compare this result to. The NTA has completed a video assessment of each council's network and this data will now be used to report on this measure going forward.	**KDC Footpaths meeting Required Level of Service** – The number of KDC footpaths meeting the required level of service is reported at 56% which is much lower than the target of 73%. This is a function of how KDC is measuring the results for this measure. Due to lack of other data, KDC is using the percentage of residents who are satisfied with the footpath network as the measure. The NTA has completed a video assessment of each council's network and this data will now be used to report on this measure. This is likely to produce a significantly better result in the future.	**WDC Footpaths meeting Required Level of Service** – The number of WDC footpaths meeting the required level of service is reported at 99% which is much higher than the target of 80%. As for KDC, this is a function of how WDC is measuring the results for this measure. Due to lack of other data, WDC is using the number of maintenance dispatches raised on the footpath network to calculate the result, which may not truly reflect whether the LOS is being met. The NTA has completed a video assessment of each council's network and this data will now be used to report on this measure. This is likely to produce a more realistic result in the future.

Resident Satisfaction – Footpaths

FNDC	KDC	WDC
		
		
FNDC Satisfaction with Footpaths – The percentage of residents who are satisfied with FNDC's footpaths is 50% and this has increased significantly over the last year. This satisfaction rate is considered to be an adequate result. The increase in satisfaction in 2020 is likely to a larger programme of footpath improvements and new footpaths being completed when compared to previous years.	**KDC Satisfaction with Footpaths** – The KDC satisfaction scores are based on people who scored 6 or more out of 10 for satisfaction (10 being the highest), whereas the other two councils counted scores of 7 or more as being satisfied. This means that the KDC results should in general be slightly higher than the other councils. The KDC satisfaction rate for their footpaths is currently 47% which is much lower than the previous two years. This satisfaction rate is considered to be a slightly poor result, given that KDC's satisfaction scores should be higher than the other councils as described above. The reason for the drop in satisfaction maybe as a result of increasing growth pressure in Mangawhai which is resulting in higher demand and expectation for better footpaths in this community.	**WDC Satisfaction with Footpaths** – The percentage satisfied with WDC's footpaths is currently 51% and has been about this level for the past four years. This satisfaction rate is considered to be an adequate result. The increase in 2017 and again in 2020 is likely to be due to the opening of sections of the shared path network.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – There are very low numbers of pedestrian and cyclist crashes on FNDC's network. The condition of FNDC's is starting to be measured through video surveys, but at this stage only a baseline for future comparison has been developed. The percentage of residents who are satisfied with FNDC's footpaths is 50% and this has increased significantly over the last year. This is likely to be due to FNDC implementing a larger footpath programme when compared to previous years.	**KDC Summary** – There are very low numbers of pedestrian and cyclist crashes on KDC's network. The number of KDC footpaths meeting the required level of service is reported at 56% which is much lower than the target of 73%. However, this is due to KDC using the percentage of residents satisfied with the footpaths which is very subjective and does not reflect the actual condition of the footpaths. A video survey has been undertaken and this will be used to determine condition going forward. The KDC satisfaction rate for their footpaths is currently 47% which is much lower than the previous two years. This maybe as a result of increasing growth pressure in Mangawhai which is resulting in higher demand and expectation for better footpaths in this community.	**WDC Summary** - It appears that there could be an increasing trend of pedestrian and cyclist crashes on WDC's the urban Arterial and Primary Collector. The number of WDC footpaths meeting the required level of service is reported at 99% which is much higher than the target of 80%. However, this is due to WDC using the percentage of dispatches raised for footpaths and does not reflect the actual condition of the footpaths. A video survey has been undertaken and this will be used to determine condition going forward. The WDC satisfaction rate for their footpaths is currently 51% and has been about this level for the past four years which is an adequate result is likely to supported by the ongoing work on the Whangarei shared path programme.

6.11.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for footpaths and cycleways:

Option	Description
Option 1 - Widen footpaths that are too narrow for a mobility scooter. Increase minimum footpath width in Engineering Standards	Widen footpaths that are too narrow for mobility scooters to pass. Consider increasing the minimum footpath width in the council engineering standards to 1.6m.
Option 2 - Continue the implementation of the Whangarei shared path network	Continue the development of the shared path network including completing the Kamo, Raumanga and Onerahi paths, as well as extending to Maunu and Tikipunga and linking through the city centre.
Option 3 - Shared path networks for Kerikeri/Waipapa and Mangawhai	Consider shared path network linking Kerikeri to Waipapa and implement the planned Mangawhai Shared Path network. This will encourage mode shift to active modes and reduce congestion during the summer peak period.
Option 4 - Construct rural Heartland rides identified in the Northland Integrated Cycle Business Case	Construct the rural cycleways (ie Heartland Rides) identified in the Regional Walking and Cycling Strategy and the PGF funded Northland Integrated Cycling Plan.
Option 5 - Develop a network of safe cycleways between rural towns	Develop a network of safe rural cycleways linking rural towns and communities, particularly in areas of high social deprivation and transport disadvantage.
Option 6 - Implement footpaths and cycleways identified through Township Improvement Plans and Council Spatial Plans	Construct footpath linkages and cycleways identified through the PGF funded Township Improvement Plans and Council Spatial Plans to encourage growth and maximise tourism opportunities.

6.11.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Walking and Cycling	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Programme Adjustment** **Route Management** • Option 2 - Continue the implementation of the Whangarei shared path network • Option 3 - Shared path networks for Kerikeri/Waipapa and Mangawhai • Option 4 - Construct rural Heartland rides identified in the Northland Integrated Cycle Business Case • Option 5 - Develop a network of safe cycleways between rural towns • Option 6 - Implement footpaths and cycleways identified through Township Improvement Plans and Council Spatial Plans **Policy Approach** **LOS Adjustments & Improve Systems and Capability** • Option 1 - Widen footpaths that are too narrow for a mobility scooter. Increase minimum footpath width in Engineering Standards	2 3 4 5 6 1	1.4 1.0 0.4 0.6 0.8 1.05	**Yes** **Yes** **Yes** No **Yes** **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Widen footpaths that are too narrow for a mobility scooter. Increase minimum footpath width in Engineering Standards
- Option 2 - Continue the implementation of the Whangarei shared path network
- Option 3 - Shared path networks for Kerikeri/Waipapa and Mangawhai
- Option 4 - Construct rural Heartland rides identified in the Northland Integrated Cycle Business Case – through alternative funding (PGF etc)
- Option 6 - Implement footpaths and cycleways identified through Township Improvement Plans and Council Spatial Plans

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Footpath and Cyclelanes (WC 124, 125, 451, 452)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments	Yes	1	Widen footpaths that are too narrow for mobility scooters.
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**			
❑ **Route** Management	Yes	2 - A 3 - B 4 - C 5 - D 6 - E	A. Continue the development of the shared path network including completing the Kamo, Raumanga and Onerahi paths, as well as extending to Maunu and Tikipunga and linking through the city centre. B. Consider shared path network linking Kerikeri to Waipapa. Implement the planned Mangawhai Shared Path network. C. Construct the rural cycleways (ie Heartland Rides) identified in the Regional Walking and Cycling Strategy and the PGF funded Northland Integrated Cycling Plan. D. Develop a network of safe rural cycleways linking rural towns and communities. E. Construct footpath linkages and cycleways identified through the PGF funded Township Improvement Plans and Council Spatial Plans.
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**	Yes	1	Consider increasing the minimum footpath width in the council engineering standards to 1.6m.

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Widen footpaths that are too narrow for a mobility scooter. Increase minimum footpath width in Engineering Standards		Option 2 - Continue the implementation of the Whangarei shared path network		Option 3 - Shared path networks for Kerikeri/Waipapa and Mangawhai		Option 4 - Construct rural Heartland rides identified in the Northland Integrated Cycle Business Case		Option 5 - Develop a network of safe cycleways between rural towns		Option 6 - Implement footpaths and cycleways identified through Township Improvement Plans and Council Spatial Plans		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	2	0.2	3	0.3	3	0.3	2	0.2	2	0.2	3	0.3		0
Problem solving effectiveness	10%	1	0.1	2	0.2	2	0.2	0	0	1	0.1	2	0.2		0
Benefits realised	10%	1	0.1	2	0.2	2	0.2	1	0.1	1	0.1	2	0.2		0
Good Environmental impacts	5%	0	0	2	0.1	1	0.05	1	0.05	1	0.05	1	0.05		0
Value for Money	10%	3	0.3	1	0.1	0	0	0	0	0	0	-2	-0.2		0
Closing Customer and Technical LoS gaps and impacts	10%	2	0.2	2	0.2	1	0.1	0	0	1	0.1	1	0.1		0
Closing ONRC Performance gaps	10%	1	0.1	2	0.2	1	0.1	0	0	1	0.1	1	0.1		0
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	0	0	0	0	-1	-0.1	-1	-0.1	0	0		0
Life Cycle Management	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
COVID-19 Recovery	5%	1	0.05	1	0.05	1	0.05	3	0.15	1	0.05	1	0.05		0
etc.			0		0		0		0		0		0		0
Totals	100%		1.05		1.4		1.0		0.4		0.6		0.8		0

6.11.6 Financial Impact

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

6.11.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
124	Cycleway Maintenance	-$30,000/yr due to Twin Coast Cycle Trail maintenance funded elsewhere	-$30,000/yr
125	Footpath Maintenance	-$500,000/yr transfer of footpath renewal funding to new WC 225 Footpath Renewals	-$500,000/yr
225	Footpath Renewals (NEW)	+$500,000/yr transfer of footpath renewal funding from WC 125 Footpath Maintenance	+$500,000/yr
341	Low Cost/Low Risk Improvements	$2,880,000 for new footpaths to improve road safety and promote active modes $1,995,000 for new on and off road cycleways to improve cyclist safety $100,000 to improve accessibility for mobility scooters and wheelchairs $200,000 for destination facilities for cyclists $175,000 to improve pedestrian access in urban areas $1,000,000 for footpaths and shared paths as identified in the Twin Coast Discovery Route PBC $475,000 for Regional Cycleway facilities identified in the FNDC Integrated Transport Plan PBC	+$4,463,000
451	Walking Facilities	No programme – No Change	No Change
452	Cycling Facilities	$8,839,000 to re-route the section of Twin Coast Cycle Trail from Kawakawa to Opua. This work is required due to the current route on the rail line, being re-used for tourist rail as part of a PGF funded project.	+$8,839,000
004	Investment Management	The following studies and plans have ben identified in the FNDC Integrated Transport Plan: $75,000 to develop a plan to improve Pedestrian Access in urban areas $75,000 to carry out a review of existing recreational walking and cycling tracks and to identify opportunities for the development of new tracks $150,000 to investigate opportunities to improve cycle connections $75,000 to develop township cycling plans	+$375,000

6.11.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
124	Cycleway Maintenance	+$5,000/yr due to maintenance associated with the new Mangawhai Shared Path	+5,000/yr
125	Footpath Maintenance	-$50,000/yr transfer of footpath renewal funding to new WC 225 Footpath Renewals	-$50,000/yr
225	Footpath Renewals (NEW)	+$50,000/yr transfer of footpath renewal funding from WC 125 Footpath Maintenance	+$50,000/yr
341	Low Cost/Low Risk Improvements	$600,000 for new footpaths to improve road safety and promote active modes	+$275,000
451	Walking Facilities	$500,000 for the construction of footbridges in Kaiwaka as part of a PGF funded initiative	+$500,000
452	Cycling Facilities	$17,360,000 for the development of the Mangawahi Shared Path to promote walking and cycling in this rapidly growing town $2,000,000 (PGF Funded) for the Kaihu Rail Trail which is part of the Twin Coast Discovery Route PBC $100,000 for the development of a business case for the Dargaville River Path which is identified in the Twin Coast Discovery Route Dargaville Township Plan PBC	+$16,760,000

6.11.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
124	Cycleway Maintenance	+$15,000/yr for maintenance of the increased shared path network in Whangarei	+$15,000/yr
125	Footpath Maintenance	-$400,000/yr transfer of footpath renewal funding to new WC 225 Footpath Renewals	-$400,000/yr
225	Footpath Renewals (NEW)	+$400,000/yr transfer of footpath renewal funding from WC 125 Footpath Maintenance	+$400,000/yr
341	Low Cost/Low Risk Improvements	$2,685,000 to continue to develop the footpath network to improve road safety and promote active modes $818,000 to develop a network of on-road cycle lanes to connect to the shared path network	+$2,278,000
451	Walking Facilities	No programme – No Change	No Change
452	Cycling Facilities	The projects below are identified in the Northland Integrated Cycle Implementation Plan PBC, the Northland Regional Walking & Cycling Strategy or the Whangarei Walking & Cycling Strategy. They will improve walking and cycling safety, promoting active modes and improving tourism opportunities. $6,200,000 to complete the Kamo Shared Path. $2,035,000 to continue the development of the Tikipunga Shared Path $5,090,000 to construct the Tukukaka Coast Heartland Ride from Whangarei to Ngunguru	+$9,281,000

		$730,000 to continue the development of the Beam Bay Coastal Trail Heartland Ride $5,146,000 (CIP Funded) to complete the development of the Raumanga Shared Path $509,000 (PGF funded) to construct the Whangarei Heads Cycle Link Heartland Ride	

6.11.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- None Identified.

6.12 Network and Asset Management

Work Categories: **151 Network and Asset Management**

6.12.1 Links to Strategic Case

Problem Statement:

Lack of adequate resourcing is a major issue for the transport industry in Northland which 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.

A key issue for customers is lack of communication of road works and the delays these cause motorists, freight operators and bus users.

Benefits of Addressing Problem:

Improving resourcing would result in better quality staff making better decisions, 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.

Without changes to the way Council communicates about road works, unexpected road works will continue to cause delay and frustration, particularly on key commuter, freight and public transport routes.

6.12.2 Levels of Service

ONRC Customer Outcomes: None

Customer Levels of Service:

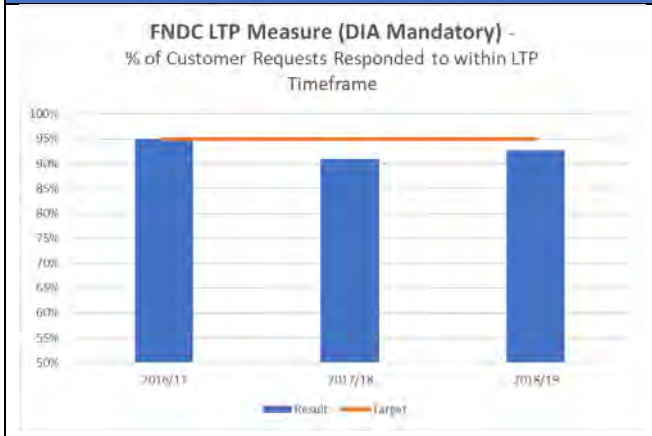
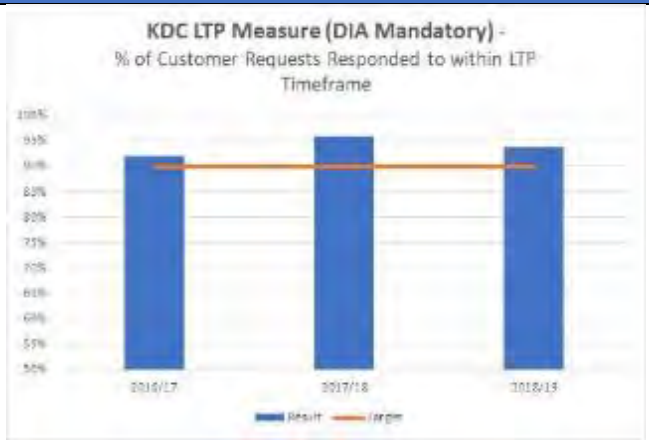
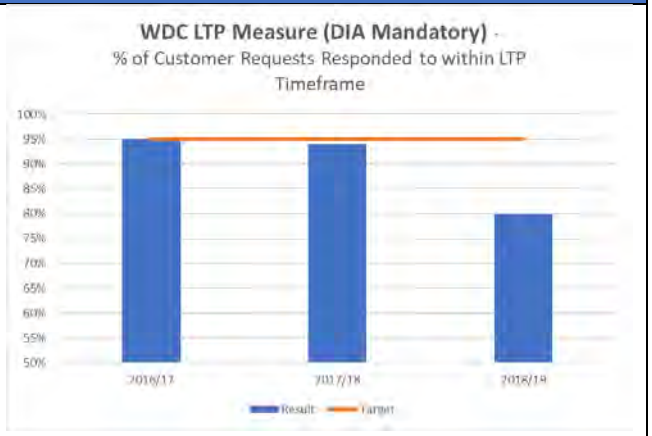
ONRC Safety TO2 – Temporary Hazards (NO DATA AVAILABLE)
ONRC Safety TO10 – Roadside Obstructions (NO DATA AVAILABLE)
ONRC Cost Efficiency 5 – Overall network cost
LTP 1.1.8 – Percentage of CRM's relating to roads and footpaths responded to within LTP timelines (Current measure-DIA)
LTP 1.1.X – The number of unplanned events and incidents (New measure) (NO DATA AVAILABLE)
LTP 1.1.X – Residents satisfaction with the road network (New measure)

6.12.3 Evidence and Gap Analysis

NZTA Peer Group Charts – 3yr Cost/km WC 151 Network and Asset Management

FNDC	KDC	WDC
		
		
FNDC Network and Asset Management Cost – FNDC's network and asset management cost is near the average for its peer group. This is lower than expected and is due in part to FNDC charging its in-house professional services for maintenance to the individual maintenance work categories, rather than to WC151. It is also due to FNDC not investing adequately in network and asset management in the past. The development of the Northland Transportation Alliance (NTA), has dramatically improved the level of management being undertaken for FNDC in the past two years which will pay benefits in terms of better management of the network's assets. Going forward the WC151 costs will increase due to the reallocation of internal maintenance costs to WC151 and the additional staff costs required for the development of the NTA.	**KDC Network and Asset Management Cost** – The KDC network and asset management cost is in the top third of their peer group. This is higher than expected, particularly given that KDC charging its in-house professional services for maintenance to the individual maintenance work categories, rather than to WC151. It is expected that KDC's WC151 cost may be higher due to the transition from an external professional service consultant to an in-house business unit in 2017. The development of the Northland Transportation Alliance (NTA), is improving the level of management being undertaken of KDC's assets. Going forward the WC151 costs will increase due to the reallocation of internal maintenance costs to WC151 and the additional staff costs required for the development of the NTA.	**WDC Network and Asset Management Cost** – The WDC network and asset management cost is near the average for their peer group. This is lower than expected due to Whangarei having a relatively complex network compared to most of its peer group and its high level of investment in asset management strategies and processes. The development of the Northland Transportation Alliance (NTA), is enabling the sharing of costs for development of strategies and processes which helping keep the WC151 costs down.

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

FNDC	KDC	WDC
		
		
FNDC Customer Requests Responded to on Time – FNDC is currently responding to 93% of its customer requests on time which is slightly below its target of 95%. Overall this is considered to be an adequate result.	**KDC Customer Requests Responded to on Time** – KDC is responding to 94% of its customer requests on time which is higher than its target of 90%. Overall this is an adequate result given that KDC has a lower target than the other councils.	**WDC Customer Requests Responded to on Time** – WDC is responding to only 80% of its customers on time and this is significantly lower than its target of 95%. Overall this is a poor result. The drop in this result in 2018/19 was due to an error found in the way WDC was previously reporting this data. WDC has put measures in place to improve this result in the future.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – FNDC's network and asset management cost is near the average for its peer group, and this lower than expected due to in-house maintenance staff costs not being charged to WC151 as well as lack of historic investment in asset management. The development of the Northland Transportation Alliance (NTA), has dramatically improved the level of management being undertaken for FNDC which will in better management of the network's assets. The WC151 costs will increase due to the reallocation of internal maintenance costs to WC151 and the additional staff costs required for the development of the NTA. Customer requests are largely being addressed on time.	**KDC Summary** – The KDC network and asset management cost is in the top third of their peer group. This is higher than expected, and is expected to be due to the transition from an external professional service consultant to an in-house business unit in 2017. KDC is also charging its in-house professional services for maintenance to the individual maintenance work categories, rather than to WC151 The development of the Northland Transportation Alliance (NTA), is improving asset management practices for Kaipara's assets. The WC151 costs will increase due to the reallocation of internal maintenance costs to WC151 and the additional staff costs required for the development of the NTA. Customer requests are being addressed on time.	**WDC Summary** - The WDC network and asset management cost is near the average for their peer group, which is lower than expected due to Whangarei having a relatively complex network compared to most of its peer group and its high level of investment in asset management strategies and processes. The development of the Northland Transportation Alliance (NTA), is enabling the sharing of costs for development of strategies and processes which helping keep the WC151 costs down. Customer requests are not currently being addressed on time, but a change in process should see these targets met in the future.

6.12.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for network and asset management:

Option	Description
Option 1 - High Risk Rural Road (HRRR) and crash reduction studies. Complete assessment of out of context curves	Identify problem areas through HRRR studies and crash reduction studies with a view to implementing Standard Safety Interventions (SSI). Complete the assessment of out of context curves so these can be adequately signed.

Option	Description
Option 2 - Safety related advocacy and support for Police	Support the new dedicated impairment vehicles for the Far North and Kaipara/Whangarei, with adequate police officers to run these on a weekly basis. Consider advocating for schemes for government funded car seats for lower socio-economic families. Advocate for more passing opportunities on State Highways where appropriate. Advocate for schemes for government funded mobile mechanics and vehicle testing stations.
Option 3 - Walking and Cycling strategy for Far North. Develop Principal Cycleway Network Plan for on-road cyclelanes in Whangarei and Kerikeri/ Waipapa	Develop a Walking and Cycling strategy for the Far North to match those already developed for the other two councils. Develop and implement a Principal Cycleway Network Plan for on-road cyclelanes in Whangarei and Kerikeri/Waipapa to provide 'quick win' cycling opportunities utilising existing road space.
Option 4 - Develop resilience strategy targeting critical routes. Discuss NZTA funding opportunities on SH detour routes.	Develop a strategic approach to managing the resilience of detour routes. Discuss with NZTA opportunities for State Highway funding of SH detour routes on local roads. Continue the development of the Resilience Strategy and FWP, targeting critical routes.
Option 5 - Ensure Council procurement of high safety rated vehicles	Through Council procurement of vehicles, target vehicles with higher safety ratings to increase the safety of the vehicle fleet.
Option 6 - Ensure future land drainage is located on private land	Ensure future land drainage is undertaken on private land to avoid having deep drains running along the roadside.

6.12.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Network and Asset Management	**Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.	**Programme Adjustment** • Increase safety programme **Policy Approach** • Additional delineation **Demand Management** • Enhanced Road Safety Promotions with active in-house management.	**Policy Approach** **Supply Chain Improvements** • Option 5 - Ensure Council procurement of high safety rated vehicles **Improve Systems and Capability** • Option 1 - High Risk Rural Road (HRRR) and crash reduction studies. Complete assessment of out of context curves • Option 6 - Ensure future land drainage is located on private land **Demand Management** **Managing Demand** • Option 2 - Safety related advocacy and support for Police	5 1 6 2	0.3 1.0 0.3 0.9	No **Yes** No **Yes**
Network and Asset Management	**Resilience** - Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.	**Programme Adjustment** • Increase programme of resilience work on the WDC and KDC networks **Policy Approach** • Prioritise critical routes at the expense of lower priority routes **Demand Management** • Preventative maintenance programme	**Policy Approach** **Improve Systems and Capability** • Option 4 - Develop resilience strategy targeting critical routes. Discuss NZTA funding opportunities on SH detour routes.	4	0.9	**Yes**

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Network and Asset Management	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Policy Approach** **Improve Systems and Capability** • Option 3 - Walking and Cycling strategy for Far North. Develop Principal Cycleway Network Plan for on-road cyclelanes in Whangarei and Kerikeri/ Waipapa	3	0.8	**Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - High Risk Rural Road (HRRR) and crash reduction studies. Complete assessment of out of context curves
- Option 2 - Safety related advocacy and support for Police
- Option 3 - Walking and Cycling strategy for Far North. Develop Principal Cycleway Network Plan for on-road cyclelanes in Whangarei and Kerikeri/ Waipapa
- Option 4 - Develop resilience strategy targeting critical routes. Discuss NZTA funding opportunities on SH detour routes.

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Network & Asset Mgt (WC 151)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	2	Support the new dedicated impairment vehicles for the Far North and Kaipara/Whangarei, with adequate police officers to run these on a weekly basis. Consider advocating for schemes for government funded car seats for lower socio-economic families. Advocate for more passing opportunities on State Highways where appropriate. Advocate for schemes for government funded mobile mechanics and vehicle testing stations.
❑ **Route** Management			
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements	Yes	5	Through Council procurement of vehicles target higher safety ratings
❑ Improve **systems and capability**	Yes	3 - A 4 - B 1 - C 6 - D	A. Develop a Walking and Cycling strategy for the Far North. Develop and implement a Principal Cycleway Network Plan for on-road cyclelanes in Whangarei and Kerikeri/Waipapa. B. Develop a strategic approach to managing the resilience of detour routes. Discuss with NZTA opportunities for State Highway funding of SH detour routes on local roads. Continue the development of the Resilience Strategy and FWP, targeting critical routes. C. Identify problem areas through HRRR studies and crash reduction studies. Complete the assessment of out of context curves. D. Ensure future land drainage is undertaken on private land.

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - High Risk Rural Road (HRRR) and crash reduction studies. Complete assessment of out of context curves		Option 2 - Safety related advocacy and support for Police		Option 3 - Walking and Cycling strategy for Far North. Develop Principal Cycleway Network Plan for on-road cyclelanes in Whangarei and Kerikeri/ Waipapa		Option 4 - Develop resilience strategy targeting critical routes. Discuss NZTA funding opportunities on SH detour routes.		Option 5 - Ensure Council procurement of high safety rated vehicles		Option 6 - Ensure future land drainage is located on private land		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	2	0.2	2	0.2	2	0.2	0	0	0	0		0
Problem solving effectiveness	10%	2	0.2	1	0.1	1	0.1	2	0.2	1	0.1	1	0.1		0
Benefits realised	10%	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	0	0		0
Good Environmental impacts	5%	0	0	0	0	0	0	0	0	0	0	0	0		0
Value for Money	10%	3	0.3	3	0.3	3	0.3	3	0.3	1	0.1	2	0.2		0
Closing Customer and Technical LoS gaps and impacts	10%	2	0.2	1	0.1	1	0.1	1	0.1	0	0	0	0		0
Closing ONRC Performance gaps	10%	1	0.1	1	0.1	0	0	0	0	0	0	0	0		0
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Life Cycle Management	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
COVID-19 Recovery	5%	0	0	0	0	0	0	0	0	0	0	0	0		0
etc.			0		0		0		0		0		0		0
Totals	100%		1.0		0.9		0.8		0.9		0.3		0.3		0

REG THE ROAD EFFICIENCY GROUP

We are. LGNZ. Te Kāhui Kaunihera ō Aotearoa.

NZ TRANSPORT AGENCY WAKA KOTAHI

6.12.6 Financial Impact

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

6.12.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
151	Network and Asset Management	+$800,000/yr for four additional in-house staff and NTA on-charging of costs which has led to better planning, more focus on safety and asset management, and better delivery. +$600,000/yr due to the transfer of in-house staff maintenance charges to WC 151. +$90,000/yr for a new travel demand management activity to promote alternative modes such as walking and cycling +$150,000/yr for additional traffic counting through the new traffic counting contract -$750,000/yr for some AMP Improvement activities and safety activities being transferred to WC 003 Activity Management Planning.	+$890,000/yr
003	Investment Management	+$750,000/yr for AMP Improvement activities and safety activities being transferred from WC 151 +$37,500 to carry out an investigation of Climate Change mitigation measures	+$762,500/yr

6.12.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
151	Network and Asset Management	+$300,000/yr for two additional in-house staff and NTA on-charging of costs which has led to better planning, more focus on safety and asset management, and better delivery. +$150,000/yr due to the transfer of in-house staff maintenance charges to WC 151. +$40,000/yr for a new travel demand management activity to promote alternative modes such as walking and cycling	+$490,000/yr
003	Investment Management	None programmed – No change	No Change

6.12.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
151	Network and Asset Management	+$375,000/yr for safety project management costs and safety studies (ie CRS, safety reports etc). This work was previously being charged through WC 341 Low Cost Low Risk Improvements. +$150,000/yr for a new travel demand management activity to promote alternative modes such as public transport, walking and cycling.	+$525,000/yr
003	Investment Management	+$30,000/yr to continue to develop Activity Management Planning activities – includes ONF development	+$30,000/yr

6.12.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Determine which Council department has ownership and maintenance responsibilities for the Council-owned assets such as carparks, street furniture, shared paths, amenity lighting etc.
- Standardise the Annual Achievement Return reporting process using RAMM data, TIO data and council financial accounts.
- Implement the Asset Data Management System (ADMS) and merge the three council databases into one combined database for efficiency gains (only having to do things once instead of three times) to standardise the data storage, and to enable regional mapping of assets etc.
- Improve KDC customer request (CRM) data to include asset type which will enable year-on-year tracking of trends.
- Carry out annual assessment of customer requests (CRMs) and requests for service (RFS) to determine trends.
- Procurement Strategy – Update the NTA Procurement Strategy. During this update, consider implementing the improvements identified in Procurement Strategy Self-Assessment Section 6.18.3, and the Climate Change Section 4.13.
- Application of the One Network Framework (ONF) including implementation of the ONF performance measures and levels of service into the AMP and maintenance contracts.
- Development of an electronic "living" AMP document that is simple to understand and easy to update.

6.13 Low Cost/Low Risk Improvements

Work Categories: **341 Low Cost/Low Risk Improvements**

6.13.1 Links to Strategic Case

Problem Statement:

Safety - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.

Resilience - Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.

Growth and Alternative Transport - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

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 safeguarded.

Growth and Alternative Transport: Investment in alternative transport will promote mode shift which will help ease pressure on congested networks, particularly in high growth areas. Congestion relief project will reduce delays and frustration at key intersections. Walking and cycling links in rural towns will improve safety and access to employment, education and social opportunities.

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, life lines and access to isolated communities.

Growth and Alternative Transport: Congestion will continue to cause delays and restrict access in high growth areas. Dependency on private vehicles will continue. Walking and cycling access to employment, education and social opportunities in rural towns will be a constraint.

6.13.2 Levels of Service

ONRC Customer Outcomes:

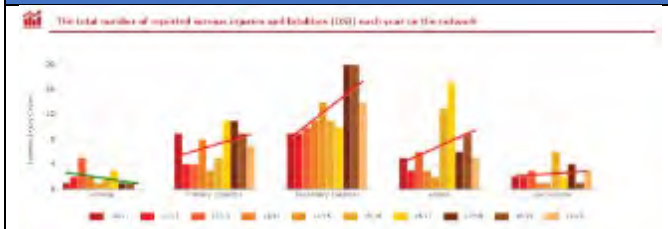
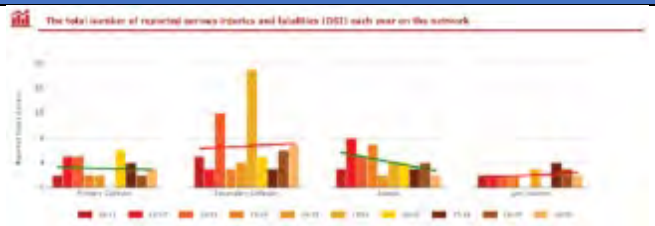
ONRC Safety CO1 – The Number of Fatal and Serious Injuries on the Network
ONRC Safety CO2 – Collective Risk
ONRC Safety CO3 – Personal Risk
ONRC Resilience CO1 – The number of journeys impacted by unplanned events(NO DATA AVAILABLE)
ONRC Resilience CO2 – The number of instances where road access is lost (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:

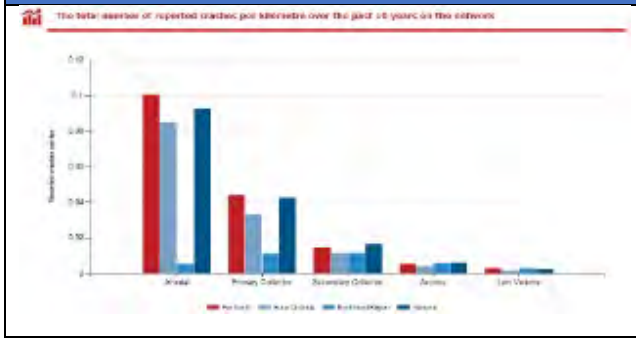
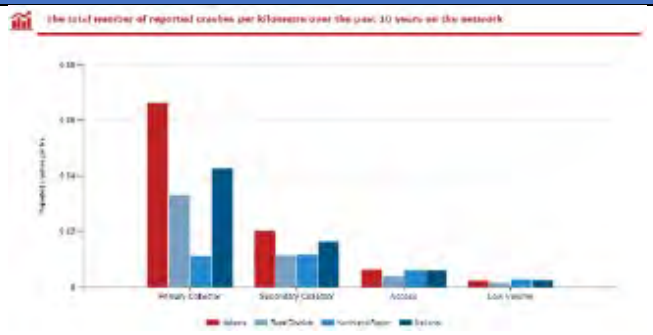
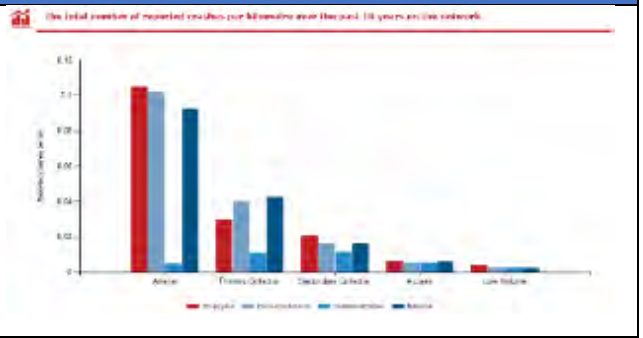
ONRC Safety TO1 – Permanent Hazards (NO DATA AVAILABLE)
ONRC Safety TO3 – Sight Distances (NO DATA AVAILABLE)
ONRC Safety TO5 – Loss of driver control at night
ONRC Safety TO6 – Intersections
ONRC Safety TO9 – Vulnerable Users
LTP 1.1.2 – The number change of fatal and serious crashes (Current measure-DIA)
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)

6.13.3 Evidence and Gap Analysis

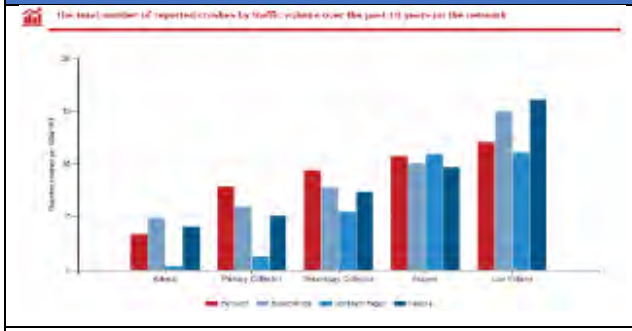
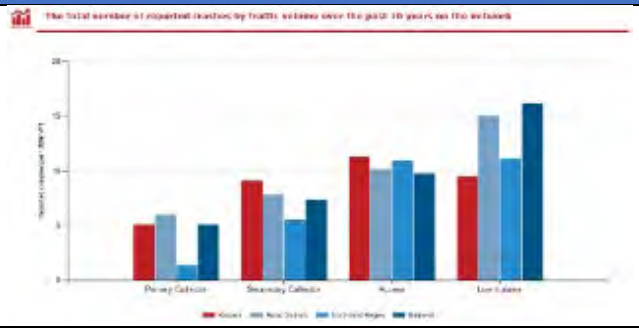
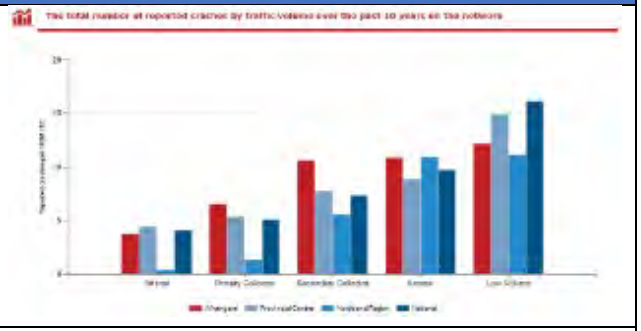
ONRC Safety CO1 – Number of Fatal and Serious Injuries on the Network

FNDC	KDC	WDC
		
Arterial ↓ / Primary Collector ↑ / Secondary Collector ↑ / Access ↑ / Low Volume ↑	Primary Collector ↓ / Secondary Collector ↑ / Access ↓ / Low Volume ↑	Arterial ↑ / Primary Collector ↑ / Secondary Collector ↑ / Access ↑ / Low Volume ↓
FNDC Number of DSI – There appears to be an increasing trend in death and serious injury (DSI) crashes on all of FNDC's road classes, apart from the Arterial roads which are showing a decreasing trend. This increasing trend is a significant concern. Whilst some of this increase will be due to rebound in traffic volumes from the global financial crisis, it also reflects the unforgiving nature of the road network and often poor driver behaviour.	**KDC Number of DSI** – There appears to be a slightly increasing trend in death and serious injury (DSI) crashes on KDC's Secondary Collector and Low Volume roads. The other road classes appear to be decreasing. This is a generally good result and shows the impact of safety interventions over the past five years.	**WDC Number of DSI** - There appears to be an increasing trend in death and serious injury (DSI) crashes on all of WDC's roads, apart from the Low Volume roads. The Arterial and Secondary Collector roads have a rapidly increasing trend which is a significant concern. As for Far North, this is likely to be a reflection of the unforgiving nature of the road network and growth in traffic volumes following the Global Financial Crisis. The focus should be on addressing crashes on Arterials and Secondary Collectors.

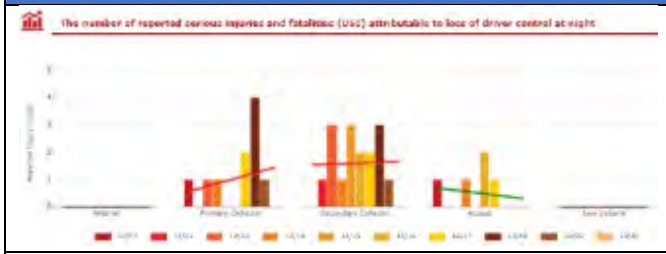
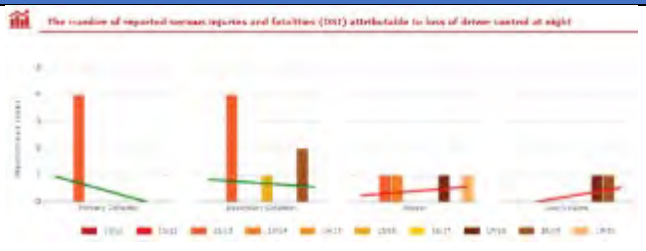
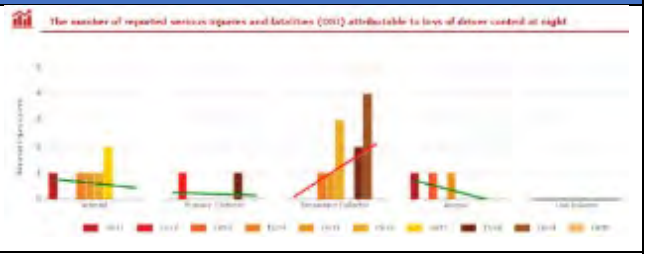
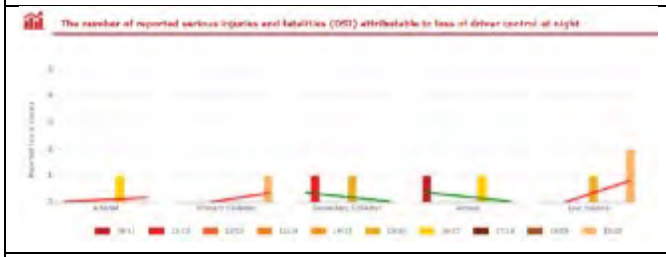
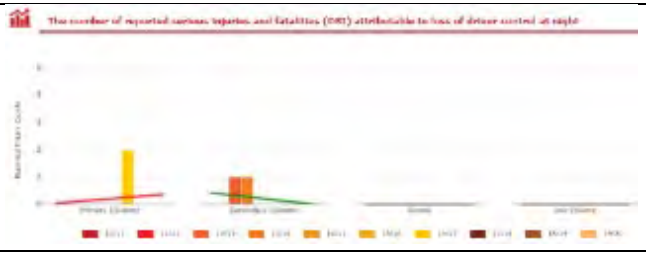
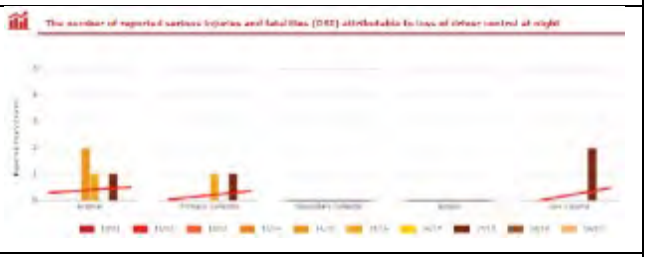
ONRC Safety CO2 – Collective Risk

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
FNDC Collective Risk – The collective risk of the FNDC network is higher than its peer group for all road classes and is significantly higher for Arterial and Primary Collector and Low Volume roads. This is a strong indicator that FNDC have a higher number of DSI crashes/km (ie crash density) than its peer group and is a significant concern. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Arterial roads is Medium and is Low-Medium or Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Arterial road network.	**KDC Collective Risk** - The collective risk of the KDC network is higher than its peer group for all road classes and is significantly higher for Primary and Secondary Collector roads. This is a strong indicator that KDC have a higher number of DSI crashes/km (ie crash density) than its peer group and is a significant concern. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Primary Collector roads is Medium and is Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Primary Collector road network.	**WDC Collective Risk** – The collective risk of the WDC network is mostly equal to its peer group, but is slightly higher for its Arterial and Secondary Collector roads. This reflects the investment in road safety on the WDC network over the past 5 years. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Arterial roads is Medium-High and is Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Arterial road network.

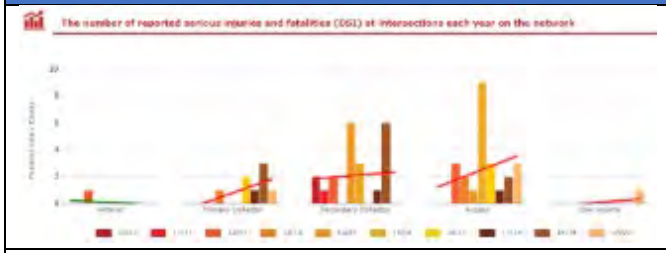
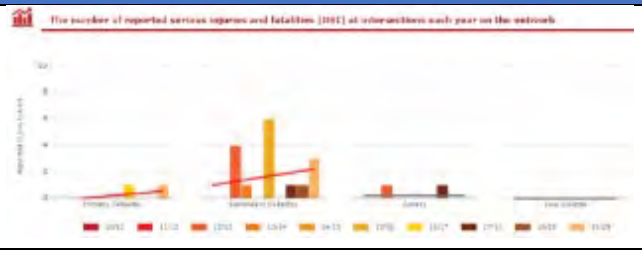
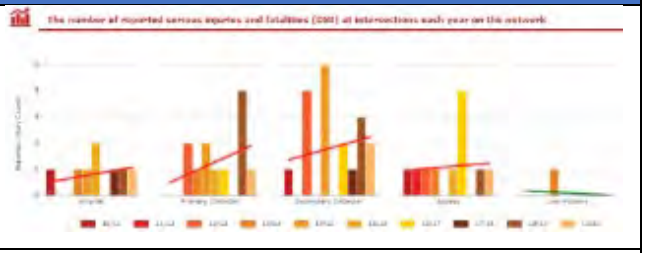
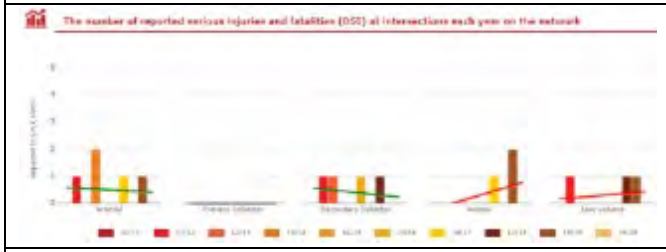
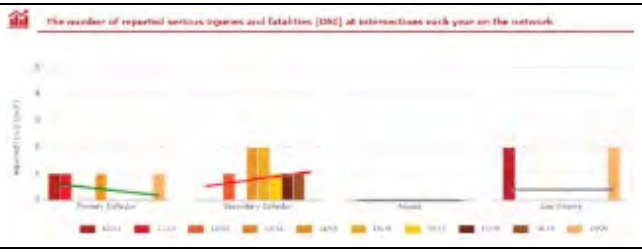
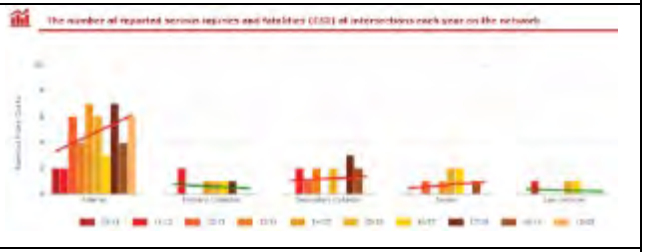
ONRC Safety CO3 – Personal Risk

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
FNDC Personal Risk – The personal risk of the FNDC network is significantly higher for Primary and Secondary Collector roads and higher for its Access roads. The Arterial and Low Volume roads are lower than the peer group. This is a strong indicator that FNDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its collector and Access roads which is a significant concern given the amount of travel on these road classes. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for all road classes apart from Primary Collectors which is Medium-High and Arterial roads which is Low-Medium.	**KDC Personal Risk** - The personal risk of the KDC network is higher than the peer group for its Secondary Collector and Access roads, but is lower for the other road classes. This indicates that KDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its Secondary Collector and Access roads which is a concern. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for Secondary Collector, Access and Low Volume roads and , Low-Medium for Primary Collector roads.	**WDC Personal Risk** - The personal risk of the WDC network is higher than the peer group for the Primary and Secondary Collector and Access roads, but is lower for the other road classes. This indicates that WDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its collector and Access roads which is a concern. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for Secondary Collectors, Access and Low Volume roads, Medium-High for Primary Collector roads and Low-Medium for Arterial roads.

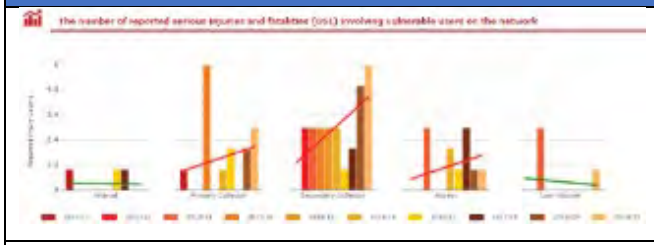
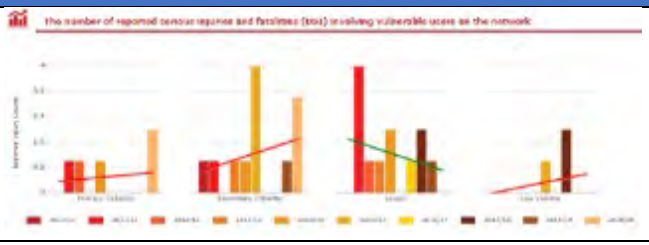
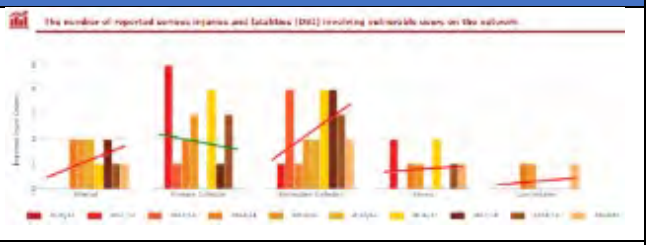
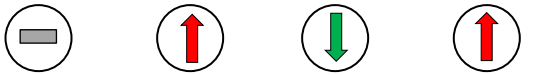
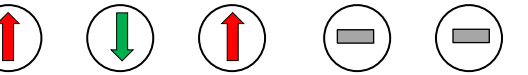
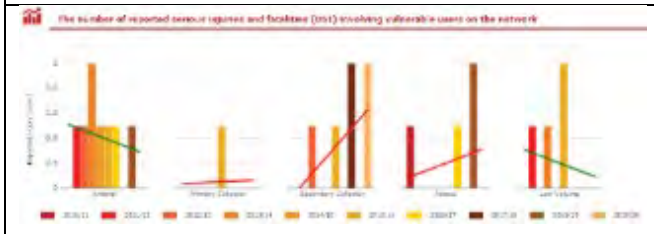
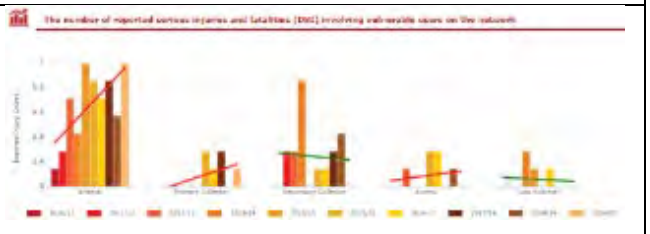
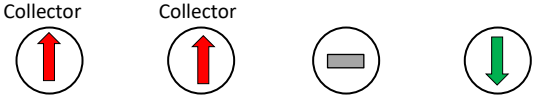
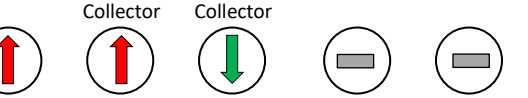
ONRC Safety TO5 – Loss of Driver Control at Night – Rural roads (top graph) & Urban roads (bottom graph)

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
FNDC Loss of Driver Control at Night DSI – It should be noted that there is very little data for nighttime crashes for rural roads and almost none for urban roads on the FNDC network. This makes it difficult to determine any issues or trends. However, it appears that there may be an increasing trend in nightime crashes on rural Primary and Secondary Collector roads.	**KDC Loss of Driver Control at Night DSI** - It should be noted that there is almost no data for nighttime crashes on the KDC network. This makes it difficult to determine any issues or trends. From the limited data available, there may be an decreasing trend in nightime crashes on the rural Secondary Collector roads.	**WDC Loss of Driver Control at Night DSI** - It should be noted that there is very little data for nighttime crashes on the WDC network. This makes it difficult to determine any issues or trends. However, it appears that there could be an increasing trend on its rural Secondary Collector and urban Arterial roads.

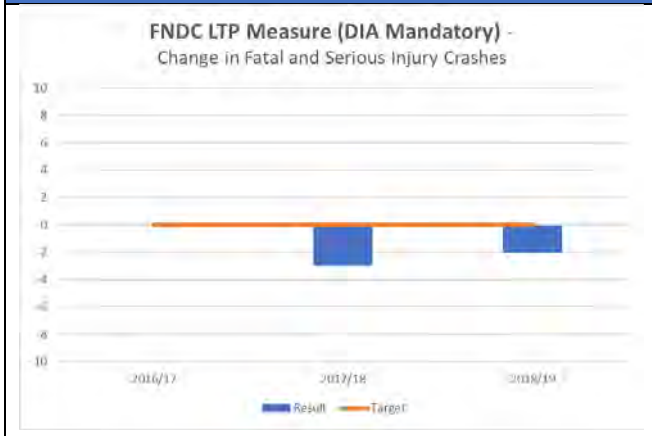
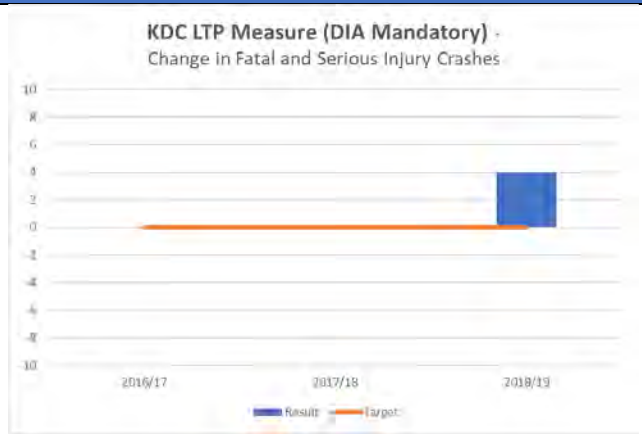
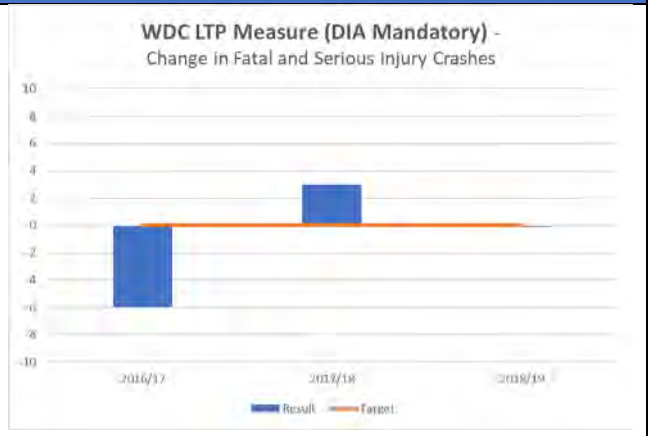
ONRC Safety TO6 – Intersection – Rural roads (top graph) & Urban roads (bottom graph)

FNDC	KDC	WDC
		
Arterial: – Primary Collector: ↑ Secondary Collector: ↑ Access: ↑ Low Volume: –	Primary Collector: – Secondary Collector: ↑ Access: – Low Volume: –	Arterial: ↑ Primary Collector: ↑ Secondary Collector: ↑ Access: ↑ Low Volume: –
		
Arterial: ↓ Primary Collector: – Secondary Collector: ↓ Access: ↑ Low Volume: ↑	Primary Collector: ↓ Secondary Collector: ↑ Access: – Low Volume: –	Arterial: ↑ Primary Collector: – Secondary Collector: – Access: – Low Volume: –
FNDC Intersection DSI – It should be noted that there is very little data for intersection crashes for rural roads and almost none for urban roads on the FNDC network. This makes it difficult to determine any issues or trends. However, it appears that there may be a increasing trend in rural intersection crashes on the Primary and Secondary Collectors, and Access roads.	**KDC Intersection DSI** - It should be noted that there is very little data for intersection crashes on the KDC network. This makes it difficult to determine any issues or trends. From the limited data available, there may be an increasing trend in rural and urban Secondary Collector roads.	**WDC Intersection DSI** – It should be noted that there is little data for intersection crashes on many road classes for the WDC network. This makes it difficult to determine any issues or trends. It appears that there could be an increasing trend of intersection crashes on WDC's rural Arterial, Primary and Secondary Collector roads. There also appears to be an increasing trend on the urban Arterial roads.

ONRC Safety TO9 – Vulnerable Users – Rural roads (top graph) & Urban roads (bottom graph)

FNDC	KDC	WDC
		
		
		
		
FNDC Vulnerable User DSI – It should be noted that there is little data for vulnerable user crashes for rural roads and almost none for urban roads on the FNDC network. This makes it difficult to determine any issues or trends. However, it appears that there may be an increasing trend in vulnerable user crashes on rural Primary and Secondary Collectors and Access roads as well as urban Secondary Collector and Access roads. Approximately 70% of these crashes involve motorcyclists or mopeds.	**KDC Vulnerable User DSI** - It should be noted that there is very little data for vulnerable user crashes on the KDC network. This makes it difficult to determine any issues or trends. It appears that there may be an increasing trend in crashes on rural and urban Secondary Collector roads. Approximately 80% of these crashes involve motorcyclists or mopeds.	**WDC Vulnerable User DSI** - It should be noted that there is little data for vulnerable user crashes for many roads on the WDC network. This makes it difficult to determine any issues or trends. However, it appears that there could be an increasing trend in vulnerable user crashes on its rural Secondary Collector and urban Arterial and Primary Collector roads. Approximately 60% of these crashes involve motorcyclists or mopeds.

LTP Measure – Change in Number of Fatal and Serious Injury Crashes (DIA)

FNDC	KDC	WDC
		
		
FNDC Change in Fatal and Serious Injury Crashes – The number of fatal and serious injury crashes has reduced on FNDC's network over the past two years. This is an interesting result because the 5 year trend in crashes reported earlier is showing an increasing trend in crashes. So while there may have been a reduction in crashes in the past two years, the longer term trend is an increase.	**KDC Change in Fatal and Serious Injury Crashes** – The number of fatal and serious injury crashes on KDC's network has only been reported for 2018/19. The 2018/19 result of 4 crashes shows that there was an increase fatal and serious injury crashes, which is a poor result.	**WDC Change in Fatal and Serious Injury Crashes** – The number of fatal and serious injury crashes on WDC's network has been static over the last year. Over the past three years, there has been a decrease in fatal and serious injury crashes, although the 5 year trend is generally showing an increasing trend.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – There appears to be an increasing trend in death and serious injury (DSI) crashes on all of FNDC's road classes, apart from the Arterial roads. These increasing trends are a significant concern. Far North's Collective Risk is higher than its peer group for all road classes, and its Personal Risk is higher for the Primary and Secondary Collector and Access roads. Nighttime crashes appear to be increasing on FNDC's rural Primary and Secondary Collector roads and intersection crashes increasing on rural Primary and Secondary Collectors, and Access roads. Vulnerable user crashes appear to be increasing on FNDC's rural Primary and Secondary Collectors and Access roads as well as urban Secondary Collector and Access roads. Approximately 70% of these crashes involve motorcyclists or mopeds which is a significant concern.	**KDC Summary** – There appears to be a slightly increasing trend in death and serious injury (DSI) crashes on KDC's Secondary Collector and Low Volume roads. Kaipara's Collective Risk is higher than its peer group for all road classes and is significantly higher for Primary and Secondary Collector roads. The Personal Risk of the KDC network is higher than the peer group for its Secondary Collector and Access roads. Nighttime crashes may be a decreasing on KDC's rural Secondary Collector roads. Intersection crashes may have an increasing trend on KDC's rural and urban Secondary Collector roads. Vulnerable user crashes appear to be increasing on KDC's rural and urban Secondary Collector roads. Approximately 80% of these crashes involve motorcyclists or mopeds which is a significant concern.	**WDC Summary** - There appears to be an increasing trend in death and serious injury (DSI) crashes on all of WDC's roads, apart from the Low Volume roads. The Arterial and Secondary Collector roads have a rapidly increasing trend which is a significant concern. Whangarei's Collective Risk is slightly higher thanks its peer group for its Arterial and Secondary Collector roads. The personal risk of the WDC network is higher than the peer group for the Primary and Secondary Collector and Access roads. Nighttime crashes could be increasing on WDC's rural Secondary Collector and urban Arterial roads. Intersection crashes appear to be increasing on WDC's rural Arterial, Primary and Secondary Collector roads and urban Arterial roads. Vulnerable user crashes appear to be increasing on WDC's rural Secondary Collector and urban Arterial and Primary Collector roads. Approximately 60% of these crashes involve motorcyclists or mopeds which is a concern.

6.13.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for low cost low risk improvements:

Safety

Option	Description
Option 1 - Speed management programme	Continue to progress the speed management programme (including school zone signs) to provide speed limits appropriate for the road environment on High Risk Rural Road (HRRR) routes or urban areas.
Option 2 - Curve warning signage and marking upgrades on HRRR.	Develop corridor curve warning and marking upgrades on HRRR routes. Sign out of context curves.
Option 3 - Audible Tactile Profile (ATP) markings on HRRR	Provide Audible Tactile Profile (ATP) markings on edgelines on HRRR routes.
Option 4 - Prioritise safe pedestrian and cyclist crossing points	Prioritise safe crossing points such as mid-block crossings, zebra crossings and raised platforms.
Option 5 - Hazard removal or protection on HRRR. Provide compliant sight rails	Hazard removal or protection on HRRR routes. This includes service poles, deep roadside drains and steep cut and fill batters. Provide compliant sightrails (half eye-height).
Option 6 - Minor alignment improvements on HRRR	Consider minor alignment improvements on High Risk Rural Road (HRRR) routes to address high risk curves.
Option 7 - Upgrade programme for old, obsolete or non-compliant guardrails	Consider an upgrade programme for old, obsolete guardrails and bridge rails to bring these to standard on HRRR routes or possibly in conjunction with rehabilitations on other significant routes.

Resilience

Option	Description
Option 1 - Programme of crack sealing on slip sites	Carry out a programme of crack sealing in summer to target areas that are high risk for slips. The crack sealing will prevent water ingress into the slip scarp and reduce the likelihood of a slip occurring.
Option 2 - Upgrade the culvert sizes in areas that are high risk for flooding or slips	Upgrade culverts sizes to provide adequate capacity in areas that are high risk for slips or flooding to minimise potential overtopping and washout.
Option 3 - Repair historic slips on high priority routes	Continue to allocate funding to resilience works to get on top of historic slips on high priority routes. This will improve the resilience of key routes over time.
Option 4 - Strengthen the resilience of routes serving isolated communities	Strengthen the resilience of routes serving isolated communities to help minimise loss of access to these communities during emergency events such as storm events.
Option 5 - Raise/Protect/ Retreat roads subject to coastal inundation	Consider options to raise/protect/retreat roads that are subject to coastal inundation to minimise instances of closure and damage. Need to consider the effects of climate change and resulting sea level rise.

Growth and Alternative Transport

Option	Description
Option 1 - Complete missing links of footpaths	Complete missing sections of footpath to complete pedestrian networks. Prioritise new footpath projects based on safety risk.
Option 2 - Upgrade intersections and mid-blocks to remove pinch points	Upgrade intersections and road links as they reach capacity to remove pinch points on the network and help maintain access to employment and social opportunities.
Option 3 - Widen shoulders and berms to provide for walking and cycling	Where suitable, provide additional shoulder or berm width on rural roads to enable safer walking and cycling opportunities.

Option	Description
Option 4 - Provide pull offs on high risk arterials	Provide adequate pull off opportunities on high risk rural arterials to enable passing opportunities and reduce driver frustration.
Option 5 - Develop safe rest areas in conjunction with the Twin Coast business case	Develop safe rest areas at suitable locations with services such as toilets and refreshments in conjunction with the Twin Coast Discovery Route Rest Area business case.
Option 6 - Carry out strategic roading improvements in Whangarei, Kerikeri/Waipapa and Mangawhai	Implement the City Centre Plan and Complete Streets Masterplan to encourage more inner city living in Whangarei. Develop and implement the Kerikeri/Waipapa Strategic Road Network. Implement the improvements from the Mangawhai Network Operating Framework.

6.13.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Low Cost Low Risk Improvements	**Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.	**Programme Adjustment** • Increase safety programme **Policy Approach** • Additional delineation **Demand Management** • Enhanced Road Safety Promotions with active in-house management.	**Programme Adjustment** **Route Management** • Option 2 - Curve warning signage and marking upgrades on HRRR. • Option 4 - Prioritise safe pedestrian and cyclist crossing points • Option 5 - Hazard removal or protection on HRRR. Provide compliant sight rails • Option 6 - Minor alignment improvements on HRRR • Option 7 - Upgrade programme for old, obsolete or non-compliant guardrails **Policy Approach** **Risk** • Option 1 - Speed management programme **Route Management** • Option 3 - Audible Tactile Profile (ATP) markings on HRRR	2 4 5 6 7 1 3	1.3 1.0 0.9 0.8 0.3 1.3 1.0	**Yes** **Yes** **Yes** **Yes** No **Yes** **Yes**
Low Cost Low Risk Improvements	**Resilience** - Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.	**Programme Adjustment** • Increase programme of resilience work on the WDC and KDC networks **Policy Approach** • Prioritise critical routes at the expense of lower priority routes **Demand Management** • Preventative maintenance programme	**Programme Adjustment** **Route Management** • Option 4 - Strengthen the resilience of routes serving isolated communities • Option 5 - Raise/Protect/ Retreat roads subject to coastal inundation **Policy Approach** **LOS Adjustments** • Option 2 - Upgrade the culvert sizes in areas that are high risk for flooding or slips **Demand Management** **Risk** • Option 1 - Programme of crack sealing on slip sites • Option 3 - Repair historic slips on high priority routes	4 5 2 1 3	1.0 0.85 1.05 1.35 1.05	**Yes** **Yes** **Yes** **Yes** **Yes**

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Low Cost Low Risk Improvements	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Programme Adjustment** **Managing Demand** • Option 6 - Carry out strategic roading improvements in Whangarei, Kerikeri/Waipapa and Mangawhai **Route Management** • Option 1 - Complete missing links of footpaths • Option 2 - Upgrade intersections and mid-blocks to remove pinch points • Option 3 - Widen shoulders and berms to provide for walking and cycling • Option 4 - Provide pull offs on high risk arterials • Option 5 - Develop safe rest areas in conjunction with the Twin Coast business case	6 1 2 3 4 5	0.75 0.95 0.9 0.5 0.5 0.5	**Yes** **Yes** **Yes** No No No

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

Safety

- Option 1 - Speed management programme
- Option 2 - Curve warning signage and marking upgrades on HRRR
- Option 3 - Audible Tactile Profile (ATP) markings on HRRR
- Option 4 - Prioritise safe pedestrian and cyclist crossing points.
- Option 5 - Hazard removal or protection on HRRR. Provide compliant sight rails
- Option 6 - Minor alignment improvements on HRRR

Resilience

- Option 1 - Programme of crack sealing on slip sites
- Option 2 - Upgrade the culvert sizes in areas that are high risk for flooding or slips
- Option 3 - Repair historic slips on high priority routes
- Option 4 - Strengthen the resilience of routes serving isolated communities.
- Option 5 - Raise/Protect/ Retreat roads subject to coastal inundation

Growth and Alternative Transport

- Option 1 - Complete missing links of footpaths
- Option 2 - Upgrade intersections and mid-blocks to remove pinch points
- Option 6 - Carry out strategic roading improvements in Whangarei, Kerikeri/Waipapa and Mangawhai

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Low Cost Low Risk - Safety (WC 341)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer	Yes	1	Continue to progress the speed management programme (including school zone signs) to provide speed limits appropriate for the road environment on High Risk Rural Road (HRRR) routes or urban areas
❑ Managing **demand**			
❑ **Route** Management	Yes	6 - A 3 - B 5 - C 7 - D 2 - E 4 - F	A. Consider minor alignment improvements on High Risk Rural Road (HRRR) routes. B. Provide Audible Tactile Profile (ATP) markings on edgelines on HRRR routes. C. Hazard removal or protection on HRRR routes. This includes service poles, deep roadside drains and steep cut and fill batters. Provide compliant sightrails (half eye-height). D. Consider an upgrade programme for old, obsolete guardrails and bridge rails to bring these to standard on HRRR routes or possibly in conjunction with rehabilitations on other significant routes. E. Develop corridor curve warning and marking upgrades on HRRR routes. Sign out of context curves. F. Prioritise safe crossing points such as mid-block crossings, zebra crossings and raised platforms.
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Speed management programme		Option 2 - Curve warning signage and marking upgrades on HRRR.		Option 3 - Audible Tactile Profile (ATP) markings on HRRR		Option 4 - Prioritise safe pedestrian and cyclist crossing points		Option 5 - Hazard removal or protection on HRRR. Provide compliant sight rails		Option 6 - Minor alignment improvements on HRRR		Option 7 - Upgrade programme for old, obsolete or non-compliant guardrails	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	2	0.2	1	0.1	0	0	3	0.3	2	0.2	2	0.2	0	0
Problem solving effectiveness	10%	3	0.3	3	0.3	3	0.3	2	0.2	2	0.2	2	0.2	1	0.1
Benefits realised	10%	3	0.3	3	0.3	3	0.3	2	0.2	2	0.2	1	0.1	1	0.1
Good Environmental impacts	5%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Value for Money	10%	2	0.2	3	0.3	2	0.2	1	0.1	1	0.1	1	0.1	0	0
Closing Customer and Technical LoS gaps and impacts	10%	2	0.2	2	0.2	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1
Closing ONRC Performance gaps	10%	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	0	0
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost of Ownership (whole of life Costs)	10%	0	0	0	0	-1	-0.1	0	0	0	0	0	0	0	0
Life Cycle Management	10%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COVID-19 Recovery	5%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
etc.			0		0		0		0		0		0		0
Totals	**100%**		**1.3**		**1.3**		**1.0**		**1.0**		**0.9**		**0.8**		**0.3**

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Low Cost Low Risk - Resilience (WC 341)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments	Yes	2	Upgrade culverts sizes in areas that are high risk for slips or flooding
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer	Yes	3 - A 1 - B	A. Continue to allocate funding to resilience works to get on top of historic slips on high priority routes. B. Carry out a programme of crack sealing in summer to target high risk areas.
❑ Managing **demand**			
❑ **Route** Management	Yes	4 - A 5 - B	A. Strengthen the resilience of routes serving isolated communities. B. Consider options to raise/protect/retreat roads that are subject to coastal inundation.
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Programme of crack sealing on slip sites		Option 2 - Upgrade the culvert sizes in areas that are high risk for flooding or slips		Option 3 - Repair historic slips on high priority routes		Option 4 - Strengthen the resilience of routes serving isolated communities		Option 5 - Raise/Protect/ Retreat roads subject to coastal innundation		Option 6		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	1	0.1	2	0.2	3	0.3	2	0.2		0		0
Problem solving effectiveness	10%	2	0.2	2	0.2	2	0.2	2	0.2	1	0.1		0		0
Benefits realised	10%	2	0.2	2	0.2	2	0.2	2	0.2	1	0.1		0		0
Good Environmental impacts	5%	1	0.05	1	0.05	1	0.05	1	0.05	1	0.05		0		0
Value for Money	10%	3	0.3	2	0.2	1	0.1	0	0	0	0		0		0
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1		0		0
Closing ONRC Performance gaps	10%	0	0	0	0	0	0	0	0	0	0		0		0
Asset preservation and sustainability	10%	2	0.2	1	0.1	1	0.1	1	0.1	2	0.2		0		0
Total Cost of Ownership (whole of life Costs)	10%	1	0.1	1	0.1	1	0.1	0	0	0	0		0		0
Life Cycle Management	10%	1	0.1	0	0	0	0	0	0	1	0.1		0		0
COVID-19 Recovery	5%	0	0	0	0	0	0	0	0	0	0		0		0
etc.			0		0		0		0		0		0		0
Totals	**100%**		**1.35**		**1.05**		**1.05**		**1.0**		**0.85**		**0**		**0**

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Low Cost Low Risk - Other (WC 341)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	6	Implement the City Centre Plan and Complete Streets Masterplan to encourage more inner city living in Whangarei. Develop and implement the Kerikeri/Waipapa Strategic Road Network. Implement the improvements from the Mangawhai Network Operating Framework.
❑ **Route** Management	Yes	1 - A 4 - B 5 - C 2 - D 3 - E	A. Complete missing sections of footpath to complete pedestrian networks. Prioritise new footpath projects based on safety risk. B. Provide adequate pull off opportunities on high risk rural arterials. C. Develop safe rest areas at suitable locations with services such as toilets and refreshments in conjunction with the Twin Coast Discovery Route Rest Area business case. D. Upgrade intersections and road links as they reach capacity to remove pinch points on the network. E. Where suitable, provide additional shoulder or berm width on rural roads to enable safer walking and cycling opportunities.
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Complete missing links of footpaths		Option 2 - Upgrade intersections and mid-blocks to remove pinch points		Option 3 - Widen shoulders and berms to provide for walking and cycling		Option 4 - Provide pull offs on high risk arterials		Option 5 - Develop safe rest areas in conjunction with the Twin Coast business case		Option 6 - Carry out strategic roading improvements in Whangarei, Kerikeri/Waipapa and Mangawhai		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	3	0.3	2	0.2	1	0.1	1	0.1	2	0.2	3	0.3		0
Problem solving effectiveness	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	2	0.2		0
Benefits realised	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	2	0.2		0
Good Environmental impacts	5%	1	0.05	0	0	0	0	0	0	0	0	-1	-0.05		0
Value for Money	10%	2	0.2	1	0.1	1	0.1	1	0.1	1	0.1	0	0		0
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	2	0.2	1	0.1	1	0.1	1	0.1	2	0.2		0
Closing ONRC Performance gaps	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	0	0	0	0	0	0	-1	-0.1	-1	-0.1		0
Life Cycle Management	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
COVID-19 Recovery	5%	2	0.1	0	0	0	0	0	0	0	0	0	0		0
etc.			0		0		0		0		0		0		0
Totals	**100%**		**0.95**		**0.9**		**0.5**		**0.5**		**0.5**		**0.75**		**0**

6.13.6 Financial Impact

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

6.13.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	$10,152,000 for a substantial increase in safety funding from $1.9M/yr to $3.5M/yr. Interventions include corridor treatments such as signs and markings, guardrails, speed management and pedestrian safety. $4,500,000 for a resilience programme to address ongoing slips on critical routes $1,950,000 for associated improvements on pavement rehabilitation projects $1,300,000 to provide new detour routes and improved resilience of existing detour routes identified through the Integrated Transport Plan $1,000,000 for new roading upgrades to improve access to communities as identified in the Twin Coast Discovery Route PBC and incorporated into the Integrated Transport Plan $18,000 for new wayfinding signage as identified in the Twin Coast Discovery Route PBC $675,000 for township upgrades as identified in the Twin Coast Discovery Route PBC and Integrated Transport Plan	+$8,084,000
324	Road Improvements	None programmed – No change	No Change
004	Investment Management	The following studies and plans were identified in the FNDC Integrated Transport Plan: $1,200,000 to develop a Business Case for the Kerikeri Strategic Road Network Plan $50,000 to develop a corridor plan for the Kaitaia to Kohukohu route which is part of the Twin Coast Discovery Route $175,000 to develop Township Transport Plans	+$1,425,000

6.13.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	$2,785,000 for a substantial increase in safety funding from $0.5M/yr to $0.9M/yr. Interventions include corridor treatments such as signs and markings, speed management and pedestrian safety. $1,500,000 for a resilience programme to address ongoing slips on critical routes $750,000 for associated improvements on pavement rehabilitation projects	+$737,000

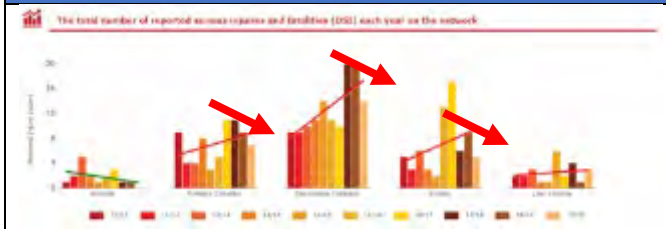
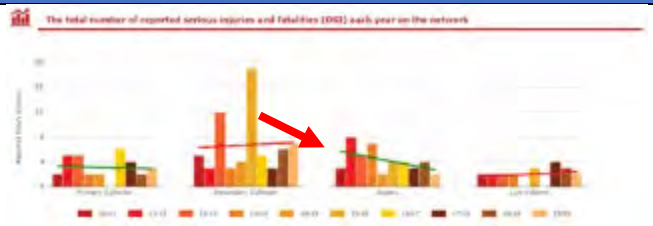
324	Road Improvements	$250,000 for a business case to investigate the feasibility of a new connection from Cove Road to the Mangawhai Central development as identified in the Mangawhai Network Operating Framework	+$250,000

6.13.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	$8,329,000 for a substantial increase in safety funding from $1.7M/yr to $2.7M/yr. Interventions include corridor treatments such as signs and markings, guardrails, speed management and pedestrian safety. $4,594,000 for a resilience programme to address ongoing slips on critical routes $1,625,000 for associated improvements on pavement rehabilitation projects -$1,800,000 due to urban intersection upgrades now being funded from WC 324 (see below)	+$2,739,000
324	Road Improvements	$4,137,000 for major safety improvements on Ngunguru Rd (Murphy's bend) to realign these out of context curves. The upgrade of the following urban intersections that have been identified in the Whangarei City Transportation Network Strategy PBC: $2,000,000 for the Robert St/Walton St intersection signalisation $2,036,000 for the upgrade of the Maunu Rd/Central Ave intersection $2,598,000 for the upgrade of the intersection on Bank St including the signalisation of the Bank/Dent intersection $2,036,000 for the upgrade of the Riverside Dr/Dave Culham Dr roundabout to two lanes $5,667,000 for the Springs Flat connection to SH1 $6,000,000 for Port Rd/Kioreroa Rd intersection upgrade $5,303,000 for the Waterfront to City Centre Connection to pedestrianise John and James St in the CBD to improve the connection between the Town Basin and the CBD	+$23,626,000
	Unsubsidised	$10,000,000 (CIP funded) for the widening of the Port Rd (Limeburners Creek) bridge to 4-lanes	+$10,000,000
004	Investment Management	$150,000 to carry out an update of the Whangarei Transportation Model to reflect the outcome of the 2018 census and Council growth predictions	-$100,000

6.13.7 Level of Service Impact

The following table shows the expected Level of Service impact of the options selected:

FNDC	KDC	WDC
 **SAFETY** – We expect that the crash trend on Primary Collectors, Secondary Collector and Access roads will decrease. This will be achieved through investment in corridor treatments on these routes such as speed management, signs and markings, hazard protection and pedestrian safety in urban areas.	 **SAFETY** – We expect that the crash trend on Secondary Collector roads will decrease. This will be achieved through investment in corridor treatments on these routes such as speed management, signs and markings, hazard protection and pedestrian safety in urban areas.	 **SAFETY** – We expect that the crash trend on Arterials, Primary and Secondary Collectors will decrease. This will be achieved through investment in corridor treatments on these routes such as speed management, signs and markings, hazard protection and pedestrian safety in urban areas.

Overall, it is expected that there will be a decreasing trend in crashes on each network.

6.13.8 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- None identified.

6.14 Education & Promotion

Work Categories: **432 Safety Promotion, Education and Advertising, 421 Travel Demand Management**

6.14.1 Links to Strategic Case

Problem Statement:

Safety - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.

Growth and Alternative Transport - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Benefits of Addressing Problem:

Safety - Fatal and serious injury crashes will decrease on our network, reducing the harm to our customers and communities.

Growth and Alternative Transport – Increase in alternative mode use and less dependency on private vehicles resulting in lower levels of congestion and less vehicle emissions.

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.

Growth and Alternative Transport – Continued dependency on private vehicle use with increasing levels of congestion and vehicle emissions.

6.14.2 Levels of Service

ONRC Customer Outcomes:

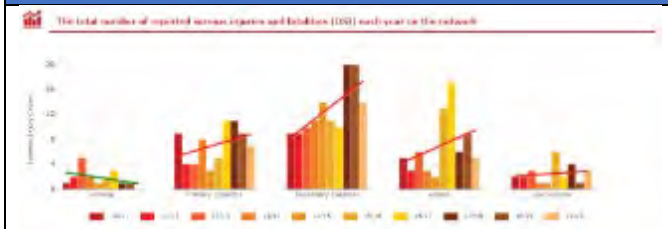
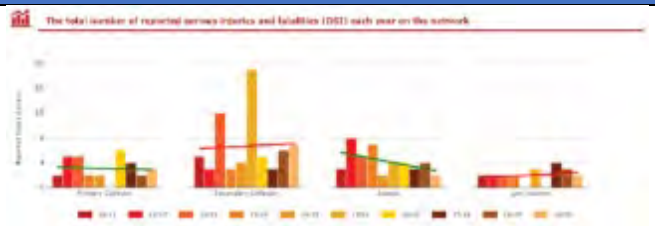
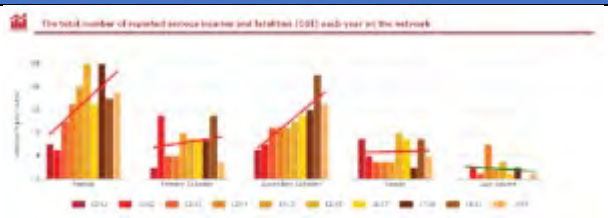
ONRC Safety CO1 – The Number of Fatal and Serious Injuries on the Network
ONRC Safety CO2 – Collective Risk
ONRC Safety CO3 – Personal Risk

Customer Levels of Service:

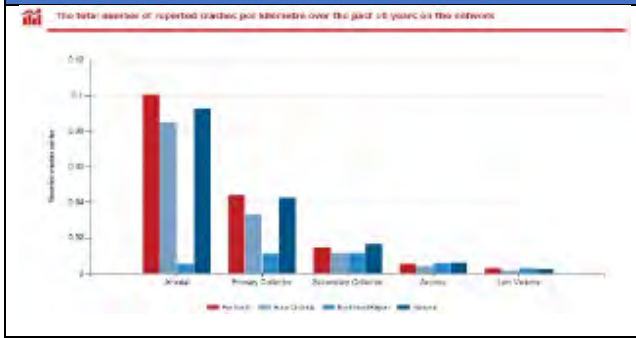
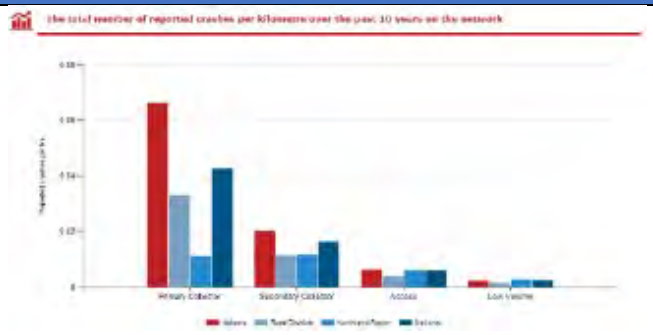
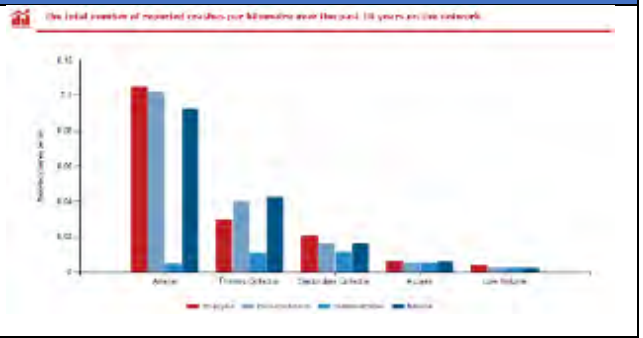
NZTA Communities at Risk Register
LTP 1.1.X – Percentage of road safety promotion projects completed (New measure)

6.14.3 Evidence and Gap Analysis

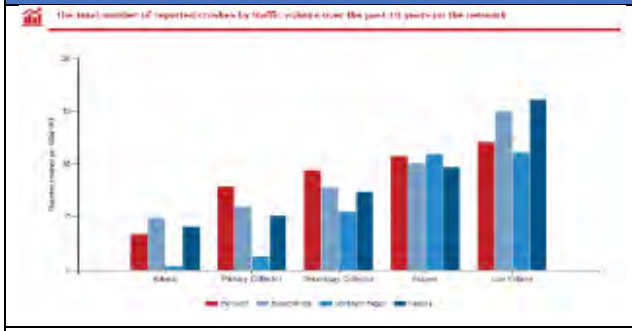
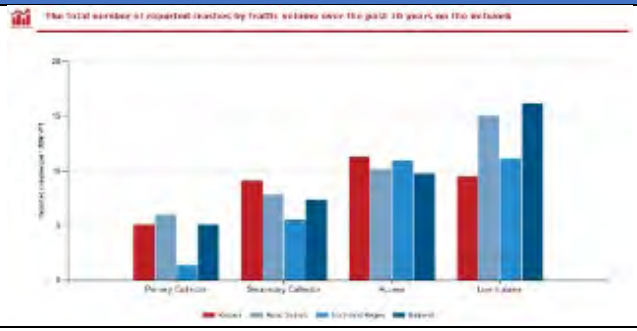
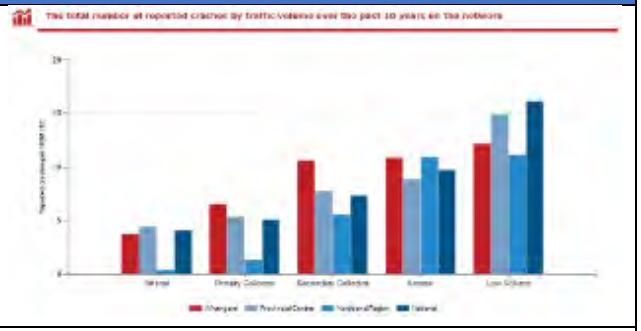
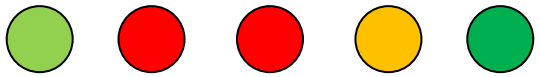
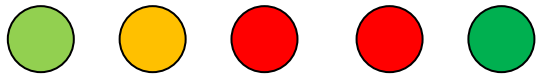
ONRC Safety CO1 – Number of Fatal and Serious Injuries on the Network

FNDC	KDC	WDC
		
Arterial ↓ / Primary Collector ↑ / Secondary Collector ↑ / Access ↑ / Low Volume ↑	Primary Collector ↓ / Secondary Collector ↑ / Access ↓ / Low Volume ↑	Arterial ↑ / Primary Collector ↑ / Secondary Collector ↑ / Access ↑ / Low Volume ↓
FNDC Number of DSI – There appears to be an increasing trend in death and serious injury (DSI) crashes on all of FNDC's road classes, apart from the Arterial roads which are showing a decreasing trend. This increasing trend is a significant concern. Whilst some of this increase will be due to rebound in traffic volumes from the global financial crisis, it also reflects the unforgiving nature of the road network and often poor driver behaviour.	**KDC Number of DSI** – There appears to be a slightly increasing trend in death and serious injury (DSI) crashes on KDC's Secondary Collector and Low Volume roads. The other road classes appear to be decreasing. This is a generally good result and shows the impact of safety interventions over the past five years.	**WDC Number of DSI** - There appears to be an increasing trend in death and serious injury (DSI) crashes on all of WDC's roads, apart from the Low Volume roads. The Arterial and Secondary Collector roads have a rapidly increasing trend which is a significant concern. As for Far North, this is likely to be a reflection of the unforgiving nature of the road network and growth in traffic volumes following the Global Financial Crisis. The focus should be on addressing crashes on Arterials and Secondary Collectors.

ONRC Safety CO2 – Collective Risk

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
FNDC Collective Risk – The collective risk of the FNDC network is higher than its peer group for all road classes and is significantly higher for Arterial and Primary Collector and Low Volume roads. This is a strong indicator that FNDC have a higher number of DSI crashes/km (ie crash density) than its peer group and is a significant concern. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Arterial roads is Medium and is Low-Medium or Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Arterial road network.	**KDC Collective Risk** - The collective risk of the KDC network is higher than its peer group for all road classes and is significantly higher for Primary and Secondary Collector roads. This is a strong indicator that KDC have a higher number of DSI crashes/km (ie crash density) than its peer group and is a significant concern. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Primary Collector roads is Medium and is Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Primary Collector road network.	**WDC Collective Risk** – The collective risk of the WDC network is mostly equal to its peer group, but is slightly higher for its Arterial and Secondary Collector roads. This reflects the investment in road safety on the WDC network over the past 5 years. In terms of the High Risk Rural Roads (HRRR) classification, the collective risk of Arterial roads is Medium-High and is Low for the other road classifications. This indicates the biggest benefit would be from addressing DSI crashes on the Arterial road network.

ONRC Safety CO3 – Personal Risk

FNDC	KDC	WDC
		
Arterial, Primary Collector, Secondary Collector, Access, Low Volume	Primary Collector, Secondary Collector, Access, Low Volume	Arterial, Primary Collector, Secondary Collector, Access, Low Volume
		
FNDC Personal Risk – The personal risk of the FNDC network is significantly higher for Primary and Secondary Collector roads and higher for its Access roads. The Arterial and Low Volume roads are lower than the peer group. This is a strong indicator that FNDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its collector and Access roads which is a significant concern given the amount of travel on these road classes. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for all road classes apart from Primary Collectors which is Medium-High and Arterial roads which is Low-Medium.	**KDC Personal Risk** - The personal risk of the KDC network is higher than the peer group for its Secondary Collector and Access roads, but is lower for the other road classes. This indicates that KDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its Secondary Collector and Access roads which is a concern. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for Secondary Collector, Access and Low Volume roads and , Low-Medium for Primary Collector roads.	**WDC Personal Risk** - The personal risk of the WDC network is higher than the peer group for the Primary and Secondary Collector and Access roads, but is lower for the other road classes. This indicates that WDC have a higher number of DSI crashes/VKT (ie crash exposure) than its peer group on its collector and Access roads which is a concern. In terms of the High Risk Rural Roads (HRRR) classification, the personal risk is High for Secondary Collectors, Access and Low Volume roads, Medium-High for Primary Collector roads and Low-Medium for Arterial roads.

NZTA Communities at Risk Register

FNDC	KDC	WDC

Communities at Risk Register 2019 Issue	FNDC	KDC	WDC	Northland
All Deaths and Serious Casualty	High	High	Medium	High
Young Drivers (of light vehicles aged 16-24 yrs)	High	High	Medium	High
Alcohol and/or Drugs	High	Medium	Medium	High
Speed (too fast for conditions)	High	High		High
Urban Intersections		Medium		
Rural Intersections				
All Intersections				
Rural Road Loss of Control and/or Head On	High	High	Medium	High
Motorcyclist Involved		High		Medium
Cyclist Involved				
Pedestrian Involved	High		High	Medium
Distraction (crash factor: attention diverted)				
Fatigue		Medium		Medium
Older Road Users (aged 75yrs or older)				
Restraints (seatbelts not worn)	High	High		High

FNDC Communities at Risk Register – The FNDC have many areas of High Risk on the Communities at Risk Register including Death and Serious injury, Young Drivers, Alcohol/Drugs, Speed, Rural Road Loss of Control/Head On, Pedestrians and Restraints. This indicates that there is significant need for on-going and improved road safety promotions in the Far North District.	**KDC Communities at Risk Register** – The KDC have many areas of High Risk on the Communities at Risk Register including Death and Serious injury, Young Drivers, Speed, Rural Road Loss of Control/Head On, Motorcyclist and Restraints. In addition, the following are Medium Risk: Alcohol/Drugs, Urban Intersections and Fatigue. As for FNDC, this indicates that there is significant need for on-going and improved road safety promotions in the Kaipara District.	**WDC Communities at Risk Register** – The WDC has one area of High Risk on the Communities at Risk Register which is Pedestrians. There are several areas of Medium Risk including Death and Serious injury, Young Drivers, Alcohol/Drugs and Rural Road Loss of Control/Head On. While the need for road safety promotion is less in Whangarei than for the other two districts, there is a need for a sustained road safety programme to address these issues.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – There appears to be an increasing trend in death and serious injury (DSI) crashes on all of FNDC's road classes, apart from the Arterial roads. These increasing trends are a significant concern. Far North's Collective Risk is higher than its peer group for all road classes, and its Personal Risk is higher for the Primary and Secondary Collector and Access roads. FNDC have many areas of High Risk on the Communities at Risk Register including Death and Serious injury, Young Drivers, Alcohol/Drugs, Speed, Rural Road Loss of Control/Head On, Pedestrians and Restraints. This indicates that there is significant need for on-going and improved road safety promotions in the Far North District.	**KDC Summary** – There appears to be a slightly increasing trend in death and serious injury (DSI) crashes on KDC's Secondary Collector and Low Volume roads. Kaipara's Collective Risk is higher than its peer group for all road classes and is significantly higher for Primary and Secondary Collector roads. The Personal Risk of the KDC network is higher than the peer group for its Secondary Collector and Access roads. KDC have many areas of High Risk on the Communities at Risk Register including Death and Serious injury, Young Drivers, Speed, Rural Road Loss of Control/Head On, Motorcyclist and Restraints. In addition, the following are Medium Risk: Alcohol/Drugs, Urban Intersections and Fatigue. This indicates that there is significant need for on-going and improved road safety promotions in the Kaipara District.	**WDC Summary** - There appears to be an increasing trend in death and serious injury (DSI) crashes on all of WDC's roads, apart from the Low Volume roads. The Arterial and Secondary Collector roads have a rapidly increasing trend which is a significant concern. Whangarei's Collective Risk is slightly higher thanks its peer group for its Arterial and Secondary Collector roads. The personal risk of the WDC network is higher than the peer group for the Primary and Secondary Collector and Access roads. The WDC has one area of High Risk on the Communities at Risk Register which is Pedestrians. There are several areas of Medium Risk including Death and Serious injury, Young Drivers, Alcohol/Drugs and Rural Road Loss of Control/Head On. While the need for road safety promotion is less in Whangarei than for the other two districts, there is a need for a sustained road safety programme to address these issues.

6.14.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for safety promotion and demand management:

Option	Description
Option 1 - NTA inhouse road safety coordinator	NTA to provide resource to better supervise road safety promotion activities to focus on achieving better driver behaviour change outcomes.
Option 2 - Continue existing road safety promotion campaigns	Continue existing road safety campaigns to educate on the use of alcohol/drugs, restraints, fatigue, young drivers, subsidised driver licence scheme (FNDC). Continue with development/roll out of mobile driver licence testing station (FNDC).
Option 3 - Enhance the speed education programme	Enhance the current road safety programme for speeding, to get better impact.
Option 4 - Implement travel planning such as New Plymouth's LetsGo programme	Implement travel planning campaigns such as New Plymouth's LetsGo to promote active modes and bus use which will result in better health impacts, reduced emissions and less congestion. These campaigns will target schools, businesses and the general public.
Option 5 - Promote vehicle maintenance and safer vehicles	Promote the importance of vehicle maintenance and safer, but affordable vehicles through the road safety promotion programme.
Option 6 - Travel demand management in Kerikeri and Mangawhai during summer peak traffic	Implement travel demand management to reduce summer peak traffic in Kerikeri and Mangwhai. This could include summer bus services (such as the Mangawhai seasonal service trialled in 2019/20).

6.14.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Safety Promotion	**Safety** - Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward for all three councils. FNDC and KDC also have higher Collective Risks than their peer group.	**Programme Adjustment** • Increase safety programme **Policy Approach** • Additional delineation **Demand Management** • Enhanced Road Safety Promotions with active in-house management.	**Policy Approach** **Improve Systems and Capability** • Option 1 - NTA inhouse road safety coordinator **Demand Management** **Managing Demand** • Option 2 - Continue existing road safety promotion campaigns. • Option 3 - Enhance the speed education programme • Option 5 - Promote vehicle maintenance and safer vehicles	 1 2 3 5	 0.85 0.8 0.9 0.5	 **Yes** **Yes** **Yes** **Yes**

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Travel Demand Management	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Demand Management** **Managing Demand** • Option 4 - Implement travel planning such as New Plymouth's LetsGo programme • Option 6 - Travel demand management in Kerikeri and Mangawhai during summer peak traffic	4 6	1.1 0.6	**Yes** **Yes**

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - NTA inhouse road safety coordinator
- Option 2 - Continue existing road safety promotion campaigns
- Option 3 - Enhance the speed education programme
- Option 4 - Implement travel planning such as New Plymouth's LetsGo programme
- Option 5 - Promote vehicle maintenance and safer vehicles
- Option 6 - Travel demand management in Kerikeri and Mangawhai during summer peak traffic

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Safety Promotion & Demand Management (WC 421, 432)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	2 - A 3 - B 5 - C 6 - D 4 - E	A. Continue existing road safety campaigns to educate on the use of alcohol/drugs, restraints, fatigue, young drivers, subsidised driver licence scheme (FNDC). Continue with development/roll out of mobile driver licence testing station (FNDC). B. Enhance the current road safety programme for speeding, to get better impact. C. Promote the importance of vehicle maintenance and safer, but affordable vehicles through the road safety promotion programme. D. Implement travel demand management to reduce summer peak traffic in Kerikeri and Mangawhai. This could include summer bus services (such as the Mangawhai seasonal service trialled in 2019/20). E. Implement travel planning campaigns such as New Plymouth's LetsGo to promote active modes and bus use.
❑ **Route** Management			
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**	Yes	1	NTA to provide resource to better supervise road safety promotion activities to focus on achieving better outcomes.

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - NTA inhouse road safety coordinator		Option 2 - Continue existing road safety promotion campaigns		Option 3 - Enhance the speed education programme		Option 4 - Implement travel planning such as New Plymouth's LetsGo programme		Option 5 - Promote vehicle maintenance and safer vehicles		Option 6 - Travel demand management in Kerikeri and Mangawhai during summer peak traffic		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	1	0.1	2	0.2	2	0.2	2	0.2	1	0.1	2	0.2		0
Problem solving effectiveness	10%	2	0.2	2	0.2	2	0.2	2	0.2	1	0.1	1	0.1		0
Benefits realised	10%	2	0.2	2	0.2	2	0.2	2	0.2	1	0.1	1	0.1		0
Good Environmental impacts	5%	0	0	0	0	0	0	1	0.05	0	0	0	0		0
Value for Money	10%	2	0.2	1	0.1	2	0.2	3	0.3	1	0.1	1	0.1		0
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1		0
Closing ONRC Performance gaps	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
Life Cycle Management	10%	0	0	0	0	0	0	0	0	0	0	0	0		0
COVID-19 Recovery	5%	1	0.05	0	0	0	0	0	0	0	0	0	0		0
etc.			0		0		0		0		0		0		0
Totals	100%		0.85		0.8		0.9		1.1		0.5		0.6		0

6.14.6 Financial Impact

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

6.14.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
432	Road Safety Promotion	+$550,000/yr for continuation of the existing road safety programmes as well as to set up a Kerikeri REAP and provide an NTA in-house coordinator to drive the regional safety outcomes +$200,000/yr for Bikes Skills Training to provide the skills to safely use the new cycle lanes and paths identified through the Principle Cycle Network and Integrated Transport Plan	+$750,000/yr
412	Travel Demand Management	No programme - TDM funded through WC 151	No Change
341	Low Cost/Low Risk Improvements	$75,000 for behaviour change initiatives including the removal of barriers for mobility impaired. Programme identified through the Integrated Transport Plan	$75,000

6.14.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
432	Road Safety Promotion	+$60,000/yr for continuation of the existing road safety programmes as well as to provide an NTA in-house coordinator to drive the regional safety outcomes +$100,000/yr for Bikes Skills Training to provide the skills to safely use the new cycle lanes and paths identified through the Principle Cycle Network and Integrated Transport Plan	+$160,000/yr
412	Travel Demand Management	No programme - TDM funded through WC 151	No Change

6.14.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
432	Road Safety Promotion	+$310,000/yr for continuation of the existing road safety programmes as well as to provide an NTA in-house coordinator to drive the regional safety outcomes +$100,000/yr for Bikes Skills Training to provide the skills to safely use the new on-road cycle lanes and shared paths identified through the Principle Cycle Network and Walking and Cycling Strategy	+$410,000/yr
412	Travel Demand Management	No programme - TDM funded through WC 151	No Change

6.14.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- None identified.

6.15 Public Transport

Work Categories: **341 Low Cost/Low Risk Improvements, 531 Public Transport Infrastructure Improvements and Major Renewals**

6.15.1 Links to Strategic Case

Problem Statement: **Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Benefits of Addressing Problem: Increase in public transport use and less dependency on private vehicles resulting in lower levels of congestion and less vehicle emissions.

Consequences of Not Addressing the Problem: Continued dependency on private vehicle use with increasing levels of congestion and vehicle emissions.

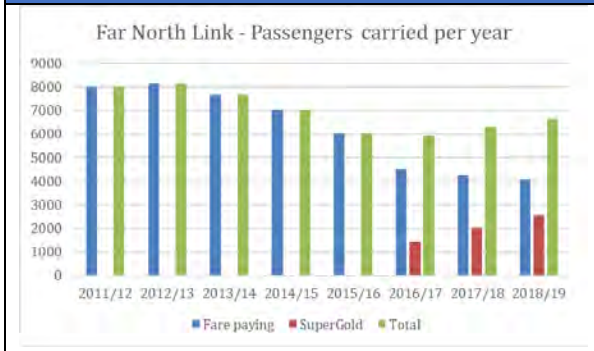
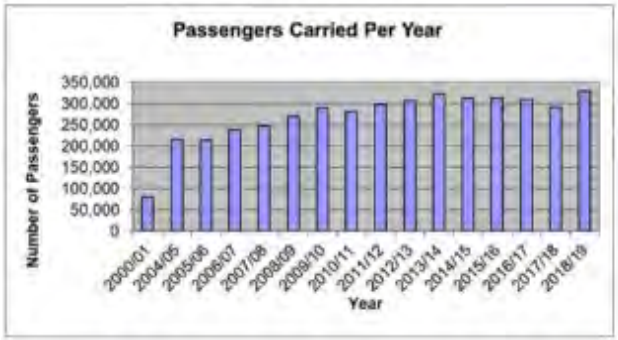
6.15.2 Levels of Service

ONRC Customer Outcomes: None

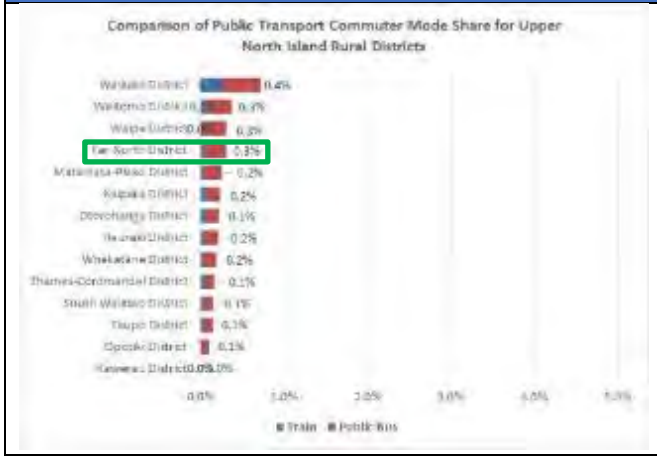
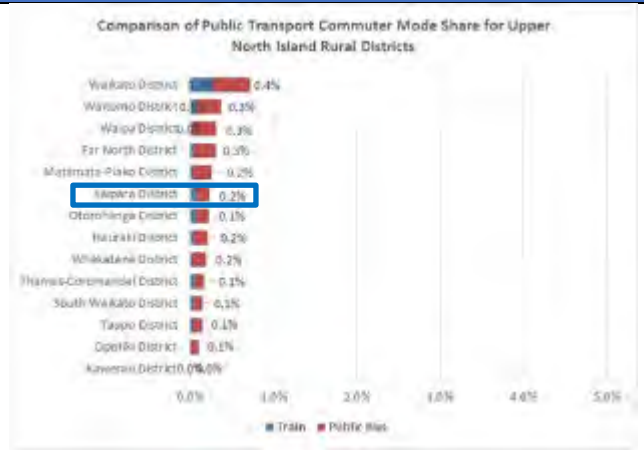
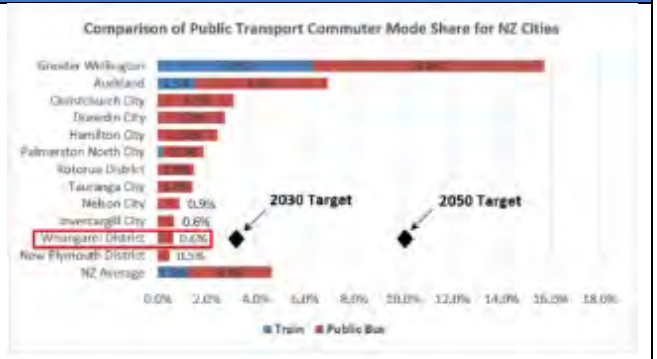
Customer Levels of Service: None

6.15.3 Evidence and Gap Analysis

Public Transport – Bus Patronage

FNDC	KDC	WDC
		
		
FNDC Bus Patronage – The number of passengers using the Far North Link service in the Kaitaia/Doubtless Bay area in 2018/19 was approximately 7,000. This has decreased from a high of 8,000 per annum in 2012/13, but has been growing for the past 3 years. Given that the population of the Far North District has grown by 17% over the past five years, this indicates that the patronage of this service is not keeping up with population growth. Passenger numbers for the Hokianga Link and Mid North Link services are not known.	**KDC Bus Patronage** – The Bream Bay Link service has only been in operation for several months and so no patronage numbers are yet known.	**WDC Bus Patronage** – The number of bus passengers using the CityLink bus service in Whangarei in 2018/19 was 323,000. This has largely been static for the last five years. Given that the population of Whangarei has increased by 18% over the past five years, this indicates the patronage of the bus service in Whangarei is not keeping up with population growth.

Public Transport – Percentage Mode Share

FNDC	KDC	WDC
		
		
FNDC Public Transport Mode Share – The public transport mode share for people travelling to work in the Far North is 0.3% (based on 2013 census data). This is similar to other similar sized Upper North Island councils. However, due to high levels of social deprivation in Northland, there are many transport disadvantaged in the community who have limited or no access to private vehicles which makes public transport more important.	**KDC Public Transport Mode Share** – The public transport mode share for people travelling to work in the Far North is 0.2% (based on 2013 census data). This is similar to other similar sized Upper North Island councils. However, as for FNDC, due to high levels of social deprivation in Northland, there are many transport disadvantaged in the community who have limited or no access to private vehicles which makes public transport more important.	**WDC Public Transport Mode Share** – The public transport mode share for people travelling to work in Whangarei is only 0.6% (based on 2013 census data). This is much lower than many other similar sized cities such as Palmerston North and Rotorua. WDC is targeting a significant increase in public transport to achieve mode shares of 3% by 2030 and 10% by 2050, which will require additional investment to grow the service.

SUMMARY

FNDC	KDC	WDC
FNDC Summary – The number of passengers using the Far North Link service is approximately 7,000 which is down from a high of 8,000 per annum in 2012/13, but has been growing for the past 3 years. However, this service is not keeping up with population growth of the area. The public transport mode share for people travelling to work in the Far North is 0.3% which is similar to other peer group councils in the Upper North Island. However, due to high levels of social deprivation in Northland, there are many transport disadvantaged in the community who have limited or no access to private vehicles which makes public transport more important.	**KDC Summary** – The Bream Bay Link service has only been in operation for several months and so no patronage numbers are yet known. The public transport mode share for people travelling to work in the Far North is 0.2% which is similar to other peer group councils in the Upper North Island. However, as for FNDC, due to high levels of social deprivation in Northland, there are many transport disadvantaged in the community who have limited or no access to private vehicles which makes public transport more important.	**WDC Summary** - The number of bus passengers using the Whangarei CityLink bus service is 323,000 and has been static for the last five years. However, this service is not keeping up with population growth. The public transport mode share for people travelling to work in Whangarei is only 0.6% which is much lower than many other similar sized cities. WDC is targeting a significant increase in public transport to achieve mode shares of 3% by 2030 and 10% by 2050, which will require additional investment to grow the service.

6.15.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for public transport:

Option	Description
Option 1 - Provide bus priority lanes in Whangarei	Provide bus priority lanes on key bus routes in Whangarei. This would initially be through lane reallocation to provide bus priority lanes during peak periods. The routes to be targeted in the next 3 years are Bank St/Kamo Rd, Riverside Dr and SH14/Maunu Rd.
Option 2 - Increase the frequency of bus services in Whangarei	Increase the frequency of the bus services to reduce the time that users are waiting for the bus. This would ideally be done in conjunction with bus priority lanes (Option 1) to ensure that buses can meet the timetable. This option would provide 15 minute buses during peak periods and 30 minute buses at other times (compared to the current service of 30-60 minutes during peak and 1-2 hours at other times).

Option	Description
Option 3 - Provide rural commuter bus services in Whangarei	Provide rural bus services suitable for commuters in Whangarei's outlying towns and villages to reduce commuter trips into the city. This would target the towns of Hikurangi, Tutukaka, Maungatapere, Parua Bay, Ruakaka and Waipu.
Option 4 - Develop shuttle bus services or ride share schemes in rural towns.	Provide lower cost shuttle bus type services where feasible between rural towns across Northland. Support the development of low-cost ride share services to provide access to communities where bus services are not feasible.
Option 5 - Consider mobility options (eg Uber/pub taxi) to avoid impaired driving	Consider potential mobility options (eg Uber type service or pub courtesy vans) to help avoid impaired driving.

6.15.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Public Transport	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Programme Adjustment** **Route Management** • Option 1 - Provide bus priority lanes in Whangarei **Policy Approach** **LOS Adjustments** • Option 2 - Increase the frequency of bus services in Whangarei • Option 3 - Provide rural commuter bus services in Whangarei • Option 4 - Develop shuttle bus services or ride share schemes in rural towns. **Demand Management** **Managing Demand** • Option 5 - Consider mobility options (eg Uber/pub taxi) to avoid impaired driving	1 2 3 4 5	0.95 0.9 0.8 0.6 0.3	**Yes** **Yes** **Yes** **Yes** No

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Provide bus priority lanes in Whangarei
- Option 2 - Increase the frequency of bus services in Whangarei
- Option 3 - Provide rural commuter bus services in Whangarei
- Option 4 - Develop shuttle bus services or ride share schemes in rural towns.

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Public Transport (WC 511, 532)

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments	Yes	2 - A 3 - B 4 - C	A. Increase the frequency of the bus services to reduce the time that users are waiting for the bus. B - Provide rural bus services suitable for commuters in Whangarei's outlying towns and villages. C - Provide lower cost shuttle bus type services where feasible between rural towns. Support the development of low-cost ride share services to provide access to communities where bus services are not feasible.
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	5	Consider potential mobility options (eg Uber type service or pub courtesy vans) to help avoid impaired driving.
❑ **Route** Management	Yes	1	Provide bus priority lanes on key bus routes in Whangarei
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

Criteria	Weighting (Importance) (Total to 100%)	How good is this option													
		Option 1 - Provide bus priority lanes in Whangarei		Option 2 - Increase the frequency of bus services		Option 3 - Provide rural commuter bus services in Whangarei		Option 4 - Develop shuttle bus services or ride share schemes in rural towns.		Option 5 - Consider mobility options (eg Uber/pub taxi) to avoid impaired driving		Option 6		Option 7	
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	2	0.2	2	0.2	3	0.3	3	0.3	1	0.1		0		0
Problem solving effectiveness	10%	2	0.2	2	0.2	1	0.1	1	0.1	1	0.1		0		0
Benefits realised	10%	2	0.2	2	0.2	1	0.1	1	0.1	1	0.1		0		0
Good Environmental impacts	5%	1	0.05	2	0.1	2	0.1	1	0.05	0	0		0		0
Value for Money	10%	2	0.2	2	0.2	1	0.1	0	0	-1	-0.1		0		0
Closing Customer and Technical LoS gaps and impacts	10%	1	0.1	1	0.1	2	0.2	1	0.1	1	0.1		0		0
Closing ONRC Performance gaps	10%	0	0	0	0	0	0	0	0	0	0		0		0
Asset preservation and sustainability	10%	0	0	0	0	0	0	0	0	0	0		0		0
Total Cost of Ownership (whole of life Costs)	10%	0	0	-1	-0.1	-1	-0.1	-1	-0.1	0	0		0		0
Life Cycle Management	10%	0	0	0	0	0	0	0	0	0	0		0		0
COVID-19 Recovery	5%	0	0	0	0	0	0	0	0	0	0		0		0
etc.			0		0		0		0		0		0		0
Totals	**100%**		**0.95**		**0.9**		**0.8**		**0.6**		**0.3**		**0**		**0**

6.15.6 Financial Impact

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

6.15.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	$1,000,000 for new wharf upgrades as identified in the Twin Coast Discovery Route PBCs and in the Integrated Transport Plan $225,000 to provide bus stops and shelters for users on bus routes as identified in the Integrated Transport Plan $125,000 to support Public Transport and Ride Sharing as identified in the Integrated Transport Plan	+$1,400,000
531	Public Transport Infrastructure Improvements and Major Renewals	None programmed – No change	No Change
004	Investment Management	The following studies and plans were identified through the Integrated Transport Plan: $175,000 to develop a long term plan for ferry operations on the Hokianga Harbour $100,000 to develop a Total Mobility Scheme for the Far North $50,000 to develop a Public Transport / Ride Share implementation plan for the Far North $75,000 to develop a plan for implementing Park and Ride facilities on public transport routes	$400,000

6.15.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	None programmed – No change	No Change
531	Public Transport Infrastructure Improvements and Major Renewals	None programmed – No change	No Change

6.15.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	$4,188,000 to develop bus priority lanes in Whangarei to improve the bus service and promote mode shift	$4,188,000

531	Public Transport Infrastructure Improvements and Major Renewals	None programmed – No change	No Change
	Unsubsidised (Note subsidy for these activities is recovered through NRC's WC 531 activity)	$1,500,000 for the Rose St Bus Terminal upgrade in Whangarei to improve uptake in bus use $674,000 to upgrade bus shelters on stops on the bus priority lanes to improve uptake in bus use $154,000 for maintenance of existing bus shelters	$1,585,000

6.15.7 Improvement Plan

Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- Determine the feasibility of rural commuter bus services to rural towns in the Whangarei District.

6.16 Parking

Work Categories: **Parking (Unsubsidised)**

6.16.1 Links to Strategic Case

Problem Statement: 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 CBD. Many of the parking meters use old technology which will soon be obsolete. Tension between providing sufficient parking with new developments and encouraging public transport use. Also demand for free parking in the CBD to compete with other "big box" developments which offer free parking.

Benefits of Addressing Problem: Advising where parking is available in real-time will reduce vehicle circulation in the CBD. Replacement of old parking machines will avoid problems with replacement parts etc when these become obsolete.

Consequences of Not Addressing the Problem: Without carrying out any changes to the parking in the CBD, customers will still be frustrated in driving around looking for a park. Obsolete parking machines will result in difficulty maintaining these machines, lowering the level of service and potentially increasing costs.

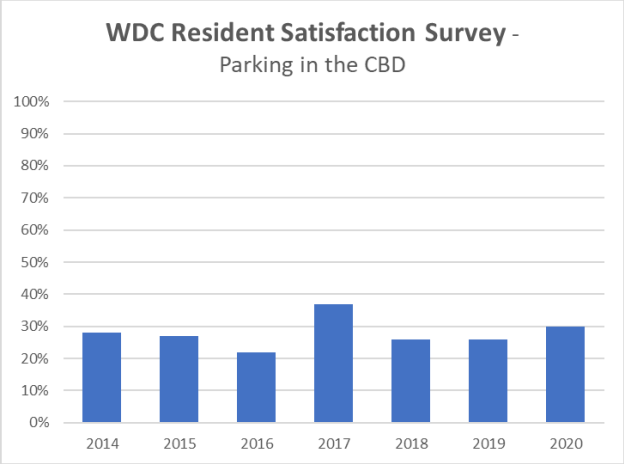
6.16.2 Levels of Service

ONRC Customer Outcomes: None

Customer Levels of Service: None

6.16.3 Evidence and Gap Analysis

Resident Satisfaction – Parking

FNDC	KDC	WDC
		
		
FNDC Satisfaction with Parking – FNDC does not measure the satisfaction with peak traffic flows.	**KDC Satisfaction with Parking** – KDC does not measure the satisfaction with peak traffic flows.	**WDC Satisfaction with Parking** – The percentage satisfied with WDC's parking in the CBD is currently 30% is slightly higher than the average over the past seven years. This satisfaction rate is considered to be an adequate result. The increase in satisfaction over the past two years is probably due to new carparks in the CBD at the old Toyota site and the Wilson carpark.

6.16.4 Options to be Considered

Based on the above data and the root cause analysis, the following options have been considered for parking:

Option	Description
Option 1 - Increase parking fees for all-day parking in Whangarei to promote bus use	Increase the parking fees for all-day parking so that these are at least as expensive as a return bus fare (price advantage) to promote bus use as a preferrable means of travel.
Option 2 - Increase the number of car parks in the Whangarei CBD	Increase the number of car parks in the Whangarei CBD to make it easier to find a carpark to help revitalise the Whangarei city centre.

6.16.5 Option Assessment & Line of Sight

The options and the line of sight to the preferred strategic response and the problems they are addressing are shown in the table below. These options have been ranked in order of preference and then have been assessed through a multi-criteria assessment (MCA) to determine the highest scoring options that are preferred and are to be adopted. The MCA assessment is also provided as follows.

Work Activity	Problem Statements Addressing	Preferred Strategic Response	PBC Options to be Considered	Option Rank	MCA Score	Preferred Options
Parking	**Growth and Alternative Transport** - Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangarei during commuter peaks and in Kerikeri/Waipapa and Mangawhai during peak holiday periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.	**Programme Adjustment** • Intersection and road upgrades including bus priority lanes, new link roads • Shared path networks for Whangarei, Kerikeri/Waipapa and Mangawhai **Policy Approach** • Increase bus frequency in Whangarei and expand rural services **Demand Management** • Travel planning and mode shift promotion. • Increase all-day parking charges	**Demand Management** **Managing Demand** • Option 1 - Increase parking fees for all-day parking in Whangarei to promote bus use **Route Management** • Option 2 - Increase the number of car parks in the Whangarei CBD	1 2	1.05 -0.6	**Yes** No

PREFFERED OPTIONS: From the multi-criteria assessment the preferred options are:

- Option 1 - Increase parking fees for all-day parking in Whangarei to promote bus use

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PBC Multi Criteria Option Analysis, RCA: NTA

Activity/Work Categories: Parking

Short list up to 3 options from the following:

Option - Can we make	Yes/No	Rank	Reason
❑ Intervention response **timing** change			
❑ **LoS** adjustments			
❑ Use existing assets **differently**			
❑ **Blending** Work Categories differently			
❑ **Risk** - Hold Assets longer			
❑ Managing **demand**	Yes	1	Increase the parking fees for all-day parking so that these are at least as expensive as a return bus fare (price advantage).
❑ **Route** Management	Yes	2	Increase the number of car parks in the Whangarei CBD
❑ Alternative approaches – different **solutions/technology**			
❑ **Maintenance vs Renewal** adjustments			
❑ **ONRC** Classification variance			
❑ Extended **temporary** management			
❑ **Supply chain** improvements			
❑ Improve **systems and capability**			

Criteria	Weighting (Importance) (Total to 100%)	How good is this option					
		Option 1 - Increase parking fees for all-day parking in Whangarei to promote bus use		Option 2 - Increase the number of car parks in the Whangarei CBD		Option 3	
		Raw	Score	Raw	Score	Raw	Score
Community Outcomes Achieved	10%	-2	-0.2	2	0.2		0
Problem solving effectiveness	10%	2	0.2	-2	-0.2		0
Benefits realised	10%	2	0.2	-2	-0.2		0
Good Environmental impacts	5%	1	0.05	-2	-0.1		0
Value for Money	10%	3	0.3	-1	-0.1		0
Closing Customer and Technical LoS gaps and impacts	10%	2	0.2	-2	-0.2		0
Closing ONRC Performance gaps	10%	0	0	0	0		0
Asset preservation and sustainability	10%	0	0	0	0		0
Total Cost of Ownership (whole of life Costs)	10%	3	0.3	1	0.1		0
Life Cycle Management	10%	0	0	-1	-0.1		0
COVID-19 Recovery	5%	0	0	0	0		0
etc.			0		0		0
Totals	**100%**		**1.05**		**-0.6**		**0**

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

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6.16.6 Financial Impact

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

6.16.6.1 Far North District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
341	Low Cost/Low Risk Improvements	$950,000 to provide parking and facilities at visitor destinations as identified in the Twin Coast Discovery Route PBCs and the Integrated Transport Plan	$950,000
004	Investment Management	$350,000 to carry out a parking review and develop a Parking Plan at visitor destinations as identified in the Integrated Transport Plan	$350,000

6.16.6.2 Kaipara District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
	Unsubsidised	None programmed – No change	No Change

6.16.6.3 Whangarei District Council

W/C	Description	Cost Impact	Overall Impact (excl Growth & Escalation)
	Unsubsidised	$1,378,000 for parking operations including meter readers and parking enforcement $612,000 to continue the programme to replace obsolete parking meters $612,000 to continue to maintain the parking meters in Whangarei $704,000 for the resurfacing of off-street carparks	$1,798,000

6.16.7 Improvement Plan

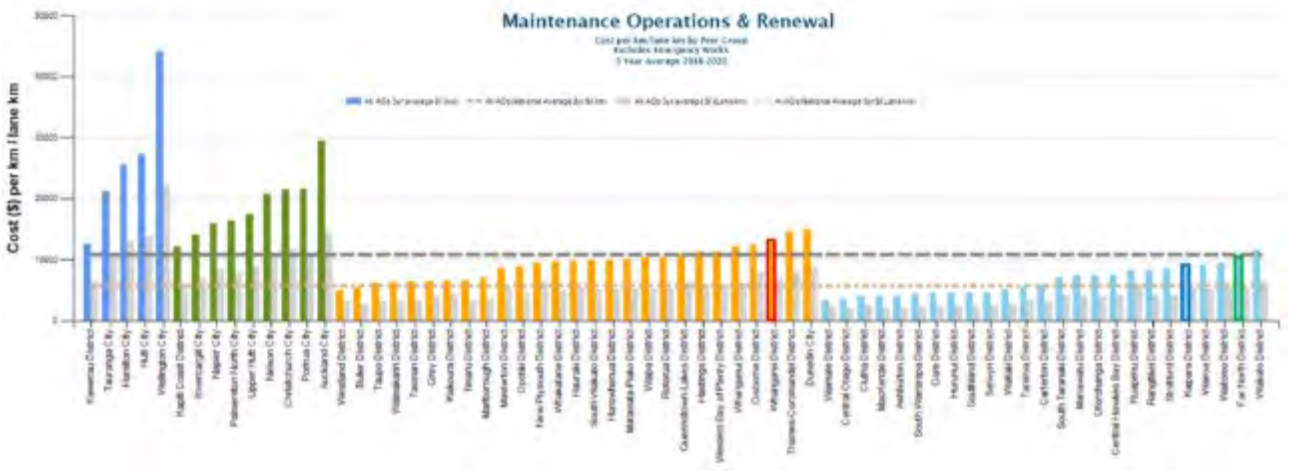
Improvements that should be considered during the 2021/24 period for inclusion in the next AMP are as follows:

- None identified.

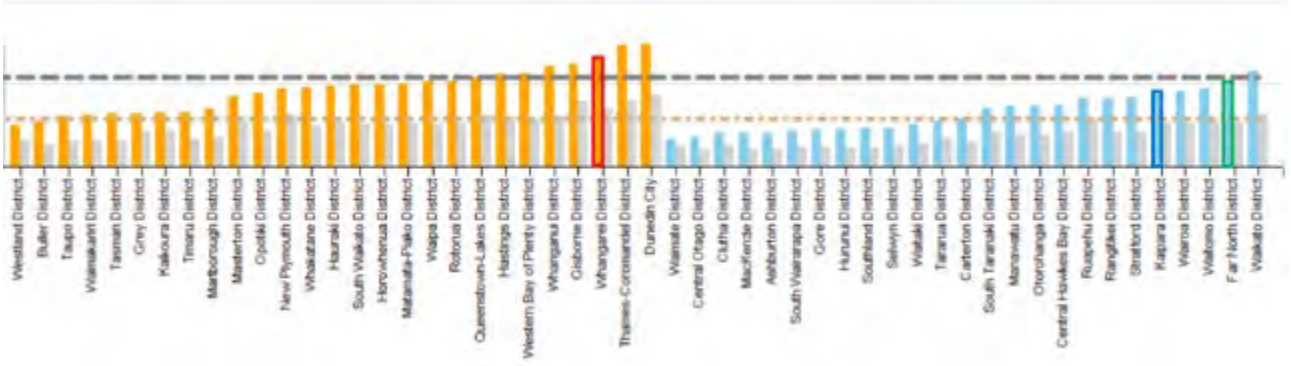
6.17 Value for Money of the Transport Activity

6.17.1 Overall Assessment

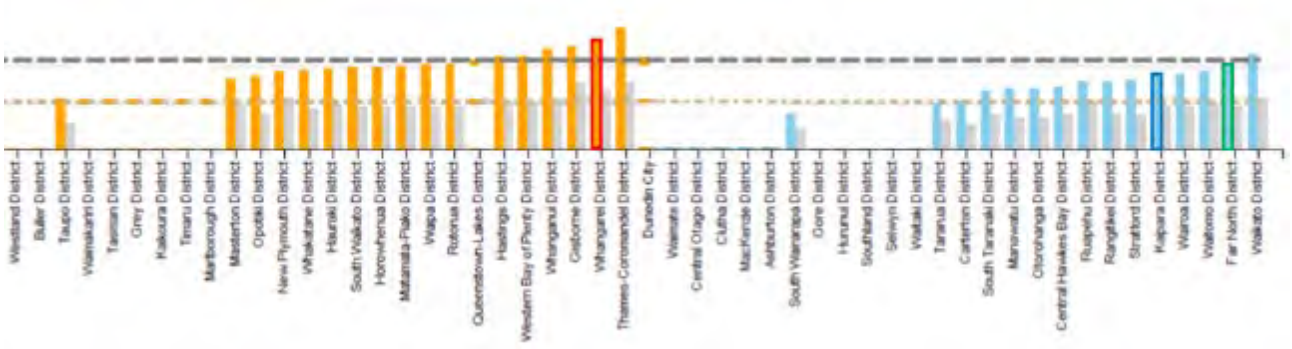
The overall value for money of the transport activity has been assessed by considering the cost to deliver the activity and level of customer satisfaction. The comparison to deliver the activity (per kilometre) over the three year period 2017/18 to 2019/20 is shown in the graphs below:



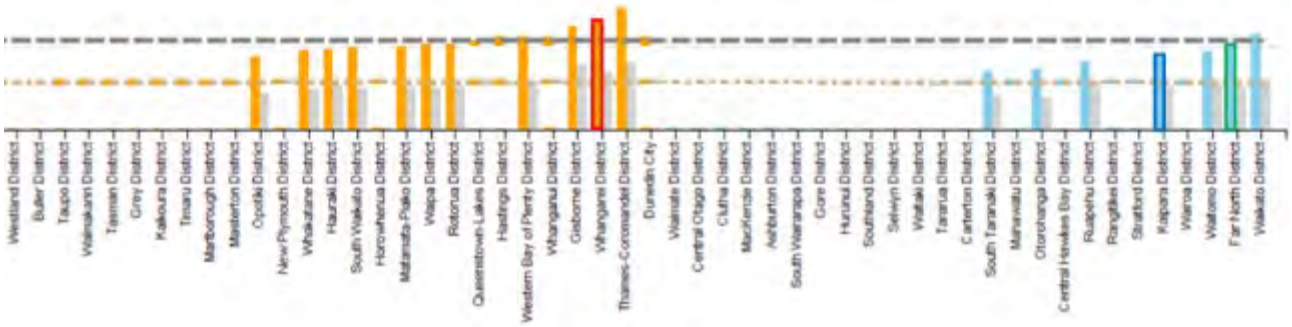
If we just focus on the Provincial Centres and Rural Districts peer groups, the comparison is as shown below. This indicates that Far North and Kaipara have the 2nd and 5th highest costs in their peer group (of 25 councils), and Whangarei has the 3rd highest cost in its peer group (of 27 councils).



However, this is not a fair comparison because there is a large variety of environmental factors such as geology and traffic loading which affect the costs of providing the activity. For example, the South Island councils have generally lower traffic flows, better subgrades (river gravels and rock) and access to good quality materials. If the South Island councils were removed from this comparison, Far North would still be the 2nd highest and Kaipara the 5th highest but out of 15 North Island councils in their peer group. Whangarei would be the 2nd highest out of the 17 North Island councils in their peer group. This is shown in the following graph.



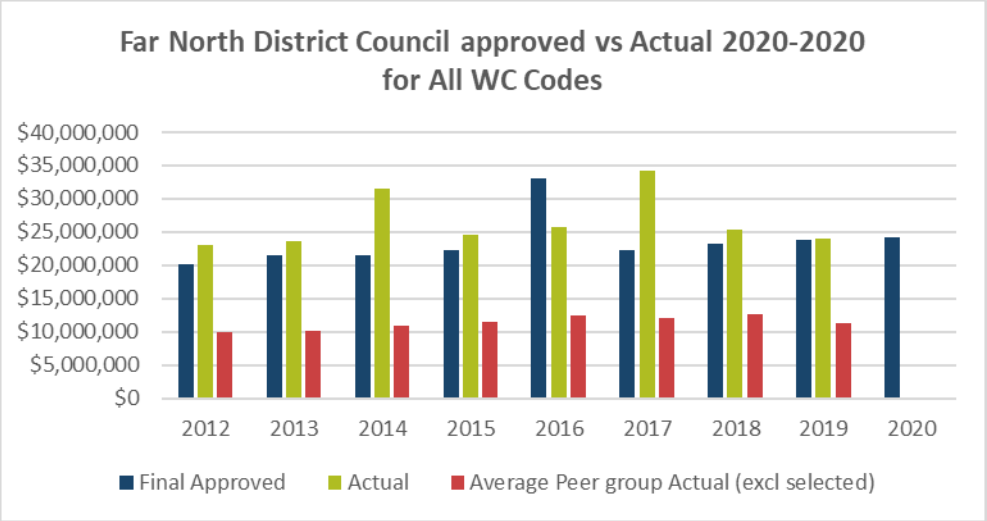
Similarly, the councils in the lower half of the North Island carry significantly less traffic and freight than the upper North Island (upper North Island Freight Triangle) as well as having better soil types. If these lower North Island councils were removed from this comparison, Far North would still be the 2nd highest and Kaipara the 4th highest but out of only 7 upper North Island councils in their peer group. Whangarei would be the 2nd highest out of the 11 upper North Island councils in their peer group. This is shown in the following graph.



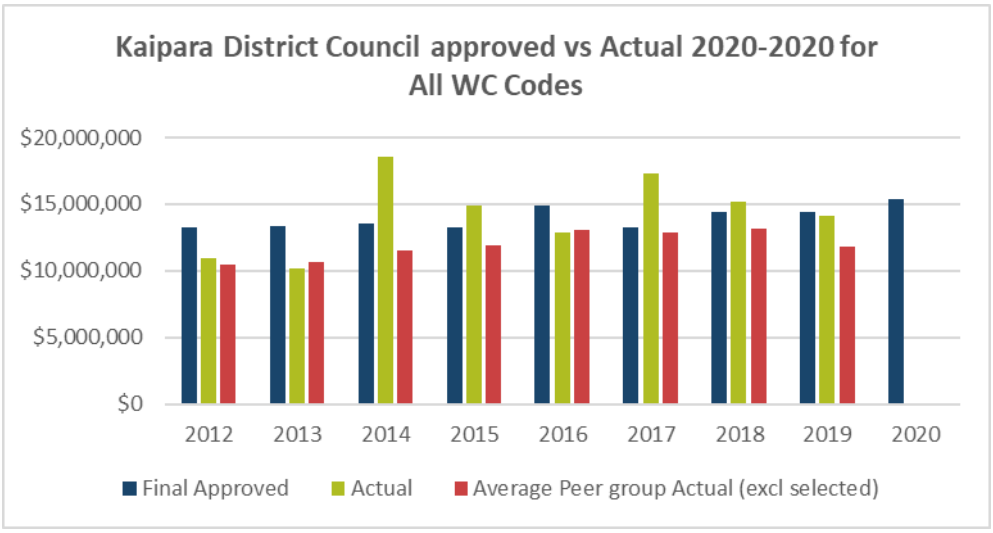
This indicates that Far North and Kaipara have similar costs to the upper North Island councils in their peer group. They also have costs/km that are equal to or lower than the national average. It should be noted that Far North also operates the Hokianga Ferry service which the other upper North Island councils in their peer group do not have.

While Whangarei's cost/km are high even when compared to the upper North Island councils in their peer group, it should be recognised that Whangarei has the third highest traffic flows (VKT/km) on its sealed road network in its peer group, and apart from Rotorua District, is the only other upper North Island council in its peer group that has a major urban area (ie city). It also has significant operational traffic management costs (extensive traffic signals and opening bridge operations) which the other upper North Island councils in the peer group do not have. This suggests that Whangarei's overall network cost are probably reasonable when all of these factors are taken into account.

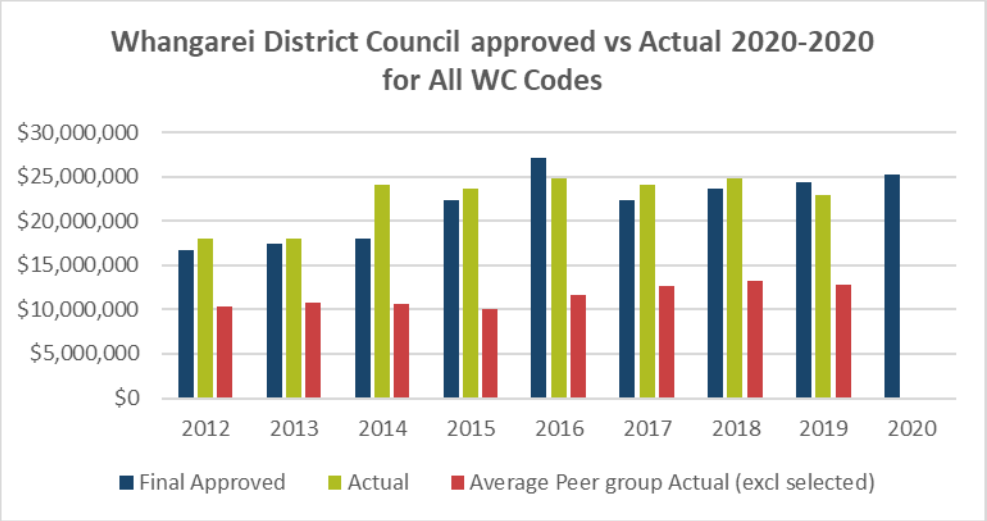
The following graphs show the approved Maintenance, Operations and Renewals (MOR) funding compared to the actual spend for each council.



This figure indicates that the Far North has typically spent more on MOR than they had approved NZTA budget for. This suggests that the Far North has a good track record of spending its MOR allocation and the network demand is generally greater than the available budget. The only exception to this was in 2016 when NZTA provided unsealed road strengthening funding in Year 1 of the 2015-2018 NLTP. The funding conditions for this funding was satisfied in 2017, hence why the 2017 spend was significantly higher than the approved funding. The overall MOR spend is significantly higher than the peer group average which is consistent with the MOR peer group comparisons above showed that FNDC was the second highest spend in their peer group.



This figure indicates that the Kaipara District Council has typically spent their approved MOR budget. This suggests that Kaipara has a good track record of spending its MOR allocation. There was an underspend in 2012 and 2013 which was as a result of limited local share available resulting from the Mangawhai rates strike. This underspend was reversed in 2014 when the local share became available. The overall MOR spend close to their peer group average.



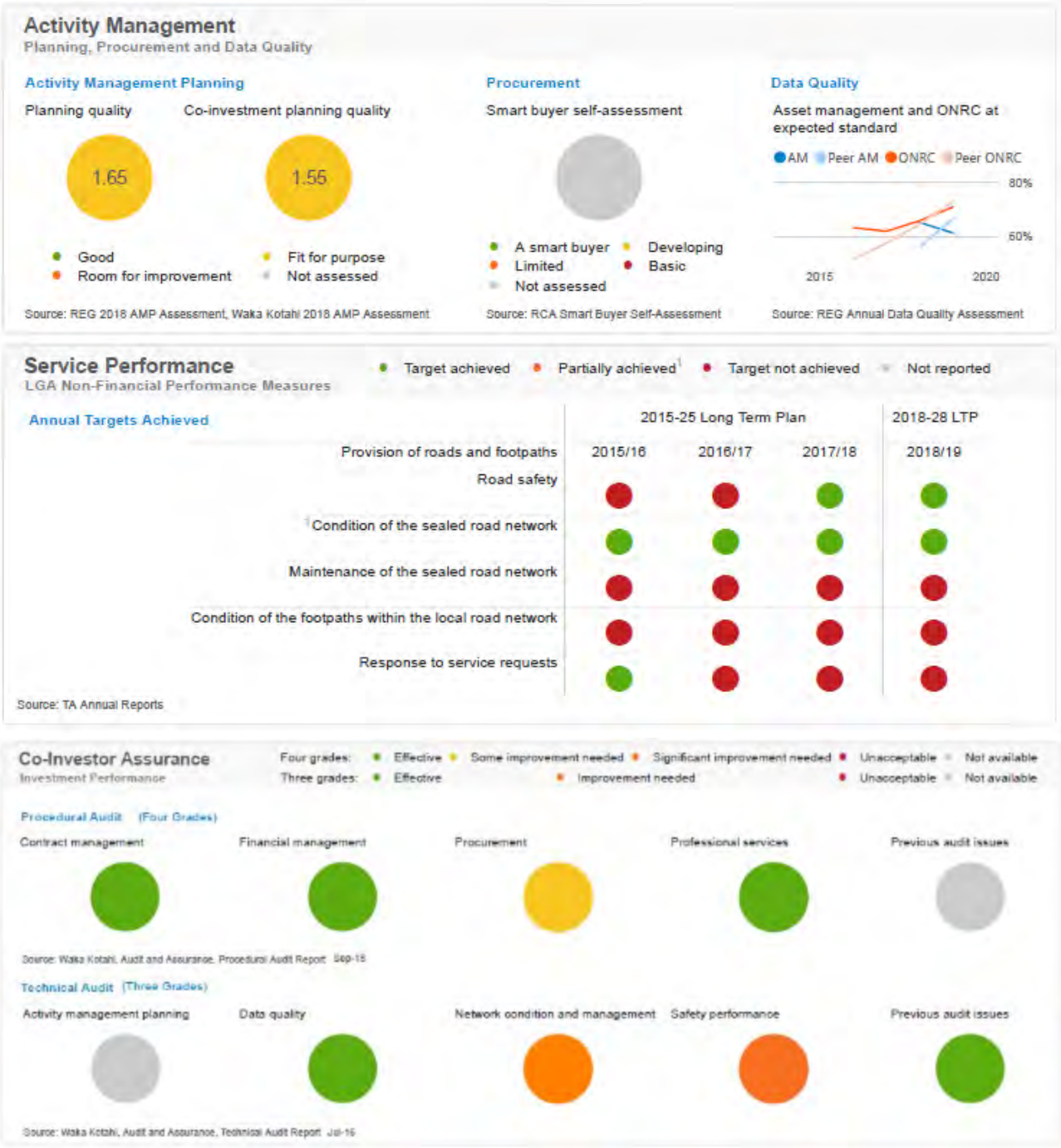
This figure indicates that Whangarei has typically spent more on MOR than they had approved NZTA budget for. This suggests that WDC has a good track record of spending its MOR allocation and the network demand is generally greater than the available budget. The overall MOR spend is significantly higher than the peer group average which is consistent with the MOR peer group comparisons above showed that FNDC was the third highest spend in their peer group.

Overall, all three councils generally have higher costs that their peer group. However, as explained above, there are valid reasons for these higher costs and it is considered that reasonable value for money is being achieved through investment in these networks.

6.17.2 REG RCA Reports

The following figures show extracts from the REG RCA Reports for 2018/19. These reports summarise the performance of each council. The full reports are included in Section 10.2.

6.17.2.1 Far North District Council

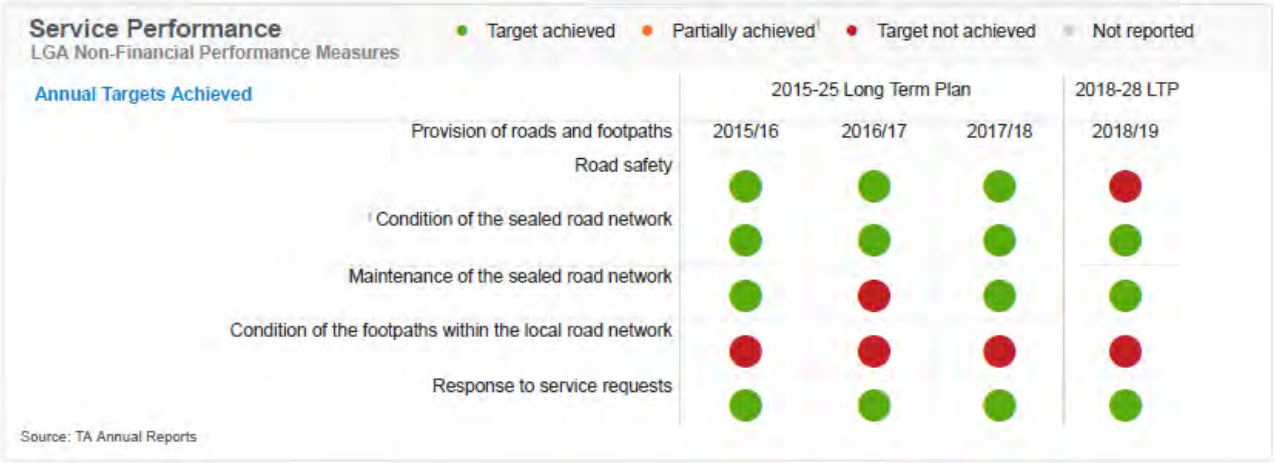


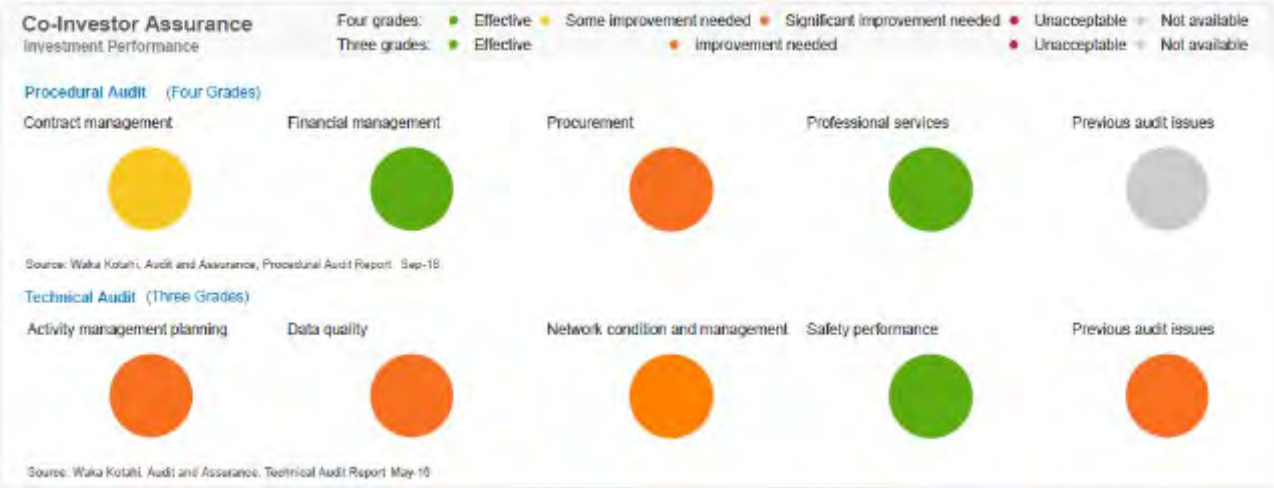
The figures above show that FNDC's activity management planning is fit for purpose and this is expected to improve through the NTA. FNDC had previously not undertaken a procurement self-assessment. However, with their merger into the NTA, they will now have a good score of 59 out of 70 (refer to Section 6.18). The data quality in 2018/19 for FNDC was reported as being close to their peer group average. This has now improved in 2019/20 to being better than their peer group as described in Section 6.19.

The service performance against the Department of Internal Affairs mandatory LOS measures indicates that FNDC is only achieving 2 of the 5 measures. This again is expected to improve going forward. The Co-Investor audit performance is generally good, but with improvement required in some areas. This is described in more detail in Section 6.20.

Overall, this demonstrates that FNDC is delivering good value for money, but there is room for improvement in some areas.

6.17.2.2 Kaipara District Council



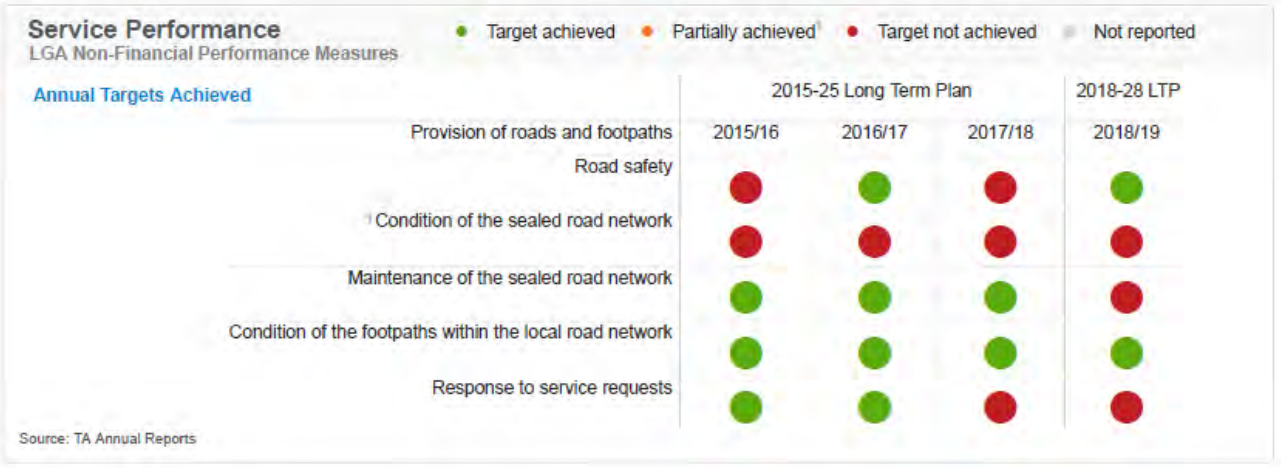


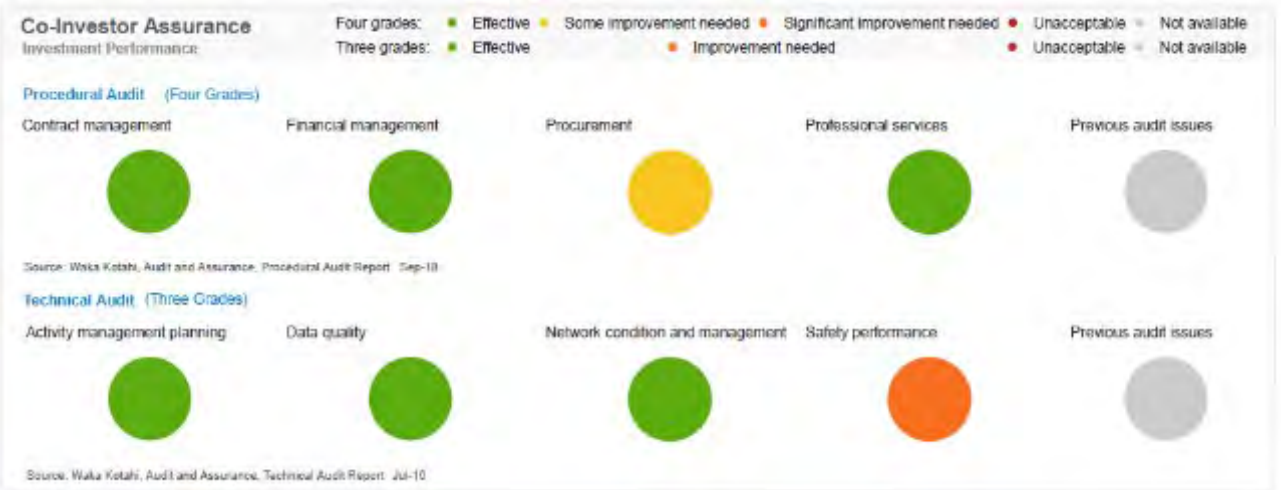
The figures above show that KDC's activity management planning is fit for purpose and this is expected to improve through the NTA. KDC had previously not undertaken a procurement self-assessment. However, with their merger into the NTA, they will now have a good score of 59 out of 70 (refer to Section 6.18). The data quality in 2018/19 for KDC was reported as being higher than their peer group for Asset Management data close to their peer group average for ONRC data. This is described in more detail in Section 6.19.

The service performance against the Department of Internal Affairs mandatory LOS measures indicates that KDC is achieving 3 of the 5 measures. This is expected to improve going forward. The Co-Investor audit performance needs further improvement in some areas. This is described in more detail in Section 6.20.

Overall, this demonstrates that KDC is delivering good value for money, but there is room for improvement in some areas.

6.17.2.3 Whangarei District Council





The figures above show that WDC's activity management planning is good and this we understand that the WDC AMP was rated third highest in the country. WDC previously had a procurement self-assessment score of 56 out of 70 and this has improved to a score of 59 out of 70 in 2020 (refer to Section 6.18). The

data quality in 2018/19 for WDC was reported as being below their peer group. However, this has improved substantially in 2019/20 and is now better than their peer group as described in Section 6.19.

The service performance against the Department of Internal Affairs mandatory LOS measures indicates that WDC is only achieving 3 of the 5 measures. This is expected to improve going forward. The Co-Investor audit performance shows that WDC is generally performing well across most areas. This is described in more detail in Section 6.20.

Overall, this demonstrates that WDC is delivering good value for money, but there is still room for improvement in some areas.

6.17.3 Northland Transport Alliance Initiatives

Several workstreams have been developed to ensure the three Northland TLA's within the Northland Transport Alliance (NTA) work together to establish consistency and a collaborative approach for Northland. These workstreams are described below:

Activity Management Plans

Objective – Produce best practice BC-AMP's that manage each districts activities but support a regional approach for Northland.

Status – **Complete** in DRAFT (This Plan 2021-24)

Outcome - All three councils are working together to produce a single AMP's that considers regional issues and aligned thinking. This is single AMP with one structure presenting local differences where required and detailing each programme case as directed by regional business case approach. Which would reduce the regional cost of AMP preparation each LTP/NLTP cycle.

Benefit – Single Business Case approach across northland to provide a more integrated consistent approach to decision making and value for money investment.

Engineering Standards

Objective – Produce a single set of engineering standards to Northland.

Status – WDC is currently finalising its amended standards utilising KDC and FNDC standards. Once adopted KDC and FNDC will look to adopt. Moving through review and adoption stages.

Outcome – Single set of standards producing consistency throughout the Northland region to allow developers and practitioners to work easily across the region. Consistent materials and assets being specified making it easier and cheaper to supply, manage and utilise staff across regions to support workloads.

Benefit – Consistent delivery of new works that comply with national standards and reduce overall future costs.

Centre Of Excellence - Unsealed Road Strategy

Objective - Produce a consistent approach to how all three road controlling authorities manage their unsealed road network. The establishment of the Centre of Excellence (CoE) allows the learnings and

strategy development to be adopted nationally through REG forums and IPWEA. This will lead to industry better unsealed management practices and a more NZ Inc consistent approach to unsealed management.

Status – The bulk of strategy has been developed and is in review with steering group. Detailed unsealed management modelling and unsealed segmentation work has been completed and introduced into this plan (2021-24 LTP) for funding consideration. This also aligns to the maintenance contract delivery philosophies for the Unsealed maintenance and renewal activity.

Outcome – That the unsealed roads are managed better and the maintenance and renewal works are proactive and planned rather than reactive. Ensuring we are investing in the right areas.

Benefit: Is lift in service level provision which in turn should result in the correct investment at the appropriate level rather than active over investment i.e. pressure from communities to under seal extensions.

Procurement – Tender timetables

Objective - Produce a list of works / projects for Northland that are to be tendered to the open market with indicative tender dates.

Status – Time table developed and published.

Outcome – All works have been set so as not to flood the market at once and give the industry advance warning of what is coming the following year.

Procurement Strategy

Objective - Provide a regional procurement strategic that each council can adopt.

Status – **Complete** during the 18/21 plan.

Outcome – Developing one strategy rather than three has allowed cost saving and a greater level of expertise the feed into the strategy. While ensuring consistency across the region and developing new maintenance contracts that will drive quality and efficiency. This is described in more detail in Section 6.15.

New Maintenance Contracts

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

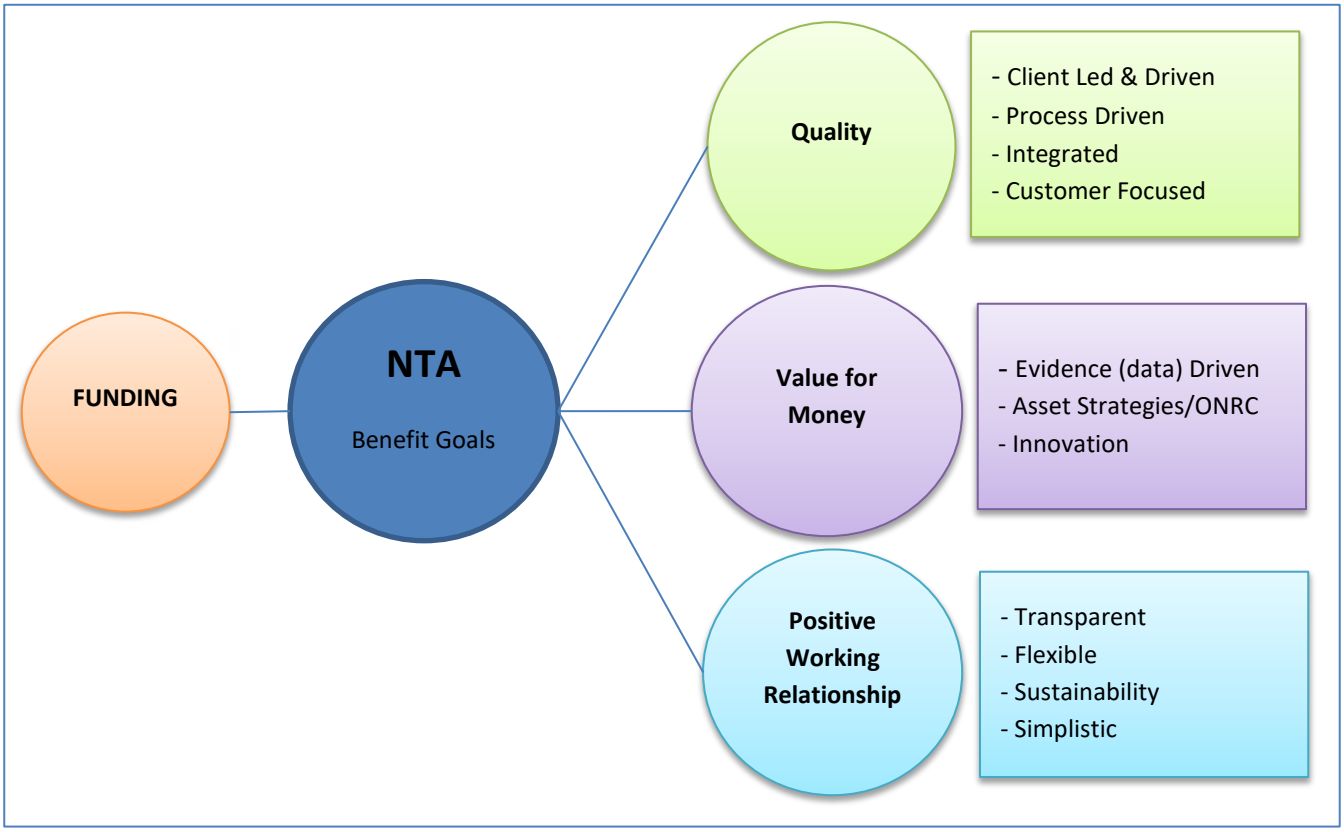
1. More engaged and capable workforce delivering superior asset management
2. Improved Transport/customer outcomes, enabling investment and social opportunities
3. Improved Regional strategy, planning and procurement
4. Transport Infrastructure is more affordable.

Status – **Complete** during the 18-21 plan

Outcome – To align how all northland roads are managed from processes to materials used. Resulting in 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, 4/10/2017 set out what is important to the NTA in delivery of the maintenance contracts.

- Delivering value for money
- 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 & Safety
- Supporting flexibility over the duration of the contract
- 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
- 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

- 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.
- 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 a 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 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 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 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.
- 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.

Benefit – Single approach to contract management to support the AMP business case strategies across the region. This includes improved work flow processes, improved data quality, improved work practices, opportunities to learn and deliver innovation from different suppliers across the region.

NZTA Memorandum of Understanding

Objective - Establish one Memorandum of Understanding (MOU) for all three councils in agreement with NZTA.

Status – Development

Outcome- A consistent procedure for staff when dealing with SH / Local road interface and utilising resources from best equipped supplier/RCA.

Staff Structure

Objective – Develop a staff structure to be best utilise the skills and expertise and allow in house specialisation.

Status – **Complete**

Outcome – Develop in house expertise less reliant on consultants and attract specialist skills to the region.

Traffic Counting Strategy Review

Objective - Review the current traffic counting strategy for WDC and KDC based on current best practice. Apply this to FNDC. Develop a revised traffic count programme based on the new strategy, to provide robust network traffic knowledge for Profiling of the network traffic growth by catchment and classification Identify change in network use Develop Traffic Count Estimates for every road in the network based on traffic count relationships Go to market with revised programme for 5-8 year counting contract.

Status – **Complete** during 2018-21 LTP Contract in place operative as of Nov 2020.

Outcome – Was to develop a Methodology to review catchments Split each catchment into different groups based on the ADT. Select 3%-7% carriageways out of each ADT group for core monitoring sample sites. Select a further 5%-7% carriageways out of the top ADT groups for annual sites to cover top 80% of the VKT within the group. Select enough carriageways out of the whole catchment for additional one-off counts for next five years to achieve better coverage of the network. There will be special counts done

annually such as; Holiday Counts, Rehabilitation Site Counts, targeted unsealed road counts and counts requested by Local Authority to use in applications like traffic modelling, safety studies and crash analysis.

Benefits - This strategy aims to maximise resources by reducing some sites from being counted four times per year and replacing them with previously uncounted sites. This will provide the data needed to produce robust traffic count estimates.

Retaining Wall Management Strategy

Objective - Develop Network Criticality model to help drive Inspection process (Done once to be overlaid on NTA decision making/inspection processes). Develop a consistent inspection process that included; Validation addition of structure data; Location type, sub type, height length etc…Assess Categorisations and Condition. From this data Undertake a Risk Assessment of all walls and develop and Multi Year management programme. All developed and captured electronically.

Status – **Completed,** implemented as part of this plan.

Outcome – For network criticality aspect Maps were produced to show the Network Criticality data as agreed in the Model. This has five categories as follows; 1-5 Rating with 5 – Most critical to 1 – Least critical. The following inputs:

Attribute	Source
ADT	RAMM Carriageway Table
% HCV	RAMM Carriageway Table
Horizontal Geometry	RAMM HSD Data Table
Vertical Geometry	RAMM HSD Data Table
Use	See Sub Attributes under Use
Forestry-collector	Forestry-collector data from Territorial Authorities
Tourist/Holiday	Roads identified from Tourist Signs data
Marae	Government Published Data
Living	N/A
Quarry	List of Quarries from WSP Lab
School	Government Published Data
Width	RANN Carriageway Table
Remoteness	N/A
Detour Routes	Detour Routes data from the Territorial Authorities
Land Use	Land Cover Database

From this the most critical routes and the will son those routes were inspected and rated in accordance with process set out in the strategy. Initial findings identified works by WC as follows; Multi Year Management Plan to Fund Retaining Wall Broken into:

- Full Replacement (WC341)
- Component Replacement (WC215)
- Structural Maintenance (WC114)

Initial Findings Suggest the following Funding Profiles Per Annum

Average Cost based on 10 programme			
$/Annum ($000)	Full Replacement	Component Replacement	Structural Maintenance
Far North DC	$250	$125	$75
Whangarei DC	$350	$175	$100
Kaipara DC	$150	$85	$50
Total $/annum	**$750**	**$385**	**$225**

These funding profiles have been requested in this plan.

Benefits – Integrated network criticality across the region on which base decision making for many activities. Robust repeatable process electronically stored and accessible to the NTA. A process on which adhoc inspections by our NTYA area inspections can undertake and feed information back into the system for review and validation. Integrate the formal inspection of retaining structures with bridge inspections and cyclic basis dependent on risk profile.

Drainage Management Strategy

Objective - Develop Multi Year Drainage Programmes based on a set of Weighted Drainage Need Assessment Factors. To provide an Overall Drainage Risk Factor across the Network (Sealed and Unsealed) to develop a process that was repeatable. Integrate the Culvert Drainage Inspections completed under the Maintenance Contracts, integrate Drainage Assessment FWP with Pavement and Surfacing FWP and prioritise the Drainage Programme based on Risk Factor and Pavement & Surfacing FWP.

Status – Desk top analysis and Programme Developed for Implementation. Funding profiles developed for this Plan LTP 2021-25.

Outcome – A programme of drainage work based on risk factor and network criticality prioritised with sealed pavement FWP. The resulted in drainage programme broken by WC as follows which has been used in this funding request LTP 2021-25.

Average Cost based on 10 programme						
$/Annum ($000)	Water Table	KCC (Rural)	Culvert Renewal	Culvert Flushing	Subsoil	Total
Far North DC	$210	$124	$485	$44	$33	$896
Whangarei DC	$120	$144	$480	$23	$20	$787
Kaipara DC	$99	$84	$450	$27	$22	$682
Total $/annum	**$429**	**$352**	**$1,415**	**$94**	**$75**	

Benefits – A consistent repeatable processes that uses data rich environment of the NTA to review drainage risk factor. Setting of Drainage forward work programme that can be delivered as work packages in the maintenance and renewal contracts.

Resilience Management Strategy

Objectives - Develop an understanding of the current state of network Resilience through consistent process of Data gathering and Inspections. Apply this process on consistent basis to grow knowledge and understanding of network resilience site by site. Develop a resilience Plan that is couched in terms of (4R'S)

- Readiness – routine maintenance of sites through data how do they perform
- Reduction – Reduce risk through physical works
- Response (emergency)
- Recovery

Get to a Future mature state where the road system is Resilient, appropriately adapting to climate change and responsive to disruption. Develop Multi Year Resilience Management Programme based on the 4R's.

Status – Inspection complete, Risk ratings being analysed initial funding profiles set for this plan LTP 2021-25.

Outcome – The development of process and system to gather in information in regard to resilience to develop risk profiles. Inspection were based on the network Criticality model to complete inspection on the high priority routes first. Undertake Risk Assessment of Threat Sites. Applied standard Likelihood and Consequence approach for risk assessment. The inspections have resulted in an identifying on average 1 slip per 1 kilometre of network. Based on High level of assessment of this data to date, using the above at a 65% risk reduction in network failure. The potential funding impact would be in the order of $1.5M/yr, per council.

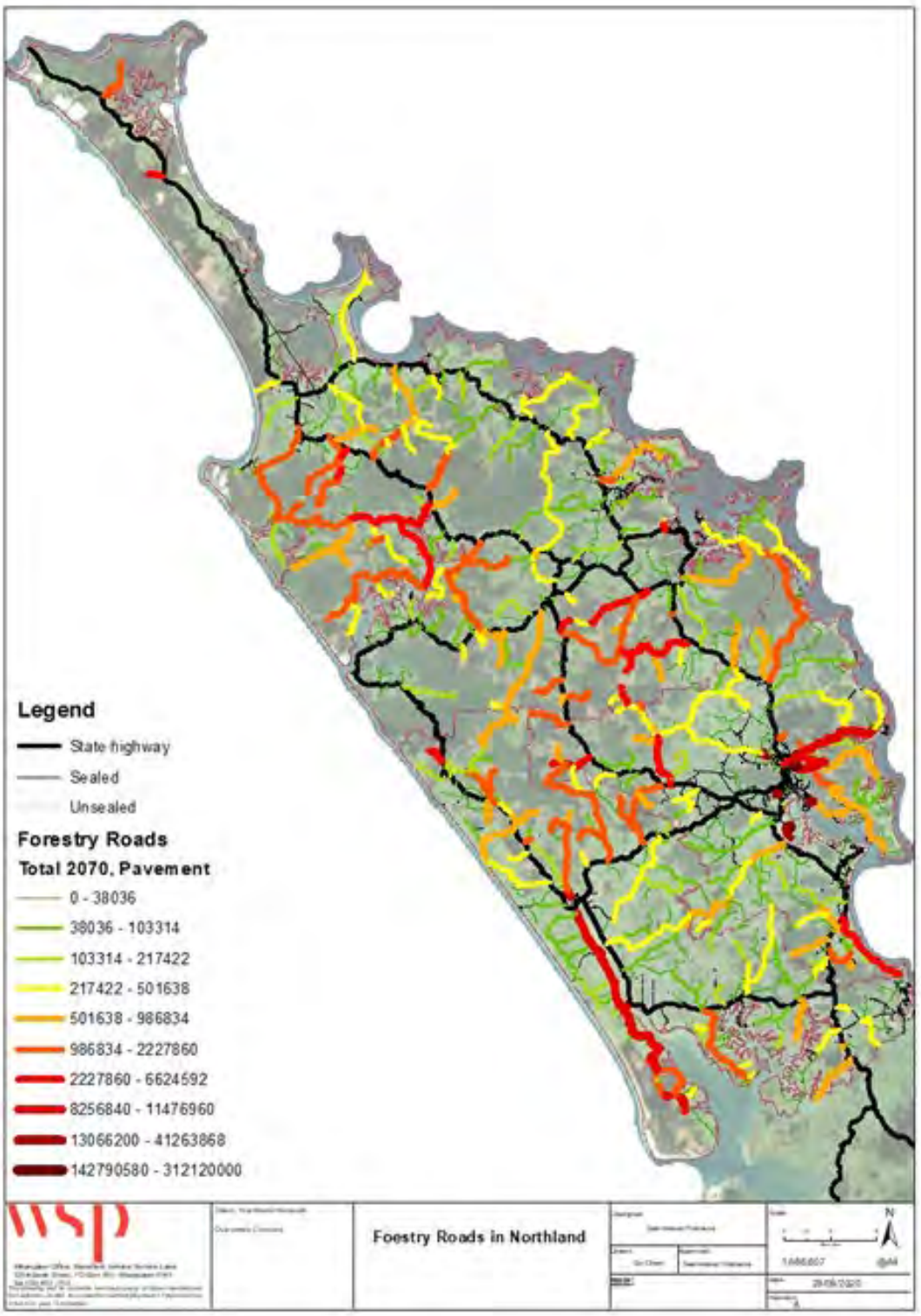
Benefits – Is to understand the resilience issue on the network and define what is critical. Undertake and objective approach to failure reduction based on the 4R's of resilience management. Target funding where the greatest return on investment will be given.

Forestry Loading Review and Impact Assessment

Objectives – There were several objectives in this project. First update the Wood Volumes across the region in consistent manner to ensure the wood volumes, forest blocks being harvested and timing of harvesting was well understood and integrated across the regions and northland roads. Second was to use these volumes to both Sealed and Unsealed modelling approaches to understand the over and above impacts on the road network with loading on maintenance and renewals investment over the next 20 years.

Status – **Complete** and used in modelling adjustment to funding request made. Will become BAU process

Outcome – Updated wood volume and harvesting plans of the next two harvest cycles for the region. Map showing these volumes and routes from 2020 to 2070.



Modelling out comes showed for the sealed network that FNDC increased cost on normal budget would be in the order of extra 6% per annum on $4.9M, KDC is 14% per annum on $2.2M and WDC is 9% per annum on $4.2M. This is to hold the current condition of the network over the next 10 years.

Benefit – Consistent approach to updating management of wood flow volumes in the region creating a single reference. Understand the overall impact on funding programmes and future impacts. Integrated in overall decision making process for FWP development and value for money investment in the network.

6.18 Procurement

6.18.1 Procurement Strategy

The formation of the Northland Transportation Alliance (NTA) has provided the opportunity for a combined regional approach to be agreed and delivered through the adoption of regional procurement strategy. The strategy has been adopted by all four councils that make up the NTA and has been endorsed by NZTA.

This strategy covers the period until 2021. The update of the strategy then will align with the 2021/24 three year programme and the 2021/31 ten year Councils' Long Term Plans. 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 coordination.

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 coordinated 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 New Zealand Transport Agency (the Transport Agency) 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 five 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 value for money through efficiencies of scale.
- The ability to coordinate the terms of all the local MO&R contracts with those of the Transport Agency'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.

- The ability to work with the suppliers to identify opportunities for regional coordination 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 are detailed as follows:

- Five MO&R contracts spanning the whole local road network of Northland (these contracts are now in place, and commenced on 1 July 2018). There are two contracts covering each of the Whangarei and Far North Districts and one contract covering the Kaipara District.
- The MO&R contracts have a term of 4+2+1+1 years (8 years maximum) and a start date of 1 July 2018. The 4+2 is to align with the Transport Agency's NOC completion dates of 2022/24. This will enable, if appropriate, joint consideration by the Councils and the Transport Agency 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 are fence to fence involving most of the M&O aspects with road marking, bridge maintenance, reseals and a portion of rehabilitation work included.
- The MO&R contracts used a price/quality procurement method and a 2-stage selection process where initially a short list of suppliers was 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 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 1 April that financial year.
- The Northland Transportation Alliance, established as a Shared Services Business Unit, provides in house professional services to the four Northland Councils.
- 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 (still to be procured). 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 shortly commencing on reviewing and updating the current Procurement Strategy which expires in September 2021. It is possible that the NTA may request an extension of the existing Procurement Strategy if there are no necessary changes to be made.

6.18.2 Smart Buyer Self-Assessment

The Northland Transportation Alliance has carried out a self-assessment using the REG Smart Buyer form to determine how much progress they have made to adopting Smart Buyer principles. A copy of this assessment is included in on the following pages.

The result of this self-assessment was a score of **59** out of a possible 70 (the higher the score the better). This indicates that the NTA has embraced the Smart Buyer principles but that there is room for further improvement. This is an improvement from the WDC self-assessment score of 56 undertaken as part of the 2018 AMP development. FNDC and KDC did not undertake a Smart Buyer self-assessment as part of the 2018 AMP development.

The areas of improvement are in relations to being more open to alternative solutions, being prepared to pay more now to achieve the lowest whole-of-life cost and seeks and receives feedback from suppliers on how to improve the NTA's performance.

Smart Buyer Principles Assessment Tool

This assessment is based on the Smart Buyer Principles identified in the Road Maintenance Task Force Report. That statement of principles is included at the end of this document. Score the following by ticking the appropriate box - (1) Disagree to (5) Strongly Agree

Whenever you score yourself "4 or 5" think of an example you can use to justify your score to an independent auditor

Assessment statement Our Organisation	Score				
	1	2	3	4	5
1. Fully understands the different contracting models available					✔
2. Holds meetings that updates the contracting industry on the forward works programme and any changes it is taking in approach and proactively engages with the contracting industry to ensure that gains optimal value out of any changes being implemented				✔	
3. Has sufficient robust data (or is in the process of gathering robust data) on our networks that enables optimal integrated decision-making				✔	
4. Has access to expertise that fully enables best use of the data available				✔	
5. Is open to alternative solutions to those proposed in the contract documents				✔	
6. Understands risk and how to allocate and manage it				✔	
7. Has a Council that is prepared to pay more now to achieve a lower whole of life cost				✔	
8. Actively pursues value for money & does not always award contracts to the lowest price				✔	
9. Is able to manage supplier relationships / contracts to ensure that expenditure is optimal and sustains infrastructural assets at appropriate levels of service			✔		
10. Supports ongoing skill and competency training and development for its staff					✔
11. Actively participates in gatherings to share and gain knowledge within the sector				✔	
12. Is effective in keeping up with best practice in procurement including best practice RFP / contract documentation					✔
13. Regularly seeks and receives candid feedback from suppliers on its own performance as a client and consistently looks to improve its performance				✔	
14. Explores opportunities for collaboration by either sharing in-house resources with neighbours, or by procuring together or tendering together. That exploration could be through an LGA s17A evaluation of transport function delivery options.					✔
Number of ticks in each column			1	9	4
Multiplying factor	x1	x2	x3	x4	x5
Total Score in Column			3	36	20
Total Score	59				

Score:	Interpretation
65 to 70:	A smart buyer: Our organisation is a smart buyer. We help to minimise rate increases by maximising the value created for our community
55 to 64:	Developing: Our organisation has embraced the principles of being a smart buyer but can still create further improved value for our communities
30 to 54:	Limited: Our organisation currently has limited capability to maximise the value created from being a smart buyer

0 to 29: Basic Our organisation is focused on tender process and compliance. We have not developed the capability to realise any of the value created for our community from being a smart buyer

6.18.3 Procurement Strategy Self-Assessment

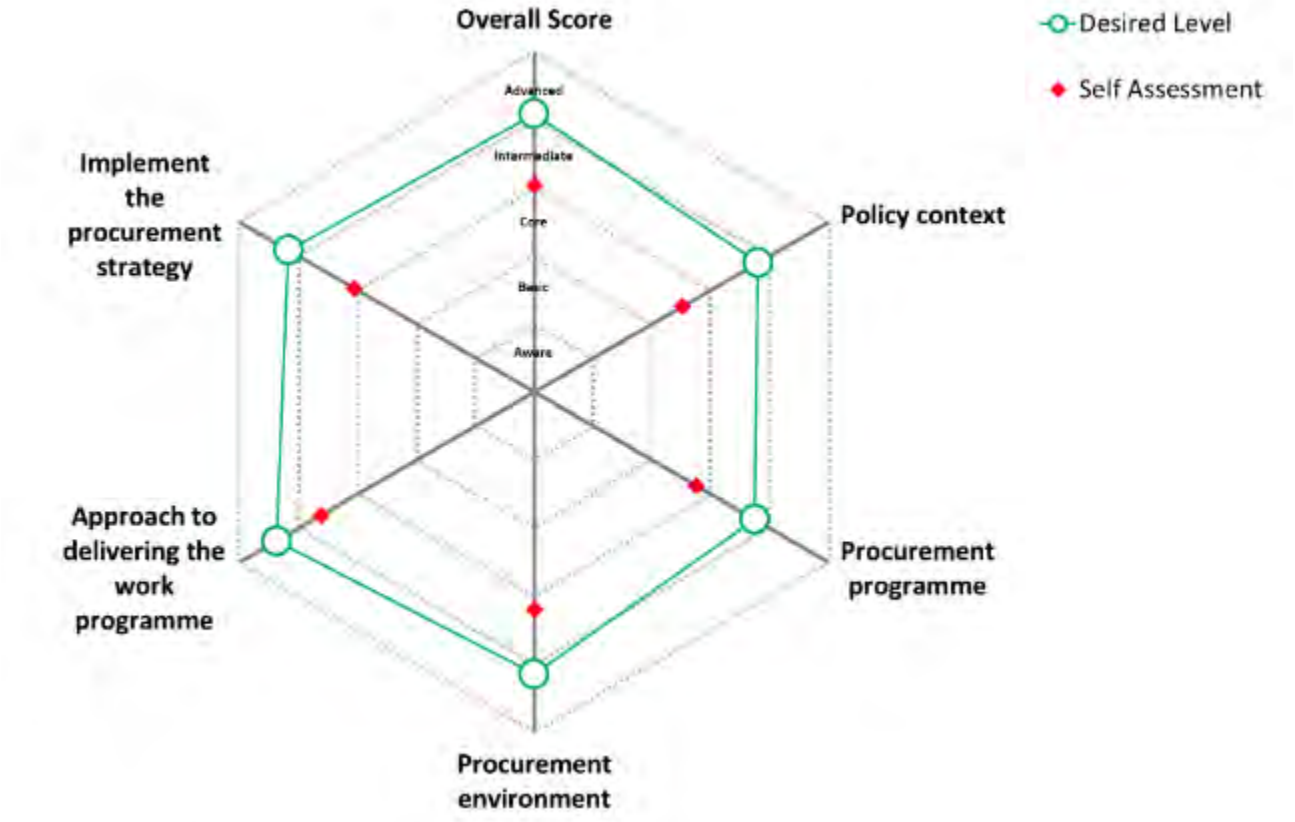
The Northland Transportation Alliance has also carried out a self-assessment using the REG Procurement Strategy Tool to determine how well their procurement processes are performing.

A summary of the results is shown in the following diagram. The result of this self-assessment indicated that their overall score was **61** (Intermediate) which is a little less than their desired score of 82 (Advanced). This indicates that the NTA has robust procurement processes but there is room for further improvement.

Key improvement opportunities that were identified were:

- Developing procurement plans (now being undertaken);
- Use the NZTA supplier panel or develop an NTA supplier panel;
- Use tender trend data to analyse the market, and tender rate analysis for use in estimates;
- Joint council contracts (now being undertaken);
- Include line of sight from Procurement Strategy KPIs and include reporting of these.

In addition, the NTA has identified that the current FNDC Procurement Board process takes a lot of time to navigate and should be reviewed with a view to improving this process. Work on improving this procurement board process is currently underway.



6.19 Data Quality

The summaries from the 2018/2019 REG data quality reports for general asset management and for the data used in the ONRC Performance Measures Reporting Tool are included in the table as follows.

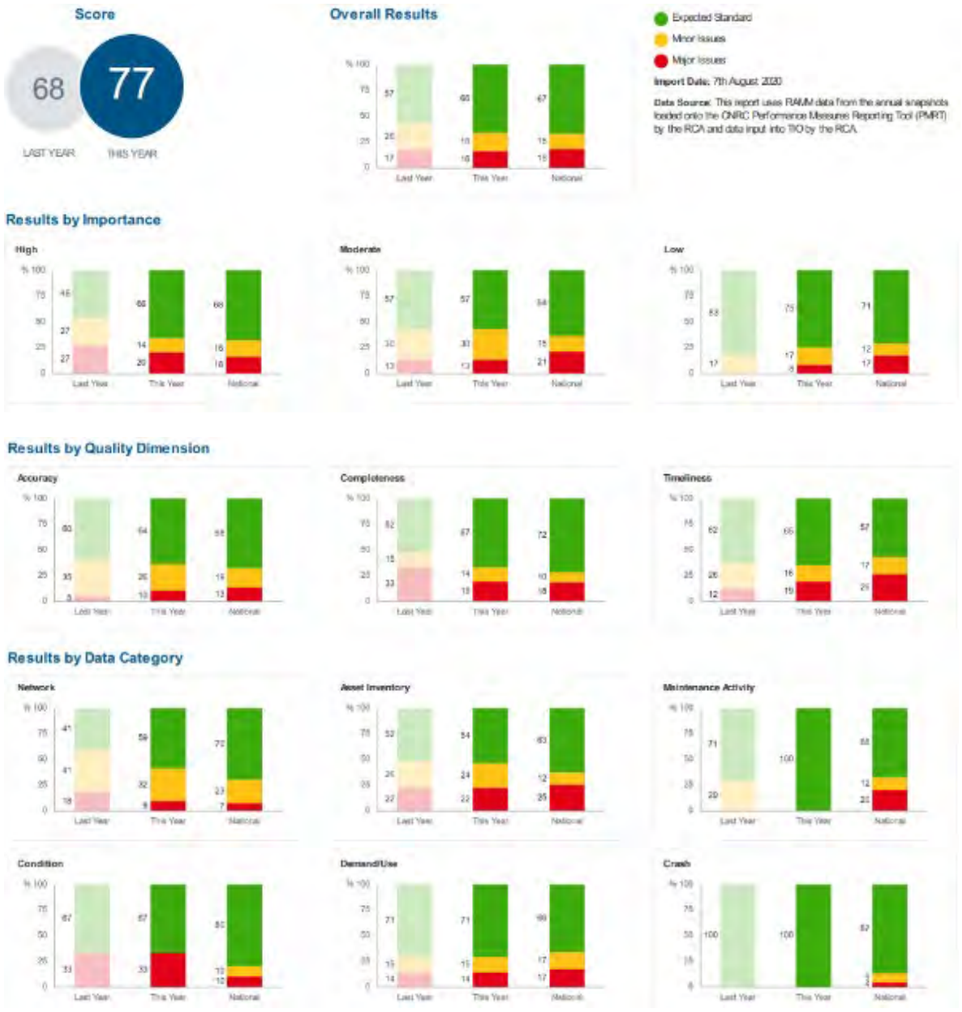
6.19.1 Far North District Council

REG Asset Management Data Quality Report	REG ONRC Data Quality Report
	
FNDC – The results for Far North show that their Asset Management Data Quality has improved significantly in the last year (from 69 to 83) and is better than the National average. The areas of concern are the Network and Condition data. The Network issues relate to the number of roads having traffic volumes that do not match the ONRC classification. This will need to be investigated and updated as necessary to the effects of growth on traffic volumes which may have affected this metric. It is also affected by issues with the treatment lengths which will also need to be investigated and resolved if necessary. The Condition data is based on RAMM condition rating which is no longer undertaken for any of the Northland councils which is affecting this metric. We use high speed data collection (roughness, rutting and cracking), Juno viewer video and contractor inspections instead.	**FNDC** – Note that this data is based on the 2019 report because the 2020 report is not yet available. The results for Far North show that their ONRC Data Quality is slightly worse than the national average and has deteriorated. This deterioration is likely to be due to new metrics being introduced which are not being actively used by FNDC. The areas of concern are Completeness, Maintenance Activity and Traffic Estimates. The Completeness and Maintenance Activity metrics are adversely affected by the amount of pavement and surfacing activity completed. This measure will need to be investigated further to determine what if any action is required. The Completeness metric is also being affected by the new work origin metrics which are not actively being managed by FNDC. The Traffic Estimates metrics is being affected by insufficient traffic estimates, the traffic estimates not always being updated after traffic counts are undertaken and incomplete traffic loading data (also affects the Completeness measure). The traffic estimate data has just been updated for FNDC and this should rectify these issues.

6.19.2 Kaipara District Council

REG Asset Management Data Quality Report	REG ONRC Data Quality Report
	
KDC – The results for Kaipara show that their Asset Management Data Quality has improved over the last year (from 72 to 78) and is better than the National average. The areas of concern are the Network, Condition and Demand/Use data. The Network issues relate to the number of new roads not being assigned ONRC classifications. It also relates to ONRC roads matching the traffic data. These issues will need to be investigated and updated as necessary to include ONRC classifications for new roads and to reflect the effects of growth on traffic volumes. The Condition data is based on RAMM condition rating which is no longer undertaken for any of the Northland councils which is affecting this metric. We use high speed data collection (roughness, rutting and cracking), Juno viewer video and contractor inspections instead. The Demand/Use issue relates to there not being enough traffic counts being undertaken and insufficient information about traffic loading. A new traffic count strategy has been adopted in 2020 for Kaipara and this will see an improvement with this data going forward.	**KDC** – Note that this data is based on the 2019 report because the 2020 report is not yet available. The results for Kaipara show that their ONRC Data Quality is slightly worse than the national average but is improving. The areas of concern are Completeness, Carriageway, Surfacing and Traffic Count. The Completeness and Surfacing metric are adversely affected by the new original cost and work origin for reseals. This is not something that KDC uses because they use RAMM Contractor for this information. The Completeness and Traffic Count metrics are also affected by only 23% of the network having traffic count data. This is because WDC use a traffic count strategy involving catchment areas and screenlines to determine growth rates and traffic estimates. This means we have less coverage of counts but more counts at the same location to monitor growth. The Completeness metric is also adversely affected by the amount of pavement and surfacing activity completed. This measure will need to be investigated further to determine what if any action is required. The Carriageway metric is affected by the ONRC classifications not completely being assigned to the carriageway table and some rural carriageways having short lengths. These issues will be investigated and addressed as necessary.

6.19.3 Whangarei District Council

REG Asset Management Data Quality Report	REG ONRC Data Quality Report
	
WDC – The results for Whangarei show that their Asset Management Data Quality has improved significantly in the last year (from 68 to 77) and is about the same as the National average. The areas of concern are the Network, Asset Inventory and Condition data. The Network issues relate to the number of roads having traffic volumes that do not match the ONRC classification. This will need to be investigated and updated as necessary to the effects of growth on traffic volumes which may have affected this metric. The Asset Inventory issues relate to two new metrics being added for pavement data (as-builting and work origin). It also relates to the number of railing assets which are known. These issues are likely to be resolved in 2021. The Condition data is based on RAMM condition rating which is no longer undertaken for any of the Northland councils which is affecting this metric. We use high speed data collection (roughness, rutting and cracking), Juno viewer video and contractor inspections instead.	WDC – Note that this data is based on the 2019 report because the 2020 report is not yet available. The results for Whangarei show that their ONRC Data Quality is slightly worse than the national average but is improving. The areas of concern are Completeness, Treatment Length, Surfacing and Traffic Count. The Completeness and Surfacing metric are adversely affected by the new original cost and work origin for reseals. This is not something that WDC uses because they use RAMM Contractor for this information. The Completeness and Traffic Count metrics are also affected by only 25% of the network having traffic count data. This is because WDC use a traffic count strategy involving catchment areas and screenlines to determine growth rates and traffic estimates. This means we have less coverage of counts but more counts at the same location to monitor growth. The Treatment Length metric needs further investigation to determine why there are some anomalies with the treatment length size and matching this data to renewal lengths.

6.20 NZTA Audits

There have been several NZTA audits over the past few years. The results of these audits have generally been positive but with some issues needing to be addressed. The Far North District Council has a joint Technical and Investment audit in November 2020 and the Whangarei District Council has an Investment audit in December 2020. The next audit of the Kaipara District Council has not been announced to date.

A summary of the last Technical and Investment audit for each council and the actions being undertaken in responses to any feedback is detailed as follows:

Far North District Council

NZTA Audit Recommendations and Actions

Date: 7/08/20

NZTA Technical and Procedural Audit — **Audit Date: March 2016** — **Auditor: Tony Pinn, Tony Lange**

Question	Issues	Risk Assessment	Risk	Recommendations	FNDC Action	Suggestions	FNDC Action
Q.1	Network Management	Amber	Medium	That Council: a) implements the Present Value case study for improved option analysis available from the REG website (link above); and	FNDC agrees and has put in place measures to use the NZTA Economic Evaluation Tool for future renewals programmes.	That Council increase cross-fall at the interface between seal and unsealed surfaces to 5% to reduce maintenance costs.	Cross-fall at end of transition of sealed to unsealed is agreed especially at bridge approaches which relatively short at present. Council has a programme to extend these to 100m minimum. This will resolve the flatter transition from bridge to gravel.
				b) increase cross-fall at the interface between seal and unsealed surfaces to 5% to reduce maintenance costs.			Council has undertaken an independent subjective audit of Contractor performance which has been used to benchmark the existing area engineer audits. The loose metal on unsealed roads is to some extent unavoidable over the dry summer months where back-grading results in loose metal cover of carriage way. Road users should be driving to the conditions experienced and the perceived speed limits.
Q.2	Databases	Green		None	None Required	None	None Required
Q.3	Safety Performance	Amber	Low	That Council: a) review the temporary speed reduction on the uneven section of Kaitaia-Awaroa Road and identify a work programme to mitigate the cause of the uneven surface; and	FNDC to ensure that when using a TSL on a semipermanent basis that documentation, signs and layout complies with COPTTM.	FNDC to discuss with the contractors to ensure all semipermanement sites comply with COPTTM.	FNDC to ensure all semipermanement sites comply with COPTTM.
				b) modify its night inspection criteria to include Council staff as part of the audit process.	Night inspections are supposed to be carried out jointly and are normally undertaken aftter the change from daylight saving (post April).	That Council modify its night inspection criteria to include Council staff as part of the audit process	Council to follow-up as why these inspections were not undertaken as they were last finanical-year.

NZTA Investment Audit — **Audit Date: May 2018** — **Auditor: Glenn McGregor**

Question	Issues	Risk Assessment		Recommendations	FNDC Action	Suggestions	FNDC Action
Q.1	Previous Audit Issues	N/A		None	None Required	None	None Required
Q.2	Financial Management	Effective		None	None Required	None	None Required
Q.3	Procurement	Some Improvement Needed		Confirms it understands the road safety audit requirements and ensures the procedures will be followed for future improvement and renewal activities.	FNDC Project Managers for renewal or improvement activities is responsible for actioning a road safety audit and are responsible for seeking an Exemption Declaration if they believe there is justification for not carrying out a safety audit.	FNDC Project Managers to ensure safety audits are undertaken on all renewal or improvement projects.	FNDC Project Managers to ensure safety audits are undertaken on all renewal or improvement projects.
					There is sufficient independence within the NTA to enable other road safety engineers to assist us with Road Safety Audits.		FNDC will work with the NZTA and develop some criteria that will satisfy them from an audit perspective but allows us to manage the level of safety audit a project may need and therefore who is able to undertake the Road Safety Audit.
Q.4	Contract Management	Effective		None	None Required	None	None Required
Q.5	Professional Services	Effective		None	None Required	None	None Required
Q.6	Waitangi Trust	Effective		None	None Required	None	None Required
Q.7	Hokianga Ferry Sevice	Significant Improvement Needed		Implements effective processes to protect the fare revenue generated by the Hokianga Ferry service.	FNDC's Internal Auditor will work with the Lighting and Transport Operations Specialist to conduct an assessment of BSL's revenue handling practices for the ferry service and will issue an audit report with recommendations on any identified areas for improvement.	Monitoring techniques to be developed to better protect revenue generated by the Hokianga Ferry.	FNDC to implement processes and techniques to protect the fare revenue of the Hokianga Ferry.
	Overall Rating	**Some Improvement Needed**					

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

Kaipara District Council

NZTA Audit Recommendations and Actions

Date: 7/08/20

NZTA Technical and Procedural Audit **Audit Date: February 2016** **Auditor: Ron Wheeler / Rebecca George**

Question	Issues	Risk Assessment	Risk	Recommendations	KDC Action	Suggestions	KDC Action
Q.6	Network Management		Low	That KDC ensures its unsealed network is managed consistently with its maintenance contract specifications and industry standards	The building of trust with the maintenance contractor has developed over the past 2-3 years, and will continue to develop, so that the trust relationship can be enhanced leading to greater contractor involvement in the decision making process. This will be underlined with the new internal business unit. A lot of effort has gone into the management of the unsealed network including drainage improvements. The accuracy of RAMM data has improved with the use of RAMM contractor and strict KPI's management on the maintenance contractor. Treatment lengths (TL) - 94% of the sealed network has TLs less than 1km. This is preferrable when analysing pavement deterioration modelling such as dTIMS. Any very small lengths will be corrected with this process. The unsealed road network is currently a focus area. KDC is planning unsealed pavement deterioration trials using blended aggregates. The outcomes will be assessed against current methods to make proactive unsealed road srategy plans. Concentration of pavement shape has been off the radar recently after reduced local share budgets were trimmed. Although it is in the maintenance contract to manage crossfalls, the aggregate portion to retain the shape was not approved during the previous budget constraint periods. Budgets requested was reduced during the approval stage and budgets had to be adjusted to fit within the approved amounts. There has been a focus on correcting the shape with the heavy metalling allocaion programme. The outcomes from the trials will reveal whether the blended metal has an advantage over typical road aggregates supplied by local quarries. Advantages anticipated are blended aggregates will hold its shape longer on the road reducing the loss of gravel, prolonging intervention. The future forward work will be captured in the updated 18/21 LTP period and will be used in the development of the ONRC CLoS gaps.	None	None Required
Q.7	Asset Management Plan & Land Transport Planning		Low	That KDC improves the development of its forward programme to deliver on its planned asset management strategies.	Refer to Q.8b response below. The modelling of dTIMS was comissioned in 2015, it will be completed shortly in 2016. The modelling will give clarity on intervention strategies, and have it based on data and science. A new AMP is being developed to include some of the recent evidence using asset data collected or about to be collected on surfacings, pavements, bridges, footpaths, culverts. The ONRC LoS is currently being developed for Kaipara and other Northland councils. Once agreed the current LoS will be measured against the CLoS to determine the gap. Closing the gap will be discussed in the AMP and how this will be addressed. The programme will require a new AMP that supports the 2018/28 LTP by mid 2017.	None	None Required
Q.8	Databases		Medium	That KDC: A) Ensures treatment selection algorithm data is reported in TIO in future; B) Confirms maintenance costs,surfacing lives, and condition rating data is applied to its forward sealed pavement, and bridges and structures programmes; and C) prioritises the reinstatement of its lost critical bridge data	A) Refer to Question 1 above, TSA was run, but was not initially appended to TIO. This has now been posted into TIO. B) KDC has been proactive in collecting the data and identified the gap in info, and this has been addressed in the latest maintenance contract in 2012, and it will be supported by dTIMS that was commissoned in 2015 and be completed shortly in 2016. For the unsealed roads, KDC has commissoned the trial of 7 blending sites to improve our maintenance and to be proactive rather than reactive position, and the end result may lead to adjustments of our maintenance specifications. The new AMP will use existing maintenance costs, surfacing lives, and condition data from all assets, where data is available. This information will be used to support dTIMS, the unsealed road blending trial work, new footpath locations and renewals, bridge repllacements and major component repairs and dainage replacement programmes. C) Over the last 3-4 years many investigations on bridges have occurred including bridge rating and discovery of 250 old bridge plans which are now im RAMM. Annual bridge inspections reports have been received from MWH. A detailed bridge assessment programmed planned for April/May 2016 will determine approximate lives of bridges and retaining wall assets completing a holistic view. Agreed location criteria have been used to determine a draft footpath construction programme during February 2016. As pat of the survey existing footpath conditions were assessed to forecast future renewals. Culverts and recently catchpit data have been reviewed in RAMM and updated. This will provide the basis for forward works renewal plans as well as improved asset valuations.	None	None Required
Q.9	Safety Performance			None	All safety reports such as night time inspections, SMS updates, safety net data etc have been used to address road safety deficiencies on the Kaipara network. All safety exemption and safety audits have been completed for each construction project	None	None Required

NZTA Investment Audit **Audit Date: July/August 2018** **Auditor: Tony Pinn**

Question	Issues	Risk Assessment		Recommendations	KDC Action	Suggestions	KDC Action
Q.1	Previous Audit Issues	N/A		None	None Required	None	None Required
Q.2	Financial Management	Effective		Investigates retentions relating to contracts 693 and 710 to ensure the amounts being held are still relevant. If these retentions are no longer valid, they will need to be credited to the relevant roading expense account.	Files for the two old projects requiring internal retention transfers have been requested for investigation	None	None Required
Q.3	Procurement	Significant Improvement Needed		That KDC implements quality assurance procedures to improve its tender evaluation process.	All tender documents will be scrutinised more thoroughly before sending out the the open market. A quality assurance template is being developed to ensure tender evaluations comply with NZTA/KDC requirements.	None	None Required
				That KDC ensures there is a Qualified Proposal Evaluator on the tender evaluation team for all NZTA financially assisted contracts with an estimated value exceeding $200,000	Consultants evaluating tenders for KDC have been advised to have a qualified evaluator in the team. Also where contacts are evaluated internally NTA has qualified evaluators.	None	None Required
Q.4	Contract Management	Some Improvement Needed		That KDC ensure that all procurement records are held on Councils contract files.	All documentation/records when managed by consultants is required to be handed over to council at the completion of projects/contracts.	None	None Required
				That KDC completes exemption declarations when it considers that a road safety audit is not required for a construciton project or renewal.	The recommedation is acknowledged and will be implemented immediately.	None	None Required
Q.5	Professional Services	Effective		None	None Required	None	None Required
	Overall Rating	**Some Improvement Needed**					

Whangarei District Council

NZTA Audit Recommendations and Actions

Date:7/08/20

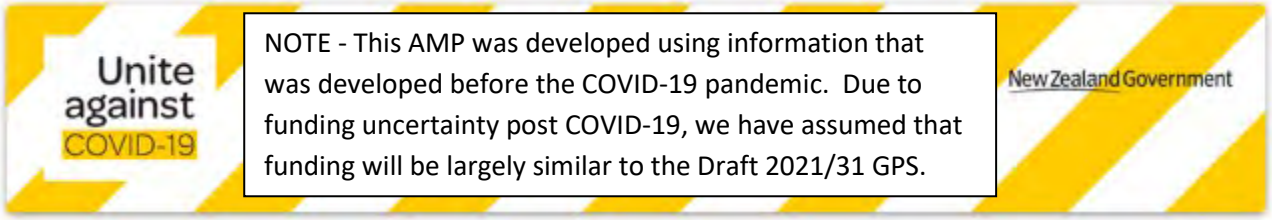
NZTA Technical Audit **Audit Date: February 2016** **Auditor: Tony Lange**

Question	Issues	Risk Assessment	Risk	Recommendations	WDC Action	Suggestions	WDC Action
Q.1	Network Management	Green		That Council implements the Present Value case study for improved option analysis available from the REG website (link above)	WDC has implemented the principals of the REG Present Value case study in its assessment of the rehabilitation programmes. RAPT-type process also being used to confirm rehabilitation programme.	That Council increase cross-fall at the interface between seal and unsealed surfaces to 5% to reduce maintenance costs.	WDC currently aims for a 6-8% crossfall on any interfaces between sealed and unsealed roads.
				That Whangarei District Council develops a policy for the management and control of stock crossings and ensures an audit programme is established to monitor compliance.	Council has in place a Stock Control Bylaw that details the requirements management of stock crossings. Council accepts the need for more auditing of existing crossings to push the upgrading and compliance.		
Q.2	Asset Management Plan and Land Transport Programme	Green		None	None Required	None	None Required
Q.3	Databases	Green		None	None Required	None	None Required
Q.4	Safety Performance	Amber	Low	That council adopt the practice of installing a "mountable culvert headwall" to mitigate the risk of run of road crashes as part of its renewal programme	WDC is incorporating mountable culvert headwalls and traversable side slopes in its renewals wherever practical.	That Council modify its night inspection criteria to include Council staff as part of the audit process	WDC will aim to incorporate council staff on the night time inspections.

NZTA Investment Audit **Audit Date: July 2018** **Auditor: Tony Pinn**

Question	Issues	Risk Assessment		Recommendations	WDC Action	Suggestions	WDC Action
Q.1	Previous Audit Issues	N/A		None	None Required	None	None Required
Q.2	Financial Management	Effective		That Whangarei District Council investigates retentions relating to Contracts 12004 and 14044 to ensure the amounts being held are still valid.	WDC have released these retentions.	Establishing a separate worksheet to record any adjustments between work categories made outside of the general ledger	This has been completed and now is undertaken monthly with the NZTA claim.
						Separating Northland Road Safety Trust revenue out of the Land Transport Disbursement Account.	This has been completed and is now kept separate from the Land Transport Disbursement Account.
Q.3	Procurement	Some Improvement Required		That Whangarei District Council ensures that all members of tender evaluation teams sign the price quality evaluation worksheets.	WDC has established a process to require all members of the tender evaluation team to sign the price quality evaliation worksheets.	None	None Required
Q.4	Contract Management	Effective		None	None Required	None	None Required
Q.5	Professional Services	Effective		None	None Required	None	None Required
Q.6	Conditions of Approval	Effective		None	None Required	None	None Required
	Overall Rating	**Effective**					

6.21 Proposed Programmes 2021/24



On the basis of the programme business case assessment, the preferred programmes for the 2021/24 period are detailed in the following tables.

These programmes allow for the effects of asset growth, heavy vehicle growth and escalation.

The 2018/21 comparison in the tables is based on the current approved programme.

NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

Far North District Council

Summary of Funding Request for 2021/2024

FNDC Maintenance, Operations and Renewals

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
111	Sealed Pavement Maintenance	7,028,410	6,257,408	771,002	Increase due to higher contract management and fixed sealed road costs (such as pothole patching) through the new maintenance contracts.
112	Unsealed Pavement Maintenance	11,842,346	8,438,609	3,403,737	Increase to fund transition to Paige-Green compliant materials identified in the unsealed road centre of excellence. It also includes contract management costs transferred from renewals and increase in contract rates from new maintenance contract. Includes an allowance for $200,000/year of dust suppression.
113	Routine Drainage Maintenance	4,876,051	3,947,723	928,328	Increase to address backlog of watertable maintenance.
114	Structures Maintenance	6,379,803	4,073,531	2,306,272	The budget increase is to fund the increase in Hokianga Ferry operating costs following the award of the new contract.
121	Environmental Maintenance	5,874,466	3,840,069	2,034,397	Increase due to higher contract management and cyclic vegetation control costs through the new mainteanance contracts.
122	Network Services Maintenance (was Traffic Services Maintenance)	5,890,965	3,575,710	2,315,255	Increase to enable a full line remark of the network due to line marking costs more than doubling through the new maintenance contracts.
123	Network Operations (was Operational Traffic Management)	0	0	0	
124	Cycleway Maintenance	0	131,384	-131,384	
125	Footpath Maintenance	480,000	1,889,694	-1,409,694	Transfer of renewal funding to new WC 225.
131	Level Crossing Warning Devices	0	0	0	
140	Minor Events	300,000	283,056	16,944	
151	Network and Asset Management	8,100,944	5,086,753	3,014,191	Increase due to six additional staff required as part of the NTA restructure. Also includes transfer of in-house staff costs for maintenance activities to WC 151. Also includes a new Travel Demand Management programme to change travel behaviour and promote mode shift to walking and cycling as identified through the ITP
211	Unsealed Road Metalling	8,893,964	8,893,964	0	
211	Unsealed Road Metalling **(ENHANCED)**	7,625,086	0	7,625,086	Substantial increase to fund transition to Paige-Green compliant wearing courses and pavement strengtheing on high demand routes. This is a step change to address the unsealed road problem statement and will overtime result in a sustainable unsealed road network.
212	Sealed Road Resurfacing	13,736,018	9,170,000	4,566,018	Increase to fund programme of TAC resurfacing on arterial roads to address a significant
213	Drainage Renewals	2,208,000	2,242,036	-34,036	
214	Sealed Road Pavement Rehabilitations	9,606,000	8,707,000	899,000	Minor increase in programme based on FWP identified through dTIMS modelling.
215	Structures Component Replacement	5,548,000	5,029,549	518,451	Increase to continue to improve the condition of the bridging stock.
216	Bridge and Structures Renewals	4,430,000	0	4,430,000	New Work Category. Was previously in Low Cost Low Risk WC 341.
221	Environmental Renewals	0	103,000	-103,000	
222	Traffic Services Renewals	1,350,000	1,552,000	-202,000	Decrease due to contract management costs being transferred to maintenance work
225	Footpath Renewals	1,500,000	0	1,500,000	New Work Category. Was previously part of WC 125.
	TOTAL 3 YEAR BUDGET	**105,670,051**	**73,221,486**	**32,448,565**	
	2.5% Escalation & Growth on 2018/21 Programme	78,713,097		44%	
	EXCLUDING ENHANCED & NEW WC 216 & TDM			**20,112,536**	
				27%	

FNDC Low Cost/Low Risk Improvements

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
341	Safety	10,152,000	5,825,136	4,326,864	Substantial increase in budget from $1.9M to $3.5M/year to make gains in reducing F&S crashes, by targeting top 5% of HRRR and high risk intersections. Interventions to include corridor treatments such as signs and marking, along with guardrails, speed management and pedestrian safety. This is in line with the Government's Road to Zero strategy and GPS direction.
341	Resilience	4,500,000	5,377,070	-877,070	Slight decrease in programme, due to 2018/21 period having some expensive flood mitigation works (Panguru Road Flood Mitigation)
341	Bridge Replacements	0	3,089,014	-3,089,014	Minor increase to fund identified bridge replacement FWP
341	Associated Improvements	1,950,000	339,000	1,611,000	Increased programme to include more safety widening in conjunction with the pavement rehabilitation programme.
341	Lighting Upgrades	4,403,434	2,000,000	2,403,434	Increased programme to complete the infill lighting/upgrades on V-Cat routes in Year 1. In Years 2 and 3 there is a $500,000 programme for P-Cat infill lighting of black spots identified through lux mapping survey to improve safety and security of people walking at night.
341	Dust Seals	3,000,000	3,030,000	-30,000	Increase to include bridge approach seals, traction seals and intersection safety seals
341	Traction Seals	3,000,000	0	3,000,000	New programme of traction seals to address unsealed roads which have high maintenance costs due to steep grades or geometry.
341	Bridge Approach Seals	900,000	0	900,000	New programme of bridge approach seals to address high cost bridge approaches and improve safety by reducing potholes and corrugations
341	Footpaths	2,880,000	2,361,780	518,220	New footpaths to improve road safety and to promote active modes
341	Cycleways	1,995,000	0	1,995,000	New cyceways identified through ITP and Principle Cycle Network
341	Stock Effluent Disposal	1,000,000	0	1,000,000	New stock effluent facilities identified through ITP
341	Detour Route Programme	1,300,000	0	1,300,000	New detour routes and improved resilience of detour routed identified through ITP
341	Access Improvements (TCDR)	1,000,000	0	1,000,000	New roading upgrades to improve access to communities as identified in the Twin Coast Discovery Route (TCDR) business cases and incorporated into the ITP
341	Improve Freight Productivity	600,000	0	600,000	New 50MAX bridge strengthening programme on forestry routes as identified through forestry strategy and ITP
341	Wharf Supporting Infrastructure	1,000,000	0	1,000,000	New wharf upgrades as identified in the Twin Coast Discovery Route (TCDR) business cases and in the ITP
341	Bus Stops and Shelters	225,000	0	225,000	New bus stops and shelters to cater for users on bus routes. This projects was identified through the ITP.
341	Behaviour Change Initiatives	75,000	0	75,000	New initiative to change driver behaviour including removal of barriers for mobility impaired.
341	Accessibility Infrastructure	100,000	0	100,000	New activity to install accessibility infrastructure i.e. mobility scooter facilities – ramps, wheelchairs, etc
341	Public Transport / Ride Share	125,000	0	125,000	Project identified in the FNDC Integrated Transport Plan PBC
341	Destination Facilities for Cyclists	200,000	0	200,000	Project identified in the FNDC Integrated Transport Plan PBC
341	Pedestrian access in urban areas	175,000	0	175,000	Project identified in the FNDC Integrated Transport Plan PBC
341	Wayfinding Signage	18,000	0	18,000	Project identified in the FNDC Integrated Transport Plan PBC
341	Twin Coast Discovery Route Footpaths / Shared Use Path	1,000,000	0	1,000,000	Project identified in the FNDC Integrated Transport Plan PBC and Twin Coast Discovery Route PBC
341	Recreational Cycling Facilities	475,000	0	475,000	Project identified in the FNDC Integrated Transport Plan PBC
341	Township Upgrades	675,000	0	675,000	Project identified in the FNDC Integrated Transport Plan PBC and Twin Coast Discovery Route PBC
341	Parking and Facilities	950,000	0	950,000	Project identified in the FNDC Integrated Transport Plan PBC
	TOTAL 3 YEAR BUDGET	**41,698,434**	**22,022,000**	**19,676,434**	

FNDC Road Safety Promotions & Travel Demand Management

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
432	High Strategic Fit	4,638,554	3,115,000	1,523,554	Continuation of existing Alcohol & Drug, Young Driver, Speed, Driver Education, High Risk and Restraints programmes. Increases in budget to allow for set up of Kerikeri REAP and in-house NTA coordinator.
432	Medium Strategic Fit	416,210	300,000	116,210	Continuation of Fatigue and Distraction programmes. Increases in budget to allow for set up of Kerikeri REAP
432	Bikes Skills Training	624,320	0	624,320	New programme to provide cyclists with the skills to use the new cycle lanes and paths identified through the Principle Cycle Network and ITP.
412	Travel Demand Management	0	0	0	
	TOTAL 3 YEAR BUDGET	**5,679,084**	**3,415,000**	**2,264,084**	

FNDC Major Capital Programme (NLTF)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
452	Twin Coast Cycle Trail Development	8,839,297	0	8,839,297	Project indentified in the Northland Integrated Cycling Implementation Plan PBC and the FNDC Integrated Transport Plan PBC
	TOTAL 3 YEAR BUDGET	**8,839,297**	**0**	**8,839,297**	

FNDC Major Capital Programme (Alternative Funding)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
	TOTAL 3 YEAR BUDGET	**0**	**0**	**0**	

FNDC Investment Management (Transport Planning)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
003	Activity Management Plan Improvement	2,250,000	150,000	2,100,000	AMP Improvement Activity including: Development of Strategies, HPMV Assessments, ONF Development, dTIMS modelling, Forward Works Plan Development, Crash Reduction Studies, Standard Safety Intervention (SSI) studies, High Risk Rural Road (HRRR) studies.
004	Kerikeri Strategic Road Network Plan	1,200,000	0	1,200,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Kaitaia to Kohukohu Corridor Plan	50,000	0	50,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Township Transport Planning	175,000	0	175,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Investigation of Climate Change Mitigation Measures	37,500	0	37,500	Project identified in the FNDC Integrated Transport Plan PBC
004	Hokianga Harbour Long Term Plan	175,000	0	175,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Parking review and plan	350,000	0	350,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Pedestrian Access in Urban Areas	75,000	0	75,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Recreational Walking & Cycling Tracks	75,000	0	75,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Cycle Connections	150,000	0	150,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Township cycling plans	75,000	0	75,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Total Mobility Scheme	100,000	0	100,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Public Transport / Ride Share	50,000	0	50,000	Project identified in the FNDC Integrated Transport Plan PBC
004	Park and Ride	75,000	0	75,000	Project identified in the FNDC Integrated Transport Plan PBC
	TOTAL 3 YEAR BUDGET	**4,837,500**	**150,000**	**4,687,500**	

FNDC Unsubsidised Activities (Activities with No Direct NZTA Co-Investment)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
	Seal Extensions (Unsubsidised)	6,320,000	5,000,000	1,320,000	Increase from $1M to $2M as per Council resolution
	Dust Mitigation (Unsubsidised)	1,500,000	1,500,000	0	No change
	Berm Management (Unsubsidised)	660,000	660,000	0	No change
	Top Energy Tree Trimming	450,000	300,000	150,000	Increased due to volume of Notices issued to FNDC from Top Energy to trim trees. Currently declare no interest but this is being challenged.
	Quarries	90,000	75,000	15,000	Council owns seven non-operational quarries, have increased budget due to costs incurred during 2018/21 for quarry sites e.g. fencing, signage
	State Highway Cleaning	75,000	75,000	0	No change - this is 100% subsidised
	NRC Consents	60,000	0	60,000	Re-establishing these costs as FNDC never budgeted for these during 2018/21
	Planning Policies and Reviews	208,000	0	208,000	New activity
	TOTAL 3 YEAR BUDGET	**9,363,000**	**7,610,000**	**1,753,000**	

Waitangi Trust - Special Purpose Road (SPR)

Summary of Funding Request for 2021/2024

Waitangi Trust - SPR Maintenance, Operations and Renewals

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
111	Sealed Pavement Maintenance	58,000	6,596	51,404	Increase to fund pre-reseal repairs
112	Unsealed Pavement Maintenance	33,000	28,286	4,714	each year prior to the activities of Waitangi celebrations in February each year on Haruru Falls Rd
113	Routine Drainage Maintenance	2,400	2,770	-370	Routine Montly LS item for SPR
114	Structures Maintenance	0			
121	Environmental Maintenance	2,400	2,771	-371	Routine Montly LS item for SPR
122	Traffic Services Maintenance	2,400	2,771	-371	Routine Montly LS item for SPR
123	Operational Traffic Management	2,400	1,498	902	Routine Montly LS item for SPR
124	Cycleway Maintenance	2,400	1,498	902	Routine Montly LS item for SPR
125	Footpath Maintenance	2,400			
131	Level Crossing Warning Devices	0	0	0	
140	Minor Events	0	1,498	-1,498	
151	Network and Asset Management	19,500	18,202	1,298	
211	Unsealed Road Metalling	0			
212	Sealed Road Resurfacing	354,000	102,514	251,486	Increase to enable resurfacing to be completed to tidy up the entire length of Tau Henare Drive over a 3-year programme.
213	Drainage Renewals	0			
214	Sealed Road Pavement Rehabilitations	0			
215	Structures Component Replacement	0			
216	Bridge and Structures Renewals	0			
221	Environmental Renewals	0			
222	Traffic Services Renewals	0			
225	Footpath Renewals	0			
	TOTAL 3 YEAR BUDGET	**478,900**	**168,404**	**308,096**	
	2.5% Escalation & Growth on 2018/21 Programme	**181,034**		**183%**	

Waitangi Trust - SPR Low Cost/Low Risk Improvements

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
341	Kerb and Channel Completion	225,000	0	225,000	Several small sections of the road that have no Kerb & Channel which leaves these sections exposed to scour. Funds approved 2018/21 but were diverted to complete 1st stage of footpath construction.
341	Footpath Continuation	450,000	297,000	153,000	519m of footpath was constructed from bridge to carpark LHS. Proposal to complete 380m from carpark around "S" bend to top.
341	Guardrail	76,000	0	76,000	New guardrails to be installed beside new footpath around "S" bend to top.
341	Street Lighting	550,000	0	550,000	New footpath lighting to be installed on completed section of footpath and proposed new section. Funds approved 2018/21 but were diverted to complete 1st stage of footpath construction
	TOTAL 3 YEAR BUDGET	**1,301,000**	**297,000**	**1,004,000**	

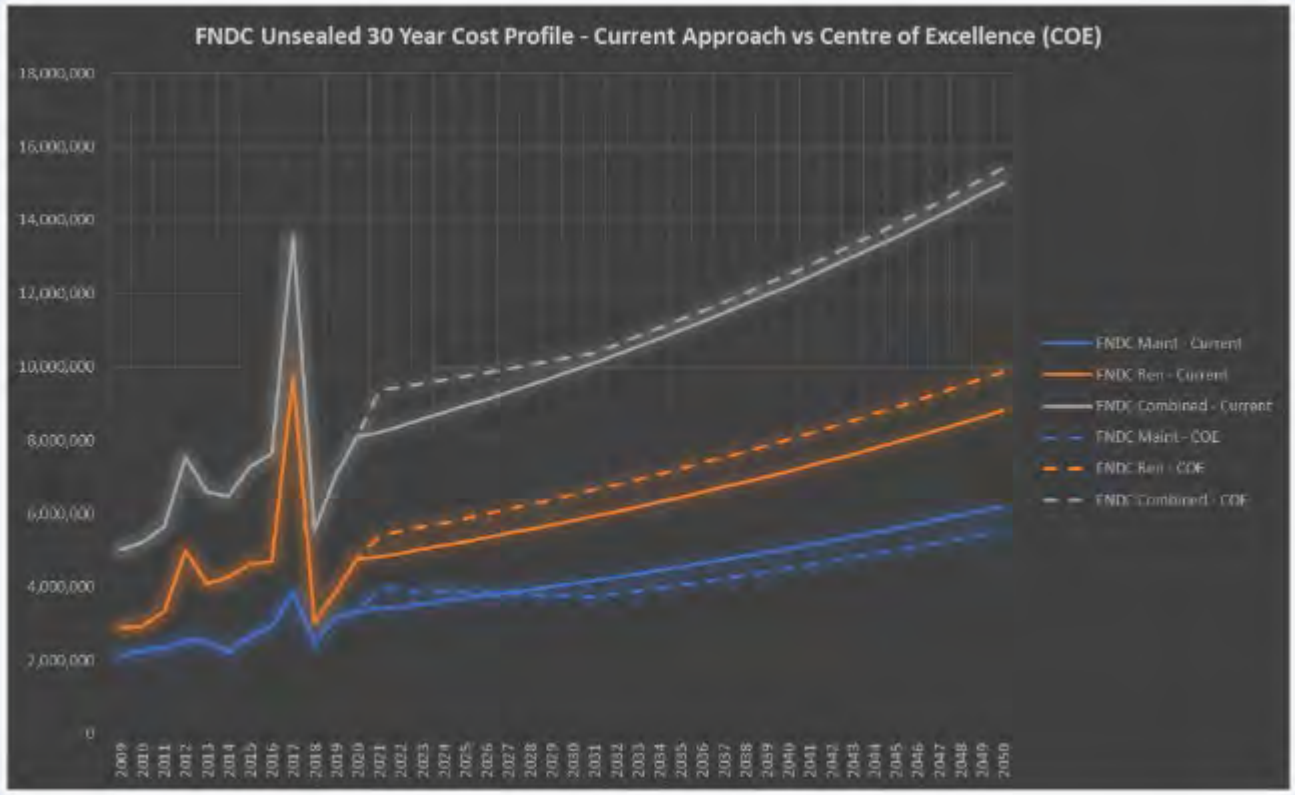
Far North District Council – MOR Extra Supporting Information for Significant Changes

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
112	Unsealed Pavement Maintenance	+$3.40M	Most of this cost increase is primarily due to Contract Management Costs and an increase in Lump Sum (LS) grading costs in the maintenance contracts. As per the attached memo, contract management costs within the new maintenance contract have increased substantially which has added a total of $1.0M/annum to FNDC maintenance costs. Of this cost increase, $300k/annum ($900k over the 3 year period) has been allocated to WC112 on a prorata basis. The LS grading costs have also increased by $175k/annum ($525k over the 3 year period) and this is expected to have been as a result of more stringent KPIs in the new maintenance contracts which forced the contractors to achieve the Level of Service requirements of the contract. This was a significant change from the previous FNDC maintenance contracts which had less stringent performance requirements which enabled the contractors to do less grading than required. In addition, the change to the Unsealed Road Centre of Excellence and the use of Paige-Green compliant materials will see an increase in unsealed road maintenance costs of $640k/annum ($1.92M over the 3 year period) in the short-term due to the use of more expensive Paige-Green materials for routine metalling. These maintenance costs will decrease over time as the Paige-Green compliant wearing courses are rolled out and will eventually see an overall decrease in WC112 costs over the next 10 years. There has also been an increase of $200k/annum ($600k over the 3 year period) to allow for dust suppression on roads with a dust risk score of 12 or more (using the NZTA General Circular 16/04 matrix). This allowance is to manage dusty roads which are currently creating health problems for local residents. The dust suppression also helps reduce the resident requests for sealing their roads. Should this work not be funded, there will be ongoing health issues for local residents due to PM_{10} dust emission, leading to complaints and potential protest action such as blockades which occurred back in 2017 prior to Council adopting its dust suppression programme. Over time the use of Paige-Green compliant materials may reduce this demand, but there is always likely to be a need for some level of dust suppression on persistently dusty roads. This cost increase has been partially decreased by the transfer of $180k/annum ($540k over the 3 year period) in-house maintenance costs that were being incorrectly charged to this work category to WC151.
113	Routine Drainage Maintenance	+$0.93M	This increase is mainly due to additional drainage maintenance, particularly watertable maintenance, being identified through the development of a drainage strategy and FWP by WSP. The Drainage Strategy was developed by WSP through a detailed review of the network's drainage systems using the latest network video. A matrix was then used to prioritise the work identified and this has been used to build a 10 year forward works programme. The work identified such as watertable maintenance, culvert maintenance and installation of subsoil drains will help reduce water ingress into pavements causing premature failure as well as making the roads more resilient to slips and flooding which are likely to be more frequent due to the impacts of climate change. This is consistent with the GPS priority of adapting to Climate Change.

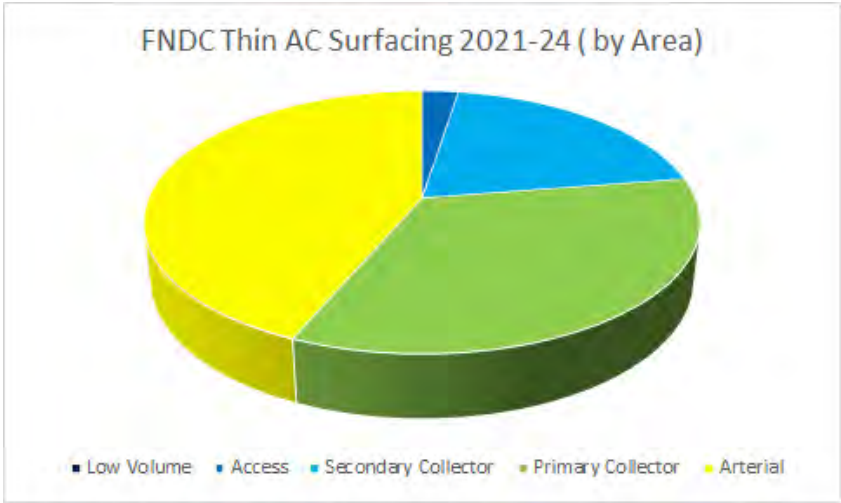
W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
			There are also additional contract management costs being charged to this work category which has added $140k/annum ($420k over the 3 year period). This cost increase has been partially decreased by the transfer of $70k/annum ($210k over the 3 year period) of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
114	Structures Maintenance	+$2.31M	This increase largely relates to the new Hokianga Ferry Service tender (started 1 May 2020). The incumbent tenderer (Broadspectrum) did not want to continue to provide the service and only one tender (Fullers) was received when it was tendered on the open market. The new maintenance and operations costs from the new tender (less predicted annual revenue of $630k/year) equate to $1.19M/year ($3.58M over the 2021/24 period). This compares to the average net cost of the service over the previous 3 years was $692k/year after revenue was deducted ($2.08M over the 3 year period). This represents an overall increase of +$1.50M over the 3 year period. In addition, there has also been an increase in the budget for bridge maintenance following the development of a 10 year bridging programme by WSP using the 2020 bridge inspections. There has also been a new budget allowed for retaining wall maintenance over the 3 year period of $225k following inspections from WSP. These cost increases have been partially decreased by the transfer of $60k/annum ($180k over the 3 year period) of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
121	Environmental Maintenance	+$2.03M	This cost increase is primarily due to the increased Contract Management Costs as well as an increase in the cyclic rates for vegetation control (eg mowing, spraying and envelope clearing costs). The increase in contract management costs is described in the attached memo and has added $510k/annum ($1.53M over the 3 year period) because no contract management costs were previously being applied to this activity. The increase in vegetation control costs has added $200k/annum ($600k over the 3 year period) and is most likely to be due to CPI increases in labour and plant costs. Options such as replacing berm mowing with spraying will be considered to help reduce this cost increase. This option would bring FNDC in line with the other two councils. However, community concerns about spraying, particularly with the growing ground toxicity concerns with glysophate sprays, may make spraying unsustainable in the future. This cost increase has been partially decreased by the transfer of $45k/annum ($135k over the 3 year period) of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
122	Network Services Maintenance (old Traffic	+$2.32M	This cost increase is primarily due to increase in line marking rates. As per the attached memo, line marking costs have increased by 150% and the proposed increase is to try and at least achieve one full annual line mark per annum (with some urban markings such as flush medians and parking being marked once every two years). Options such as long-life markings will be investigated to see whether these can reduce ongoing line marking costs. The amount of line marking will be reviewed on urban roads and Access and Low Volume roads following

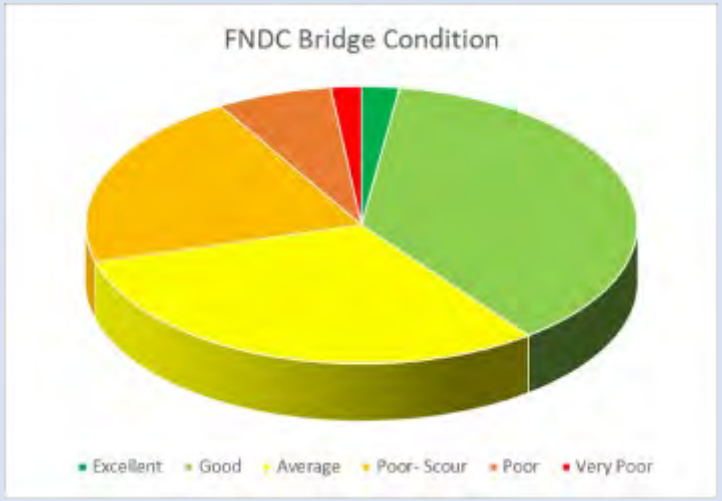
W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
	Services Maint)		the recent NZTA Technical Audit and this may result in a reduction in the proposed budget. This needs to be weighed up against the need for good delineation in rural areas given that FNDC has is a High Risk community for Death and Serious Casualties and for Rural Road Loss of Contract and/or Head On Crashes. FNDC also has an increasing trend of Death and Serious Injury crashes on all of its road classes except for Arterials, so reducing the level of delineation on rural routes may not be desirable as it may lead to further DSI crashes which is contrary to the Road to Zero strategy outcomes and the GPS Safety priority. This cost increase has been partially decreased by the transfer of $35k/annum ($105k over the 3 year period) of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
151	Network and Asset Management	+$3.01M	Through the development of the NTA and the new maintenance contracts there have been eight new staff employed by FNDC (Aram Goes, Apikali Rokobigi, Sandi Morris, Victor Devyatov, Mike Huxtable, James Obamila, Peter Phung, Dianna Goodwin). While some of these positions replace vacant staff positions from previous staff leaving (Wil Pille, Tim Elliott, Mike Fox, Andy Brown), half are new positions. In addition, there are on charges from other Tier-2 and Tier-3 NTA managers (such as Jeff Devine, Greg Monteith, Nick Marshall, Jon Wyeth, Shakhin Sharma) for time spent on FNDC planning, reporting and governance. The net result of this is an increase in costs of approximately $800k/year ($2.4M over the 3 year period). It should be noted that when the new NTA structure was decided in 2018, FNDC did not increase their budgets to cover the cost of these additional staff and had been operating some lean staffing budgets before then which tended to stretch their staff and had led to historic under performance in many areas. The benefits of the NTA for FNDC have been better planning, more focus on safety outcomes and asset management, as well as greater outcomes being achieved through the maintenance contracts. There is also a “challenge culture” which has been developed through the NTA which drives better behaviours and outcomes. The net result of this has been demonstrated through FNDC’s good score through the recent NZTA Technical Audit result. This has been achieved through the additional staff being employed by FNDC as well as the support from the wider NTA team. Reducing this funding may compromise the gains for FNDC that have been made to date through the NTA. There has also been a transfer of in-house maintenance staff costs to WC 151. Previously these costs were being charged incorrectly to the individual maintenance and operations (ie 100 series) work categories. This has increased the cost of WC151 by $600k/year ($1.8M over the 3 year period). This increase has been offset by the same level of decrease across the other 100 series work categories, so there is no net change overall to MOR from this change. In addition, Travel Demand Management activity to develop travel plans and drive mode shift (particularly in the Kerikeri area) has been added to WC151 as per NZTA guidance. This adds $90k/annum ($280k for the 3 year period). Finally, there has been an increase in the traffic counting cost of $140-150k/year ($440k over the 3 year period). This has been the result of the development of an NTA traffic count strategy, which has seen a need for significantly more traffic counts in the Far North to better develop traffic catchments for establishing robust traffic estimates and to provide better supporting evidence on unsealed roads.

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
			To partially balance these cost increases, there has been a transfer of $750k/annum ($2.25M for the 3 year period) for AMP Improvement and Safety activities such as strategy development, HPMV assessments, ONF development, dTIMS modelling, FWP development, crash reduction studies, standard safety intervention (SII) assessments, high risk rural road (HRRR) assessments etc. This work is now to be funded through WC003 Activity Management Planning.
211	Unsealed Road Metalling	+$7.63M	This increase is due to the implementation of the Unsealed Road Centre of Excellence being developed by the NTA. This is to implement Paige-Green compliant wearing courses and provide adequate pavement strength for the loading. This will see an increase in renewal costs (wearing courses and heavy metalling), but a decrease in maintenance costs over time (less inspections, grading and pothole patching/spot metalling). Far North has by far and away the largest proportion of heavily laden forestry traffic travelling on the unsealed road network in Northland and this has resulted in FNDC having a higher cost impact from the Centre of Excellence than the other two councils. The overall cost profile for FNDC over the next 30 years is shown in the figure below (this includes the impacts of the PGF seal extensions on Ruapekapeka, Ngapipito and Peria Rds):

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
			 This indicates that the overall long term cost profile for implementing the Centre of Excellence is almost identical to the current maintenance practices. However, there will be significant Level of Service gains resulting from this change as described below: • Improved and more stable pavement condition (less corrugations and potholes) • Enables a move from a reactive to a proactive maintenance regime • Less susceptibility to weather impacts (climate change is likely to generate more intensive storms and more drought conditions) • Lower dust generation which will reduce health impacts to residents and demands for dust suppression and seal extensions • Improved overall user and resident satisfaction The savings in maintenance costs will be realised by converting the current LS rates for grading and unsealed pothole patching into measure and value rates at the first maintenance contract roll-over in 2022.

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
			The 474km of higher cost "Rebuild" in the programme for high risk (Band 3) and medium risk (Band 2 Forestry) roads has been reviewed to make sure that this is reasonable. Of this 474km length of unsealed roads, only 17km (3.5%) does not have forestry traffic. A review of the Forestry Strategy indicates that there are 186km of the FNDC unsealed network in the 2021/24 period that is forecast to have harvest volumes in excess of 1,000 laden logging trucks over this period. This equates to an unsealed rebuild programme of 62km/annum. By comparison, funding the 474km of "Rebuild" roads would only address 47km/annum of unsealed roads during the 2021/24 period (based on the 10 year rebuild cycle). This demonstrates that in the 2021/24 period there is more demand from forestry than is being programmed for a pavement rebuild. Overall this is not a concern, because the proposed programme will "catch up" over the 10 life of the rebuild cycle. Options to accelerate or slow the roll out of the Centre of Excellence programme have also been considered. • Accelerating the programme (to say a 5 year roll-out of the "Rebuild" roads) would result in a higher upfront renewal cost which would be even less affordable to NZTA and this is not warranted based on the forestry harvest information as detailed above (62km/year affected by heavy harvest vs 95km/year programme based on a 5 year cycle). • Slowing the programme (to say a 15 year roll-out of the "Rebuild" roads) would result in only 2/3rds of the 474km length being achieved before the 10 year life of these roads is reached which would then require another round of treatment (in other words you are chasing your tail and never catch up). This would reduce the renewal cost but only achieve 2/3rds of the maintenance savings on these high risk roads. A way to get around this problem would be to design the "Rebuild" roads to last 15 years so that the full maintenance savings on these roads can be achieved. This would require a higher upfront renewal cost for the extra metal depth which would mostly negate the savings from the longer programme. In addition, the Forestry Strategy is indicating harvest forecasts which would suit a 10 year cycle (62km/year affected by heavy harvest vs 47km/year programme). Using a 15 year cycle (62km/year vs 32km/year programme), would mean that about half of these high risk roads would be untreated when the harvest is undertaken leading to a risk of much higher maintenance costs due to pavement failure than even the current maintenance practice would achieve. It would also result in these logging routes being subject to more failures which would not achieve the GPS priority of Improving Freight Connections. From the above assessment, the proposed 10 year programme for "Rebuild" sites appears to be the right timing based on the forecast harvest and best balances the additional cost of the renewals vs the risk of higher maintenance costs caused by pavement failure of these high risk roads.
212	Sealed Road Resurfacing	+$4.57M	FNDC is proposing a programme of Thin Asphalt Concrete (TAC) surfacings in the 2021-24 period to address a backlog of heavily cracked asphalt that is in need of treatment. This TAC backlog has been created by TAC surfacings being historically considered too expensive to replace and so they have been "sweated" for too long. These surfacings are now in a condition where resurfacing is really the only viable

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
			option left, and is required to maintain waterproofing on these high stress seals. If this work is not undertaken, there is the very real risk of the pavements failing due to excessive water ingress leading to very expensive urban rehabilitations. Attached is the detailed breakdown of each Thin Asphalt Concrete (TAC) site in the 2021-24 surface renewal programme as requested by NZTA. All of the sites in the next three year programme fit with the criteria provided by NZTA, as follows: • The average annual daily trips on a road exceed 10,000 vehicle movements per day; or • The road services an industrial or commercial area and has a high number of turning heavy vehicles; or • High stress areas such as; Cul-de-sac heads to provide for trucks (rubbish/delivery etc) turning, roundabouts, sharp bends, steep gradient areas (exceeding 15% or a cross-fall of >6%) which require significant breaking. By ONRC classification, the TAC programme for 2021-24 is shown in the figure to the right. This shows that the focus is on Arterial and Primary Collector sites. The TAC cost is also being driven by a high cost in the maintenance contract of $66/m2 which includes traffic control, milling, levelling and membrane seals. This cost is being driven largely by the additional 1-2 hour cartage time (in each direction) from the manufacturing plants (Whangarei or Silverdale) to the Far North. The NZTA NOC contract is paying similar rates for sites in the Far North. By comparison, the price of an urban rehabilitation (in Whangarei) is about $150/m2, so timely investment in TAC is going to delay a much more expensive rehabilitation.  Other options have been considered to try and reduce these costs and this is detailed in the attached memo. This includes surfacing options such as chip sealing, or alternative sealing technologies, but these sites are now in a condition that TAC surfacing is the best option when weighing up the cost vs risk. There are also alternative procurement options, such as tendering this work out on the open market that have been considered, but again this has much higher risks of non-delivery and there is no guarantee that costs would actually decrease. A site visit was undertaken with an NTA staff member and the NZTA Regional Investment Advisor to look at many of these TAC sites, particularly the larger urban sites. This indicated that about 90% of these TAC sites were considered appropriate. The one site which may need further consideration is the Kerikeri Heritage Bypass which may be able to resurfaced with specialised chip seal surfacings such as mixed grade chip (perhaps with polymer) or fabric seals. These will be considered further. Should these be considered suitable, these will need to

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC
			be discussed with the local community to get buy-in that this is the right level of service in this high growth tourist town. We have kept this budget unchanged at this stage until the design option for the Kerikeri Heritage Bypass has been determined.
214	Sealed Road Pavement Rehabilitation	+$0.90M	The minor increase is to achieve an overall programme of 6.4km/year or 0.7% of the network (a 135 year cycle time). This programme has been developed using dTIMS and field validation.
215	Structures Component Replacement	+$0.52M	A 10 year programme of bridge component replacement work has been developed by WSP following the 2020 round of bridge inspections. In addition, WSP has also developed a 3 year programme of retaining wall component replacements based on inspections undertaken in 2020 on the most critical routes. The first 3 years of these two programmes has been used to develop this budget. There is a minor increase due mainly to a new 3 year budget of $375k being included for retaining walls.
216	Bridge and Structures Renewals	+$4.43M	This is a new work category which has been introduced by NZTA. Was previously funded through WC 341 Low Cost/Low Risk Improvements (budget for 2018/21 was $2.86M). A 10 year programme of full bridge replacements has been developed by WSP following the 2020 round of bridge inspections. This programme is largely focused on addressing heavily corroded "Armco" type steel culverts, particularly in the first 3 years. However, there are some large bridge replacements planned for the 5-10 year period of the programme. WSP has advised that they are very concerned with the poor state of FNDC bridge stock (see the figure to the right) and that the proposed level of funding is required to slowly improve this condition. Without this investment, the bridge asset will continue to deteriorate, with more bridges needing weight and speed restrictions which will further limit freight access which is contrary to the GPS priority of "Improving Freight Connections". The first 6 years of this programme (2021-2027) are shown below: 

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - FNDC

FAR NORTH DISTRICT COUNCIL — BRIDGE REPLACEMENT PROGRAMME

Road No.	Bridge No.	FNDC Area	Roadway	Bridge Name	Span Arrangement	Culvert size span x v	Culvert Soffit Length	Culvert Invert Length	Description	Rough Order Cost Estimate	Aggregate Cost per year
2020-21											
2543	G01	North	West Coast Road	West Coast Road (Kohukohu) Bridge G01	3/12.6/12.6/12.6				Replacement of poor condition bridge	$600,000	
											$600,000
2021-22											
2598	D41	North	Kaitaia-Awaroa Road	Kaitaia-Awaroa Road Culvert D41	1@3.0				Replacement of poor condition culvert	$275,000	
2184	D50	North	Puhata Road	Puhata Road Bridge D50	1@3.2				Replacement of poor condition bridge	$440,000	
2210	B13	North	Quarry Road (Awanui)	Quarry Road (Awanui) Culvert B13	1@2.1	2.1 x 1.35	15.0	19.0	Replacement of poor condition culvert	$275,000	
2535	J18	South	Wekaweka Road	Wekaweka Road Culvert J18	1@3.0	3.0 x 1.8	15.0	17.0	Replacement of poor condition culvert	$275,000	
											$1,265,000
2022-23											
2357	F15	North	Taemaro Road	Taemaro Road Culvert F15	1@3.0	2.75	15.0	15.0	Replacement of poor condition culvert	$275,000	
2557	UN28	North	Whangaroa Road	Whangaroa Road Culvert UN28	1/1.8	1.8 x 1.8	11.5	16.5	Replacement of poor condition culvert	$275,000	
2159	P17	South	Picadilly Road	Picadilly Road Culvert P17	1@2.1				Replacement of poor condition culvert	$275,000	
2585	B15	North	Wireless Road	Wireless Road Culvert B15	2/1.9				Replacement of poor condition culvert	$330,000	
											$1,155,000
2023-24											
2454	UN23	North	Totara North Road	Totara North Road Culvert UN23	1/1.9	1.9 X 1.9	8.4	12.4	Replacement of poor condition culvert	$275,000	
3085	A39	North	Waiharua Road	Waiharua Road Culvert A39	1@2.5	2.5 x 2.1	9.0	9.0	Replacement of poor condition culvert	$275,000	
2543	G28	North	West Coast Road (Kohukohu)	West Coast Road (Kohukohu) Culvert G28	1@4.5	4.5 x 2.8	12.0	19	Replacement of poor condition culvert	$330,000	
2219	L08	South	Rakauwahia Road	Rakauwahia Road Culvert L08	1@4.5	4.5 x 3.1	13	20	Replacement of poor condition culvert	$330,000	
											$1,210,000
2024-25											
2177	D35	North	Powells Road (Diggers Valley)	Powells Road (Diggers Valley) Culvert D35	1/1.8	1.8 m	7.3	7.3	Install another barrel? Check Consent has been obtained and hydraulic capacity is adequate (unlikely)	$220,000	
2596	C35	North	Zidich Road Culvert	Zidich Road Culvert C35	1/1.5				Replacement of poor condition bridge	$275,000	
2284	X11	South	Russell Whakapara	Russell Whakapara Bridge X11	1@3.5				Replacement of poor condition bridge	$440,000	
1815	M35	South	Kahikatea Road	Kahikatea Road Culvert M35	1/1.5	1.2 x 1.5	4.0	6.0	Replacement of poor condition culvert	$220,000	
											$1,155,000
2025-26											
1998	C03	North	Matai Bay Road	Matai Bay Road Bridge C03	2@3.2@3.2				Replacement of poor condition bridge	$1,100,000	
											$1,100,000
2026-27											
2598	D42	North	Kaitaia-Awaroa Road	Kaitaia-Awaroa Road Bridge D42	4@9@9@9				Replacement of poor condition bridge	$2,000,000	
											$2,000,000

In addition, WSP has also developed a 3 year programme of retaining wall replacements based on inspections undertaken in 2020 on the most critical routes.

The first 3 years of these two programmes have been used to develop this budget. The bridge programme is $770k higher for the 3 year period than allowed for previously due to the poor and deteriorating state of FNDC's bridges. It also includes a new 3 year budget of $800k for retaining wall replacement.

Kaipara District Council

Summary of Funding Request for 2021/2024

KDC Maintenance, Operations and Renewals

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
111	Sealed Pavement Maintenance	6,536,939	5,815,253	721,686	An overall increase LS CM costs have been moved from capex, NB - a slight decrease did occur in the overall calcuations which offsets some of the CM movments as internal staff costs now being charged to WC151
112	Unsealed Pavement Maintenance	5,207,850	6,874,284	-1,666,434	Overall a reduction as realisation of the unsealed rehab and wearing course application from CoE will be reaching a tipping point where maintenance activities are now able to be managed under the maintenance contact grading activities at around year 3, NB - there is a slight increase within the overall calculation to move LS CM costs from capex and slight decrease to move internal staff costs to WC151.
113	Routine Drainage Maintenance	2,757,097	2,001,506	755,591	Increased to move LS CM costs from capex and a slight decrease to move internal staff costs to WC151 plus escalation
114	Structures Maintenance	814,413	656,151	158,262	NC - Escalation Only - NB staff costs now to WC151
121	Environmental Maintenance	1,608,579	1,596,204	12,375	NC - Escalation Only - NB staff costs now to WC151
122	Network Services Maintenance (was Traffic Services Maintenance)	2,757,097	1,888,287	868,810	NC - Escalation plus allowance for linemarking and lighting mtce contract - NB staff costs now to WC151
123	Network Operations (was Operational Traffic Management)	122,538	0	122,538	School Zone signs maintenance and running costs
124	Cycleway Maintenance	15,000	0	15,000	
125	Footpath Maintenance	244,259	403,965	-159,706	NC - moved 40% of total cost to renewals new code - NB staff costs now to WC151
131	Level Crossing Warning Devices	70,630	27,967	42,663	NC - Escalation only on year 1, rail crossing expected to become live again in y2 and will need more frequent inspections and/or repairs, RPO is approx $4k per time allowing for 3-4 inspections/repair per year.
140	Minor Events	306,344	0	306,344	Adding $100k annual allowance for events under $100k
151	Network and Asset Management	5,873,192	4,466,312	1,406,880	Increase to move all internal staff costs from Opex to 151 and $120k for CM bonus payment allowance. Also includes a new Travel Demand Management programme to develop travel plans and support mode shift in the Kaipara District.
211	Unsealed Road Metalling	9,325,114	5,593,954	3,731,160	Increase from CoE works and change from removing LS CM costs to opex, see supporting analysis sheet, adds an extra 7% to overall budget
212	Sealed Road Resurfacing	6,126,882	6,697,891	-571,009	reduction by moving LS CM costs to opex
213	Drainage Renewals	1,955,854	2,012,859	-57,005	reduction by moving LS CM costs to opex
214	Sealed Road Pavement Rehabilitations	5,207,850	3,974,229	1,233,621	Some Reduction for years 1-3 of LTP to assist in reducing rates increase, Inflation adjusted but also an overall reduction by moving LS CM costs to opex
215	Structures Component Replacement	3,063,441	3,940,390	-876,949	Reduction has occurred as there are no major projects like Tomorata projected
216	Bridge and Structures Renewals	3,063,441	0	3,063,441	New Category, replacement programme alowance of $1.0M annually plus inflation
221	Environmental Renewals	0	0	0	
222	Traffic Services Renewals	566,737	505,748	60,989	NC - Escalation plus allowance for time charged to replace 1 failed LED luminaire per month
225	Footpath Renewals	162,839	0	162,839	New category - still finalising programme with KDC
	TOTAL 3 YEAR BUDGET	**55,786,095**	**46,455,000**	**9,331,095**	
	2.5% Escalation & Growth on 2018/21 Pr	**49,939,125**		**20%**	
	EXCLUDING NEW WC 216 & TDM ACTIVITY			**6,147,654**	
				13%	

KDC Low Cost/Low Risk Improvements

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
341	Safety	2,785,000	1,563,526	1,221,474	Increase budget from $0.5M to $0.8M/year to make gains in reducing F&S crashes, by targeting speed management and pedestrian safety. This is in line with the Government's Road to Zero strategy and GPS direction.
341	Resilience	1,500,000	2,099,451	-599,451	Increase in budget to progress resilience improvements on high priority routes, in line with the Resilience Strategy and FWP.
341	Bridge Replacements	0	2,549,154	-2,549,154	Now included in MOR programme as Work Category 216
341	Retaining Wall Replacements	0	0	0	Now included in MOR programme as Work Category 216
341	Associated Improvements	750,000	635,355	114,645	
341	Lighting Upgrades	1,000,000	0	1,000,000	V-Category Infill lighting to upgrade arterial lighting in Mangawhai, Dargaville and Te Kopuru.
341	Footpaths	600,000	324,886	275,114	New footpaths predominantly in Mangawhai to improve road safety, promote active modes and completing links to the Mangawahi Shared Path.
341	Drainage Improvements	250,000	0	250,000	
341	Cycleways	0	604,388	-604,388	
341	Intersection Improvements	0	1,933,448	-1,933,448	
341	Other	0	0	0	
	TOTAL 3 YEAR BUDGET	**6,885,000**	**9,710,208**	**-2,825,208**	

KDC Road Safety Promotions & Travel Demand Management

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
432	High Strategic Fit	644,504	465,000	179,504	Increased programme of existing Alcohol & Drug, Young Driver and Speed programmes plus Restraints. Increases in budget to allow for In-house NTA coordinator.
412	Bikes Skills Training	306,040	0	306,040	New programme to build up bike skills training of school children in Kaipara District to extend the existing Northland programme.
412	Travel Demand Management	0	0	0	
	TOTAL 3 YEAR BUDGET	**950,544**	**465,000**	**485,544**	

KDC Major Capital Programme (NLTF)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
452	Mangawhai Shared Path	17,360,600	2,700,000	14,660,600	Based on the Mangawhai Shared Path business case
324	Dargaville River Path	100,000	0	100,000	Part of the Twin Coast Discovery Route (TCDR) Township Improvement PGF project
324	Cove Road Connection to Mangawhai Central	250,000	0	250,000	Identified in the Mangawhai Network Operating Framework (NOF) to connect to the new town centre being built as part of the Mangawhai Central development
	TOTAL 3 YEAR BUDGET	**17,710,600**	**2,700,000**	**15,010,600**	

KDC Major Capital Programme (Alternative Funding)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
324	Unsealed Road Improvements (PGF)	4,003,000	3,150,000	853,000	Unsealed Road Improvements which are part of the Kaipara Kick Start PGF project.
325	Pouto Rd Seal Extension -Stage 1 (PGF)	3,200,000	1,850,000	1,350,000	Based on the Pouto Road Seal Extesnion business case and part of Kaipara Kick Start PGF
325	Pouto Rd Seal Extension -Stage 2 (PGF)	2,800,000	330,000	2,470,000	Based on the Pouto Road Seal Extesnion business case and part of Kaipara Kick Start PGF
452	Kaihu Valley Rail Trail (PGF)	2,000,000	0	2,000,000	Part of the Twin Coast Discovery Route (TCDR) Northland Integrated Cycle Trail PGF project
452	Kaiwaka Footbridges (PGF)	500,000	0	500,000	Part of the Twin Coast Discovery Route (TCDR) Township Improvement PGF project. Funding is for design phase only.
	TOTAL 3 YEAR BUDGET	**12,503,000**	**5,330,000**	**7,173,000**	

KDC Investment Management (Transport Planning)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
003	Activity Management Plan	0	0	0	
	TOTAL 3 YEAR BUDGET	**0**	**0**	**0**	

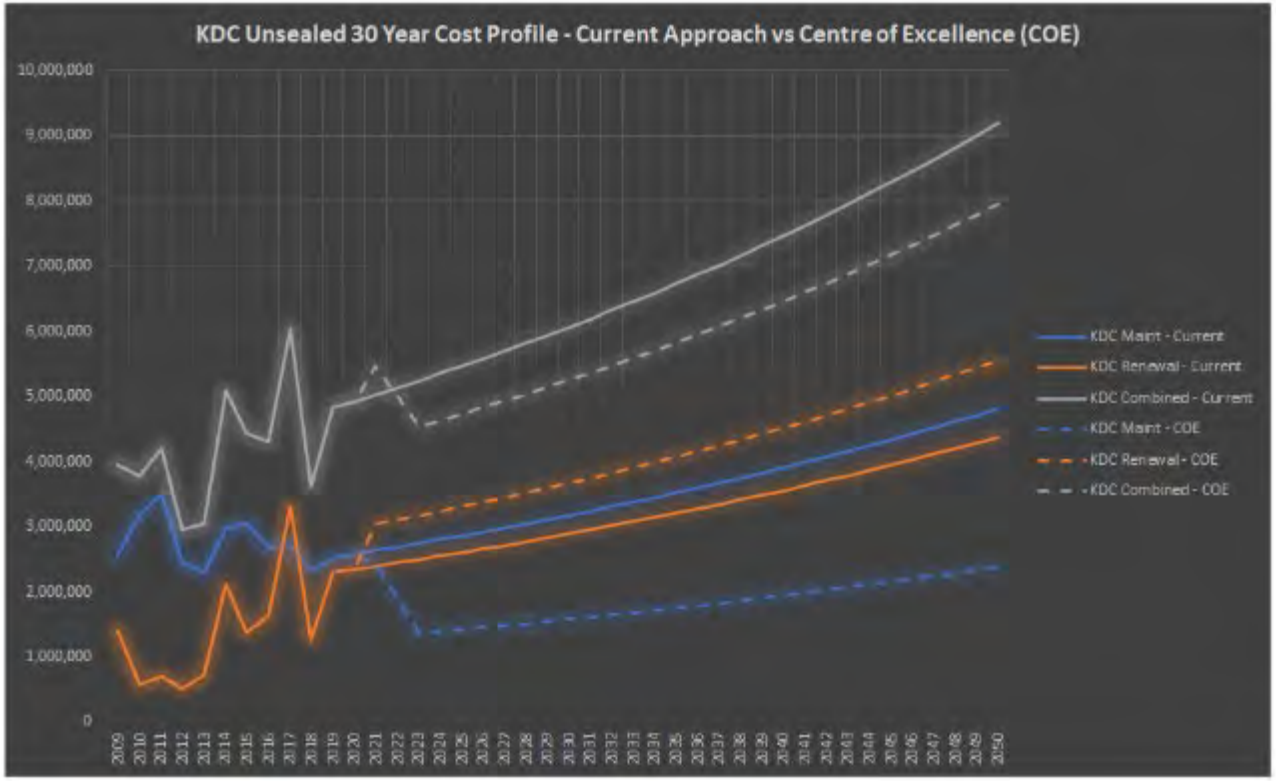
KDC Unsubsidised Activities (Activities with No Direct NZTA Co-Investment)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
	Pouto Road Second Coat Seals	500,000	0	500,000	
	TOTAL 3 YEAR BUDGET	**500,000**	**0**	**500,000**	

Kaipara District Council - MOR Extra Supporting Information for Significant Changes

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - KDC
111	Sealed Pavement Maintenance	+$0.72M	Most of this cost increase is primarily due to Contract Management Costs and an increase in Lump Sum (LS) maintenance (potholes etc) and inspection costs in the maintenance contracts. As per the attached memo, contract management costs within the new maintenance contract have increased substantially. The LS maintenance and inspection costs have also increased and this is expected to have been as a result of more stringent KPIs in the new maintenance contracts to achieve the Level of Service requirements of the contract. This cost increase has been partially decreased by the transfer of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
113	Routine Drainage Maintenance	+$0.76M	This increase is mainly due to additional drainage maintenance, particularly watertable maintenance, being identified through the development of a drainage strategy and FWP by WSP. There are also additional contract management costs being charged to this work category. This cost increase has been partially decreased by the transfer of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
122	Network Services Maintenance (old Traffic Services Maint)	+$0.87M	This cost increase is primarily due to increase in line marking rates. As per the attached memo, line marking costs have increased by 150% and the proposed increase is to try and at least achieve one full annual line mark per annum (with some urban markings such as flush medians and parking being marked once every two years). There is also going to be an increase in streetlight maintenance costs. The incumbent streetlight maintenance contractor has been engaged on an informal contract for many years and their agreed charges are unsustainably low (<$1k/mth). Because of this the level of service being provided by the contractor is not sufficient and the incumbent wants to negotiate new rates. A new maintenance contract (possibly combining KDC and WDC streetlight maintenance) is to be let by July 2021 and this is likely to see the streetlight maintenance costs increase significantly for KDC with a corresponding lift in level of service. These expected costs have been allowed for in the 2021/24 budget and this largely absorbs any savings generated from the LED conversion. This cost increase has been partially decreased by the transfer of in-house maintenance costs that were being incorrectly charged to this work category to WC151.
123	Network Operations (old Operational Traffic Management)	+$0.12M	This is a new budget to reflect the maintenance and operation costs of the new school zone active signs that have been installed in the 2018/21 period and new signs being installed in the 2021/24 period. This includes the licence costs to run the control software for the signs. Based on the WDC costs it is estimated that $40k/year ($120k over the 3 year period) is required.

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - KDC
140	Minor Events	+$0.31M	This allowance allows for one minor event of $100k to occur per annum ($300k over the 3 year period). This allowance is in line with what is being allowed for FNDC and WDC, and reflects the high likelihood of Northland having a storm event which could generate less than $100k of damage.
151	Network and Asset Management	+$1.41M	Through the development of the NTA and the new maintenance contracts there have been six new staff employed by KDC (Andy Brown, Ravi Tridevi, Anchal Shrivastava, Don Anderson, Robert du Preez, Jason Ackroyd). While some of these positions replace vacant staff positions from previous staff leaving (Henri van Zyl, Garry McGraw, Dwyane Classsen, Wendy Mosley), two are new positions. In addition, there are on charges from other Tier-2 and Tier-3 NTA managers (such as Jeff Devine, Greg Monteith, Aram Goes, Nick Marshall, John Wyeth) for time spent on KDC planning, reporting and governance. The net result of this is an increase in costs of approximately $300k/annum ($900k for the 3 year period). The benefits of the NTA for KDC have been better planning, more focus on safety outcomes and asset management, as well as greater outcomes being achieved through the maintenance contracts. There has also been a transfer of in-house maintenance staff costs to WC 151. Previously these costs were being charged incorrectly to the individual maintenance and operations (ie 100 series) work categories. This has increased the cost of WC151 by $150k/annum ($450k for the 3 year period). This increase has been offset by the same level of decrease across the other 100 series work categories, so there is no net change overall to MOR from this change. In addition, Travel Demand Management activity to develop travel plans and drive mode shift (particularly in Mangawhai) has been added to WC151 as per NZTA guidance. This adds $40k/annum ($120k for the 3 year period).
211	Unsealed Road Metalling	+$3.73M	As for FNDC, this increase is due to the implementation of the Unsealed Road Centre of Excellence. KDC have already been implementing Paige-Green compliant wearing courses over the past 3 years and are well down the track in achieving a sustainable unsealed road network. The implementation of the Centre of Excellence will see an increase in renewal costs (wearing courses and heavy metalling), but a decrease in maintenance costs over time (less inspections, grading and pothole patching/spot metalling). The overall long-term cost impact of implementing the Centre of Excellence on KDC's network is shown below:

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - KDC
			 This indicates a relatively sudden reduction in maintenance costs and this is due mainly to the $8M injection of PGF unsealed road strengthening funding. This is reflected in the proposed WC112 Unsealed Road Maintenance budget reduction for the 2021/24 period. Overall, there will be a long-term reduction in unsealed road costs. As for FNDC, the Centre of Excellence will also generate significant Level of Service improvements in terms of improved condition, less weather susceptibility, less reactive and more proactive maintenance, less dust generation and improved user satisfaction.
214	Sealed Road Pavement Rehabilitation	+$1.23M	The increase is to achieve an overall programme of 3.6km/year or 0.8% of the network (a 123 year cycle time). This is an increase over the last 3 years when a very low rate of only 1-2km of rehab were undertaken per annum (approx. 0.3% of the network/annum

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - KDC
			or a 300+ year cycle time) which was only sustainable for a short period while KDC were getting on top of their first coast seal issue. This programme has been developed using dTIMS and field validation.
216	Bridge and Structures Renewals	+$3.06M	This is a new work category which has been introduced by NZTA. Was previously funded through WC 341 Low Cost/Low Risk Improvements (budget for 2018/21 was $2.62M which is almost identical to the proposed budget for 2021/24 of $3.06M). A 10 year programme of full bridge replacements has been developed by Stantec following the 2020 round of bridge inspections. In addition, WSP has developed a 3 year programme of retaining wall replacements based on inspections undertaken in 2020 on the most critical routes. The first 3 years of these two programmes has been used to develop this budget. Overall there is a minor increase in the budget over the 2018/21 period (+$0.44M). This reflects a minor increase in bridging work and a minor allowance for retaining wall replacement.

Whangarei District Council

Summary of Funding Request for 2021/2024

WDC Maintenance, Operations and Renewals

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
111	Sealed Pavement Maintenance	8,656,000	8,028,867	627,133	Increase due to higher contract management and fixed sealed road costs through the new maintenance contracts.
112	Unsealed Pavement Maintenance	5,089,000	5,052,104	36,896	
113	Routine Drainage Maintenance	3,324,000	2,940,041	383,959	
114	Structures Maintenance	1,539,000	1,161,920	377,080	+$50,000/yr for retaining wall maintenance from retaining wall inspections.
121	Environmental Maintenance	2,936,000	3,013,079	-77,079	
122	Network Services Maintenance (was Traffic Services Maintenance)	5,233,000	4,941,561	291,439	
123	Network Operations (was Operational Traffic Management)	3,140,000	3,024,970	115,030	
124	Cycleway Maintenance	162,000	107,825	54,175	
125	Footpath Maintenance	1,077,000	2,316,579	-1,239,579	Renewal funding portion now funded through New WC 225. -$50,000/yr for footpath maintenance to match spend.
131	Level Crossing Warning Devices	185,000	258,677	-73,677	
140	Minor Events	154,000	201,055	-47,055	
151	Network and Asset Management	8,726,000	7,056,223	1,669,777	+$375,000/yr for safety programme management, 3 yearly crash reduction studies and safety project identification and scoping. Was previously being charged to WC 341 and WC 003. +$150,000/yr for Travel Demand Management. New programme to develop travel plans and support mode shift including the development of a web-based programme similar to New Plymouth's "LET'S GO" programme
211	Unsealed Road Metalling	6,909,000	3,891,220	3,017,780	+$1,000,000/yr to fund transition to Paige-Green compliant wearing courses and metal strengthening.
212	Sealed Road Resurfacing	15,452,000	14,430,704	1,021,296	+$200,000/yr for increase in reseal rates through new maintenance contracts. +$250,000/yr for additional focus on addressing old AC surfacings on arterial roads in Whangarei City. -$100,000/yr for skid resistance seals to match need.
213	Drainage Renewals	4,386,000	3,328,004	1,057,996	+$100,000/yr for Kerb and Channel replacement to address poor condition kerbing in Whangarei City. +$225,000/yr due to increase in contract management costs through the new maintenance contracts.
214	Sealed Road Pavement Rehabilitations	10,093,000	10,526,334	-433,334	Targeting 6km of rehabilitation/yr (approx same length as 2018/21), and continuing focus on urban area. Minor reduction to reflect savings through rural rehabs being undertaken through the new maintenance contracts.
215	Structures Component Replacement	4,735,000	3,107,313	1,627,687	+$400,000/yr for increased bridge component renewal to extend the life of aging assets. +$100,000/yr for increased retaining wall component renewal from retaining wall inspections.
216	Bridge and Structures Renewals	5,898,000	0	5,898,000	**NOTE** - New Work Category for 2021-24 period. Was previously funded from LCLR. Increased budget due to fund more armco culvert replacements which are reaching the end of their useful life. Includes new programme of retaining wall replacements.
221	Environmental Renewals	0	0	0	
222	Traffic Services Renewals	2,616,000	2,191,783	424,217	+$100,000/yr for traffic signal renewal to ensure the traffic signals are as efficient as possible.
224	Cycle Path Renewals	0	0	0	**NOTE** - New Work Category for 2021-24 period.
225	Footpath Renewals	1,324,000	0	1,324,000	**NOTE** - New Work Category for 2021-24 period. +100,000/yr for additional footpath renewals in Whangarei City based on FWP developed from OnSIte video surveys.
	TOTAL 3 YEAR BUDGET	**91,634,000**	**75,578,259**	**16,055,741**	**21%**
	Excluding New WC 216 & TDM Activity	**85,274,305**		**9,696,046**	
	2.5% Escalation & Growth on 2018/21 P	**81,246,628**		**13%**	

WDC Low Cost/Low Risk Improvements

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
341	Safety	8,329,000	5,700,000	2,629,000	Increase budget fro $1.7M to $2.7M/year to make gains in reducing F&S crashes, by targeting top 5% of HRRR and high risk intersections. Interventions to include guardrails, speed management and pedestrian safety. This is in line with the Government's Road to Zero strategy and GPS direction. Minor decrease due to shift of safety project management into
341	Resilience	4,594,000	3,078,000	1,516,000	Increase budget from $1M to $1.5M/year to reduce incidences of road closures on high priority routes based on Resilience FWP and to provide funding for emergency works events.
341	50MAX/HPMV Bridge Strengthening	1,531,000	0	1,531,000	New programme to address 50MAX and HPMV restrictive bridges on the network based on detailed bridge assessments.
341	Bridge Replacements	0	1,539,000	-1,539,000	**NOTE** - Now funded from New MOR Work Category 216.
341	Retaining Wall Replacements	0	0	0	**NOTE** - Now funded from New MOR Work Category 216.
341	Associated Improvements	1,625,000	1,231,000	394,000	
341	Lighting Upgrades	3,828,000	1,539,000	2,289,000	Increased programme to complete the infill lighting/upgrades on V-Cat routes and installation of Central Management System (CMS) to control the lights and provide a backbone for "Smart City" technologies.
341	Traffic Signals	2,040,000	1,930,000	110,000	Programme to provide CCTV cameras, fibre connection, WiFi back up and central management to better control the traffic signals.
341	Bus Priority Lanes	4,188,000	0	4,188,000	New programme of bus priority lane trials to improve the bus service and promote mode shift, which will reduce pressure on the existing network and result in less vehicle emissions.
341	Porowini/Maunu Intersections Upgrad	0	1,000,000	-1,000,000	
341	Porowini Ave Bridge Widening	0	800,000	-800,000	
341	Te Matau a Pohe Remote Operation	200,000	500,000	-300,000	Remote operations of Te Matau a Pohe resulting in operational savings, following CCTV and PA upgrades in 2020/21
341	Seal Extensions	970,000	2,000,000	-1,030,000	Bridge approach seals, traction seals and intersection safety seals
341	Footpaths	2,685,000	1,225,000	1,460,000	New footpaths to improve road safety and to promote active modes
341	On-Road Cycleways	817,732	0	817,732	
341	Other	0	0	0	
	TOTAL 3 YEAR BUDGET	**30,807,732**	**20,542,000**	**10,265,732**	

WDC Road Safety Promotions & Tavel Demand Management

W/C		Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
432	High Strategic Fit	1,991,000	1,037,000	954,000	Increased programme of existing Alcohol & Drug, Young Driver and Speed programmes plus Restraints. Increases in budget to allow for In-house NTA coordinator.
432	Medium Strategic Fit	31,000	31,000	0	Fatigue
432	Emerging Issue	0	0	0	
412	Bikes Skills Training	612,000	300,000	312,000	Increased programme to provide cyclists with the skills to use the shared cyclepaths and road network.
412	Travel Demand Management	0	0	0	Now funded through WC 151.
	TOTAL 3 YEAR BUDGET	**2,634,000**	**1,368,000**	**1,266,000**	

WDC Major Capital Programme (NLTF)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
452	Kamo Shared Path	6,200,000	10,429,218	-4,229,218	Completion of the Kamo route to Kamo Village, including connection to Kamo High School. Funding already approved (Committed Activity)
452	Tikipunga Shared Path	2,035,000	0	2,035,000	Shared path from Whangarei Falls to City Centre. Mixture of on and off road cycleways. Builds off work undertaken through the Forestry Redeployment funding to build a path between the Totara Parklands subdivision and the Whangarei Falls.
452	Tutukaka Coast Heartland Ride	5,090,000	0	5,090,000	Construction of a Heartland Ride from Whangarei to Ngunguru. Project indentified in the Northland Integrated Cycling Implementation Plan PBC.
452	Bream Bay Coastal Trail Heartland Ride	729,708	0	729,708	Continuation of the rural cycleway between Waipu Cove and Ruakaka to create a Heartland Ride. Project indentified in the Northland Integrated Cycling Implementation Plan PBC. Cycleway will connect to the off-road cycleway which is being planned as part of the SH1 Whangarei to Port Masrden 4-laning project.
324	Robert St/Walton St Intersection Improvements	2,000,000	0	2,000,000	Upgrading of the Robert St/Walton St intersection to provide full movement and improve access into the CBD. This is likely to include signalisation of the intersection to provide for improved pedestrian access.
324	Water St/Central Ave Intersection Improvements	2,036,000	0	2,036,000	Upgrading of the Maunu Rd/Central Ave/Water St/Walton St intersection to improve bus and pedestrian access on this route. This is likely to involve additional lanes.
324	Bank St/Dent St Intersection Improvements	2,598,000	0	2,598,000	Upgrading of the intersections on Bank St to improve bus and pedestrian access on this route. This is likely to involve the signalisation of the Bank/Dent roundabout and removal of the Barnes dance pedestrian signals at the Bank/Cameron/Rust and Bank/Water/Vine
324	Riverside Dr/Dave Culham Dr Intersection Improvements	2,036,000	0	2,036,000	Upgrading of the Riverside Dr/Dave Culham Dr intersection to improve access to and from the city from Onerahi and the Whangarei Heads. The project is likely to involve the two laning of the roundabout.
324	Urban Intersection Upgrades	0	6,151,098	-6,151,098	Urban Intersection Upgrades are now shown as individual intersection improvement projects as shown above.
324	Ngunguru Road (Murphy's Bend) Safety	4,137,000	0	4,137,000	Major safety improvement project on this high risk area which has had 1 fatal and 4 serious injury crashes in the last 5 years. The project is likely to involve a realignment of these out of context curves.
324	Springs Flat Connection	5,667,000	0	5,667,000	Development of a new intersection to connect Springs Flat Rd to SH1 in Kamo.
324	Port Kioreroa Intersection Upgrade	6,000,000	0	6,000,000	Upgrading of the Port/Kioreroa Intersection to a roundabout or signals to improve freight access to and from the Whangarei Marine Cluster on Port Rd.
324	Waterfront to City Centre Connection - John and James St	5,303,000	0	5,303,000	Forming a strong pedestrian link between the Town Basin and City Centre. Includes turning John St into a shared space and James St into a pedestrian mall. This work is a key part of the Whangarei Complete Streets Masterplan placemaking project.
	TOTAL 3 YEAR BUDGET	**43,831,708**	**16,580,316**	**27,251,392**	

WDC Major Capital Programme (Alternative Funding)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
452	Raumanga Shared Path - Bernard St to Maunu Rd Section (CIP)	5,146,100	1,000,000	4,146,100	Completion of the Raumanga route including the Bernard to Maunu section.
324	Port Road (Limeburners Creek) Bridge 4-laning (CIP)	8,500,000	1,500,000	7,000,000	Widening of the Limeburners Creek bridge to 4-lanes and provision of a shared cycleway on the bridge.
452	Whangarei Heads Cycle Link (PGF)	509,000	0	509,000	Construction of a Heartland Ride from Whangarei to the Whangarei Heads. Project is idenitifed in the Northland Regional Walking and Cycling Strategy.
	TOTAL 3 YEAR BUDGET	**14,155,100**	**2,500,000**	**11,655,100**	

WDC Investment Management (Transport Planning)

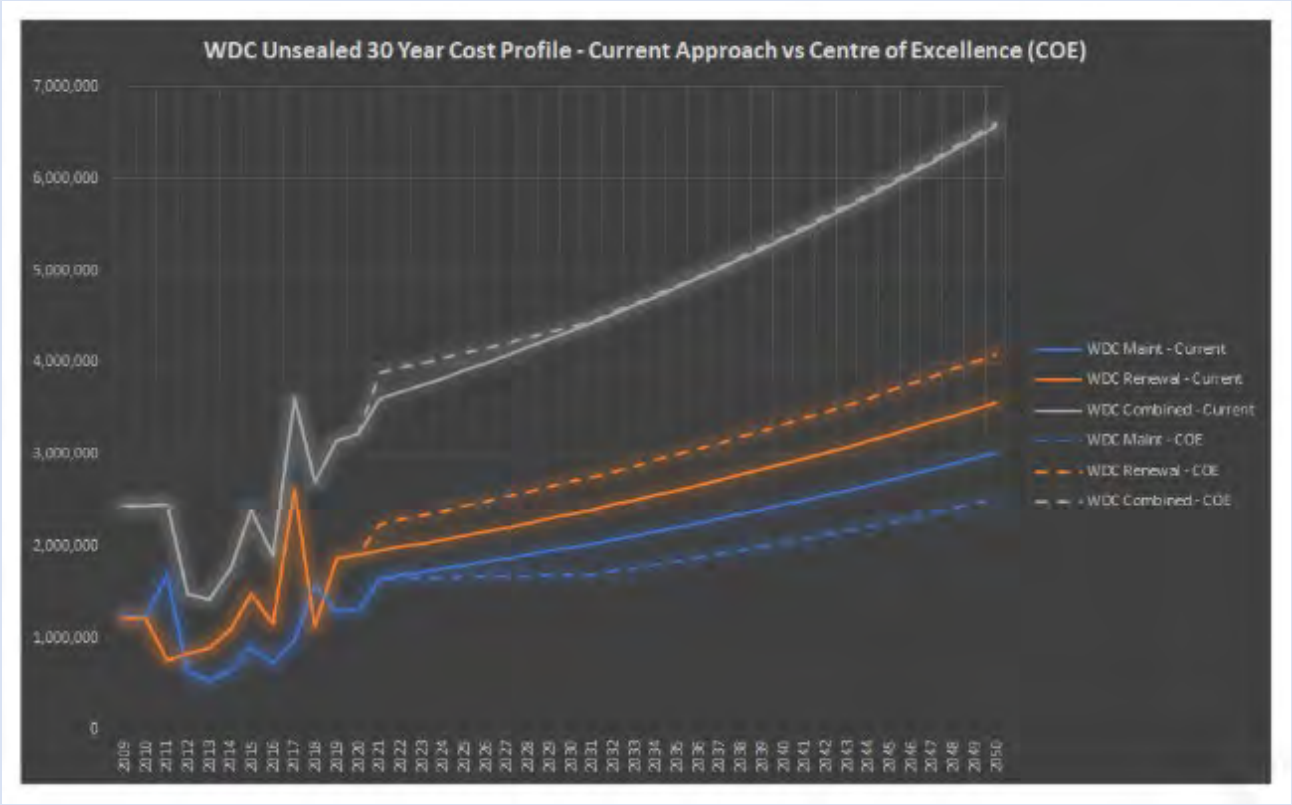
W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
003	Activity Management Plan	462,000	205,000	257,000	Combination of AMP development and ONRC/ONF development
003	ONRC Transition Plan	0	153,000	-153,000	
004	Whangarei Transport Model Update	150,000	250,000	-100,000	Update of model to reflect outcome of 2018 census data and Council growth predictions.
	TOTAL 3 YEAR BUDGET	**612,000**	**608,000**	**4,000**	

WDC Unsubsidised Activities (Activities with No Direct NZTA Co-Investment)

W/C	Description	Proposed 2021/24 Budget	Current 2018/21 Budget	Difference 2018/21 vs 2021/24	Comments
	Rose Street Bus Terminal Upgrade	1,500,000	313,000	1,187,000	To improve uptake in PT mode share as identified in the Whangarei Transportation Strategy. Co-investment with NRC.
	Bus Shelters and Seats - New & Renewals	674,000	276,000	398,000	To improve uptake in PT mode share as identified in the Whangarei Transportation Strategy. Increased budget to provide shelters on stops on the bus priority lane trial routes.
	Bus Shelters and Seats - Maint	154,000	154,000	0	
	Seal Extensions (Unsubsidised)	8,728,000	2,050,000	6,678,000	To carry out approximately 6km of seal extension per annum.
	Amenity Lighting - New & Renewal	276,000	95,000	181,000	Re-introduction of amenity lighting improvements
	Amenity Lighting - Maint & Ops	31,000	154,000	-123,000	
	Subdivision Works Contribution	168,000	153,000	15,000	To carry out improvement works in conjunction with subdivision development.
	Parking Meters - New & Renewal	612,000	369,000	243,000	To continue the programme of replacing obsolete parking meters
	Parking Meters - Maintenance	612,000	431,000	181,000	
	Parking Meters - Operations	1,378,000	400,000	978,000	
	Off-Street Parking Resurfacing & Maint	704,000	308,000	396,000	
	Coastal Protection Structures	260,000	246,000	14,000	
	Drainage - Maint (Unsub)	1,072,000	616,000	456,000	
	Walkway - Maint	61,000	431,000	-370,000	
	NZTA Admin Work	827,000	246,000	581,000	
	Work for Other Departments (Non-Recoverable)	31,000	149,000	-118,000	
	Other Miscellaneous	551,000	292,000	259,000	
	Land for Roads	0	0	0	
	Sense of Place	572,000	291,000	281,000	
	TOTAL 3 YEAR BUDGET	**18,211,000**	**6,974,000**	**11,237,000**	

Whangarei District Council – MOR Extra Supporting Information for Significant Changes

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - WDC
111	Sealed Pavement Maintenance	+$0.63M	Most of this cost increase is primarily due to Contract Management Costs and an increase in Lump Sum (LS) maintenance (potholes etc) and inspection costs in the maintenance contracts. As per the attached memo, contract management costs within the new maintenance contract have increased substantially. The LS maintenance and inspection costs have also increased and this is expected to have been as a result of more stringent KPIs in the new maintenance contracts to achieve the Level of Service requirements of the contract.
151	Network and Asset Management	+$1.67M	There has been an increase of $375k/year ($1,125k over the 3 year period) for safety project management costs and safety studies (ie CRS, safety reports etc) that was previously being charged to WC341 Low Cost/Low Risk Improvements. This increase makes up the majority of the cost increase for this activity. There has also been an increase in the bridge inspections to increase the inspection frequency of coastal and high risk structures to yearly and include retaining wall inspections. These inspection costs have been largely offset by decreases in other areas such as AMP preparation, through NTA efficiencies/cost sharing. In addition, Travel Demand Management activity to develop travel plans and drive mode shift (particularly in Whangarei City) has been added to WC151 as per NZTA guidance. This adds $150k/annum ($460k for the 3 year period).
211	Unsealed Road Metalling	+$3.02M	As for FNDC and KDC, this increase is due to the implementation of the Unsealed Road Centre of Excellence. This is to implement Paige-Green compliant wearing courses and provide adequate pavement strength for the loading. This will see an increase in renewal costs (wearing courses and heavy metalling), but a decrease in maintenance costs over time (less inspections, grading and pothole patching/spot metalling). The overall long-term cost impact of implementing the Centre of Excellence on WDC's network is shown below:

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - WDC
			 This indicates that the long term unsealed road costs resulting from the Centre of Excellence will be almost identical to the current maintenance practices. As for the other councils, the Centre of Excellence will also generate significant Level of Service improvements in terms of improved condition, less weather susceptibility, less reactive and more proactive maintenance, less dust generation and improved user satisfaction.
212	Sealed Road Resurfacing	+$1.02M	There has been an increase in rates of $200k/annum ($600k over the 3 year period) due to the new maintenance contracts. In addition, the dTIMS modelling is indicating that a higher rate of Thin Asphaltic Concrete (TAC) resurfacing in Whangarei City is required to stay on top of the

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - WDC
			old AC surfaces that are becoming heavily cracked and deteriorating. The TAC budget has been increased by $250k/annum ($750k over the 3 year period). These increases have been partially balanced by a $100,000/annum ($300k over the 3 year period) reduction in budget for skid resistance seals. This reduction is based on the PMRT data which shows that the wet road loss of control crashes in Whangarei are generally static or declining (apart from Urban Arterials which are likely to be addressed through the larger TAC programme anyway).
213	Drainage Renewals	+$1.06M	The majority of this cost increase is due to $225k/annum ($675k over the 3 year period) of contract management costs being allocated to this activity. As per the attached memo, this is due to contract management costs increasing in the new contracts, and a portion being allocated to drainage renewals to reflect contractor fixed costs (planning, management and overheads) for culvert replacements, heavy watertabling and kerb and channel replacement. There has also been a new programme of $100k/annum ($300k over the 3 year period) for kerb and channel replacement associated with the footpath renewal programme. This is to provide for replacement of cracked and broken kerbing when undertaking footpath renewals in Whangarei City.
215	Structures Component Replacement	+$1.63M	A 10 year programme of bridge component replacement work has been developed by WSP following the 2020 round of bridge inspections. In addition, WSP has also developed a 3 year programme of retaining wall component replacements based on inspections undertaken in 2020 on the most critical routes. The first 3 years of these two programmes has been used to develop this budget. There has been a significant increase in the budget for bridge component replacement of $450k/annum ($1.35M over the 3 years period). This is to try and hold the condition of aging bridges to defer the likely (and costly) replacement in the next 5-10 years. There is also a new budget of $100k/annum ($300k for the 3 year period) for retaining wall component replacement budget.
216	Bridge and Structures Renewals	+$5.90M	This is a new work category which has been introduced by NZTA. Was previously funded through WC 341 Low Cost/Low Risk Improvements (budget for 2018/21 was $1.13M). A 10 year programme of full bridge replacements has been developed by WSP following the 2020 round of bridge inspections. In addition, WSP has also developed a 3 year programme of retaining wall replacements based on inspections undertaken in 2020 on the most critical routes. The first 3 years of these two programmes has been used to develop this budget. The bridge programme is $1,580k/annum ($4.73M for the 3 year period), which is substantially higher than allowed for in the 2018/21 period. This is due to a bow wave of old armco culverts needing to be replaced. While this has been a focus for many years, this programme needs to be accelerated to address these heavily corroded

W/C	Description	2018/21 vs 2021/24 Programme Difference	Justification - WDC

structures before major bridge replacements start to occur (which is likely to start to happening in the next 5-10 years based on these inspections). The first 6 years of the bridge programme are shown in the following table:

WHANGAREI DISTRICT COUNCIL — BRIDGE / CULVERT REPLACEMENT PROGRAMME

Road No.	Bridge No.	WDC Area	Roadway	Bridge Name	Span Arrangement	Culvert size span x v	Culvert Soffit Length	Culvert Invert Length	Axle Limit	Gross Limit	Rough Order Cost Estimate	Aggregate cost per year	Description
2020-21													
510	877	S	Cemetery Road	Cemetery Culvert 877C	1/3.2	3.2 x 2.2	11.0	15.0			$200,000		Culvert steel shell corroding under lining. Replace culvert.
434	553	N	Whangarei Heads Road	McLeod Bay Culvert 553a	1/2.9	2.85 x 2	16.9	22.0			$250,000		Culvert steel shell corroding under lining. Replace culvert.
725	6	N	Glenhomlown Road	King's Ck	1/1.8	1.8 dia	6.7	6.1			$100,000		Culvert steel shell corroding under lining. Replace culvert.
730	387	N	Harris Road	Harris 387a	1/3.6	3.6 x 1.5	21.0	28.0			$250,000		Culvert steel shell corroding under lining. Replace culvert.
649	21	N	Waiparera Road	J.M. Ross 21a	1/4.2	4.2 x 2.5	8.5	15.6			$250,000	$1,650,000	Culvert steel shell corroding under lining. Replace culvert.
2021-22													
961	133	S	Mangapai Road	Mowerhare Turnoff 133a	2/4.7	2 x 4.7 x 2.8	12.0	20.7			$1,100,000		Culvert steel shell corroding under lining. Replace both barrels with a bridge.
160	395	C	Cillingham Road	Sauls 395b	1/3.5, 1/5.5, 1/3.5				8000 kg	75% Class 1	$650,000	$1,650,000	Replace the old bridge.
2022-23													
990	189	S	Bird Road	Birds 189a	1/3.51	3.5 dia	15.0	25.0			$330,000		Culvert steel shell corroding under lining. Replace culvert.
706	525	N	Otonga-Manuia Road	Otonga Nor 525a	1/3.6	3.6 x 2.3	13.0	21.0			$275,000		Culvert steel shell corroding under lining. Replace culvert.
882	44h	N	Wride Road	Mimiha Domain 44bd	1/4.3	4.3 x 2.5	11.5	17.6			$330,000		Exposed pipe with big holes near the outlet. Replace culvert.
578	477	N	Aponga Road	Aponga 4/1b	1/2.28	2.2 dia	18.0	18.0			$275,000		Culvert steel shell corroding under lining. Replace culvert.
687	335	N	White Road	335a White	2/1.8	2 x 1.8 dia	7.3	13.3			$330,000	$1,545,000	Culvert steel shell corroding under lining. Replace culvert.
2023-24													
780	14	N	Ody Road	Ryan 14h	1/3.4	3.4 x 2.2	7.5	14.00			$275,000		Culvert steel shell corroding under lining. Replace culvert.
844	126	S	Pipiroma Road	Leitch Nor 126a	1/4.00	4.0 x 2.5	20.0	28.0			$330,000		Culvert steel shell corroding under lining. Replace culvert.
950	128	S	Mangapai Caves Road	Mangapai Caves Nor 128a	1/2.50	2.5 dia	12.00	18.20			$275,000		Culvert steel shell corroding under lining. Replace culvert.
970	A7a	S	Millbrook Road	McAuley No2 78A-a	2/1.8	2 x 1.8 dia	10.0	12.0			$330,000		Culvert steel shell corroding under lining. Replace culvert.
976	6E	S	Mountfield Road	Johnny Jacks Nor 6Ea	2/2.5	2.5 x 1.8	11.00	17.30			$330,000	$1,540,000	Culvert steel shell corroding under lining. Replace culvert.
2024-25													
646	564	N	Pukaka Road	Pukaka Culvert 564a	1/3.5	3.5 x 2.1	12.5	19.5			$330,000		Culvert steel shell corroding under lining. Replace culvert.
649	21	N	Waipapa Road	J.M. Ross 21a	1/4.2	4.2 x 2.5	8.5	15.6			$275,000		Culvert steel shell corroding under lining. Replace culvert.
651	A100	N	Waitangi	Foster 400A-b	1/8.0						$700,000		Old structure, too short with poor alignment and at risk from scour. Replace structure.
788	838b	N	Pekeua North	Donaldsons (2)	1/3.5	3.1 x 3.0	14	20.00	1.60		$275,000	$1,650,000	Culvert steel shell corroding under lining. Replace culvert.
2025-26													
478	642	N	Peach Orchard Road	Peach Orchard No2 642b	1/6.2						$385,000		Replace older deteriorating structure.
1434	107	S	Wespu Caves Road	Shields 107a	1/3.2	3.1 x 2.0	12.0	18.3			$275,000		Culvert steel shell corroding under lining. Replace culvert.
1043	159	S	Tapuhia Road	Stephens 159a	1/4.2	2 x 4.0 x 2.5	9.0	15.6			$275,000		Culvert steel shell corroding under lining. Replace culvert.
1282	44H	N	Ngunguru Bay Road	Foster Nor 44Hb	1/6.0						$385,000		Replace older deteriorating abutments on the scour structure (with culvert).
647	340	S	Murray Road	Meyers 340b	1/3.0	3.0 x 2.1	10.0	15.7			$275,000	$1,650,000	Culvert steel shell corroding under lining. Replace culvert.
2026-27													
427	109	N	Vinegar Hill Road	Denver 109a	1/3.84	3.8 x 1.9	11.0	17.0			$275,000		Culvert steel shell corroding under lining. Replace culvert.
490	193	S	Graham Road	Graham Nor 193a	1/3.05	3.05 x 1.9	11.0	21.3			$275,000		Culvert steel shell corroding under lining. Replace culvert.
640	469	N	Morgan Road	Morgan 469b	1/6.8						$385,000		Bridge steel superstructure is under water most of the time. Replace abutments and raise bridge and approaches. Or replace with a culvert.
657	472	N	Pukeitoi Road	472a	1/5.1	5.1 x 3.3	11.0	22.8			$330,000		Culvert steel shell corroding under lining. Replace culvert.
685	480	N	Takararoa Road	1004a	1/4.1	4.1 x 2.5	13.0	20.0			$330,000	$1,545,000	Culvert steel shell corroding under lining. Replace culvert.

The proposed budget also includes a new programme of retaining wall replacements of $350k/annum ($1,050k for the 3 year period), based on the WSP inspections.

6.22 Improvement Plan

6.22.1 Previous AMP Improvement Plan

Over the past three years progress has been made on developing the AMP improvement activities identified in the 2018/2048 AMP for each council. These improvement plan activities were collated into a "master list" of activities across the three councils. Other tasks have been added to this list as activities have been identified. The most significant of these activities are summarised below:

- A combined Northland Transportation Alliance AMP which covers the Far North, Kaipara and Whangarei Districts (this AMP).
- Tender and procure new Maintenance Contracts.
- Unsealed Road segmentation, Maintenance Intervention Strategy (MIS) and forward works programme (FWP).
- Drainage MIS and FWP.
- Resilience Plan and FWP.
- Retaining Wall criticality assessment, inspections and FWP.
- Forestry study reboot and FWP.
- Traffic Count Strategy and combined contract
- Improving data quality

Many of the above strategies and initiatives are described in more detail in Section 6.17.3.

The progress on the AMP Improvement tasks is shown in the REG Dashboard on the following page. Overall, as of 30 November 2020, the 2018/21 AMP improvement tasks are **91%** complete. We will continue working on completing these tasks through the 2020/21 year.

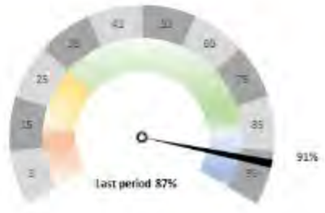
Northland Transport Alliance (NTA) - Activity Management Improvement Programme 2018-21

SYSTEMS

EVIDENCE

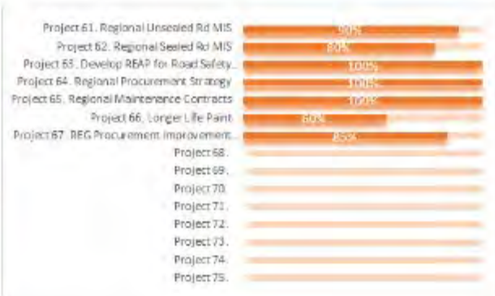
COMMUNICATING

OVERALL PROGRESS

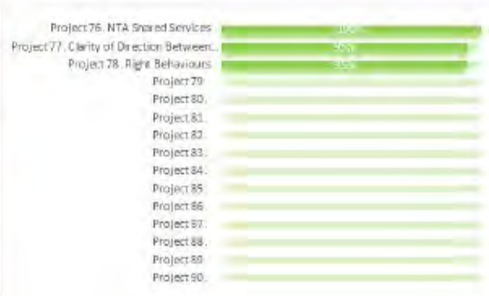


DECISION MAKING

SERVICE DELIVERY



PEOPLE / CULTURE



6.22.2 New AMP Improvement Plan

The new improvement plan items identified during the assessment of each work activity in Sections 6.4 to 6.16 have been summarised into the following table. These improvements are recommended to fully implement the ONRC and BCA principles into the Activity Management Plan and to ensure that activities are undertaken as efficiently as possible. Funding has been allowed for these tasks in the budgets for the 2021/24 period.

Action	GPS Priority	Priority	Estimated Cost	Target Date	Status/Comment
SEALED ROADS					
Investigate and trial alternative seal designs such as: Emulsion seals to reduce the health and safety risk to workers; Fibredek-type seals to extend the life of cracked surfaces; the use of plastic in asphalt mix design; and seal rejuvenation techniques to extend the seal life.	Value for Money	High	$30,000	Jun-22	
UNSEALED ROADS					
Air monitoring of adjoining unsealed sections with and without Paige-Green compliant material to determine the reduction in PM_{10} dust emissions.	Climate Change	High	$50,000	Apr-22	
Change unsealed Lump Sum items for pothole patching and grading in Maintenance Contracts to measure and value items to realise the savings through the Unsealed Centre of Excellence.	Value for Money	High	N/A	Jun-22	Through the contract roll-over process
Improve unsealed road data collection including implementing regular roughness monitoring through RoadROID or similar, and visual dust assessment tool that can determine likely PM_{10} dust emissions.	Value for Money, Climate Change	High	$50,000	Oct-22	
STRUCTURES					
Continue to carry out full assessment on key bridges that have current 50Max restrictions to determine whether these restrictions are necessary.	Improving Freight Connections	Med/High	$80,000	Dec-22	
Seismic assessments to be carried out on structures on key life lines, arterials and freight routes. Develop a programme of remedial work as required.	Improving Freight Connections	Medium	$100,000	Jun-23	
Bridge and retaining wall asset data to be broken into their component parts in RAMM. Bridge and retaining wall condition, maintenance dispatches (including photos) and repairs to be stored in RAMM.	Value for Money	High	$50,000	Jun-22	
ENVIRONMENTAL					
Investigate and develop a programme of sediment control measures for roadside drainage systems and maintenance practices to minimise sediment runoff into harbour catchments (particularly the Kaipara Harbour).	Climate Change	Low	$50,000	Oct-23	In conjunction with the Kaipara Harbour restoration project
Climate Change - Carry out a stock take of assets likely to impacted by climate change and include in RAMM and carry out Dynamic Adaptive Planning Pathway (DAPP) on these assets to determine adaptation strategies. This could be done as part of the Resilience Strategy.	Climate Change	Med/High	$60,000	Jun-22	
Climate Change - Develop a strategy to identify and implement initiatives that reduce the greenhouse gas emissions from transport related maintenance and construction activities.	Climate Change	Med/High	$60,000	Jun-22	
TRAFFIC SERVICES					

Action	GPS Priority	Priority	Estimated Cost	Target Date	Status/Comment
Develop forward works programme of high priority "black" areas resulting from the lux mapping survey (HISLAT survey) of the P-Category (local road) lights.	Safety	Low	$20,000	Dec-21	
Undertake an assessment of long-life markings to determine where and when these should be used.	Safety, Value for Money	Medium	$30,000	Apr-22	
Undertake cyclic night-time inspections with safety engineers to determine improvements to signs, markings, RRPMs and edge marker posts.	Safety	High	$135,000	Yearly by Aug	Annual programme with 3 year budget
Carry out an audit of existing guardrails to determine their condition and compliance with current safety standards.	Safety	Med/High	$100,000	Jun-22	
NETWORK & ASSET MANAGEMENT					
Determine which Council department has ownership and maintenance responsibilities for the Council-owned assets such as carparks, street furniture, shared paths, amenity lighting etc.	Value for Money	Low	$30,000	Dec-23	
Standardise the Annual Achievement Return reporting process using RAMM data, TIO data and council financial accounts.	Value for Money	Med/High	$30,000	Jun-22	
Implement the Asset Data Management System (ADMS) and merge the three council databases into one combined database for efficiency gains (only having to do things once instead of three times) to standardise the data storage, and to enable regional mapping of assets etc.	Value for Money	High	$150,000	Jun-23	
Improve KDC customer request (CRM) data to include asset type which will enable year-on-year tracking of trends.	Value for Money	Medium	$10,000	Dec-21	
Carry out annual assessment of customer requests (CRMs) and requests for service (RFS) to determine trends.	Value for Money	Medium	$30,000	Yearly by Jun	Annual programme with 3 year budget
Procurement Strategy – Update the NTA Procurement Strategy. During this update, consider implementing the improvements identified in Procurement Strategy Self-Assessment Section 6.18.3, and the Climate Change Section 4.13.	Value for Money	High	$60,000	Oct-21	
Application of the One Network Framework (ONF) including implementation of the ONF performance measures and levels of service into the AMP and maintenance contracts.	Value for Money	High	$60,000	Jun-22	To coincide with contract roll-overs
Development of an electronic "living" AMP document that is simple to understand and easy to update.	Value for Money	High	$120,000	Oct-23	
PUBLIC TRANSPORT					
Determine the feasibility of rural commuter bus services to rural towns in the Whangarei District.	Better Travel Options	Med/High	$50,000	Jun-23	
TOTAL COST FOR 2021/24 IMPROVEMENT PLAN (funded mostly from W/C 151)			**$1,355,000**		

PART C – DETAILED BUSINESS CASE

7 Preferred Options

Detailed analysis of the preferred options

7.1 Lifecycle management Plan (how we provide the service)

This chapter is split into sections based on the following different asset groups:

- Section 7.2 – Introduction
- Section 7.3 – Pavements & Surfacing
- Section 7.4 – Sealed Pavements and Surfacing
- Section 7.5 – Unsealed Pavements
- Section 7.6 – Structures
- Section 7.7 – Road Drainage
- Section 7.8 – Traffic Facilities
- Section 7.9 – Operational Traffic Management
- Section 7.10 – Network lighting
- Section 7.11 – Footpaths & Cycleways
- Section 7.12 – Carparking
- Section 7.13 – Environmental
- Section 7.14 – Network and Asset Management
- Section 7.15 – Safety Management
- Section 7.16 – Major Capital Programme

7.2 Introduction

The life cycle of assets involves the following steps:

- Acquisition/Creation of new assets
- Maintenance and Operations of existing assets
- Renewal of existing assets which have reached the end of their useful life
- Improvement of existing assets to provide a higher level of service
- Disposal of assets that are no longer required or are obsolete

The overall life cycle management objective for the Transport Network is:

OBJECTIVE	To maintain performance measures that will ensure current strategies do not consume the asset, leading to an unexpected increase in maintenance/renewal expenditure in the future.

7.2.1 Background data (what assets we have)

Activity Group	Asset Type	Component (Asset Breakdown)	Database - Table
Pavements Sealed	Sealed Pavements Sealed Surfaces	Chip Surface AC Surface Base-course Sub-base Formation (not held in RAMM, Valuation Component)	RAMM – Surface Structure RAMM – Pavement Structure
Pavement Unsealed	Unsealed Pavements Unsealed Surfaces	Unsealed Wearing Course Base- course Sub-base Formation (not held in RAMM, Valuation Component)	RAMM – Surface Structure RAMM – Pavement Structure
Structures	Bridges & Major Culverts	Bridges (incl. footpath bridges) Stock Underpasses Rail Under/Over Major Culverts Stairs	RAMM-Bridge RAMM-Drainage (large Drain Structures) RAMM-Minor Structure
	Retaining Walls	Retaining Walls Seawalls	RAMM-Retaining Wall
	Minor Structures	Under / over passes etc.	RAMM-Minor Structures
Complex Assets	Large Structures	Te Matau a Pohe (Complex Bridge) Kotuitu Whitinga Walk Bridge (Complex Bridge)	RAMM – Bridges RAMM – UDT (Custom Table)
Drainage Systems	SW Channel	Kerb & Channel Earth Channel	RAMM-Surface Water Channel
	Sub Surface Drains	Culverts Catch Pits (Not owned by Roading in Urban Area) Subsoil Drains Manholes	RAMM-Drainage
Corridor Traffic Devices & Facilities	Signs/Marking/Delineation	Regulatory Signs Permanent Warning Signs Information Signs Destination Signs EMPs Culvert Markers Sight Rails Line Markings RRPMs	RAMM-Signs RAMM-Signs RAMM-Signs RAMM-Signs RAMM-Signs RAMM-Signs RAMM-Railing RAMM-Marking RAMM-Marking
	Traffic Islands (Calming/management devices asset derived from function and form)	Kea Crossing Pedestrian Crossing Pedestrian Refuge Speed Humps/Table	RAMM-Island RAMM-Island RAMM-Island RAMM-Traffic Facility
	Road Safety Barriers	Barriers Wire & Rope Concrete Barriers	RAMM-Railing
	Street Furniture	Benches Bollard Bins (ownership with parks) Fences (Decorative) Bus Stops Bus Shelters (Bus Stops maintained through other budget lines)	RAMM-Minor Structure
Corridor Lighting	Lighting	Poles Lights/Lamps Brackets	RAMM-Streetlight
Operational Traffic Control Systems	Intelligent Traffic Systems	Driver Feedback Moveable Signs School Zone Loops Cabinets Permanent Counters	RAMM-ITS RAMM-ITS RAMM-ITS RAMM-ITS RAMM-ITS RAMM-ITS
	Traffic Signals	Poles Lanterns	RAMM-Intersection -Traffic Signals

Activity Group	Asset Type	Component (Asset Breakdown)	Database - Table
		Cables Cabinets/Controller Loops Pedestrian Call Buttons Software (SCATS) Servers (comms)	
Off Street Parking (Ring fenced Asset - Self Funding)	Parking Metres	Pay & Display Individual Meters	RAMM-Feature
	Car Parks	Surface Pavement Line Markings Buildings / Structures Lighting/Lamps Footpaths Drainage (K&C)	RAMM-Surface Structure RAMM-Markings RAMM-Minor Structure RAMM-Streetlight RAMM-Footpath RAMM-Carriageway RAMM-Drainage
Environmental Management	Environmental / Road Environments	Sight lines Spray Areas Roadside Mowing Storm Water Devices Stock Effluent Disposal Sites	N/A RAMM-Vegetation RAMM-Vegetation RAMM-Drainage N/A
Walking & Cycling	Footpaths & Walkways	Footpaths Kerb Drop Downs Crossing Places Barriers (restrict access)	RAMM-Footpath RAMM-Crossing RAMM-Crossing RAMM-ITS
	Shared Paths (Pedestrian/Cycle Facilities)	Shared Path (Walking/Cycleway) Network	RAMM – Roads/Carriageway RAMM-Footpath
Safety Management	All Assets	Safety Management systems, processes and analysis	
Network and Asset Management	All Assets	Network and Asset Management systems and processes and analysis	

7.2.2 Life Cycle Management Objectives

The diagram below shows the life cycle management objectives that are achievable based on the proposed funding levels;

LIFE CYCLE MANAGEMENT OBJECTIVES	
ACQUISITION	To plan and provide capital investment within the district that is the right thing, at the right time, at an affordable cost, to help deliver the community outcomes and core values in this plan.
MAINTENANCE	To maintain the network through continued inspection and maintenance programming and approval based on the *Maintenance Intervention Strategy*, to allocate available funds to only the highest priority works.
RENEWALS	To undertake renewal/replacement of assets on a whole of life cycle cost basis determined by condition and economic need, with regard to required Level of Service.
IMPROVEMENT	The provision of limited capital improvement investment to treat only the highest priority need.

7.2.3 Life Cycle Management Inputs

Life cycle management planning is generally based on the following factors;

7.2.3.1 Condition

Condition measures are used to determine if an asset requires maintenance or renewal and prioritises the programme of works. Intervention levels are determined from the condition of the asset.

In general, the assets assessed from the customer performance point of view with a related condition profile:

Table 7-1: Asset Customer and Condition Profiles

Rank	Customer Performance Description	Condition Description
Excellent	The customer experiences a very smooth ride. There is no visible deterioration of the surface. The customer is provided a safe no surprises environment clear sight lines.	Generally new or near new asset, no signs of distress receiving normal routine maintenance.
Good	The customers ride quality has diminished slightly. There are minor visible signs of the defect in the surface. The surrounding road corridor presents a consistent message to the customer.	Generally new or near new asset, minor signs of distress operating as expected receiving only routine maintenance.
Fair	The customers ride quality has diminished further experiencing bumps at irregular intervals. The surrounding corridor presents some inconsistencies to the customer.	Aging asset, has more evident signs of distress, requires proactive planned maintenance as expected for the age of the asset.
Poor	The customer ride quality continues to diminish becoming very bumpy at regular intervals. The surrounding corridor presents inconsistent message to the customer poor sight lines and customer experiences a number of surprises.	Aging asset, significant levels of distress, requires both large scaled planned maintenance and reactive maintenance to maintain serviceability
Failing	The customer experiences a very bumpy or undulating ride occurring at very frequent intervals. There are significant amounts of defect or repair evident. The surrounding corridor is very inconsistent with limited recovery from error, poor sight lines.	The asset needs replacing as it can no longer provide the service qualities expected

7.2.3.2 Performance

Performance measures are used to determine if an asset requires improvement. An example of a performance measure is the difference between the capacity and the demand on a section of road. If the demand is found to exceed the capacity, the road is under-performing and requires improvement.

7.2.3.3 Criticality

Criticality is used to prioritise works based on asset types (e.g. bridges are more critical) and works based on the individual assets (e.g. bridge on a high volume, sealed route is more critical than on a low volume, unsealed route).

7.2.3.4 Age & Useful Life

The age and useful life of assets is often used as another measure of condition, with the useful life used as an indicator of when an asset is likely to require renewal. In the absence of all other factors above, age may be used to determine the replacement of an asset to ensure that a burgeoning future replacement programme is avoided.

7.2.3.5 Valuation and Depreciation

The valuation and depreciation information provide a link to the financial investment expected based on the useful lives of the assets, the replacement value and the depreciation patterns. This provides an opportunity to compare the annual depreciate with actual planned renewal investment and provides a measure of the gap, positive or negative, between deprecation and renewal investment. This then provides an input into the long-term investment planning of the network.

7.2.4 Funding

The level of funding has a large impact on how all roading assets are managed. The measures above are generally used to prioritise the works that need to be undertaken, while the available funding determines how much of this work is completed and in what time-frame.

7.2.5 Acquisition / Creation Plan

Acquisition works are those works that create a new asset that did not previously exist. They may result from growth or social or environmental needs. Assets may be acquired at no direct cost to the organisation (e.g. sub-divisional development) or through Council funded projects.

Council funded projects generally result through growth in traffic volumes through population growth and land use development.

7.2.6 Maintenance Plan

Maintenance and operation include all work necessary to keep roads open and trafficable at the Levels of Service described under the Approved LTP Funding profile and within this plan.

Once the maintenance required to ensure an asset is in a safe and reasonable condition becomes too expense or time consuming the asset is considered for renewal.

The maintenance needs of the sealed carriageways are primarily determined from regular inspections of the network with all observed defects logged into the maintenance defect pool within RAMM Contractor. The work typically includes the minor issues (pothole repairs, sealing of cracks, dig-out repairs, repair of edge breaks and removal of detritus).

Other routine maintenance includes:

1. carriageway pavement and surface maintenance to ensure that the carriageway is free of major defects resulting in safe and comfortable travel;
2. bridge maintenance to ensure that the structural integrity of all bridges is protected and that their load capacity is maintained;
3. maintaining footpaths to provide for safe pedestrian access;
4. maintaining parking areas in a clean and tidy state, with clear paint markings and a reasonable surface;
5. the regular cleaning of drains and culverts to minimise blockages and ensure flows through the drainage system are as regular as possible. Also, the repair or replacement of damaged culverts and other drainage structures;
6. the regular re-marking of pavement markings is undertaken to maintain a high level of delineation, promoting safety;
7. cleaning and vegetation control around signs and other safety assets including edge marker posts and guardrails to ensure their visibility;
8. maintenance of the vegetation alongside roads to maintain visibility sight lines and ensure an adequate open envelope is available, especially for larger vehicles;
9. street cleaning in the urban areas;
10. restoration after emergencies. When there is an emergency such as a major traffic crash or storm damage (such as a washout or over-slip that blocks the road) Council's goal is to restore the road to at least one viable traffic lane within 24 hours, then back to at least its original condition as soon as possible thereafter that, depending on the availability of funding (including Government co-investment); and
11. management of the maintenance activity including regular inspections to identify necessary work, regular maintenance patrols, planning and prioritisation of work, budget management and control and regular customer satisfaction surveys.

All routine maintenance physical works are contracted out over five separate areas of the Region: WDC north and South; FNDC north and south and KDC.

7.2.7 Renewal Plan

Condition and performance of assets are generally used to determine if it requires renewal, with these measures. The assets condition, criticality and the funding available are used to prioritise the works.

7.2.8 Improvement Plan

The improvement of assets generally occurs for the following reasons;

- New technology is developed that will increase the performance or safety of the asset,
- An upgrade is required to increase the capacity of the asset, or

- An upgrade is desired by the community to improve the level of service.

Improvement works are generally prioritised and contracted out in the same way as renewal works and whenever possible they are co-ordinated with renewals to achieve efficiencies of scale (e.g. seal widening is normally done in conjunction with pavement rehabilitation).

7.2.9 Disposal Plan

The disposal plan for any of the assets managed by the Roading Department generally consists of any recoverable items being returned to Council. Disposal of the transportation assets normally occurs due to renewal/rehabilitation works and assets are rarely sold.

Often during renewal works any surplus material (such as old bridge beams) becomes the property of the contractor carrying out the works for them to reuse or dispose of. Any scrap value from these assets are generally obtained through a reduction in the contractors tendered price. Where assets are recognised as being obsolete, surplus or uneconomic to continue to own, these are identified and disposed through an appropriate process.

7.3 Pavements & Surfacing

7.3.1 Introduction

Pavements and surfacing make up the core of the road network. This asset group includes:

- Sealed pavements
- Unsealed pavements
- Other (concrete; bridge decks etc)

They are critical for providing road access throughout the region. Table 7-2 summarises the current replacement cost / Value of the pavements and surfacing (excluding the land under the roads) and its percentage of the total asset network.

Table 7-2 Pavements and surfacing asset value and percentage of total transportation assets

District	Current Combined Value of Pavements and surfacing	Percentage of total transportation assets per district
FNDC	$1,003M	68%
KDC	$472M	70%
WDC	$843M	64%

The breakdown between sealed and unsealed for the three districts are show below in Figure 7.1:

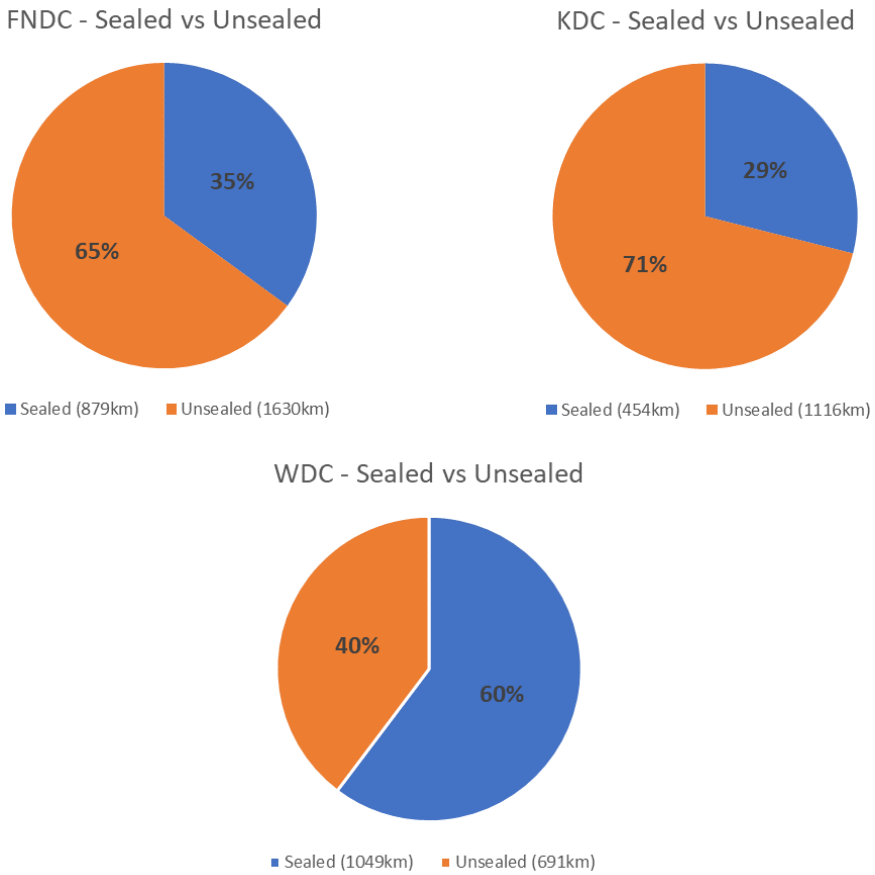


Figure 7-1 -Breakdown of sealed vs unsealed roads per district

The following sections describe the background and issues affecting each council's pavements and surfacing.

7.3.2 Background

7.3.2.1 Method of Contracting

Pavement and surfacing maintenance along with other operations are undertaken through the new Road Maintenance and Renewals Contracts. There are five Contracts covering the following areas:

- WDC - North: CON 17085 (North)
- WDC - South: CON 17086 (South)
- FNDC - North: CON 7/18/100 (North)
- FNDC - South: CON 7/18/101 (South)
- KDC: CON 888

Each Maintenance Contract is required to:

- Maintain the Roading Network Assets
- Achieve the standards specified in the contract documents for the duration of the contract
- To provide the complete management of the maintenance services.

Some pavement rehabilitations, bridge renewals, seal extensions and other routine maintenance programmes are tendered using separate professional service contracts (for design) and physical works contracts (for construction).

7.3.3 Geology

The geology of Northland generally consists of poor clay soils with some pockets of volcanic soils and sandy soils on the coast. In general, the common clay subgrades are weak and form a poor foundation for pavements. They are often highly sensitive to moisture and are not free draining which results in pavements failing during periods of wet weather. Ensuring adequate drainage in these soils is a priority. The low strength subgrades and unstable geology is also prone to landslides.

Due to the poor geology of the region there are limited sources of aggregates suitable for road maintenance and construction activities.

The combination of weak subgrades which require thicker pavements to support the design loads over the life of the pavement and limited sources of suitable materials which have to be hauled longer distances results in more expensive pavements.

7.3.4 Geometry

The geometry on the majority of the network was built well before any standardised design was developed, thus our roads have poor alignments and inadequate road widths particularly on corners causing safety issues.

7.3.5 Ownership & Responsibilities

Each of the District Councils are responsible for maintaining the road network within their District. No Council is responsible for any pavements or surfacing on the State Highway network.

NZ Transport Agency (NZTA) is responsible for the maintenance of State Highways and intersecting roads onto State Highways for a distance along the intersection as follows:

- Road maintenance up to 10m distance along district roads (sealed) intersecting with the State Highway from the edge of the state highway seal.
- Includes the repair costs to any raised traffic island and painting of island kerbing forming part of the intersection with State Highway.
- Regulatory signage associated with the junction intersection control on District Roads adjoining State Highways.

Exemptions which are works included in the maintenance contracts are:

- Replacing of road name blades and community amenity signs; Urban and rural
- Footpath maintenance on State Highways
- Sweeping of State Highways in the urban environment

The Memorandum of Understanding (MOU) between each Council and (NZTA) clarifies the responsibility of the parties for maintenance, incidence response and control of activities on state highways within each of the council's districts.

NZTA subsidise pavement related activities for maintenance, renewal, and capital improvement where this meets with NZTA funding rules.

7.4 Sealed Pavements & Surfacing

7.4.1 Asset Description

Sealed pavements make up 2,388km or 41% of Northland's total road network.

Length (Kms) and percentage (%) of sealed vs unsealed roads in Northland region

	KDC	FNDC	WDC	
Sealed	454.7	877.2	1056.3	**2388.2**
Unsealed	1119.4	1629.6	694.0	**3443.0**
	1574.1	**2506.8**	**1750.3**	

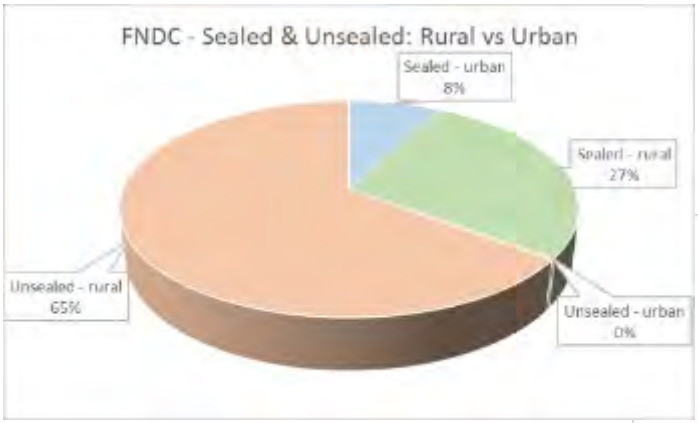
	KDC	FNDC	WDC	
Sealed	29%	35%	60%	**41%**
Unsealed	71%	65%	40%	**59%**
	100%	**100%**	**100%**	

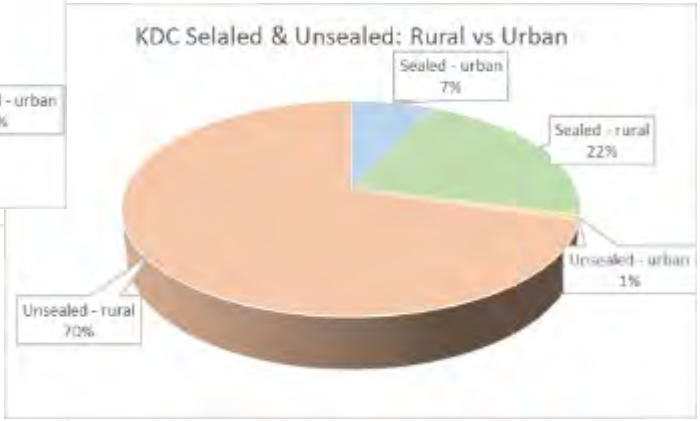
These pavements consist of the following main pavement types:

- Unstabilised M/4 pavements
- Stabilised pavements (generally with either lime or cement)
- Other pavements (structural asphalt or concrete bridges etc.)

The majority of surfacing is chip seal (99.7%).

The breakdown of the pavements by urban/rural split and the sealed pavements by ONRC classification are shown in Figure 7-2 and Figure 7-3.





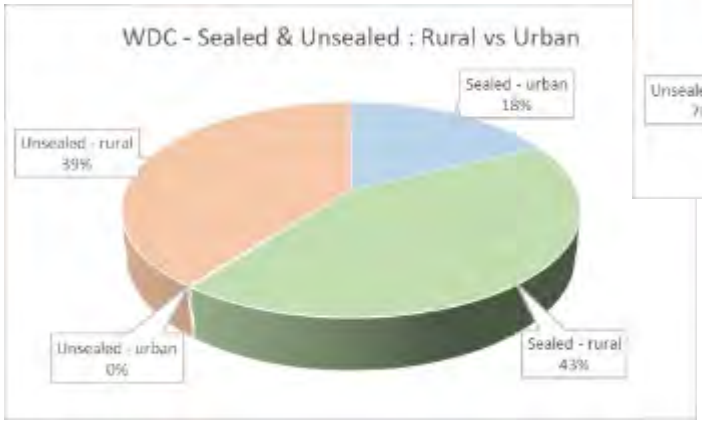


Figure 7-2 - Sealed & Unsealed Roads by Rural and Urban classification

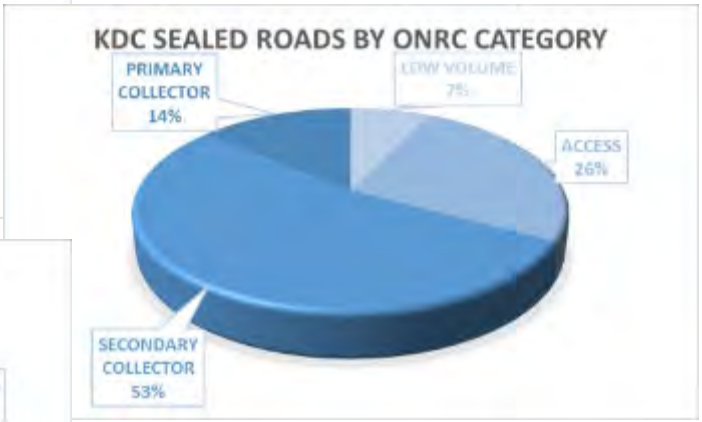


Figure 7-3 - Sealed Roads by ONRC Classification

7.4.2 Acquisition (Growth) Plan

Growth in sealed pavements is based on the following;

- Capital projects undertaken by Council to reduce congestion and delays by providing additional road links or road widening. These projects are usually major capital projects identified through the Council *Whangarei Transportation Network Strategy*. Future projects which will increase the sealed pavement network over the next 10 years are:
  - Urban intersection upgrades which will result in larger sealed intersections in Whangarei City.
  - Riverside Drive 4-laning.
  - Port Road/Kioreroa Road intersection upgrade and 4-laning.
  - One Tree Point Road, Ruakaka Beach Road and McEwan Road widening.
- Assets that are created by a third party for development reasons and vested to council.
- Assets that are given to Council due to revocation of State Highway. The 4-laning of SH1 to the south of Whangarei is likely to result in 20-30km of the old SH1 being revoked and included in Council's road network over the next 10-20 years.
- The *Seal Extension Plan* that upgrades unsealed pavements to sealed pavements

In recent years, there has been a trend towards sub divisional development using expensive asphaltic concrete surfacing on local and collector roads where a chip seal surfacing would be suitable

To address this issue going forward, Council will look to chip seal over asphalt where an asphalt surface is not required to handle either the traffic volume or the stress level of the road surface but will balanced with amenity value and environment in which the switch out from AC to chip seal may occur. In general, asphalt will be applied where the ADT is greater than 8,000 vehicles per day or on high stress intersections and tight corners where chip seal surfaces are not likely to survive.

7.4.3 Maintenance Plan

The general overall approach to managing maintenance work is provided in Figure 7-4.

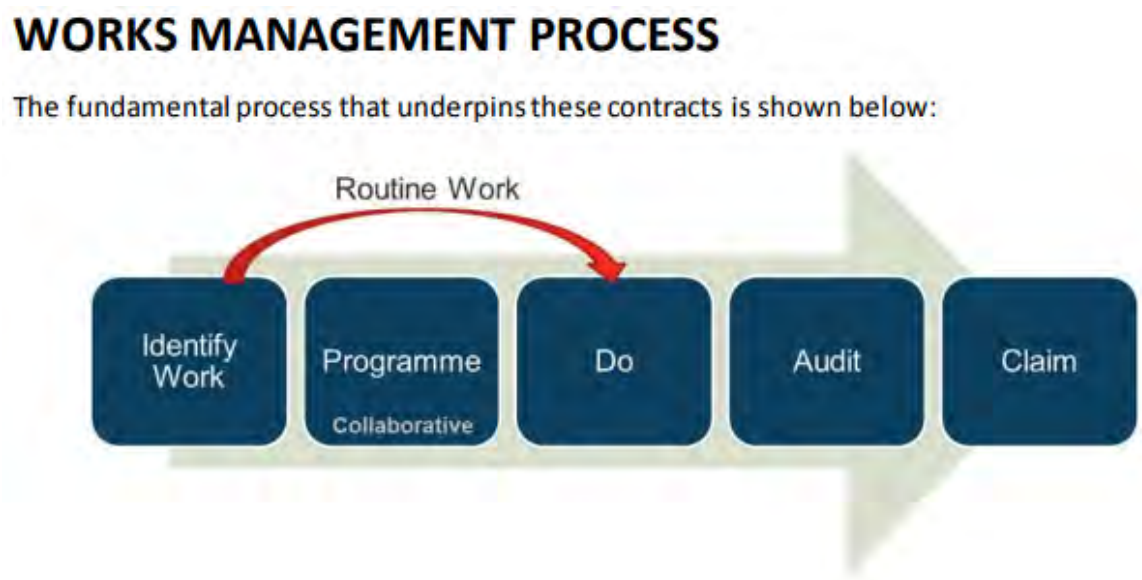


Figure 7-4 Works Management Process

This process is embedded in the five Road Maintenance Contracts awarded in July 2018.

The maintenance of sealed pavements is provided through the *Road Maintenance Contract*. Minor routine and reactive maintenance is undertaken as described in Volume 2 - Appendix E, with any major defects becoming programmed work and managed according to the maintenance plan under the approved LTP funding according to priority.

The application of major sealed maintenance is based on the *Maintenance Intervention Strategy (MIS)* and the renewals identified in the Forward Works Programme. The MIS sets out criteria for prioritising maintenance activities as described in *Table 7-3: Maintenance Defect Priority Score* below:

Table 7-3: Maintenance Defect Priority Score

Priority	Name	Description	
9	**Routine**	Work completed as of right, the "house-keeping" generally found under the routine work lump sum items but may include routine measure and value work as well.	This work has a clear intervention point at which point a response time is initiated
Urgent	**Urgent / Callout**	Poses an immediate safety issue to customers	RESPOND
1	**Must Do**	Immediate work required or major failure/defect with significant impact on the network in terms of safety or asset preservation.	To be programmed.
2	**Should Do**	Work that is required in accordance with good practice and doesn't have an urgency that would make it a Priority 1.	Programmed after priority 1's and when resources and budget available.
3	**Monitor**	The defect does not require work at this stage, but it is apparent that at some point in the near future that it will require attention	Not to be programmed unless the repair exists in a Resurfacing site and needs to be completed as a pre-seal repair to protect the integrity of the Resurfacing treatment.

The maintenance decision process is based on the priority of the work in relation to the severity of the defect, the risk they pose based on the road hierarchy and their location in the road corridor. Further details of this decision process are provided in Volume 2 Appendices.

In general Maintenance dispatches are raised and programmed by the contract as set within the contract specification. The Council's network inspector can identify work and then programme is verified by Council area engineers for delivery each month.

The strategy going forward to maintain Council's pavements is to focus on carrying out the priority one repairs and priority two repairs to allow work efficiency where the budget allows. Funding of pre seal repairs down to priority two and in some cases priority three where these may look to have detrimental impact on resurfacing works into the future.

Routine maintenance works (pothole filling, street sweeping etc…) the house-keeping, is prioritised and delivered based on Operational Performance Measures (OPM) set out in the maintenance contracts. The OPM's set out the intervention level for a defect and the resulting response time based on the One Network Road Classification (ONRC) framework. Details of the OPM specification can be found in the current maintenance contracts.

7.4.4 Renewals Plan

Pavement Renewals (Rehabilitations)

Each Council is proposing an annual programme of pavement rehabilitation (approximate kms) as indicated below for years 21/22, 22/23, and 23/24:
FNDC – 6.3km, 6.1kms, and 6.3kms (6.2kms average)
KDC – 3.6kms, 3.8kms, and 3.5kms. (3.7kms average)
WDC – 4.5kms, 6.5kms, and 5.1kms (5.4kms average)

This is based on the actual need determined through dTIMS analysis and site validation and equates to a cycle time of pavement rehabilitations of about 125 years for FNDC, 91 years for KDC and 119 years for WDC.

High priority renewals will be undertaken based on increasing maintenance costs or to intervene on pavements where maintenance is no longer the most economic option. These will be prioritised by ONRC hierarchy, risk and criticality. The forestry and urban Arterial/Collector road networks will be a focus of this programme over the next three years with a mix of strategic rural sites. Access and Low Volume roads will not be treated unless they meet the criteria set out above and are deemed a high risk to the customers.

Pavement rehabilitations have been in past typically identified through high speed data collection, dTIMS analysis, site validation and then inclusion on the forward works programme. However, this approach has lead to problems when the NPV calculations are undertaken which show that the site does not have a positive NPV or new sites (often proposed reseal sites) are identified due to having a high amount of maintenance dispatches raised. This issue seems to revolve around the timing of when dispatches are raised which can often be out of date if a site has not been looked at for a while and focuses attention on reseal sites which have higher levels of dispatches raised. In addition, positive NPVs can be difficult to achieve if sites are looked at in isolation of the trends in its condition.

To try and address these issues going forward, the forward works programme will be assessed by a RAPT type team in the field on an annual basis with access to good quality trend data using the Juno platform to make decisions about each site. This will be supplemented with up to date maintenance dispatches and costs. Upon sites being assessed as candidates for pavement rehabilitation, NPV calculations will be completed using current dispatches, historic maintenance costs, condition trend data and how the site is performing based on the ONRC performance measures. This process should result in a robust selection process for identifying rehabilitation sites.

Once the pavement renewal has been committed into the following years programme the process in Figure 7-5 is applied. This process is embedded in the new 2018 Maintenance contract.

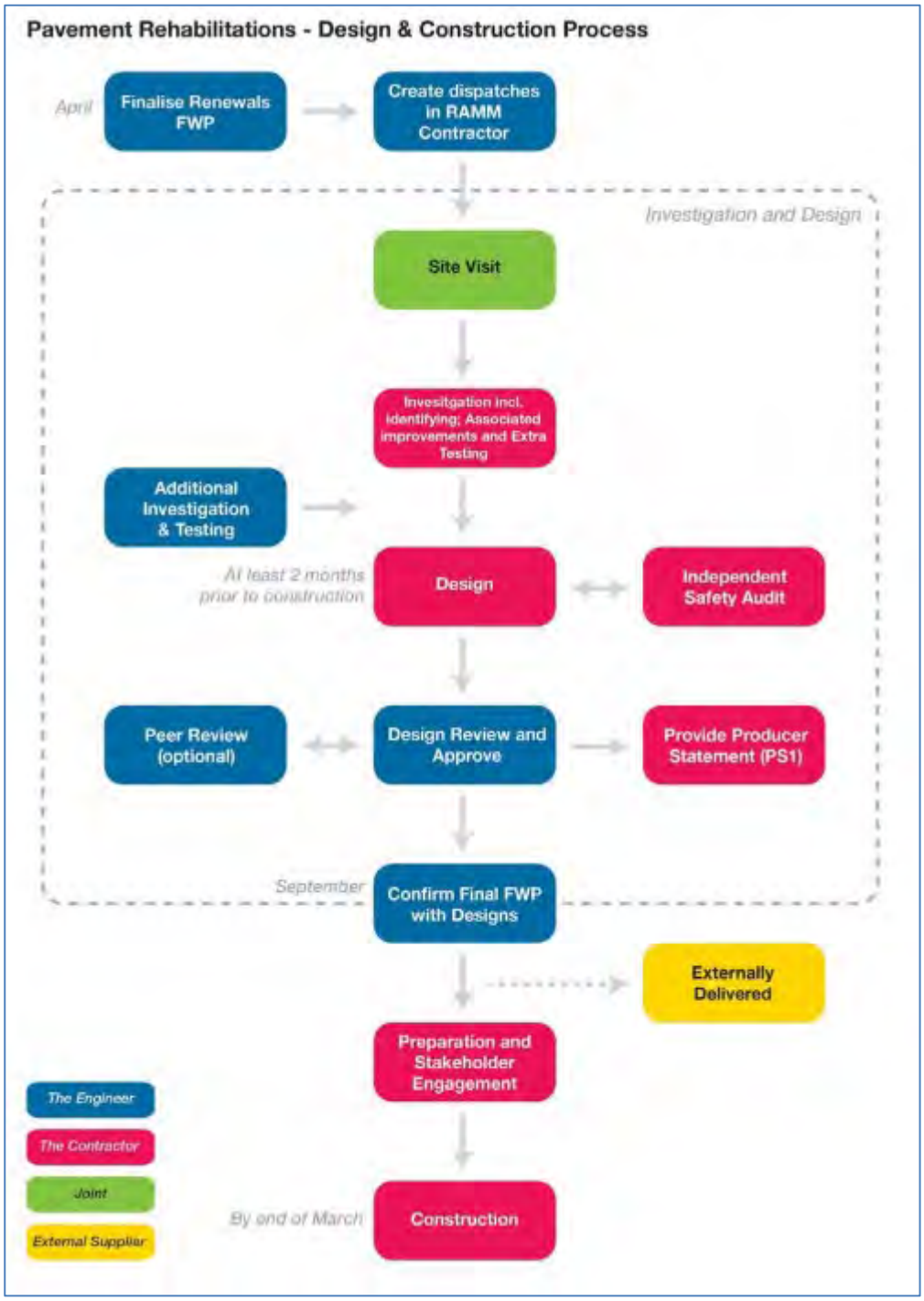
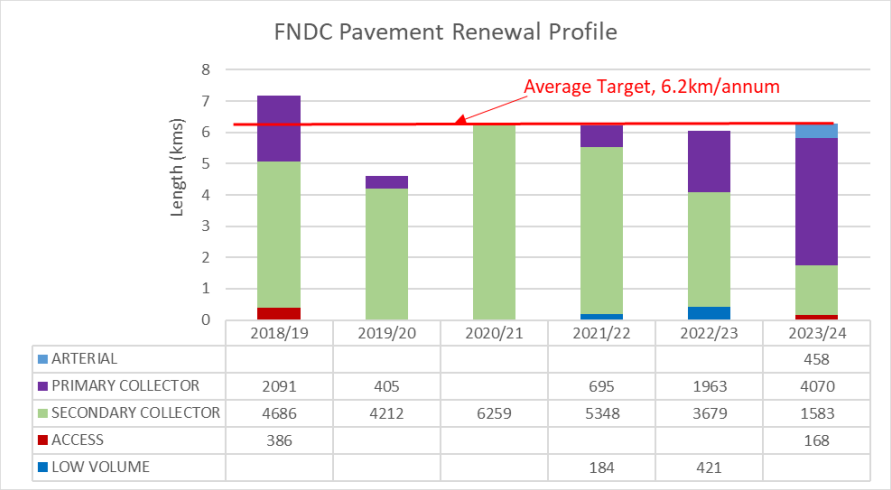
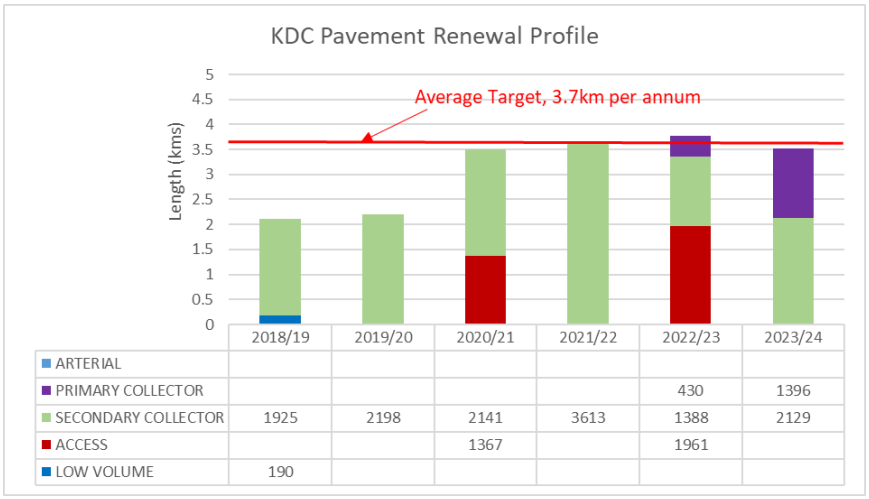


Figure 7-5: Pavement Renewal Design and Construction Process

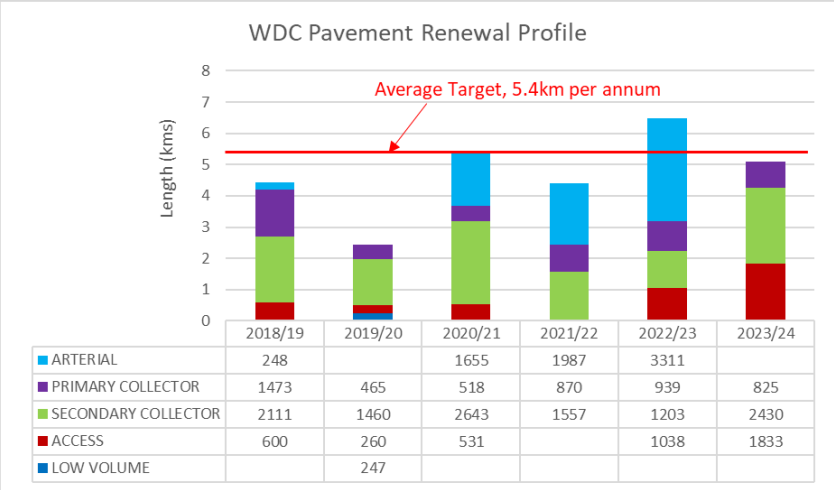
Figure 7-6 provides break down of the pavement renewal programme by ONRC for FNDC, KDC and WDC.



	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
ARTERIAL						458
PRIMARY COLLECTOR	2091	405		695	1963	4070
SECONDARY COLLECTOR	4686	4212	6259	5348	3679	1583
ACCESS	386					168
LOW VOLUME				184	421	



	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
ARTERIAL						
PRIMARY COLLECTOR					430	1396
SECONDARY COLLECTOR	1925	2198	2141	3613	1388	2129
ACCESS			1367		1961	
LOW VOLUME	190					



	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
ARTERIAL	248		1655	1987	3311	
PRIMARY COLLECTOR	1473	465	518	870	939	825
SECONDARY COLLECTOR	2111	1460	2643	1557	1203	2430
ACCESS	600	260	531		1038	1833
LOW VOLUME		247				

Figure 7-6 Pavement Renewal Programmes by ONRC for FNDC, KDC & WDC

FNDC has been carrying a high rate of rehabilitations. This has mainly been due to early failure of "cheap" seal extensions built in the late 1990's, unstable surfacing through high historic sealing rates and poor optimisation of the programme.

The rehabilitation programme is now optimised through dTIMs, field validation and a RAPT type process and should see these costs drop to more sustainable levels over time.

KDC has been carrying out approximately 2km of rehabilitation per annum for the last 3 years and based on dTIMs, field validation and RAPT type process the optimised quantities are being increased to 3.7kms per annum.

WDC has been targeting expensive urban rehabilitations using structural AC in Whangarei City to improve the poor condition of the urban network. The rehabilitation costs have been reducing over the last 3 years and are expected to reach a sustainable level of about 5.4km/year based on dTIMs, field validation and RAPT type process.

Surfacing Renewals

Reseals are identified through dTIMS analysis, field validation in relation to the rehabilitation programme. The process is then to review the 5 year reseal programme by assessing seals on site and prioritised based on the ONRC hierarchy, cost, the condition and risk posed, the criticality of the route and the number of wet road crashes that have occurred at the site. The renewals plan will consist of as much high priority reseals as the funding allows.

If a surface site is too expensive to repair and has a history of repeated maintenance investment, the site will not be re-surfaced and will be managed until such time as a better long-term treatment, such as a pavement rehabilitation, can be undertaken.

Once the pavement renewal has been committed into the following years programme the process in Figure 7-7 is applied. This process is embedded in the new 2018 Maintenance contract.

Figure 7-7: Resurfacing Design & Construction Process

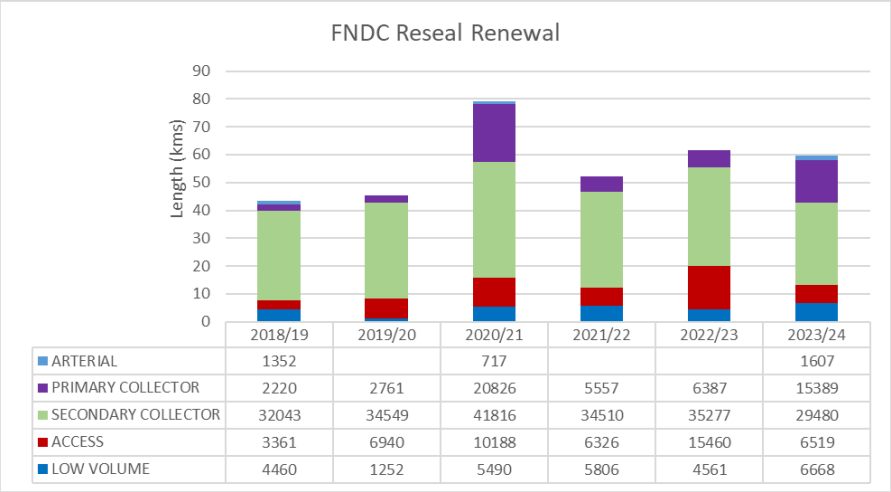
Figure 7-8 provides a summary of the chip reseal renewals (achievement and programme for 3 years) reseals and second coat reseals, broken down by ONRC categories for each district.

Historically FNDC targeted a programme of high rates of reseals to meet a Long Term Plan KPI. In 2017/18 there was also a larger number of reseals undertaken on Secondary Collectors as part of the additional Forestry Strengthening funding from NZTA. The resealing programme is expected to increase in the short term to address the backlog of Thin AC surfacing, but will be kept as low as possible through an optimised programme based on dTIMS modelling backed up by field validation and RAPT type process

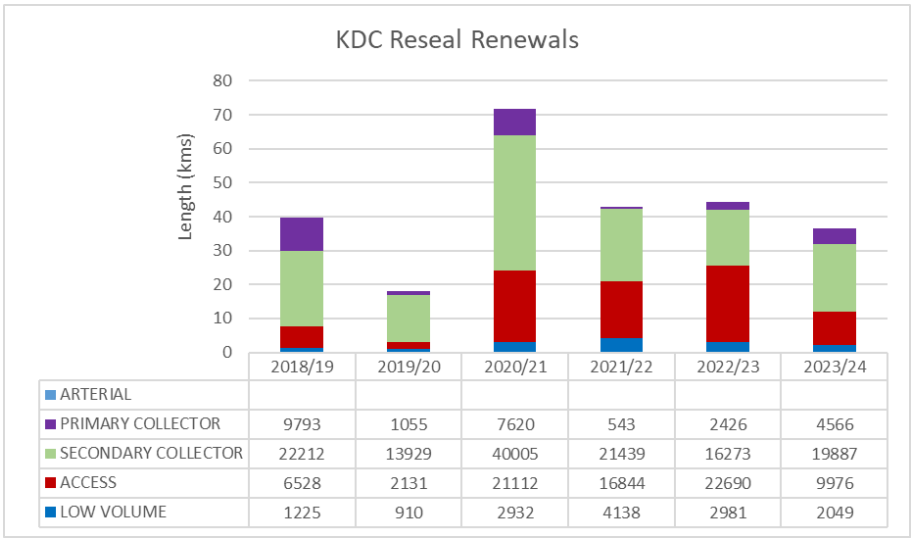
There remains a backlog of first coat seals that KDC is resealing due to the historic funding constraints caused by the Kaipara rates strike. The resealing quantities are expected to reduce going forward as a

result of the seal road condition reaching a relatively stable condition and being based on an optimised programme based on dTIMS modelling backed up by field validation and RAPT type process.

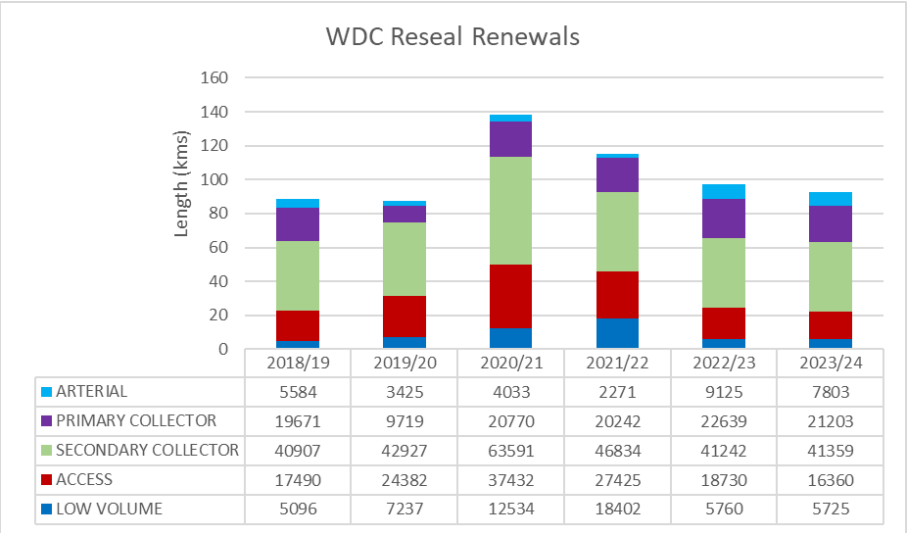
In 2020/21 WDC is aiming to get on top of its legacy of old void fill seals. This should enable Whangarei to lower it's reseal programme to a more sustainable target.



	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
ARTERIAL	1352		717			1607
PRIMARY COLLECTOR	2220	2761	20826	5557	6387	15389
SECONDARY COLLECTOR	32043	34549	41816	34510	35277	29480
ACCESS	3361	6940	10188	6326	15460	6519
LOW VOLUME	4460	1252	5490	5806	4561	6668



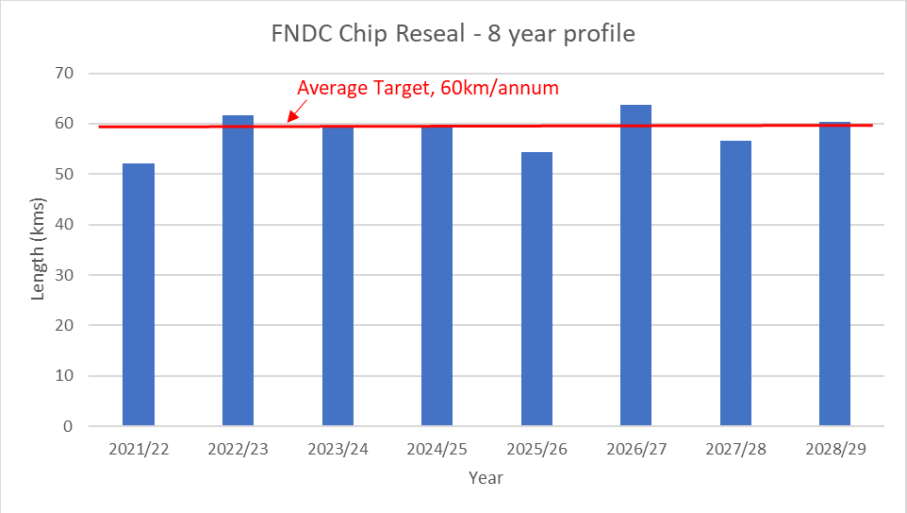
	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
ARTERIAL						
PRIMARY COLLECTOR	9793	1055	7620	543	2426	4566
SECONDARY COLLECTOR	22212	13929	40005	21439	16273	19887
ACCESS	6528	2131	21112	16844	22690	9976
LOW VOLUME	1225	910	2932	4138	2981	2049

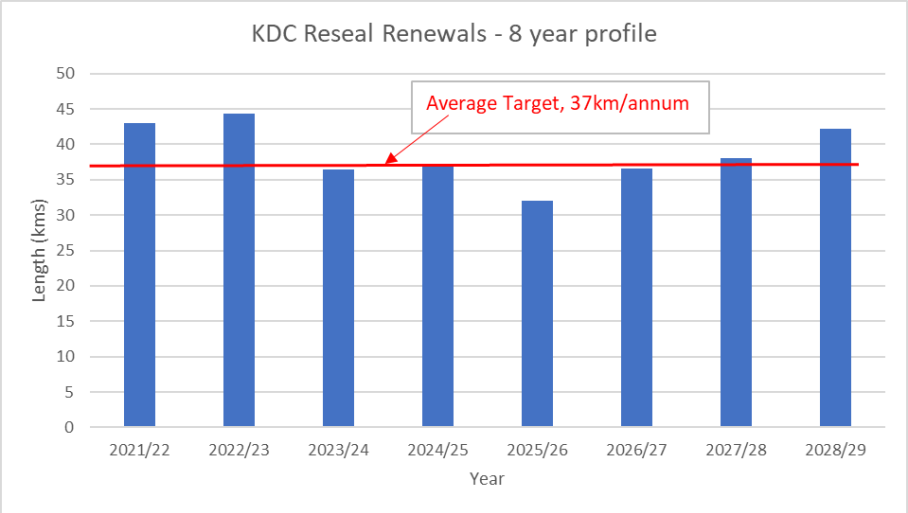


	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
ARTERIAL	5584	3425	4033	2271	9125	7803
PRIMARY COLLECTOR	19671	9719	20770	20242	22639	21203
SECONDARY COLLECTOR	40907	42927	63591	46834	41242	41359
ACCESS	17490	24382	37432	27425	18730	16360
LOW VOLUME	5096	7237	12534	18402	5760	5725

Figure 7-8 Chip Seal Renewals (achievement and 3yr programme) by ONRC category for FNDC, KDC & WDC

FNDC target of 60km/annum is higher than historically





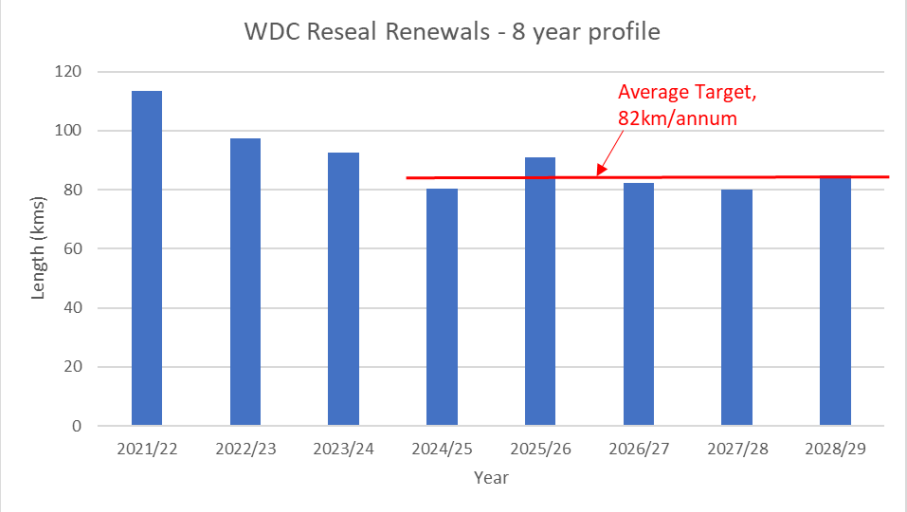
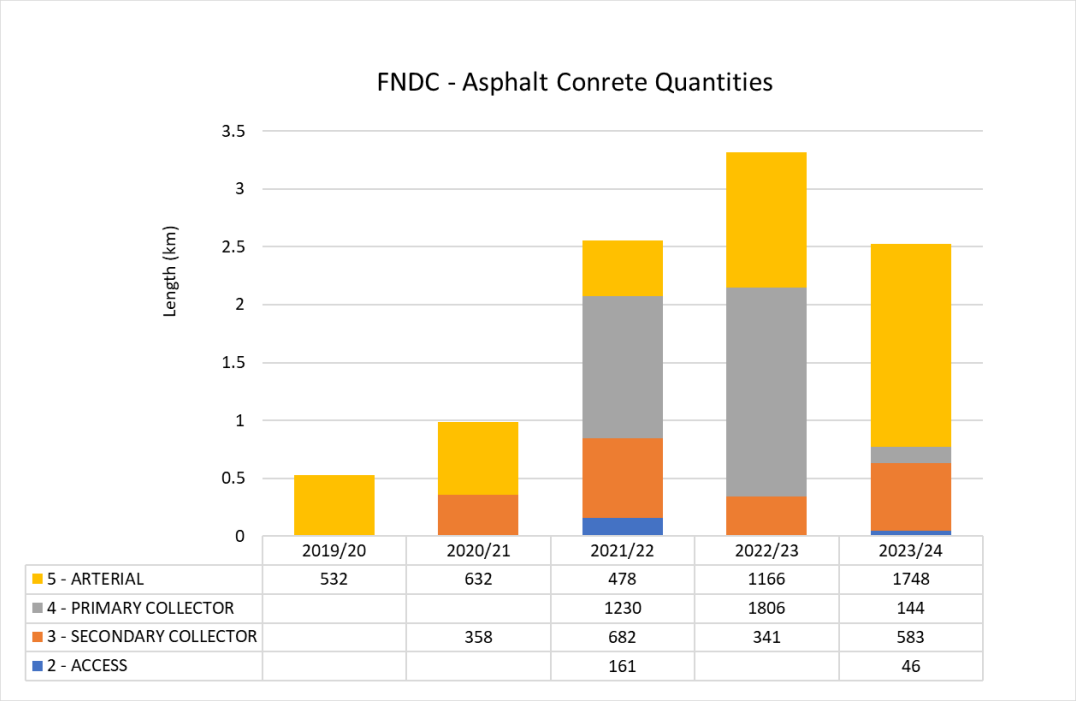


Figure 7-9 Chip Seal Renewals - 8-year profile for FNDC, KDC & WDC

The development of Thin Asphalt Concrete programme is completed in the same way as the pavement rehabilitation and chip seal programme, through dTIMS analysis, field validation and balanced against affordability. The NTA take the approach to engineer TAC off the network where possible, do not introduce TAC as part of renewal programme.

The FNDC thin asphalt concrete (TAC) programme shown in Figure 7-10 below by ONRC reflects the growing asphalt renewal need on the network. Currently there is a significant length of high volume roads and urban town city roads in or rapidly approaching poor to very poor condition. As can be seen the clear majority of the programme is in the Arterial Primary and Secondary network on the urban network mainly. Where there is asphalt programmed on the Access and Low Volume parts of the network these are on rural high stress corners which are due for replacement as condition dictates. There has been little to no investment made in previous plans to renewal the asphalt network in the Far North. The 18/21 plan has started to treat the worst condition sites which require a higher level of deep structural maintenance patching prior to the TAC being applied. This plan looks to continue the investment in TAC renewals. The budget for this plan set at $2M will achieve approximately is set to deliver2-2.5km. The major issue with FNDC is the cost of TAC resurfacing at $65/m2. This has been tested against the northland SH contract and to cart prep and place in the Far North these cost would seem to compare with industry pricing.



	2019/20	2020/21	2021/22	2022/23	2023/24
5 - ARTERIAL	532	632	478	1166	1748
4 - PRIMARY COLLECTOR			1230	1806	144
3 - SECONDARY COLLECTOR		358	682	341	583
2 - ACCESS			161		46

Figure 7-10: Thin Asphalt Renewal Profile

On further analysis, comparing condition with remaining age, Figure 7-11 it becomes evident that the large majority of this backlog is true condition backlog. Therefore, there is an emerging condition based funding issue that this programme is looking to address.

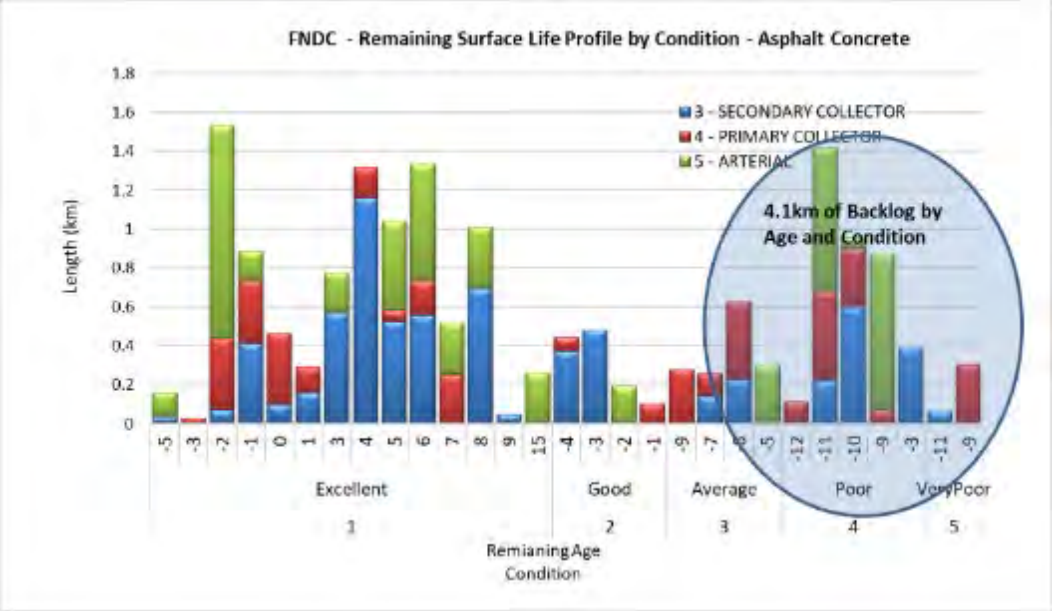
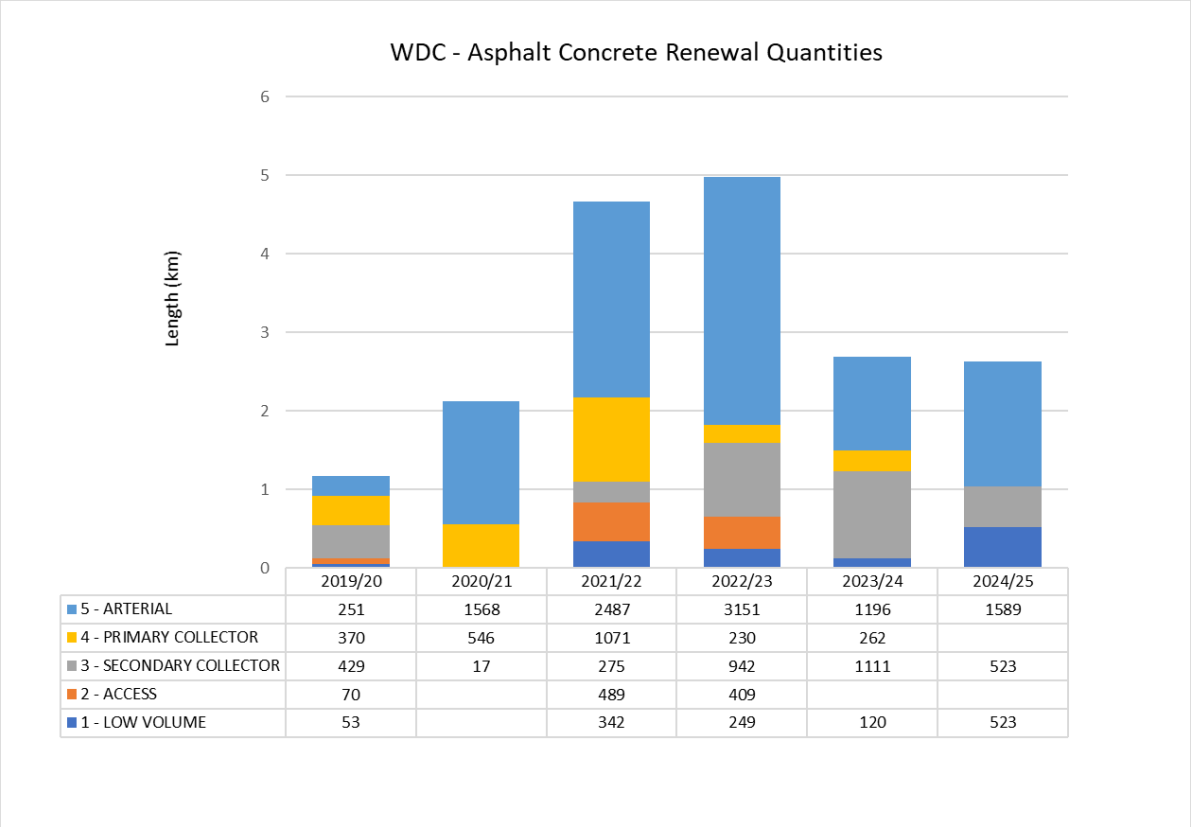


Figure 7-11: FNDC Thin Asphalt Renewal Profile

This currently shows a 4.1km of poor or very poor condition of FNDC TAC surface beyond remaining life on the higher volume network.

WDC thin asphalt concrete (TAC) programme shown in Figure 7-12 below by ONRC reflects the growing asphalt renewal need on the network. Currently there is a significant length of high volume roads that are in or rapidly approaching poor to very poor condition. As can be seen the clear majority of the programme is in the Arterial network. Where there is asphalt programmed on the Access and Low Volume parts of the network these are on rural high stress corners which are due for replacement as condition dictates. This profile has increased due to deferral of thin asphalt in the last plan due budget impacts. This has had an impact on the 21-24 plan quantities. The 2018/21 plan was to deliver approximately 3km of TAC, this was reduced average of 2km. The budget for this plan set at $1.27M will achieve approximately is set to deliver3.5 to 4km.



	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
5 - ARTERIAL	251	1568	2487	3151	1196	1589
4 - PRIMARY COLLECTOR	370	546	1071	230	262	
3 - SECONDARY COLLECTOR	429	17	275	942	1111	523
2 - ACCESS	70		489	409		
1 - LOW VOLUME	53		342	249	120	523

Figure 7-12: WDC Thin Asphalt Renewal Profile

On further analysis, comparing condition with remaining age, Figure 7-13 it becomes evident that the large majority of this backlog is true condition backlog. This was at 5.2km at the start of the 18/21 and is now at 2.1km at the start of 21/24 plan.

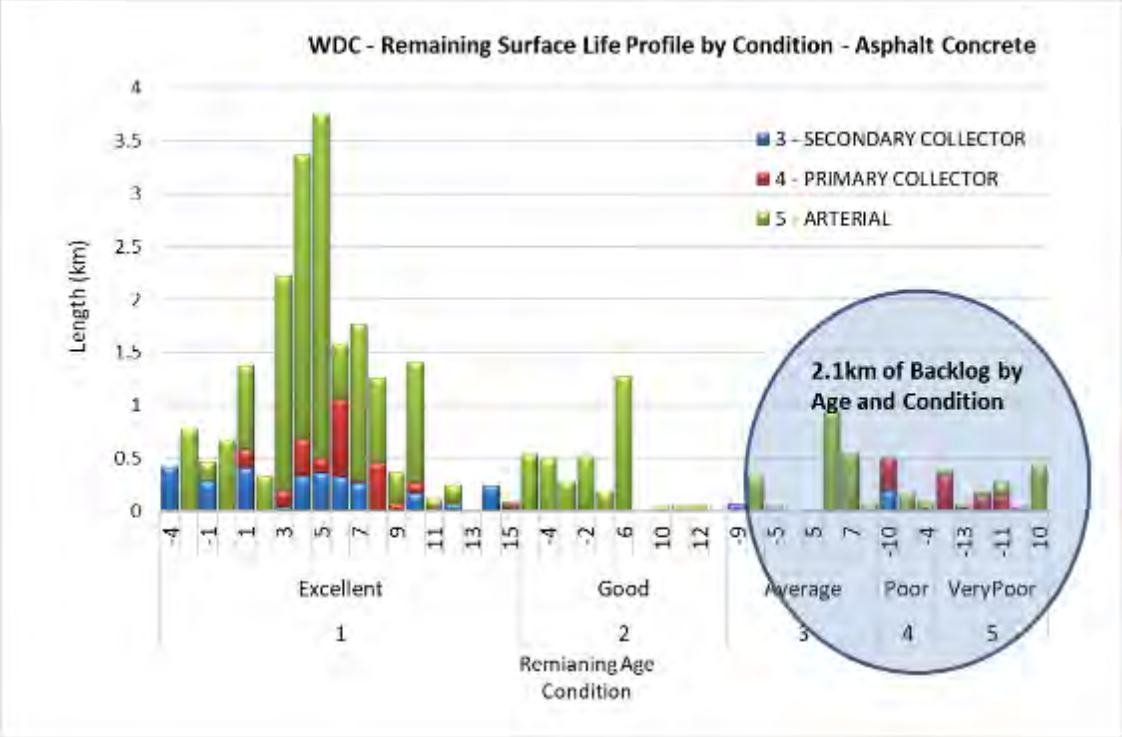


Figure 7-13: Asphalt Concrete Remaining Age and Condition

Surface Renewals Skid Resistance

As identified in Section 5.1.5, there continues to be a concern for wet road loss of control crashes on the networks. Over the course of the previous 2018-21 plan this has been attended to and analysis would suggest that wet road loss of control has reduced.

The surfacing renewals programme also considers the application of high-quality skid resistant chip where the is a history of loss of control crashes on corners. The programme is defined in number of ways on a risk based approach.

- Assessment of network is undertaken based on the curve data to derive several factors:
  - Rural curves less than 500m curve radius
  - Calculated Approach speeds
  - Derive Curve risk rating

This is applied to the network to develop a curve risk table, held in RAMM (under development). This table is then used to help define where high friction surface treatments should be undertaken.

As part of the programming process the latest surfacing renewal programme is compared with the crash data and the identified high risk curves. This is used to then determine if as part of the current programme a surface renewal is being undertaken as an asset seal. If so, a High Friction Surface (HFS) material if accessible, is used for the asset seal surfacing. In the instance where there is no asset seal taking place within the 5 year window of the programme, a high friction surface will then be considered for programming. Considerations for programming a High Friction Surface are:

- Curve Risk Rating
- Loss of control wet curve crashes
- Injury or Non-injury
- Loss of Control Dry Curve crashes

Current funding application of $150,000/annum approximates to 3.3km of high friction surfacing each year. Where current total quantity of HFS exceeds current annual budget the quantity would be spread over 5 year term of the programme on priority basis as set out above.

Now that process has been in place the budget to treat these areas has been reduced in light of the actual application of the process. The resurfacing renewal programme is naturally tending to treat areas of concern with new surfacing to increase the friction qualities on the road, as the resurfacing process includes the assessment of wet loss of control crashes.

7.4.5 Improvement Plan

Pavement improvement covers the widening and realignment of the pavement. This is often undertaken as associated improvements in conjunction with pavement rehabilitation projects. Improvements can also be through the minor improvements programme or major capital projects to increase the road width and capacity of critical routes.

Widening of seals will generally be done to provide a “fit for purpose” road width. For rural forestry and arterial routes this will be generally to 7.5-8m width, and for other roads this will be to 6.5-7m width depending on the road hierarchy and terrain.

In terms of new designs, the base design life assumption is 30 years for all new pavements.

For surfacing, improvements can be through the asphalting of previously chip sealed pavements. This is normally only considered on urban arterial roads and on tight rural curves where there are high tyre stresses.

7.4.6 Disposal Plan

Opportunities to stop maintenance on pavements that serve only one property will be investigated.

7.5 Unsealed Pavement Activity

7.5.1 Asset Description

The Unsealed Pavement Activity includes the following categories;

- Unsealed Base-Course Pavements
- Unsealed Stabilised Pavements

Unsealed pavement is also broken into three broad functional groups;

- Two Wheel Track Roads (U1) – farm at end, no other service, no exit, average width 3 metres
- Three Wheel Track Roads (U2) – farming, low housing possible, no exit, average width 4 - 5 metres
- Four Wheel Track Roads (U3) – farms & medium housing, through road, increasing development, average width 5 - 7 metres

There is a total of 3443km of unsealed pavements (59% of the total road network) in the region, which broken into the three districts are:
FNDC – 1630km or 71.1% of their district roads
KDC – 1119kms or 65% of their district roads, and
WDC – 694kms or 39.7% of their district roads

Almost all of the unsealed roads are classed as rural road. This is shown in the following figure:

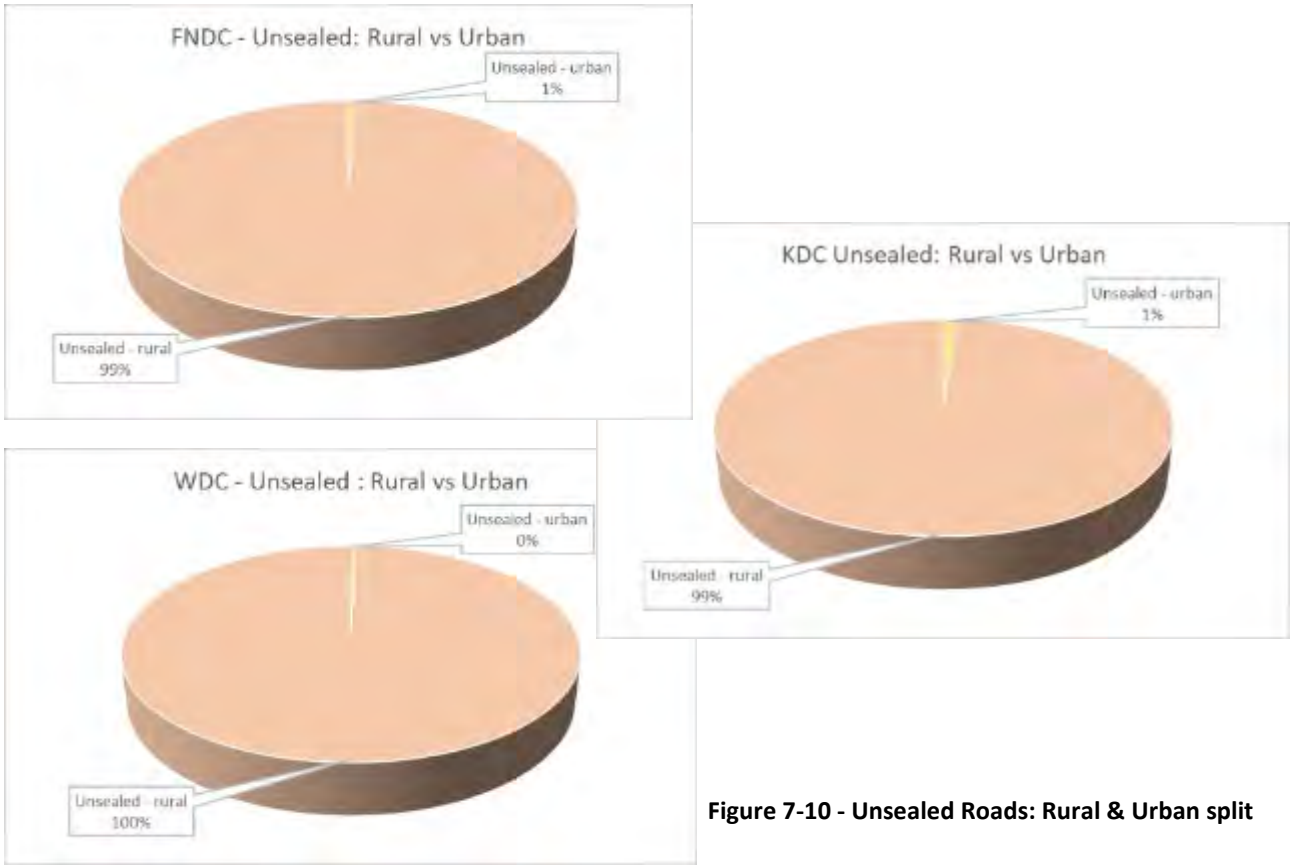


Figure 7-10 - Unsealed Roads: Rural & Urban split

The ONRC hierarchy of the unsealed road network mostly consists of Access and Low Volume roads as shown in the following figure:

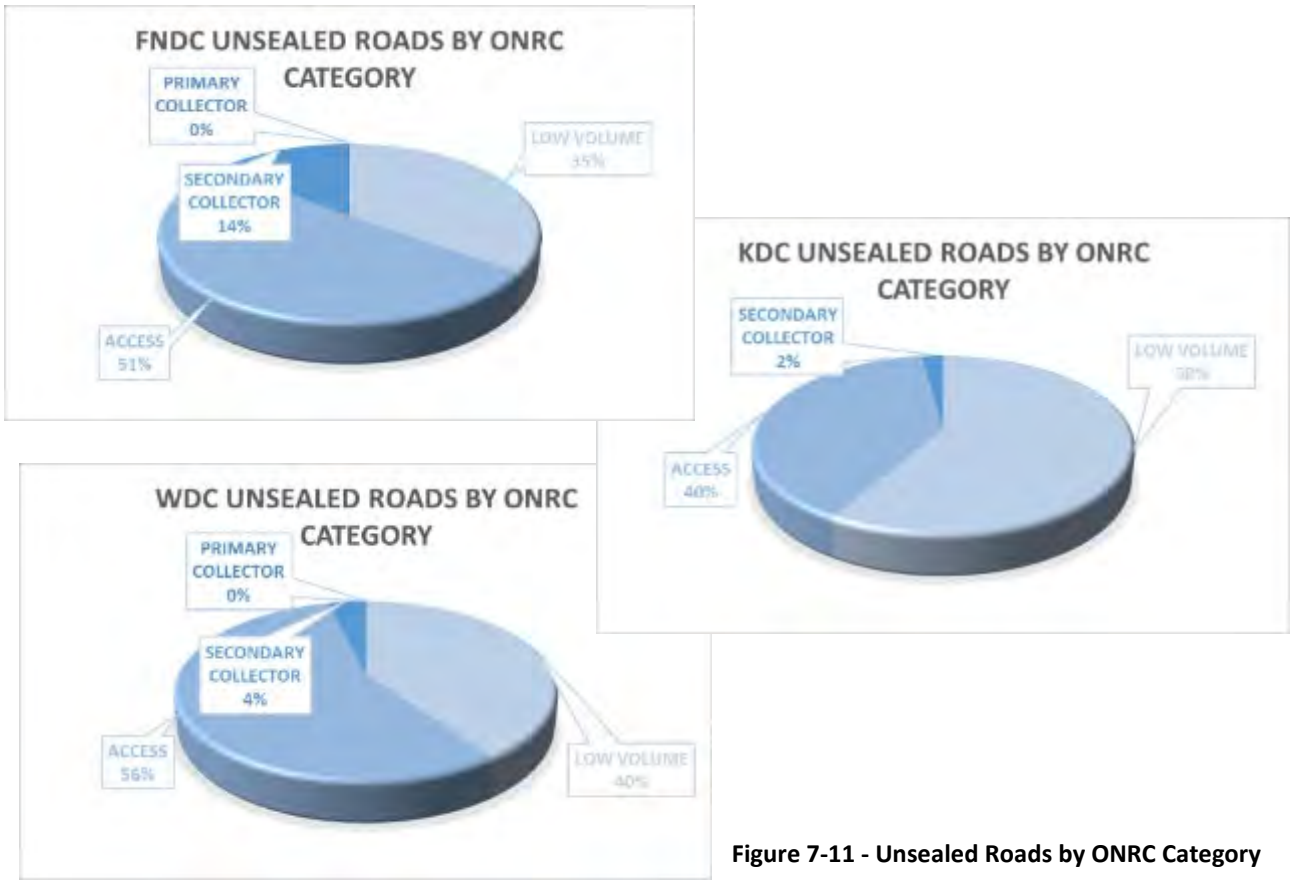


Figure 7-11 - Unsealed Roads by ONRC Category

7.5.2 Unsealed Road Strategy

The Northland Transport Alliance has been in development of a Centre of Excellence for Unsealed Roads and this includes a regional unsealed road strategy. The vision for the unsealed roads centre of excellence and the unsealed roads strategy is an asset management led proactive approach to all unsealed road maintenance work. It is the intention that all work undertaken will be programmed, planned and have the appropriate intervention that is weighed up against all other programs and activities to achieve the best value for money investment decisions and the optimum life cycle return on a given asset.

An Asset Management led structured approach to maintenance work will enable the district councils to invest in renewals work before operational maintenance work. By focusing capital (Capex) investment in Granular Pavements, Paige-Green compliant Bound Wearing Courses and Culvert & Drainage renewals while focusing operational (Opex) investment on appropriate drainage maintenance and keeping unsealed carriageways within the specification of the maintenance contract through better grading/blading frequencies, Councils will be able to systematically work through the networks and build an appropriate level of service that meets the needs of all road users.

Included in this work are the activities like forestry and dairy freight which from vehicle kilometers travelled (VKT) affect small portions of the network but, if not included and the appropriate level of service catered for, lead to significant damage and maintenance expenditure. It is the intent though that rather than catering specifically to industry the wider needs of all the community will be met through improved and sometimes decreased levels of service that will be a direct outcome of appropriately timed Interventions and treatment types led by asset management strategy.

To date the strategy has identified the following issues:

- There is very little data collection for unsealed roads which makes it difficult to determine maintenance programmes.
- Maintenance that is undertaken on unsealed roads is poorly recorded in RAMM making it difficult to identify where this work was undertaken, what its cost was and what was done.
- Maintenance interventions are largely reactive in response to customer complaint which leads to inappropriate maintenance treatments such as grading in summer, which typically requires an expensive wet, roll and grade treatment.
- Maintenance aggregate are generally blue aggregates which, while good foundation materials for structural pavement, result in poorly bound surfaces which result in higher rates of metal loss and dust generation. Most of these pavements were constructed when there was an expectation that these roads would be subject to a future seal extension and that the pavement would form part of the sealed road subgrade.
- Contractors real world performance is often poorly delivered, with standards of maintenance practices often led by profitable but inefficient corporate strategy and practices. This leads to poor quality works being completed time and time again.

Based on the strategy developed to date the following improvements are being proposed in the 2021/24 period:

- Introduce the asset management led approach
- Improve data collection of the unsealed road network using RoadRoid or similar technology to determine the roughness profile of each road so that grading cycles can be determined for each road.
- Carry out test pits on the unsealed network to determine the pavement thickness and to determine long term aggregate loss.
- Accurately record the location, type and cost of maintenance activities, including wearing course applications on the unsealed road network.
- Carry out metal trials to determine appropriate metal blends to provide a bound, low maintenance, low dust wearing surface for unsealed roads.
- Implement developed forward works programmes

This information will provide continuation of the baseline data established in the 18/21 programme that can be used in the asset management planning of appropriate grading and metalling cycles. It will also enable the determination of appropriate structural pavement thicknesses and tightly bound wearing courses to provide a long-term treatment to improve the level of service and reduce maintenance costs and dust on the unsealed road network. These initiatives were developed over the 2018/21 period and are to be implemented in the 2021/24 period.

During the 2018/21 programme, a programme of dust suppression was also proposed to address PM_{10} dust on forestry routes with a dust risk assessment of 12 or more (using NZ Transport Agency's General Circular 16/04). This was expected to be a short term programme until such time as appropriate low maintenance/low dust wearing courses could be constructed on these forestry routes. This programme is now fully developed for FNDC and being implemented for the 21/24 period.

The introduction of a proactive maintenance regime and the application of a suitable wearing course is also expected to improve customer satisfaction with the unsealed road network and reduce the pressure on Council to carry out seal extensions.

7.5.3 Acquisition (Growth) Plan

The Roading Department does not create unsealed pavements; however some unsealed assets may be vested to Council as per the Councils Environmental Engineering Standards;

'Council may, by specific approval, allow rural roads to be unsealed. Approval will not normally be given where the road will service properties that are predominantly urban, lifestyle, horticultural or similar, or that extend or join a sealed road. Approval for unsealed roads shall be confirmed in writing at the time of resource consent application.'

Council also has the right to create paper roads, which are unsealed and generally unmaintained, however there are no plans to do create any within the timeframe of this plan.

7.5.4 Maintenance Plan

Unsealed maintenance consists of the following activities;

- Grading/ shape maintenance
- Maintenance metalling
- Drainage
- Pavement defect repairs

Maintenance activities will focus on the following aspects:

- Forestry roads – preparing roads based on logging info supplied by the forest managers. These roads will be strengthening by the addition of pavement aggregate to restore the structural strength and shape of the pavement; i.e. Heavy Metal Maintenance.

- Heavy trafficked roads – these are predominantly lifestyle residential, farming and timber haul routes. Roads will be maintained according to specification and metal applied where necessary. The level of service and response time will be adhered to, to minimise legitimate ratepayer complaints.

- Light trafficked roads - the balance of the rural roads. Grade and pothole patching as required.

- Black dot maintenance - Target reoccurring failure sites as identified by RoadRoid and carry out permanent repairs.

- Dust suppression – Carryout dust suppression on high risk forestry routes over summer when dust levels reach unacceptable levels.

Going forward, the new maintenance contract will include provision for the use of blended material using the Paige/Green chart or similar to provide wearing courses that are less prone to unravelling and dust production..

The maintenance of unsealed pavements is based on intervention levels and response times set in the maintenance contract. The intervention levels are considered to be the level at which the defect becomes a hazard to property or safety and the response times are based on the ONRC hierarchy, the criticality of the road and the level of work required to repair the defect. There will be limited ability to react to unforeseen impact on any portion of the unsealed network.

The traffic use and loads on some roads, particularly those in coastal areas and those leading to production forests, will continue to be a problem due to the demand peaks experienced. The future expenditure on unsealed roads is expected to increase to meet the current impact from logging operations over the horizon of this plan.

The maintenance decision process, what level of defects requires repairs and in what time-frame, is shown in Volume 2-Appendix E. These processes are based on the requirements of the *Road Maintenance Contract*.

7.5.4.1 Dust Suppression

As described above, dust suppression is being proposed as a short term measure on high risk roads to reduce the health effects of PM_{10} dust on adjoining dwellings. This treatment would be required until such time as an appropriate pavement structure and wearing course can be applied. This is expected to reduce PM_{10} dust to acceptable levels in the long term. However, there is still a risk that dust suppression is required following this long term treatment.

7.5.5 Renewals Plan

The renewals plan involves the strengthening of the pavement, by adding road aggregate to restore or improve the structural strength of the pavement. The most common method of strengthening the road is to add additional metal. Strengthening can also be achieved by adding a proprietary product, such as lime or cement, to modify the metal, improving its properties. Drainage improvements and widening are usually carried out in conjunction with these strengthening operations.

There is a seasonal regime of adding clean GAP12 material when the moisture condition is just right to bind up with bony material. This generally occurs prior to winter when there is a programme of bringing metal onto the road.

With the development of the Forestry Road Management Strategy, the plan going forward is to proactively plan renewals on roads prior to logging commencing so that the pavement will be in an adequate condition to cope with the additional loading. This should prevent situations that have occurred in the past when an unplanned logging activity starts up which results in catastrophic failure of the road and requires significant metal to bring the road back to a trafficable condition.

The Regional Unsealed Road Strategy is recommending that unsealed roads have a proper pavement structure built with a capping of a wearing course. The wearing course will meet the Paige-Green Chart for material properties so that it will form a firm base that is resistant to unravelling and dust production. This should result less metal loss and reduced dust generation which will reduce the cost of managing these roads. This will be developed further in the 2018/21 period and will be incorporated into the maintenance contract for the 2021/24 period.

7.5.6 Improvement Plan

Unsealed pavements can be improved either through widening (which often also includes strengthening) or through seal extension. Both are discussed below.

7.5.6.1 Widening Plan

Widenings are undertaken based on a number of triggers such as increased maintenance, safety concerns and heavy vehicle loading. These triggers are as follows:

- Increase in use (heavy commercial, bus traffic, logging activities) – strengthening and widening
- Demand changes (Annual Daily Traffic, customer) – more grading (see renewals plan)
- Road starts to service key community facilities (schools) - seal extension.

7.5.6.2 Seal Extension Plan

The Council has for a number of years developed a *Strategic Seal Extension Programme* to manage the needs and funding for seal extensions across the District. The objective of the Council's *Strategic Seal Extension Programme* is

OBJECTIVE	To develop a sealed network over a reasonable planning period which meets the needs of the District at an affordable cost.

Criteria to be taken into account include:

- Completing the sealing of the arterial road network.
- Developing links between communities.
- Meeting the requirement for no ratepayer to be more than five kilometres from a sealed road.
- Sealing roads affected by significant heavy traffic, if that is the best solution for upgrading that particular section of road, such as the Wright Road/McCardle Road forestry route.
- Considering dust control sealing, if that fits as the best solution for upgrading a particular section of road.
- Maximising the level of NZTA subsidy and/or ratepayer contribution in the development of the annual seal extension programme.

It is accepted that a fairly high proportion of the district roads will remain unsealed into the foreseeable future. There are some road links which clearly need completion early in the programme and others which, although desirable, are less of a priority.

Bridge Approach and Traction Seals

Sealing of the approach to bridges is aimed at decreasing the maintenance involved with these sections as it decreases the rate at which potholes are created.

Traction seals are to be created on roads where the lack of traction due to the metalled surface is a safety issue (such as the approach to intersections or on steep hill sections).

7.6 Structures

7.6.1 Overall Strategy

Structures consist the following asset types:

- Bridges and large culverts
- Large culverts
- Retaining Walls
- Barriers (guard rails and sight rails)

7.6.1.1 Bridges and large culverts

Bridges and large culverts are an important part of the transport network (large culverts are those with an area of over 3.4m², which corresponds to the NZTA asset category).

Because of their cost, importance to the network and the consequences of failure, bridges and large culverts are amongst Council's highest risk assets. Accordingly, Council regularly inspects all bridges and large culverts, and from these inspections determines the need for routine and planned maintenance (e.g. repairs). Higher frequency monitoring is carried out on timber structures and those that are sign posted with weight restrictions. There is also a process to identify appropriate routes for overweight vehicles to ensure that bridges and large culverts are not damaged.

Bridge Replacements: The focus will be on trying to carry out lower cost heavy maintenance repairs or component replacements rather than replacing entire bridge structures. However, there are many steel Armco culverts which are rusting out under their concrete linings and will require replacement over the next 10 years.

HPMV/50Max: In 2010 the Vehicle Dimension and Mass (VDM) Rule Amendment came into force. This amendment allows vehicle operators to apply for High Productivity Motor Vehicle (HPMV) Permits for vehicles with divisible loads, provided their axle and gross weights are within specified limits. However, a nationwide State Highway bridge screening exercise revealed that older bridges in particular were not suitable for these heavier weights.
In 2013, a form of 'limited' HPMV was designated, which allowed for vehicles that would be heavier than conventional 44 tonne trucks (at the time, Class 1 designation) but not so heavy that they couldn't be driven over the current bridge stock. These were designated as 50MAX vehicles, and these vehicle combinations have one more axle than conventional 44-tonne vehicles combinations, meaning the overall truck load is spread further and there is no additional wear on roads/bridges per tonne of freight.
All councils have signed a MOU with NZTA to allow 50Max vehicles on the road network.

There are 68 bridges on the FNDC network; 8 Bridges on the WDC network; and 27 bridges on the KDC network that have been assessed as not have the required strength to handle 50Max vehicles.

Seismic Capabilities: With the change in building requirements following the Christchurch earthquakes there may be a need to strengthen some of our structure to improve their seismic capabilities to preserve key lifelines.

Overweight/Dimension Vehicles: WDC and FNDC currently manages this process through their bridge consultant, Opus, which KDC manages this process through their consultant Stantec. It needs to be considered whether going forward we should align with NZTA processes which would mean that NZTA would administer this process.

Moveable Bridges:
The Te Matau a Pohe bascule bridge (WDC) is currently operated from a control room on site which requires this to be manned during daylight hours. WDC have improved the CCTV camera and communication technologies at the bridge with a view to allow this operation to be remotely operated which is likely to significantly reduce the operating costs.

The Kotuitui Whitinga Footbridge (WDC) is a 100m long, 10 span walking and cycle bridge which spans the Waiarohia Stream from the Hihiaua peninsular to Port Road. The bridge has a 10m long opening section that swings sideways on a slew bearing. The Kotuitui Whitinga Footbridge is controlled by the bridge operator in the Te Matau a Pohe control room and has the same response times as Te Matau a Pohe.

7.6.1.2 Retaining Walls
A management program has been created to categorise the criticality of the retaining walls network and then to collect the relevant data and create a forward works program based on the higher risk structures.

7.6.1.3 Guardrails
New guard rail sites are identified through crash reduction studies and prioritised through the High Risk Rural Roads and minor improvements programme. An inspection programme and rating system for guardrails will be developed targeting older assets and high risk roads first and from this replacement programme developed.

7.6.2 Asset Description
The assets that make up this activity are;

- Bridges & Footbridges

- Major Culverts (culvert area > 3.4m²)
- Fords
- Retaining Walls and seawalls
- Rails and Barriers
- Structural Stairs
- Over Bridges – rail bridges over roads.
- Pedestrian Under/Overpasses – Council currently do not own any pedestrian under/overpasses.
- Stock Underpasses – These assets are not owned by Council but are inspected by Council and recorded on the Councils database.

The major structures: Bridges; Culverts; and Retaining walls have been shown by their ONRC breakdown and their Material type in the charts below.

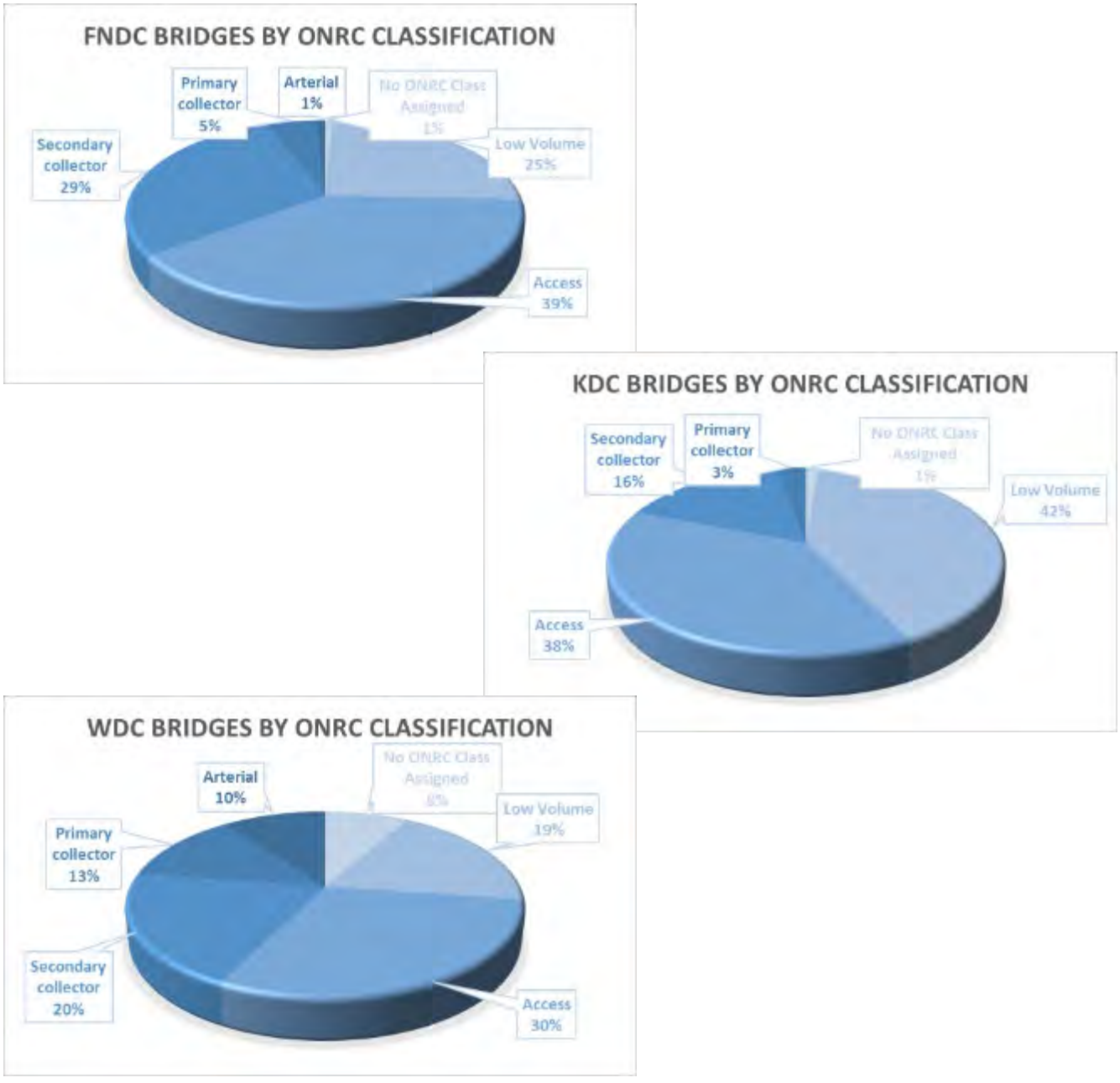
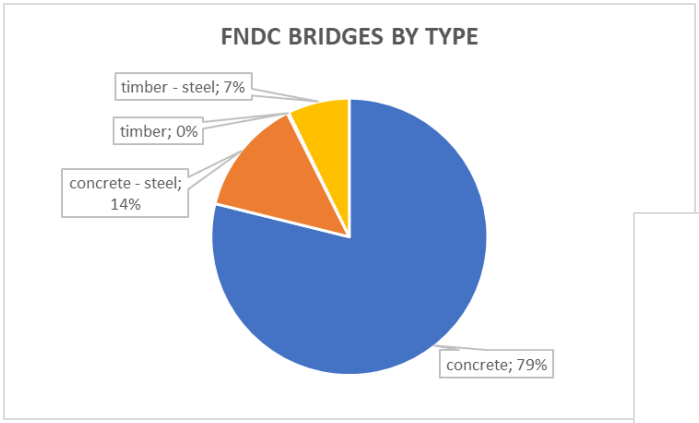
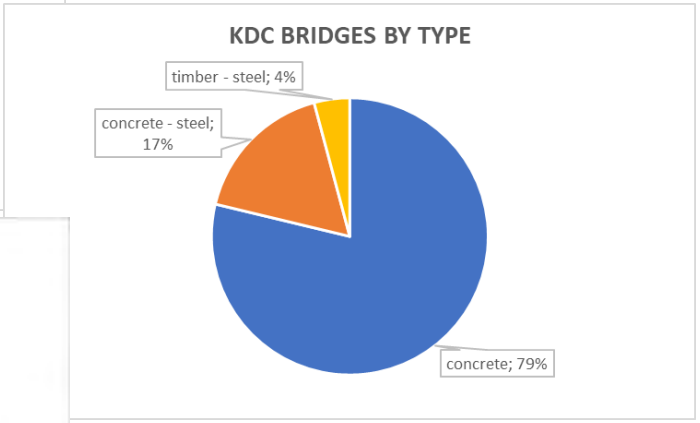


Figure 7-12 – Bridges by ONRC Classification





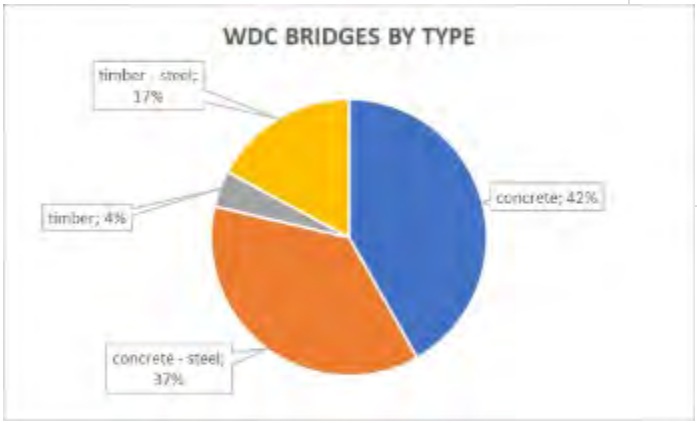
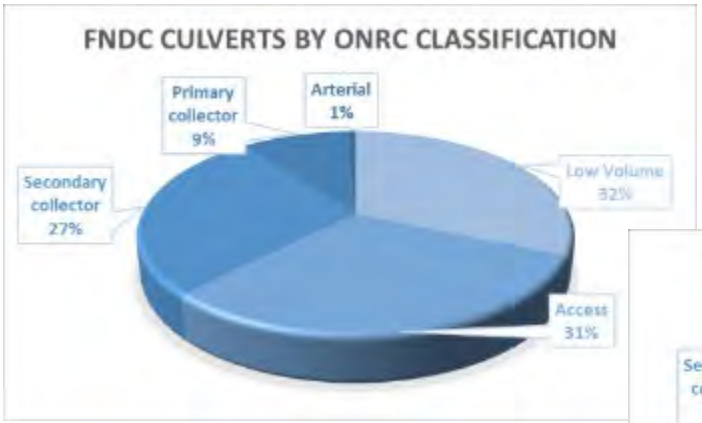
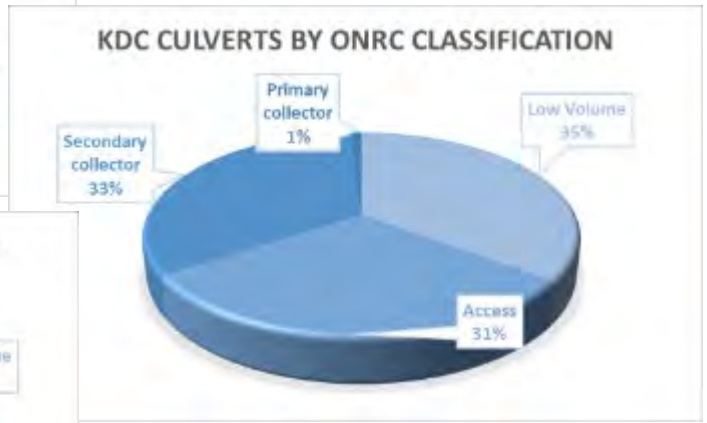


Figure 7-13 Bridges by Material Type





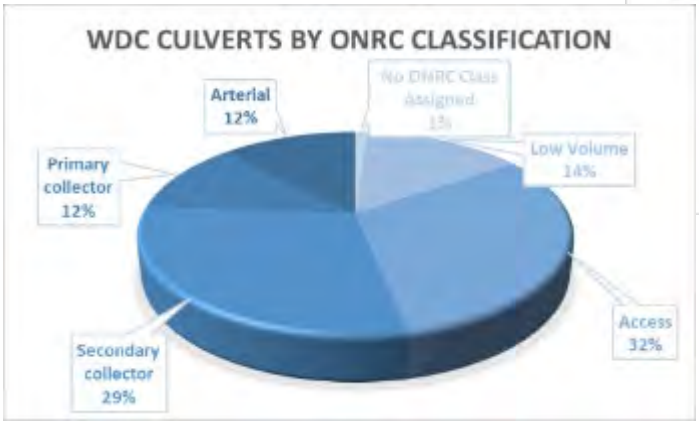
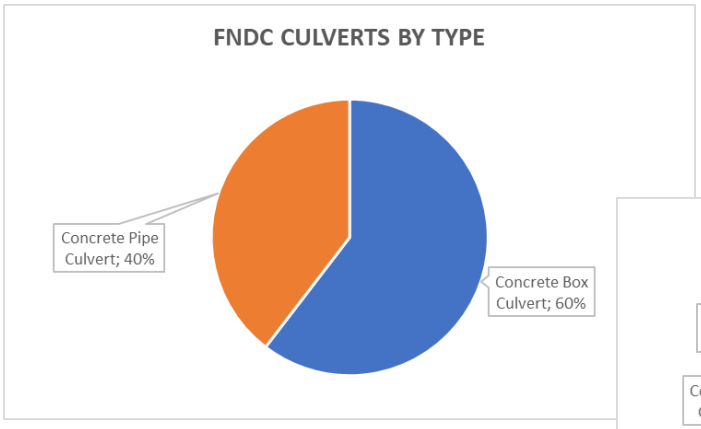
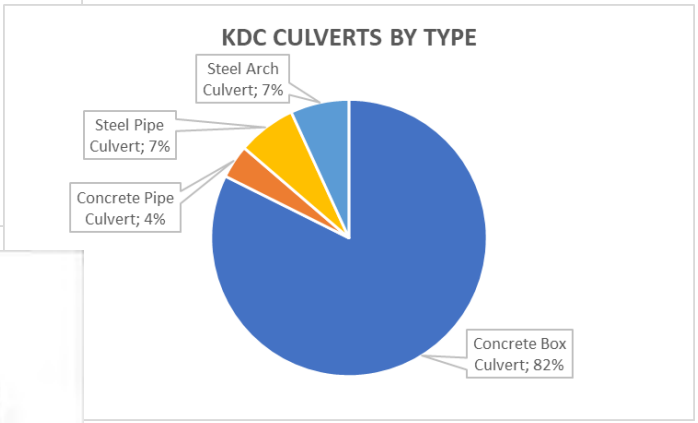


Figure 7-14 Culverts by ONRC Classification





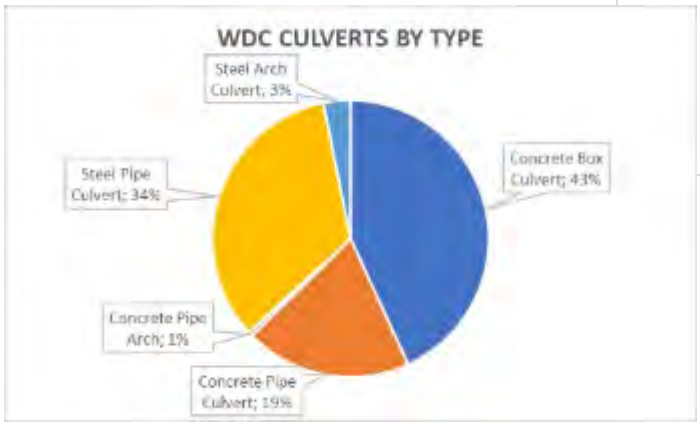
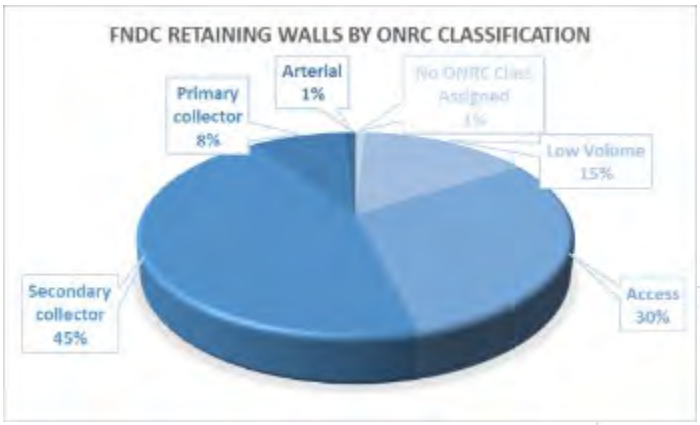
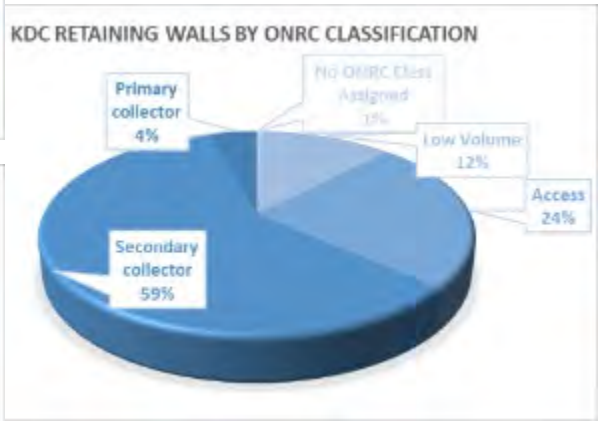


Figure 7-15 Culverts by Material Type





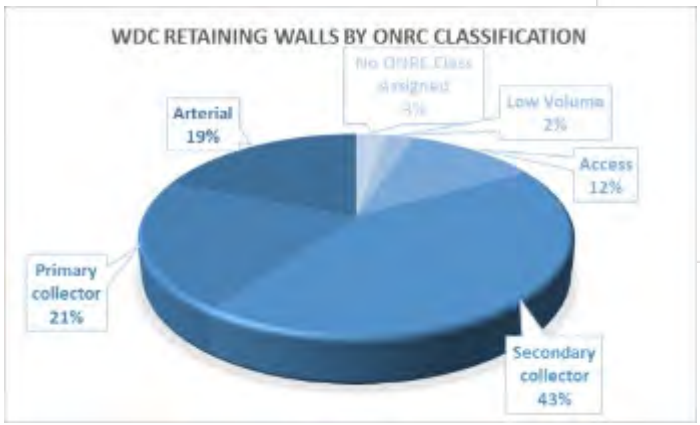


Figure 7-16 Retaining Walls by ONRC classification

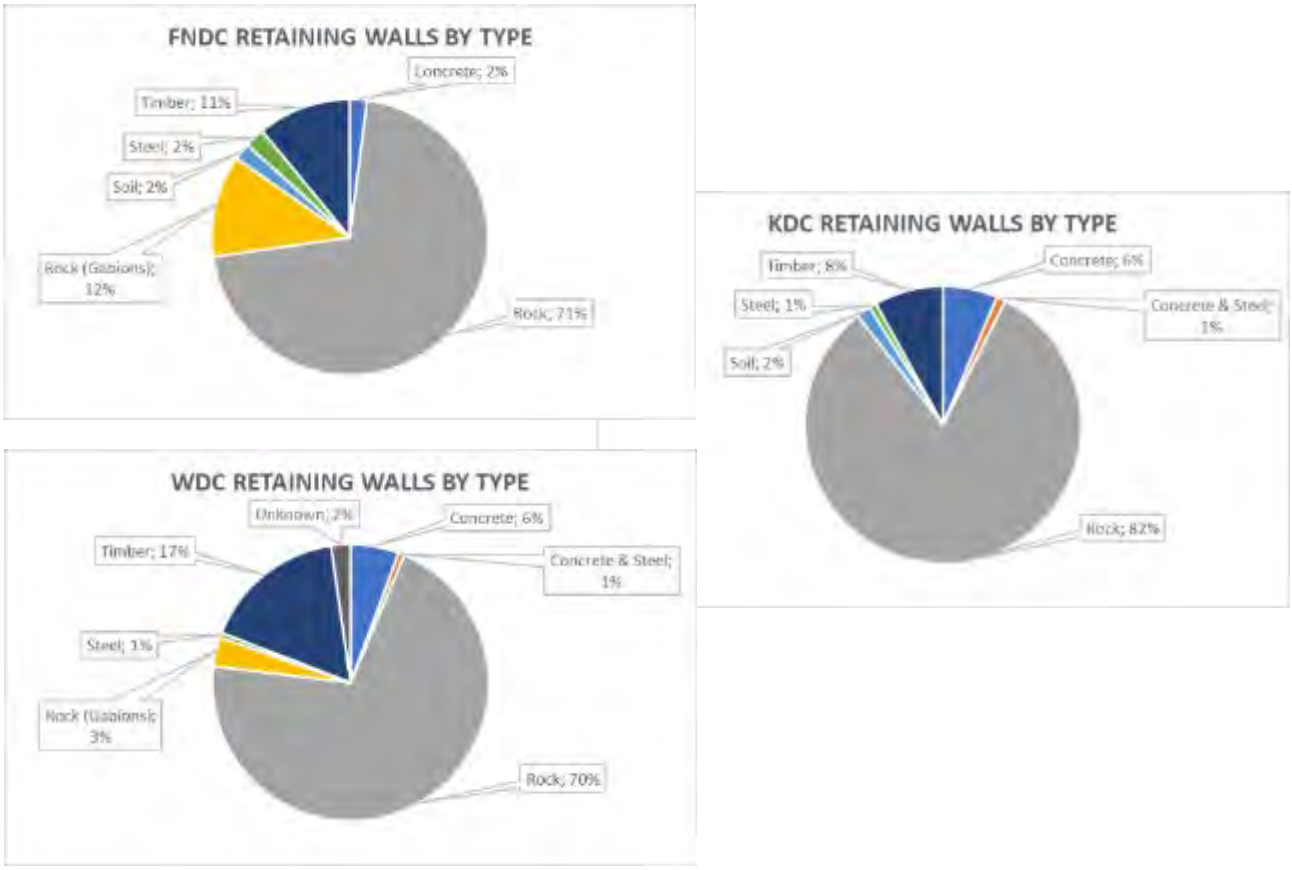


Figure 7-17 Retaining Walls by Material Type

7.6.3 Management & Operations

7.6.3.1 Maintenance Contract

Most of the maintenance and operations associated with this activity are conducted by the maintenance contractors and governed by the *Road Maintenance Contract*. This allows for minor maintenance of the structures (such as minor repairs, painting, clearing deck drainage etc.) that is found as part of the carriageway inspections.

7.6.3.2 Renewal Works Contracts

Any structural replacement work found as a result of the inspections is packaged into one off contracts and tendered out.

7.6.3.3 Ownership

Some of these assets, mainly footbridges and seawalls, are located in parks and reserves which are owned and maintained by the Councils Parks Department

The ownership of other bridges are:

Rail Overbridges

These are owned, managed and maintained by the railway owner. The Roading Department is only responsible for the signage that is associated with the overbridges applicable to the road users.

Stock Underpasses

Although council inspects these assets, they are all owned by the property owners who are responsible for any maintenance and improvements required.

Road Overbridges and Underpasses

These are owned by NZTA if they are part of the State Highway network, otherwise they are owned by the Roading Department and are managed through the bridges, pavements and surfaces activities.

7.6.4 Monitoring & Condition

7.6.4.1 Inspections

Structural inspections of bridges and large culverts assets are currently undertaken by Consultants on behalf of the Councils. In the FNDC and WDC, WSP conduct the inspections and in KDC, Stantec conduct the inspections. The inspections cover all assets associated with the bridges including railings and barriers.

Inspection of all the retaining walls were conducted by WSP on behalf of the Councils during 2020. An assessment of their criticality with regard to the network was identified and those classified as 4 and 5 (criticality 1 were least critical and criticality 5 were those identified as most critical) were inspected and a forward works program created. Retaining Walls of Criticality 1 to 3 were not inspected due to time and cost constraints during 2020. The future inspections will follow the same process as the bridge inspections and incorporate all the retaining walls over time.

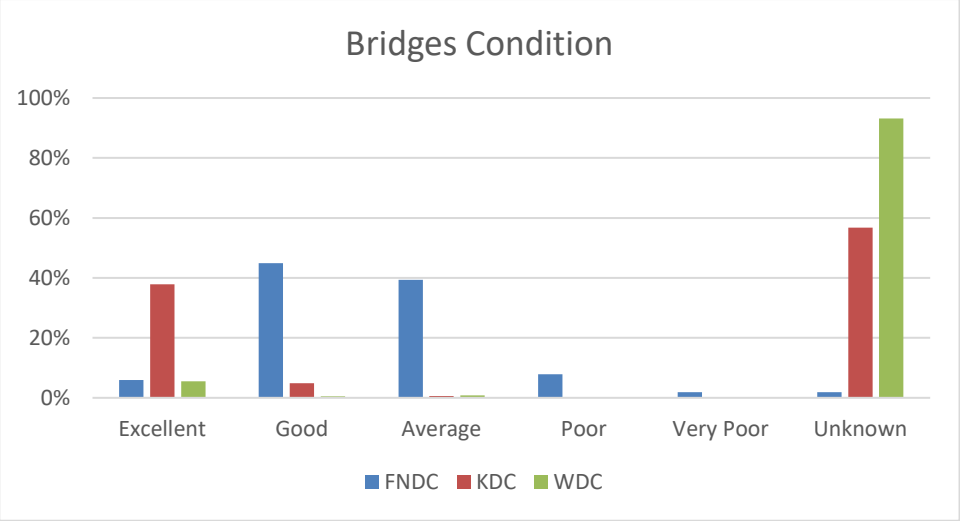
Inspection of all road safety barriers is undertaken as part of the *Road Maintenance Contract* and involves the inspection of the barriers, two weekly, monthly, or three monthlies based on ONRC. This inspection only involves the identification of defects. It does not consider the overall structural integrity of the barrier.

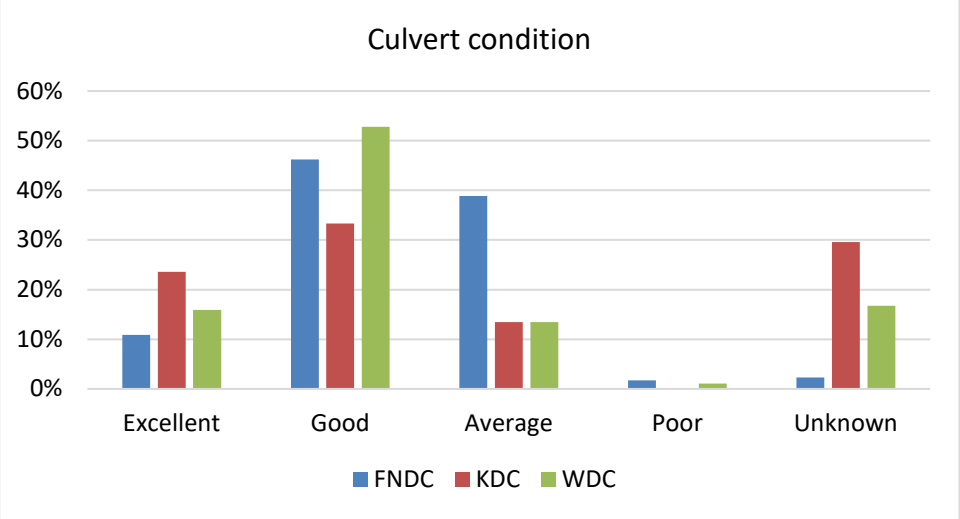
Road safety barriers associated with bridges are inspected for structural integrity during the bridge inspections that are conducted every year or every two years based on the bridges' criticality. These barriers are covered by the Bridge and Major Culvert Activity.

7.6.4.2 Condition

<u>Bridges</u>

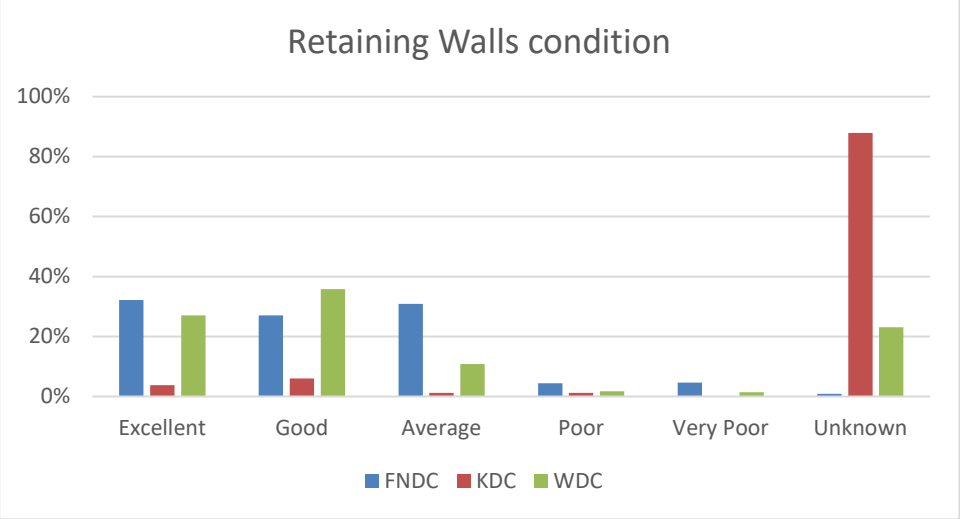
Due to a minor glitch with the RAMM records the condition of the majority of the WDC bridges and some of the KDC Bridges and Culverts are recorded as unknown although inspections have been undertaken. The summary graph of the Bridge condition is therefore skewed.





Retaining Walls

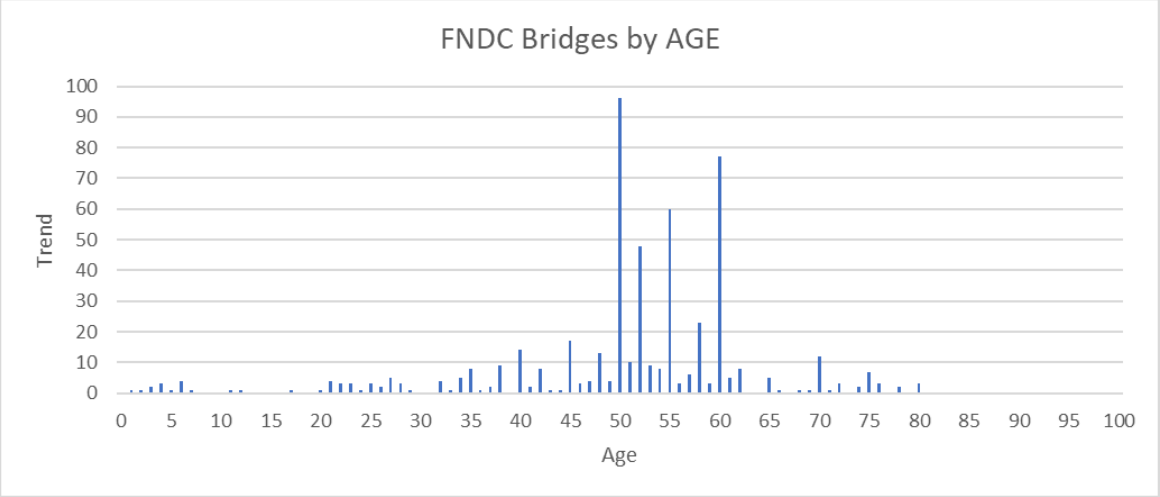
Due to a minor glitch with the RAMM records the condition of the majority of the KDC Retaining Walls are recorded as unknown although inspections have been undertaken. The summary graph of the Retaining Walls condition is therefore skewed.

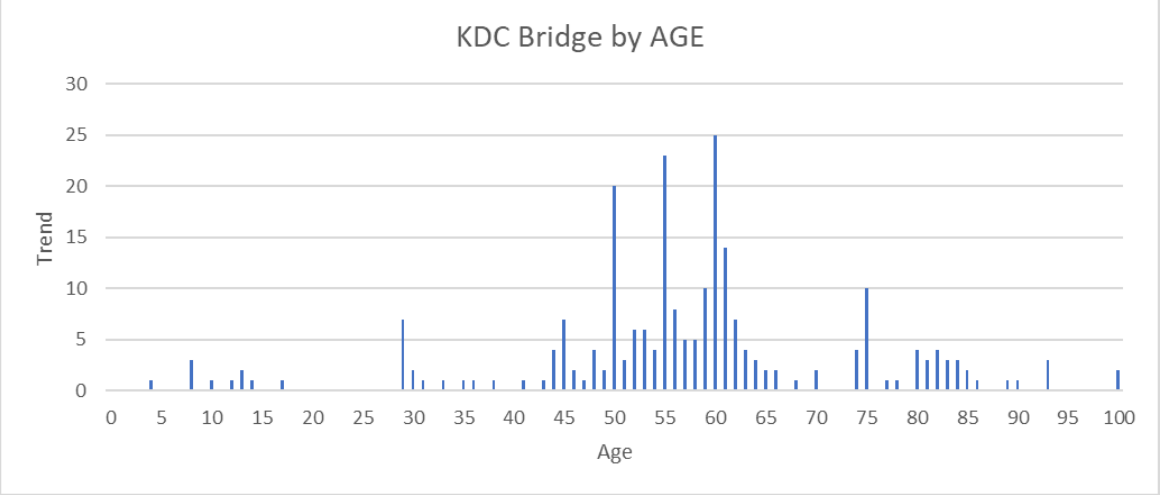


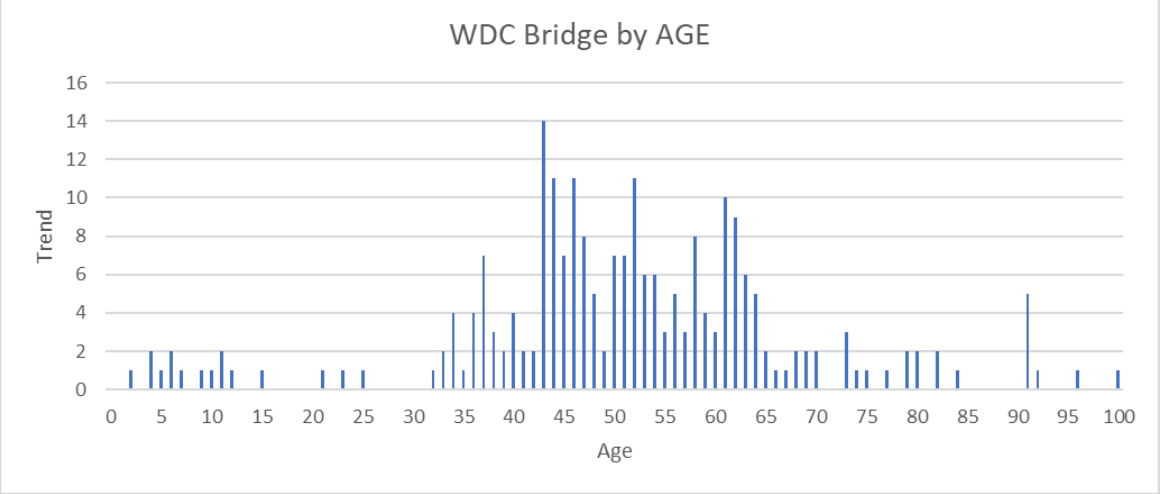
7.6.4.3 Age

Bridges

As indicated below, the bridge age profile is typically distributed, with bridges ranging in age from new to almost 100 years old.

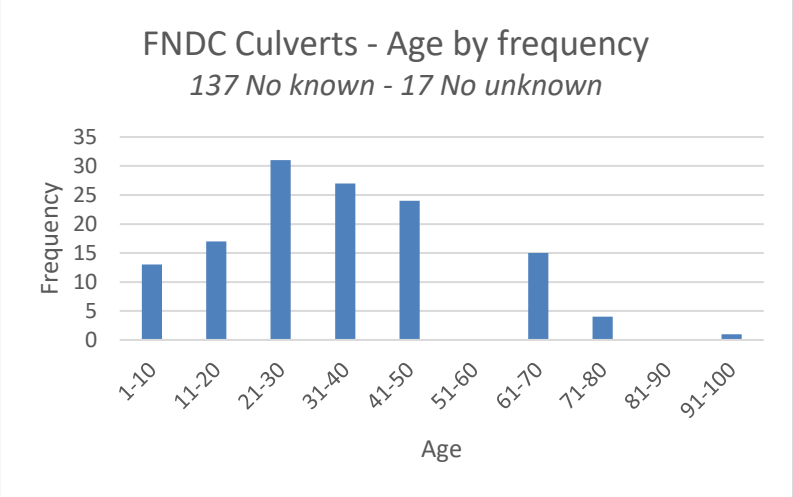


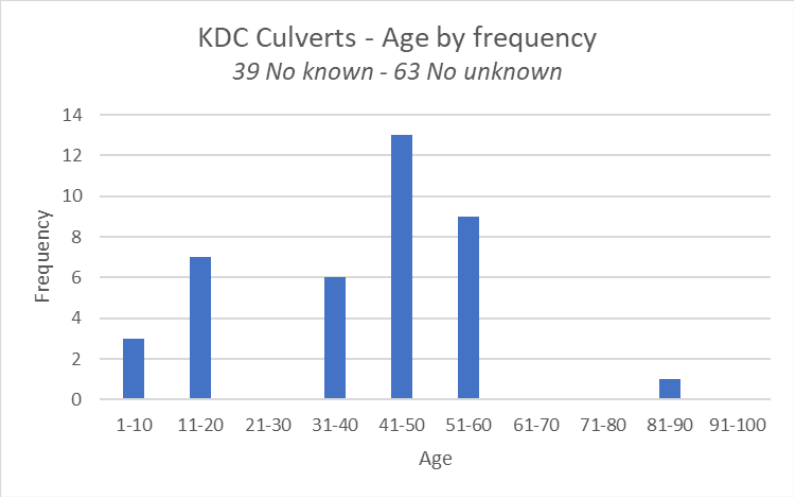


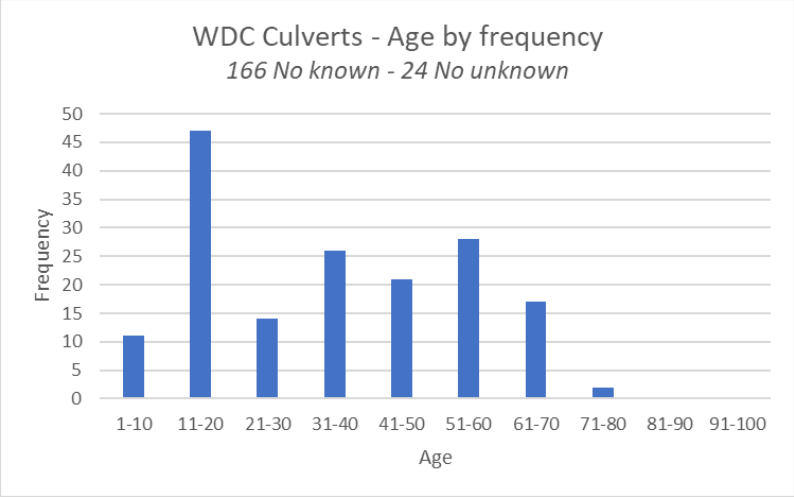


Culverts

As indicated below, the culvert age profile is typically distributed, with culverts ranging in age from new to almost 80 years old.

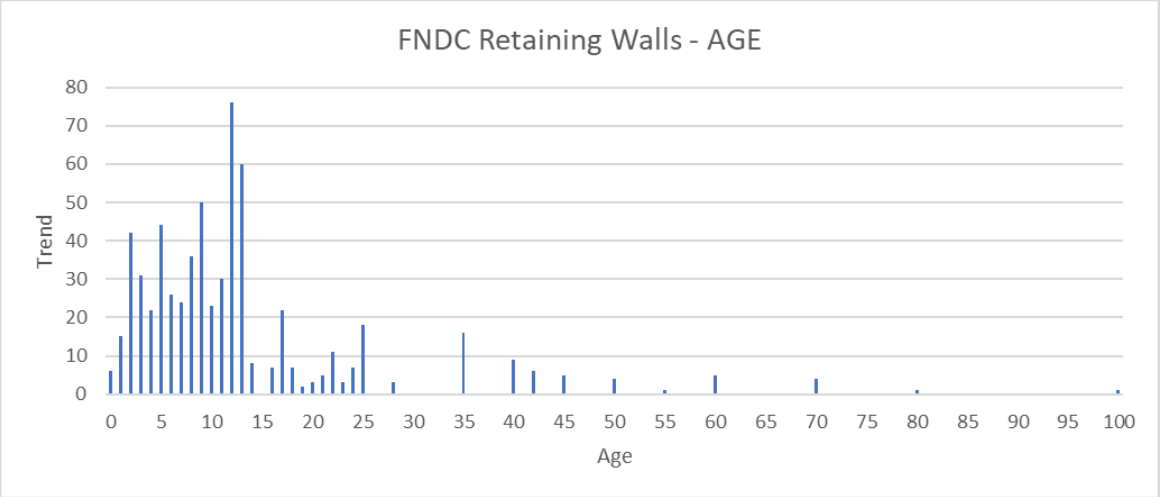


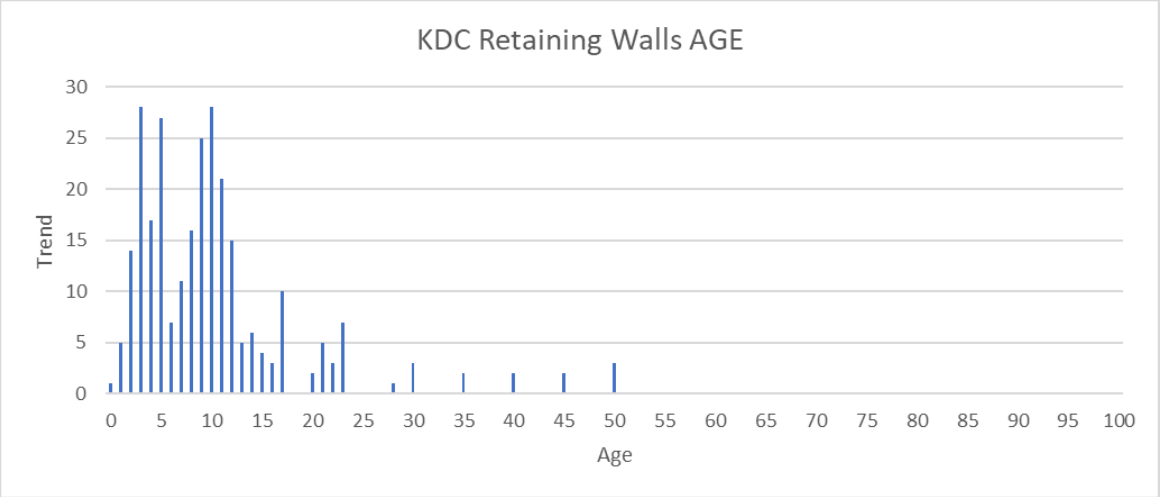


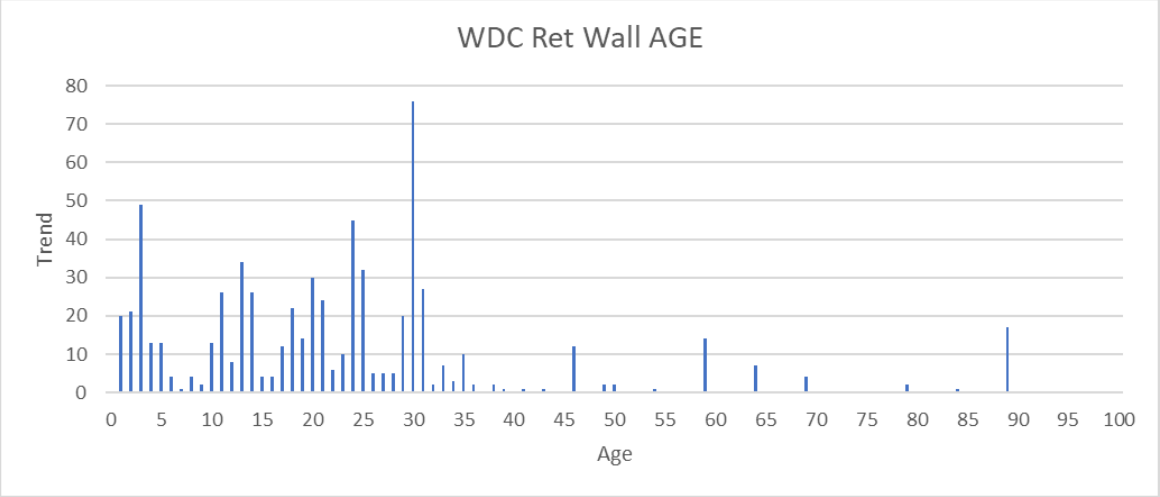


Retaining Walls

Of the known data that is in RAMM the following graphs represent the retaining walls age. In general the wall age is within 30 year although there are a few outliers that are clearly errors.







7.6.5 Acquisition (Growth) Plan

Structures are created through new construction projects and through assets vested to Council from subdivisional developments. In addition:

- Retaining walls are also created through repairs to slips occurring either through emergency work repairs to storm damage or resilience improvements to long term instabilities.
- Road safety barriers are created through the minor improvements programme and can be identified through high risk rural road studies, crash reduction studies, the deficiency database or through network inspections.

Section 10.2.10 contains the major projects that are planned for the next 10 years and details those projects that include the creation or widening of a bridge or major culvert.

7.6.5.1 Stock Underpasses

Council does not construct stock underpasses and a land owner wishing to install these under public roads must seek approval from Council to do so. The approval process works through a number of issues to do with placement of the underpass and drainage, as this relates to the transport corridor, and on-going operation and maintenance agreements are as set out in the maintenance plan below.

7.6.6 Maintenance Plan

Structures maintenance is undertaken to ensure that the structural integrity of all structures is protected and that their load capacity is maintained.

7.6.6.1 Bridges and Major Culverts

Bridges and major culverts are inspected by two parties;

The Road Maintenance Contractors inspect the carriageway and deck surfaces least once a month. These inspections are tracked through RAMM contractor and where work is undertaken a job is raised. Additional culverts inspections are conducted after any high rainfall.

The Roading Department also has two bridge contractors, WSP for FNDC and WDC and Santec for KDC, who inspect the structural integrity of all bridges and major culverts once every year or two.

Both these inspections include the associated railings and barriers.

The priorities concerning the maintenance requirements identified through the *Road Maintenance Contract* are shown in Volume 2 - Appendix E, while the structural inspections report splits the works required into four priorities based on when the works should be completed.

Both Te Matau a Pohe (opened July 2013) and the Kotuitui Whitinga Footbridge (opened September 2014) are recently constructed projects. As such the maintenance needs of both these structures are likely to be minor and renewals will only be of consumables (such as hydraulic oil, timber re-oiling etc.). However, issues with expansion have meant that remedial works have been required to ensure that a sufficient gap is maintained at the opening section and this has resulted in some early maintenance cost.

7.6.6.2 Stock Underpasses

The Roading Department does not own this asset although they are inspected as part of the structures inspection programme. Minor Maintenance is generally attended to by Council, but other maintenance

issues are passed onto the owner to attend to. Where the maintenance issues are not attended to by the owner Council contractors undertake the repairs and pass costs onto the owner.

The justification for this process is that the stock underpasses are a critical component for the Transport Network and cannot fail for obvious reasons.

7.6.6.3 Retaining Walls

A Retaining Wall Maintenance intervention strategy has been developed, whereby the critical routes (criticality 4 & 5) have been prioritised and the condition of the retaining walls along those routes inspected. It is proposed that the remaining Retaining walls will be developed into routine inspection programmes similar to the existing programmes for the bridges and major culverts activity.

7.6.6.4 Road Safety Barriers

The inspection of all railings is undertaken as part of the entire network inspections that occur weekly, two weekly, or monthly depending on the road hierarchy through the roading maintenance contract. Further inspection of railings is also undertaken as part of the night inspections that are required to be completed at twice a year for T1 – T5 roads, and once a year for other roads.

7.6.7 Renewals Plan

Structures requiring renewals will be prioritised based on their condition and the criticality of the route. They will then be renewed in priority order, with the volume of renewals based on the funding available.

Bridges are prioritised for renewal as part of the inspection process undertaken by the bridge consultant.

As for the maintenance plan, there are likely to be numerous retaining walls that have recently been identified, or are still to be identified, that require renewal.

The planned renewals are shown in Section 10.2.4.

7.6.8 Improvement Plan

The forms of improvement are:

Increasing one lane bridge to two lanes – This would normally considered in conjunction with a bridge renewal.

Replacing bridge structure with large culvert structure - In some instances it is more efficient and effective to replace a bridge structure with a large culvert structure. This will be assessed at the design stage for bridge renewals.

Upgrading of ford to either a bridge or large drainage structure - In general fords provide a stable crossing point in flood prone streams. Fords are an historical structure and are generally in place on low volume unsealed roads where the expense of a bridge or culvert structure is not viable or justified. It is rare for a ford to be replaced with either a bridge or large culvert structure unless there was a major development that would require it. If this was the case then this would generally occur at the cost of the developer.

Increasing waterway capacity - There are a number of culverts that have insufficient waterway capacity to deal with conditions during periods of heavy rain fall. Consideration should be given to the development of a programme to increase the size of these structures to protect the pavement at these sites.

Replacing non-compliant terminal ends - It is recognised that there is a significant amount of non-compliant terminal ends on the network, especially associated with bridge safety railing, however there is no current or future programme to attend to this issue.

The planned improvements/replacements are shown in Section 10.2.5.

7.6.8.1 Bridge Strengthening for High Productivity Motor Vehicles (50Max & *HPMV)*

In 2010 the Vehicle Dimension and Mass Rule was introduced to allow the freight industry to move freight safely with fewer vehicles, within an appropriately regulated and permitted environment. This was proposed as part of the Government's direction to make the freight industry more efficient, free up capital for increased economic productivity, and create more jobs.

HPMV and 50Max means moving more freight with fewer trucks, reduced fuel consumption, vehicle operating costs and driver hours per unit of freight moved. Increased safety benefits from fewer truck trips means reduced crash risks, higher safety standards required on newer vehicles and advanced safety features like electronic stability control. The increased payloads of HPMV and 50Max can lead to economic benefits for producers, customers and our communities.

7.6.8.2 50Max (50 tonne vehicles)

The 50Max is a new generation of truck that is slightly longer than the standard 44 tonne truck and has an additional axle (9 in total). The modified design means that these trucks can carry more load, but they perform on the road in a similar way to a standard 44 tonne truck.

The 50Max trucks are designed to have no greater pavement wear than that of the current 44 tonne vehicle fleet, however existing restricted bridges and bridges with spans greater than 25-30m in length may be subject to load restrictions.

All Councils have signed a MOU with NZTA to allow 50Max on their road network. This will release the economic efficiency available from 50Max to the District.

There are 68 bridges on the FNDC network; 8 Bridges on the WDC network; and 27 bridges on the KDC network that have been assessed as not have the required strength to handle 50Max vehicles.

7.6.8.3 HPMV (62 tonne vehicles)

Full HPMV (62 tonne) vehicles are only permitted to run on two specific WDC roads – Wilsonville Road and Portland Road which are part of the Wilsonville Quarry to Portland Cement Works route along SH1. HPMV vehicles are not currently permitted on other WDC roads.

SH1 through Whangarei is a designated HPMV route and the Kamo Bypass on SH1 is often closed due to maintenance works or due to a vehicle crash or other emergency. The detour route for this section of state highway is along Great North Road and onto Kamo Road through Kamo Village. There were two bridges on this route that could not carry HPMV loads which result in HPMV vehicles having to park up whenever the Kamo Bypass is closed. A detailed structural assessment of these two bridges were undertaken in the 2018/21 period to determine whether they can carry HPMV loads and, if not, what works would be necessary to make them HPMV compliant. The Great North Rd bridge was found to be fine for 50MAX/HPMV and so was to be removed from the 50MAX register. The Kamo Rd Rail Overbridge needs to be strengthened to allow 50MAX or HPMV vehicles to use it. WDC has allowed a $500k/year budget for the

next 5 years in the AMP & LTP to address 50MAX/HPMV restrictive bridges and the Kamo Rail Overbridge would be a high priority and probably done in Year 1 if possible.

NTA have also carried out 50MAX detailed assessments on several bridges for each council (2 more for WDC, 5 for FNDC and 2 for KDC).

7.6.8.4 Seismic Strengthening

An investigation into Seismic strength of bridges that form critical life lines should be undertaken to determine which bridges require strengthening. This will be considered in the future planned works.

7.7 Road Drainage

7.7.1 Overall Strategy

A summary of the overall strategy for the next 5-10 years is:

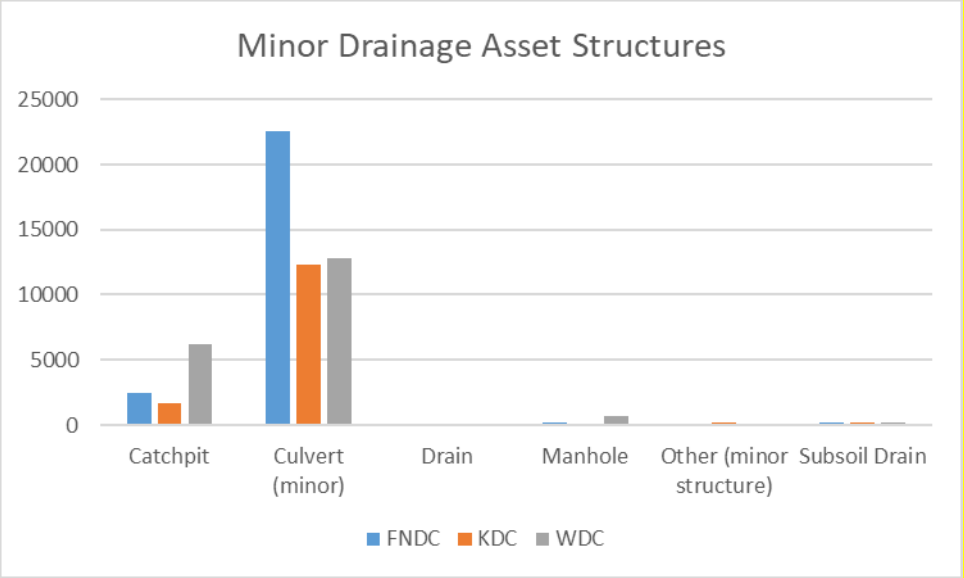
- Watertable Maintenance: It is intended to carry out a programme of watertable maintenance to reinstate proper roadside drainage throughout the network. This is likely to reduce water ingress into pavement and extend pavement life.
- With the amount of new kerb and channel increasing as a result of new subdivisions, a review of existing street sweeping cycle times is being carried out to accommodate these within current budgets.
- Proactive repairs and maintenance of kerb and channel will still precede the reseal program of work.
- Culverts: An annual workload for culvert maintenance is derived from the annual inspection of all culverts. Updating the condition and culvert information is part of this process. In time the workload on this asset will stabilise after the first few rounds of inspection and maintenance. A heightened workload of culvert cleaning usually following storm events.
- Catchpits: The intention is to continue with the annual cleaning of all catchpits, and follow-up cleaning of those that accumulate detritus more rapidly.

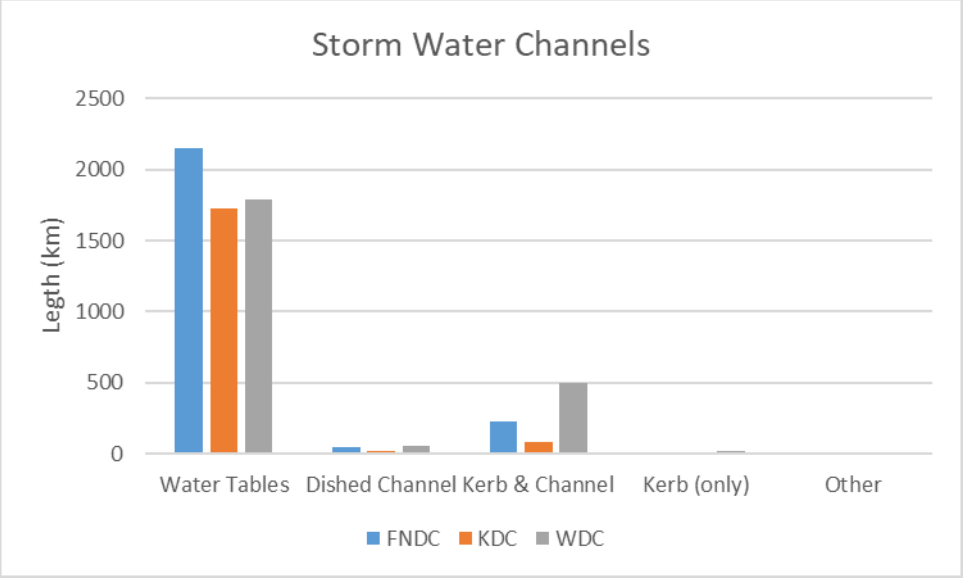
7.7.2 Description

The drainage activity consists of the following breakdown of categories;

- 121km of Dished Channel (FNDC – 49km; KDC – 17km; WDC – 55km)
- 853km of Kerb (with and without Channel) (FNDC – 238km; KDC – 99km; WDC – 517km)

- 5,675km of Water Tables (FNDC – 2,153km; KDC – 1,728km; WDC – 1793km)
- 47,675No Culverts – only those not considered 'major culverts' as these are covered in the Bridges and Major Culverts Activity. (FNDC – 22,538No; KDC – 12,344No; WDC 12,793No)
- 10,572No Catchpits, Sumps & Drains (FNDC - 2,551No; KDC – 1,798No; WDC – 6,223)
- 654No of Subsoil Drains (FNDC – 189No; KDC – 244No; WDC – 221No)
- 992No Manholes (FNDC – 246No; KDC – 97No; WDC – 649No)





The ONRC hierarchy of the drainage assets is shown in the following figure:

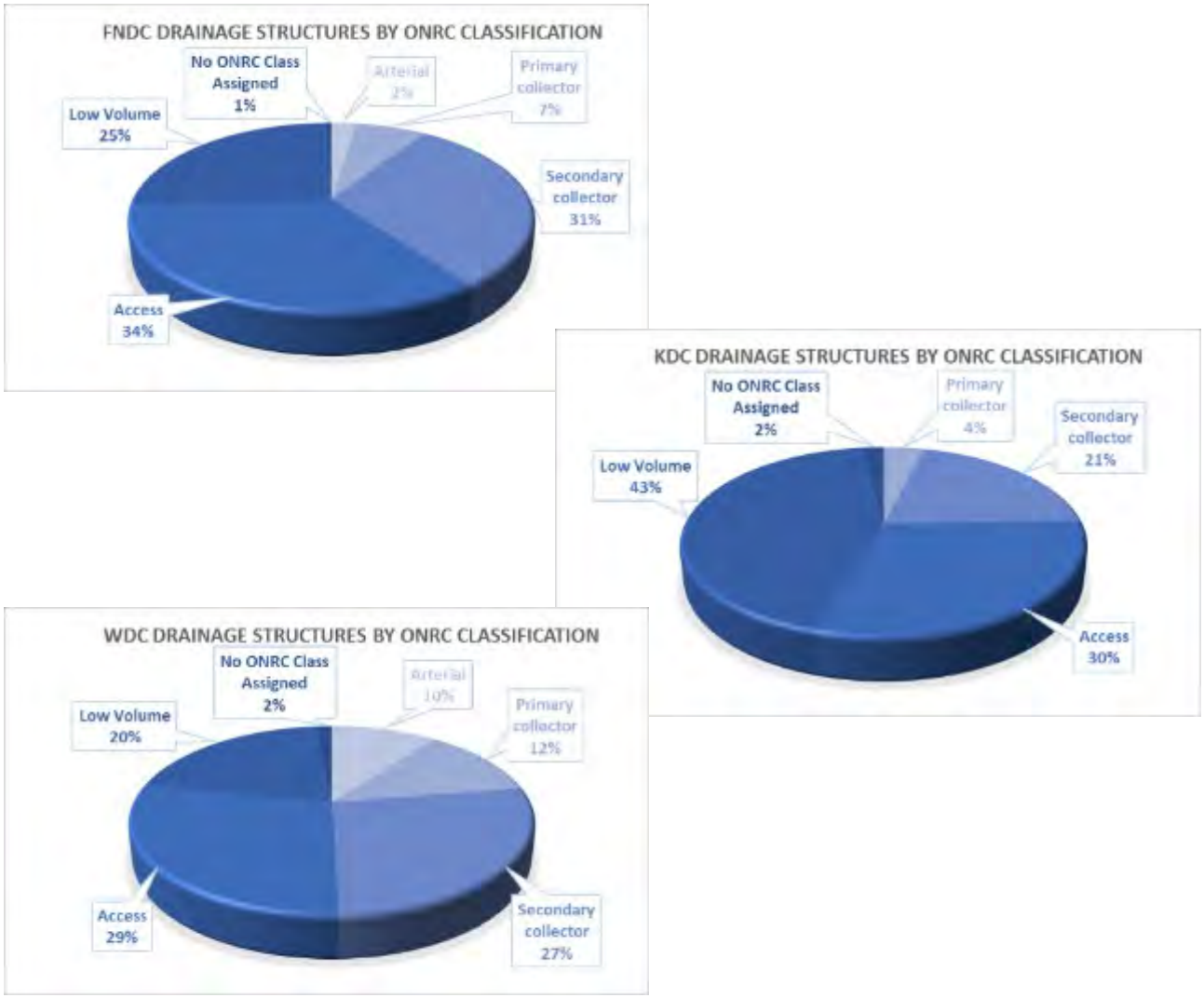


Figure 7-18 Drainage structures by ONRC Classification

7.7.3 Management & Operations

7.7.3.1 Maintenance Contract

Most of the maintenance and operations associated with this activity are conducted by the maintenance contractors and governed by the *Road Maintenance Contract*. This contract only covers components such as kerb and channel, surface water channels, culverts, catchpits and manholes, it does not cover underground pipe networks as these are owned and maintained by the Councils Waste and Drainage Division.

7.7.3.2 Ownership

Both the Roading Department and the Waste and Drainage Department are responsible for drainage assets. In general the Roading Department is responsible for roadside drainage (kerb and channel etc.) while the Waste and Drainage Department are responsible for any under-ground assets. .

7.7.3.3 NZTA

As part of the MOU with NZTA, NZTA is responsible for all the drains in the state highway corridor other than land drains in the rural area and where they form part of the reticulation system in the urban area. Each respective Council is responsible for channel cleaning of all urban state highways which is funded from the State Highway Programme.

7.7.4 Monitoring & Condition

7.7.4.1 Inspection

Routine inspections are carried out through the maintenance contracts.

7.7.4.2 Condition

Condition rating is completed on surface water channels to identify maintenance issues. The items that are rated for condition are;

- % blocked,
- channel ineffective, and
- broken channel

This data is used in the Treatment Selection Analysis in RAMM to help define the maintenance requirement and identify where defective channels may be having a detrimental impact on the allowing the ingress of water into the pavement.

Only five of the sub-surface drainage assets have been assigned a condition rating, with two being 'average' and three being 'excellent'. There is no formal condition rating of culverts and catch pits, and drop structures. The routine inspections are relied upon to identify priority issues and report these accordingly.

7.7.5 Acquisition (Growth) Plan

Acquisition of drainage facilities is generally as part of new infrastructure through roads being vested with Council, major capital projects and road improvement projects such as rehabilitations and seal extensions.

7.7.6 Maintenance Plan

The maintenance of surface water channels is provided through the *Road Maintenance Contract*. The drainage facilities are inspected during the routine network inspections. Any minor maintenance requirements identified are undertaken as per Volume 2 - Appendix E, with major maintenance requirements becoming programmed work.

There is a pool of identified deficiency on the network related to drainage. These are continually being recorded as dispatches in RAMM Contractor and ranked accordingly.

Budget constraints continue to hinder the ability of the Roading Department to implement and treat the identified drainage deficiency on the network.The focus will be on carrying out surface water channel maintenance on arterial and forestry roads on the network to minimise water ingress into pavements to extend the pavement life and reduce pavement maintenance.

A maintenance plan has been developed for the sealed condition ratings, undertaken annually for high traffic volume roads and once every two years for lower volume road, as it identifies the level of surface water fault on the network. This is based on the outcomes of the treatment selection algorithm in RAMM

and the works required are generally completed as part of any associated pavement and surface renewal works.

In addition, the council has over the past few years implemented a maintenance strategy of allocating a portion of the kerb and channel maintenance budget to replace damaged kerb and channel in conjunction with the road resealing programme. Approximately 90 km of district roads are resealed annually and as each road is resealed, all kerb and channel defects are removed at the same time.

Road sweeping and cesspit cleaning is undertaken as routine maintenance. The district is split into three zones with zone one being swept/cleaned once a week, zone two once a month, and zone three every three months. **Error! Reference source not found.** below shows the extent of zones one and two. All other roads in the district are zone three. All cesspit grates also require inspection and cleaning during heavy rainfall.

7.7.7 Renewals Plan

The failure modes and condition indicators that are used to determine the renewal of drainage facilities are shown in Volume 2 - Appendix E.

The bulk of all drainage renewals is associated with pavement and surface renewal works. At the time of design the effectiveness and condition of the related drainage is assessed and renewed where required. Surface water channel renewal works are identified through routine inspections and programmed maintenance. Where this is the case, the project is recorded as a dispatch in RAMM Contractor and prioritised based on risk and benefit.

7.7.8 Improvement Plan

Minor Improvements generally consists of the up-sizing of specific culverts or the construction of drainage structures in relation to the restoration of a flood damage site. These improvements are to be considered at the time of undertaking renewals of the drainage system.

The Northland Transport Alliance (NTA) has developed a Resilience Strategy. This strategy identifies critical culverts and overland flow paths that are at high risk of causing road washout or slips during heavy rain events. Drainage improvement identified through this strategy will be prioritised and undertaken as funding allows.

7.8 Traffic Facilities

7.8.1 Signs, Markings and Delineation Activity

7.8.1.1 Overall Strategy

Summary of the overall strategy for the next 5-10 years including:

- Maintenance & Operations
    - Signs: A small proportion of signage is replaced due to ageing. The bulk is due to accident damage and vandalism.
    - Sight-rails: These are either painted or cleaned annually. Sight rails which are higher than 0.5 x eye height shall be modified to meet this requirement.
    - Pavement markings: Long life products will be used on high wear sites where the payback period will be achieved.
    - Reflective Raised Pavement Markers (RRPMs) : These are to provide or maintain RRPMs to meet the NZTA standards for all arterial, collector and tourist routes.
    - Edge Marker Posts (EMPs): These are to provide or maintain EMPs to meet the NZTA standards for all arterial, collector and tourist routes.

- Renewals - Usually done as part of reseals and rehabs.
- Improvements - All improvements are identified through dispatches raised through RAMM Contractor or road safety inspections. There is no set strategy for these improvements with the majority of improvements being implemented through the minor improvements programme.
- New Assets - Through capital works.

7.8.1.2 Description

The signs, markings and delineation activity include:

- 40,539 Signs - broken into:

	FNDC	KDC	WDC
Advisory	3389	3060	3922
Regulatory	4291	2149	4845
Temporary Warning			26
Warning	8239	3956	6662
Grand Total	15919	9165	15455

- 29.4km of Sight Rails – does not include safety barriers, these are considered in the road safety barrier activity (FNDC – 18.3km; KDC – 4.2km; WDC 6.9km).
- Pavement Markings
- RRPMs (Reflective Raised Pavement Markers)
- Edge Marker Posts

7.8.1.3 Management & Operations

Maintenance Contract

The *Road Maintenance Contracts* incorporate all operation, maintenance and renewals of signs, sightrails, markings, raised reflectorized pavement markers and edge marker posts. The contract also covers the creation of new signage, markings and delineation as requested by the Engineer.

State Highways

As part of the MOU with NZTA the Roading Department is responsible for markings on the State Highway network such as parking bays, taxi stands, fire hydrants, bus bays and loading zones. All other markings are the responsibility of NZTA.

All marker posts are the responsibility of NZTA.

The Roading Department are responsible for certain signs on the state highways. These are;

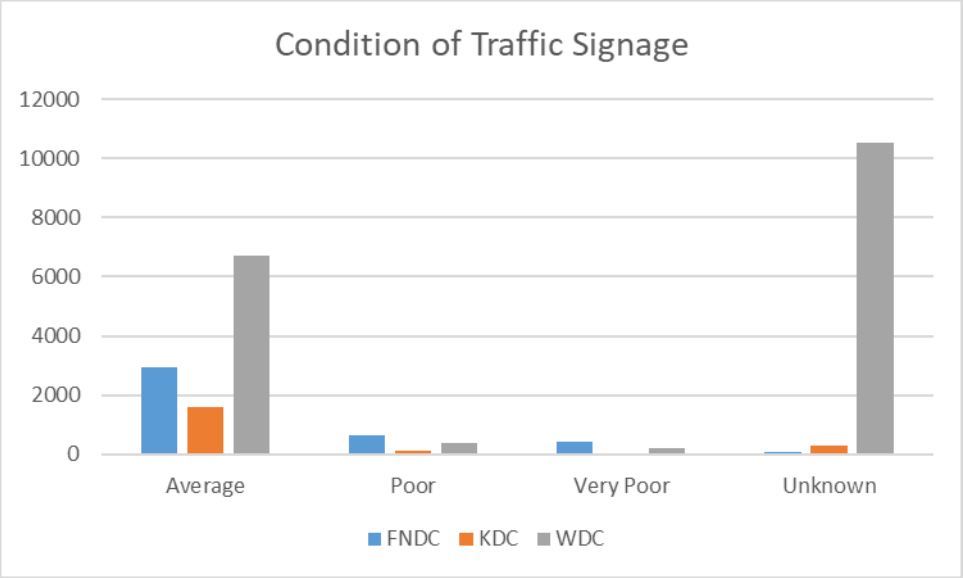
- Road names
- Locality and services
- Some general information
- Tourist route

- School zone
- Parking
- Community facilities

7.8.1.4 Monitoring & Condition

Signs

The figure below shows the condition ratings of the road signs across the district.



There is significant proportion of the assets 34% for WDC which has unknown condition recorded in our RAMM databases and this will require repopulating.

It can be seen from the condition ratings that the majority of the signs are in 'average' or above condition, however due to the small amount of data available on the age of the signs, the graph above is unlikely to be an accurate representation.

7.8.1.5 Acquisition (Growth) Plan

Creation of these assets is undertaken through minor improvement works as a result of any identified deficiencies or customer requests. New assets can also be created through major capital projects or roads being vested with council through subdivision development.

Sight rails are often installed due to storm damage. If any unsafe or major works cannot be repaired within a certain timeframe, a sight rail is installed as part of the minor safety works to advise road users of the hazard. Sight rails are not normally constructed from minor safety studies as there is a move to use signage rather than railings.

7.8.1.6 Maintenance Plan

The faults with these assets are identified in the following ways;

- CRMs
- client identifies
- patrol for specific reasons e.g. storm, strong winds, spate of vandalism
- changes requested WDC

- faults identified in the field by our team
- faults identified by our routine maintenance patrol

The maintenance plan is based on the routine inspections and planned and reactive maintenance. Night inspections are required to be completed twice a year for T1 – T5 roads and once a year for others. These inspections are to ensure that all signs and markings are clearly visible at night. The only planned maintenance for this activity is the cleaning of all edge marker posts which is to occur annually. All other maintenance is reactive.

Maintenance Decision Processes

The faults are prioritised by their function, the more relevant to safety and enforcement the higher the priority. Priority is assessed by field engineer and the area engineer. In practise the work is a flow from identification, to ordering, to supply, to installation. Usually this happens quite smoothly so the jobs are done in the order they are identified.

Routine and minor reactive maintenance is based on the intervention levels and response times set out in the maintenance contracts. Any large maintenance that is identified is prioritised based on the risks posed by the defect and the criticality of the asset or associated road.

Parking and Edgeline Policy

The current policy is that council does not remark edge lines and parking limit lines in the District's Urban areas (50kph or less) unless the edge lines form part of a formal marked cycleway.

Reinstatement of marking after repairs:

Apart from reseal sites as described below, all failure repairs are to have the markings reinstated within 5 working days irrespective of when the annual remarking is going to take place.

Repairs that are going to be resealed over in the current season may not have to marked ahead of the reseal. Temporary marking will be required if safety, compliance or regulatory issues are likely to arise and/or the time lapse between the repair and reseal is going to span a few weeks. Reinstating rural roads centre lines, edge lines etc. are less of an issue.

7.8.1.7 Renewals Plan

Failures are identified either through the regular inspections of the entire network or through the night inspections conducted that focus on signs, markings and delineation.

The standards for the renewal of signs, markings and delineation are set out in the maintenance contract.

7.8.1.8 Improvement Plan

It is proposed to continue with the following improvements:

- Provide RRPMs and edge marker posts to NZTA standards on all arterial, collector and tourist routes.
- Long life pavement markings shall be used on major intersections where there is a positive payback period.

- Sight rails are to be progressive lowered where necessary so that they meet the 0.5 x eye height standard.

7.8.2 Traffic Island & Calming Device Activity

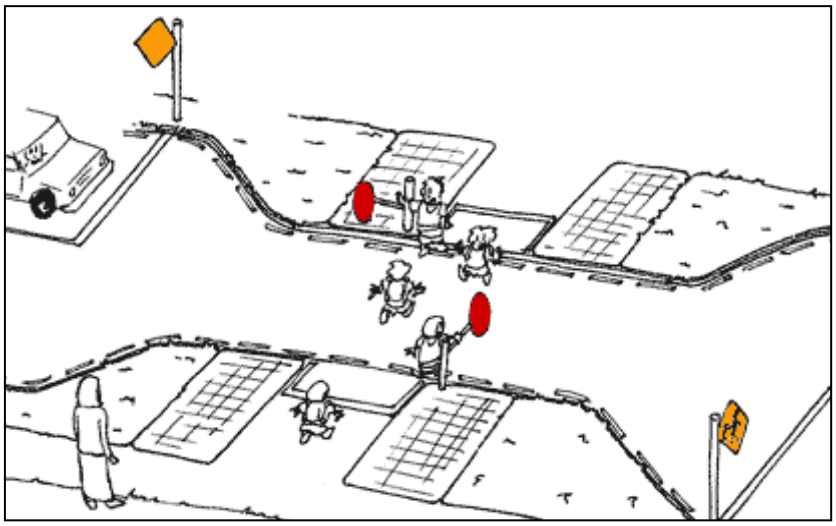
7.8.2.1 Overall Strategy

7.8.2.2 Description

The Traffic Island and Calming Devices Activity includes of the following assets;

- Rotary Islands – large central islands at an intersection
- Channelized Islands – to guide traffic into the correct lanes or to slow the traffic through Chicanes
- Divisional Islands – dividing the highway into separate directional traffic thus eliminating head on collisions and reducing accidents.
- Pedestrian loading Islands – to protect pedestrians at bus stops or crossing points including schools
    - Kea Crossings – marked crossings with foldout signs, generally outside schools (see **Error! Reference source not found.**). These are temporary crossings that are only in operation for

a limited period before and after school hours. Outside these hours vehicles are not required to give way to pedestrians.



Typical Kea Crossing Configuration[1]

- Speed Humps – these are often constructed in conjunction with traffic islands.

7.8.2.3 Quantity of Assets

The majority of these assets are unknown in quantity as there is little information in RAMM and no records regarding the creation of the majority of the assets. A program may be put in place to acquire this information, but what information we do have on record is shown in the table below:

	FNDC	KDC	WDC
Channelizing	86	39	244
Divisional Island	34	9	28
Other	4		17
Pedestrian Loading Islands	40	22	218
Rotary Islands	21	5	24
	185	75	531

7.8.2.4 Management & Operations

Maintenance Contract

The *Road Maintenance Contract* covers most of the maintenance of these devices. Although the contract does not mention them specifically, it does cover their components such as markings, signage, surfacing and pavements.

Parks Department

Garden in-fills on traffic islands, roundabouts etc. are the responsibility of the Councils Parks Department and maintained through their maintenance contracts.

[1] From NZTA *Kea Crossings: School Crossing Points (Factsheet 26)*

7.8.2.5 Monitoring & Condition

The majority of these assets are inspected as part of the *Road Maintenance Contract* in terms of their markings, signs etc. However, no formal inspection or condition rating process is in place for these devices and very little is known about them in terms of type, age, location etc.

7.8.2.6 Acquisition (Growth) Plan

Selection Criteria and Formal Ranking Procedure

The creation of these assets is generally undertake either as part of a Major Project, such as the creation of a new road or a major seal renewal, or as Minor Improvement works through customer requests of identified Safety Deficiencies.

7.8.2.7 Maintenance Plan

As mentioned in the Management & Operations section, there is no maintenance contract or plan specific to these devices, however their components are covered by the *Road Maintenance Contract;*

- markings,
- signs,
- surfacing, and
- pavements

and the Parks Department maintenance contract for the maintenance of garden in-fills.

Any further detail on maintenance can be found in the relevant sections of this Life Cycle Management section.

7.8.2.8 Renewals Plan

The majority of these assets are unknown in terms of their condition, age etc. This means that the renewal of these assets generally only occurs as part of pavement or surface renewal projects or as Minor Improvement works identified through the Deficiency Database.

7.8.2.9 Improvement Plan

Improvements of these assets will only be undertaken as part of Capital Improvement Projects such as pavement or surface improvements.

7.8.3 Street Furniture & Bus Shelter Activity

7.8.3.1 Overall Strategy

Summary of the overall strategy for the next 5-10 years including:

- Maintenance & Operations - When a shelter is vandalised on a regular basis, it becomes too expensive to replace the glass – approximately $2,500 to re-glaze an entire shelter. The next step is that when a more appropriate/deserving site is identified the vandalised shelter may be refurbished and relocated
- Renewals - The old steel shelters are becoming structurally unsafe. When these are removed, a decision on the replacement style of shelter will be made based on the track record of vandalism in the area.
- New Assets - This will be driven by customer requests and validated by the NRC. Some sites do not lend themselves to shelters due to the lack of space or resistance from property owners. Shelters are often perceived by locals to be venues of undesirable behaviour. New vandal proof shelters have been installed at some sites replacing glass sided shelters as they are relocated.

The capital expenditure has in the past been vulnerable to cost cutting. However, to achieve the proposed gains in public transport use that have been identified in the Whangarei Transportation Strategy, a budget increase is being proposed that enables five new shelters to be installed annually (up from the previous two per annum). An increase is also being proposed to provide additional seating.

7.8.3.2 Description

The street furniture and bus shelters activity consists of;

- 74 seats (all located in the CBD);
  - 7 bench seats with no backs
  - 67 bench seats with backs
- Seven timber fences at a total length of 607m,

- An unknown quantity of bollards, and
- Approximately 50 bus shelters (glass, concrete and steel).

Typical Bus Bench Seat

7.8.3.3 Management & Operations

Public Bus Stops & Shelters

The Northland Regional Council tender and manage the bus service in Whangarei and to surrounding areas: Bream Bay; Hikurangi and Hokianga. Over recent time the NTA have started managing the associated bus service infrastructure on behalf of the NRC. This has been done on the basis that WDC Roading Department have the resources and physical works contractors to more effectively put this infrastructure in place. NRC provides some subsidies regarding the creation and maintenance of the bus shelters.

School Bus Stops & Shelters

Rural school bus shelters and stops are not funded by the Roading Department. The creation and maintenance of these shelters is generally undertaken and funded by community groups.

Ownership

Some clarification is required as to which Council department owns and is responsible for some of the benches in the district. In generally any benches in the road reserve is owned by the Roading Department; however, those in walkways/alleyways that link roads to parks or reserves could be deemed the property of either the Roading or the Parks Departments.

NZTA

Street furniture on the urban highways is the responsibility of WDC, while NZTA looks after all furniture on the rural highways.

Maintenance Contract

The maintenance and operations associated with the district's street furniture are conducted by the maintenance contractors and governed by the *Road Maintenance Contract.* This excludes bus shelters which are maintained by small local operators.

7.8.3.4 Monitoring & Condition

The data retained in RAMM for the condiiton of the Bus Shelters records 50% as excellent and 50% and unknown. It is therefore unrelaiabe data and further update is required for reporting the condition of the bus shelters.

7.8.3.5 Acquisition (Growth) Plan

Street Furniture

It is anticipated that approximately five seats/benches per year are to be installed at a cost of around $10,000. These, along with bollards and fences are generally installed as part of street scaping projects.

Bus Shelters

The Northland Regional Council (NRC) operates the local buses in the district and works closely with the Roading Department to determine the most appropriate location for bus stops and shelters. The Northland Regional Council's Public Transport Infrastructure Strategy will help determine the current and long term location of bus stops and their associated infrastructure (pull off bays, bus shelters, signage and seating).

The selection process for bus shelters is based upon a number of criteria:

- List of sites compiled from NRC, the bus company and the public. These sites can be influenced by changes in bus routes or extra routes being included.
- Passenger volumes are then considered – this can define the sort of shelter required.
- Pull off bays as part of the bus shelter – designed behind the whole bus pull off area.

7.8.3.6 Maintenance Plan

Maintenance of street furniture, including bus shelters, is conducted as part of the *Road Maintenance Contract*. The furniture is inspected during the inspections of the entire network .Bus stop maintenance is reactive only.

All bus shelters are cleaned monthly small local operators.

Fence maintenance is all reactive and is generally driven by customer complaints.

A large part of the maintenance of street furniture and bus shelters is due to vandalism and tagging. The glass bus shelters are the most susceptible to vandalism,

7.8.3.7 Renewals Plan

Benches

Generally around two seats per year are refurbished at a cost of approximately $1,000 each.

Bus Shelters

All the old steel bus shelters in the district require renewing and the glass shelters are to be phased out due to their susceptibility to vandalism. These may be replaced by perforated steel shelters. These renewals will occur at a rate of two replacements per year.

The assets that require renewal are generally identified either by the maintenance contractors during their inspections or by the public. There are no set intervention levels of defects that are used.

The renewal of both the steel and glass shelters is being undertaken due to the steel shelters reaching the end of their life-spans, and the glass shelters requiring a high level of maintenance.

7.8.3.8 Improvement Plan

It is proposed that an accelerated programme of 5 new bus shelters and seats be provided on an annual basis to encourage uptake in public transport use.

7.9 Operational Traffic Management

7.9.1 Traffic Signals Activity

7.9.1.1 Overall Strategy

Detectors – Induction detector loops are quite an issue at some locations. Overall the main technical issue is the quality and accuracy of detection, particularly for vehicle and in some cases cycle detection. The quality of detection is very important, and directly impacts the levels of service delivered. Waterproofing feeder cables at the joint with the loop wire tails in kerb junction (toby) boxes has been done at a number of sites and this has assisted, along with cable replacements where necessary. A rolling programme will be developed to address this issue going forward. This programme will also address life cycle issues with premature loop replacement in thin asphalt pavements as a result of loops being destroyed during TAC reseals and needing replacement post reseal. The programme will also address gaps found in the National P43 specification for traffic signals in terms of detailing loop installation in new and existing pavements.

In addition, it is proposed to provide improved pedestrian and public transport detection technology at key intersections. The pedestrian detection will utilise CCTV cameras using a thermal imaging and analytics technology to confirm whether a pedestrian is still waiting to cross before activating a pedestrian phase to limit green time being wasted by cancelling demands if the user should leave the detection zone, this will improve the efficiency of intersections and manage potential privacy issues .

Public transport detection will be provided using the SCATS Priority Engine (formerly known as PTIPS) system which enables detection of approaching buses using in-board transmitters which are being fitted in the Northland Regional Council's bus service. This system will enable a specific phase to be called to give the approaching bus priority on the intersection over other movements, increasing the efficiency of the bus service.

SCATS Master Computer – The main SCATS computer located at Forum North that controls the traffic signal network is 10 years old, technologically obsolete and is becoming unreliable. There is a significant risk that this old computer will fail, which would result in all traffic signal sites reverting to the default settings stored at intersection computer level, which would cause major congestion. It is proposed to replace this computer with a new modern computer with updated communications technologies, including GSM. This should result in a more reliable and efficient management of the traffic signals.

The existing SCATS communications hardware also only has sufficient capacity to cater for 32 sites. Following the completion of the Kamo Cycleway and SH1/Tarewa Rd intersections projects there will be 30 sites, which will not allow for sufficient capacity to cater for future demand, particularly that resulting from the Whangarei to Te Hana project which could introduce another 5 signal sites in Whangarei City. The new SCATS communications equipment will also provide sufficient capacity to cater for future demands from proposedadditional sites in Whangarei and elsewhere in Northland.

A review in conjunction with ICT has found that there are items within the ICT architecture that need attention to ensure SCATS and corporate operations are separated, and appropriate information security practices are followed. This will be included in the work on the master computer above.

Communications - The majority of the network operates on leased circuit analogue point-to-point copper lines. Telecom/Chorus has advised that the leased circuit point-to-point copper communications links we currently use are now regarded as a "legacy" product, i.e. there will be no new circuits and any we retire will not be able to be reactivated. This copper wire communication is becoming unreliable due to its age and lack of maintenance which can cause a site to "drop out" from the SCATS system and revert to its default green time settings. Therefore, we need a new communications solution for traffic signals. WDC is proposing to install an IP-based network for our communications using a combination of private fibre connection to its signals using the cycleway network, and common carrier fibre and xDSL (digital subscriber line) for those intersections where fibre is not available.

Ducts for this fibre network are being installed as part of the Kamo Cycleway and can be retrofitted on the other cycleway corridors. Traffic signals that do not have WDC fibre connections will be connected to the Northpower fibre network, or will have xDSL communications. 4G will also be used as a back up for the primary fibre or xDSL communications should the service go down. This should make WDC's traffic signals more reliable and efficient.

Traffic Monitoring Cameras(CCTV) – Currently the traffic signal network has no cameras, which means that some issues that occur on site can only be addressed by someone visiting the site to confirm and determine what is causing the issue. This results in slower responses to issues that occur and increased delay to traffic flows. In conjunction with the proposed improvements to communications, the Council is proposing to install CCTV cameras on its traffic signal network to enable the traffic signals to be controlled remotely resulting in faster response times to issues and a more efficient service. It will also enable better monitoring or crashes and incidents resulting in easier identification of issues requiring upgrade works. Over the 2018/21 period, five intersections will be upgraded with CCTV cameras to trial this approach.

Remote Operations – Following the upgrade of the SCATS master computer, the improved fibre/xDSL communications and installation of CCTV Cameras, the Council will have improved ability to control the traffic signal network remotely. It is also proposed to combine the streetlight CMS system being installed as part of the LED streetlight conversion project currently underway with the School Zone and other ITS

signs as well as the Te Matau a Pohe bridge operations to create a true remote operations centre, similar to that of ATOC (Auckland Traffic Operations Centre). This system would include fault recognition which would generate an automatic text to maintenance staff to alert them to issues as they arise. This will enable faster response times to issues, efficiencies in operating costs and back up from ATOC or other providers when necessary.

Traffic Signal Controllers – Good progress has been made with replacing old obsolete traffic signal controllers and this programme needs to be completed. Two obsolete traffic signal controllers will be replaced in the 2018/21 period at the Rust Ave Railbridge overheight warning signals and at the Dent St/John St pedestrian crossing.

As part of the transition to an IP-based /ethernet based network it has been identified that we require a device with a native ethernet communications capability. This is to facilitate administration and diagnosis and further, more importantly to improve the security of the urban traffic control system architecture by promoting a "defence-in-depth" security posture.

Belisha Pedestrian Crossings - Many of the crossings have cable that is of the tough-plastic-sheathed (TPS) type. This is the type of cable normally used in internal building electric "fixed wiring" and as such is not rated for use in an underground situation. All crossings in this situation require their wiring to be replaced for safety with suitably rated cable such as neutral-screened cable.

Lighting on the crossings currently does not comply with the requirements of AS/NZS1158.4:2009 Lighting for Pedestrian Crossings and other aspects of the AS1158 Road Lighting series, however this issue will be addressed as part of the LED streetlight conversion which is currently underway.

7.9.1.2 Description

This group includes all components associated with traffic signals and level crossing lights;

- Signal Pole / Outreach Arm
- Signal Lantern
- Pedestrian Call Box
- Loops
- Cabling
- Control Cabinets
- External detection, e.g. thermal imaging cameras
- SCATS Control System

There is a total of 31 traffic signals sites that are maintained and operated by WDC. Of these, 9 are on the State Highway network but are managed by the Roading Department as part of the signals network. There are also 17 pedestrian crossings which are electrically lit at night and which also operate Belisha beacons.

7.9.1.3 Management & Operations

The management and operations of traffic signals is conducted using SCATS.

The Council operates a programme called the Sydney Coordinated Adaptive Traffic System (SCATS). This programme provides the ability to;

- link intersections to effectively respond to changes in traffic flows,

- monitor intersections performance,
- collect and analyse fault and alarm data, and
- operate a fall-back system to allow intersections to operate in the event of communication breakdowns.

Maintenance Contract

The maintenance of traffic and pedestrian signals is governed by the *Traffic and Pedestrian Signal Maintenance Contract*. The contract covers 31 sets of traffic lights, 17 lit pedestrian zebra crossings, and 66 school zone signs and includes any installations necessary as well as maintenance and inspections.

NZTA

The Roading Department manages and maintains the traffic signals on the district's state highways as part of an agreement with NZTA. NZTA reimburses all maintenance costs associated with these signals and includes an additional 9% of the overall expenditure as professional fees.

7.9.1.4 Monitoring & Condition

As part of the maintenance contract the signals are inspected every three months.

The main condition issues that have been identified are;

- On-going maintenance issues that are created due to repairs done under a constrained budget such as vehicle detection,
- Old controllers that are now technologically obsolete,
- Old SCATS master computer that is becoming less reliable;
- Old plastic housings that are allowing water to seep into the lanterns, and
- Corrosion issues around old poles, possibly rusting from the inside out.
- Aging communication equipment – technology obsolescence and end of service life

7.9.1.5 Acquisition (Growth) Plan

Most new signals are created as part of a larger project where a major intersection realignment or new urban link is being planned. Therefore, requirements for the traffic signal component are completed as part of the larger project. An example of this is the Kamo Cycleway project which is currently under construction and has added 4 TOUCAN combination pedestrian and cycle traffic signals to the network.

Where a signalised control project is being completed as a standalone project, the planning issues revolve around property purchase negotiation and consultation with affected parties. Where the project is 'simple', issues are not generally significant so planning can be completed within the same year as the design and physical works. Where the projects are more complex, planning and design is committed to the year prior to the physical works.

A complex project is defined as where a full intersection redesign is required that may include realignment of the intersection or an existing non signalised intersection has been identified for signalisation.

The following table details new traffic signals which may be added to the network managed by WDC.

Table 4 - Traffic Signal Acquisition Projects

Project	New Assets	Indicative Timing
Bank / Dent Street	1 new traffic signal site	2021-2024
Walton / Robert intersection	1 new traffic signal site	2021-2023
SH1 Whangarei to Te Hana Upgrade	Potentially 5 new traffic signal sites at the southern end of Whangarei City	2019-2028
SH1 Kawakawa Pedestrian Crossing Upgrade	1 new pedestrian signal sites	2018-2023

7.9.1.6 Maintenance Plan

Traffic signals maintenance is tendered as a separate contract. Council also undertakes the maintenance of the state highway signals groups on behalf of NZTA.

The maintenance plan is based on the routine inspections conducted every 13 weeks. From these inspections any minor maintenance, under $1,000, is undertaken as per Volume 2 - Appendix E. Any major maintenance, over $1,000, must first be authorised by the Council's engineer and then it becomes scheduled maintenance.

Over the past years the repairs on traffic signals have been undertaken with budget constraints. This has resulted in on-going long-term maintenance issues such as;

- Old plastic housings that are allowing water to seep into the lantern heads.
- Corrosion issues around old poles, possibly rusting from the inside out.
- Detector failure due to poor pavement / surfacing and old cabling and ducting.

Reactive, unplanned and emergency works undertaken on traffic signals are based on the criticality of the signals with;

- Critical sites running 24/7 and attracting priority for repairs,
- Important sites operable within 4 hours of defect notification, and
- Non-critical sites operable as soon as possible but within 24 hours of defect notification.

7.9.1.7 Renewals Plan

The detector loops at many sites are subject to water ingress and are unreliable or have failed. This results in inefficient allocation of green time due to poor or no vehicle detection which leads to increased delays and congestion.

A review is planned to assess whether the design/installation methodology is appropriate and the outcome of this will be fed into the contract standards and the WDC Regional Special Conditions to the P43 National Specification.

The SCATS master computer is now 10 years old and is becoming unreliable. There is a significant risk of this computer failing which would result in all traffic signal sites reverting which would result in all traffic signal sites reverting to the default settings stored at intersection computer level, which can cause significant congestion due to loss of adaptive signal control (the fallback plans are fixed-time plans).The network currently has two controllers that are now technologically obsolete. This means that it is no longer possible to acquire parts for these assets, leading to severe maintenance issues.

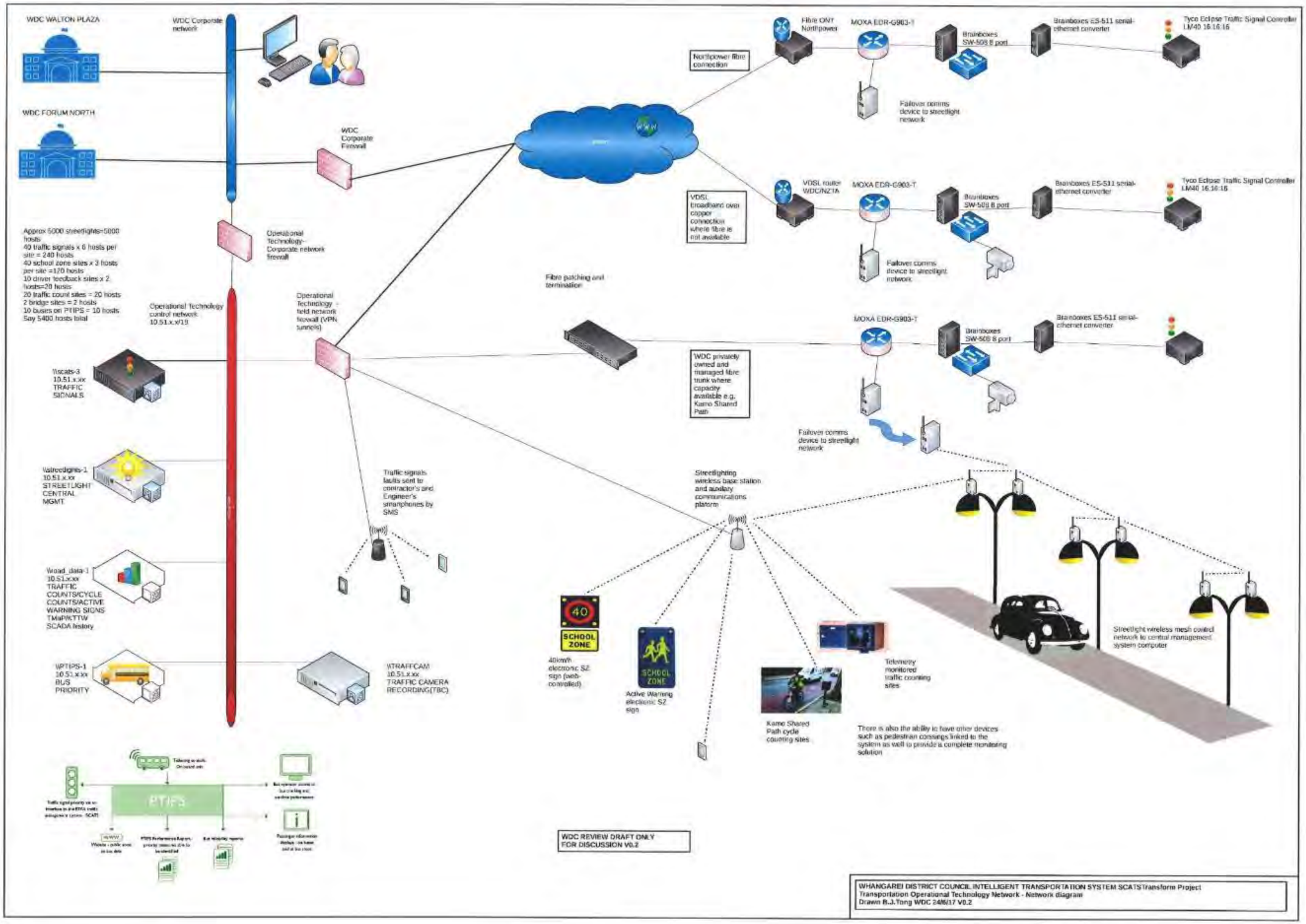
The aim of the renewals programme over the 2018/21 period is to have a rolling programme of detector renewals, replace the old SCATS computer and to replace the two obsolete traffic signal controllers.

7.9.1.8 Improvement Plan

A substantial improvement of the traffic signal network is planned.The improvement projects that are proposed include:

- Replace the obsolete copper wire communications with fibre optic/xDSL communications with 4G failover.
- Install CCTV cameras, including pedestrian detection cameras and PTIPS for bus prioritisation
- Develop a remote operations control centre to control the traffic signal network, ITS devices, streetlight network and the Te Matau a Pohe and Kotuitui Whitinga opening bridges.
- Trials and introduction of intelligent transportation systems technologies including thermal imaging camera vehicle detection, infrastructure to user/user to infrastructure ITS technology e.g. Beasmart which allows the visually impaired to interact with the traffic signals
- Introduction of uninterruptible power supply (UPS) technology at critical intersections to limit the impact of power outages shorter than 5 hours duration on network operation and service levels.

A schematic diagram of how this remote operation would be structured is provided on the following diagram.


WDC WALTON PLAZA
WDC Corporate network
WDC FORUM NORTH
WDC Corporate Firewall
Approx 5000 streetlights=5000 hosts
40 traffic signals x 6 hosts per site = 240 hosts
40 school zone sites x 3 hosts per site =120 hosts
10 driver feedback sites x 2 hosts=20 hosts
20 traffic count sites = 20 hosts
2 bridge sites = 2 hosts
10 buses on PTIPS = 10 hosts
Say 5400 hosts total
Operational Technology- Corporate network firewall
Operational Technology control network 10.51.x.x/19
Operational Technology - field network firewall (VPN tunnels)
\\scats-3 10.51.x.xx TRAFFIC SIGNALS
\\streetlights-1 10.51.x.xx STREETLIGHT CENTRAL MGMT
\\road_data-1 10.51.x.xx TRAFFIC COUNTS/CYCLE COUNTS/ACTIVE WARNING SIGNS TMaP/KTTW SCADA history
\\PTIPS-1 10.51.x.xx BUS PRIORITY
\\TRAFFCAM 10.51.x.xx TRAFFIC CAMERA RECORDING(TBC)
Traffic signals faults sent to contractor's and Engineer's smartphones by SMS
Fibre patching and termination
Northpower fibre connection
Fibre ONT Northpower
MOXA EDR-G903-T
Brainboxes SW-508 8 port
Brainboxes ES-511 serial-ethernet converter
Tyco Eclipse Traffic Signal Controller LM40 16.16.16
Failover comms device to streetlight network
VDSL Broadband over copper connection where fibre is not available
VDSL router WDC/NZTA
WDC privately owned and managed fibre trunk where capacity available e.g. Kamo Shared Path
Streetlighting wireless base station and auxiliary communications platform
40km/h electronic SZ sign (web-controlled)
SCHOOL ZONE
Active Warning electronic SZ sign
Kamo Shared Path cycle counting sites
Telemetry monitored traffic counting sites
Streetlight wireless mesh control network to central management system computer
There is also the ability to have other devices such as pedestrian crossings linked to the system as well to provide a complete monitoring solution
PTIPS
WDC REVIEW DRAFT ONLY FOR DISCUSSION V0.2
WHANGAREI DISTRICT COUNCIL INTELLIGENT TRANSPORTATION SYSTEM SCATSTransform Project
Transportation Operational Technology Network - Network diagram
Drawn B.J.Tong WDC 24/5/17 V0.2

7.9.2 Intelligent Traffic System Activity

7.9.2.1 Overall Strategy

- School Zone Signs - The maintenance cost for the SCZ40 type signs is much too high, in excess of $50k per annum. The key issue is that moisture enters the signs and the electronics deteriorate rapidly after a time in the field. We have attempted to resolve this with a retrofit sealant solution (magic rubber) but this only produced a partial cure.

  The preferred solution is to retire these signs and commence a replacement programme. A new type of sign the ASL SZS sign has been identified which has a much higher level of water resistance and with digital telemetry equipment to identify faults. There are some 35 SCZ40 signs in the network as outlined above.

- Traffic Count Loops - Council's traffic counting is largely procured using contracted resources based on tube traffic counters. For higher volume routes and inner CBD areas this method is not suitable for reasons of wear and tear on equipment, Health & Safety for count staff, vandalism and accuracy. Where the traffic flow is greater than 10,000 ADT as the H&S and count reliability issues become difficult to manage we need to consider installing a permanent count site.

  Council is proposing to install telemetry traffic and cyclist/pedestrian counters in conjunction with the planned traffic signal upgrades and school zone signs which with the data being sent via WiFi to Council's traffic operations centre (TOC).

7.9.2.2 Description

The Intelligent Traffic Systems (ITS) Activity consists of;

- Driver Feed-Back Signs
- School Zone Signs HMI SCZ40 40km/h roundel – solar powered
- School Zone Active Warning Signs HMI SCZAFL – solar powered
- VMS signs associated with the Te Matau a Pohe bridge
- Inductive Loop Traffic Counting Sites – classification
- Inductive loop Traffic Counting Sites - vehicle count only

7.9.2.3 Quantity of Assets

The WDC owns two driver feedback devices that are moved between seven sites. These are installed to provide driver awareness and feedback on speed in order to educate the driver to be aware of the speed limit in relation to their travelling speed. This is a joint campaign between WDC and ACC and is directed at reducing speed in the urban areas.

Additional to this, there are also a number of schools which are now limited speed zones (40km/hr) during certain times during the school week. Council has 27 school variable speed zone sites. The hardware comprises of 35 SCZ40 40km/h roundel signs (HMI), 13 SZS 40km/h roundel signs (ASL), and 18 Active Warning Signs type SCZAFL (HMI).

The Active Warning signs are installed in rural environments with a 100km/h base speed limit as these locations do not meet the Traffic Note 37 requirements for a 40km/h variable speed limit to be imposed.

There are 5 road VMS signs controlled via wireless communications via the Te Matau a Pohe bridge PLC. There are also 8 inductive loop traffic counting sites on the road network.

7.9.2.4 Management & Operations

The maintenance of ITS assets is completed under the *Traffic and Pedestrian Signal Maintenance Contract* and therefore is subject to similar maintenance, renewal and improvement plans.

7.9.2.5 Monitoring & Condition

No condition data is collected on this asset at this time. The asset operation is monitored through the maintenance contract.

7.9.2.6 Acquisition (Growth) Plan

There are no plans to create or acquire any ITS. The creation of these assets results from demands from customers or through finding from minor safety studies. All ITS are funded by the community or the Low Cost/Low Risk Improvements budget.

7.9.2.7 Maintenance Plan

As part of the *Traffic and Pedestrian Signals Maintenance Contract* the school zone signs are inspected before the start of each school term (four times per year). From these inspections any minor maintenance, under $1,000, is undertaken. Any major maintenance, over $1,000, must first be authorised by the Councils engineer and then it becomes scheduled maintenance.

Minor maintenance is based on the maintenance contract (the response times etc. are set out in Volume 2 Appendices) while major maintenance is prioritised based on the severity of the damage and the criticality of the asset.

7.9.2.8 Renewals Plan

The School Zone Signs 40km/h type SCZ40 are to be retired as Council's field experience with this particular unit has been poor. To keep the unit's operating has been a struggle and the ongoing poor reliability has produced significant amounts of negative feedback from our School stakeholders.

There is also an ongoing cost for providing the communications for the signs.

The replacement is the ASL type SZS. This sign has full IP55 rating which means that the moisture ingress problem that has caused ongoing faults due to corrosion and electrical deterioration will be resolved. The device also has remote monitoring via the GSM network and a proprietary web interface (Digital Telemetry Ltd).

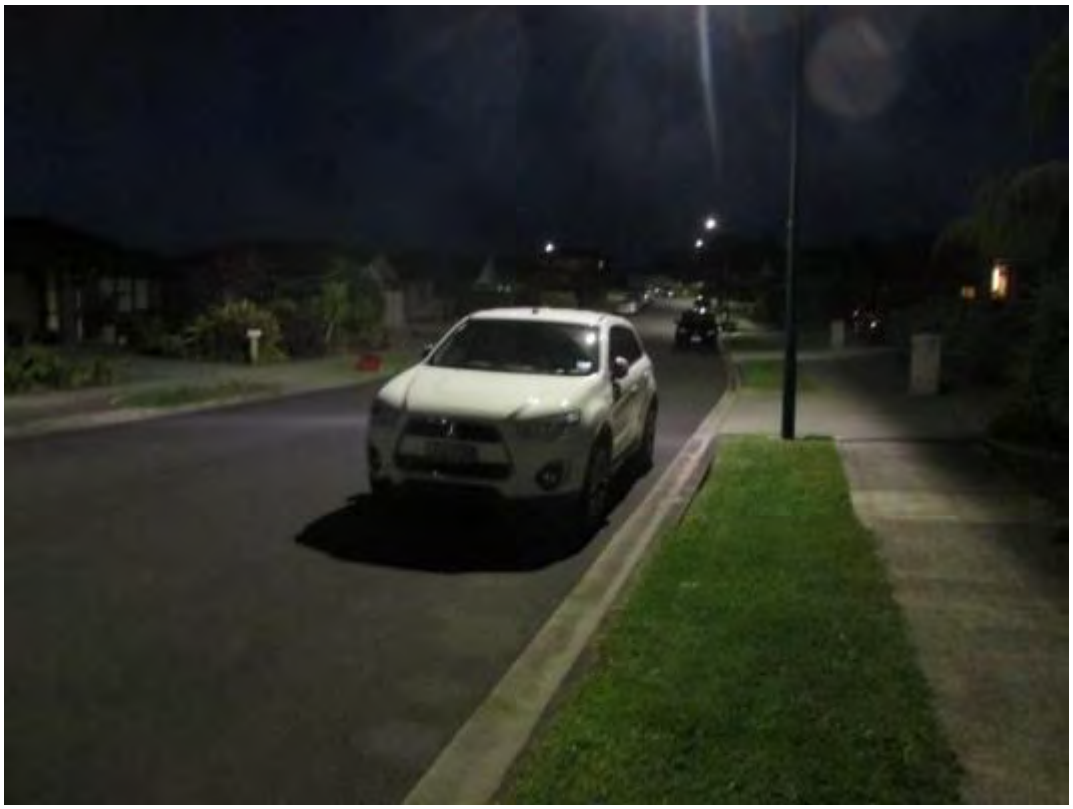
These features (and good feedback from Hutt City and Nelson City who are current users) is expected to dramatically reduce maintenance costs on this asset type.

The new type will be rolled out progressively, but it is envisaged that Schools will be prioritised based on the history of the equipment at each location.

7.9.2.9 Improvement Plan

Intelligent traffic systems are generally improved by replacing old assets with new technology, and this is incorporated in the Renewal Plan.

7.10 Network Lighting



7.10.1 Overall Strategy

LED Luminaires – All Councils are currently undertaking a replacement of all of its existing streetlights with LED streetlights. This work is being undertaken to achieve efficiency gains because LED luminaires have 30-60% less power consumption than traditional street lights and are expected to last 20 years which reduces maintenance costs. A business case prepared by Opus has indicated that the payback period for LED luminaires is about 8-10 years. Overseas research also indicates that white light of around 4000 K (kelvin) is superior in terms of reaction times for motorists and this translates into crash savings of up to 30%.

Central Management System (CMS) – As part of the LED replacement project, a central management system (CMS) is also being installed. This consists of a light point controller (LPC) on each LED luminaire which sends a radio signal to a local gateway which then on sends this to a CMS via the internet using WiFi. This CMS will identify when a light is out and needs fixing and also will provide actual power usage for more accurate power billing. Council is also proposing to "piggy-back" off the CMS to provide telemetry for School Zone Signs and other ITS, as well as telemetry traffic and cyclist/pedestrian counters.

Infill Lighting – The Council have recognized the AS/NZS1158 series of standards as the standards that the adequacy of road lighting will be assessed against. These standards provide for two main categories: Category V lighting, where the intent is to light the road carriageway for the benefit of road traffic (ie arterial roads) and category P lighting, where the intent is to light the road corridor as a whole for the benefit of all users – to deter crime and fear of crime (ie local roads).

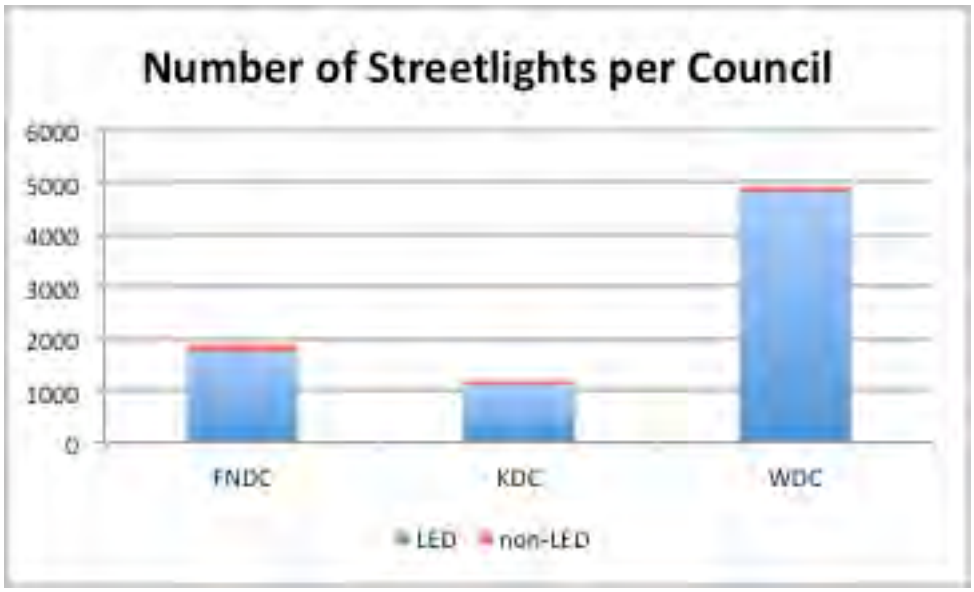
As part of the LED replacement project, the V Category intersections and roads on the Twin Coast Discovery Highway will be upgraded with infill lighting as necessary to meet the V Category standards and remove dark areas.

NTA has undertake a HISLAT survey to identify any dark areas on the P Category (local) roads and has prioritised the deficiencies based on proximity to schools, community safety, traffic flows and crash history. Where funding allows, some P Category infill lighting will be programme to address the worst of these dark areas.

Poles - Pole condition is a concern. There are quite a few concrete columns whose condition is unknown. Previously there were failures of Oclyte type columns at Riverside Dr and Bank St, and the discovery of acid soils and corrosion issues at Rewarewa Rd and also in the Marsden Point area means a non-destructively checking the condition of poles is required. Ongoing testing of streetlight poles is likely to require a regular replacement programme to be developed.

7.10.2 Description

There are a network of some 8,017 streetlights, amenity lights, and also a significant number of other lights in areas such as carparks, amenity areas and toilet blocks. Also Roading maintains feature and decorative lighting for other elements of Council.



The Network Lighting Activity includes all components associated with network lighting and is made up of the following asset categories;

7.10.2.1 Street Lighting

The street lighting is directly associated with the roads and streets to assist motorists with all necessary visual information (e.g. course of the road ahead, kerbs, footpaths, movement of pedestrians, cycles or other vehicles, etc.).

7.10.2.2 Amenity Lighting

Amenity lighting is associated with pedestrian areas to assist pedestrians with all visual information and personal security in hours of darkness.

7.10.3 Management & Operations

7.10.3.1 Maintenance Contract

The maintenance and operations of the networks light is governed by the *Streetlight Maintenance Contract*. It covers both street and amenity lighting in the urban and rural areas.

7.10.3.2 Ownership

There is some uncertainty around the ownership of some amenity lights. These uncertainties occur between the Roading Department and other Council departments around areas such as parks and public toilets.

7.10.4 Monitoring & Condition

As part of the maintenance contract every light is inspected at least once every five years.

There is currently no condition ratings in RAMM associated with either the poles or the lamps.

7.10.5 Acquisition (Growth) Plan

The requirement for capital street lighting programmes, inclusive of pedestrian lighting, is based on the deficiency identified on the network from lighting standards. In addition, capital lighting projects are requested by community groups to provide increased levels of lighting for safety reasons. These sites are assessed in terms of:

- community size
- safety issues being addressed
- related factors, such as police reports on theft in the area etc.
- impact on LoS and contribution to community outcomes
- budget constraints

These factors are then used to assess and prioritise one project against another. All projects are managed and maintained within the deficiency database.

Capital lighting projects can also be associated with new road construction and vested assets through subdivision development.

The capital works programme will focus on infill lighting on the P Category (minor collector and local roads) road network in FNDC and KDC, Amenity Lighting in WDC as well as an upgraded Central Management system (CMS).

7.10.6 Maintenance Plan

The maintenance of the network lighting activity is delivered through the *Streetlight Maintenance Contract*. The maintenance plan is based on the routine inspections, some planned maintenance and reactive maintenance. The contract requires night-time inspections of arterial roads, car parks and recreational areas to be conducted at least four times per year.

Following the LED conversion project, the maintenance plan will be revised through the next version of the *Streetlight Maintenance Contract* to reflect the much reduced maintenance needs of the LED luminaires and the improved response times following the implementation of the central management system (CMS).

7.10.7 Renewals Plan

A key current focus area is the introduction of Light Emitting Diode (LED) streetlight lamps to replace the older less power efficient lamps on our network. LED lights are providing the same light output for about half the power demand. The power costs for WDC's streetlights are about $0.6M/yr so the savings would be significant. In addition, LED lights have long lives of approximately 20 years compared to a replacement cycle of 5 years for High Pressure Sodium lights which will reduce bulb replacement costs.

LED streetlights are currently providing between 30-60% power savings. Modelling by Opus shows that the pay-back period for LED lights on the Whangarei network is in the order of 8-10 years.

7.10.8 Improvement Plan

The improvement of network lighting involves the replacement of old lamps with new, more efficient technologies and is therefore incorporated into the renewals plan. Occasionally infill programmes are completed for safety reasons. These are generally driven by customers concerns for personal safety.

Amenity Lighting

The Council is proposing to reintroduce a programme of amenity lighting upgrades to provide new lights to illuminate Council and community assets that are not associated with the transport network.

- To cater for community requests for improved lighting that is not subsidised by NZTA.
- The provision of this lighting creates a safer environment at night.
- Lighting is installed based on the priority.
- Upgrades are carried out by increasing the number of lights or light fittings.

Amenity lighting includes the lighting of:

- buildings
- property and reserves
- under-veranda lighting
- festive lighting
- any other lighting not directly related to the operation of a road.

7.11 Footpaths and Cycleways

7.11.1 Overall Strategy

Northland Regional Council has prepared a Northland Walking and Cycling Strategy (August 2018) in partnership with Far North, Kaipara and Whangarei District Councils. The Regional Strategy provides the overall framework for regional walking and cycling routes and aspirations of the Northland Region. It is consistent with the focus of the Whangarei District Walking and Cycling Strategy, The Kaipara Walking and Cycling Strategy and the FNDC draft Integrated Transport Strategy.

The table below defines the linkages between the National, Regional, and District strategies on walking and cycling:

Table 5 Linkages between Strategies

National	Regional	District
• The Government Policy Statement for Land Transport Funding is produced by the Ministry of Transport. It sets the priorities for central government land transport funding. • The New Zealand Transport Agency (NZTA) is a key partner	• The Northland Regional Land Transport Plan (2015- 2021) sets out the overall regional land transport priorities. This includes a strategic priority to increase travel choices and to improve participation in walking and cycling, and to promote connections between	• Whangarei District Council's Walking and Cycling Strategy 2018 (draft) provides the detail for a comprehensive set walking and cycling initiatives within the district and how these will link with other areas. • The Kaipara Walking and Cycling Strategy 2017 outlines

and funding agency for transport projects across Northland. • The Ministry of Business Innovation and Employment (MBIE) funds economic and regional development including cycle trail development. • The Department of Conservation (DOC) administers Great Walks, Short Walks and Day Hikes in its role as custodian for New Zealand's public conservation land. • The New Zealand Walking Access Commission is a Crown entity that protects and promotes free, certain, enduring and practical access to the outdoors. • Nga Haerenga, The New Zealand Cycle Trail Inc. is focused on growing New Zealand through outstanding cycling experiences. to promote connections between walking, cycling and public transport.	walking, cycling and public transport. • The Tai Tokerau Northland Economic Action Plan provides a strategic framework for regional economic and tourism development. • Northland Forward Together is the collective plan for all four Northland councils to work together to deliver better outcomes for Northland and its people.	plans for the district to become a walking and cycling destination. • Work is underway on a walking and cycling strategy for Far North District and an Experience and Product Development Plan for Pou Herenga Tai-Twin Coast Cycle Trail.

The strategy will assist in achieving the vision and responding to the issues and opportunities by delivering on four strategic focus areas.

1. Developing appealing and cohesive walking and cycling networks that connect Northland.
2. Growing walking and cycling participation and promoting Northland's coastal point of difference.
3. Improving community wellbeing including creating economic opportunities.
4. Ensuring walking and cycling infrastructure, and its use, is sustainable.

The first focus area emphasises the built infrastructure; the second concentrates on the promotion of that product; the third reflects the desire to see that the development bring benefits to Northlanders; and the fourth ensures that it is all done sustainably.

Figure 7-25 defines the cycle trails current and future.

Figure 7-19 Existing and proposed regional and walking cycle routes

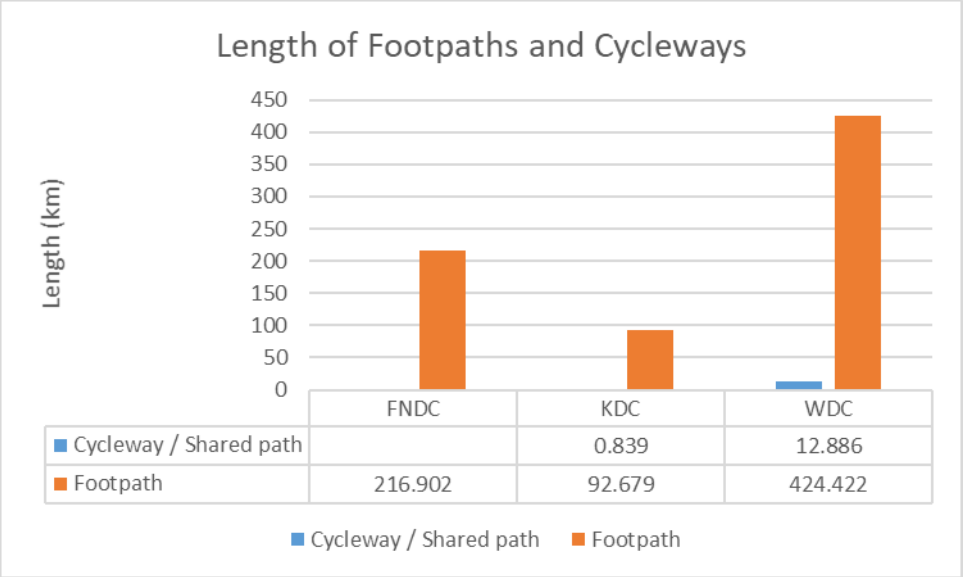
7.11.2 Description

This activity consists of assets relating to walking and shared paths: cycling and walking including;

- Shared cycleways
- Footpaths and walkways attached to the roading network, including kerb dropdowns and crossing places
- Pedestrian barriers

The three Councils maintains 734 km of footpaths, 13.7km of shared paths. Note the cycle trails are not included in this list. Over 95% of the paths are constructed from concrete, with a few others constructed from Asphaltic Concrete, interlocking blocks or timber.

The graph below provides a breakdown by Council:



7.11.3 Management & Operations

7.11.3.1 Maintenance Contract

Most of the maintenance and operations associated with this activity are conducted by the maintenance contractors and governed by the *Road Maintenance Contract*.

7.11.3.2 Ownership

Some clarification is required as to which Council department owns, and is responsible for, some of the walkways and alleyways in the district. In generally any walkway/alleyway that links two roads is owned by the Roading Department; however walkways/alleyways that link roads to parks or reserves could be deemed the property of either the Roading or the Parks Departments.

7.11.3.3 NZTA

As part of the MOU with NZTA the WDC is responsible for all school crossing controls, while NZTA is responsible for all other pedestrian crossing assets on State Highways.

All footpath maintenance is the responsibility of Council NZTA only reinstates the footpaths and only when they have been removed as part of State Highway works.

Cycleways are jointly funded by NZTA and Council where these are part of Council's approved Walking and Cycling strategy.

7.11.3.4 Vehicle Crossing Applications

All new vehicle crossings require consent from the Council to ensure that they are constructed to the appropriate standards and cause as little disruption as possible to roadside drainage and neighbouring properties.

The maintenance of driveways from the road edge to the property boundary is the responsibility of the property owner.

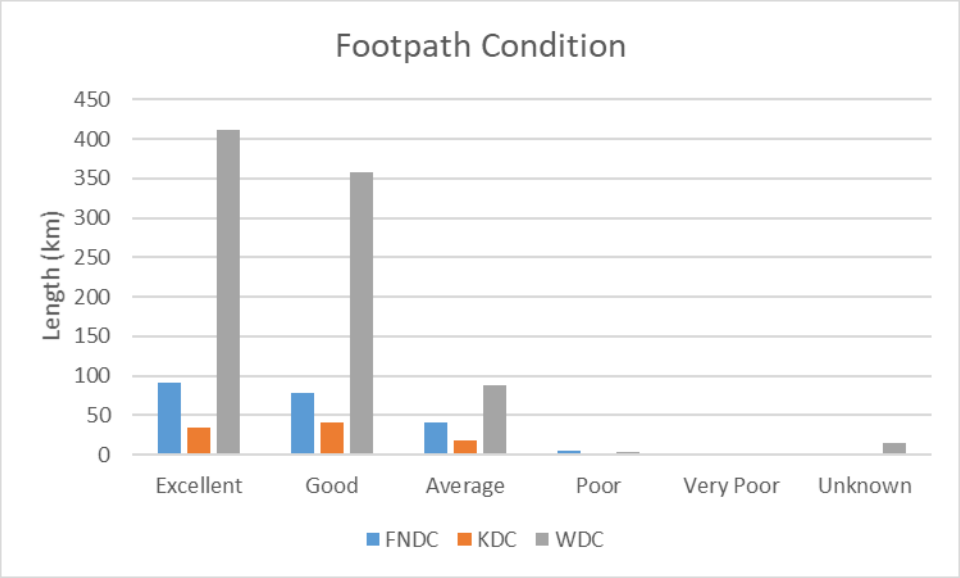
7.11.3.5 Cycle Paths

On-road cycle paths are managed as part of the carriageway so are covered by the sealed pavement and sealed surface activities.

7.11.4 Monitoring & Condition

7.11.4.1 Condition

The last rating for footpath condition was done in 2018. This data is held within RAMM footpath condition rating table and is used to programme footpath maintenance programmes.



The majority of the footpaths are classified as Excellent, Good or Average.

There is also no condition data for cycleways and there is no formal condition rating programme at present.

7.11.5 Acquisition (Growth) Plan

Along with creating footpaths, the council also takes ownership of footpaths created by others. These acquisitions are generally aligned with the creation of new roads, either by Council, or by other parties such as developers creating a new subdivision. All assets vested to Council must comply with the EES.

The Deficiency Database and Prioritisation (DDP) holds the footpath requirements of the network, which have been identified from a number of sources. As noted earlier the DDP uses risk and benefit outcomes to determine the highest priority works to be completed.

Due to funding constraints and the fact the identified work far exceeds Councils ability to implement all the required footpaths, a strategy has been developed to gain the maximum benefit from any footpath work undertaken. The strategy recognises the importance of the link as set out in the following:

Footpath projects are assessed through the DDP selection process which allows assessment of risk benefits.

The top priority sites are then reviewed in terms of the importance of the link. This focuses on those links, in priority order, that:

- link schools to neighbouring communities
- link hospitals and health care centres with communities
- create access to neighbouring parks and recreation facilities
- provide general community to community links

Once priority order is established a programme of footpath capital creation is developed to suit the funding available.

There are also certain issues regarding the type of assets vested to Council. For assets to be vested to Council they must comply with the EES. However, for footpaths and walkways there is no requirements regarding the materials that must be used to create these paths. This can / has resulted in the Roading Department acquiring assets that require higher levels of maintenance than most footpaths the department creates. An example of this is the recent acquisition of a footpath at Langs Cove that has been created using pebbles and hence requires significantly higher levels of maintenance compared to other footpaths in the area.

The footpath project list, based on the strategy above, is currently held within the DDP. Included in this programme is the development of Pedestrian Crossing points, Cycle Facilities and Pedestrian Facilities.

7.11.6 Maintenance Plan

Footpath and off-road cycleway maintenance is completed as part of the *Road Maintenance Contract*. As part of the contract they are inspected at least once a month to determine if any maintenance is required.

Cyclepaths in the road-way are maintained as part of the carriageway and hence are covered by the *Road Maintenance Contract*. See the sealed pavements and surfaces maintenance plan for further details.

Carriageways where detritus collects on the cycle ways require occasional sweeping.

Our road maintenance contractors are required to inspect all footpaths to identify hazardous defects whilst undertaking monthly inspections of the road. In the event of the council being notified by the public of a dangerous defect in the footpath, this is attended to immediately by restoring an even surface on a temporary basis. The contractor then programs the permanent repair for the following month.

In addition, the council has over the past few years implemented a maintenance strategy of allocating a portion of the footpath maintenance budget to replace damaged footpaths in conjunction with the road resealing programme. Several district roads are resealed annually and as each road is resealed, all footpaths defects are removed at the same time.

Routine and minor reactive maintenance is based on the intervention levels and response times set out in the maintenance contracts. Any large maintenance that is identified is prioritised based on the risks posed by the defect and the criticality of the section of footpath or walkway

7.11.7 Renewals Plan

The majority of the footpaths in the district are assumed to have a useful life of 25 - 55 years depending on its material type. However it has been found that many of the older assets were constructed to a lower standard than that is currently accepted. Due to these low standard footpaths the majority of the plan is focused on the renewal of these sections of footpaths.

Footpaths will be renewed based on the levels of funding, with priority going to the footpaths that are in worst condition and are considered critical links it community facilities such as schools and hospitals.

The shared cycleways are relatively new so there is no immediate requirement for their renewal.

The decision process for the renewal of existing pedestrian facilities is based on the asset use and purpose. Pedestrian facilities that link key community areas and access to community services, such as hospitals and schools are considered priority routes. Coupled with this are high volume areas, such as the CBD. Included then are mobility issues with appropriate widths and facilities to assist the physically disadvantaged portion of the community to have the same level of access on the network.

These projects are identified and managed through DDP system and prioritised accordingly.

7.11.8 Improvement Plan

Footpaths and cycleways can be improved in the following ways;

7.11.8.1 Path Widening

The widening of both footpaths and cycleways is based on the level of demand (the quantity of people using the path) and the type of demand (pushbikes, prams, scooters etc.).

7.11.8.2 Kerb Drop-Downs and Crossing

Some kerb drop-downs and crossing places in the district are not adequate for use by mobility scooters and prams etc. The current programme will be developed based on complaints / requests by residents.

7.11.8.3 Hand Rails

Hand rails may be improved based on any safety deficiencies identified. These will be prioritised based on the criticality of the route and the severity of the issue.

7.11.8.4 Cycle Facilities

Cycle facilities such as cycle parking spaces, lean rails and signage may be provided based on any deficiencies identified. These will be prioritised based on the criticality of the route and the severity of the issue.

7.12 Public Transport

7.12.1 Overall Strategy

Strategic objectives to support public transport in the region are designed to support relevant outcomes from the 30 Year Transport Strategy for Northland 'incorporating' the Regional Land Transport Plan 2015-2021. They are as follows:

1) An effective and efficient bus network in main centres
2) People have access to shared transport options
3) Reliable travel times and transport choice for communities servicing employment areas, retail and public services
4) Public transport opportunities on appropriate corridors
5) Transport management is effectively incorporated into land use planning
6) A procurement system that supports the efficient delivery of public transport services.

7.12.2 Description

The public transport in Northland comprises:

CityLink Whāngārei

The key feature of the region's public transport system is the Whāngārei bus network, (branded as CityLink). It is a contracted bus network operating entirely within urban Whāngārei.

Bream Bay Link

This once a week bus service operates between Kaiwaka via Mangawhai and Waipu.

Hikurangi Link
This one a week bus service operates between Hikurangi and Whangarei via Kamo.

Whangarei Heads Link
This once a week bus service operates between Whangarei Heads and Whangarei City.

Far North Link Far North Link
This was formerly BusAbout Kaitāia and is currently contracted to run by the Northland Regional Council. The twice weekly bus service covers the Far North around Kaitāia, including Doubtless Bay, Ahipara and Pukenui.

Mid North Link
A bus service operates two routes from Kaikohe to Waipapa, one via Opua, Paihia and Waitangi and the second via Okaihau. The routes run three days a week: Tuesday, Thursday and Saturday.

Hokianga Link
A route funded by the regional council. The bus service operates three days a week: Tuesday, Thursday and Saturday from Opononi/Omparere to access services in Kaikohe and Kerikeri.

Total Mobility Scheme
The Total Mobility Scheme provides subsidized licensed taxi services to people who have an impairment that prevents them from undertaking any one or more of the following five components of a journey unaccompanied, on a bus, train or ferry in a safe and dignified manner:
1. getting to the place from where the transport departs
2. getting onto the transport
3. riding securely
4. getting off the transport
5. getting to the destination

Non-contracted transport services
There are a number of other services in Northland that are not contracted by Northland Regional Council. Although the council has no direct involvement in these services, it does have an interest in ensuring they are maintained as they contribute towards the core objectives of the council's Long Term Plan and the Regional Land Transport Plan. These are: -

- Commercial operators – including Intercity, Naked Bus and Northliner operate scheduled intercity coach services into and around the region from Auckland. Through the Intercity network, Kaitāia, Doubtless Bay and the Bay of Islands can be reached, and Naked Bus serves the Bay of Islands. Routes both cover Whāngārei and various settlements along State Highway 1. Connections are available in some instances to other destinations through local operators. At the time of writing there is only one non-contracted commercial service by a local operator serving communities in Northland outside of Whāngārei. This is a Dargaville - Whāngārei service called the 'Westcoaster' which runs twice a day in both directions.
- School bus operators – currently run either on a commercial basis or are subsidised by the Ministry of Education. There may also be opportunities for other fare paying passengers to be accommodated on these services at the discretion of the school and/or operator.
- Tour operators – catering for tourists, these services are non-scheduled and are concentrated around peak season. –

- The following ferry services operate in Northland:
    - Passenger ferry in the Bay of Islands between Paihia and Russell;
    - Passenger/vehicular ferry in the Bay of Islands between Opua and Okiato; and
    - Passenger/vehicular ferry (Kohu Ra TuaRua) in the Hokianga between Rawene and Kohukohu (this service is partially subsidized by Far North District Council).

The Hokianga ferry (Kohu Ra TuaRua) provides a strategic link from South Hokianga (Rawene) to North Hokianga (Rangiora) within the roading network. The vehicular ferry is a critical asset and provides a vital connection for the local communities of Rawene and Kohukohu in the Far North, enabling access to community facilities such as health care. It is also an important tourist link in the western leg of the Twin Coast Discovery route, which is of strategic importance on a national level. The service has 14 scheduled return trips/day, 7 days/week. **Error! Reference source not found.**8 below is the scheduled ferry timetable and Fig 7-26 show the ferry route from Rawene to the Narrows.

Table 6 Ferry timetable

South Terminal	North Terminal (4 km South of Kohukohu)
Rawene	Narrows
0700 (weekdays only – excludes Public Holiday's)	0715 (weekdays only – excludes Public Holiday's)
0730 – 7 days	0745 – 7 days
0815 – 7 days	0830 – 7 days
0845 – 7 days	0900 – 7 days
0930 – 7 days	1000 – 7 days
1030 – 7 days	1100 – 7 days
1130 – 7 days	1200 – 7 days
1230 – 7 days	1300 – 7 days
1330 – 7 days	1400 – 7 days
1430 – 7 days	1500 – 7 days
1530 – 7 days	1600 – 7 days
1630 – 7 days	1700 – 7 days
1730 – 7 days	1800 – 7 days
1830 – 7 days	1900 – 7 days
1930 – 7 days	2000 – 7 days

Figure 7-20 Hokianga Ferry Route

The Kohu Ra TuaRua is a double ended, monohull, flat-deck vehicle ferry, specifically designed and built for operating on the Hokianga Harbour. Boarding access to the vehicle deck is via hydraulically operated ramps at both ends of the vessel. The ferry has a carrying capacity of 20 cars or equivalent heavy vehicles.

Figure 7-21 Kohu Ra TuaRua Ferry

Asset Capacity/Performance

During the peak season, there can be a backlog of cars waiting to board the ferry but only for short periods of time, due to scheduled return trips that the ferry operates to. With the current timetable there is no need to introduce additional sailings.

The superstructure is located on the nominated port side and contains the wheelhouse, enclosed seating for pedestrian passengers, the ship's office, storage space and a toilet.

The hull is welded steel construction; the superstructure is aluminium. The ferry is maintained under Maritime Operator Safety System (MOSS) programme.

Length overall	33.6m
Waterline length	31.38m
Breadth	12.3m
Depth	2.0m
Draft	0.9m
Lightship displacement	146 tonne
Deadweight capacity	131 tonne
Capacities	Fuel 10,300 / Freshwater 3,000 / Lube Oil 500/
Engines	4 x MAN model 2866, TE each developing 186 kw
Propulsion	4 x Schottel model SPJ 57T Pump Jets with Co-pilot 2,000 integrated controls

7.12.3 Management and Operation

As the bus and total mobility operations are contracted out the management of the operation is undertaken through contract management.

Fullers Great Sights, as Council's contractor, operates the Hokianga Harbour Ferry Service, and is responsible for preparing and managing the agreed routine and periodic maintenance programmes for the ferry vessel; including all mechanical, electrical, hydraulic systems, re-painting and anti-corrosive maintenance to all surfaces to maintain the vessel to a serviceable and presentable standard throughout the period of the contract.

The Piles and ramps at both ferry terminals are owned by FNDC and are maintained as part of the ferry operation by the Contractor.

7.12.4 Monitoring and Condition

The monitoring plan for the public transport network will be undertaken using the following key service delivery performance indictors:

- Patronage – total public transport boardings and by category.
- Passenger km – total passenger kilometres travelled.
- Fare box revenue – fare box revenue by time period.
- Service reliability – scheduled trips completed in full.
- Service punctuality – trip start, en route and at destination.
- Customer satisfaction – for public transport users.
- Disability access - proportion of services with disability access.
- Patronage growth – total patronage growth on all services

7.12.5 Acquisition (Growth) Plan

In order to expand the current bus network there are guidelines on establishing a trial bus service prior to implementing a permanent service. The fundamental requirement is to establish a need through:

- Established demand
- Reviewing potential fares and routes
- Establishing a willingness to pay (via survey)
- Reviewing social and economic factors in the applicable areas.

7.12.6 Renewals Plan

The Hokianga ferry (Kohu Ra TuaRua) Although the engines and propulsion units have been very well maintained, they have accumulated a large number of hours and may require full replacement very soon. The remaining useful life of the hull is 9 years

7.13 Car Parking

7.13.1 Overall Strategy

The Parking Strategy for WDC is due for review in 2021 and neither FNDC or KDC have a structured parking strategy, but do have bylaws regarding Parking.

With regard to WDC the following is a summary of the current strategy:

Maintenance & Operations

- Due to the lack of replacement parts the maintenance of the old generation pay & display machines has become problematic. Some cascading of parts has been taking place as newer machines are commissioned.
- The meter heads can still function well until they eventually get phased out.
- As a result of high pedestrian use of footpaths around carparks, there will be a greater focus on these areas.
- A number of carparks are considered as temporary, and a lower standard of surface on these are accepted.
- Markings are allowed to deteriorate extensively before remarking.

Renewals

- Replacement parts for the Classic pay and display machine are increasingly more difficult to obtain. With some parts (printers) no longer being available. It is proposed to phase out the old classic machines over several years replacing approximately 10 machines a year. Following on from this the Global machines will be replaced in a similar fashion. The exact programme will be dependent on the availability of parts and possibly changes in technology.

- No plan exists for the replacement of the metre heads at this time. It is envisaged these will continue to remain in use until parts are discontinued.

- Replacement of car park signs will be undertaken to replace old parking station and charging signs with new signs reflecting the new parking charges.

Improvements

- Improvements will be achieved through the Renewals. Additional improvements will be considered with the development of new technologies and new machines. For example Tap n Go payment facilities will be installed in the new Metro machines.

New Assets

- New assets will only occur as new parking areas are developed. At this time no new parking facilities are known to be planned.

7.13.2 Description

The car park activity consists of the following categories;

- Parking Meters:
  Pay and Display Units – of which there are two types;
  - Classics – 1st generation green units
  - Globals – 2nd generation silver units
  - Metropolis – silver units with credit card slots

  Single Electronic Head Machines – service a single parking spot
- Car Park Surfaces
- Car Park Footpaths
- Car Park Pavements
- Car Park Drainage
- Car Park Markings
- Car Park Amenity Lighting
- Car Park Structures

There are a total of 27 off street carparking sites throughout the district. The maintenance, renewals and improvements associated with the Carparking Activity are generally undertaken as part of other activities.

The Whangarei District Council currently operates 84 Pay and Display Units and 128 Electronic Head Machines in and around the CBD.

7.13.3 Management & Operations

7.13.3.1 Maintenance Contract

The maintenance and operations associated with the car parking is governed by the *Parking Meter Maintenance Contract*, *Road Maintenance Contract*, *Streetlight Maintenance Contract* and *Road Marking Contract*.

7.13.3.2 Parking Fees Collection

The collection of parking fees from the machines is completed under a separate money collection contract administer directly by the Roading Department.

7.13.3.3 Funding

The Parking Meters and Car Parking Activities have their own 'ring-fenced' account. This means that all funding for the activities comes from the fees collected by the meters and the fines given to customers that over-stay or do not pay.

7.13.4 Monitoring & Condition

7.13.4.1 Condition

All the parking meters in the district have been assigned a condition rating. As seen from *Figure 7-28* below, the majority of the meters are in either 'good' or excellent' condition. Only 1.5% of the meters are in 'poor' condition, indicating the need for replacement of renewal in the near future.

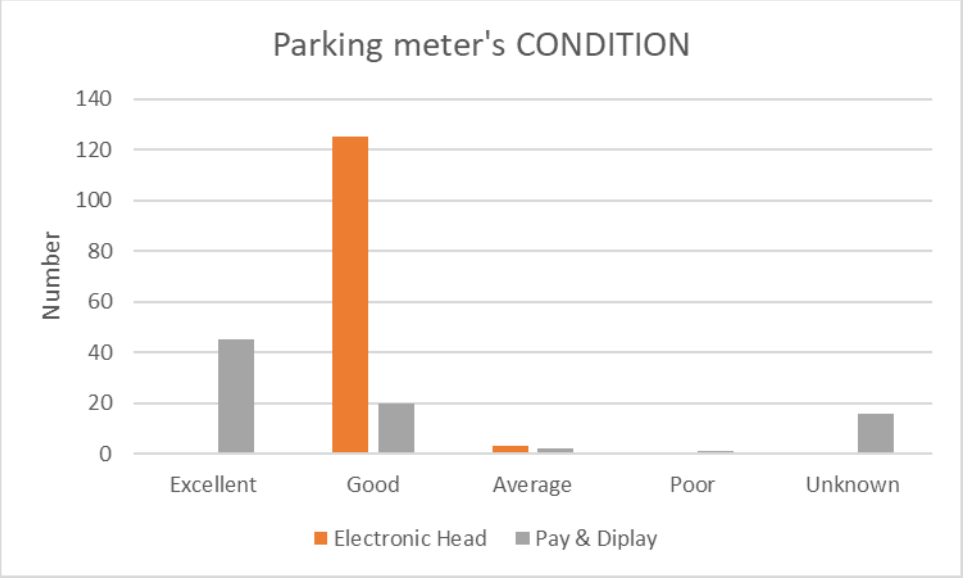


Figure 7-22: Condition Ratings of Parking Meter Assets

Condition and age data associated with the other components of carparks (e.g. pavement, surfacing, lighting etc.) can be found in the sections relevant to that activity.

7.13.4.2 Age

There is currently no age data for any of the parking meters recorded in RAMM.

7.13.5 Acquisition (Growth) Plan

As a result of regular attempts to break into the meter heads, these were all replaced with older cast-iron heads that are more robust. The original heads are held in the Roading store room. An exercise to dispose of these units needs to be undertaken.

The replacement of old machines provides additional spare parts to keep the existing stock operational. All useful parts are stored and the remaining parts are usually just sold for scrap.

No other new carparks are intended on being constructed or purchased in the next 10 years.

7.13.6 Maintenance Plan

Car park pavement and surfacing maintenance is completed as part of the *Road Maintenance Contract* for each area. The maintenance plan is based on routine inspections and programmed maintenance. In general the maintenance requirement for these facilities is identified as part of the pre-seal repair contract. This includes any concrete works that might be required.

The maintenance plan is based on routine inspections conducted daily by the contractors and reactive maintenance undertaken when a member of the public informs the Roading Department that a meter requires work.

Many of the current pay and display meters are based on old technology which is now obsolete. This is an identified issue and the funding is being provided to continue to replace these old meters.

Any minor maintenance is undertaken as routine, while any other maintenance over and above these defect levels is termed 'major maintenance' and becomes programmed work. The programme is based on the severity of the fault and the criticality of the meter.

7.13.6.1 Repercussions of meters being out of order

Using the average monthly calls logged, the number of motorists inconvenienced as a result of meters being out of order was at least 90 people. One can assume that at least triple that amount experienced the problem, i.e. 270. Some of these faults results in money paid but no ticket issued.

The costs to council as a result of meters being out of order include the lost revenue due to machines not working & motorist not paying for parking and the lost revenue due to inability to impose fines if the time had been exceeded on the meter.

7.13.6.2 Alternatives if a P&D machine is not working

In all our larger carparks there are at least two units at each location that provides an alternative if one is not working.

In most of the CBD there are other units in the vicinity, either on the opposite side of the road further along the road.

7.13.7 Renewals Plan

The parking meter renewal plan covers the replacement of old pay and display meters, as well as the replacement of any meters that are no longer functional.

A small selection of parking meters will be replaced based on the network performance measures and the priority of the meter. The Roading Department manages the renewal of these assets through a stock of old

meters that have been sourced from other Councils, as WDC is running older parking meter technology compared to some other Councils.

Within the next five years the plan has identified that a technology upgrade is required as the current stocks of technology are either receding or are no longer supported in terms of hardware manufacture. This has been allowed for within the renewal plan.

When funding is available we will try and replace the oldest machines first and try to undertake an replacements in a whole area rather than spread this out over the city. The identification of these replacements is completed in discussion with the parking metre maintenance contractor.

7.13.8 Improvement Plan

7.13.8.1 Pay & Display Units

Replacing all the machines with the latest state of the art machines will not necessarily eliminate all faults. The maintenance contractor advises that there is not much difference between the older and the newer machines, regarding the vulnerability to faults. The majority of the faults relate to vandalism, faulty or incorrect coins and the manner in which coins are fed into the machines.

The current issue is that the smaller coins (10c and 20c) are very light weight and with a little moisture or dirt they will hold up inside the coin race. This suggestion is given weight by the fact that very seldom does the heavier $1 and $2 coins give this problem.

Ideally if we could install machines that have the ability to communicate their status to a central point then a proactive response can be made to faults.

7.13.8.2 Parking Meter Heads

Currently there are 152 single head machines of which some are vulnerable to vandalism & theft. Most of these have been replaced by older versions that cannot be broken into. These meters are in low usage areas or parking bays that are remote. There is no intention to replace these in the near future.

7.13.8.3 Replacement Machines

The latest P&D unit that has become available since late 2006 is the Metro.

These machines offer various options for payment and service, pay by plate, pay by space, credit card payments and texting.

New metro machines will have payment options of credit card, coin and Tap n Go Eftpos payment. Text parking was not invested in as the Council has developed Mpark for electronic payments.

7.13.8.4 Central Management System

EziCom is a communications and management system (CMS) available for parking meter fleet management with remote monitoring in real time via a dual GPRS/GSM Modem fitted to CHS Pay and Display Parking Meters.

Text messages or email notifications automatically notify the meter technicians of machines with errors or warnings allowing them to respond immediately.

A variety of reports are available. Revenue, Audits, Cash Clearances, Maintenance and Asset Management information can be viewed easily from the simple to read screen layouts.

7.13.8.5 VMS Signs

VMS signs to advise motorists of the number of carparks available were installed at the Forum North carpark off Rust Ave, Vine St carpark and Farmers Carpark off Robert St. These have had several teething problems with not accurately picking up car numbers. It is not proposed to install more of these VMS signs until these signs have proved successful.

VMS signs on the main arterials leading into the City to advise motorists of each carpark and the number of available parks may also be considered in the future.

7.13.8.6 Suggested Program of Improvements

The Roading Department manages the upgrade of these assets through a stock of old meters that have been sourced from other Councils, as WDC is running older parking meter technology compared to some other Councils.

Within the next five years the plan has identified that a technology upgrade is required as the stocks of current technology are either receding or are no longer supported in terms of hardware manufacture.

A contract for the management and upgrade of the parking assets is being assessed versus the council directly undertaking this works

7.13.9 Disposal Plan

No removal of current car parks is currently envisaged.

7.14 Environmental

7.14.1 Overall Strategy

The overall strategy for this activity for the next 5-10 years is:

- Vegetation: to undertake vegetation control in the road corridor to maintain the integrity of its roading assets and ensure public safety and to fulfil its obligations under the Regional Pest Management Strategy.
- Stormwater Quality Devices: to maintain existing devices so that they operate effectively.
- Cleanfill sites: to ensure that contractors manage their clean-fill sites in a way that minimises any actual or potential adverse effects on the environment.

7.14.2 Description

7.14.2.1 Vegetation

The Vegetation category includes the function of maintaining the vegetation within the road corridor. These functions include;

- Verge Mowing – Undertaken in urban areas using a ride-on mower
- Hydro Mowing – Undertaken in rural areas that require this type of mowing for visibility reasons

- Surface Channel Spraying – Spraying behind the kerb and channel to prevent vegetation from encroaching into the kerb and channel
- Deep Drain Spraying – Spraying deep drains to prevent vegetation build-up
- Roadside Spraying – Preferred method of vegetation control in rural areas as an alternative to mowing
- Noxious Weed Spraying – Driven by NRC as a means of eradicating noxious weeds
- Tree Trimming – Trimming of self-sown trees within the road corridor
- Tree Removal – Removal of trees that are identified as a safety hazard

7.14.2.2 Special Storm Water Devices

- Rain Gardens
- Storm Water Quality Devices

7.14.2.3 Stock Effluent Disposal Sites

Sites that allow stock trucks to dispose of their effluent.

7.14.2.4 Dump Sites

- Cleanfill
- Concrete
- Landfills

7.14.3 Quantity of Assets

7.14.3.1 Vegetation

The majority of this function is only quantifiable through standards and specifications set by council or through standards that exist within the *Road Maintenance Contract*.

7.14.3.2 Special Storm Water Devices

The WDC maintains three Downstream Defenders which are hydrocarbon traps located within manhole type structures. These were constructed as part of the recently completed Lower Hatea River Crossing project.

7.14.3.3 Stock Effluent

There is one stock effluent disposal facility within the Whangarei District. This is located on Saleyards Road in Kauri and was constructed in 2012. The operations and maintenance of the site is the responsibility of Council.

7.14.3.4 Dump Sites

There are several clean fill dumpsites that are managed by Councils across Northland.

7.14.4 Management & Operations

7.14.4.1 Maintenance Contract

The vegetation maintenance and dump site management are conducted by the maintenance contractors and governed by the *Road Maintenance Contracts*.

7.14.4.2 Subcontracts

Hydro mowing is required in some areas where a high degree of visibility is important. All this type of mowing is subcontracted out on a planned basis.

7.14.4.3 State Highways

The MOU with NZTA requires the Roading Department to maintain all vegetation beyond the surface water channels and berms in the urban areas, while NZTA does all rural areas, verges and carriageways (e.g. median strips, roundabouts).

NZTA is responsible for all litter on rural state highways and the carriageways of urban highways and WDC is responsible for litter in the berm areas of urban highways.

7.14.4.4 Parks Department

The Parks Department of the Infrastructure and Services Group is involved in the mowing of certain urban areas that require a high standard of mowing. Most of these areas are adjacent to where the Park Division mow as part of the maintenance of their assets. This mowing is generally for amenity value, as this high standard is not required for safety reasons.

The Parks Department is also responsible for the maintenance of all the gardens in traffic islands, roundabouts etc.

7.14.5 Monitoring & Condition

The only condition measures used are the Operational Performance Measures set in the maintenance contracts.

7.14.6 Acquisition (Growth) Plan

There is no plan to create or acquire any storm water devices within the next ten years, although stormwater treatment devices may be vested to Council through land developments.

7.14.7 Maintenance Plan

Environmental maintenance is made up of the following activities;

- Berms and shoulders (vegetation control)
- Trees, maintenance of protection planting
- Graffiti removal
- Stock effluent maintenance and removal
- Specialised storm water devices
- Clean fill site

Vegetation maintenance shall be based on a routine plan consisting of mowing and spraying. Storm water device maintenance occurs once a defect has been identified, usually by the public (e.g. catchpit overflowing)

Reactive maintenance is based on requests received from residents and any defects found during corridor inspections. Reactive maintenance also includes any maintenance associated with the dump sites. Each of the clean fill sites are inspected annually, with the only exception being the site at Helena Bay that is inspected every six months. Any maintenance requirements identified from these inspections are undertaken as reactive maintenance.

Any large maintenance that is identified, such as tree removal, is prioritised based on the risks posed by the defect and the criticality of the section of road corridor.

The stock effluent disposal system may have an impact on the maintenance requirements and costs associated with this activity. Until the design stage is complete the maintenance requirements for the system cannot be known.

7.14.7.1 Dumpsite Maintenance

The additional cost to Council in maintaining the clean fill dumpsites has been included in the maintenance programme.

7.14.8 Renewals Plan

The stock effluent site and the majority of the storm water devices are reasonably new and therefore are not likely to require renewal in the near future.

7.14.9 Improvement Plan

There is no plan to improve any of these assets as the majority are reasonably new.

7.15 Network and Asset Management

7.15.1 Introduction

This section is primarily about the people, processes, systems, tools and management activities that the Northland Transportation Alliance (NTA) (an alliance of the Roading divisions of the four Councils: FNDC; KDC; WDC and NRC) uses to provide a safe, efficient and effective Transport Network. Table 7.14.1.1 below defines all activities detailed in this section.

Table 7.14.1 1: Network Management and Administration Activities

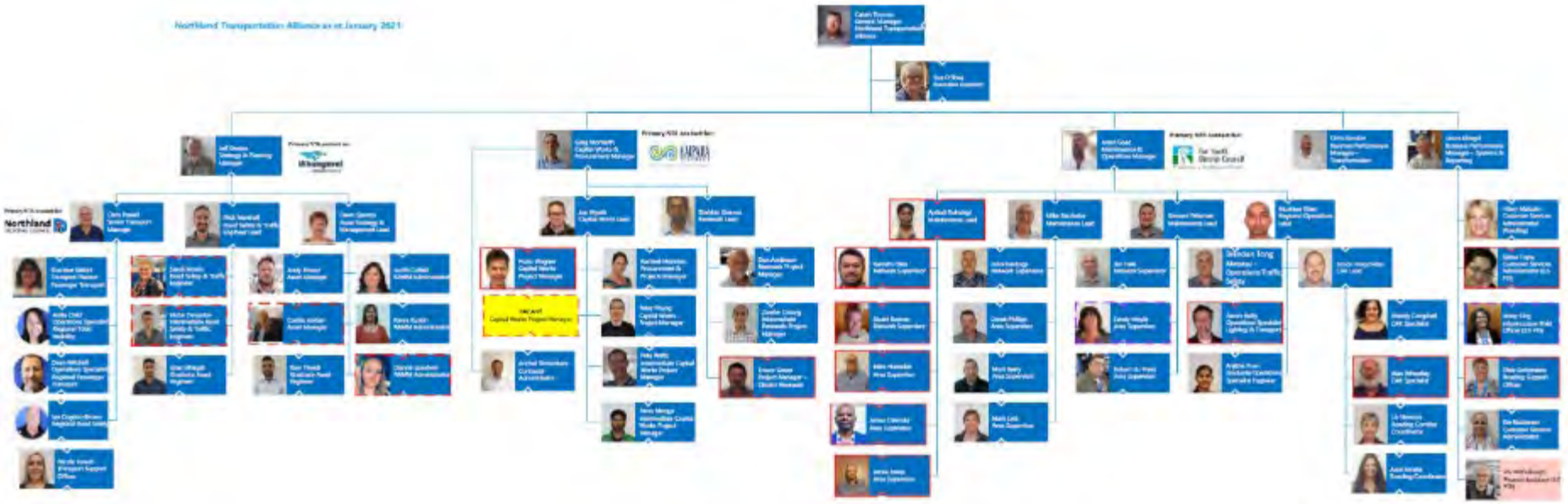
Activity	Sub – Activities
Operations & Quality Control	Human resource management Financial management and monitoring - Funding acquisition - Budget control Processes to ensure quality of work and assets Stakeholder liaison
Asset Management & Strategy	Life Cycle management and planning for all assets - Creation - Improvement - Maintenance - Disposal - Renewal Acquisition, storage and analysis of asset information
Transportation Planning	Traffic Modes Transport / Network Strategy Studies Projects Identification & Prioritisation Developer / Subdivision Liaison
Safety Management	Strategies Plans Community Programmes
Corridor Management	Corridor Access Requests Temporary Traffic Management Other Corridor Permits
Customer Management	Customer Requests
Captial Projects	Project development Project prioritisation Project management
Maintenance Management	Maintenance of all assets - Decision process - Management of works
Renewals Management	Renewal of all assets - Decision process - Management of works
Emergency Management	Flood Damage Lifelines Group Contractor call out Response Civil Defence

7.15.2 NTA Operations and Structure

The activities described in this Transportation Activity Management Plan are delivered by the NTA's Asset Management and Strategy Team, Maintenance, Operations and Renewals Team and the Capital Team.

NORTHLAND TRANSPORTATION ALLIANCE

"Moving Northland Forward"



Organization chart for NTA staff (January 2021)

The chart above demonstrates the organisation structure of the NTA, which comprises staff from the Far North District Council, Kaipara District council, Whangarei District council and the Northland Regional Council.

There are four predominant areas within the NTA: Operations and quality Control; Asset Strategy and Management; Maintenance, Operations and Renewals; and Capital Projects.

The NTA delivers the majority of the professional services required for this Transportation AMP with in-house resources, supported by consultants as and when required.

The NTA team participate in each of their respective Council's wider training and development processes including; performance reviews, IT training, inductions, health and safety etc.

7.15.3 Financial and Funding Management

Financial Management processes are carried out through the respective Council's Financial Management and job costing systems. The Council records costs against specific funding categories, such as being incurred through external contractual arrangements or through Council's internal payroll structure.

The accounting system Council uses is an Accrual Accounting System, which backdates the expenditure to the financial year in which it is undertaken even if payment occurs in the next financial year.

Budgetary funding for the transportation programme is managed by the Asset Strategy and Management team through applications to NZTA to mirror the share of funds available through Counci's LTP. These applications are made through NZTA's Transport Investment Online (TIO) website.

The Land Transport Management Act 2003 requires Council to prepare a three-year Land Transport Programme. The programme is a summary of the work required to provide an effective Transport Network. It is prepared by the Roading Department, approved by Council, and then forwarded to NZTA to gain funding through the National Land Transport Programme (NLTP). This AMP is the business case to support the budgetary funding application.

NZTA provides funding assistance to Council for works that comply with NZTA's policies. Currently NZTA provides financial assistance rates (FAR) as summarised below:

- FNDC – 67%
- KDC – 62%
- WDC – 53%
- Streetlighting Upgrades (all councils) – 85%
- Road Safety Program / Safe Road Network Program / PGF projects – 100%

7.15.4 Asset & Information Management

7.15.4.1 Description

The transportation network has a vast amount of asset data and information which relates directly to the asset (e.g. Road Asset Management and Maintenance data, or RAMM data) as well as information from within the corporate business and from customers and stakeholders (such as public requests etc).

RAMM Contractor/ Pocket RAMM has been implemented to manage the maintenance, operations and renewal works, and for compiling claims. The introduction of RAMM Contractor has significantly improved the quality and timeliness of data available for asset maintenance decisions and management.

The core data systems that are relevant to operating and delivering the transport activity are the RAMM database, as well as the following:

- Forward Work Programme
- TechOne Customer Request Management (CRM) Module
- TechOne Corporate Management System (Finance)
- Trim Document Management System
- Trifecta T3 for Road Corridor Management
- Balanced Score Card Performance Measure Management System
- Transportation Activity Management Plan
- Transportation Deficiency Database
- Bridge Database

Figure 7.14.4.1 below outlines the information flow and how each system within Council fits together.

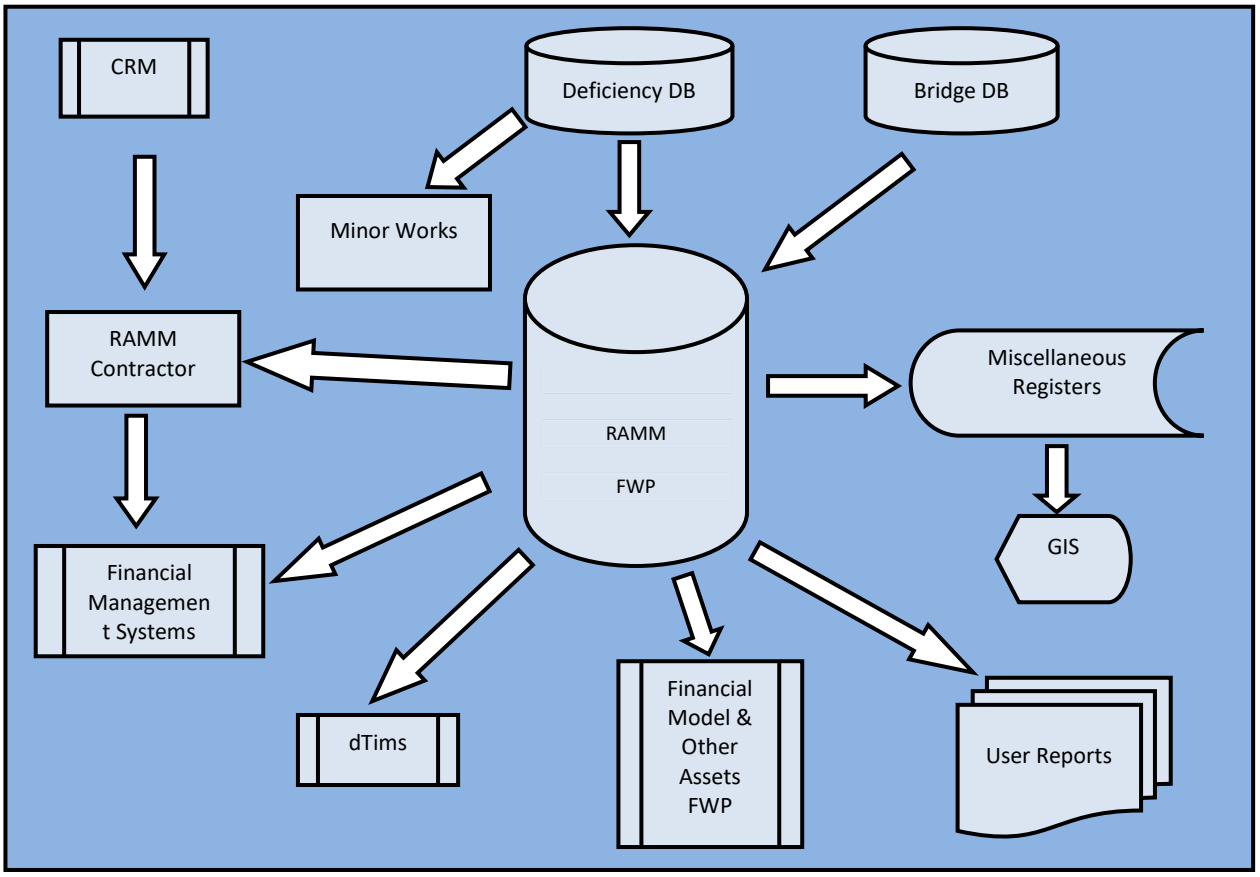


Figure 7.14.4.1: Information Flow between Council Systems

7.15.4.2 Management & Operations

(a) Information Storage & Analysis

Table 7.14.4.1 below summaries how the Roading Department records and stores all the information associated with the Transport Network.

Table 7.14.4 1: Data Information

Data Type	Location/System	Comments
Asset Inventory	RAMM Asset Register	Maintained through professional service contract. Provides data for LoS measures. Also used by NZTA for national benchmarking
Scheme Descriptions	Hardcopy/As-Built/RAMM (attributes and condition)	Plan copies held in council trim system. As built stripped and loaded to RAMM
Condition	RAMM	Condition Assessments, roughness, rating
	External Service Providers	Performance Records
Operations Data	RAMM	Historical maintenance cost data
	Contract Management System	Current approved programmes of work. Tracking and management of tasks on the network
	SCATS	Stores operational information.
Customer Enquiries	Service Requests Register	Held in TechOne system, also used as input to LoS measures
	Asset Managers Files Finance and Records (Historical)	Hard copies all work orders and invoices raised through TechOne
Asset Valuations	RAMM Valuation Module	Data integration with asset inventory and condition
Finances Economics	Council financial systems	TechOne
Development Data	RAMM – NOMAD Forward Planning Tool	Data integration with asset inventory and condition data
Forward Forecast	Urban Traffic Model	Provides future demand and capacity modelling allowing the identification of future works
	dTims Pavement Performance Model	Allows the performance of the pavement and surfacing assets to be modelled providing a tool on which to determine future renewal and maintenance programmes
Levels of Service	Transportation Activity Management Plan – Bulk of source data for LoS held in RAMM system and TechOne.	Also held in Balanced score card system

The Department has created a Road Asset Database Operations Manual that provides clear guidelines on how the asset data is managed.

7.15.4.3 Community Consultation

The LGA 2002 requires Council to consult with affected and interested parties in making decisions. Before implementing level of service changes, options analysis and the selection of the best practicable and preferred options must be done using a coherent and transparent process.

All Councils recognise there is a wide range of customers and stakeholders with an interest in how the land transport activity is managed, including road users, the resident community, visitors, specific interest groups within the community and regional and central government agencies.

The procedure for all consultation is set out in each councils online web pages.

7.15.4.4 LTP and Annual Plan

The majority of the Roading Department's public consultation is undertaken during Council's consultative process integral to development of the Long Term Plans and Annual Plans. This process also includes consultation with local authority elected members.

7.15.4.5 Council Meetings

A senior NTA manager/engineer attends community meetings that are applicable to roading. Other relevant staff members are also asked to attend when appropriate (e.g. Safety Engineer if the topic is road safety).

7.15.4.6 General Public

The Local Government Act requires that the Council must consult the public in regards to the Long Term Plan and the Annual Plan, and sets the procedures for the consultation process that must be followed. This process covers all aspects of the plans, including roading, and is the main process used by the Roading Department to inform the public of the works they are planning to undertake.

The NTA also informs the public of significant upcoming works through press-releases in the Council News section of the local newspaper and on the Council's websites, Facebook page and Twitter account. Prior to commencing construction works, roading contractors are required to notify residents of the works via letter drops.

7.15.4.7 Iwi

The Act states that a local authority must 'establish and maintain processes to provide opportunities for Māori to contribute to the decision-making processes'. Council has established a Maori Liaison Committee to notifiy iwi of upcoming projects including roading works. The Roading Department also consults with iwi on projects that require resource consents.

7.15.4.8 Communitrak Surveys

Council also undertakes surveys of the community. These surveys are undertaken annually and provide a benchmark of how Council is performing on a range of areas including transport. Council uses this information to set appropriate Levels of Service.

7.15.5 Corridor Management

Corridor management involves the management of any person or party that wishes to occupy the road in such a way that the normal usage will be disrupted. This includes road inspections and work or events that will involve road closures or traffic flow disruption.

7.15.5.1 Corridor Access Requests (CAR) & Traffic Management Plans (TMP)

Any party that wish to occupy or work on a Council owned road must have approval from the Roading Department before commencing. The applicant must submit a Corridor Request Form accompanied by:

- Hazard Management Plan
- Traffic Management Plan
- Works Plan
- Copy of any public notification, if applicable

The application process is based on the National Code of Practice for Utility Operators' Access to Transport Corridors.

The NTA has acquired a programme called 'Trifecta T3' that was designed by Global Infrastructure Solutions. The module is used to automate the process for Corridor Access Requests (CARs) and Traffic Management Plans (TMPs) and is based on the National Code for Practice for Utilities' Access to the Transport Corridor and covers all steps of the process.

7.15.5.2 Stock Control

Each of the Council Compliance Department is responsible for all wandering stock on the districts roads as well as on the State Highway network in the district. All wandering stock requirements are dealt with by

the Road Maintenance Contractors. The Parking and Traffic Bylaw 2017 details how the Council manages livestock in terms of road crossing permits.

7.15.5.3 Vehicle Crossings

The maintenance of vehicle crossings from the road edge to the property boundary is the responsibility of the property owner. All new crossings require consent from the Councils Building Department to ensure that they are built to the Councils requirements, as set out in the Environmental Engineering Standards (EES).

7.15.6 Procurement Management

7.15.6.1 Term Contracts

The Councils through the NTA currently has several term contracts for carry out maintenance, operations and renewals on the road network. These contracts are shown in the table below:

Table 7 - Term Contracts

<table>
<tr><th>Contract</th><th>Description</th></tr>
<tr><td>WDC:CON17085(North) / CON17086(South)
FNDC:CON7/18/100(North) / CON7/18/101(South)
KDC: CON888</td><td>Maintenance and operations management for the road network for the five areas across Northland. These contracts include:
Sealed pavements
Unsealed pavements
Drainage
Signs
Structures
Vegetation control
Traffic Facilities
Paths
Clean-fill site management
Street Furniture
Traffic Delineation
Standby Service & Incident Response</td></tr>
<tr><td>Streetlight Upgrade, Infill and Maintenance</td><td><table>
<tr><th>No</th><th>Contract No</th><th>Contract Description</th><th>Contractor</th><th>District</th></tr>
<tr><td>9</td><td>CON19018 - SP1</td><td>LED Upgrade - Southern Infill (Whangarei City)</td><td>Currie Eletrical LTD</td><td>WDC</td></tr>
<tr><td></td><td>CON19018 - SP2</td><td>Kaipara</td><td>Awaiting $</td><td>KDC</td></tr>
<tr><td></td><td>CON19018 - SP3</td><td>Ruakaka/ Waipu</td><td>Awaiting $</td><td>WDC</td></tr>
<tr><td>10</td><td>CON19017 - SP1</td><td>LED Upgrade - Northern Infill (Whangarei City)</td><td>McKay Electrical Ltd</td><td>WDC</td></tr>
<tr><td></td><td>CON19017 - SP2</td><td>Hikurangi</td><td>Awaiting $</td><td>WDC</td></tr>
<tr><td></td><td>CON19017 - SP3</td><td>Kaitaia / Kerikeri</td><td>McKay Electrical Ltd</td><td>FNDC</td></tr>
<tr><td></td><td>CON19017 - SP4</td><td>Remaining Areas</td><td>Awaiting $</td><td>FNDC</td></tr>
</table></td></tr>
<tr><td>07041 Parking Meter Maintenance</td><td>This contract covers the inspection and maintenance of all the Roading Department's parking meters as well as the collection of money from the meters.</td></tr>
<tr><td>17038 Lower Hatea River Crossing – Bridge Operations</td><td>This contract covers the general operation of the Te Matau a Pohe and Kotuitui Whitinga bridges as well as inspections and maintenance of the electrical systems.</td></tr>
</table>

Contract	Description
17039 Te Matau a Pohe & Kotuitui Whitinga – Hydraulic & Mechanical Maintenance	This contract covers the inspection and maintenance of the hydraulic and mechanical systems associated with the Te Matau a Pohe and Kotuitui Whitinga opening bridge.

7.15.7 Maintenance Management

Maintenance management covers the inspection of assets and the prioritisation, budgeting and completion of the maintenance required for all assets within the network.

Asset renewal is the process of restoring the level of service delivered by an asset to its original design level, or close to it, by repairing or replacing the worn components. The purpose of the renewal strategy is to maintain the levels of service by identifying the most cost-effective time to renew the asset.

7.15.7.1 Management & Operations

(a) Maintenance Intervention Strategy (aka Corridor Management Strategy)

This strategy is used to assist in the development of maintenance programmes for different assets. The strategy was developed as a way to ensure that the maintenance programmes are an effective, co-ordinated approach to maintenance over time.

Maintenance strategies determine how the local transportation network will be operated and maintained on a day-to-day basis in order to achieve the optimum use of the asset.

Table 8 Maintenance Categories

Maintenance Activity	Description
Routine Maintenance	Routine maintenance is the regular ongoing day-to-day work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again. This work falls into two broad categories as follows:
Proactive	Proactive inspection and maintenance works planned to prevent asset failure.
Reactive	Reactive action to correct asset malfunctions and failures on an as required basis.

A key element of asset management planning is determining the most cost-effective blend of planned and unplanned maintenance as illustrated in Figure 7-32.

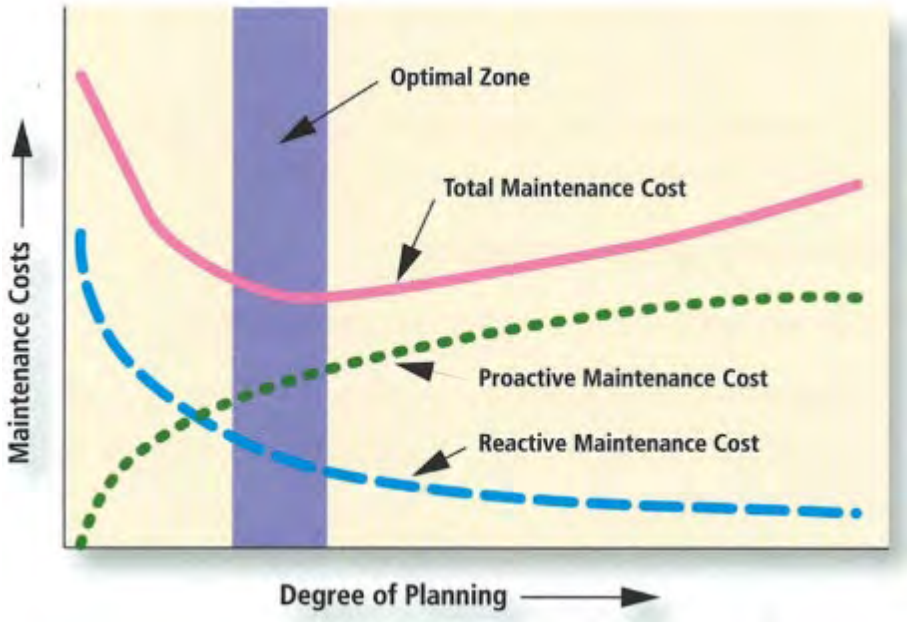


Figure 7-23 Maintenance Decision Making Process

(b) Pavement Deterioration Modelling (dTIMS)

dTIMS is a pavement modelling system used to predict pavement deterioration and thus develop forward expenditure profiles for various user defined scenarios. This system has been adopted by the National Roading Information Management System (RIMS) group.

The WDC and now the NTA has been running the dTIMS model since 2008 and uses this to optimise its pavement maintenance and renewal programmes. This information is then validated by site inspections to refine the programmes before they are entered in the Forward Work Programmes.

(c) Forward Work Programmes

The forward work programs contain all the required renewals that have been identified. The plan is used to prioritise the renewals, with the volume of works undertaken being based on the funding available.

(d) Life Cycle Management Plan (LCMP)

This plan contains details on the volume of maintenance and renewal activities to be undertaken. It covers the next 30 years and is reasonably flexible in terms of the type and volume of maintenance that will actually be undertaken.

(e) MOU with NZTA

The Memorandum of Understanding (MOU) between the Councils via the NTA and NZTA sets the Roading Department's maintenance responsibilities in regards to assets associated with the state highways in the district. The maintenance associated with each asset group is detailed in the relevant section of the Life Cycle Management part of this plan.

(f) Cost Recording

The system of maintenance cost recording is specified within the maintenance contracts. The maintenance contractors record this data directly in to RAMM Contractor. At the end of each month the payment to the contract is made on value that is present to WDC from RAMM Contractor. The following process outlines how this is managed.

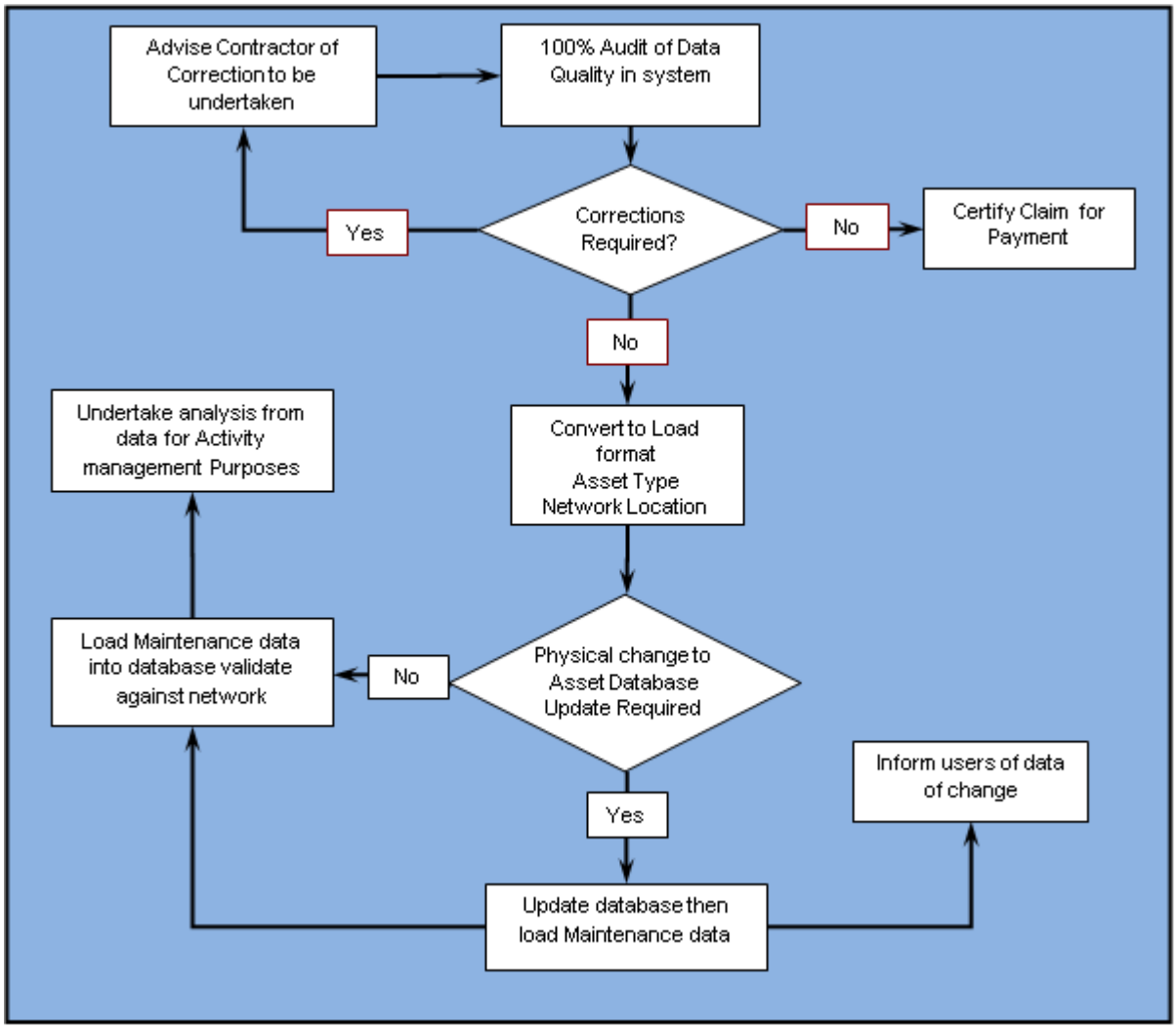


Figure 7.14.10.2: Maintenance Cost Flow Process

7.15.8 Emergency Management

An emergency event is a risk that is inherent with the management of all infrastructure networks. It is therefore a requirement of the plan to identify this as a risk, and to plan accordingly. Management and plans are based on recognition of triggers that indicate the broad nature of event occurring, and in turn which process to follow as the event unfolds.

There are a number of levels within emergency management framework and these are defined in Table 14 below.

Table 9 Emergency Management Framework

Scale	Description	Responsibility/Plan
Internally Coordinated Emergency Events	Managed by each District Council operations team with little co-ordination with external authorities apart from advising of current status of the event. This might take the form of storms events, road closures etc.	NTA respective council's Maintenance Contracts Manager,
Externally Coordinated Emergency Events	These are events that require co-ordination with external authority to manage the event, e.g. a crash on the state highway where a local roads detour route is required	NTA respective council's Maintenance Contracts Manager, Maintenance Contract documents and Quality Assurance Plans State Highway Detour Maps etc.
Civil Defence Emergency	These are events where Civil Defence Emergency Management Plans are enacted. At this stage all Council's operation teams work to these plans to support the district or region in the state of emergency	Regional Civil Defence Co-ordinator Northland Civil Defence Emergency Plan 2010

7.16 Safety Management

Ensuring that the road network is safe and efficient is a key role of Council and supports the Ministry of Transport's Safer Journeys and GPS objectives of reducing fatal and serious injury crashes. The NTA has a process to identify safety issues and to mitigate these through road improvements, maintenance activities or education.

7.16.1 Safety Hazard Identification

Table 15 sets out the systems, tools and resources used to identify safety issues on the road network

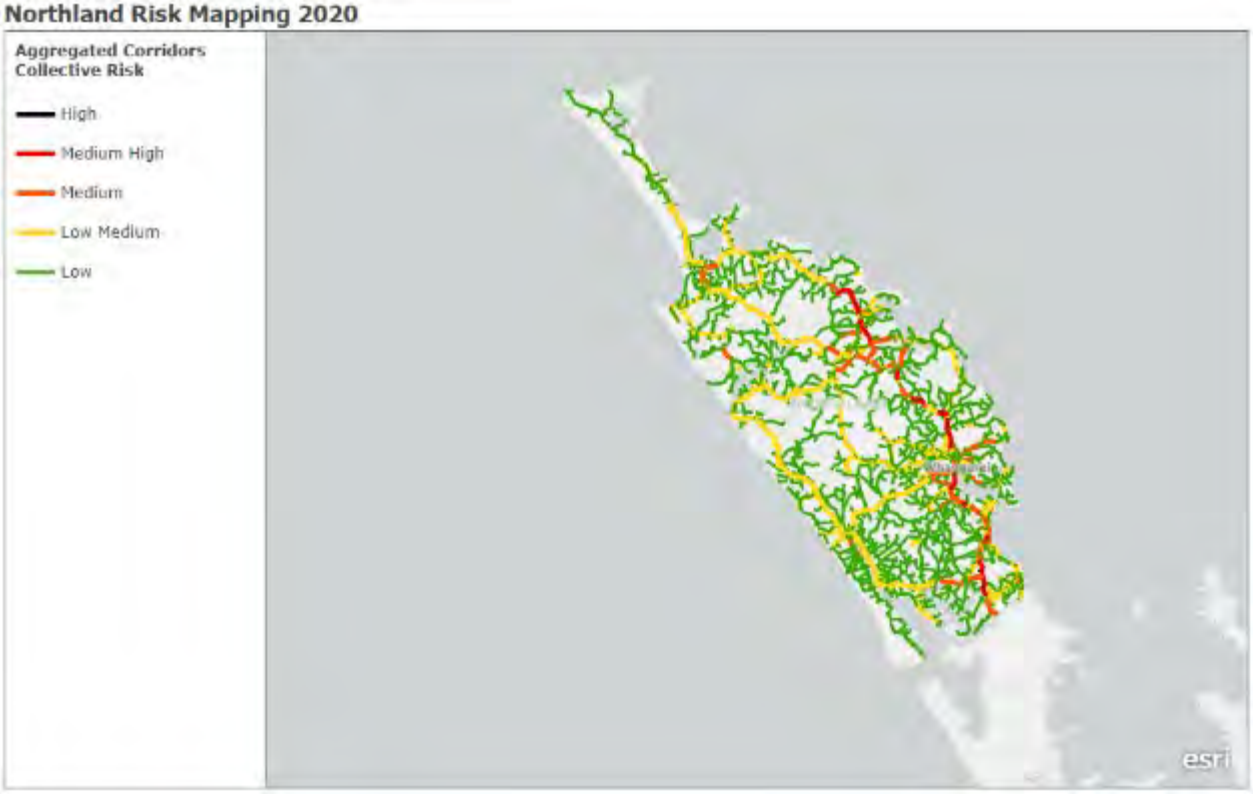
Table 10 Safe Systems, Tools and Resources

Resource	Description
Crash Reduction Studies	NTA carries out Crash Reduction Studies (CRS) on regular cycle. CRS use the CAS database (see below) to identify high risk roads and intersections and to identify possible treatments. It is desirable to complete a CRS on a 3 yearly cycle to pick up on any change in crash trends. The next CRS is currently programmed for early 2021.
CAS Database	The Crash Analysis System (CAS) is an NZTA-administered database which provides crash records that can be used to identify crash trends.
SafetyNet	A GIS-based system that enables the easy identification of high risk roads and intersections.
NZTA Road Safety Reports	Annual reports on crash trends in each district and identifies crash types that are over-represented.
NZTA Communities at Risk Register	A register that identifies which causal crash factors (such as speed, alcohol, young drivers etc) are over-represented in each district.
Safety Audits	Audits of new projects to identify any safety issues and recommend treatments that can be undertaken in conjunction with the project.
Deficiency Database	Repository of untreated safety deficiencies identified previously through CRS, safety audits or through and Council staff and public feedback. Although this database is still maintained, its usefulness in addressing fatal and serious crashes is questionable.
Safety Management System	Provides a central reference of safety standards and processes to be consulted when undertaking works.
Public Feedback	Safety issues identified through public feedback.

7.16.2 Safety Assessment

The following diagrams are screenshots from the Northland Risk Mapping 2020 - a risk mapping system which identifies high risk roads and intersections which should be investigated further for possible safety improvements.

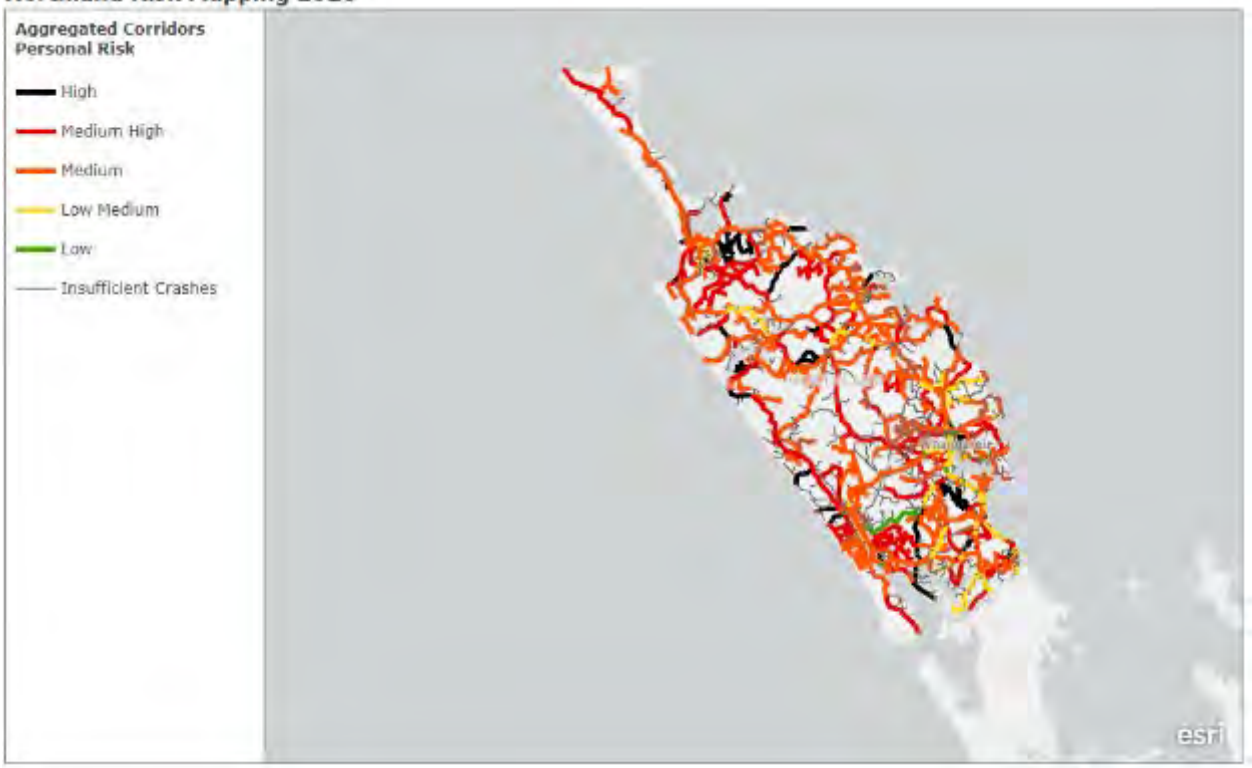
Northland Risk Mapping 2020



The above diagram shows the Collective Risk (eg crash density) of the rural road network. Apart from the State Highway network, the only High or Medium High collective risk rural road in the region are:

- FNDC - 2 Medium High Risk sections: Kerikeri Road (part) and Kerikeri Inlet Road
- WDC – 1 High Risk section: Riverside Drive and 6No Whangarei city centre road as well as the Whangarei Heads Road and the Marsden Point Road.

Northland Risk Mapping 2020



This diagram shows the Personal Risk (eg crash rate) of the rural road network. This shows that there are many roads with High and Medium High personal crash rates across the region.

7.16.3 Safety Programmes

7.16.3.1 Low Cost/Low Risk Improvements Programme

The Roading Department carries out numerous safety improvement projects to assist in improving the safety of the network through their annual Low Cost/Low Risk Improvements programme. Typical Low Cost/Low Risk Improvement projects are listed in Table 16 below.

Table 11 Assets and their contribution to Safety

Asset	Contribution to Safety
Road Safety Barriers	Barriers provide delineation to help drivers recognise road edges as well as offering protection in the event of an accident
Signs, Markings and Delineation	Signs are used to warn drivers of dangerous sections of road and to help control vehicle speed. Marking and delineation provide guidance to drivers by clearly indicating centrelines and road edges.[1]
Driver Feed-Back Signs	These signs are used to promote driver awareness and encourage drivers to be more aware of their speed and the speed limits.
School Zone Signs	These signs are used to encourage drivers to aware of school children and encourage drivers to limit their speed and be extra vigilant in school areas.
Lighting	Lighting improves driver's vision at night and also offers protection to pedestrians by increasing the safety of the areas they use.
Vegetation Control & Sight Benching	Vegetation control is important in ensuring that signs and markings are visible and that driver's sightlines are clear, particularly at intersections. Sight benching helps keep sightlines clear, particularly on blind corners.
Traffic Calming Devices	These devices are used to control the speed of drivers and encourage focus on the road in areas with vulnerable users such as pedestrians.
Traffic Signals	Controls the flow of traffic at intersections, reducing conflicts between traffic streams, hence reducing the likelihood of an accident.
Road Widening	Widening the carriageway provides more wander space for drivers before they enter the road should where they may lose control of their vehicle. This work is often undertaken in conjunction with pavement rehabilitation work.
Speed Limits	With the release of the NZTA Speed Management Guide, opportunities to change speed limits to better reflect the safe and appropriate speed of a road will be investigated and implemented where appropriate.

7.16.3.2 Road Safety Promotions

Each Council is responsible for the delivery of Road Safety Promotion within their district.

WDC and KDC have engaged Northland Road Safety Trust (through RoadSafe Northland) to undertake this work on its behalf and FNDC use Far North REAP. These partnerships have been in place for many years and allows many road safety programmes promotions for a relatively small investment by way of NZTA subsidies and utilising contributions from the community (local share)

The original plan was developed by 'RoadSafe' Northland in conjunction with the 'Road Safety Action Plan Group' for the NTA. This group that includes representatives from:

- the NTA,
- NZTA,
- RoadSafe Northland,
- The Police, and
- ACC.
- Northland Regional Council
- Northland District Health Board

The plan sets out areas to be targeted and activities to promote road safety, and ultimately reduce fatal and serious injury crashes on Whangarei's transport network. This group develops a plan of safety initiatives across the district to focus on high risk issues that have been identified through the Communities-at-Risk Register;

- Young Driver Education
- Alcohol and/or drugs
- Speed
- Rural road loss of control/head on
- Intersections
- Inattention and Fatigue
- Restraints (child restraints)

The plan is updated every three years, with a full review undertaken every six years.

8 Risk Management & Criticality

The NTA use risk management to assist with the identification of possible works and the prioritisation and programme development of these works as illustrated in *Figure 8-1*.

The following outlines the purpose and scope of the risk management processes and procedures established and the parameters within which risks have been identified and analysed within the Roading Department. It also sets the way in which the identified risks will be managed.

The procedure is based on the Guidelines in *AS/NZS 4360:2004 Risk Management* and the definition of risk management presented in Standards New Zealand Handbook, *Risk Management for Local Government (SNZ HB 4360:2000 A1)* as set out below:

DEFINITION	"The systematic applications of management policies, procedures and practices to the task of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or plans or from complying with its legal obligations".

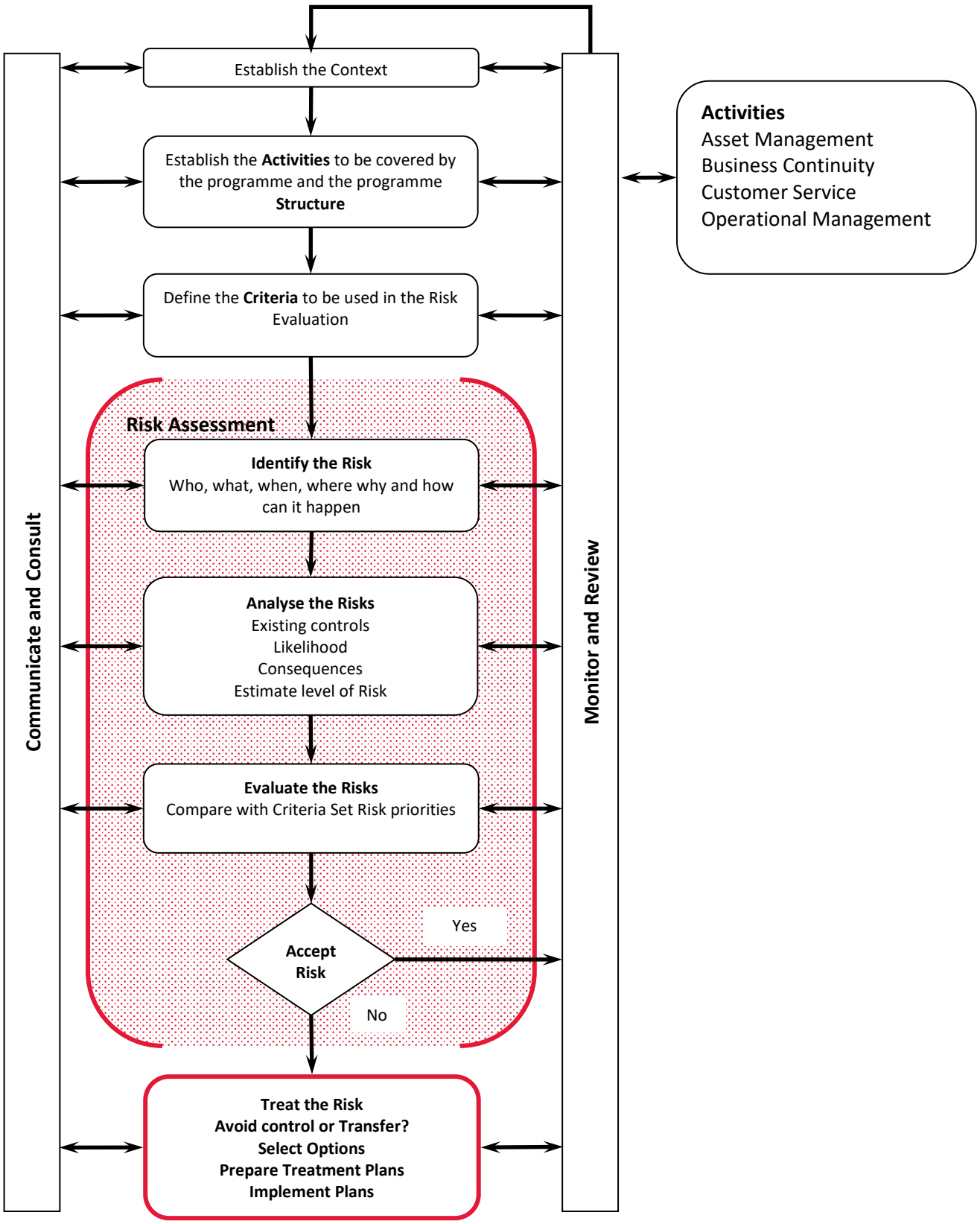


Figure 8-1: Risk Management Process

8.1 Context

The issue of risk is considered and managed as an integral part of the Asset Management and Strategy Team of the NTA for many good reasons such as 'Business Continuity', so that stakeholders experience uninterrupted services in line with target 'Customer Outcomes' and 'Levels of Service'. Risk is also a significant influence on programme prioritisation and budget planning.

Some further commentary on context is provided below:

8.1.1 Risk Management Context - Roading

The Risk Management context is in relation to the activities set out within this plan. Tools include a Risk Assessment Matrix to assess the likelihood and consequence of a risk, a Risk Register and Risk Treatment Plans. We reference Levels of Service to guide our consideration of risk to ensure that it is appropriate and balanced. This is because the identification, analysis and treatment of risk issues impacts at all levels in the management of the assets.

8.1.2 Strategic Context- Region wide

The strategic context is the relationship of this Activity Management Plan to the Risk Management framework set out in the *Activity Management Planning – Policy and Practice* document, which provides a consistent framework for the analysis of risk across the Infrastructure and Services Group. The risk framework allows each identified risk to be weighed against the intent of the Council Mission Statement, the Community Outcome goals, and Levels of Service goals. Where practical, risk management work gives due regard to other key plans and strategies within this local authority and the region.

8.1.3 Importance of Transportation Network to 'Lifelines'

What are Lifelines?

Lifelines are the essential infrastructure and services that support our community – utility services such as water, wastewater and stormwater, electricity, gas, telecommunications and transportation networks including road, rail, airports and ports.

What is Lifelines Engineering?

Lifelines Engineering is a process whereby people from these organisations work together to make sure they are well prepared for an emergency. The objectives of Lifelines Engineering are to:

- reduce damage following a major disaster; and
- reduce the time lifeline utilities will take to restore their usual level of service after such an event.

The Civil Defence Emergency Management Act 2002 requires organisations managing lifelines to work together with the Civil Defence Emergency Management group in their region.

Northland Lifelines Group

Northland has a Lifelines Utility Group comprising representatives from most utilities in the transport, energy, water and communications sectors.

The group aims to co-ordinate efforts to reduce the vulnerability of Northland's lifelines to hazard events and to make sure they can recover as quickly as possible after a disaster.

Lifelines (Study & Plan)

The Northland Lifelines Group undertook a study of the risk exposure to the life links in the event of a major disaster (e.g. Common threats in Northland being earthquake, flood and tsunami). The study considers a number of outcomes and the associated risks for the Transport Network and its assets.

This study resulted in the development of the Northland Lifelines Group Infrastructure Resilience Plan. This plan is used specifically to develop our understanding of the critical links in our network through the criticality assessment. This is then used as an input to our prioritisation of work programmes.

8.2 Analysis Criteria

The summary of the *Activity Management Planning - Policy and Practice*, document which contains details of the criteria to be referenced when assessing likelihood and consequence of risks are summarised in the tables below:

Table 8-1: Risk rating Criteria

Rating	Descriptor
Low Risk	Operational risk, record, mitigate if possible or work around
Medium Risk	Mitigation plans in AMPS
Significant Risk	High priority to mitigate through AMPs
Unacceptable Risk	Mitigation top priority

Table 8-2: Likelihood Scale

Score	Descriptor	Description	Indicative Frequency	Probability of at least one occurrence in 10 years
5	Probable	The threat is expected to occur frequently	> 1 year	>99.9
4	Common	The threat will occur commonly	1 to 5 years	90% to 99.9%
3	Possible	The threat occurs occasionally	5 to 10 years	65% to 90%
2	Unlikely	The threat could occur infrequently	10 to 50 years	20% to 65%
1	Rare	The threat may occur in exceptional circumstances	>50	<20%

8.3 Analysis & Treatment

8.3.1 Risk Analysis

The risk management process involves the development of a comprehensive list of risks and the evaluation of each one against the assessment criteria, (refer Activity Management Planning - Policy and Practice

document for further details). The risks are entered into a Risk Register. Ideally, a risk should be identified in the following terms:

[Something happens] leading to [negative outcome]. The description should include additional information, such as:

- what is the source of the risk?
- what is the inherent risk (without any controls)?
- what are the existing controls or influences on the risk?
- what (specifically) are the consequences?
- What is it dependent on other risks or conditions?

The risk may trigger several categories of potential consequence, or if it has a range of likelihood and consequence, it should be rated according to the combination that gives the highest risk rating.

POLICY	Risk analysis will be completed in terms of the Planning – Policy and Practice document. The Risk Register will be reviewed on a yearly basis with the confirmation of annual plans and budgets. Risk Management Plans will be developed for risks rated HIGH or greater. These plans will have owners, and be reviewed every six months. Where HIGH or greater rated risks cannot be managed through the recommended mitigation action set out in the risk management plan, these will be referred to the I&S Manager.

8.3.2 Risk Outcomes

8.3.2.1 Identified Risks

POLICY	Any actions, improvements or identified gaps in terms of risk management will be put into the Opportunities & Issues Register for review.

Currently there are over a hundred identified risks on the transportation risk register. These are of varying priority level. (Apart from these risks there are the corporate risks as identified through the LTP which have not been considered in this framework.)

8.3.3 Risk Treatment

A risk treatment plan is prepared for those risks that are considered HIGH or greater. These treatments plan are based on *Figure 8-2*.

Risk No:	Activity:	Identified Risk:	Ref:
Summary			
Existing Control Measures			
Improved Control Measures			
Resource Requirements			
Responsibility			
Timing			
Reporting and Monitoring			
Compiled By:	**Date:**	**Reviewed By:**	**Date:**

Figure 8-2: Risk Treatment Plan

Risk No.	Activity	Risks	Controls and Changes that Influence Risk	Management of the Risk	Review Frequency	Affected Activity
1010	Demand Change	Local Industry growth and exceptional Demand on portion of the network- eg Northport Growth (Ports of Auckland change), Airport Relocation.	Roading AMP Demand management Plan. Improvement process required to understand current and future demand	Incorporate planned changes into TRACKS traffic model, urban growth strategy data feeds AMP rewrite, improved forecasting	6 monthly	Capital Programme
1012	Demand Change	Emergency Detour Routes State Highway to Local Roads - higher crash risk or severe congestion on LA side due to geometry, width, speed environment	Detour routes identified, maintenance plans in place, capital improvement programme identified Knowledge of occurrence but no procedure for understanding impact, possible to use CAS but need sufficient data	Develop Regional Resilience Strategy Plan. Direct funding to resilience and safety improvements through Low Cost/ Low Risk improvements	6 monthly	Emergency Management
1014-1017	Funding Provision	Reduction in Pavement, Surfacing and Bridge Renewal funding from that advised in the TAMP and DLTP and as forecasted for expenditure in the LTP as agreed to with LoS option	Presentation of Roading Budget to Council outlining the basis of the programme and the expected outcomes of under funding; Supporting information in AMP to deal with consequences in robust fashion	RAMM Improvement programme and AMP rewrite	6 monthly	Pavements, Surfacings and Bridges
1023	Human Resources	Staff turn over due to job dissatisfaction or NTA workload/restructure	Staff survey creating reasonable work environment. Corporate level initiatives	Succession planning, work environment	6 monthly	Department Operations
1044	Routine Inspection	Road subsidence and slips	Professional service contracts and Routine Maintenance contracts. Levels of Service. Clearing of blocked culverts and crack sealing	Develop Regional Resilience Strategy, Criticality studies identify routes affected, identify resilience works to mitigate	6 monthly	Emergency Management
1065	Emergency Management	Russell Road - Road closures due to slips and/or flooding	Routine maintenance contracts, emergency management processes and plans	Develop Regional Resilience Strategy, Criticality studies identify routes affected, identify resilience works to mitigate	6 monthly	Emergency Management
1085	Network Operations	All signalised intersections are supplied with power from the Northpower network. Should this network fail signalised intersections could be left without power and unable to operate.	NZ law requires that normal STOP/GIVE WAY rules apply to an intersection which is blacked out or in the flashing amber fault state.	All category 1 sites should ideally be considered for some sort of UPS treatment to flash amber for a defined period in the event of mains failure, together with an LED upgrade to minimise power consumption.	6 monthly	Operational Traffic Management
1088	Network Operations	Loss of SCATS region (master) computer or associated hardware	Hardware: New server installed in 2007 with redundant network cards, power supplies, mirrored hard drives(RAID), server health checking and management software. Software: Current version of SCATS 6.5.2, current OS Windows 2003 with necessary patches, virus protection and firewalls as part of the WDC corporate network. Also security measures for internet access per WDC corporate network. Access is restricted to server itself and only holders of SCATS security keys can alter the SCATS system. Backups of the server are taken each evening.	The proposed Corridor Management Plan for traffic signals (CMP) will require all sites under coordination to have flexilink data included as part of their PROM. The plan further suggests a regular updating cycle for the data to ensure its relevance. These updates will be stored in the intersection's RAM which is battery backed, and also the data is held on SCATS to ensure it is not lost. Upgrade SCATS Master computer to reduce likelihood of failure.	6 monthly	Operational Traffic Management
1090	Network Operations	Network Operations Management - Rust Ave. Vehicles striking low overhead rail bridge on route from SH1 into CBD	Structure is less than 4.4m and signed with PW45 and PW46 signs per the Manual of Traffic Signs and Markings (MOTSAM). There are advance warning signs on Bank St and SH1 at Western Hills/ Selwyn Ave. Also a special set of signals are operated to detect and warn drivers of over-height vehicles approaching the bridge from either direction.	Existing controls	6 monthly	Operational Traffic Management
1091	Funding Provision	SPM database for generating DC charge, relies on district growth strategy also sensitivity of the model inputs and development of the projects into renewal/backlog/growth. Challenges to DC charge leading to legal action against council	Workshops with developers of the DC programme, department guidance on best practice, process management document compiled to track how DC have been developed for Transport	Existing controls	6 monthly	Financial Management
1092	Emergency Management	Emergency Detour Routes State Highway to Local Roads - lack of resilience results in detour routes not being available when SH closed	Detour routes identified, maintenance plans in place, capital improvement programme identified Knowledge of occurrence but no procedure for understanding impact, possible to use RAMM but need sufficient data. Resilience Strategy required.	Develop Resilience Strategy. Provide adequate funding for resilience improvement works.	6 monthly	Emergency Management
1093	Level of Service	Few arterial routes in Whangarei City and Mangawhai combined with high population growth leading to excessive congestion.	Transportation and growth modelling to identify levels of service and programme forward works.	Continue to invest in walking and cycling. Fund investment in PT infrastructure. Carry out capacity improvements where necessary.	6 monthly	Capital Programme
1094	Renewal Works	Sealed road network is vulnerable to HCV damage, particularly due to soft subgrades and block cracking issues. Thin pavements and lack of drainage are also impacting on roughness and maintenance costs	Programme of reseals, rehabilitations and maintenance on HCV routes. Identification of high risk routes.	Identify and strengthen high risk routes as necessary. Rehab designs to avoid creating pavements susceptible to block cracking	6 monthly	Pavements and Surfacing
1095	Safety Implementation	Increasing trend in fatal and serious injury crashes	Minor improvement programme of $1M/pa to focus improvements to sites/routes identified through CRS, HRRR or Deficiency Database	Increase funding form safety works. Focus on improved delineation and high skid resistance surfacings. Implement speed management.	6 monthly	Safety Management
1097	Funding Provision	Reduction in transport budgets to fund the emergency works after a major event	None	Provide resilience budget sufficiently large to reduce the risk of budget cuts and reduce the number of high risk sites	6 monthly	Financial Management

Risk No.	Activity	Risks	Controls and Changes that Influence Risk	Management of the Risk	Review Frequency	Affected Activity
1099	Human Resources	Only have one traffic systems engineer with no succession planning.	Back up limited to Auckland based consultant	Provide succession planning for this role. Provide remote operation which enables back up by ATOC etc.	6 monthly	Operational Traffic Management
1102	Emergency Management	Road closure due to flooding, crash etc. Note not WDC asset but affects WDC network	Routine maintenance contracts, emergency management processes and plans	Criticality studies identify routes affected, id preventative works to mitigate	6 monthly	Emergency Management
1103	Emergency Management	Road closure due to flooding, slip, crash etc to a road that serves an isolated community with no other means of access. Eg Whangarei Heads Rd past Parua Bay, Pataua North and South Rds etc	Routine maintenance contracts, emergency management processes and plans	Criticality studies identify routes affected, id preventative works to mitigate. Develop Resilience Strategy	6 monthly	Emergency Management
1104	Legislation Compliance	PM10 Dust on HCV routes, particularly forestry routes, above the national health standard resulting in road closures due to protest action by local residents	Routine maintenance contracts, limited dust suppression, sealing sections of the roads	Add a Paige-Green Wearing course (as per Centre of Excellence Recommendations); Dust suppression on forestry routes; Seal extensions	6 monthly	Capital Programme
1116	Capital/Renewal Works	Services within the road corridor are often shallow, require relocation/repair/ protection and can cause early failure of pavements. Uneven service lids create bumps which are hazards for cyclists/motorcyclists.	EES standards control depth and location of services. Legislation	Ensure services are at correct depth and are adequate quality. Raise service lids.	6 monthly	Pavements
1117	Capital/Renewal Works	Old voidfill seals and TAC are allowing water to ingress into sealed pavements and are causing premature failure and increased maintenance costs	FWP developed to address backlog of voidfills and TAC	Carry out programme to address backlog of voidfills and TAC	6 monthly	Surfacings
1124	Legislation Compliance	KiwiRail require an increasingly high standard for road crossings over railway lines	Routine maintenance contract.	Liaise with KiwiRail about required standards	6 monthly	Renewals
1125	Service Provision Purchasing	The new maintenance contract may result in cost increases or decreased levels of service	Maintenance contract being developed and procured in a manner that should drive cost efficiency	Develop contract to drive cost efficiency and maintain service levels	6 monthly	Financial Management

8.3.4 Criticality Analysis

8.3.4.1 Key Strategic Risks and Issues

Key strategic risks and issues have been identified through the development of the Infrastructure Strategy as follows:

8.3.4.2 Sealed Roads

Issue	Options	Implications
The cost of urban rehabilitations in Northland are expensive, resulting in our sealed roads having some of the highest costs per kilometre in our peer group. This means we can do less for our money.	Do nothing	• Worsening of pavement condition over time (e.g. more potholes and failures) and an increase in long-term maintenance costs, slower travel times and potential safety issues.
	Continue with current programme to maintain levels of services including reducing backlog of works.	• Continuation of an adequate programme of pavement renewals will enable the sealed pavement to be maintained in a fit for purpose condition while optimizing the long-term maintenance costs. • Address the poor condition thin asphaltic (TAC) surfacing as these surfaces allow water ingress and premature (and expensive) pavement failure. • Programme incorporates expensive structural asphaltic concrete (SAC) pavements in Whangarei City will keep sealed road costs high.
	Investigate alternative solutions for urban rehabilitations in Whangarei City, Mangawhai and Kerikeri to reduce the reliance on high cost structural asphaltic concrete (SAC) pavements.	• Improved and more cost effective programme for sealed roads • Maintaining freight routes to a higher standard will make these roads better able to cope with the increasing freight loads over time, reduce continual disruptive maintenance patching and more resilient to adverse weather events.

Most likely management scenario

The consequences of not addressing this issue, is that our sealed roads will deteriorate under increasing traffic and freight demand leading to a reduced level of service, reduced resilience during wet weather events, increased road hazards (pot holes etc.) and increased maintenance costs. To address this issue NTA will:

- Carryout an adequate programme of pavement renewals that will enable the sealed pavement to be maintained in a fit for purpose condition while optimizing the long-term maintenance costs.
- Investigate and plan for new technologies to look to replace the expensive structural asphaltic concrete (SAC) pavements over time.
- Ensure our sealed roads are suitable for the traffic demands, particularly freight, while optimizing the long-term maintenance costs.

8.3.4.3 Drainage

Ad hoc historic maintenance of drainage systems has increased the susceptibility of our pavements to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.

Issue	Options	Implications
Pavements are susceptible to water ingress and premature failure. It also increases the likelihood of flooding and slips during heavy rain events.	Do nothing, continue with ad-hoc reactive maintenance.	• Inadequate control of water flows to keep pavements free of water ingress resulting in pavement failure, flooding and scour of roads, particularly on the unsealed network
	Adopt the NTA's Drainage Plan and Maintenance Intervention Strategy.	• Able to identify inadequate water-tables in areas that are high risk for water ingress, flooding and scour. • Proactive treatment of these high-risk areas which should prolong the life of the pavement and surfacing and will reduce the amount of water flooding across roads

Most likely management scenario

The consequences of not addressing this issue is that our Pavements will continue to fail prematurely due to water ingress. Slips and flooding will continue to cause resilience issues on our roads during heavy rain events resulting in road closures that often affect freight, tourist and detour routes, key lifelines and isolated communities. To address this issue the NTA will:

- Adopt the NTA's Drainage Plan and Maintenance Intervention Strategy to identify water-tables in areas that are high risk for water ingress, flooding and scour
- Inspect Culverts annually to address blocked culverts.
- Carry out an adequate programme of drainage repairs that enable proactive treatment of these high-risk areas which should prolong the life of the pavement and surfacing and will reduce the amount of water flooding across roads.

8.3.4.4 Resilience

Poor geology, a subtropical climate and poor drainage systems make our roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.

Issue	Options	Implications
Northland roads susceptible to slips and flooding during heavy rain events, resulting in road closures that often affect critical routes. This is only expected to get worse over time due to the effects of climate change.	Do nothing	• Worsening of pavement condition over time (e.g. more potholes and slip failures) and an increase in long-term maintenance costs, slower travel times and potential safety issues including cutting access to communities.
	Implement the NTA's Resilience Plan and maintenance intervention strategy (MIS) to develop a prioritized programme of retaining wall & slip repairs and flood mitigation required on key arterial routes, tourist routes and on roads that form the only vehicle access to isolated communities.	• Addressing slips and flood mitigation in a proactive manner will reduce the likelihood of catastrophic failure and will reduce ongoing maintenance costs. • It will minimize delay and disruption on key arterials, tourist routes and will provide security of access for isolated coastal communities. • Considering the impacts of climate change in low-lying coastal areas will help planning of new roads and coastal protection in these areas. This will help future proof the road network from potential sea level rise.
	Investigate alternative to expand the resilience strategy to a Corridor Network Resilience Analysis and FWP.	• Improved and more focused programme for resilience works • Providing fit for purpose detour routes for the state highway network and key local arterials would enable traffic and freight flows to negotiate the detour efficiently and safely

Most likely management scenario

The consequences of not addressing this issue is that our Pavements will continue to fail prematurely during emergency events with the likelihood of delay and travel disruption due to road closures on freight tourist and detour routes and key lifelines. To address this issue the NTA will:

- Adopt the NTA's Resilience Plan and Maintenance Intervention Strategy to identify retaining walls & slip repairs and flood mitigation measures
- Inspect existing retaining walls and flood protection structures.
- Carry out an adequate programme of retaining wall repairs and slip repairs that enable proactive treatment of high-risk areas which should minimize delay and disruption on key arterials, tourist routes and will provide security of access for isolated coastal communities.

8.3.4.5 Unsealed Roads

Northland has a high percentage of unsealed roads. Use of out of specification GAP aggregates on our unsealed roads is results in adverse health impacts to residents due to dust, high levels of community dissatisfaction due to poor road condition and high maintenance costs.

Issue	Options	Implications
Unsealed roads are a community priority. There has been limited funding in the past to fund upgrades.	Do nothing	• Continual worsening of pavement condition with increased potholing, corrugations, gravel loss and dust which is leading to high levels of customer dissatisfaction, and health concerns.
	Continue with current programme of re-metalling roads on an ad-hoc basis.	• Continual high maintenance costs. • Continuing to maintain the unsealed network without knowing the pavement depth or condition will retain the current reactive approach to customer complaints which is likely to be suboptimal and result in more customer dissatisfaction. • Dust has become a significant concern for resident's health, particularly on freight routes, which is driving significant demand for dust suppression and sealing of roads.
	Adopt the Centre of Excellence (CoE) recommendation to use Paige-Green compliant materials as a wearing course on high and medium demand roads where additional pavement strengthening to provide the required strength and shape is undertaken.	• Maintenance costs are reduced. • With low demand routes dust is reduced, but with high demand routes the use of a dust coat seal may still be required to mitigate excessive dust. • Development of a proactive programme of works.

Most likely management scenario

The consequences of not addressing this issue, is that maintenance costs will remain high and roads will deteriorate and create high levels of dust particularly on high freight routes, which leads to high Customer dissatisfaction. To address this issue NTA will:

- Adopt the Centre of Excellence (CoE) recommendation to strengthen structural pavement layer and place a Paige- Green compliant material over the pavement.
- Develop of a proactive programme of works.

8.3.4.6 Structures

Lack of historic maintenance and renewals of structures is resulting in a large number of structures prematurely reaching the end of their life which is adversely affecting freight access and increasing demands for expensive bridge and retaining wall replacement

Issue	Options	Implications
Asset information on condition of structures including retaining walls and bridges, is limited. Some bridges are unable to carry 50MAX traffic impacting on freight movements.	Do nothing	• Bridges will continue to deteriorate and as their structural integrity is impacted more will be added to the 50MAX register. • Impacts on freight movement and economic growth. • It also has health and safety implications if bridges and retaining walls are not maintained. • Retaining walls will also deteriorate and potentially fail during storm events if inspections are not undertaken.
	Annual inspection programme of critical bridge and coastal structures. will enable maintenance work to be identified in a timely manner and potentially reduce more expensive repairs in the future. A retaining wall forward works plan is being developed for the first time and this is identifying demand for retaining wall renewals and replacement	• Programmes will enable maintenance work to be identified in a timely manner and potentially reduce more expensive repairs in the future and prevent further bridges being added to the 50MAX register • Reduce ongoing maintenance costs on bridges and retaining walls
	Continue the annual inspection programme and implement a forward works programme for the replacement and upgrade for bridges and retaining walls.	• The removal of bridges from the 50MAX restriction register will enable more use of these higher productivity vehicles and will reduce freight costs and improve opportunities for investment. • Increased upgrades adds resilience to the network enabling better freight routes and a safer network.

Most likely management scenario

The benefit of a fit for purpose bridge and retaining wall asset that provide access for freight and high productivity vehicles (50Max and HPMV) on arterial, freight and detour routes.

The Consequences of not address the problem statement is that our structures will deteriorate over time leading to further restrictions to freight and increasing risk of bridge or retaining wall failure resulting in safety issues and complete loss of access

To address this issue NTA will:

- Implement an annual inspection programme
- Implement a strategy that creates a forward works programme
- Request funding for a forward works programme

8.3.4.7 Growth and Alternative Transport

Rapid growth and lack of suitable alternative transport modes are causing congestion in Whangārei and Mangawhai during commuter peaks and Summer periods. Lack of alternative transport modes in many communities restricts access to places of employment, education and social opportunities which is leading to severance, safety issues and higher levels of social deprivation.

Issue	Options	Implications
Congestion during commuter peaks and lack of alternative modes.	Do nothing Congestion during commuter peaks and lack of alternative modes.	• Without addressing capacity issues at know problem areas there will continue to be delays to freight and frustration to road users. These delays will continue to grow as each location increases in population. • No increases to public transport provision continue to support private vehicle use and congestion. • No change to the cycle network will result in lower uptake of users and less health and congestion relief benefits being achieved. • Without improving walking and cycling links and bus services to rural towns, these communities will continue to suffer from community severance, safety issues and lack of access to employment, education and social opportunities which will result in continuing high levels of social deprivation.
	Continue with current programme	• Implementation of the major capital works such as four laning and junction improvements at the known problem areas. • Continue the implementation of the Walking and Cycling Strategy to connect disparate sections of the network. • Supporting the Regional Councils initiatives to extend bus services.
	Investigate ongoing upgrade programmes based on changing road use over time. Including alternative solutions for increasing modal changes to the transportation network.	• Continue to scope and develop options for network upgrades to manage congestion and peak flows. • Expand the focus of the Walking and Cycling Strategy to extend to outlying communities. • Create a step change uptake of other transportation modes.

Most likely management scenario

The constrained road network in Whangarei City and Mangawhai combined with high dependence on private vehicle use results in higher traffic volumes on its arterial road network and is resulting in congestion in the commuter peaks. The high traffic growth rate is expected to continue for the near future due to high population, freight and tourism growth.

To address this issue NTA will:

- Addressing capacity issues at known problem areas.
- Support the Regional Council bus initiatives to encourage higher passenger numbers and would reduce private vehicle use and congestion. Rural bus services would reduce rural commuter traffic on key arterials servicing the city.
- Provide cycleway connections in Whangarei and Mangawhai.
- Improve walking and cycling connections in rural towns.

8.3.4.8 Safety

Northland has a narrow, winding and unforgiving rural road network which combined with poor driver behaviour has resulted in the region being a high Community at Risk for death and serious injury (DSI) crashes and the rate of DSI crashes is trending upward.

Issue	Options	Implications
Northland is a high Community at Risk for death and serious injury (DSI) crashes. Exacerbated by the narrow and winding road network.	Do nothing	• Without adequate investment into road safety measures, the increasing trend in fatal and serious injury crashes on the Northland local road network is likely to continue. • Not achieving the Road to Zero Strategy
	Continue with current programme: • Targeting investment on areas with highest safety risk. • Road safety promotion programme • Speed management reviews • Traffic mode segregation as part of the Walking and Cycling Strategy • Safer crossing points	• Targeted investment on the areas with the highest safety risk • Reduce crash rates • Target road safety promotion activities in high risk areas identified in the Communities at Risk register • Continue to implement speed management reviews across the district. • Safer walking and cycling routes through traffic mode segregation. • Improving crossing points and routes for pedestrians and cyclists
	Investigate alternative solutions for implementing a road widening programme through the pavement rehabilitation programme. Further development of the Road Safety Programme.	• Road widening will provide more road space before a vehicle encroaches on the unsealed shoulder and will provide more space for cyclists and pedestrians. • Increased road safety to a higher level

Most likely management scenario

The consequences of not addressing this issue is that we will increase the trend in fatal and serious injury crashes on the Whangarei local road network is likely to continue and we will not meet our Road to Zero targets.

To address this issue NTA will:

- target investment on areas with highest safety risk.
- implement the road safety promotion programme
- undertake speed management reviews
- traffic mode segregation as part of the Walking and Cycling Strategy
- safer crossing points

8.3.5 Critical Assets

An analysis has been completed to identify the most critical routes in the Region. In summary, the assessment framework is based around recognising the priority of Key Service Areas, as defined through the Lifelines Study. The need for reliable access to these areas in turn attaches importance to certain routes, which is reflected in the roading network hierarchy.

OBJECTIVE	Recognise the critical routes/links within the district to allow for the application of different management strategies. This will then assist in the resilience and recovery of the network during and after an emergency event.

The criticality analysis table thus developed values the importance of a route and its associated transport asset components, and gives due regard to the consequences of them failing or becoming damaged. Criticality plans for the road(s) that are identified as critical are being developed so that financial planning to manage these important routes is considered in terms of likely increased expenditure necessary to protect them.

There are many component assets associated with the routes in question, and many associated risks. Some of these have much less risk than others and do not directly affect the route; hence, some components are adjudged 'not critical' in the terms risk to route, whilst the route itself remains of critical importance.

The critical asset table below summarises the function of a route, and identifies specific issues that could cause the route to become critical.

Table 8-3: Criticality and Associated Risk of Each Asset

Asset Group	Asset Type	Functional Issues	Critical Yes/No	Specific Issue	Associated Risk
Roads	All	Access to CBD, Small communities	Yes	Storm event, collapse	Yes
Structures	Bridges includes Over-bridge	Access carries services	Yes	Collapse, earthquake service broken. Over-bridge if it affects access to critical routes	Yes
	Structures	Retaining Wall Stability, retaining	Yes	Collapse, earth quake service broken, affects access, becomes a critical issue, roads full blown condition and performance monitoring.	Yes
	Guardrail	Safety, guides and delineates	No		Yes
Drainage	All	Associated with roads	Yes	Associated with roads	Yes
Traffic Control Devices	Traffic Signals	Manage traffic	Yes	Maintain control, hierarchy of sites, network issues	Yes
	Sign/Marking/ Delineation	Safety, guides and delineates	No		
	Intelligent Traffic Systems		No		Yes

Asset Group	Asset Type	Functional Issues	Critical Yes/No	Specific Issue	Associated Risk
Walking & Cycling	All	Pedestrian access	No		Yes
Street Scape	All	Personnel safety and security	No		Yes
Non Asset Specific	All	Communications, emergency plans	Yes	Maintaining communications, roles and responsibilities in emergency events	Yes

8.3.5.1 Further Actions

For risk and criticality a number of further actions are required. These are:

- Funding allowance made in relation to all HIGH and VERY HIGH level risks. Under the best practice plan this has been allowed for to some extent, but requires further recognition.
- There are a number of risks that are shared between the Asset Management and Corporate Management. These risks will need to be elevated through the current framework to agree how they are to be addressed.
- The HIGH risks identified need be more tightly integrated to the level of service delivery strategy under which this plans works.
- NTA Department risks need to be considered against risks identified in the other 'Infrastructure and Services Group' departments. The priorities and balancing that should result from that exercise would then need to be fed back into each department's plan.

9 Financials

This section details what the three councils are forecasted to spend, on what and how the this they will acquire these funds.

9.1 Funding Sources

The Councils have developed policies around how projects and other activities are to be funded. These policies are set out in *Table 9-1* and further information on each of these policies can be found in the *Long Term Plan and Councils funding Policies*.

Table 9-1: Councils Funding and Financial Policies

Policy	Description	Relationship to the Roading Department
Development Contribution Policy	The policy sets out what the value of the contributions will be and who is required to pay.	Capital projects are undertaken based on demand and the required funding for the growth portion which is acquired from these contributions.
Revenue and Financing Policy	The policy outlines how operating and capital expenditure for each activity will be funded, what funding sources are available to Council and how spending contributes to the Community Outcomes	The Roading Department complies with this policy.

The recognised funding sources for the transport activity are:

- General Rates – usually used to fund maintenance and operations and renewal
- Targeted Rates – used to fund specific works (e.g. ratepayer contribution for a seal extension)
- NZTA Subsidy – contributes to the funding of approved NZTA operations and maintenance, renewal and capital works (in accordance with the NZTA *Programme and Funding Manual*)
- Development Contribution – to fund the growth portion of capital works (Whangarei and Kaipara DC only)
- Fees and Charges – to fund activities that fees and charges are taken for (e.g. car parking)
- Loans – to fund the balance of capital works
- Cost Share Agreements – agreements between the Roading Department and other parties to share the costs of operations (e.g. forestry industry contributing to road maintenance)
- Private Developer Agreements - agreement between the Roading Department and developers to share costs as opposed to collecting development contributions for that specific development
- Petroleum Tax – share of the Central Governments petroleum tax that contributes to maintenance
- Alternative Funding Sources – additional Central Government funding has been granted to the councils over the last 3 years from alternative funding sources such as the Provincial Growth Fund (PGF), Crown Infrastructure Partners (CIP) fund and Tourism Infrastructure Fund (TIF). This funding has been provided to the councils as a grant for specific capital improvement projects.

These are generally accessed in priority order as follows;

Table 9-2: Funding Sources

Expenditure Area	Funding Source
Operations and Maintenance	NZTA subsidy General Rates Petroleum Tax
Renewals	NZTA subsidy, General Rates (depreciation fund)
Capital New and Improvement	NZTA subsidy, Development Contribution, Targeted Rates Debt funded General Rates

9.1.1 Government Funding

The Councils policy around acquiring funding is;

POLICY	The Council aims to optimise the subsidies available from NZTA for the provision of infrastructure while balancing the need for unsubsidised work and the overall Council funds available.

With the change in the vehicle dimension mass rule this issue is more relevant in terms of the heavy industry routes and who should pay.

Continued lobbying of central government for such monies continues to ensure that the rate payers of Northland are not unfairly carrying the cost of maintaining the roads when the benefit derived is a regional or national one.

9.1.2 Development Contributions

Section 3.2.4 of the *Activity Management Planning - Policy and Practice* contains information on growth funding (development contributions).

With the enactment of the *Local Government Act 2002*, Council has the power to levy new developments where costs to the community could arise.

9.1.2.1 Far North DC Development Contribution

FNDC has taken the following position as noted under the significant Forecasting Assumption with LTP:

“Development contributions: In 2015 Council resolved to suspend Development Contribution charges in light of the economic downturn. No decision has been made to re-commence the charging of Development Contributions for the term of this LTP, and therefore no income from source is assumed”.

9.1.2.2 Kaipara DC Development Contribution

The Kaipara District Development Contributions Policy 2021 is adopted under the Local Government Act 2002 (the Act). It is one of a number of financial policies the Council uses to meet its funding needs, including those for funding the Roading activity. The policy is based on capital expenditure proposed in the 2021-31 Long Term Plan (LTP). Development contributions for each Council activity are calculated in a development contributions model supporting the policy. This can be examined on request at any office of the Council. It contains the schedules required by the Act to show how contributions are calculated and the resulting contribution amounts.

In keeping with the principles in section 197AB of the Act, the model has the following steps:

- It only allows a capital project to go into the development contribution calculations when a clear connection can be shown between development occurring and the asset or increased capacity in the asset, being provided;
- It shares the net project cost (less any subsidies and other sources of funding), among those persons who will benefit from the asset and those who created the need for the asset;
- It spreads the resulting development-related project cost over the capacity life of the asset – that is between the year in which the asset starts to provide capacity and the year in which that capacity is consumed, and another project is needed to add further capacity to the network;
- It groups developments into geographic areas or 'catchments', across which project costs can be shared.

For projects adding capacity to the entire district Roading network, the Council has determined to use a single district-wide Roading catchment to share costs. Several projects in the LTP mainly support strong growth occurring along the eastern (Auckland) district boundary including Mangawhai and Kaiwaka areas. These project costs have been allocated to a separate Roading East catchment.

Once the development-related costs of an activity for the 10 years of the LTP have been determined for each catchment, the costs are divided by the number of additional rating units projected in that catchment over that time. This gives the development contribution per unit of demand (UoD) for the activity.

The approved development contribution for Roading in Kaipara District per unit of demand (excluding GST), has been calculated as (currently out for Consultation with LTP):

- $90 for the district-wide catchment; and
- an additional $2273 for development in the Roading East catchment.

9.1.2.3 Whangarei DC Development Contribution

WDC has adopted a *Development Contributions Policy* under the *Local Government Act 2002*. A copy can be obtained from Council on request. Under the revised Local Government Act the application of Development Contribution (DC) to the transport activity had to be revised. This revision required that the roading network was broken into Localities and the application of DC tested in terms of placing the cost of growth with the area of growth. On this basis the Roading network now consist of 5 Localities with DC charge related to each of these Localities based upon the growth community and either the number of projects or the percentage of any given programme of works occurring in these Localities.

Development Contributions have been calculated using SPM Development Contribution (DC) systems, into which Council have loaded the District Growth Model. The development contribution income is based on the portion of the project expenditure that is required due to growth. This is assessed through developing a

cost allocation for each project as this relates to a level of service e.g. Peak Traffic might be used for a project that is looking to alleviate traffic congestion that is being created by the growth community. The model then calculates what portion of the population, in terms of Household Equivalent Units (HUE) is community growth. This then determines the income required per HUE that will be charged when development in the district is undertaken, whether this be a new house or a major industrial/residential subdivision.

The approved Development Contribution (DC) for transport, per Household Unit Equipment (HUE) excluding GST has been set based on per catchment. Refer to *'Council's Development Contributions Policy for the DC charges'*. These are currently under consultation with the LTP.

For WDC Capacity projects for the purposes of determining DC for land transportation activity are developed in the following manner;

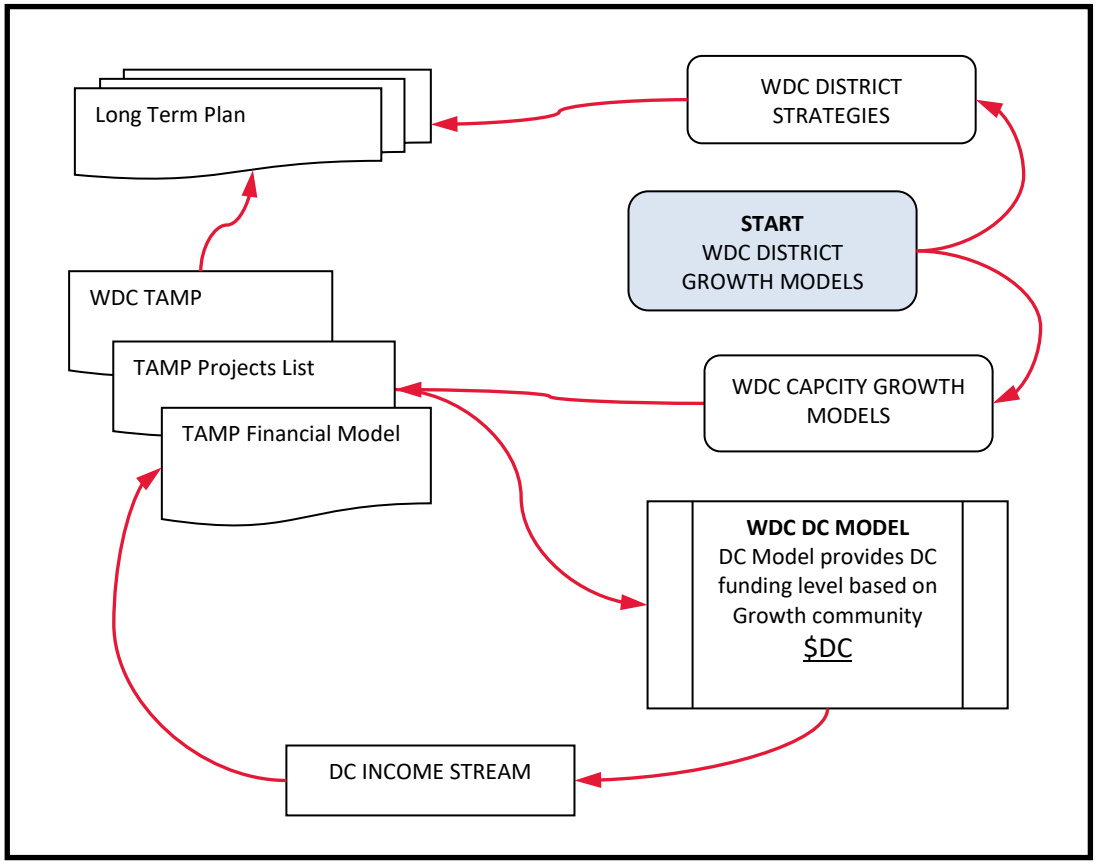


Figure 9-1: Development Contribution Relationship

9.1.2.4 Funding of Parking

Whangarei District Council's current policy for the funding of parking is to apply user charges for operating costs to the users of parking space and to fine over-stayers. The *Parking Management Strategy* sets out a number of fee structures for short term, long term and all day parking to encourage users to park in such a way that occupancy rates for parking can be lifted to meet targets of 75 - 90%.

All parking fines are issued and collected by the Council's Compliance Department and used to offset Parking Warden costs. Income from parking fees is used to fund maintenance, renewal and development of the car park asset.

Far North and Kaipara District Councils do not have formal policy in regards to parking and parking fees.

9.2 Operational Funding

9.2.1 Routine & Planned Maintenance

The routine and planned maintenance plan expenditure supports the overall life cycle management strategy. This strategy looks to invest in pavement renewal and technology upgrades with long term savings being realised through reduction in escalating pre-seal repair maintenance, power costs and reduction in the long-term resurfacing of the sealed pavements.

Table 9-3, 9-4 and 9-5 and *Figure 9-2, 9-3 and 9-4* shows in detail the routine and planned maintenance expenditure for the transport activity. This is shown in un-inflated dollars and excludes income, improvement and capital but includes for asset growth due to capital investment.

Table 9-3: FNDC Routine and Planned Maintenance Expenditure

Asset Group Desc	Asset Type Desc	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31
Drainage	Sub Surface Drainage	$1,672,884	$1,558,084	$1,495,084	$1,453,084	$1,295,084	$1,183,084	$1,169,084	$1,191,084	$1,235,084	$1,235,084
	Surface Water Channel	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
Drainage Total		$1,747,884	$1,633,084	$1,570,084	$1,528,084	$1,370,084	$1,258,084	$1,244,084	$1,266,084	$1,310,084	$1,310,084
Emergency Works	Emergency Works	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Emergency Works Total		$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Pavement	Pavement Sealed	$2,331,203	$2,330,003	$2,367,203	$2,399,203	$2,399,203	$2,399,203	$2,399,203	$2,399,203	$2,399,203	$2,399,203
	Unsealed Pavement	$4,447,449	$4,447,449	$4,447,449	$4,447,449	$4,447,449	$4,447,449	$4,447,449	$4,447,449	$4,447,449	$4,447,449
Pavement Total		$6,778,652	$6,777,452	$6,814,652	$6,846,652	$6,846,652	$6,846,652	$6,846,652	$6,846,652	$6,846,652	$6,846,652
Street Scaping	Environmental Management	$2,328,155	$2,328,155	$2,328,155	$2,328,155	$2,328,155	$2,328,155	$2,328,155	$2,328,155	$2,328,155	$2,328,155
	Street Lights	$565,000	$635,000	$645,000	$645,000	$645,000	$645,000	$645,000	$645,000	$645,000	$645,000
Street Scaping Total		$2,893,155	$2,963,155	$2,973,155	$2,973,155	$2,973,155	$2,973,155	$2,973,155	$2,973,155	$2,973,155	$2,973,155
Traffic Control Devices	Signs	$1,346,855	$1,352,255	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855
Traffic Control Devices Total		$1,346,855	$1,352,255	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855	$1,346,855
Walking & Cycleways	Foot Path	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000
Walking & Cycleways Total		$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000	$160,000
Grand Total		**$13,026,546**	**$12,985,946**	**$12,964,746**	**$12,954,746**	**$12,796,746**	**$12,684,746**	**$12,670,746**	**$12,692,746**	**$12,736,746**	**$12,736,746**

Table 9-4: KDC Routine and Planned Maintenance Expenditure

Asset Group Desc	Asset Type Desc	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31
Drainage	Sub Surface Drainage	$900,000	$918,900	$938,197	$957,899	$978,015	$998,553	$1,019,523	$1,040,492	$1,062,343	$1,084,652
Drainage Total		$900,000	$918,900	$938,197	$957,899	$978,015	$998,553	$1,019,523	$1,040,492	$1,062,343	$1,084,652
Emergency Works	Emergency Works	$100,000	$102,100	$104,244	$106,433	$108,668	$110,950	$113,280	$115,610	$118,038	$120,517
Emergency Works Total		$100,000	$102,100	$104,244	$106,433	$108,668	$110,950	$113,280	$115,610	$118,038	$120,517
Pavement	Pavement Sealed	$2,133,855	$2,178,666	$2,224,418	$2,271,131	$2,318,824	$2,367,520	$2,417,238	$2,466,956	$2,518,762	$2,571,656
	Unsealed Pavement	$1,700,000	$1,735,700	$1,772,150	$1,809,365	$1,847,362	$1,886,156	$1,925,765	$1,965,375	$2,006,648	$2,048,787
Pavement Total		$3,833,855	$3,914,366	$3,996,568	$4,080,496	$4,166,186	$4,253,676	$4,343,003	$4,432,330	$4,525,409	$4,620,443
Street Scaping	Environmental Management	$525,089	$536,116	$547,374	$558,869	$570,605	$582,588	$594,822	$607,057	$619,805	$632,821
	Street Lights	$40,000	$40,840	$41,698	$42,573	$43,467	$44,380	$45,312	$46,244	$47,215	$48,207
Street Scaping Total		$565,089	$576,956	$589,072	$601,442	$614,073	$626,968	$640,135	$653,301	$667,020	$681,028
Structures	Bridges & Major Culverts	$265,849	$271,432	$277,132	$282,952	$288,894	$294,960	$301,155	$307,349	$313,803	$320,393
Structures Total		$265,849	$271,432	$277,132	$282,952	$288,894	$294,960	$301,155	$307,349	$313,803	$320,393
Traffic Control Devices	Signs	$900,000	$918,900	$938,197	$957,899	$978,015	$998,553	$1,019,523	$1,040,492	$1,062,343	$1,084,652
Traffic Control Devices Total		$900,000	$918,900	$938,197	$957,899	$978,015	$998,553	$1,019,523	$1,040,492	$1,062,343	$1,084,652
Walking & Cycleways	Foot Path	$79,733	$81,408	$83,117	$84,863	$86,645	$88,464	$90,322	$92,180	$94,116	$96,092
	Walk Ways (Sub)	$0	$5,000	$10,000	$10,210	$10,424	$10,643	$10,867	$11,090	$11,323	$11,561
Walking & Cycleways Total		$79,733	$86,408	$93,117	$95,073	$97,069	$99,108	$101,189	$103,270	$105,439	$107,653
Grand Total		**$6,644,526**	**$6,789,061**	**$6,936,527**	**$7,082,194**	**$7,230,920**	**$7,382,769**	**$7,537,807**	**$7,692,846**	**$7,854,395**	**$8,019,338**

Table 9-5: WDC Routine and Planned Maintenance Expenditure

Asset Group Desc	Asset Type Desc	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31
Drainage	Sub Surface Drainage	$1,380,000	$1,385,150	$1,390,300	$1,395,450	$1,400,600	$1,405,750	$1,410,900	$1,416,050	$1,421,200	$1,432,530
	Surface Water Channel	$50,000	$50,250	$50,500	$50,750	$51,000	$51,250	$51,500	$51,750	$52,000	$52,550
Drainage Total		$1,430,000	$1,435,400	$1,440,800	$1,446,200	$1,451,600	$1,457,000	$1,462,400	$1,467,800	$1,473,200	$1,485,080
Emergency Works	Emergency Works	$50,000	$50,250	$50,500	$50,750	$51,000	$51,250	$51,500	$51,750	$52,000	$52,550
Emergency Works Total		$50,000	$50,250	$50,500	$50,750	$51,000	$51,250	$51,500	$51,750	$52,000	$52,550
Parking (On & Off Street)	Carpark Assets	$140,000	$140,000	$140,000	$140,000	$140,000	$140,000	$140,000	$140,000	$140,000	$140,000
	Carpark Meters	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
	Electricity	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking (On & Off Street) Total		$340,000	$340,000	$340,000	$340,000	$340,000	$340,000	$340,000	$340,000	$340,000	$340,000
Pavement	Pavement Sealed	$2,830,000	$2,827,260	$2,822,820	$2,921,780	$2,808,840	$2,907,800	$2,898,260	$2,942,970	$2,987,680	$3,058,690
	Unsealed Pavement	$1,650,000	$1,661,550	$1,673,100	$1,684,650	$1,696,200	$1,707,750	$1,719,300	$1,730,850	$1,742,400	$1,753,950
Pavement Total		$4,480,000	$4,488,810	$4,495,920	$4,606,430	$4,505,040	$4,615,550	$4,617,560	$4,673,820	$4,730,080	$4,812,640
Street Scaping	Amenity Lighting	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
	Bus Shelters	$30,000	$40,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
	Environmental Management	$70,000	$70,350	$70,700	$71,050	$71,400	$71,750	$72,100	$72,450	$72,800	$73,570
	Street Furniture	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
	Street Lights	$750,000	$753,750	$757,500	$761,250	$765,000	$768,750	$772,500	$776,250	$780,000	$788,250
	Vegetation Management	$850,000	$904,500	$909,000	$913,500	$918,000	$922,500	$927,000	$931,500	$936,000	$945,900
Street Scaping Total		$1,720,000	$1,788,600	$1,807,200	$1,815,800	$1,824,400	$1,833,000	$1,841,600	$1,850,200	$1,858,800	$1,877,720
Structures	Bridges & Major Culverts	$230,000	$231,150	$232,300	$233,450	$234,600	$235,750	$236,900	$238,050	$239,200	$241,730
	Lower Harbour Bridge	$585,000	$587,925	$590,850	$593,775	$596,700	$599,625	$602,550	$605,475	$608,400	$614,835
Structures Total		$815,000	$819,075	$823,150	$827,225	$831,300	$835,375	$839,450	$843,525	$847,600	$856,565
Traffic Control Devices	Intellignet Traffic Systems	$60,000	$60,300	$60,600	$60,900	$61,200	$61,500	$61,800	$62,100	$62,400	$63,060
	Level X-ings	$60,000	$60,300	$60,600	$60,900	$61,200	$61,500	$61,800	$62,100	$62,400	$63,060
	Pavement Marking	$850,000	$854,250	$858,500	$862,750	$867,000	$871,250	$875,500	$879,750	$884,000	$893,350
	Pedestrian Crossings	$15,000	$15,075	$15,150	$15,225	$15,300	$15,375	$15,450	$15,525	$15,600	$15,765
	Signs	$440,000	$442,200	$444,400	$446,600	$448,800	$451,000	$453,200	$455,400	$457,600	$462,440
	Traffic Signal	$290,000	$291,450	$292,900	$294,350	$295,800	$297,250	$298,700	$300,150	$301,600	$304,790
Traffic Control Devices Total		$1,715,000	$1,723,575	$1,732,150	$1,740,725	$1,749,300	$1,757,875	$1,766,450	$1,775,025	$1,783,600	$1,802,465
Walking & Cycleways	Foot Path	$350,000	$351,750	$353,500	$355,250	$357,000	$358,750	$360,500	$362,250	$364,000	$367,850
	Walk Ways (Unsub)	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
	Walking & Cycling	$35,000	$52,500	$70,000	$87,500	$105,000	$122,500	$140,000	$157,500	$175,000	$192,500
Walking & Cycleways Total		$405,000	$424,250	$443,500	$462,750	$482,000	$501,250	$520,500	$539,750	$559,000	$580,350
Grand Total		**$10,955,000**	**$11,069,960**	**$11,133,220**	**$11,289,880**	**$11,234,640**	**$11,391,300**	**$11,439,460**	**$11,541,870**	**$11,644,280**	**$11,807,370**

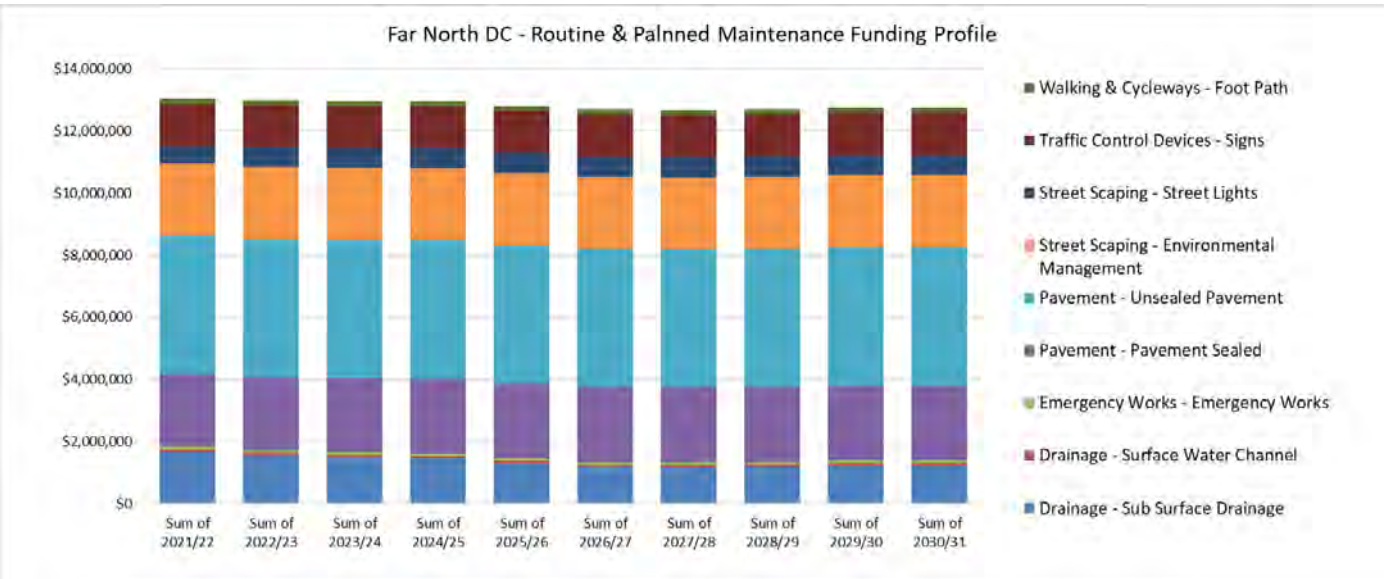


Figure 9-2: FNDC Routine and Planned Maintenance Expenditure

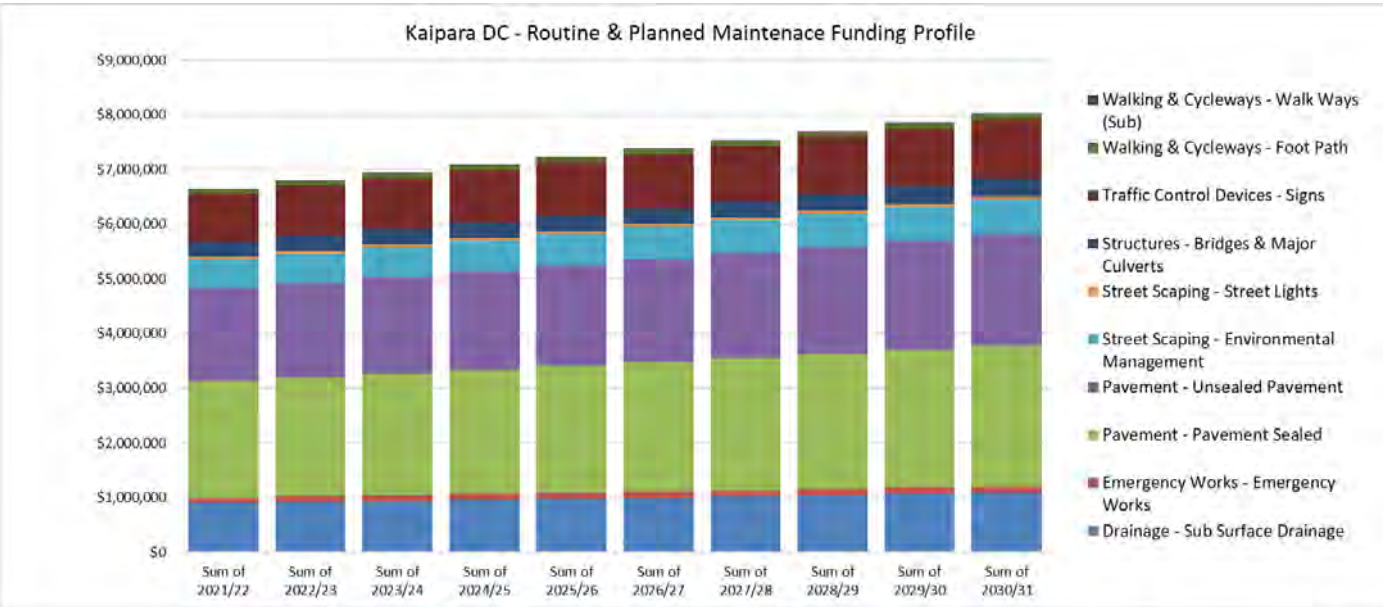


Figure 9-3: KDC Routine and Planned Maintenance Expenditure

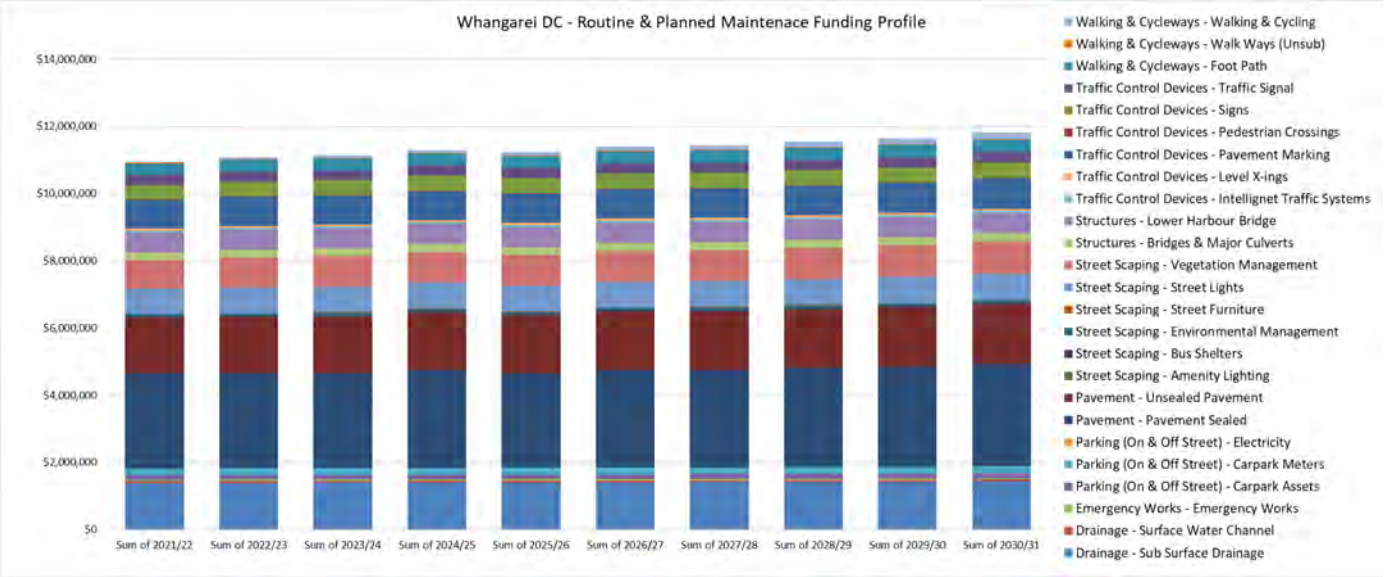


Figure 9-4: WDC Routine and Planned Maintenance Expenditure

9.2.2 Renewal & Replacement

The renewals plan is based around the strategy of maintaining the investment in sealed pavement rehabilitations in order to reduce the escalating maintenance costs, close the gap on the current depreciation profile and deliver long term savings.

The renewals and replacement plan for each Council is shown in *Table 9-6, 9-7 and 9-8* and *Figures 9-5, 9-6 and 9-7*.

The renewals and maintenance plans are related. Any funding changes made in either area will require a review of the overall network strategy to deliver the required service levels.

Table 9-6: FNDC Renewals Expenditure

Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31	Sum of 2031/32
Footpath renewals	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00
Sealed road resurfacing	$ 4,477,800.00	$ 4,579,554.00	$ 4,678,664.00	$ 4,666,184.00	$ 4,982,040.00	$ 4,867,048.00	$ 4,203,172.00	$ 5,248,334.00	$ 5,248,334.00	$ 5,248,334.00	$ 5,248,334.00
Unsealed road metalling	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83	$ 5,506,349.83
Drainage renewals - Culvert renewals	$ 750,000.00	$ 445,000.00	$ 630,000.00	$ 550,000.00	$ 600,000.00	$ 335,000.00	$ 390,000.00	$ 300,000.00	$ 250,000.00	$ 740,000.00	$ 435,000.00
Drainage renewals - Kerb & channel renewal	$ 53,000.00	$ 300,000.00	$ 30,000.00	$ 246,000.00	$ 500,000.00	$ 36,000.00	$ 83,000.00	$ 355,000.00	$ 145,000.00	$ 53,000.00	$ 300,000.00
Sealed road pavement rehabilitation	$ 3,154,000.00	$ 3,058,000.00	$ 3,394,000.00	$ 3,202,000.00	$ 3,058,000.00	$ 3,586,000.00	$ 3,394,000.00	$ 2,770,000.00	$ 2,770,000.00	$ 2,770,000.00	$ 2,770,000.00
Structures component replacements - Bridges	$ 1,542,000.00	$ 1,542,000.00	$ 1,542,000.00	$ 935,000.00	$ 910,000.00	$ 905,000.00	$ 905,000.00	$ 770,000.00	$ 770,000.00	$ 990,000.00	$ 990,000.00
Structures component replacements - Retaining Walls	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00	$ 125,000.00
Structures component replacements - Ferry	$ 130,000.00	$ 334,000.00	$ 83,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00
Bridge renewals	$ 1,265,000.00	$ 1,155,000.00	$ 1,210,000.00	$ 1,155,000.00	$ 1,100,000.00	$ 2,000,000.00	$ 1,300,000.00	$ 2,000,000.00	$ 550,000.00	$ 550,000.00	$ 550,000.00
Retaining Wall renewals	$ 200,000.00	$ 250,000.00	$ 350,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00
Traffic services renewals - maintenance contract	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00
Traffic services renewals - streetlights	$ 70,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00
Wharf Supporting Infrastructure	$ 100,000.00	$ 450,000.00	$ 450,000.00	$ -	$ 500,000.00	$ 500,000.00	$ -	$ -	$ -	$ -	$ -
Grand Total	**$ 18,233,149.83**	**$ 18,704,903.83**	**$ 18,959,013.83**	**$ 17,715,533.83**	**$ 18,611,389.83**	**$ 19,190,397.83**	**$ 17,236,521.83**	**$ 18,404,683.83**	**$ 16,694,683.83**	**$ 17,312,683.83**	**$ 17,254,683.83**

Table 9-7: KDC Renewals Expenditure

Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31
211 - Unsealed road metalling	$ 3,044,000.00	$ 3,107,924.00	$ 3,173,190.00	$ 3,239,827.00	$ 3,307,864.00	$ 3,377,329.00	$ 3,448,253.00	$ 3,519,177.00	$ 3,593,079.00	$ 3,668,534.00
212 - Sealed road resurfacing	$ 2,000,000.00	$ 2,042,000.00	$ 2,084,882.00	$ 2,128,665.00	$ 2,173,366.00	$ 2,219,007.00	$ 2,265,606.00	$ 2,312,205.00	$ 2,360,762.00	$ 2,410,338.00
213 - Drainage renewals	$ 638,450.00	$ 651,857.00	$ 665,546.00	$ 679,523.00	$ 693,793.00	$ 708,363.00	$ 723,238.00	$ 738,114.00	$ 753,614.00	$ 769,440.00
214 - Sealed road pavement rehabilitation	$ 1,700,000.00	$ 1,735,700.00	$ 1,772,150.00	$ 1,809,365.00	$ 1,847,362.00	$ 1,886,156.00	$ 1,925,765.00	$ 1,965,375.00	$ 2,006,648.00	$ 2,048,787.00
215 - Structures component replacements	$ 1,000,000.00	$ 1,021,000.00	$ 1,042,441.00	$ 1,064,332.00	$ 1,086,683.00	$ 1,109,504.00	$ 1,132,803.00	$ 1,156,103.00	$ 1,180,381.00	$ 1,205,169.00
222 - Traffic services renewals	$ 185,000.00	$ 188,885.00	$ 192,852.00	$ 196,901.00	$ 201,036.00	$ 205,258.00	$ 209,569.00	$ 213,879.00	$ 218,370.00	$ 222,956.00
225 - Footpath Renewals	$ 53,156.00	$ 54,272.00	$ 55,412.00	$ 56,575.00	$ 57,763.00	$ 58,976.00	$ 60,215.00	$ 61,453.00	$ 62,744.00	$ 64,061.00
226 - Bridge Replacements	$ 1,000,000.00	$ 1,021,000.00	$ 1,042,441.00	$ 1,064,332.00	$ 1,086,683.00	$ 1,109,504.00	$ 1,800,000.00	$ 1,156,103.00	$ 1,180,381.00	$ 1,205,169.00
Pouto Road Second Coat Sealing	$ -	$ -	$ 500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grand Total	**$ 9,620,606.00**	**$ 9,822,638.00**	**$ 10,528,914.00**	**$ 10,239,520.00**	**$ 10,454,550.00**	**$ 10,674,097.00**	**$ 11,565,449.00**	**$ 11,122,409.00**	**$ 11,355,979.00**	**$ 11,594,454.00**

Table 9-8: WDC Renewals Expenditure

Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31	Sum of 2031/32
Amenity Lighting	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00	$ 90,000.00
Unsealed Road Metalling	$ 2,060,000.00	$ 2,074,420.00	$ 2,088,840.00	$ 2,103,260.00	$ 2,117,680.00	$ 2,132,100.00	$ 2,146,520.00	$ 2,160,940.00	$ 2,175,360.00	$ 2,189,780.00	$ 2,204,200.00
Structures - Coastal Protection Structures	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00	$ 85,000.00
Drainage - Structures New & Renewals	$ 200,000.00	$ 201,000.00	$ 202,000.00	$ 203,000.00	$ 204,000.00	$ 205,000.00	$ 206,000.00	$ 207,000.00	$ 208,000.00	$ 210,200.00	$ 211,200.00
Drainage - Water Table Renewals (K&C Repl Hvy WT)	$ 500,000.00	$ 502,500.00	$ 505,000.00	$ 507,500.00	$ 510,000.00	$ 512,500.00	$ 515,000.00	$ 517,500.00	$ 520,000.00	$ 525,500.00	$ 528,000.00
Drainage - Sealed Rehab Culverts	$ 350,000.00	$ 351,750.00	$ 353,500.00	$ 355,250.00	$ 357,000.00	$ 358,750.00	$ 360,500.00	$ 362,250.00	$ 364,000.00	$ 367,850.00	$ 369,600.00
Footpath - Renewals	$ 400,000.00	$ 402,000.00	$ 404,000.00	$ 406,000.00	$ 408,000.00	$ 410,000.00	$ 412,000.00	$ 414,000.00	$ 416,000.00	$ 420,400.00	$ 422,400.00
Footpath - Renewals Others	$ 30,000.00	$ 30,150.00	$ 30,300.00	$ 30,450.00	$ 30,600.00	$ 30,750.00	$ 30,900.00	$ 31,050.00	$ 31,200.00	$ 31,530.00	$ 31,680.00
Parking Off Street - Meters New & Renewal	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00
Parking Off Street - Resurface	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00
Structures - Bridge replacements	$ 1,650,000.00	$ 1,540,000.00	$ 1,540,000.00	$ 1,650,000.00	$ 1,650,000.00	$ 1,650,000.00	$ 1,650,000.00	$ 1,650,000.00	$ 1,650,000.00	$ 1,650,000.00	$ 1,650,000.00
Sealed Pavement - Design MSQA	$ 150,000.00	$ 152,550.00	$ 155,100.00	$ 157,650.00	$ 160,200.00	$ 162,750.00	$ 165,300.00	$ 167,850.00	$ 170,400.00	$ 174,450.00	$ 177,000.00
Sealed Pavement - Rehabilitation	$ 3,000,000.00	$ 3,051,000.00	$ 3,102,000.00	$ 3,153,000.00	$ 3,204,000.00	$ 3,255,000.00	$ 3,306,000.00	$ 3,357,000.00	$ 3,408,000.00	$ 3,489,000.00	$ 3,540,000.00
Sealed Road Resurfacing - Line Marking	$ 200,000.00	$ 203,400.00	$ 206,800.00	$ 210,200.00	$ 213,600.00	$ 217,000.00	$ 220,400.00	$ 223,800.00	$ 227,200.00	$ 232,600.00	$ 236,000.00
Sealed Road Resurfacing - Chip Seal	$ 3,100,000.00	$ 3,152,700.00	$ 3,205,400.00	$ 3,258,100.00	$ 3,310,800.00	$ 3,363,500.00	$ 3,416,200.00	$ 3,468,900.00	$ 3,521,600.00	$ 3,605,300.00	$ 3,658,000.00
Sealed Road Resurfacing - Management	$ 100,000.00	$ 101,700.00	$ 103,400.00	$ 105,100.00	$ 106,800.00	$ 108,500.00	$ 110,200.00	$ 111,900.00	$ 113,600.00	$ 116,300.00	$ 118,000.00
Sealed Road Resurfacing - Thin Asphalt	$ 1,250,000.00	$ 1,271,250.00	$ 1,292,500.00	$ 1,313,750.00	$ 1,335,000.00	$ 1,356,250.00	$ 1,377,500.00	$ 1,398,750.00	$ 1,420,000.00	$ 1,453,750.00	$ 1,475,000.00
Sealed Road Resurfacing - SCRIM Seals	$ 200,000.00	$ 203,400.00	$ 206,800.00	$ 210,200.00	$ 213,600.00	$ 217,000.00	$ 220,400.00	$ 223,800.00	$ 227,200.00	$ 232,600.00	$ 236,000.00
Structures - General Repair	$ 150,000.00	$ 150,750.00	$ 151,500.00	$ 152,250.00	$ 153,000.00	$ 153,750.00	$ 154,500.00	$ 155,250.00	$ 156,000.00	$ 157,650.00	$ 158,400.00
Structures - Hvy Maint Bridges	$ 200,000.00	$ 201,000.00	$ 202,000.00	$ 203,000.00	$ 204,000.00	$ 205,000.00	$ 206,000.00	$ 207,000.00	$ 208,000.00	$ 210,200.00	$ 211,200.00
Structures - Scour Protection	$ 150,000.00	$ 150,750.00	$ 151,500.00	$ 152,250.00	$ 153,000.00	$ 153,750.00	$ 154,500.00	$ 155,250.00	$ 156,000.00	$ 157,650.00	$ 158,400.00
Structures - Componet Replacement BRDG	$ 945,000.00	$ 944,700.00	$ 939,300.00	$ 964,250.00	$ 969,000.00	$ 973,750.00	$ 978,500.00	$ 983,250.00	$ 988,000.00	$ 998,450.00	$ 1,003,200.00
Lighting Renewals	$ 200,000.00	$ 201,000.00	$ 202,000.00	$ 203,000.00	$ 204,000.00	$ 205,000.00	$ 206,000.00	$ 207,000.00	$ 208,000.00	$ 210,200.00	$ 211,200.00
Signs Railings & facilities - Renewals	$ 250,000.00	$ 251,250.00	$ 252,500.00	$ 253,750.00	$ 255,000.00	$ 256,250.00	$ 257,500.00	$ 258,750.00	$ 260,000.00	$ 262,750.00	$ 264,000.00
Traffic Signal - Renewals	$ 300,000.00	$ 301,500.00	$ 303,000.00	$ 304,500.00	$ 306,000.00	$ 307,500.00	$ 309,000.00	$ 310,500.00	$ 312,000.00	$ 315,300.00	$ 316,800.00
ITS - Renewals	$ 100,000.00	$ 100,500.00	$ 101,000.00	$ 101,500.00	$ 102,000.00	$ 102,500.00	$ 103,000.00	$ 103,500.00	$ 104,000.00	$ 105,100.00	$ 105,600.00
MI - School Zones and driver feed back	$ 170,000.00	$ 210,000.00	$ 130,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MI - Traffic signals	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00
Structures - Retaining Wall Rreplacements	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00	$ 350,000.00
Cycleways - On Road	$ 250,000.00	$ 250,000.00	$ 300,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sealed Road Resurfacing - Contrtact Mngt Fixed Cost	$ 110,000.00	$ 111,870.00	$ 113,740.00	$ 115,610.00	$ 117,480.00	$ 119,350.00	$ 121,220.00	$ 123,090.00	$ 124,960.00	$ 127,930.00	$ 129,800.00
Sealed Road Pavement - Contrtact Mngt Fixed Cost	$ 90,000.00	$ 91,530.00	$ 93,060.00	$ 94,590.00	$ 96,120.00	$ 97,650.00	$ 99,180.00	$ 100,710.00	$ 102,240.00	$ 104,670.00	$ 106,200.00
UnSealed Road - Contrtact Mngt Fixed Cost	$ 180,000.00	$ 181,260.00	$ 182,520.00	$ 183,780.00	$ 185,040.00	$ 186,300.00	$ 187,560.00	$ 188,820.00	$ 190,080.00	$ 191,340.00	$ 192,600.00
Drainage - Sealed Rehab	$ 50,000.00	$ 50,250.00	$ 50,500.00	$ 50,750.00	$ 51,000.00	$ 51,250.00	$ 51,500.00	$ 51,750.00	$ 52,000.00	$ 52,550.00	$ 52,800.00
Drainage - Contract Mngt Fixed Cost	$ 225,000.00	$ 226,125.00	$ 227,250.00	$ 228,375.00	$ 229,500.00	$ 230,625.00	$ 231,750.00	$ 232,875.00	$ 234,000.00	$ 236,475.00	$ 237,600.00
Drainage - Kerb & Channel Renewal	$ 100,000.00	$ 100,500.00	$ 101,000.00	$ 101,500.00	$ 102,000.00	$ 102,500.00	$ 103,000.00	$ 103,500.00	$ 104,000.00	$ 105,100.00	$ 105,600.00
MI - Sight Rails	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MI - Stock Underpasses	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Structures - Ret Wall Component Replacement	$ 100,000.00	$ 100,500.00	$ 101,000.00	$ 101,500.00	$ 102,000.00	$ 102,500.00	$ 103,000.00	$ 103,500.00	$ 104,000.00	$ 105,100.00	$ 105,600.00
Grand Total	**$ 18,125,000.00**	**$ 18,226,305.00**	**$ 18,362,510.00**	**$ 18,199,065.00**	**$ 18,375,420.00**	**$ 18,551,775.00**	**$ 18,728,130.00**	**$ 18,904,485.00**	**$ 19,080,840.00**	**$ 19,364,725.00**	**$ 19,541,080.00**

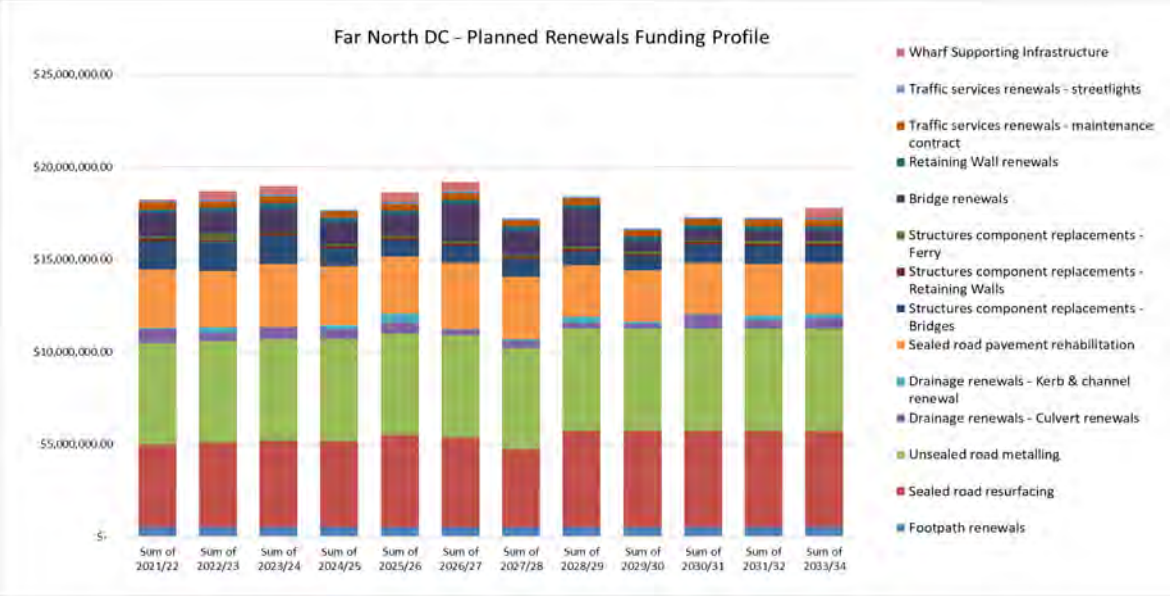


Figure 9-5: FNDC Renewals Expenditure

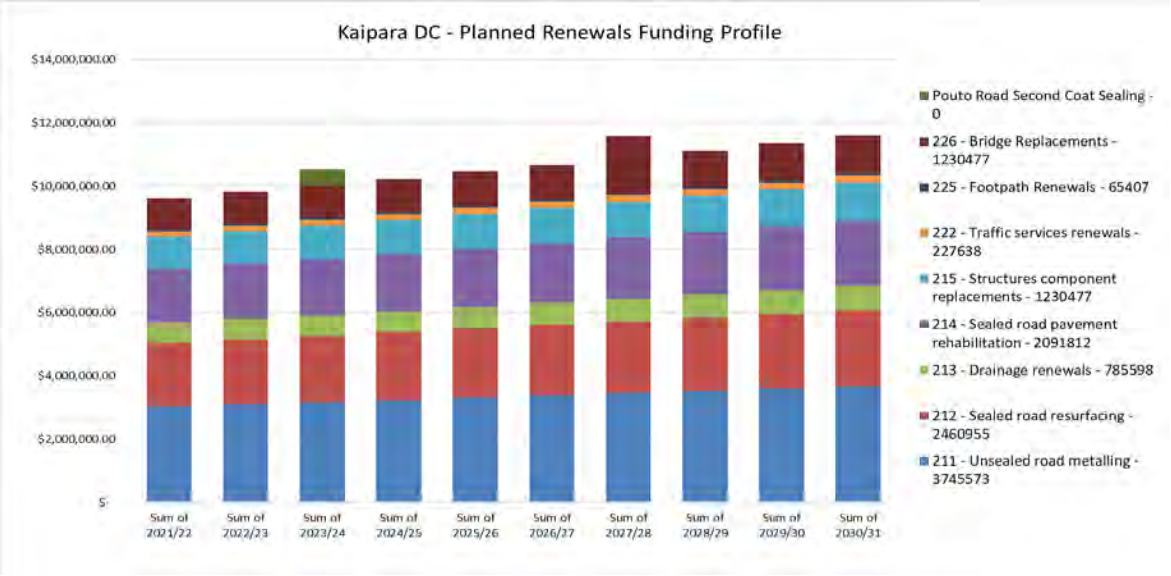


Figure 9-6: KDC Renewals Expenditure

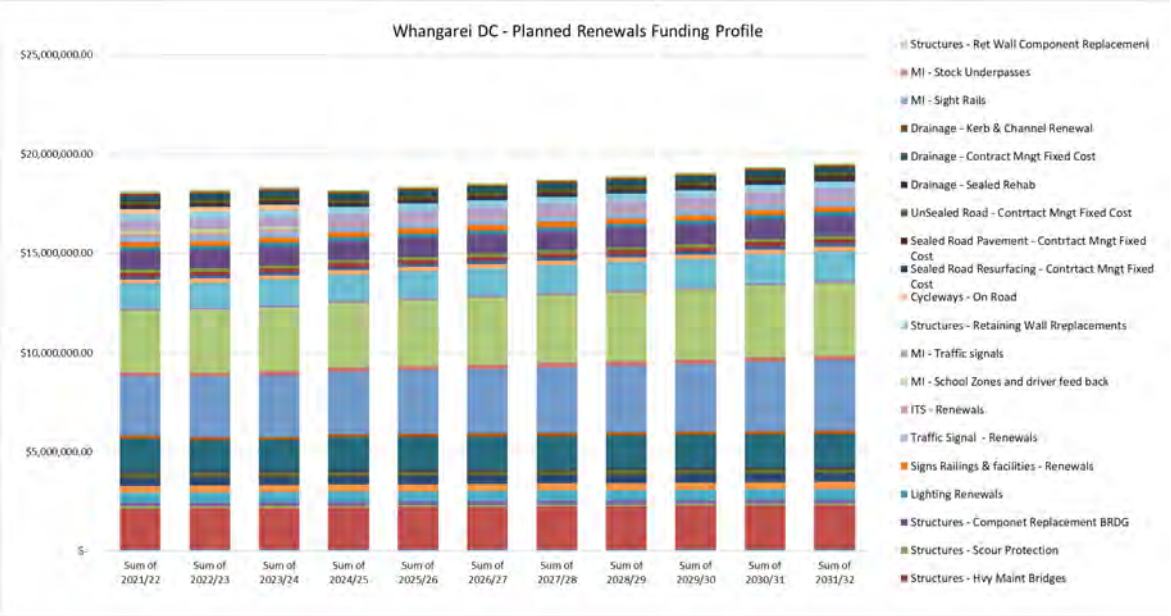


Figure 9-7: WDC Renewals Expenditure

9.2.3 Capital New & Improvement Expenditure

For Whangarei District Council, significant investment is programmed to continue for the Shared Path (Cycleway Strategy) over the term of this plan. In relation to this investment is being sought for Passenger Transport (PT) development and upgrade. These two investment strategies look to reduce the demand on the road network and encourage modal transport shift to Walking /cycling and PT. These projects are identified in WDC's Whangarei City Transportation Network Strategy and One Tree Point/Marsden Point Strategy Study.

Both Far North and Kaipara Councils are starting a programme of improvements to the road network and walking/cycling projects to address growth areas, improve safety and provide alternative travel choices. These projects have been identified through FNDC's Integrated Transport Plan and KDC's Mangawhai Network Operating Framework and township spatial plans.

Far North and Whangarei Councils have indicated that they wish to continue a programme of seal extension on the network. This plan is addressing this issue in a number of ways:

- The sealing of the high priority unsealed roads based on Seal Extension Prioritisation Matrix. Where business case for subsidy can proven, then NZTA share will be requested.
- Where houses have been identified as being close to an unsealed road and there is safety/health issues related to dust nuisance from heavy commercial vehicles then the sealing of 100m strips is being programmed.
- Where there is continuing request from the community to seal roads, a rate payer subsidy for the construction of the seal extension is required to certain value which council will then consider funding the balance. No other funding avenues are currently available for seal extension.

Table 9-9, 9-10 and 9-11 and *Figures 9-8, 9-9 and 9-10* detail the funding for the planned new and improvement programme.

Table 9-9: FNDC Capital Improvement Expenditure

Work Type	Primary Drivers	Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31	Sum of 2031/32
New	Growth	Footpaths	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 960,000.00
		New Rest areas and upgrades	$ -	$ -	$ -	$ -	$ -	$ 427,500.00	$ 855,000.00	$ 1,282,500.00	$ 855,000.00	$ 855,000.00	$ 427,500.00
		Hokianga New Ferry Services	$ -	$ -	$ -	$ 300,000.00	$ 300,000.00	$ 530,000.00	$ -	$ 500,000.00	$ 1,000,000.00	$ 234,000.00	$ 5,000,000.00
	Growth Total		$ 960,000.00	$ 960,000.00	$ 960,000.00	$ 1,260,000.00	$ 1,260,000.00	$ 1,917,500.00	$ 1,815,000.00	$ 2,742,500.00	$ 2,815,000.00	$ 2,049,000.00	$ 6,387,500.00
	Level of Service	Parking review and plan	$ 200,000.00	$ 150,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Recreational Walking & Cycling Tracks	$ -	$ 75,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Cycle Connections	$ 75,000.00	$ 75,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total Mobility Scheme	$ -	$ 100,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Public Transport / Ride Share	$ 50,000.00	$ 75,000.00	$ -	$ -	$ 250,000.00	$ 250,000.00	$ -	$ -	$ -	$ -	$ 50,000.00
		Park and Ride	$ -	$ 75,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Resilience	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00
		Traction Seals - Subsidised	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00
		Bridge Approach Seals - Subsidised	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00	$ 300,000.00
		Cycleways	$ 425,000.00	$ 430,000.00	$ 1,140,000.00	$ 4,050,000.00	$ 4,100,000.00	$ 4,000,000.00	$ 3,850,000.00	$ 3,750,000.00	$ 3,800,000.00	$ 3,200,000.00	$ 3,200,000.00
		Stock Effluent Disposal	$ 100,000.00	$ 400,000.00	$ 500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Bus Stops and Shelters	$ -	$ -	$ 225,000.00	$ 225,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000.00
		Accessibility Infrastructure	$ -	$ 50,000.00	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000.00
		Destination Facilities for Cyclists	$ -	$ -	$ 200,000.00	$ 200,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Wayfinding Signage	$ 18,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Twin Coast Discovery Route Footpaths / Shared Use Path (PGF)	$ -	$ 500,000.00	$ 500,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 1,000,000.00	$ -	$ 500,000.00
		Recreational Cycling Fcilities (TIF)	$ -	$ 75,000.00	$ 400,000.00	$ 400,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 300,000.00
		Parking and Facilities (TIF)	$ 500,000.00	$ 450,000.00	$ -	$ 135,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 300,000.00
		TCDR Cycling	$ -	$ -	$ -	$ 358,000.00	$ 500,000.00	$ 1,000,000.00	$ 2,500,000.00	$ 2,500,000.00	$ 2,000,000.00	$ 1,000,000.00	$ -
		Tourism Byway Sealing to major attractions	$ -	$ -	$ -	$ -	$ 700,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ -	$ 500,000.00	$ -
		Resilience / Flood mitigation	$ -	$ -	$ -	$ -	$ 2,000,000.00	$ -	$ 1,495,000.00	$ -	$ -	$ -	$ -
		Waoku Coach Road	$ -	$ -	$ -	$ -	$ -	$ 1,600,000.00	$ -	$ -	$ -	$ -	$ -
		Waitangi to Kerikeri (Northland Integrated Cycling Implementation Plan)(TRP)	$ -	$ -	$ -	$ 997,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Opua to Paihia (Northland Integrated Cycling Implementation Plan) - Extension of the Twin Coast Cycle trail(TRP)	$ -	$ -	$ -	$ 750,000.00	$ 1,410,744.00	$ 660,744.00	$ -	$ -	$ -	$ -	$ -
		Unsubsidised Sealing	$ 2,320,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ -	$ -	$ -	$ -
		Twin Coast Cycle Trail Development	$ 3,339,808.00	$ 4,548,729.00	$ 950,760.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Level of Service Total		$ 9,827,808.00	$ 11,803,729.00	$ 8,765,760.00	$ 12,915,000.00	$ 14,760,744.00	$ 14,810,744.00	$ 15,145,000.00	$ 11,550,000.00	$ 9,600,000.00	$ 7,500,000.00	$ 7,230,000.00
New Total			$ 10,787,808.00	$ 12,763,729.00	$ 9,725,760.00	$ 14,175,000.00	$ 16,020,744.00	$ 16,728,244.00	$ 16,960,000.00	$ 14,292,500.00	$ 12,415,000.00	$ 9,549,000.00	$ 13,617,500.00
Grand Total			**$ 10,787,808.00**	**$ 12,763,729.00**	**$ 9,725,760.00**	**$ 14,175,000.00**	**$ 16,020,744.00**	**$ 16,728,244.00**	**$ 16,960,000.00**	**$ 14,292,500.00**	**$ 12,415,000.00**	**$ 9,549,000.00**	**$ 13,617,500.00**

Table 9-9: FNDC Capital Improvement Expenditure (Cont)

Work Type	Primary Drivers	Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31	Sum of 2031/32
Improvement	Growth	Paihia Town Centre upgrades	$ -	$ -	$ -	$ -	$ 1,500,000.00	$ 2,100,000.00	$ 1,500,000.00	$ 1,950,000.00	$ 2,000,000.00	$ 1,000,000.00	$ -
	Growth Total		$ -	$ -	$ -	$ -	$ 1,500,000.00	$ 2,100,000.00	$ 1,500,000.00	$ 1,950,000.00	$ 2,000,000.00	$ 1,000,000.00	$ -
	Level of Service	Activity Management Plan Improvement	$ 750,000.00	$ 750,000.00	$ 750,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Kerikeri Strategic Road Network Plan	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Kaitaia to Kohukohu Corridor Plan	$ -	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Township Transport Planning	$ 87,500.00	$ 87,500.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Investigation of Climate Change Mitigation Measures	$ -	$ -	$ 37,500.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Hokianga Harbour Long Term Plan	$ 175,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Pedestrian Access in Urban Areas	$ 75,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Township cycling plans	$ 37,500.00	$ 37,500.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Public Transport / Ride Share	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Road Safety Promotion	$ 1,819,286.00	$ 1,892,058.00	$ 1,967,740.00	$ 2,065,084.00	$ 2,065,084.00	$ 2,065,084.00	$ 2,065,084.00	$ 2,065,084.00	$ 2,065,084.00	$ 2,065,084.00	$ 1,160,000.00
		Safety - Capital	$ 3,002,000.00	$ 3,225,000.00	$ 3,925,000.00	$ 2,965,000.00	$ 3,085,000.00	$ 1,645,000.00	$ 3,705,000.00	$ 1,645,000.00	$ 2,185,000.00	$ 1,615,000.00	$ 1,665,000.00
		Associated Improvements	$ 650,000.00	$ 650,000.00	$ 650,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00
		Dust Seals - Subsidised	$ 250,000.00	$ 1,475,000.00	$ 1,275,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00
		Streetlight Infill programme	$ 3,303,434.00	$ 550,000.00	$ 550,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00
		Detour Route Programme	$ 100,000.00	$ 400,000.00	$ 800,000.00	$ -	$ 400,000.00	$ 400,000.00	$ -	$ -	$ -	$ -	$ 800,000.00
		Access Improvements (TCDR)	$ 100,000.00	$ 450,000.00	$ 450,000.00	$ -	$ 2,000,000.00	$ 2,000,000.00	$ 1,500,000.00	$ 2,500,000.00	$ 1,000,000.00	$ -	$ 1,500,000.00
		Improve Freight Productivity	$ -	$ 100,000.00	$ 500,000.00	$ 500,000.00	$ 1,000,000.00	$ 1,700,000.00	$ 1,700,000.00	$ 1,500,000.00	$ 1,700,000.00	$ 1,300,000.00	$ -
		Behaviour Change Initiatives	$ 75,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 75,000.00
		Pedestrian access in urban ares	$ 75,000.00	$ -	$ 100,000.00	$ 100,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Gateway Treatements	$ -	$ -	$ -	$ -	$ -	$ -	$ 400,000.00	$ 400,000.00	$ -	$ -	$ 540,000.00
		Township Upgrades (PGF)	$ 587,500.00	$ 87,500.00	$ -	$ -	$ -	$ 571,000.00	$ 100,000.00	$ 75,000.00	$ -	$ -	$ 200,000.00
		Upgrades to existing roads	$ -	$ -	$ -	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,500,000.00
		Road stormwater upgrades	$ -	$ -	$ -	$ 30,000.00	$ 500,000.00	$ 500,000.00	$ -	$ -	$ -	$ -	$ -
		Kerikeri Road Network Projects	$ -	$ -	$ -	$ 500,000.00	$ 1,000,000.00	$ 1,500,000.00	$ 2,500,000.00	$ 2,000,000.00	$ 1,500,000.00	$ 1,000,000.00	$ 2,000,000.00
	Level of Service Total		$ 11,537,220.00	$ 10,154,558.00	$ 11,405,240.00	$ 8,760,084.00	$ 12,650,084.00	$ 12,981,084.00	$ 14,570,084.00	$ 13,785,084.00	$ 12,050,084.00	$ 9,580,084.00	$ 12,040,000.00
Improvement Total			$ 11,537,220.00	$ 10,154,558.00	$ 11,405,240.00	$ 8,760,084.00	$ 14,150,084.00	$ 15,081,084.00	$ 16,070,084.00	$ 15,735,084.00	$ 14,050,084.00	$ 10,580,084.00	$ 12,040,000.00
Grand Total			**$ 11,537,220.00**	**$ 10,154,558.00**	**$ 11,405,240.00**	**$ 8,760,084.00**	**$ 14,150,084.00**	**$ 15,081,084.00**	**$ 16,070,084.00**	**$ 15,735,084.00**	**$ 14,050,084.00**	**$ 10,580,084.00**	**$ 12,040,000.00**

Table 9-10: KDC Capital Improvement Expenditure

Work Type	Primary Drivers	Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31
Improvement	Growth	LCLR - LED Infill lighting programme	$ 1,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Unsealed Road Improvements (PGF)	$ 4,003,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Growth Total		$ 5,003,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Level of Service	LCLR - District wide road safety improvements	$ 525,000.00	$ 505,000.00	$ 505,000.00	$ 505,000.00	$ 505,000.00	$ 505,000.00	$ 505,000.00	$ 505,000.00	$ 505,000.00	$ 515,605.00
		LCLR - Speed Management	$ 500,000.00	$ 250,000.00	$ 500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		LCLR - Associated improvements for Rehab and Reseals	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 255,250.00
		NI - Wood Street Urban Improvements	$ -	$ -	$ -	$ 2,000,000.00	$ 2,000,000.00	$ -	$ -	$ -	$ -	$ -
		NI - Hokianga St improvements	$ -	$ -	$ -	$ 200,000.00	$ 500,000.00	$ 1,000,000.00	$ 1,000,000.00	$ -	$ -	$ -
		NI - Waiuku Coach Trail	$ -	$ -	$ -	$ -	$ -	$ 800,000.00	$ -	$ -	$ -	$ -
		NI - Kaiwaka Oniriri Road Intersection Upgrade	$ -	$ -	$ -	$ 250,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Mangawahai – Improved access to Alamar Boat Ramp	$ -	$ -	$ -	$ 200,000.00	$ -	$ -	$ -	$ -	$ -	$ 2,000,000.00
	Level of Service Total		$ 1,275,000.00	$ 1,005,000.00	$ 1,255,000.00	$ 3,405,000.00	$ 3,255,000.00	$ 2,555,000.00	$ 1,755,000.00	$ 755,000.00	$ 755,000.00	$ 2,770,855.00
Improvement Total			$ 6,278,000.00	$ 1,005,000.00	$ 1,255,000.00	$ 3,405,000.00	$ 3,255,000.00	$ 2,555,000.00	$ 1,755,000.00	$ 755,000.00	$ 755,000.00	$ 2,770,855.00
New	Growth	LCLR - Network Wide Footpath Projects	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 204,200.00
		NI - Kaiwaka Eastern Network Growth	$ -	$ -	$ -	$ -	$ 300,000.00	$ -	$ -	$ -	$ -	$ -
	Growth Total		$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 500,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 204,200.00
	Level of Service	LCLR - Drainage improvement programme	$ 50,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 102,100.00
		LCLR - Road Safety Promotion	$ 310,000.00	$ 316,200.00	$ 324,344.00	$ 373,645.16	$ 381,491.71	$ 389,503.03	$ 397,682.60	$ 405,862.16	$ 414,385.27	$ 423,087.36
		NI - Pouto Road Phase 1 (Physical works) (PGF)	$ 3,200,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Kaiwaka footbridges (PGF)	$ 500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Dargaville River Path	$ -	$ -	$ 100,000.00	$ 2,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Dargaville to Maungaturoto HR	$ -	$ -	$ -	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ -
		NI - Mangawhai to Waipu Cove Trail	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 200,000.00	$ -
		NI - Cove Road Connection to Mangawhai Central	$ -	$ 250,000.00	$ -	$ -	$ -	$ -	$ 10,000,000.00	$ -	$ -	$ -
		NI - Pouto Road Phase 2 (Physical works) (PGF)	$ 2,800,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		WC- Mangawhai Shared Path - Wood Street to Village (MBIE Funding local share)	$ 3,700,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		WC- Mangawhai SP various phases for construction	$ 2,210,200.00	$ 5,725,200.00	$ 5,725,200.00	$ (0.33)	$ (0.33)	$ 5,862,526.67	$ 1,053,978.00	$ 1,053,978.00	$ 1,053,978.00	$ -
		WC - Kaihu Valley Trail (PGF Funded)	$ 2,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		WC - Kaihu Valley Rail Trail	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 800,000.00	$ 2,900,000.00
	Level of Service Total		$ 14,770,200.00	$ 6,391,400.00	$ 6,249,544.00	$ 2,673,644.83	$ 681,491.38	$ 6,552,029.70	$ 11,751,660.60	$ 1,759,840.16	$ 2,768,363.27	$ 3,425,187.36
	Renewal	LCLR - Slip repair	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 2,000,000.00	$ 2,042,000.00
	Renewal Total		$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 2,000,000.00	$ 2,042,000.00
New Total			$ 15,470,200.00	$ 7,091,400.00	$ 6,949,544.00	$ 4,373,644.83	$ 2,681,491.38	$ 8,252,029.70	$ 13,451,660.60	$ 3,459,840.16	$ 4,968,363.27	$ 5,671,387.36
Grand Total			$ 21,748,200.00	$ 8,096,400.00	$ 8,204,544.00	$ 7,778,644.83	$ 5,936,491.38	$ 10,807,029.70	$ 15,206,660.60	$ 4,214,840.16	$ 5,723,363.27	$ 8,442,242.36

Table 9-11: WDC Capital Improvement Expenditure

Work Type	Primary Drivers	Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31	Sum of 2031/32
New	Growth	MI - Footpaths - New	$ 990,000.00	$ 640,000.00	$ 1,000,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00
		NI - Riverside Drive Upgrades - 4 Laning	$ -	$ -	$ -	$ 3,000,000.00	$ 5,000,000.00	$ 10,000,000.00	$ 12,000,000.00	$ -	$ -	$ -	$ -
		NI - Kamo Route Bus Priority Lanes/4-Laning	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,000,000.00	$ 8,000,000.00	$ 8,000,000.00	$ -
		NI - Port Bridge 4-laning	$ 8,500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Reyburn St/Okara Dr/Port Rd Bus Priority Lanes/4-Laning	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000,000.00	$ 5,000,000.00
		NI - Tikipunga Route Bus Priority Lanes/4-Laning	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,000,000.00	$ 5,000,000.00
		NI - Maunu Rd/Water St Bus Priority Lanes/4-Laning	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - PT Bus Priority Lanes	$ 1,600,000.00	$ 800,000.00	$ 1,700,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00
	Growth Total		$ 11,090,000.00	$ 1,440,000.00	$ 2,700,000.00	$ 4,500,000.00	$ 6,500,000.00	$ 11,500,000.00	$ 13,500,000.00	$ 9,500,000.00	$ 9,500,000.00	$ 12,500,000.00	$ 11,500,000.00
	Level of Service	Cycleways - CAPEX Programmed Work	$ -	$ -	$ -	$ 2,300,000.00	$ 5,150,000.00	$ 4,250,000.00	$ 550,000.00	$ 1,450,000.00	$ 4,750,000.00	$ 5,250,000.00	$ 5,000,000.00
		Cycleways - Tikipunga	$ 500,000.00	$ 3,500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Cycleways - Kamo Cycleways	$ 6,200,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Cycleways - Raumanga	$ 500,000.00	$ 2,000,000.00	$ 2,500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Cycleways - Tutukaka Coast Heartland Ride	$ 500,000.00	$ 4,500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		PT - Bus Seats	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
		Cycleways - Bream Bay Costal Trail - Heart land Ride	$ -	$ -	$ 700,000.00	$ 3,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Cycleways - Whangarei Heads Link	$ 50,000.00	$ 450,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		TP- Springs Flat	$ 500,000.00	$ 2,000,000.00	$ 3,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		TP- Bank Dent Signilisation	$ 50,000.00	$ 250,000.00	$ 2,200,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		TP- Riverside Drive Dave Culham RAB 2-laning	$ 200,000.00	$ 1,800,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - High Risk Rural Roads / Urban Corridors	$ 480,000.00	$ 580,000.00	$ 560,000.00	$ 2,267,000.00	$ 3,120,320.00	$ 5,960,000.00	$ 2,207,000.00	$ 2,685,000.00	$ 6,510,000.00	$ 4,145,000.00	$ 3,000,000.00
		MI - Resilience Mngt	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00
	Level of Service Total		$ 10,500,000.00	$ 16,600,000.00	$ 10,480,000.00	$ 9,087,000.00	$ 9,790,320.00	$ 11,730,000.00	$ 4,277,000.00	$ 5,655,000.00	$ 12,780,000.00	$ 10,915,000.00	$ 9,520,000.00
New Total			$ 21,590,000.00	$ 18,040,000.00	$ 13,180,000.00	$ 13,587,000.00	$ 16,290,320.00	$ 23,230,000.00	$ 17,777,000.00	$ 15,155,000.00	$ 22,280,000.00	$ 23,415,000.00	$ 21,020,000.00
Grand Total			**$ 21,590,000.00**	**$ 18,040,000.00**	**$ 13,180,000.00**	**$ 13,587,000.00**	**$ 16,290,320.00**	**$ 23,230,000.00**	**$ 17,777,000.00**	**$ 15,155,000.00**	**$ 22,280,000.00**	**$ 23,415,000.00**	**$ 21,020,000.00**

Table 9-11: WDC Capital Improvement Expenditure (Cont)

Work Type	Primary Drivers	Project Description	Sum of 2021/22	Sum of 2022/23	Sum of 2023/24	Sum of 2024/25	Sum of 2025/26	Sum of 2026/27	Sum of 2027/28	Sum of 2028/29	Sum of 2029/30	Sum of 2030/31	Sum of 2031/32
Improvement	Growth	Subdivision Works Contribution	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00	$ 55,000.00
		PT - Bus Shelters New & Renewal	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00
		MI - High Risk Rural Intersections / Urban Intersections	$ 370,000.00	$ 950,000.00	$ 400,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Rehab Associated Improvements	$ 800,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00
		NI - Tarewa Rd Intersection Upgrade and Tarewa/Walton 4-Laning	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - One Tree Point Road Upgrades	$ -	$ -	$ -	$ -	$ 840,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Marsden Point Road Upgrades	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000,000.00	$ 2,913,600.00	$ -	$ -	$ -
		NI - McCathie Road Upgrades	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - McEwan Road Upgrades	$ -	$ -	$ -	$ -	$ 1,064,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Ruakaka Beach Road Upgrades	$ -	$ -	$ -	$ -	$ 1,568,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		NI - SH1 to SH14 Maunu Link Road (Pompellier Link)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Hatea Dr 4-Laning	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Intersection improvements	$ -	$ -	$ -	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00	$ 2,000,000.00
		MI - Misc works (sight benching and new parking signs etc)	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		SOP - Kamo Business District Upgrade	$ 279,000.00	$ 287,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Subsidised Business Unit	$ -	$ -	$ -	$ -	$ 50,000.00	$ 250,000.00	$ 5,600,000.00	$ 400,000.00	$ 4,600,000.00	$ 400,000.00	$ -
		NI - Port Kiorera Intersection	$ 6,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		NI - SH1/SH14 Connection (Hospital)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,000,000.00	$ 5,000,000.00	$ -	$ -
	Growth Total		$ 7,804,000.00	$ 1,992,000.00	$ 1,155,000.00	$ 2,655,000.00	$ 6,177,000.00	$ 2,905,000.00	$ 11,255,000.00	$ 10,968,600.00	$ 12,255,000.00	$ 3,055,000.00	$ 2,655,000.00
	Level of Service	Seal Extensions - Unsubsidised (Rate payer Subsidised)	$ 2,850,000.00	$ 2,850,000.00	$ 2,850,000.00	$ 4,850,000.00	$ 4,850,000.00	$ 4,850,000.00	$ 4,850,000.00	$ 6,850,000.00	$ 6,850,000.00	$ 6,850,000.00	$ 850,000.00
		MI - Streetlight Upgrades	$ 2,600,000.00	$ 1,000,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00
		50 MAX / HPMV Bridge Strengthening	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		NI - Int Imp - Water / Central upgrade	$ 200,000.00	$ 1,800,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		TP - WDC model update	$ 150,000.00	$ -	$ -	$ -	$ -	$ 150,000.00	$ -	$ -	$ -	$ -	$ 150,000.00
		PT - Rose Street Terminal	$ 1,500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		PT - Park N Ride Facilities	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Pedestrian safety	$ 150,000.00	$ 360,000.00	$ 860,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Speed Management	$ 800,000.00	$ 500,000.00	$ 500,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Te Matau a Pohe CCTV Upgrade and Remote Operation	$ 200,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Road Safety (NS)	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ -	$ -	$ -	$ -
		TP - Robert Walton	$ 2,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		CS - Waterfront to City Centre Connection - John St Package	$ 200,000.00	$ 200,000.00	$ 4,000,000.00	$ 4,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		CS - Waterfront to City Centre Connection - James St Package	$ -	$ -	$ 700,000.00	$ 1,000,000.00	$ 2,000,000.00	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Murphy's Bend Safety Imps	$ 250,000.00	$ 1,000,000.00	$ 2,750,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		PT - Commuter Rail Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Local Area Traffic Mngt (LTMA)	$ 210,000.00	$ 210,000.00	$ 180,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Road Ssaftey Lighting	$ 30,000.00	$ 50,000.00	$ 30,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Dent/Riverside/Hatea Traffic Signal Improvements	$ 50,000.00	$ 450,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		MI - Seal Extensions Bridge Approaches	$ 250,000.00	$ 300,000.00	$ 300,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00	$ 250,000.00
		MI - Seal Extensions-Intersection safety seals	$ 40,000.00	$ 40,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
	Level of Service Total		$ 12,080,000.00	$ 9,360,000.00	$ 12,990,000.00	$ 10,920,000.00	$ 7,920,000.00	$ 5,570,000.00	$ 5,420,000.00	$ 7,320,000.00	$ 7,320,000.00	$ 7,320,000.00	$ 1,470,000.00
Improvement Total			$ 19,884,000.00	$ 11,352,000.00	$ 14,145,000.00	$ 13,575,000.00	$ 14,097,000.00	$ 8,475,000.00	$ 16,675,000.00	$ 18,288,600.00	$ 19,575,000.00	$ 10,375,000.00	$ 4,125,000.00
Grand Total			$ 19,884,000.00	$ 11,352,000.00	$ 14,145,000.00	$ 13,575,000.00	$ 14,097,000.00	$ 8,475,000.00	$ 16,675,000.00	$ 18,288,600.00	$ 19,575,000.00	$ 10,375,000.00	$ 4,125,000.00

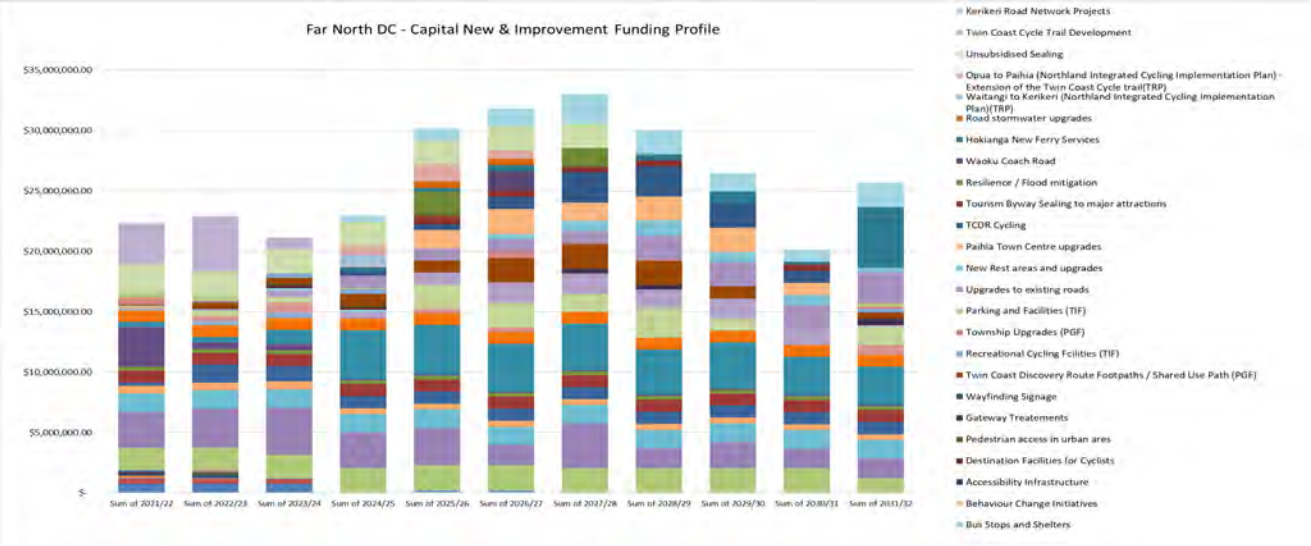


Figure 9-8: FNDC Capital Improvement Expenditure

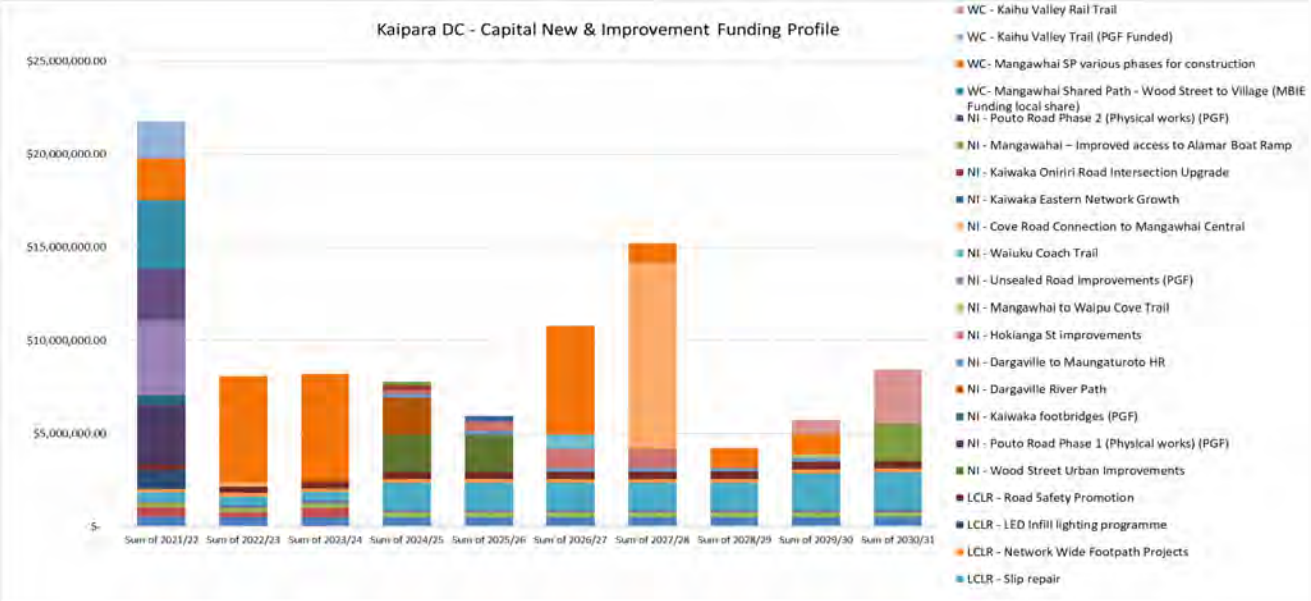


Figure 9-9: KDC Capital Improvement Expenditure

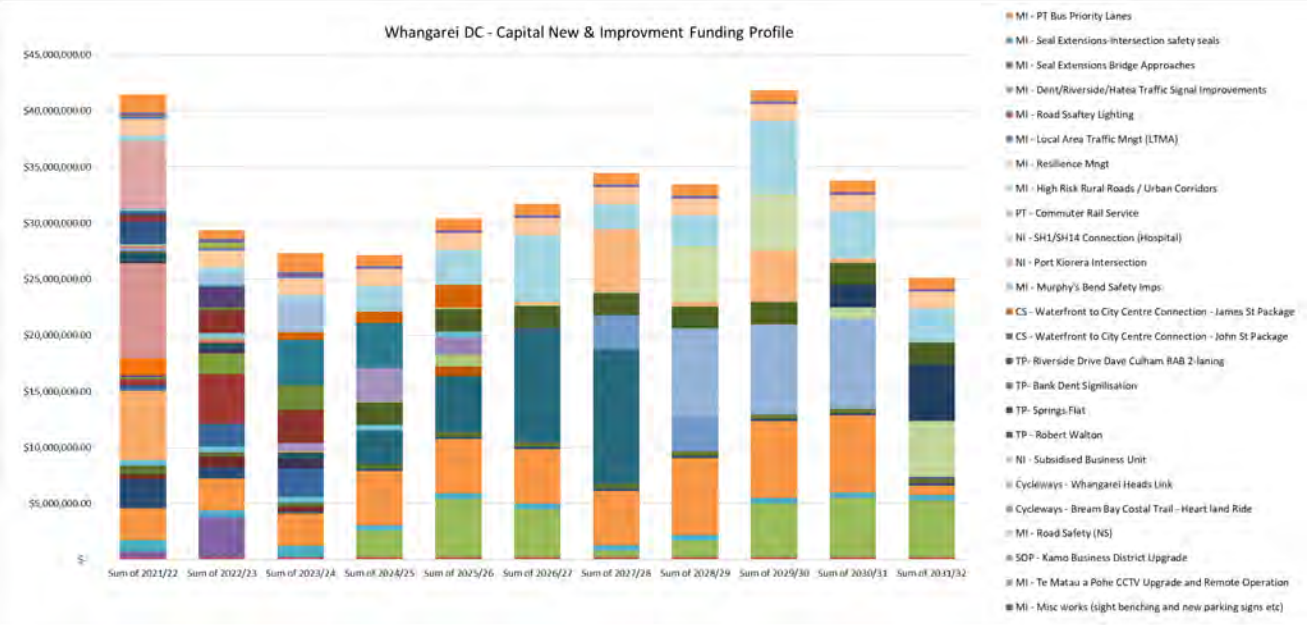


Figure 9-10: WDC Capital Improvement Expenditure

WDC have a number of Service level projects planned such as Sense of Place projects. These are not generally capacity or renewal projects and therefore will be consider in terms of the overall service delivery council consider important to the district as a whole.

9.2.4 Department Operations Expenditure & Revenue

Department operations expenditure and revenue are set out in the LTP Financial Impact Statement.

9.3 Debt Profile

Debt profiles are set out set out in the LTP Financial Impact Statement.

9.4 Transportation Asset Valuation

The valuation was completed as at 30th June 2020 and includes the replacement costs of the assets, depreciated value as well as the forecasted value over the term of this plan.

The Roading Departments completes a valuation every year. This is undertaken using the RAMM valuation module apart from Far North DC, refer method below. Each valuation update is reported to the finance team with the key data being the capital additions, vested assets, write-offs and disposals. The valuation from RAMM is then compared to the finance updated valuation with the difference tracked and reported.

OBJECTIVE	The objective of the valuation is to; set the replacement costs of the assets, the depreciated replacement costs and the annual depreciated investment value at the component level in regard to the asset management practices undertaken in this plan. This provides the link between the financial investment and the management of the assets and provides the opportunity to communicate with decision makers on the investment levels and the losses in service potential over time. To set the intergenerational equity in how the asset replacement should be funded. Comply with financial reporting requirements and legislation

POLICY	The valuation will be undertaken each year, reporting the current renewal profiles with the required depreciation investment. Updated figures will also be reported to the finance team using the RAMM valuation module for the vested asset values and write-off/disposal value.

9.4.1 Valuation Methodology

Figure 9-12 provides an over-view of the valuation process used to value the transport assets. In general, the process is the same for all northland councils. The only detail is that Far North DC extract the data from RAMM and undertake the valuation external of RAMM. However, the same process is followed.

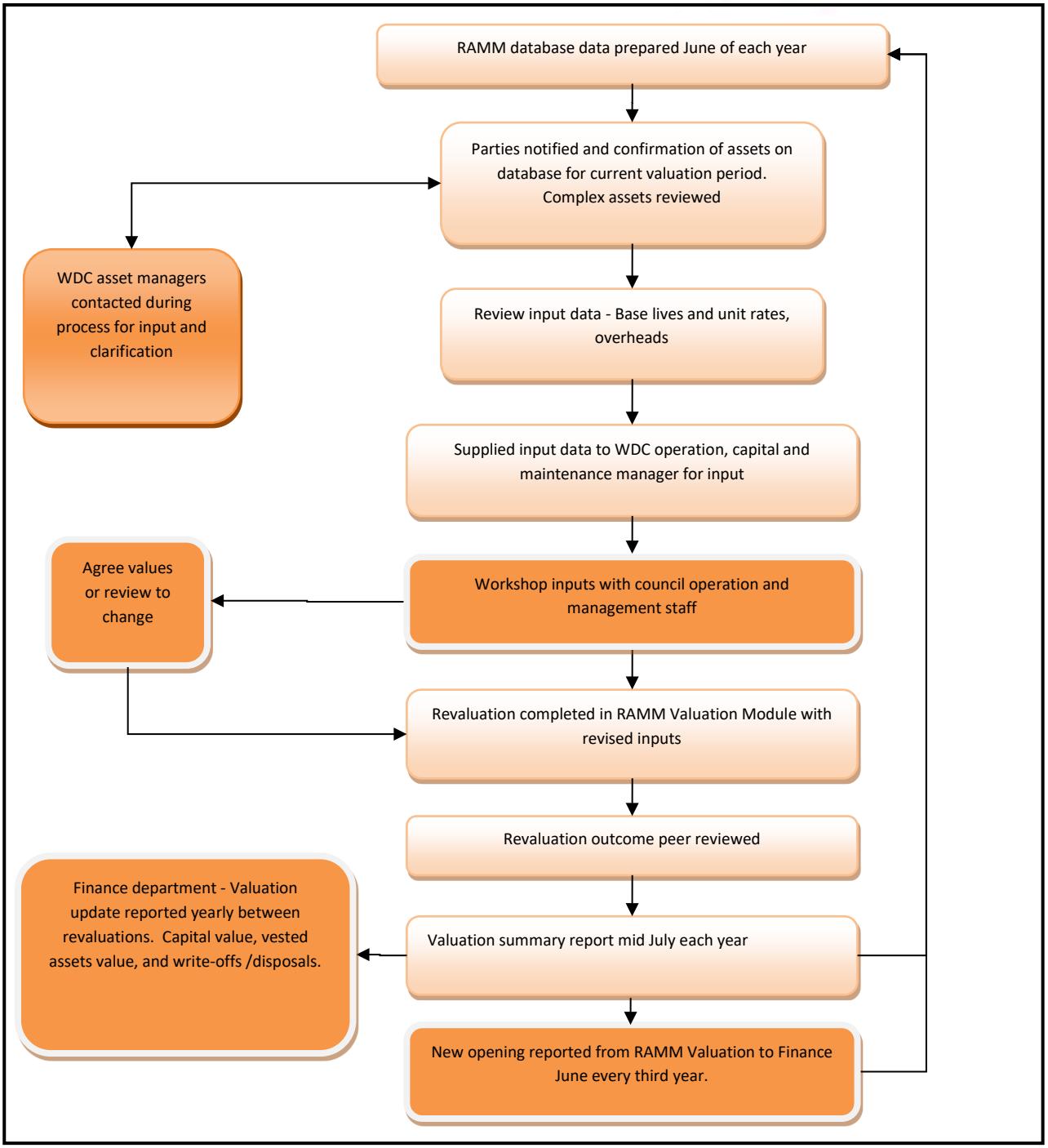


Figure 9-11: Transport Asset Valuation Process

9.4.2 Asset Lives

The key inputs to the valuations are the expected useful lives, unit replacement costs and the form of depreciation chosen. The asset components that have the greatest effect on the outcome, in terms of the key inputs, are the pavement base-course (sealed and unsealed) and the pavement surface.

Currently the expected lives of the base-course are set by hierarchy to recognise that these pavements differ in the forms of loss of service potential due to the differing impacts from traffic mix and loading. Each council's June 2020 Valuation report holds list of Useful lives and key input data in relation to the Valuation.

In general, the roading valuation is completed based on the following asset group in *Table 9-12* below.

Table 9-12: Roading Assets Valued

Asset Group	Asset	Asset Description
Roads	Formation	The formed platform upon which the road is constructed
	Pavement	The pavement granular layers (base-course, sub-base) used to form the road carriageway.
	Surface	The surface material (chipseal, asphalt cement) that forms the running surface on the road
Structures	Bridges/Culverts	Bridges including pedestrian bridges and culverts.
	Other	Structures that require structural inspections e.g. stairs, over/under passes.
	Retaining Walls	All retaining walls owned by the Roading Department
Drainage	SW Channels	Includes dish channels, kerbs and channels, mountable kerbs and channels
	Other Drainage	Includes all other roadside drainage e.g. sumps, leads and circular and box-shaped culverts.
Traffic Control	Traffic Signals	Traffic signals for the management of traffic at high volume intersections.
	Signs & Markings	Road signs, poles and markings, intelligent traffic systems
	Calming Devices	Traffic islands, chicanes, speed tables etc.
	Railings	Guardrails, handrails & sight-rails of various materials.
Parking		Meters, car park pavements, surfaces, markings etc.
Street Scaping	Street Furniture	Seats, shelters etc.
	Street Lighting	Carriageway lighting includes poles, lanterns, lamps, cables & outreach arms.
	Services	Cleaning, mowing, spraying etc.
Walking & Cycling	Footpaths	Roadside footpaths and walkways between roads
	Cycling Facilities	Cycle lanes off roads

9.4.3 Valuation Summary

The valuation reports as at 30th June 2020 holds the detail in regards to the revaluation outcome. The valuation summary is provided in section 2.7 “Value of what We Manage”.

The keys points form the valuation s are as follows:

Excluding the non-depreciable assets (Formation, Subbase, Land), the depreciation rate:

- For Far North DC is approximately 1.9% per annum
- For Kaipara DC is approximately 2.1% per annum
- For Whangarei DC is approximately 2.4% per annum.

These rates of depreciation are not out of place with other local authority roading departments. Whangarei is slightly higher but this has complex urban network with a number of high value shorter lived asserts than FNDC and KDC.

In terms of the current annual depreciation (ADep.) the following is observed:

- Far North DC ADep as at 30th June 2020 was set at $18.889M compared to current year one renewals funding of $18.233M. This provides for a balanced approach to meeting a balanced budget approach to infrastructure management.

- Kaipara DC ADep as at 30th June 2020 was set at $7.534M compared to current year one renewals funding of $9.620M. The renewal investment is set higher than required depreciation however, KDC have an under-investment legacy issue that is being addressed through this plan.

- Whangarei DC ADep as at 30th June 2020 was set at $20.608M compared to current year one renewals funding of $18.123M. This provides for a balanced approach to meeting a balanced budget approach to infrastructure management but needs to be monitored going forward to ensure there is no burgeoning gap between cumulative deprecation vs. renewal.

9.4.4 Confidence Ratings

Confidence ratings for the valuations are provided in detail in the valuation reports for each council.

9.5 Forecast Asset Value

Following is the forecasted 30 year valuation outcomes for each council based on the investment profiles these plans present.

9.5.1 Replacement Value

FNDC Replacement Value Forecast

Under the current plan the asset value is $1,468.6M (2019/20), rising to over approximately $1,705.0M after 10 years (based on the un-inflated funding profiles).

At the end of Year 30 the forecasted value will be approximately $2,049.4M.

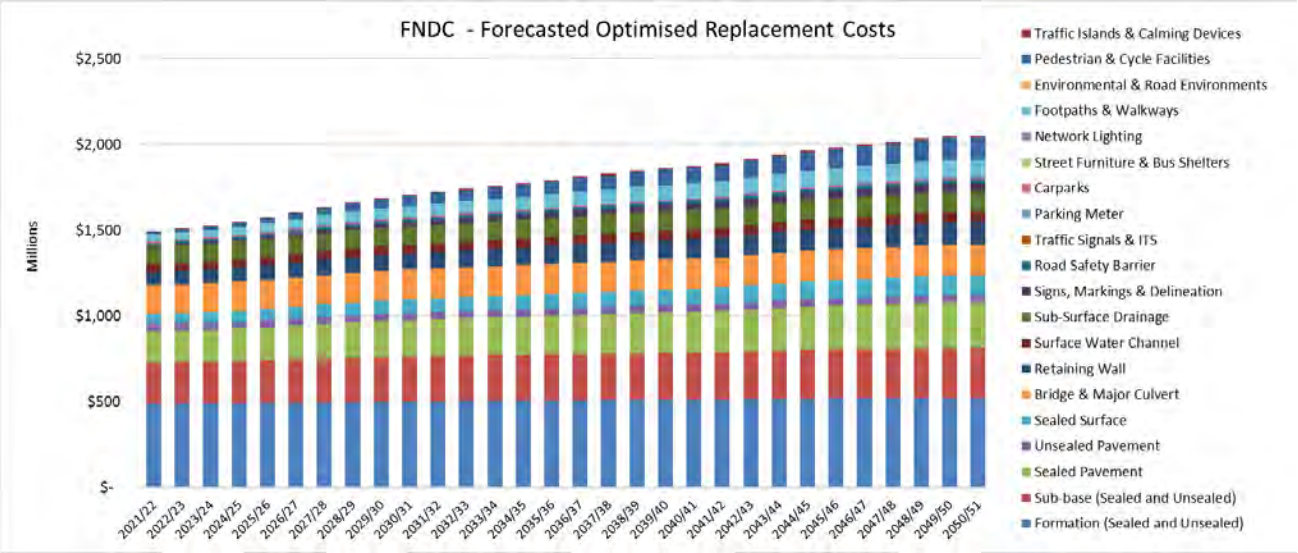


***Figure 9-12*: FNDC Forecast Replacement Costs**

KDC Replacement Value Forecast

Under the current plan the asset value is $650.6M (2019/20), rising to over approximately $751.0M after 10 years (based on the un-inflated funding profiles).

At the end of year 30 the forecasted value will be approximately $760M.

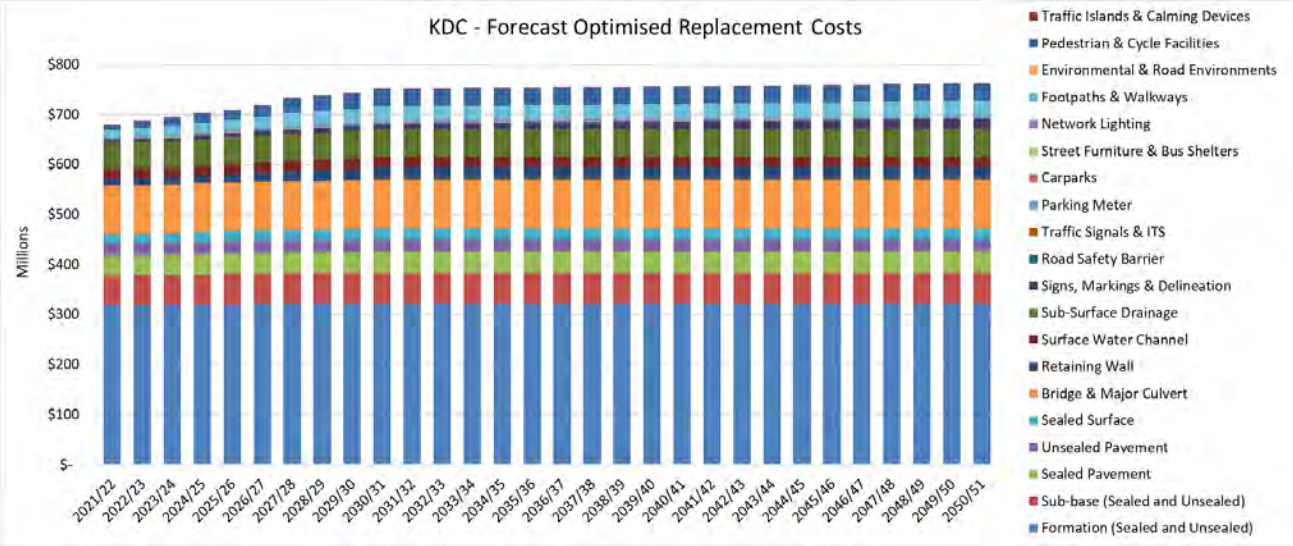


***Figure 9-13*: KDC Forecast Replacement Costs.**

WDC Replacement Value Forecast

Under the current plan the asset value is $1,276.7M (2019/20), rising to over approximately $1,600.0M after 10 years (based on the un-inflated funding profiles).

At the end of year 30 the forecasted value will be approximately $2,000.0M.

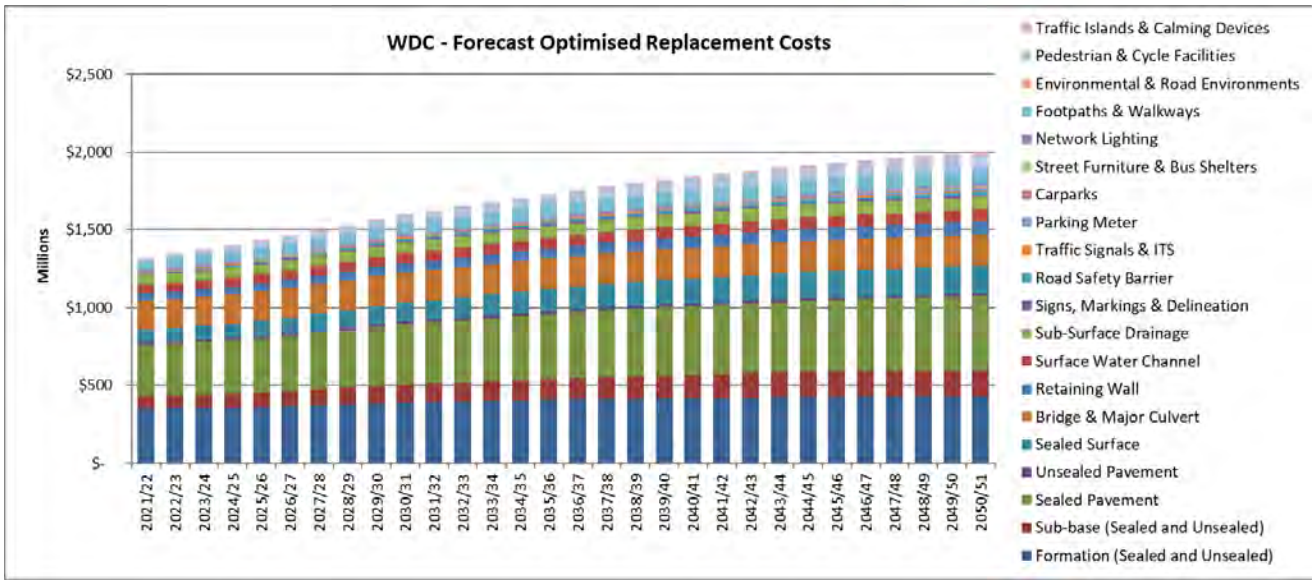


***Figure 9-14*: WDC Forecast Replacement Costs**

9.5.2 Depreciated Value

FNDC Depreciated Replacement Value Forecast

The current depreciated replacement cost is $1,103.01M. Under this plan it is expected to increase to approximately $1,398.93M (based on the un-inflated funding profiles) after 10 years.

Over the 30 year period this value will increase to $1,680.6M as capital and renewals continues to occur.

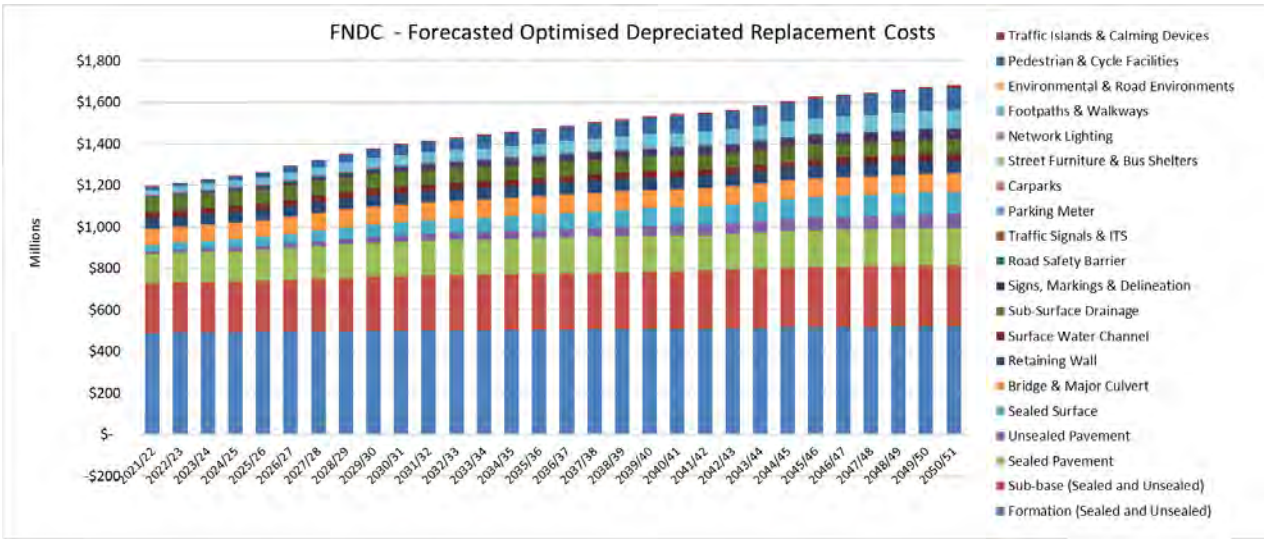


Figure 9-15: FNDC Forecast Depreciated Replacement Costs

KDC Depreciated Replacement Value Forecast

The current depreciated replacement cost is $514.7M. Under this plan it is expected to increase to approximately $662.9M (based on the un-inflated funding profiles) after 10 years.

Over the 30 year period this value will increase to $798.3M as capital and renewals continues to occur.

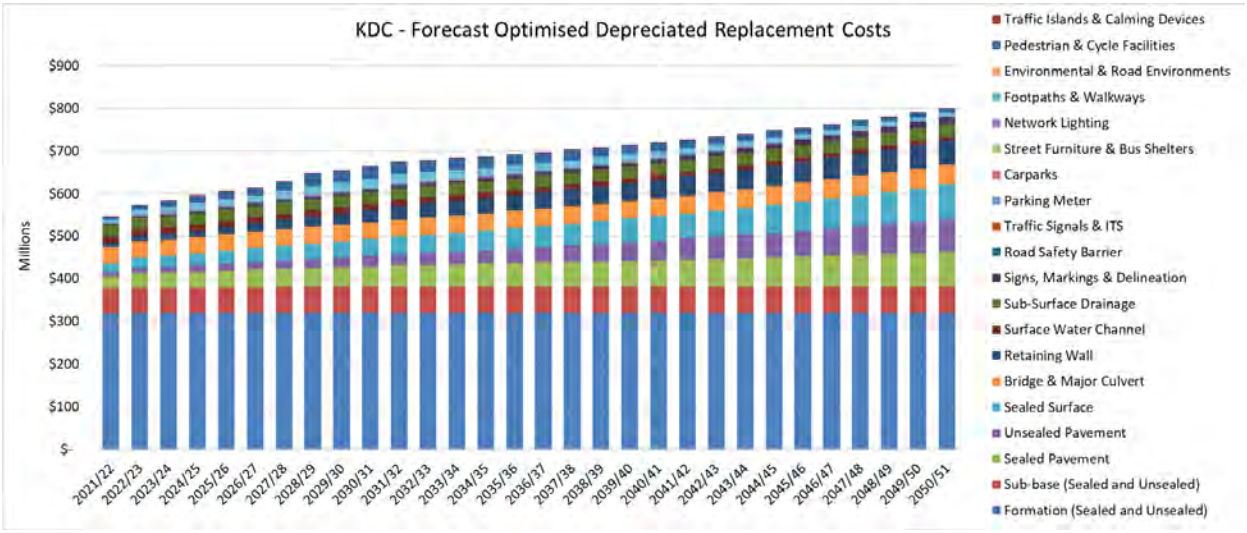


Figure 9-16: KDC Forecast Depreciated Replacement Costs

WDC Depreciated Replacement Value Forecast

The current depreciated replacement cost is $814.7M. Under this plan it is expected to increase to approximately $1,086.4M (based on the un-inflated funding profiles) after 10 years.

Over the 30 year period this value will increase to $1,400.1M as capital and renewals continues to occur.

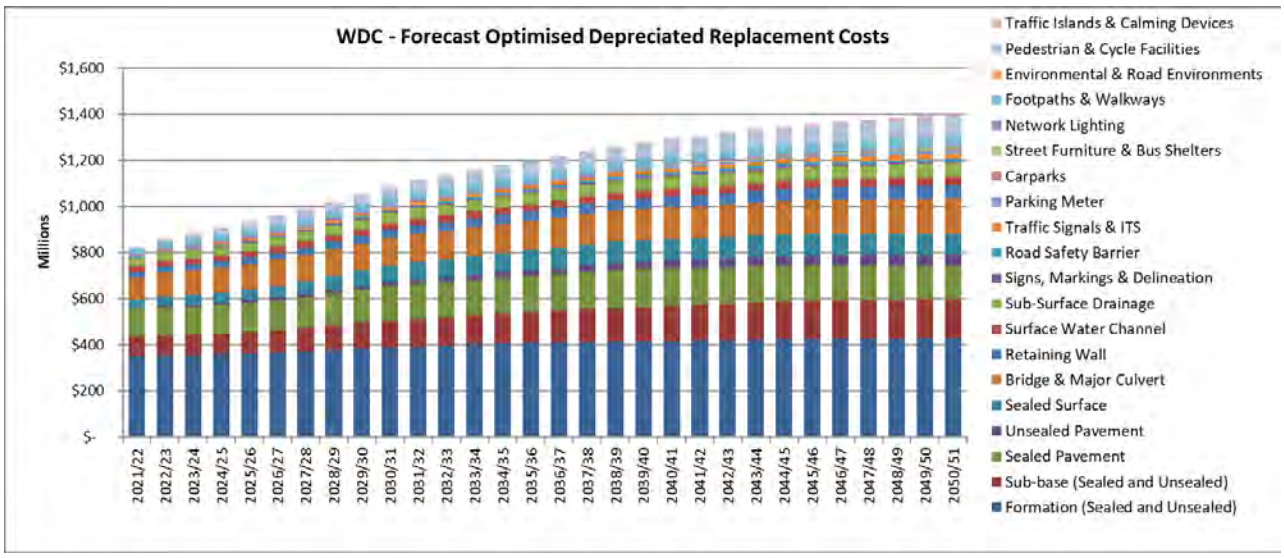


Figure 9-17: KDC Forecast Depreciated Replacement Costs

FNDC Annual Depreciation

On this basis, the projected annual depreciation by year 10 is expected to be $21.5M. This indicates that the renewal investment should be at a similar rate. The renewals investment is on average $18.0M per annum on average.

This does indicate under investment in the assets as capital investment is made and provision for funding and renewing is not keeping pace. The continued investment in Seal Extension is a notable stand out, adding value to the network, with the resulting impact on high cost to renewal these assets once built.

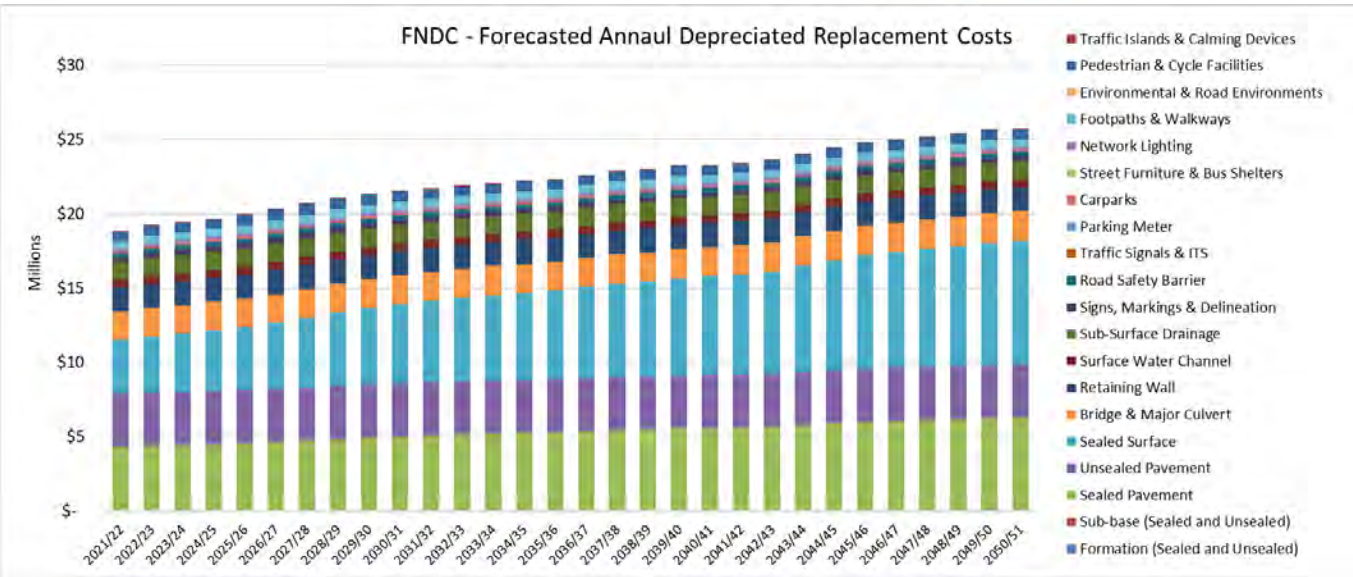


Figure 9-18: FNDC Forecast Annual Depreciation

This change in investment is best reflected in the tracking the cumulative Annual Depreciation vs. Cumulative Renewal *Figure 9-19* and the Net Annual Change in asset value (service potential) *Figure 9-20*.

Figure 9-19 indicate that renewal investment is keeping pace with rate of depreciation. After approximately Year 10 a gap in these profiles starts to appear indicating that either the rate of capital new investment is unaffordable or the renewal investment to account for renewal for these new assets is not set correctly. This is not an immediate issue but needs to be monitored and adjustment to renewal investment made accordingly in future plans.

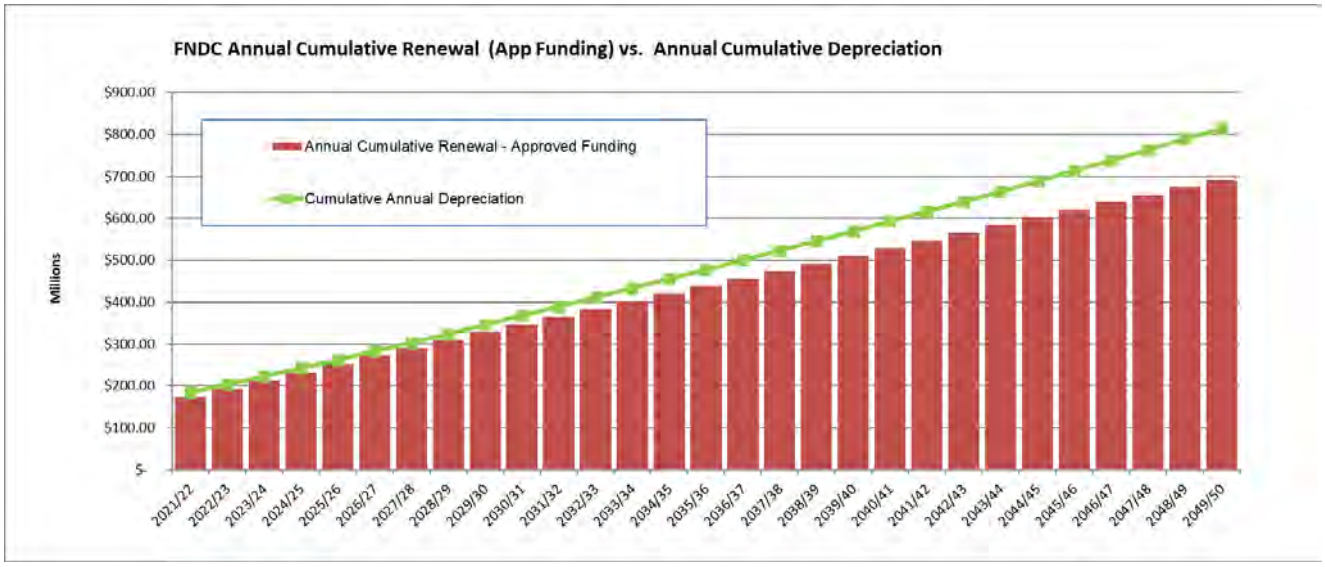


Figure 9-19: Cumulative Dep. Vs Cumulative Renewal

This can be further expressed as Net Change in Asset value or the loss in Service Potential. As noted above there is not an immediate concern but does need to be monitored.

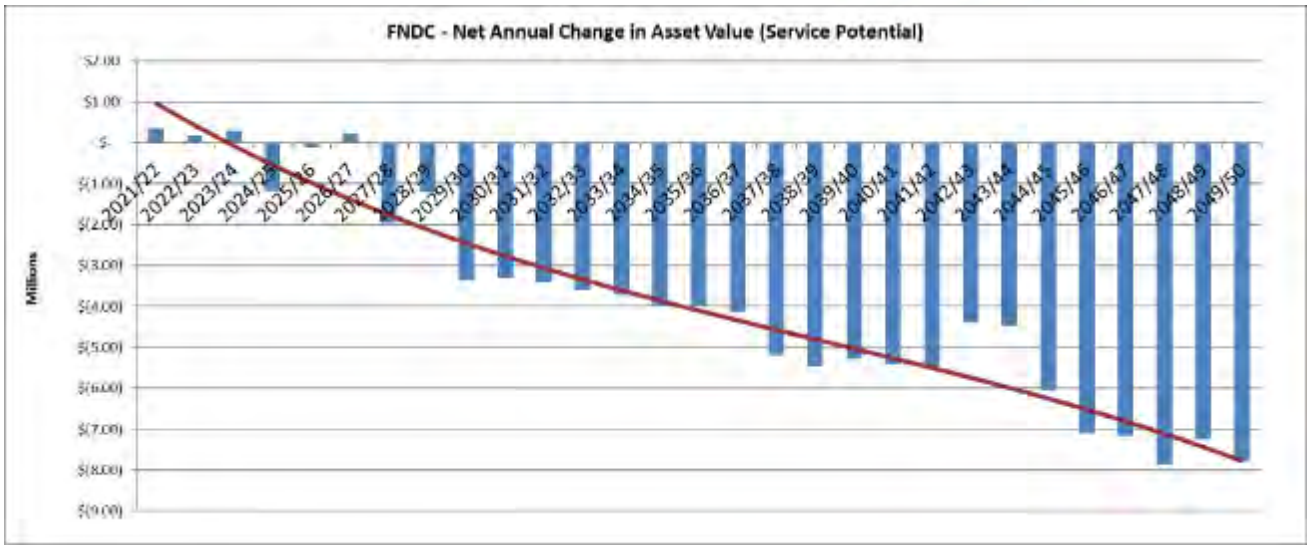


Figure 9-20: FNDC Service Potential (Net Annual Change in Asset Value)

KDC Annual Depreciation

On this basis, the projected annual depreciation by Year 10 for KDC is expected to be $8.9M. This indicates that the renewal investment should be at a similar rate. The renewals investment is on average $10.0M per annum on average, over 10yrs.

This does indicate over investment in the assets as capital investment is made. However it is noted that there is no capital investment shown in the 20 to 30 year. However, the renewal investment is accounting for asset growth for the period of 30 year profile.

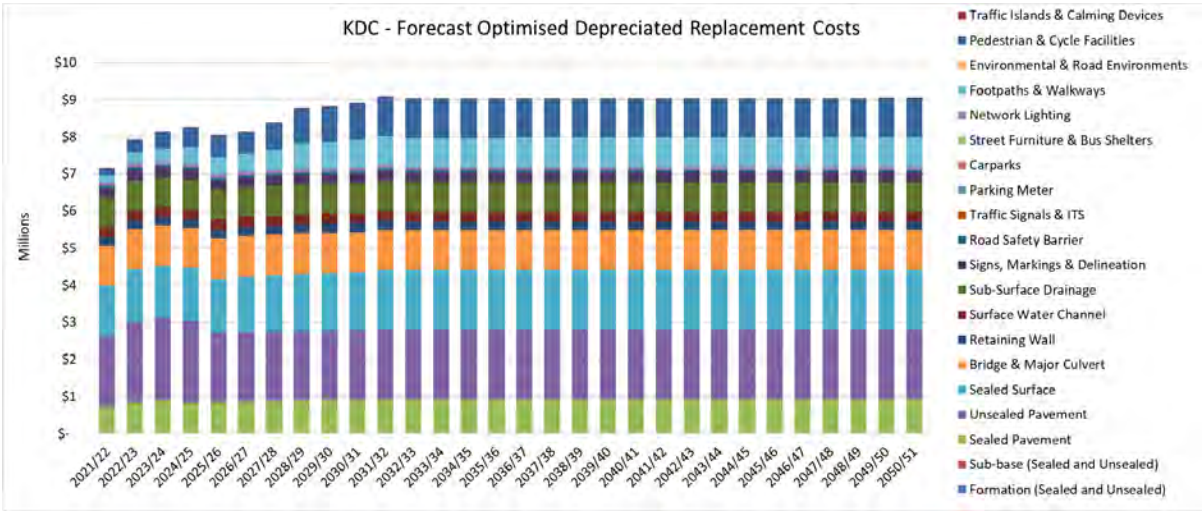


Figure 9-21: KDC Forecast Annual Depreciation

This change in investment is best reflected in the tracking the cumulative Annual Depreciation vs. Cumulative Renewal *Figure 9-22* and the Net Annual Change in asset value (service potential) *Figure 9-*23.

Figure 9-22 indicates that renewal investment is more than keeping pace with rate of depreciation. This is not an immediate issue but needs to be monitored and adjustment to renewal investment made accordingly in future plans.

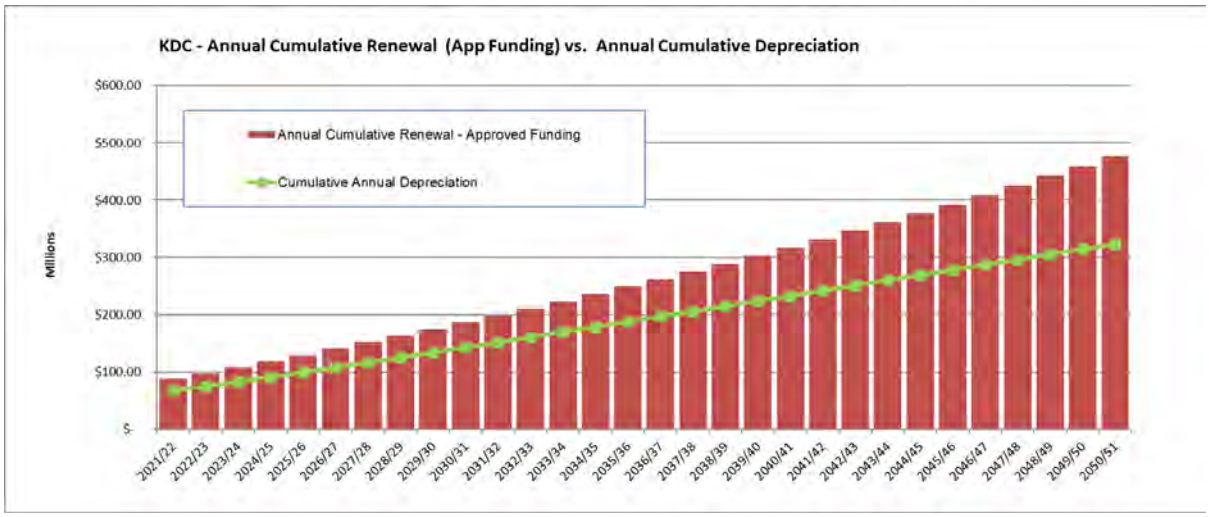


Figure 9-22: Cumulative Dep. Vs Cumulative Renewal

This can be further expressed as Net Change in Asset value or the loss in Service Potential. This indicates that there is some value potential in the assets now and going forward. As noted above this needs to be confirmed/tested through a full 30 investment plan.

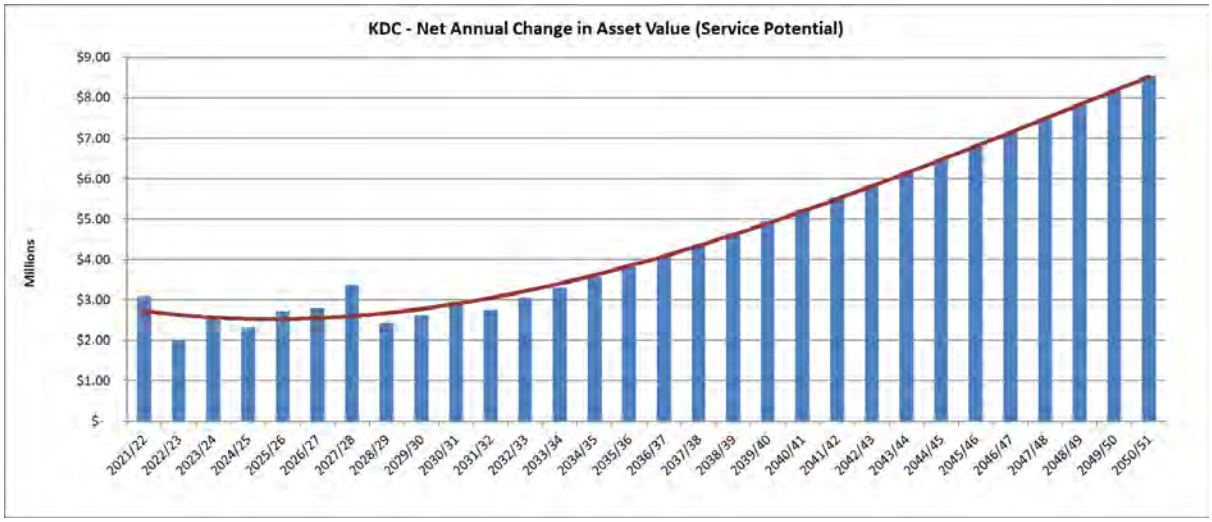


Figure 9-23: KDC Service Potential (Net Annual Change in Asset Value)

WDC Annual Depreciation

On this basis, the projected annual depreciation by year 10 for WDC is expected to be $25.6M. This indicates that the renewal investment should be at a similar rate. The renewals investment is on average $18.8.0M per annum on average, over 10yrs.

This does indicate under investment in the assets as capital investment is made and provision for funding and renewing is not keeping pace. The continued investment in Seal Extension notably stands out, adding value to the network, with the resulting impact on high cost to renewal these assets once built.

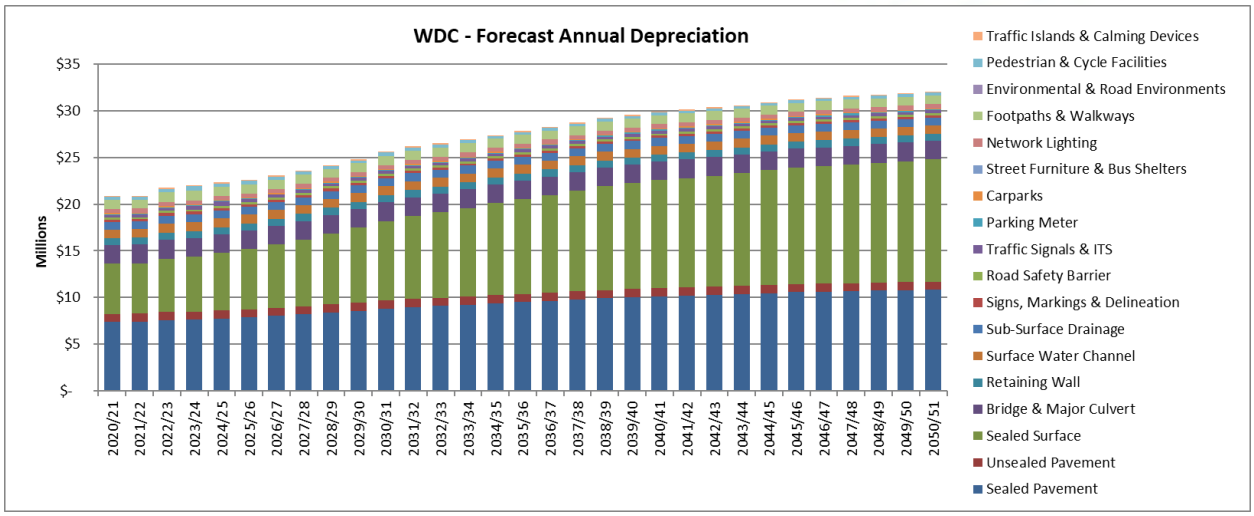


Figure 9-24: WDC Forecast Annual Depreciation

This change in investment is best reflected in the tracking the cumulative Annual Depreciation vs. Cumulative Renewal *Figure 9-25* and the Net Annual Change in asset value (service potential) *Figure 9-26*.

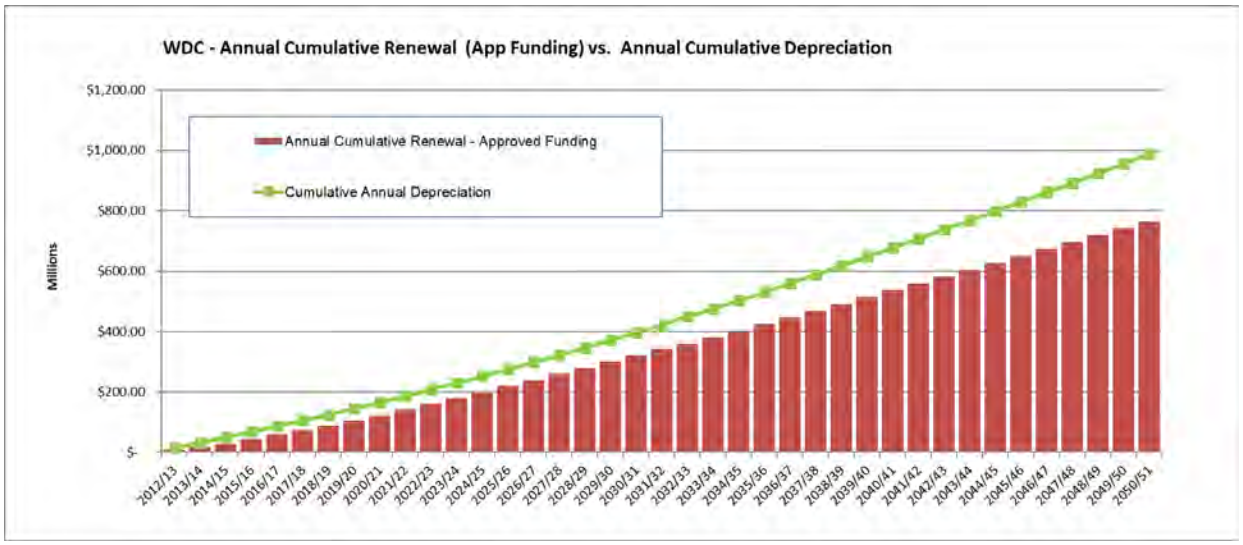


Figure 9-25: Cumulative Dep. Vs Cumulative Renewal

Figure 9-25 indicates that renewal investment is not keeping pace with rate of depreciation. This has been tracked since the 2012/13. Over time, each LTP has made grounds on reducing the gap in these profiles. However, this LTP and 30 year investment profile does indicate high level of new and improvement capital in the network through seal extension and capacity upgrades to accommodate for mode shift planning. This does come at a cost.

This can be further expressed as Net Change in Asset value or the loss in Service Potential. As noted, there was some gains being made under previous plans in returning service potential or value back into the assets. As indicated by the light pink bars which are the historic plans. This future plan looks to increase capital investment. Asset growth was accounted for in the renewals plan but not at the pace of capital investment being made. Whilst this seems alarming this is not an immediate issue and continued monitoring of these profiles will be made.

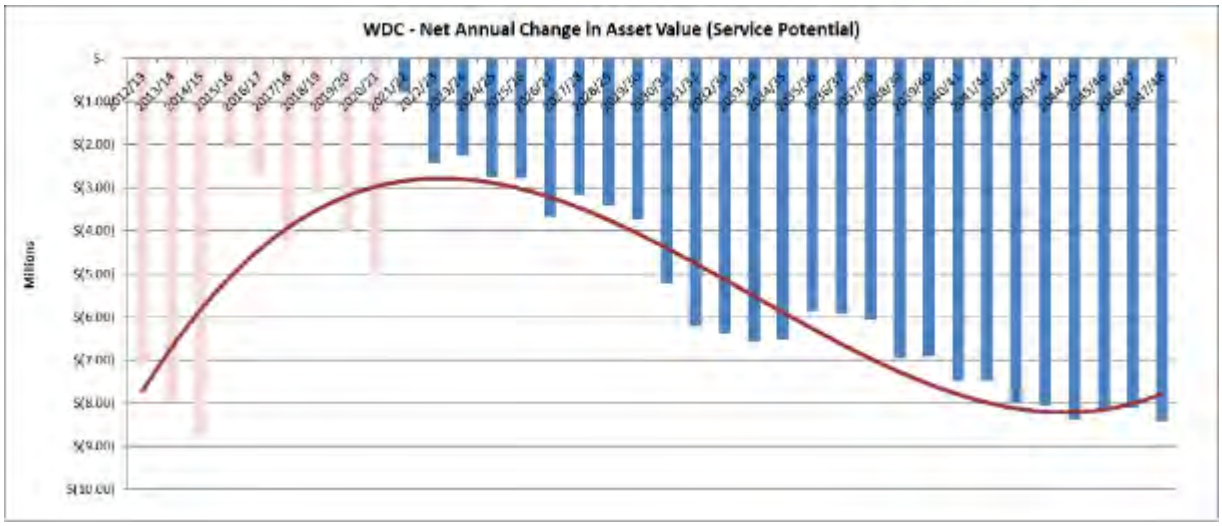


Figure 9-26: WDC Service Potential (Net Annual Change in Asset Value)

9.6 Funding Impacts Statement

The Funding Impact statement is provided in the Long Term Plan.

9.7 Key Financial Assumptions & Uncertainties

The follow key financial assumptions have been made:

- That Council will continue to deliver the activity for the foreseeable future
- NZTA financial assistance rates will remain unchanged for the planning horizon of this plan
- Outcomes of the Pavement Performance Model and Urban Traffic Model are reliable and correct in providing inputs to the Forward Work Programmes
- The District Growth Model, as used within the Development Contribution Database, is accurate enough to set development contribution income.
- That NZTA will fund the requested envelope to meet the local share.
- Council Finance Models in regard to debt profiles and subsidy incomes are correct.

10 Supporting Information

10.1 Abbreviations

The following abbreviations are used in this document.

Abbreviation	Description
50MAX	50 Tonne Maximum Load trucks
AADT	Annual Average Daily Traffic
AD	Annual Depreciation
ADMS	Asset Database Management System
AMP	Activity Management Plan
ATP	Audible Tactile Pavement markings (also known as rumble strips)
BCR	Benefit Cost Ratio
BCA	Business Case Approach
CIP	Crown Infrastructure Partners funding
COE	Centre of Excellence
CRM	Customer Request Management system
DSI	Death and Serious Injuries
dTIMS	Deighton Total Infrastructure Management System
FNDC	Far North District Council
FWP	Forward Works Programme
GAP	General All-Passing (aggregate)
GDP	Gross Domestic Product
GPS	Government Policy Statement (for Transport)
ILM	Investment Logic Mapping
ITS	FNDC Integrated Transport Strategy or Intelligent Transport Systems
KDC	Kaipara District Council
LCLR	Low Cost Low Risk improvements
LGA	Local Government Act
LGNZ	Local Government New Zealand
LOS	Level of Service
LTP	Long Term Plan
ONF	One Network Framework
ONRC	One Network Road Classification
MIS	Maintenance Intervention Strategy
MOR	Maintenance, Operations and Renewals
NLTF	National Land Transport Fund
NPV	Net Present Value
NRC	Northland Regional Council
NTA	Northland Transportation Alliance
NZTA	New Zealand Transport Agency (also known as Waka Kotahi)
ODRC	Optimised Depreciated Replacement Cost
ORC	Optimised Replacement Cost
PBC	Programme Business Case
PGF	Provincial Growth Fund
PII	Pavement Integrity Index
PM10	Particulates less than 10 micons in size
RAMM	Road Asset Maintenance Management system
REG	Roading Effciency Group
RFS	Request for Service (customer request)
RLTP	Regional Land Transport Plan
RPTP	Regional Public Transport Plan
SAC	Structural Asphaltic Concrete

Abbreviation	Description
SCI	Surface Condition Index
SNP	Safe Networks Programme
STE	Smooth Travel Exposure
TAC	Thin Asphaltic Concrete
TCDR	Twin Coast Discovery Route
TIF	Toursim Infrastructure Fund
TIO	Transport Investment Online
VKT	Vehicle Kilometres Travelled
WC	Work Category
WDC	Whangarei District Council

10.2 REG RCA Reports

REG

2018/19 Far North District Council RCA Report

We are. LGNZ.

WAKA KOTAHI NZ TRANSPORT AGENCY

64,400 Population	$2,030 GDP ($M)	$1,073 Valuation ($M)	$31 Expenditure ($M)	$468 Expenditure per capita	66% FAR
2,508 Total (km)	871 Sealed (km)	1,637 Unsealed (km)	2,304 Rural (km)	205 Urban (km)	723 No. of bridges

Activity Management
Planning, Procurement and Data Quality

Activity Management Planning

Planning quality: 1.65 — Good / Room for improvement

Co-investment planning quality: 1.58 — Fit for purpose / Not assessed

Source: REG 2018 AMP Assessment, Waka Kotahi 2018 AMP Assessment

Procurement

Smart buyer self-assessment

A smart buyer · Developing · Limited · Basic · Not assessed

Source: RCA Smart Buyer Self-Assessment

Data Quality

Asset management and ONRC at expected standard

AM · Peer AM · ONRC · Peer ONRC

80%
60%
2015 2020

Source: REG Annual Data Quality Assessment

Service Performance
LGA Non-Financial Performance Measures

Target achieved · Partially achieved · Target not achieved · Not reported

Annual Targets Achieved

Provision of roads and footpaths	2015-25 Long Term Plan 2015/16	2016/17	2017/18	2018-28 LTP 2018/19
Road safety				
Condition of the sealed road network				
Maintenance of the sealed road network				
Condition of the footpaths within the local road network				
Response to service requests				

Source: TA Annual Reports

Transport Outcomes
Healthy and Safe People

Fatal and Serious Injuries by Mode (No. per 100,000 Population)

Total

TA · Peer Group

50
0
2015 2020

Road

TA · Peer Group

50
0
2015 2020

Cycling

TA · Peer Group

2
0
2015 2020

Walking

TA · Peer Group

5
0
2015 2020

Source: Waka Kotahi Crash Analysis System and MBIE Regional Economic Activity Tool

Co-Investor Assurance
Investment Performance

Four grades: Effective · Some improvement needed · Significant improvement needed · Unacceptable · Not available

Three grades: Effective · Improvement needed · Unacceptable · Not available

Procedural Audit (Four Grades)

Contract management · Financial management · Procurement · Professional services · Previous audit issues

Source: Waka Kotahi Audit and Assurance, Procedural Audit Report Sep-18

Technical Audit (Three Grades)

Activity management planning · Data quality · Network condition and management · Safety performance · Previous audit issues

Source: Waka Kotahi, Audit and Assurance, Technical Audit Report Jul-16

Delivery and Achievements
Expenditure, Cost Efficiency, Works Completed and Road Condition

Co-Invested Expenditure

All transport activities

$40M
$0M
2015 2020

Road maintenance · Walking and cycling · Road improvement · Other

New roads and road improvements (>$1M ea)

$4M
$2M
$0M
2015 2020

Minor improvements (low cost, low risk) · Resilience and improvements · Roads and bridges · Other

Road maintenance, operations and renewals

$40M
$0M
2015 2020

Corridor and environment and drainage · Pavement and seal · Emergency · Other

Cost Efficiency

Total expenditure / length ($1000 / km)

TA · Peer Group

$10
$0
2015 2020

Road safety promotion

TA · Peer Group

$1.0M
$0.5M
$0.0M
2015 2020

New and improved walking and cycling facilities (excl. low cost <$1M, low risk)

TA · Peer Group

$2M
$0M
2015 2020

Investment management, network and property management

TA · Peer Group

$1M
$0M
2015 2020

Maintenance, operations and renewals expenditure / length ($1000 / km)

TA · Peer Group

$10
$5
$0
2015 2020

Works Completed

Pavement rehabilitation (lane kms)

Actual · Planned

20
0
2015 2020

Pavement resurfacing (lane kms)

Actual · Planned

150
0
2015 2020

New and improved roads and bridges

0.4
0.2
0.0
Road Lane km
2015 2020

Road Condition (Sealed Roads)

Ride quality, pavement and surface condition (peer group lighter)

Surface · Pavement · Ride

98%
96%
94%
92%
2015 2020

Source: Waka Kotahi Data and Tools

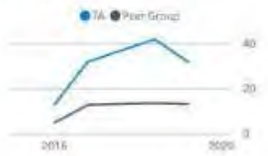
2018/19 Far North District Council RCA Report

Customer Outcomes

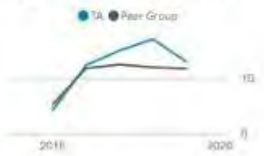
Safety and Amenity

Fatal and Serious Injuries

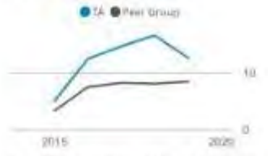
No. per annum



No. per 100 M VKT (personal risk)



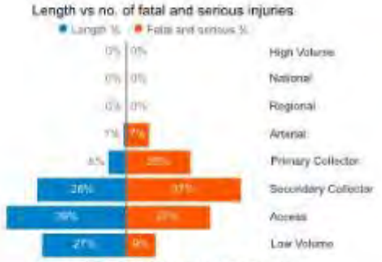
No. per 1000 km (collective risk)



Source: Waka Kotahi Crash Analysis System and Data and Tools

Crash Distribution

Length vs no. of fatal and serious injuries



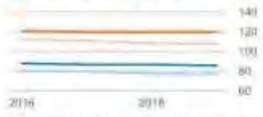
Source: REG ONRC Performance Measure Reporting

Road Condition

Ride quality (roughness of the roads)

Source: Waka Kotahi Data and Tools

Peak and average road roughness (NAASRA) (peer group lighter)



Source: REG ONRC Performance Measure Reporting

Territorial Activity

Economic Activity and Financials

Economic

GDP per capita

GDP by industry

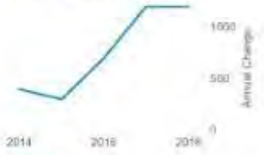
Top 5 TA Industries

- Rental, Hiring And Real Estate Services
- Agriculture
- Owner-Occupied Property Operation
- Forestry, Fishing, Mining, Electricity, Gas, Water And Waste Services
- Gst On Production, Import Duties And Other Taxes

Source: MBIE Regional Economic Activity Tool

Population

Resident population



Tourism

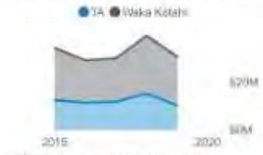
Guest nights per capita

Housing

New dwellings per 10,000 capita

Financials

Co-invested expenditure and funding



Source: Waka Kotahi Data and Tools

Roading valuation

Service life

Source: TA Annual Reports

Technical Outputs

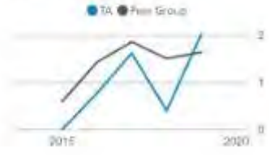
Safety

Fatal and Serious Injuries (No. per 100,000,000 Vehicle km Travelled)

Loss of control on wet roads

Loss of control at night

At intersections



Involving vulnerable users

Source: Waka Kotahi Crash Analysis System and Data and Tools

Network Physical Characteristics

Roads, Cycleways and Bridges

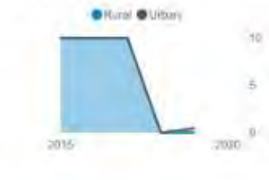
Roads

Network length (km)

Urban % by length

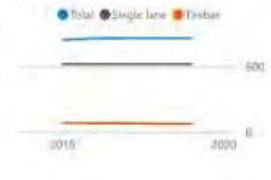
Cycleways

Network length (km)



Bridges

No. bridges



Source: Waka Kotahi Data and Tools

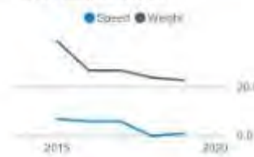
Road Network Use

Roads, Bridges and Public Transport

Roads and Bridges

Vehicle kilometers travelled (VKT)

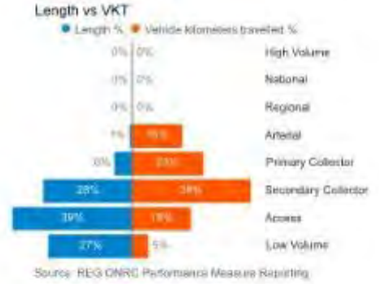
No. of restricted bridges



Source: Waka Kotahi Data and Tools

Journey Distribution

Length vs VKT

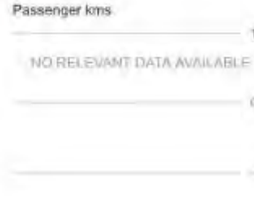


Source: REG ONRC Performance Measure Reporting

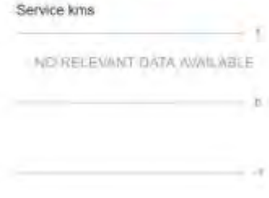
Public Transport (Region Only)

Fleet size (No.)

Passenger kms



Service kms



Source: Waka Kotahi Data and Tools

2018/19 Kaipara District Council RCA Report

REG THE ROAD EFFICIENCY GROUP

We are. LGNZ.

WAKA KOTAHI NZ TRANSPORT AGENCY

23,200 Population	$812 GDP ($M)	$527 Valuation ($M)	$19 Expenditure ($M)	$809 Expenditure per capita	61% FAR
1,572 Total (km)	451 Sealed (km)	1,121 Unsealed (km)	1,455 Rural (km)	118 Urban (km)	349 No. of bridges

Activity Management
Planning, Procurement and Data Quality

Activity Management Planning

Planning quality: 1.65 — Good, Room for improvement

Co-investment planning quality: 1.82 — Fit for purpose, Not assessed

Source: REG 2018 AMP Assessment, Waka Kotahi 2018 AMP Assessment

Procurement

Smart buyer self-assessment

A smart buyer, Developing, Limited, Basic, Not assessed

Source: RCA Smart Buyer Self-Assessment

Data Quality

Asset management and ONRC at expected standard

AM, Peer AM, ONRC, Peer ONRC

2015 2020

Source: REG Annual Data Quality Assessment

Service Performance
LGA Non-Financial Performance Measures

Target achieved, Partially achieved, Target not achieved, Not reported

Annual Targets Achieved

	2015-25 Long Term Plan			2018-28 LTP
Provision of roads and footpaths	2015/16	2016/17	2017/18	2018/19
Road safety				
Condition of the sealed road network				
Maintenance of the sealed road network				
Condition of the footpaths within the local road network				
Response to service requests				

Source: TA Annual Reports

Transport Outcomes
Healthy and Safe People

Fatal and Serious Injuries by Mode (No. per 100,000 Population)

Total

Road

Cycling

Walking

TA, Peer Group

2015 2020

Source: Waka Kotahi Crash Analysis System and MBIE Regional Economic Activity Tool

Co-Investor Assurance
Investment Performance

Four grades: Effective, Some improvement needed, Significant improvement needed, Unacceptable, Not available

Three grades: Effective, Improvement needed, Unacceptable, Not available

Procedural Audit (Four Grades)

Contract management, Financial management, Procurement, Professional services, Previous audit issues

Source: Waka Kotahi, Audit and Assurance, Procedural Audit Report Sep-18

Technical Audit (Three Grades)

Activity management planning, Data quality, Network condition and management, Safety performance, Previous audit issues

Source: Waka Kotahi, Audit and Assurance, Technical Audit Report May-18

Delivery and Achievements
Expenditure, Cost Efficiency, Works Completed and Road Condition

Co-Invested Expenditure

All transport activities

New roads and road improvements (>$1M ea)

Road maintenance, operations and renewals

Road maintenance, Walking and cycling, Road improvement, Other

Minor improvements (low cost, low risk), Resilience and improvements, Roads and bridges, Other

Corridor and environment and drainage, Pavement and seal, Emergency, Other

Cost Efficiency

Total expenditure / length ($1000 / km)

Road safety promotion

New and improved walking and cycling facilities (excl. low cost <$1M, low risk)

Investment management, network and property management

Maintenance, operations and renewals expenditure / length ($1000 / km)

Works Completed

Pavement rehabilitation (lane kms)

Pavement resurfacing (lane kms)

New and improved roads and bridges

Actual, Planned

Road Condition (Sealed Roads)

Ride quality, pavement and surface condition (peer group lighter)

Surface, Pavement, Ride

Source: Waka Kotahi Data and Tools

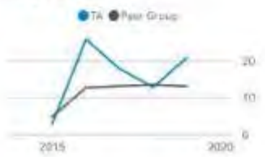
2018/19 Kaipara District Council RCA Report

Customer Outcomes

Safety and Amenity

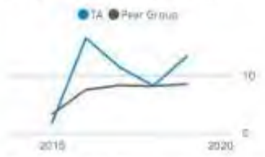
Fatal and Serious Injuries

No. per annum



No. per 100 M VKT (personal risk)

No. per 1000 km (collective risk)



Source: Waka Kotahi Crash Analysis System and Data and Tools

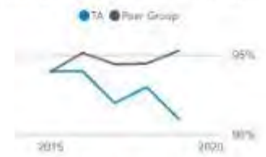
Crash Distribution

Length vs no. of fatal and serious injuries

Source: REG ONRC Performance Measure Reporting

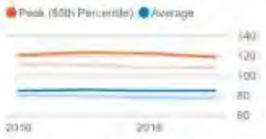
Road Condition

Ride quality (roughness of the roads)



Source: Waka Kotahi Data and Tools

Peak and average road roughness (NAASRA) (peer group lighter)



Source: REG ONRC Performance Measure Reporting

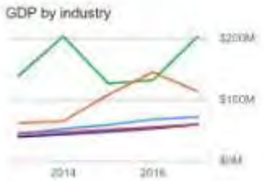
Territorial Activity

Economic Activity and Financials

Economic

GDP per capita

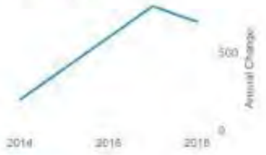
GDP by industry



Source: MBIE Regional Economic Activity Tool

Population

Resident population



Tourism

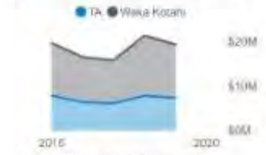
Guest nights per capita

Housing

New dwellings per 10,000 capita

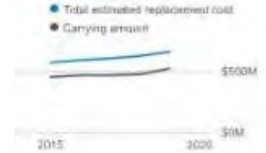
Financials

Co-invested expenditure and funding



Source: Waka Kotahi Data and Tools

Roading valuation



Service life

Source: TA Annual Reports

Technical Outputs

Safety

Fatal and Serious Injuries (No. per 100,000,000 Vehicle km Travelled)

Loss of control on wet roads

Loss of control at night

At intersections

Involving vulnerable users

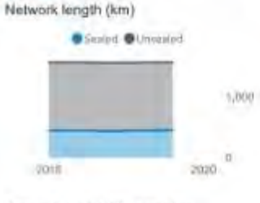
Source: Waka Kotahi Crash Analysis System and Data and Tools

Network Physical Characteristics

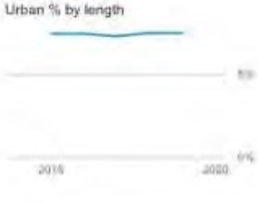
Roads, Cycleways and Bridges

Roads

Network length (km)



Urban % by length

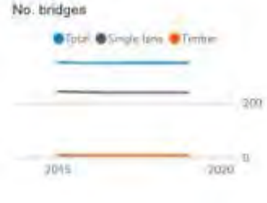


Cycleways

Network length (km)

Bridges

No. bridges



Source: Waka Kotahi Data and Tools

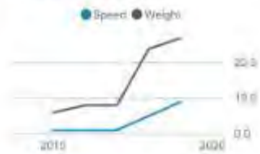
Road Network Use

Roads, Bridges and Public Transport

Roads and Bridges

Vehicle kilometers travelled (VKT)

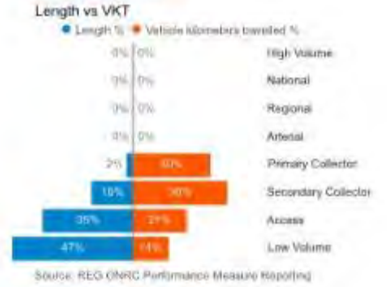
No. of restricted bridges



Source: Waka Kotahi Data and Tools

Journey Distribution

Length vs VKT



Source: REG ONRC Performance Measure Reporting

Public Transport (Region Only)

Fleet size (No.)

Passenger kms

Service kms

Source: Waka Kotahi Data and Tools

2018/19 Whangarei District Council RCA Report

Population	GDP ($M)	Valuation ($M)	Expenditure ($M)	Expenditure per capita	FAR
91,400	$4,169	$812	$43	$456	53%

Total (km)	Sealed (km)	Unsealed (km)	Rural (km)	Urban (km)	No. of bridges
1,748	1,055	693	1,434	314	477

Activity Management
Planning, Procurement and Data Quality

Activity Management Planning

Planning quality

- Good
- Room for improvement

Co-investment planning quality

- Fit for purpose
- Not assessed

Source: REG 2018 AMP Assessment, Waka Kotahi 2018 AMP Assessment

Procurement

Smart buyer self-assessment

- A smart buyer
- Developing
- Limited
- Basic
- Not assessed

Source: RCA Smart Buyer Self-Assessment

Data Quality

Asset management and ONRC at expected standard

Source: REG Annual Data Quality Assessment

Service Performance
LGA Non-Financial Performance Measures

- Target achieved
- Partially achieved[1]
- Target not achieved
- Not reported

Annual Targets Achieved

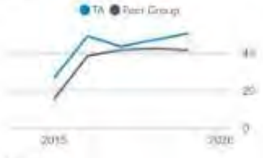
	2015-25 Long Term Plan			2018-28 LTP
	2015/16	2016/17	2017/18	2018/19
Provision of roads and footpaths				
Road safety				
[1]Condition of the sealed road network				
Maintenance of the sealed road network				
Condition of the footpaths within the local road network				
Response to service requests				

Source: TA Annual Reports

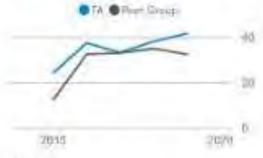
Transport Outcomes
Healthy and Safe People

Fatal and Serious Injuries by Mode (No. per 100,000 Population)

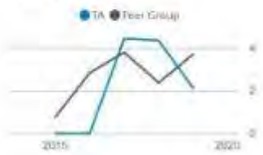
Total



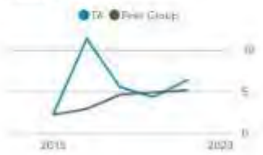
Road



Cycling



Walking



Source: Waka Kotahi Crash Analysis System and MBIE Regional Economic Activity Tool

Co-Investor Assurance
Investment Performance

Four grades: Effective · Some improvement needed · Significant improvement needed · Unacceptable · Not available
Three grades: Effective · Improvement needed · Unacceptable · Not available

Procedural Audit (Four Grades)

Contract management	Financial management	Procurement	Professional services	Previous audit issues

Source: Waka Kotahi, Audit and Assurance, Procedural Audit Report Sep-18

Technical Audit (Three Grades)

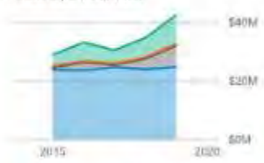
Activity management planning	Data quality	Network condition and management	Safety performance	Previous audit issues

Source: Waka Kotahi, Audit and Assurance, Technical Audit Report Jul-18

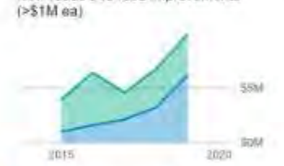
Delivery and Achievements
Expenditure, Cost Efficiency, Works Completed and Road Condition

Co-Invested Expenditure

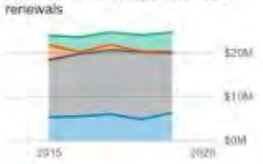
All transport activities



New roads and road improvements (>$1M ea)

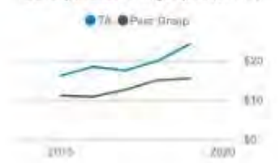


Road maintenance, operations and renewals

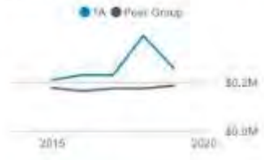


Cost Efficiency

Total expenditure / length ($1000 / km)

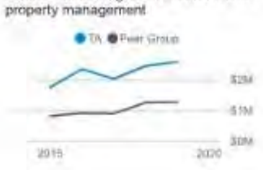


Road safety promotion

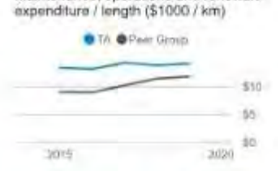


New and improved walking and cycling facilities (excl. low cost <$1M, low risk)

Investment management, network and property management

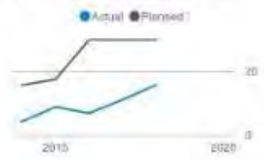


Maintenance, operations and renewals expenditure / length ($1000 / km)

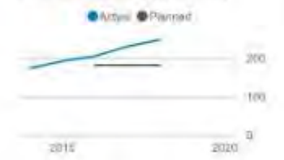


Works Completed

Pavement rehabilitation (lane kms)



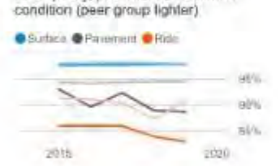
Pavement resurfacing (lane kms)



New and improved roads and bridges

Road Condition (Sealed Roads)

Ride quality, pavement and surface condition (peer group lighter)



Source: Waka Kotahi Data and Tools

2018/19 Whangarei District Council RCA Report

We are. LGNZ.

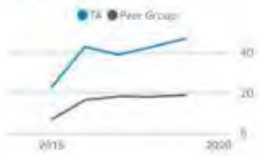
WAKA KOTAHI NZ TRANSPORT AGENCY

Customer Outcomes

Safety and Amenity

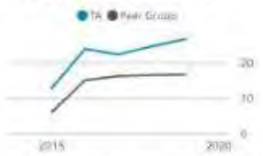
Fatal and Serious Injuries

No. per annum



No. per 100 M VKT (personal risk)

No. per 1000 km (collective risk)



Source: Waka Kotahi Crash Analysis System and Data and Tools

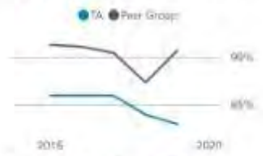
Crash Distribution

Length vs no. of fatal and serious injuries

Source: REG ONRC Performance Measure Reporting

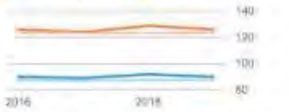
Road Condition

Ride quality (roughness of the roads)



Source: Waka Kotahi Data and Tools

Peak and average road roughness (NAASRA) (peer group lighter)



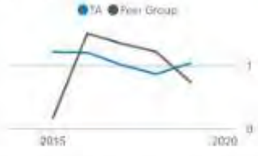
Source: REG ONRC Performance Measure Reporting

Technical Outputs

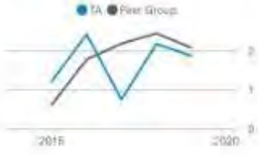
Safety

Fatal and Serious Injuries (No. per 100,000,000 Vehicle km Travelled)

Loss of control on wet roads

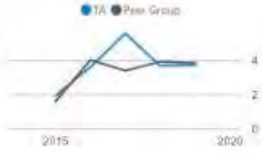


Loss of control at night



At intersections

Involving vulnerable users



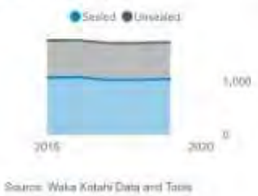
Source: Waka Kotahi Crash Analysis System and Data and Tools

Network Physical Characteristics

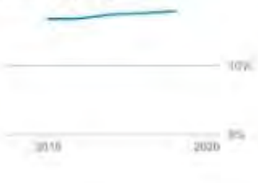
Roads, Cycleways and Bridges

Roads

Network length (km)



Urban % by length



Cycleways

Network length (km)

Bridges

No. bridges

Source: Waka Kotahi Data and Tools

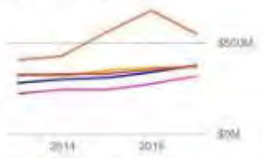
Territorial Activity

Economic Activity and Financials

Economic

GDP per capita

GDP by industry

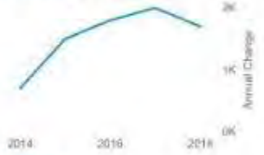


Top 5 TA Industries
- Manufacturing
- Health Care And Social Assistance
- Owner-Occupied Property Operation
- Gst On Production, Import Duties And Other Taxes
- Rental, Hiring And Real Estate Services

Source: MBIE Regional Economic Activity Tool

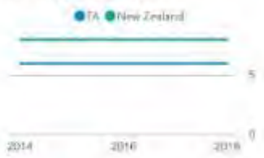
Population

Resident population



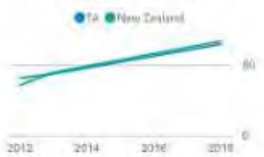
Tourism

Guest nights per capita



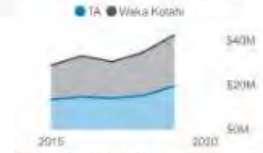
Housing

New dwellings per 10,000 capita



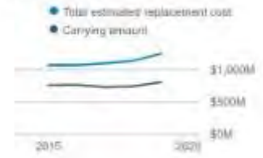
Financials

Co-invested expenditure and funding

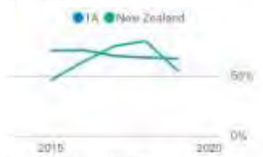


Source: Waka Kotahi Data and Tools

Roading valuation



Service life



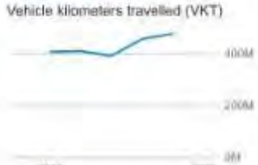
Source: TA Annual Reports

Road Network Use

Roads, Bridges and Public Transport

Roads and Bridges

Vehicle kilometers travelled (VKT)

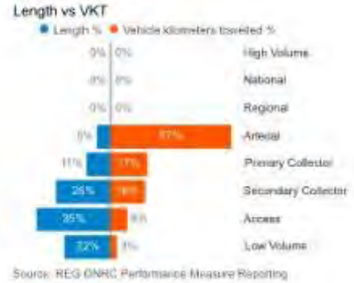


No. of restricted bridges

Source: Waka Kotahi Data and Tools

Journey Distribution

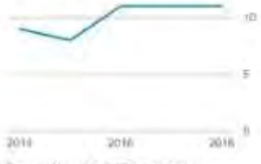
Length vs VKT



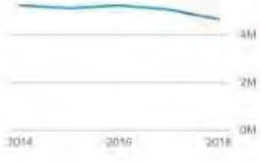
Source: REG ONRC Performance Measure Reporting

Public Transport (Region Only)

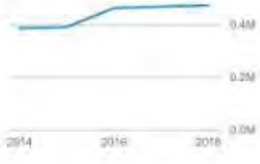
Fleet size (No.)



Passenger kms



Service kms



Source: Waka Kotahi Data and Tools

10.3 Regional Stakeholder Engagement Workshops

The workshops were broken into a series of sessions which focused on specific topics.

Summary – Main Issues
Pre-engagement • NZTA will support actions arising from the Tai Tokerau Action Plan, Safer Journeys Action Plan and REG findings. • Government Policy Statement (GPS) should have same focus as previous (ie Economic Growth, Safety and Value for Money). • Business Case AMP about exploring options and considering consequences/benefits.
Session 1 – Freight / Forestry / Resilience • Connectivity / Reliability of journey times. Resilience • Good quality connection on SH1 to Auckland critical – Connecting the Golden triangle to Northland • Understanding what the effects are if the roads go down or prolong road works occurring • Sharing of information with Public Stakeholders • Forestry currently at peak production (4.5m tonnes/yr) and will stay at that level until 2026, then drop to half until 2040 when it ramps back to 4m tonnes/yr. • Rail being wound down – not likely to be a significant transport mode. • SH detour routes not to standard suitable for 50Max/HPMV vehicles and have one lane bridges. • Road works on freight routes leading to excessive delays and unreliable travel times. • Same day delivery & lack of warehousing makes transport reliability critical. • More truck stops, rest areas, services on freight routes required.
Session 2 – Safety • Network is too narrow and unforgiving. • Fatal Five issues – Young Drivers, Alcohol and/or Drugs, Speed, Rural Loss of Control Head-ons, Intersections • Travel planning required. • Funding for Road safety promotions. Local share more difficult to get. • Old vehicle fleet contributing to higher severity crashes. • Speed management an issue.
Session 3 – Tourism & Economic Development • Significant growth in tourism numbers. More attractions planned Hundertwasser etc. Do we understand this sufficiently? • Transport network must facilitate growth in these areas. Are we planning sufficiently for this growth? • Twin Coast Discovery route to be improved - issues are ease of travel, visual prompts, fatigue/rest areas etc. • Electric vehicle uptake. • Transport needs for Whangarei Regional Airport potential change of location
Session 4 - Public Transport / School Buses • Rose Street bus terminal in Whangarei – Needs relocating to Vine Street. Must be pleasant and welcoming • Reliability – providing a bus that arrives at the same time every day. • Planning for public transport needs to be included at the consent stage. • Parking restrictions an enabler for public transport.

• Future consideration of rural commuter bus services.
Session 5 – Walking and Cycling • Good quality infrastructure connecting areas – if we make it attractive people will use it. • Travel planning – Targeting school to get kids back to walking and cycling. • Education and training – Level 2 training and training facilities required. • Local and regional strategies to align. • Need to provide for mobility scooters/less physically-abled people due to aging population. • National cycleway extension – loop from Horeke to Dargaville to Whangarei & up east coast to Okaihau.

10.4 Far North District - Work Programme Lists

10.4.1 FNDC - Three Year Pavement Renewal Programmes (W/C 214)

GPS Priority: Value for Money	Problem Statement: Sealed Roads

FNDC – W/C 214 Pavement Rehabilitation Programme 2021/22

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt	Estimate Costs
KINGS ROAD	0	205	205	2644.5	SECONDARY COLLECTOR	Rehabilitation	$98,400.00
KOHUKOHU ROAD	9750	10605	855	5557.5	SECONDARY COLLECTOR	Rehabilitation	$410,400.00
KOHUKOHU ROAD	10605	11182	577	3750.5	SECONDARY COLLECTOR	Rehabilitation	$276,960.00
MIDGELEY ROAD	600	2217	1617	10511	SECONDARY COLLECTOR	Rehabilitation	$776,160.00
NGAWHA SPRINGS ROAD	2610	3163	553	3307	SECONDARY COLLECTOR	Rehabilitation	$265,440.00
ORURU ROAD	7962	8307	345	2174	PRIMARY COLLECTOR	Rehabilitation	$165,600.00
ORURU ROAD	13450	13800	350	2275	PRIMARY COLLECTOR	Rehabilitation	$168,000.00
SUMMERVILLE AVENUE (KAITAIA)	0	184	184	1417	LOW VOLUME	Rehabilitation	$88,320.00
TAUPO BAY ROAD	1033	1459	426	2556	SECONDARY COLLECTOR	Rehabilitation	$204,480.00
WAIMATENUI / MATARAUA ROAD	1338	1923	585	3296	SECONDARY COLLECTOR	Rehabilitation	$280,800.00
WAIMATENUI / MATARAUA ROAD	2070	2600	530	2862	SECONDARY COLLECTOR	Rehabilitation	$254,400.00

FNDC – W/C 214 Pavement Rehabilitation Programme 2022/23

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt	Estimate Costs
AUCKS ROAD	3535	3988	453	3171	PRIMARY COLLECTOR	Rehabilitation	$217,440.00
CUMBER ROAD	0	421	421	2063	LOW VOLUME	Rehabilitation	$202,080.00
KAPIRO ROAD	5304	5790	486	4374	PRIMARY COLLECTOR	Rehabilitation	$233,280.00
MATAWAIA-MAROMAKU ROAD	9438	9521	83	498	SECONDARY COLLECTOR	Rehabilitation	$39,840.00
MATAWAIA-MAROMAKU ROAD	15921	16043	122	732	SECONDARY COLLECTOR	Rehabilitation	$58,560.00
NGAPIPITO ROAD	13065	13507	442	2696	SECONDARY COLLECTOR	Rehabilitation	$212,160.00
NGAPIPITO ROAD	13507	13996	489	3270	SECONDARY COLLECTOR	Rehabilitation	$234,720.00
REDAN TERRACE	0	152	152	669	PRIMARY COLLECTOR	Rehabilitation	$72,960.00
TAKAHE ROAD	0	50	50	310	SECONDARY COLLECTOR	Rehabilitation	$24,000.00
TAKAHE ROAD	50	1506	1456	9027	SECONDARY COLLECTOR	Rehabilitation	$698,880.00
TE AHU ROAD	0	495	495	3218	SECONDARY COLLECTOR	Rehabilitation	$237,600.00
WAIKARE ROAD	2600	3142	542	3523	SECONDARY COLLECTOR	Rehabilitation	$144,429.45
WAIMATE NORTH ROAD	908	1780	872	5930	PRIMARY COLLECTOR	Rehabilitation	$232,366.20

FNDC – W/C 214 Pavement Rehabilitation Programme 2023/24

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt	Estimate Costs
KAITAIA-AWAROA ROAD	7919	8382	463	3241	PRIMARY COLLECTOR	Rehabilitation	$222,240.00
KAITAIA-AWAROA ROAD	18620	18979	359	2262	PRIMARY COLLECTOR	Rehabilitation	$172,320.00
KAITAIA-AWAROA ROAD	18979	20162	1183	7346	PRIMARY COLLECTOR	Rehabilitation	$567,840.00
KAITAIA-AWAROA ROAD	20858	21463	605	3630	PRIMARY COLLECTOR	Rehabilitation	$290,400.00
KERIKERI ROAD	665	1123	458	4122	ARTERIAL	Rehabilitation	$219,840.00
OPITO BAY ROAD	35	815	780	5070	SECONDARY COLLECTOR	Rehabilitation	$374,400.00
OPITO BAY ROAD	1403	2206	803	5220	SECONDARY COLLECTOR	Rehabilitation	$385,440.00
ORAKAU ROAD	5474	5546	72	432	ACCESS	Rehabilitation	$34,560.00
ORAKAU ROAD	7332	7406	74	444	ACCESS	Rehabilitation	$35,520.00
ORAKAU ROAD	8773	8795	22	132	ACCESS	Rehabilitation	$10,560.00
TE AHU AHU ROAD	9792	10498	706	5154	PRIMARY COLLECTOR	Rehabilitation	$338,880.00
WAIARE ROAD	376	890	514	2930	PRIMARY COLLECTOR	Rehabilitation	$136,968.15
WAIMATE NORTH ROAD	1780	2020	240	1537	PRIMARY COLLECTOR	Rehabilitation	$63,954.00

10.4.2 FNDC - Three Year Asphalt Concrete Renewal Programmes (W/C 212)

GPS Priority: Value for Money	Problem Statement: Sealed Roads

FNDC – W/C 212 Asphalt Resurfacing Programme 2021/22

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt
BAYVIEW ROAD (PAIHIA)	0	115	115	1529.5	PRIMARY COLLECTOR	Thin asphaltic concrete
CANNON DRIVE	0	15	15	141	SECONDARY COLLECTOR	Thin asphaltic concrete
COMMERCE STREET (KAITAIA)	750	1228	478	5736	ARTERIAL	Thin asphaltic concrete
PUKEPOTO ROAD (KAITAIA)	0	517	517	6080.4	SECONDARY COLLECTOR	Thin asphaltic concrete
SCHOOL ROAD (PAIHIA)	0	483	483	2887.6	PRIMARY COLLECTOR	Thin asphaltic concrete
SELWYN ROAD (PAIHIA)	0	169	169	2078.7	PRIMARY COLLECTOR	Thin asphaltic concrete
SELWYN ROAD (PAIHIA)	169	239	70	861	PRIMARY COLLECTOR	Thin asphaltic concrete
SETTLERS WAY	103	264	161	1915.3	ACCESS	Thin asphaltic concrete
TAU HENARE DRIVE (SPR)	120	270	150	1095	SECONDARY COLLECTOR	Thin asphaltic concrete
WILLIAMS ROAD	0	114	114	1596	PRIMARY COLLECTOR	Thin asphaltic concrete
WILLIAMS ROAD	114	393	279	3163.5	PRIMARY COLLECTOR	Thin asphaltic concrete

FNDC – W/C 212 Asphalt Resurfacing Programme 2022/23

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt
GILLIES STREET (EAST)	0	44	44	858	PRIMARY COLLECTOR	Thin asphaltic concrete
HERITAGE BYPASS	320	530	210	2247	ARTERIAL	Thin asphaltic concrete
HERITAGE BYPASS	530	615	85	909.5	ARTERIAL	Thin asphaltic concrete
HERITAGE BYPASS	615	1455	840	8988	ARTERIAL	Thin asphaltic concrete
KAITAIA-AWAROA ROAD	0	56	56	408.8	PRIMARY COLLECTOR	Thin asphaltic concrete
LANDING ROAD (KERIKERI)	681	731	50	407.6	SECONDARY COLLECTOR	Thin asphaltic concrete
MEMORIAL AVENUE	0	304	304	3739.2	PRIMARY COLLECTOR	Thin asphaltic concrete

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt
PUKEPOTO ROAD (KAITAIA)	1517	1598	81	972	SECONDARY COLLECTOR	Thin asphaltic concrete
RECREATION ROAD	567	597	30	384	PRIMARY COLLECTOR	Thin asphaltic concrete
REDAN ROAD	150	515	365	4599	PRIMARY COLLECTOR	Thin asphaltic concrete
REDAN ROAD	515	887	372	4325.2	PRIMARY COLLECTOR	Thin asphaltic concrete
REDAN ROAD	887	993	106	1166.6	PRIMARY COLLECTOR	Thin asphaltic concrete
REDAN ROAD	993	1065	72	763.2	PRIMARY COLLECTOR	Thin asphaltic concrete
STATION ROAD (KAIKOHE)	0	457	457	5774.3	PRIMARY COLLECTOR	Thin asphaltic concrete
TAU HENARE DRIVE (SPR)	270	480	210	1533	SECONDARY COLLECTOR	Thin asphaltic concrete
WAIPAPA ROAD	4192	4223	31	285.2	ARTERIAL	Thin asphaltic concrete

FNDC – W/C 212 Asphalt Resurfacing Programme 2023/24

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt
AHIPARA ROAD	0	36	36	230.4	PRIMARY COLLECTOR	Thin asphaltic concrete
COBHAM ROAD	0	241	241	3084.8	ARTERIAL	Thin asphaltic concrete
COBHAM ROAD	435	502	67	683.4	ARTERIAL	Thin asphaltic concrete
COBHAM ROAD	612	815	203	1947	ARTERIAL	Thin asphaltic concrete
COBHAM ROAD	1034	1072	38	334.4	ARTERIAL	Thin asphaltic concrete
FAIRWAY DRIVE	0	130	130	1300	ARTERIAL	Thin asphaltic concrete
FAIRWAY DRIVE SRVC LANE 2	0	46	46	253	ACCESS	Thin asphaltic concrete
HOBSON AVENUE (KERIKERI)	0	298	298	3576	ARTERIAL	Thin asphaltic concrete
HOBSON AVENUE (KERIKERI)	298	345	47	564	ARTERIAL	Thin asphaltic concrete
HOMESTEAD ROAD	0	232	232	2186.8	ARTERIAL	Thin asphaltic concrete
HOMESTEAD ROAD	232	324	92	920	ARTERIAL	Thin asphaltic concrete
KAITAIA-AWAROA ROAD	9587	9695	108	722.8	PRIMARY COLLECTOR	Thin asphaltic concrete
KERIKERI INLET ROAD	0	36	36	288	ARTERIAL	Thin asphaltic concrete
KERIKERI ROAD	3170	3534	364	4976	ARTERIAL	Thin asphaltic concrete
PUCKEY AVENUE	440	500	60	720	SECONDARY COLLECTOR	Thin asphaltic concrete
SHEPHERD ROAD (KERIKERI)	0	16	16	112	SECONDARY COLLECTOR	Thin asphaltic concrete
TAAFFE STREET	0	140	140	1680	SECONDARY COLLECTOR	Thin asphaltic concrete
TAU HENARE DRIVE (SPR)	480	847	367	2679.1	SECONDARY COLLECTOR	Thin asphaltic concrete

10.4.3 FNDC - Three Year Chip Seal Renewal Programmes (W/C 212)

Held within the FWP system. Can be supplied on Request.

10.4.4 FNDC - Three Year Structural Component Replacement Programme (W/C 215)

GPS Priority: Improving Freight Connections	Problem Statement: Structures & Resilience

FNDC – W/C 215 Structural Component Replacement Programme 2021/22

Location	Project	Hierarchy (ONRC)	Value
GROVE ROAD	Superstructure upgrade	LOW VOLUME	$165,000
HIHI ROAD	Replacement of poor condition bridge deck	SECONDARY COLLECTOR	$275,000
KAITAIA-AWAROA ROAD	Major concrete repairs/pile jacketing	PRIMARY COLLECTOR	$110,000
KAITAIA-AWAROA ROAD	Major concrete repairs/pile jacketing	PRIMARY COLLECTOR	$110,000
KENANA ROAD	Concrete lining	ACCESS	$110,000
MATAI BAY ROAD	Replacement of failing supports. Major repairs/replacement of bridge piles required. Abutments also showing issues	SECONDARY COLLECTOR	$220,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting, corrosion protection and scour protection	VARIOUS	$552,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$125,000
HOKIANGA FERRY	Modifications of vent shut offs / Repair/Refurbish finger ramps / Top end service Engine x 4	FERRY	$130,000
TOTAL			**$1,797,000**

FNDC – W/C 215 Structural Component Replacement Programme 2022/23

Location	Project	Hierarchy (ONRC)	Value
DUNCAN ROAD	Upgrade of low strength bridge	LOW VOLUME	$165,000
DUNCAN ROAD	Upgrade of deteriorated bridge	LOW VOLUME	$165,000
KOHUKOHU ROAD	Major concrete repairs/pile jacketing	SECONDARY COLLECTOR	$110,000
SILVER EGG ROAD	Replacement of the abutments	LOW VOLUME	$220,000
WAIHAPA ROAD	Upgrade of low strength bridge	LOW VOLUME	$165,000
WAITAPU CREEK ROAD	Upgrade of low strength bridge, diaphragms and deck	LOW VOLUME	$165,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting, corrosion protection and scour protection	VARIOUS	$552,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$125,000
HOKIANGA FERRY	Prepare and Repaint below water line while out of water / Modification of engine room and place CO2 on deck (fire safety)	FERRY	$334,000
TOTAL			**$2,001,000**

FNDC – W/C 215 Structural Component Replacement Programme 2023/24

Location	Project	Hierarchy (ONRC)	Value
HIHI ROAD	Replacement of poor condition deck	SECONDARY COLLECTOR	$275,000
INKSTERS ROAD	Only two beams. Re-assessment of capacity required. Upgrade superstructure	LOW VOLUME	$165,000
INLAND ROAD	Corrosion reinstatement. Major concrete repairs	PRIMARY COLLECTOR	$110,000
ORURU ROAD	Major concrete repairs	PRIMARY COLLECTOR	$110,000
OTAUA ROAD	Bridge upgrade	SECONDARY COLLECTOR	$165,000
RAKAUTAO ROAD	Upgrade of low strength bridge	LOW VOLUME	$165,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting, corrosion protection and scour protection	VARIOUS	$552,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$125,000
HOKIANGA FERRY	Electrical & interior spaces	FERRY	$83,000
TOTAL			**$1,750,000**

10.4.5 FNDC - Three Year Structural Renewals Programme (W/C 216)

GPS Priority: Improving Freight Connections	Problem Statement: Structures & Resilience

FNDC – W/C 216 Structural Renewals Programme 2021/22

Location	Project	Hierarchy (ONRC)	Value
KAITAIA-AWAROA ROAD	Replacement of poor condition culvert	PRIMARY COLLECTOR	$275,000
QUARRY ROAD (AWANUI)	Replacement of poor condition culvert	SECONDARY COLLECTOR	$275,000
PUHATA ROAD	Replacement of poor condition bridge	LOW VOLUME	$440,000
WEKAWEKA ROAD	Replacement of poor condition culvert	ACCESS	$275,000
RETAINING WALL	Replacement of retaining walls	VARIOUS	$250,000
TOTAL			**$1,515,000**

FNDC – W/C 216 Structural Renewals Programme 2022/23

Location	Project	Hierarchy (ONRC)	Value
PICADILLY ROAD	Replacement of poor condition culvert	ACCESS	$275,000
TAEMARO ROAD	Replacement of poor condition culvert	ACCESS	$275,000
WHANGAROA ROAD	Replacement of poor condition culvert	SECONDARY COLLECTOR	$275,000
WIRELESS ROAD	Replacement of poor condition twin barrel culvert	SECONDARY COLLECTOR	$330,000
RETAINING WALL	Replacement of retaining walls	VARIOUS	$250,000
TOTAL			**$1,405,000**

FNDC – W/C 216 Structural Renewals Programme 2023/24

Location	Project	Hierarchy (ONRC)	Value
RAKAUWAHIA ROAD	Replacement of poor condition culvert	ACCESS	$330,000
TOTARA NORTH ROAD	Replacement of poor condition culvert	SECONDARY COLLECTOR	$275,000
WAHARUA ROAD	Replacement of poor condition culvert	LOW VOLUME	$275,000
WEST COAST ROAD (KOHUKOHU)	Replacement of poor condition culvert	SECONDARY COLLECTOR	$330,000
RETAINING WALL	Replacement of retaining walls	VARIOUS	$250,000
TOTAL			**$1,460,000**

10.5 Kaipara District - Work Programme Lists

10.5.1 KDC - Three Year Pavement Renewal Programmes (W/C 214)

GPS Priority: Value for Money	Problem Statement: Sealed Roads

KDC – W/C 214 Pavement Rehabilitation Programme 2021/22

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt	Estimate Costs
BAYLYS COAST RD	3175	4000	825	5692.5	SECONDARY COLLECTOR	Rehabilitation	$371,250
MURRAY RD	300	1400	1100	7260	SECONDARY COLLECTOR	Rehabilitation	$495,000
PARORE WEST RD	1780	2100	320	2688	SECONDARY COLLECTOR	Rehabilitation	$144,000
TANGOWAHINE VALLEY RD	11501	11673	172	1135.2	SECONDARY COLLECTOR	Rehabilitation	$77,400
TANGOWAHINE VALLEY RD	11673	11904	231	1524.6	SECONDARY COLLECTOR	Rehabilitation	$103,950
TANGOWAHINE VALLEY RD	12080	12542	462	3049.2	SECONDARY COLLECTOR	Rehabilitation	$207,900
WHAKAPIRAU RD	6263	6766	503	3039.8	SECONDARY COLLECTOR	Rehabilitation	$226,350

KDC – W/C 214 Pavement Rehabilitation Programme 2022/23

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt	Estimate Costs
LOGAN ST	792	1496	704	6018.4	SECONDARY COLLECTOR	Rehabilitation	$316,800
POUTO RD	790	1220	430	3440	PRIMARY COLLECTOR	Rehabilitation	$193,500
ROBERTSON RD	0	202	202	1292.8	ACCESS	Rehabilitation	$90,900
ROBERTSON RD	202	1057	855	5472	ACCESS	Rehabilitation	$384,750
ROBERTSON RD	3734	4638	904	5695.2	ACCESS	Rehabilitation	$406,800
TANGOWAHINE VALLEY RD	3257	3506	249	1643.4	SECONDARY COLLECTOR	Rehabilitation	$112,050
TANGOWAHINE VALLEY RD	3695	4130	435	2871	SECONDARY COLLECTOR	Rehabilitation	$195,750

KDC – W/C 214 Pavement Rehabilitation Programme 2023/24

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt	Estimate Costs
COLVILLE RD	1059	1455	396	3545	PRIMARY COLLECTOR	Rehabilitation	$178,200
MURRAY RD	3202	3504	302	1993.2	SECONDARY COLLECTOR	Rehabilitation	$135,900
MURRAY RD	3504	4104	600	3960	SECONDARY COLLECTOR	Rehabilitation	$270,000
OMAMARI RD (WEST)	0	212	212	1356.8	SECONDARY COLLECTOR	Rehabilitation	$95,400
OMAMARI RD (WEST)	212	278	66	422.4	SECONDARY COLLECTOR	Rehabilitation	$29,700
OMAMARI RD (WEST)	278	920	642	4108.8	SECONDARY COLLECTOR	Rehabilitation	$288,900
POUTO RD	0	524	524	4192	PRIMARY COLLECTOR	Rehabilitation	$235,800
POUTO RD	524	790	266	2128	PRIMARY COLLECTOR	Rehabilitation	$141,874
POUTO RD	1220	1430	210	1680	PRIMARY COLLECTOR	Rehabilitation	$112,006
TANGOWAHINE VALLEY RD	541	848	307	2026.2	SECONDARY COLLECTOR	Rehabilitation	$163,742

10.5.2 KDC - Three Year Asphalt Concrete Renewal Programmes (W/C 212)

GPS Priority: Value for Money	Problem Statement: Sealed Roads

KDC – W/C 212 Asphalt Resurfacing Programme 2021/22

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt
ARAPOHUE RD	8134	8294	160	1264	ACCESS	Thin asphaltic concrete
COLVILLE LOGAN RDBT	0	47	47	437.1	ACCESS	Thin asphaltic concrete

KDC – W/C 212 Asphalt Resurfacing Programme 2022/23

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt
LOGAN ST	766	792	26	208	ACCESS	Thin asphaltic concrete
MOIR ST	859	1034	175	1487.8	PRIMARY COLLECTOR	Thin asphaltic concrete
MOLESWORTH DR / MANGAWHAI HDS RDBT	0	65	65	455	PRIMARY COLLECTOR	Thin asphaltic concrete
MOLESWORTH DRV	0	122	122	1537.2	PRIMARY COLLECTOR	Thin asphaltic concrete
MOLESWORTH DRV (WEST BRANCH)	0	36	36	216	PRIMARY COLLECTOR	Thin asphaltic concrete

KDC – W/C 212 Asphalt Resurfacing Programme 2023/24

Road Name	Start (m)	End (m)	Length (m)	Width (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt
N/A							

10.5.3 KDC - Three Year Chip Seal Renewal Programmes (W/C 212)

Held within the FWP system. Can be supplied on Request.

10.5.4 KDC - Three Year Structural Component Replacement Programme (W/C 215)

GPS Priority: Improving Freight Connections	Problem Statement: Structures & Resilience

KDC – W/C 215 Structural Component Replacement Programme 2021/22

Location	Project	Hierarchy (ONRC)	Value
BULL ROAD	Install rock armour at abutments and pier	LOW VOLUME	$18,000
FORD ROAD	Replace heavily corroded beams	ACCESS	$30,000
GIBBONS ROAD	Install erosion protection works for both abutments	ACCESS	$24,000
KAIWAKA MANGAWHAI ROAD	Strengthening of weak bridge	PRIMARY COLLECTOR	$360,000
MITITAI ROAD	Strengthening of weak bridge	ACCESS	$250,000
PAPAROA OAKLEIGH ROAD	Install erosion protection works for both abutments	PRIMARY COLLECTOR	$18,000
PUKEHUIA ROAD	Install erosion protection in front of abutment	ACCESS	$18,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting and corrosion protection	VARIOUS	$197,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$85,000
TOTAL			**$1,000,000**

KDC – W/C 215 Structural Component Replacement Programme 2022/23

Location	Project	Hierarchy (ONRC)	Value
DUNN ROAD	Replace timber retaining wall	SECONDARY COLLECTOR	$24,000
FORD ROAD	Strengthening of weak bridge	ACCESS	$350,000
KING ROAD	Install gabion baskets on the upstream abutment	ACCESS	$18,000
NOTORIOUS WEST RD	Remedial works for ailing timber headwall	ACCESS	$24,000
PAPAROA-OAKLIEGH ROAD	Install erosion protection works at both abutments and all wingwalls	PRIMARY COLLECTOR	$24,000
PARADISE ROAD	Investigate and potentially install timber lagging and rockfill to reduce approach settlement	LOW VOLUME	$24,000
POYNER ROAD	Install erosion protection works at both abutments and pier piles	LOW VOLUME	$24,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting and corrosion protection	VARIOUS	$427,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$85,000
TOTAL			**$1,000,000**

KDC – W/C 215 Structural Component Replacement Programme 2023/24

Location	Project	Hierarchy (ONRC)	Value
MAITAHI ROAD	Erosion protection of western abutment	LOW VOLUME	$24,000
POUTO ROAD SOUTH	Strengthening of weak bridge	SECONDARY COLLECTOR	$216,000
TROUNSON PARK ROAD	Erosion protection of abutment	SECONDARY COLLECTOR	$24,000
WHAKAPIRAU ROAD	Replace concrete deck and carry out strengthening works for the beams	SECONDARY COLLECTOR	$96,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting and corrosion protection	VARIOUS	$555,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$85,000
TOTAL			**$1,000,000**

10.5.5 KDC - Three Year Structural Renewals Programme (W/C 216)

GPS Priority: Improving Freight Connections	Problem Statement: Structures & Resilience

KDC – W/C 216 Structural Renewals Programme 2021/22

Location	Project	Hierarchy (ONRC)	Value
MONTEITH ROAD	Refurbishment works include replacement of steel beams, decking timber and barrier system. Install pile jacketing	LOW VOLUME	$350,000
OMANA ROAD	Replace existing bridge	ACCESS	$350,000
PUKEHUIA ROAD	Replace existing bridge	ACCESS	$300,000
TOTAL			**$1,000,000**

KDC – W/C 216 Structural Renewals Programme 2022/23

Location	Project	Hierarchy (ONRC)	Value
TAIPUHA ROAD	Replace existing bridge	LOW VOLUME	$650,000
WAOKU ROAD	Replace existing bridge	LOW VOLUME	$350,000
TOTAL			**$1,000,000**

KDC – W/C 216 Structural Renewals Programme 2023/24

Location	Project	Hierarchy (ONRC)	Value
TO BE DETERMINED			$850,000
RETAINING WALL – PAPAROA OAKLEIGH ROAD	Evidence of visible scarp crossing the centre of the road. Current wall ineffective and will not stop movement. Install new wall.	PRIMARY COLLECTOR	$150,000
TOTAL			**$1,000,000**

10.6 Whangarei District - Work Programme Lists

10.6.1 WDC - Three Year Pavement Renewal Programmes (W/C 214)

GPS Priority: Value for Money	Problem Statement: Sealed Roads

WDC – W/C 214 Pavement Rehabilitation Programme 2021/22

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt	Estimate Costs
KIOREROA RD	1700	2274	574	7404.6	ARTERIAL	Urban Rehabilitation	$1,314,943
KOKOPU BLOCK RD	3030	3900	870	6090	PRIMARY COLLECTOR	Rural Rehabilitation	$327,423
MAUNU RD	22	120	98	1215.2	ARTERIAL	Structural asphaltic concrete	$215,801
MAUNU RD	120	220	100	1240	ARTERIAL	Structural asphaltic concrete	$220,205
MAUNU RD	220	433	213	2641.2	ARTERIAL	Structural asphaltic concrete	$469,036
MAUNU RD	433	537	104	1300	ARTERIAL	Structural asphaltic concrete	$230,860
MCCARDLE RD	300	1200	900	5670	SECONDARY COLLECTOR	Rural Rehabilitation	$304,842
NGUNGURU RD NTH	18153	18515	362	2534	ARTERIAL	Recycling (cold milling)	$136,238
ONERAHI RD	1104	1640	536	6292.6	ARTERIAL	Urban Rehabilitation	$338,316
PIPIWAI RD NTH	15630	16037	407	2808.3	SECONDARY COLLECTOR	Rural Rehabilitation	$150,986
RUSHBROOK RD	1600	1850	250	1650	SECONDARY COLLECTOR	Rural Rehabilitation	$88,711

WDC – W/C 214 Pavement Rehabilitation Programme 2022/23

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt	Estimate Costs
KIOREROA RD	1142	1700	558	7198.2	ARTERIAL	Urban Rehabilitation	$1,278,289
PIPIWAI RD CTRL	867	1675	808	6544.8	ARTERIAL	Rural Rehabilitation	$351,875
PIPIWAI RD NTH	1724	1781	57	427.5	ARTERIAL	Rehabilitation AMix Surface	$22,984
PIPIWAI RD NTH	1781	1865	84	630	ARTERIAL	Rural Rehabilitation	$33,871
PIPIWAI RD NTH	1865	3257	1392	10417	ARTERIAL	Rural Rehabilitation	$559,717
PIPIWAI RD NTH	15177	15630	453	3126	SECONDARY COLLECTOR	Rural Rehabilitation	$168,050
PIPIWAI RD NTH	35241	36274	1033	6923.1	ACCESS	Rural Rehabilitation	$372,214
PIPIWAI RD NTH	36274	36279	5	33.5	ACCESS	Rural Rehabilitation	$1,801
PORT RD	2506	3296	790	8189.8	PRIMARY COLLECTOR	Rural Rehabilitation	$440,317
THREE MILE BUSH RD STH	47	148	101	1212	ARTERIAL	Rehabilitation	$65,162
THREE MILE BUSH RD STH	148	459	311	3732	ARTERIAL	Rehabilitation	$200,648
THREE MILE BUSH RD STH	459	608	149	1281.4	PRIMARY COLLECTOR	Rehabilitation	$68,893
WAIOTIRA RD	7000	7750	750	4650	SECONDARY COLLECTOR	Rural Rehabilitation	$250,003

WDC – W/C 214 Pavement Rehabilitation Programme 2023/24

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt	Estimate Costs
RUSSELL RD (CTL)	0	383	383	2681	SECONDARY COLLECTOR	Rural Rehabilitation	$476,104
SNOOKS RD	4757	5730	973	6421.8	SECONDARY COLLECTOR	Rural Rehabilitation	$345,262
SNOOKS RD	5730	6455	725	4785	SECONDARY COLLECTOR	Rural Rehabilitation	$257,261
WAIOTIRA RD	25	850	825	5692.5	PRIMARY COLLECTOR	Rural Rehabilitation	$306,052
WAIOTIRA RD	5857	6206	349	2163.8	SECONDARY COLLECTOR	Rural Rehabilitation	$116,335
WHATITIRI RD	3023	4500	1477	9446.5	ACCESS	Rural Rehabilitation	$507,883
WHATITIRI RD	4500	4856	356	2278.4	ACCESS	Rural Rehabilitation	$122,496

10.6.2 WDC - Three Year Asphalt Concrete Renewal Programmes (W/C 212)

GPS Priority: Value for Money	Problem Statement: Sealed Roads

WDC – W/C 212 Asphalt Resurfacing Programme 2021/22

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt
BUTTER FACTORY LANE	0	161	161	676.2	LOW VOLUME	Thin asphaltic concrete
CAMERON ST	239	352	113	1383.7	ARTERIAL	Thin asphaltic concrete
CARPARK THE CENTRE (WAIPU)	0	51	51	2754	CARPARK	Thin asphaltic concrete
CARRUTH ST	0	180	180	2160	PRIMARY COLLECTOR	Thin asphaltic concrete
CARRUTH ST	180	309	129	1548	PRIMARY COLLECTOR	Thin asphaltic concrete
CLARK RD SERVICE LANE NO. 1	0	258	258	1625.4	ACCESS	Thin asphaltic concrete
CLARK RD SERVICE LANE NO. 3	0	47	47	291.4	LOW VOLUME	Thin asphaltic concrete
COVE RD	32	123	91	1078	PRIMARY COLLECTOR	Thin asphaltic concrete
DENT ST	12	117	105	1575	ARTERIAL	Thin asphaltic concrete
DENT ST	117	441	324	4217.8	ARTERIAL	Thin asphaltic concrete
EWING RD	0	26	26	322.4	SECONDARY COLLECTOR	Thin asphaltic concrete
GREAT NORTH RD	603	648	45	441	ARTERIAL	Thin asphaltic concrete
GUMDIGGER PL	390	441	51	637.5	SECONDARY COLLECTOR	Thin asphaltic concrete
HEREKINO ST SERVICE LANE NO.2	0	40	40	248	LOW VOLUME	Thin asphaltic concrete
JOHN ST	0	152	152	1884.8	ARTERIAL	Thin asphaltic concrete
JOHN ST	172	346	174	2157.6	ARTERIAL	Thin asphaltic concrete
KAKA ST	0	39	39	471.9	PRIMARY COLLECTOR	Thin asphaltic concrete
KAMO RD	1830	1986	156	2003.1	ARTERIAL	Thin asphaltic concrete
KAMO RD	1986	2094	108	1393.2	ARTERIAL	Thin asphaltic concrete
MARUA RD	3558	3568	10	60	PRIMARY COLLECTOR	Thin asphaltic concrete
MATAPOURI RD	3361	3457	96	691.2	PRIMARY COLLECTOR	Thin asphaltic concrete
MATAPOURI RD	3585	3750	165	1188	PRIMARY COLLECTOR	Thin asphaltic concrete
MCGILL RD	0	24	24	177.6	ACCESS	Thin asphaltic concrete
MCGILL RD	124	182	58	429.2	ACCESS	Thin asphaltic concrete
MURDOCH CRES	0	65	65	494	SECONDARY COLLECTOR	Thin asphaltic concrete
OKARA DR	0	60	60	480	ARTERIAL	Thin asphaltic concrete
PATAUA NORTH RD	6622	6713	91	591.5	PRIMARY COLLECTOR	Thin asphaltic concrete
PATAUA NORTH RD	7615	7701	86	559	PRIMARY COLLECTOR	Thin asphaltic concrete
POROWINI AVE	580	665	85	1027.2	ARTERIAL	Thin asphaltic concrete
QUAYSIDE ST	0	56	56	347.2	LOW VOLUME	Thin asphaltic concrete
RAB BREAM BAY DR/SURFSIDE LANE	0	54	54	367.2	ACCESS	Thin asphaltic concrete
RAB FAIRWAY DR/TE PUIA ST	0	59	59	265.5	SECONDARY COLLECTOR	Thin asphaltic concrete

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	21/22 Trt
RAB ONERAHI RD/WHANGAREI HEADS RD/CHURCH ST	0	59	59	389.4	ARTERIAL	Thin asphaltic concrete
RAB PUNA RERE DR/SPEDDING RD/DENBY CRES	0	56	56	229.6	ARTERIAL	Thin asphaltic concrete
RAB REYBURN ST/OKARA DR/HEREKINO ST	0	72	72	691.2	ARTERIAL	Thin asphaltic concrete
RAB RIVERSIDE DR/DAVE CULHAM DR	0	78	78	702	ARTERIAL	Thin asphaltic concrete
RAMA RD	441	481	40	328	ACCESS	Thin asphaltic concrete
REYBURN ST	214	275	61	834	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (N)	500	522	22	165	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (N)	522	667	145	1238.5	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (N)	667	721	54	480.6	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (N)	721	820	99	881.1	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (S)	0	96	96	787.2	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (S)	96	157	61	500.2	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (S)	1932	1971	39	429	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (S)	1971	2069	98	1078	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (S)	2110	2310	200	2652	ARTERIAL	Thin asphaltic concrete
RIVERSIDE DR (S)	2310	2335	25	275	ARTERIAL	Thin asphaltic concrete
ROBERT ST	0	184	184	2658.8	PRIMARY COLLECTOR	Thin asphaltic concrete
RUST AVE SERVICE LANE	0	38	38	91.2	LOW VOLUME	Thin asphaltic concrete
TE WAIITI PL	0	25	25	250	ACCESS	Thin asphaltic concrete
TE WAIITI PL	300	330	30	300	ACCESS	Thin asphaltic concrete
WRACK ST	0	15	15	192	SECONDARY COLLECTOR	Thin asphaltic concrete
WRIGHT RD	2913	2972	59	418.9	SECONDARY COLLECTOR	Thin asphaltic concrete

WDC – W/C 212 Asphalt Resurfacing Programme 2022/23

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt
CAIRNFIELD RD	490	506	16	177.6	SECONDARY COLLECTOR	Thin asphaltic concrete
CAIRNFIELD RD	506	649	143	1630.2	SECONDARY COLLECTOR	Thin asphaltic concrete
CARPARK REYBURN HOUSE LANE (END OF FINLAYSON ST)	0	19	19	342	CARPARK	Thin asphaltic concrete
CARPARK REYBURN ST (LOWER HANNAH ST)	0	57	57	1026	CARPARK	Thin asphaltic concrete
CARPARK WATER ST	0	151	151	4409.2	CARPARK	Thin asphaltic concrete
ELGIN PL	128	153	25	165	LOW VOLUME	Thin asphaltic concrete
HATEA DR	0	265	265	3206.5	ARTERIAL	Thin asphaltic concrete
HOME CENTRE SERVICE LANE	0	44	44	294.8	LOW VOLUME	Thin asphaltic concrete
JAMES ST	70	152	82	1057.8	ARTERIAL	Thin asphaltic concrete
JAMES ST	168	170	2	25.8	ARTERIAL	Thin asphaltic concrete
JAMES ST	170	337	167	2154.3	ARTERIAL	Thin asphaltic concrete
KAIATEA RD	4715	4760	45	279	ACCESS	Thin asphaltic concrete
KAMO RD	2094	2247	153	1973.7	ARTERIAL	Thin asphaltic concrete
KAMO RD	2247	2757	510	6579	ARTERIAL	Thin asphaltic concrete
KENSINGTON AVE	72	344	272	3291.2	ARTERIAL	Thin asphaltic concrete
KEYTE ST	0	12	12	147.6	SECONDARY COLLECTOR	Thin asphaltic concrete
KING ST	0	16	16	188.8	SECONDARY COLLECTOR	Thin asphaltic concrete
KIRIPAKA RD	1684	1854	170	2122	ARTERIAL	Thin asphaltic concrete
KIRIPAKA RD	1920	2152	232	2807.2	ARTERIAL	Thin asphaltic concrete
KIRIPAKA RD	2152	2399	247	3235.7	ARTERIAL	Thin asphaltic concrete
KIRIPAKA RD	2399	2491	92	1104	ARTERIAL	Thin asphaltic concrete
LOWER DENT ST	0	38	38	471.2	PRIMARY COLLECTOR	Thin asphaltic concrete

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	22/23 Trt
MAINS AVE	0	26	26	306.8	SECONDARY COLLECTOR	Thin asphaltic concrete
MAINS AVE	736	764	28	330.4	SECONDARY COLLECTOR	Thin asphaltic concrete
MOA PL	45	72	27	145.8	LOW VOLUME	Thin asphaltic concrete
MOODY AVE	0	14	14	154	ACCESS	Thin asphaltic concrete
MT TIGER RD	2529	2570	41	266.5	SECONDARY COLLECTOR	Thin asphaltic concrete
NGUNGURU FORD RD	1620	1675	55	368.5	SECONDARY COLLECTOR	Thin asphaltic concrete
NGUNGURU RD CTRL	0	28	28	291.2	ARTERIAL	Thin asphaltic concrete
PAH RD	257	282	25	257.5	ACCESS	Thin asphaltic concrete
PAH RD	310	330	20	132	LOW VOLUME	Thin asphaltic concrete
PERCY ST	0	23	23	266.8	SECONDARY COLLECTOR	Thin asphaltic concrete
PIPIWAI RD NTH	35194	35241	47	361.9	ACCESS	Thin asphaltic concrete
POROWINI AVE	82	196	114	1368	ARTERIAL	Thin asphaltic concrete
POROWINI AVE	1160	1178	18	162	ARTERIAL	Thin asphaltic concrete
POROWINI AVE	1178	1205	27	243	ARTERIAL	Thin asphaltic concrete
POROWINI AVE	1205	1246	41	369	ARTERIAL	Thin asphaltic concrete
PORT RD	0	25	25	380	ARTERIAL	Thin asphaltic concrete
PUNGA GRV	0	23	23	128.8	ACCESS	Thin asphaltic concrete
RAB OKARA DR/POROWINI AVE	0	95	95	1026	ARTERIAL	Thin asphaltic concrete
RAB OKARA DR/PORT RD	0	83	83	805.1	ARTERIAL	Thin asphaltic concrete
RUSSELL RD (CTL)	14252	14595	343	2160.9	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	14990	15020	30	189	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	15290	15324	34	214.2	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	15990	16026	36	226.8	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	16277	16304	27	170.1	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	16557	16593	36	226.8	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	16693	16750	57	359.1	SECONDARY COLLECTOR	Thin asphaltic concrete
RUSSELL RD (CTL)	16895	16914	19	119.7	SECONDARY COLLECTOR	Thin asphaltic concrete
SIMONS ST	0	15	15	138	ACCESS	Thin asphaltic concrete
STATION RD SERVICE LANE	0	46	46	225.4	LOW VOLUME	Thin asphaltic concrete
STATION RD SERVICE LANE	46	83	37	181.3	LOW VOLUME	Thin asphaltic concrete
STEERE PL	100	134	34	224.4	LOW VOLUME	Thin asphaltic concrete
TAWHAI PL	413	653	240	1512	ACCESS	Thin asphaltic concrete
VINE ST	0	192	192	2323.2	PRIMARY COLLECTOR	Thin asphaltic concrete
WALTON ST	325	800	475	5777.2	ARTERIAL	Thin asphaltic concrete
WALTON ST	800	853	53	646.6	ARTERIAL	Thin asphaltic concrete
ZEALANDIA ST	0	16	16	195.2	LOW VOLUME	Thin asphaltic concrete

WDC – W/C 212 Asphalt Resurfacing Programme 2023/24

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt
ABBEY CAVES RD	1596	1644	48	316.8	SECONDARY COLLECTOR	Thin asphaltic concrete
ALBERT ST	0	29	29	353.8	PRIMARY COLLECTOR	Thin asphaltic concrete
ALBERT ST SERVICE LANE	0	120	120	576	LOW VOLUME	Thin asphaltic concrete
CEMETERY RD	3510	3584	74	481	SECONDARY COLLECTOR	Thin asphaltic concrete
CENTRAL AVE	350	500	150	1645.2	ARTERIAL	Thin asphaltic concrete
HEWLETT ST	0	26	26	312	PRIMARY COLLECTOR	Thin asphaltic concrete
HUNT ST	15	214	199	2507.4	SECONDARY COLLECTOR	Thin asphaltic concrete
KAKA ST	124	152	28	338.8	PRIMARY COLLECTOR	Thin asphaltic concrete
KAKA ST	260	288	28	338.8	PRIMARY COLLECTOR	Thin asphaltic concrete
KAKA ST	310	335	25	302.5	PRIMARY COLLECTOR	Thin asphaltic concrete
KAMO RD	2914	3626	712	8761	ARTERIAL	Thin asphaltic concrete
NGUNGURU RD NTH	8599	8688	89	623	ARTERIAL	Thin asphaltic concrete
NGUNGURU RD NTH	8809	8904	95	665	ARTERIAL	Thin asphaltic concrete
ONE TREE POINT RD	5146	5176	30	234	PRIMARY COLLECTOR	Thin asphaltic concrete
POMPALLIER ESTATE DR	0	590	590	3953	SECONDARY COLLECTOR	Thin asphaltic concrete

Road Name	Start (m)	End (m)	Length (m)	Area (m2)	Hierarchy (ONRC)	23/24 Trt
RAB JAMES ST/ROBERT ST	0	30	30	150	ARTERIAL	Thin asphaltic concrete
RAB JOHN ST/ROBERT ST	0	30	30	150	ARTERIAL	Thin asphaltic concrete
RAB ONE TREE POINT RD /PYLE RD EAST/PYLE RD (W)	0	37	37	333	PRIMARY COLLECTOR	Thin asphaltic concrete
RAB ONE TREE POINT RD/SHEARWATER ST/PLOVER ST	0	59	59	454.3	PRIMARY COLLECTOR	Thin asphaltic concrete
ROBERT ST	200	262	62	793.6	ARTERIAL	Thin asphaltic concrete
ROBERT ST	282	310	28	358.4	ARTERIAL	Thin asphaltic concrete
TAUROA ST (BOTTOM)	0	36	36	428.4	SECONDARY COLLECTOR	Thin asphaltic concrete
TAUROA ST (BOTTOM)	36	76	40	476	SECONDARY COLLECTOR	Thin asphaltic concrete
VINERY LANE	0	124	124	800	SECONDARY COLLECTOR	Thin asphaltic concrete

10.6.3 WDC - Three Year Chip Seal Renewal Programmes (W/C 212)

Held within the FWP system. Can be supplied on Request.

10.6.4 WDC - Three Year Structural Component Replacement Programme (W/C 215)

GPS Priority: Improving Freight Connections	Problem Statement: Structures & Resilience

WDC – W/C 215 Structural Component Replacement Programme 2021/22

Location	Project	Hierarchy (ONRC)	Value
ARARUA ROAD	Pier repairs, diaphragms, HD bolts, painting	LOW VOLUME	$360,000
MCBETH ROAD	Deck replacement	ACCESS	$85,000
NGUNGURU ROAD	Major pier repairs	ARTERIAL	$85,000
OLD TOKATOKA ROAD	Replace structural components	LOW VOLUME	$165,000
ROSYTHE ROAD	Deck replacement	SECONDARY COLLECTOR	$85,000
TAKITU ROAD	Deck replacement, guardrail repairs	LOW VOLUME	$110,000
WHANANAKI SOUTH ROAD	Timber Footbridge – Replace 10-15 worst piles (about 5%)	TE ARAROA TRAIL	$55,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting and corrosion protection	VARIOUS	$425,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$175,000
TOTAL			**$1,545,000**

WDC – W/C 215 Structural Component Replacement Programme 2022/23

Location	Project	Hierarchy (ONRC)	Value
BUSHBY ROAD	North abutment upgrade – scour protection works	LOW VOLUME	$55,000
COVE ROAD	Major pier repairs	PRIMARY COLLECTOR	$85,000
HILFORD ROAD	Piers replacement	LOW VOLUME	$110,000
NGAHAU BAY ROAD	Replace substructure	LOW VOLUME	$220,000
THE CENTRE	Pile jacketing (prestressed) of 8-10 piles	PRIMARY COLLECTOR	$165,000
THOMPSON ROAD	Railover bridge - Replace structural components	LOW VOLUME	$165,000
WAIPU CAVES ROAD	Deck replacement, patch painting	ACCESS	$140,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting and corrosion protection	VARIOUS	$425,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$175,000
TOTAL			**$1,540,000**

WDC – W/C 215 Structural Component Replacement Programme 2023/24

Location	Project	Hierarchy (ONRC)	Value
KERSHAW ROAD	Diaphragms and beam refurbishment.	LOW VOLUME	$85,000
MATAPOURI ROAD	Pile jacketing of all 6 piles	PRIMARY COLLECTOR	$110,000
NGUNGURU ROAD	Major pile repairs	ARTERIAL	$110,000
NOVA SCOTIA DRIVE	Pile jacketing (prestressed) of 12 piles	PRIMARY COLLECTOR	$220,000
REYBURN STREET	Pile jacketing to remaining unjacketed piles	ARTERIAL	$110,000
WHANANAKI SOUTH ROAD	Timber Footbridge – Replace another 10-15 worst piles (about 5%)	TE ARAROA TRAIL	$55,000
WHANANAKI SOUTH ROAD	Pile jacketing of 3 piles	ACCESS	$75,000
WHANGAREI HEADS ROAD	Remove the old bridge – extend the culvert	ARTERIAL	$165,000
MAJOR BRIDGE REPAIRS	Major repairs, beam painting and corrosion protection	VARIOUS	$425,000
RETAINING WALL	Major retaining wall repairs	VARIOUS	$175,000
TOTAL			**$1,530,000**

10.6.5 WDC - Three Year Structural Renewals Programme (W/C 216)

GPS Priority: Improving Freight Connections	Problem Statement: Structures & Resilience

WDC – W/C 216 Structural Renewals Programme 2021/22

Location	Project	Hierarchy (ONRC)	Value
GILLINGHAM ROAD	Replace the old weight restricted bridge (75% Class I, 8,000kg axle). Bridge links the Tikipunga North growth area to Whangarei.	LOW VOLUME	$550,000
MANGAPAI ROAD	Culvert steel shell corroding under lining. Replace both culvert barrels with a bridge.	PRIMARY COLLECTOR	$1,100,000
RETAINING WALL – COVE ROAD RP 16150	Concrete rock spall wall has failed, large crack at edge of road and subsequent slip down steep bank.	PRIMARY COLLECTOR	$300,000
TOTAL			**$1,950,000**

WDC – W/C 216 Structural Renewals Programme 2022/23

Location	Project	Hierarchy (ONRC)	Value
APONGA ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	ACCESS	$275,000
BINT ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	ACCESS	$330,000
OTONGA-MARUA ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	ACCESS	$275,000
WEBB ROAD	Exposed steel with big holes near the outlet. Replace with concrete box culvert.	ACCESS	$330,000
WHITE ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	LOW VOLUME	$330,000
RETAINING WALL – RUSSELL RD RP 36820	Concrete rock spall wall has failed, large crack at edge of road and subsequent slip down steep bank.	SECONDARY COLLECTOR	$425,000
TOTAL			**$1,985,000**

WDC – W/C 216 Structural Renewals Programme 2023/24

Location	Project	Hierarchy (ONRC)	Value
MANGAPAI CAVES ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	ACCESS	$275,000
MILLBROOK ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	ACCESS	$330,000
MOUNTFIELD ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	ACCESS	$330,000
ODY ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	LOW VOLUME	$275,000
PAPAROA ROAD	Culvert steel shell corroding under lining. Replace with concrete box culvert.	PRIMARY COLLECTOR	$330,000
RETAINING WALL - WHAREORA ROAD RP 1728	Gabion baskets broken and slipping down steep bank.	PRIMARY COLLECTOR	$300,000
TOTAL			**$1,840,000**

10.7 Northland Life Lines Maps


Northland Lifelines Project
Whangarei Map
1:25,000
Legend
Airports
Public Health Facilities
Electricity Towers
Ambulance
EOC
Fire Service
Police
Welfare Centre
Railway
Natural Gas Sites
Kordia Transmission Towers
Telecom. Sites_Telecom
Telecom. Sites_Vodafone
WDC Waste Water Sites
WDC Waste Water Network
WDC Water Sites
Electricity Sites -Northpower
TransPower Network
State Highways
PriorityRoads
Rivers
Railway Stations
Natural Gas Network
Whangarei POI (Telstra)
WHANGAREI
KENSINGTON
Kensington
Whangarei Ambulance
Whangarei District Welfare Centre
Whangarei Fire Station
Whangarei Station
Hatea PS
Parahaki Transmission
KMO
Punga PS
Punga Grove
Otaika PS
Kioreroa Rd PS
Whau Valley WTP
063
069
090
071
060
070
067
096
241
WNH
WGC
WID
PTD
WHA
WHAN
HATEA DRIVE
QUAYSIDE
MAUNU ROAD
PORT ROAD
Whau Valley Road
Jack Street
Weaver Street
Percy Street
Cairnfield Road
Mill Road
Loyatt Crescent
Mair Street
Parahaki Street
Bank Street
Hatea Drive
Vale Road
Ewing Road
Dundas Road
Old Parua Bay Road
Kohe Street
Eureka Place
Tanekaha Drive
Mackesy Road
Port Road
Railway Road
Reyburn Street
Porekino Street
Walton Street
James Street
Fifth Avenue
Third Avenue
Second Avenue
First Avenue
Glen Dale Road
Cheviot Street
Maunu Road
West End Avenue
Te Mai Road
Tarewa Road
Morningside Road
Anzac Lane
Raewyn Street
Limeburners Street
Kioreroa Road
Ashley Avenue
High Street
Murdoch Crescent
Kahiwi Street
Isola Street
Hedley Place
Fairburn Street
Tauroa Street
South End Avenue
Rewa Rewa Road
Dunbar Place
Russell Road
Kamo Road
Matai Street
Korau Road
Hinau Street
Kiripaka Road
Bedlington Street
Huia Street
Kerrie Street
King Street
Mains Avenue
Gillington Street
Park Avenue
Kaikaru Road
Western Hills Drive
Kent Road
Hoffie Street
Kirikiri Road
Rakaumanga Valley Road
Carr Street
Fairway Drive
Ralfurly Place
Summit Lane
Tait Street
Fisher Terrace
SH 1
William Jones Drive
Braden Drive
Northland Regional Council