

Transport

Asset Management Plan



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TRANSPORT ASSET MANAGEMENT PLAN

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1 Asset Management Strategy and Planning

1.1 Asset Management Plan

1.1.1 Plan Purpose

Asset Management may be defined as:

“The combination of management, financial, economic, engineering and other practices, applied to physical assets with the objective of providing the required level of service in the most cost effective manner”.

The International Infrastructure Management Manual Version 3 2006.

The tenth Schedule of the Local Government Act 2002, requires Councils to include in Long Term Plans (LTPs) the following information in relation to groups of activities and assets or groups of assets –

Group of Activities:
(1) A Long-Term Plan must, in relation to each group of activities of the local authority, -
(a) identify the activities within the group of activities:
(b) identify the rationale for delivery of the group of activities (including the community outcomes to which the group of activities primarily contributes):
(c) outline any significant negative effects that any activity within the group of activities may have on the social, economic, environmental, or cultural well-being of the local community:
(d) identify the assets or groups of assets required by the group of activities and identify, in relation to those assets or groups of assets, -
(i) how the local authority will assess and manage the asset management implications of changes to –
(A) demand for, or consumption of, relevant services; and
(B) service provision levels of standards:
(ii) what additional asset capacity is estimated to be required in respect of changes to each of the matters described in subparagraph (i):
(iii) how the provision of additional asset capacity will be undertaken:
(iv) the estimated costs of the provision of additional asset capacity identified under subparagraph (ii), and the division of those costs between each of the matters in respect of which additional capacity is required:
(v) how the costs of the provision of additional asset capacity will be met:
(vi) how the maintenance, renewal, and replacement of assets will be undertaken:
(vii) how the costs of the maintenance, renewal, and replacement of assets will be met:
(e) include the information specified in sub clause (2) –
(i) in detail in relation to each of the first 3 financial years covered by the plan; and
(ii) in outline in relation to each of the subsequent financial years covered by the plan.
(2) The information referred to in sub clause (1) (e) is -
(a) a statement of the intended levels of service provision for the group of activities, including the performance targets and other measures by which actual levels of service provision may meaningfully be assessed:
(b) the estimated expenses of achieving and maintaining the identified levels of service provision, including the estimated expenses associated with maintaining the service capacity and integrity of assets:

(c) a statement of how the expenses are to be met:

(d) a statement of the estimated revenue levels, the other sources of funds, and the rationale for their selection in terms of section 101(3).

Asset management planning is “knowing” about assets: what they are, where they are, what condition they are in, how much they are worth, what level of service is expected of them and at what cost. Other things that must be known are how the assets are performing, what extra capacity they have, what future capacity is required, when they need to be replaced or upgraded, (and at what cost), what further works are required to meet future demand and what improvements are programmed.

1.1.2 Linking between this Plan and other Council documents

The following diagram shows the linkages between the Council’s various planning documents including the Long Term Plan (LTP) and Asset Management Plans (AMPs).

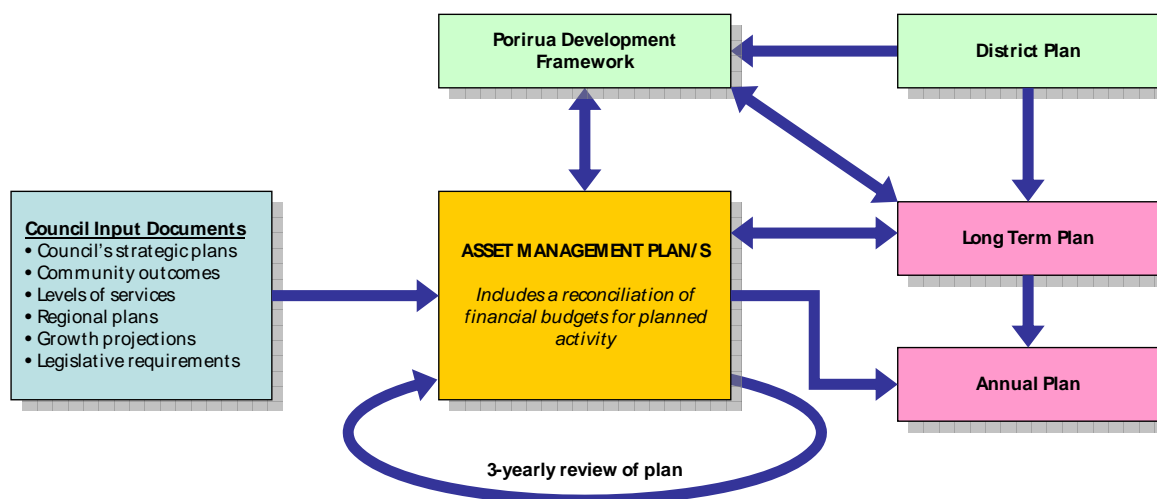


Figure 1 - Council Planning Activity

Asset Management Plans are the link between the Council's 'input' documents (shown in the blue box in the diagram), and what happens at a tactical and operational level.

This Transport Asset Management Plan (the Plan) was first developed in 1997 alongside other Council plans for core infrastructure assets, such as water supply, wastewater and stormwater, in accordance with the Local Government Act 1974. Since then, the Plan has been regularly updated and has become an essential part of the Council's strategic and operational framework for the delivery of water services. The Plan is scheduled for triennial updates, to coincide with and inform the review of Council's Long Term Council Community Plan.

In 2008, MWH (Consultants) were engaged by the Council to review the then present version of the Plan. The key issues raised within that peer review have been included within this document to ensure that this plan matches sector best practice.

1.1.3 Layout of the Plan

The layout of this Plan has been adapted from the template of the AMCL Asset Management Excellence Model. This model provides for six areas of Asset Management, as shown in Table 1. For this Asset Management Plan, a seventh section entitled 'Finance' has been added. The

Finance section details funding implications of the Plan and revenue sources. This structure gives the basis for the logic flow of this document.

Note that a Glossary, or definition of terms, is included in Appendix 1 – Section 8.1.

Chapter	Title
1	Asset Management Strategy & Planning
2	Whole-life Cost Justification
3	Lifecycle Delivery
4	Asset Knowledge Systems
5	Organisation & People
6	Risk, Confidence Levels & Review
7	Finance
8	Appendices

Table 1 - AMCL Asset Management Excellence Model

1.2 Policy and Strategy

1.2.1 Policy

This Transport Asset Management Plan is aligned with the following legislation and documents:-

Land Transport Management Act 2003

- | |
|--|
| (1) The purpose of this Act is to contribute to the aim of achieving an affordable, integrated, safe, responsive, and sustainable land transport system. |
| (2) To contribute to that purpose, this Act— |
| (a) provides an integrated approach to land transport funding and management; and |
| (b) improves social and environmental responsibility in land transport funding, planning, and management; and |
| (c) provides the New Zealand Transport Agency (NZTA) with a broad land transport focus; and |
| (d) improves long-term planning and investment in land transport, including planning and investment in coastal shipping and rail; and |
| (e) ensures that land transport funding is allocated in an efficient and effective manner; and |
| (f) improves the flexibility of land transport funding by providing for alternative funding mechanisms. |

It should be noted that, NZTA manages the subsidy of Council roading activities, and assesses potential Council funding applications against the above criteria. This is important for the Council, as funding applications will have the greatest chance of success if they align with the NZTA requirements.

Land Transport Act 1998

An Act—
(a) To promote safe road user behaviour and vehicle safety; and
(b) To provide for a system of rules governing road user behaviour, the licensing of drivers, and technical aspects of land transport, and to recognise reciprocal obligations of persons involved; and
(c) To consolidate and amend various enactments relating to road safety and land transport; and
(d) To enable New Zealand to implement international agreements relating to road safety and land transport

The above legislation governs some of the technical aspects that must be included within the Council's management of its roading network.

New Zealand Transport Strategy

In August 2008, the government launched a set of defined targets and associated actions for the transport sector to achieve over the next 30 years. This is the first time specific targets have been set for the whole sector and they are detailed in two key documents: the New Zealand Transport Strategy 2008 (NZTS) and the first Government Policy Statement on Land Transport Funding (GPS). These documents are part of a raft of changes to the transport sector and will be the driving force to achieving an affordable, integrated, safe, responsive and sustainable transport system.

Government Policy Statement on Land Transport Funding

The Government Policy Statement on Land Transport Funding (GPS) sets out the government's priorities for the National Land Transport Fund over the next 10 years.

The Policy Statement details the funding allocation between activities such as road safety policing, state highways, local roads and public transport. The Statement also discusses how NZTA may assess funding applications, in accordance with the updated Strategy. It should be noted, however, that the above Strategy is liable to change if successive governments take opposing policy directions. This plan aligns with the GPS of 2011, which includes a re-affirmation of the Governments continued focus on 'Roads of National Significance', including the proposed Transmission Gully Motorway.

1.2.2 Strategy

The Wellington Regional Land Transport Strategy

The Wellington Regional Land Transport Strategy (RLTS) is a statutory document (prepared under the Land Transport Act 1998) that Greater Wellington Regional Council is required to produce via the Regional Land Transport Committee (RLTC). The RLTS guides the development of the region's transport system including provisions for; public transport, roads, walking, cycling and freight for the next ten years and beyond.

The RLTS 2007 – 2016 was adopted by Greater Wellington Regional Council on 19 July 2007, following the consideration of feedback from 1,300 public submissions and results of a telephone survey, of 800 residents and 100 businesses. <http://www.gw.govt.nz/Market-research-report-RLTS-review/>

The adopted Strategy includes a strong commitment to public transport and reducing greenhouse gas emissions. It also recognises the importance of a strategic road network which

operates safely and efficiently. The Strategy contains outcomes and ambitious new targets in relation to increasing the use of sustainable transport modes such as passenger transport, walking and cycling. Other focus areas include reducing greenhouse gas emissions, improving road safety, reducing severe traffic congestion, improving freight efficiency and improving land use and transport integration.

The RLTS specifically outlines, in specific terms the roading projects that Porirua City Council may consider in delivering roading improvements on the network.

Compatibility of the Plan with the Wellington Regional Land Transport Strategy

Porirua City Council, as part of its maintenance programme and new land transport projects supports the objectives of the Wellington Regional Land Transport Strategy in the following ways:

<p>1. Improve Road Safety:</p> <p>The Council is determined to achieve Regional and Central Government targets as stated in the Road Safety Strategy 2010, by undertaking the</p> <ul style="list-style-type: none"> • Minor safety projects • Community safety works • New roading projects.
<p>2. Pedestrians and Cyclists:</p> <p>The Council seeks to:</p> <ul style="list-style-type: none"> • Increase the mode share of pedestrians and cyclists • Provide an acceptable level of service for cycleways and footpaths • Serve most urban road frontages with safe footpath.
<p>3. Reduce Greenhouse Gas Emissions:</p> <p>Council seeks to mitigate these negative greenhouse effects by encouraging pedestrian and cycle use, and by road enhancements to reduce congestion.</p>
<p>4. Improve Land Use And Transportation Integration:</p> <p>Council asset managers contribute to the assessment of subdivision proposals. The Council encourages good integrated design and assists in this outcome by contributing to the provision of supporting public infrastructure.</p>
<p>5. Reduce Road Congestion:</p> <p>The Council assesses the priority for new projects by using national best practice, which includes consideration of benefits from reduced road congestion.</p>

The road safety aspect of the above strategy also aligns with the Government strategy of 'Safer Journeys – NZ's Road Safety Strategy 2010-20.

Council's Strategic Direction

Porirua City Council is managed as a business. The role of elected members is similar to that of a board of directors; they set the strategic direction in consultation with shareholders – in this case, the community, and this is set out in the Long Term Plan (LTP) and Annual Plan. The Executive Management Team (EMT) - comprising the Chief Executive, General Managers and Communications & Marketing Manager - are responsible for efficient and effective implementation of these plans. Each business group works within this wider Council context.

The elected members have set a direction for the Council, in the LTP, to become known for “City Leadership” - encompassing four strategic priorities:

- A City of Villages
- A Healthy and Protected Harbour
- A Growing City
- A Great City Experience.

Porirua Land Transportation Strategy

The Council is developing the Porirua Land Transportation Strategy to analyse traffic modes and demands. The Strategy will outline proposed improvements and new land transport projects. The development of strategies for Cycleway and Pedestrian networks and for Travel Demand Management are nearing completion.

Analysis of the roading network requires consultation with stakeholders and residents. It is expected that the Strategy will be completed in 2011.

1.3 Demand analysis

1.3.1 Demand Forecast Overview

The effective management of assets must attempt to satisfy demand and promote optimum use, to ensure present and future returns on the funds invested. Demand management and growth forecasting have particular significance for roading assets because the majority of assets are expected to be maintained for a significant period of time. Change in use and the required level of service through increased or decreased demand, technological advancement or funding restriction is inevitable. Demand management involves providing a level of service, standard or capacity appropriate to current and future demand.

Although working as a relatively stable transportation network for some years, the construction of the Transmission Gully section of State Highway, construction commencing in 2016, partially running through the area, will have a significant effect on traffic patterns on PCC roads.

The assessment of traffic demand prior to the opening of Transmission Gully is relatively straightforward, as it is based on existing patterns of road usage adapted to projected increases in population and development of housing areas in the area. A rigorous assessment of traffic demand after the opening of Transmission Gully has been carried out by NZTA, and this assessment has been adopted in this demand forecast, as detailed in Table 4 below.

1.3.2 Population Growth

Population growth is a useful indicator of potential traffic growth. Specific changes in population or demographics that need to be monitored due to their influence on traffic demand are total growth (for effects on the overall network, particularly arterials), zonal growth (for effects on localised areas), and age distribution. Age distribution is important since an increase in the 5-20 year range could possibly result in increased peak traffic demand in some zones, particularly near educational institutions. A predominately elderly population may reduce traffic demand in an extreme case where a large percentage of people may be unable to drive.

Statistics New Zealand (SNZ) prepares a summary of population projections as an output from each five yearly national census. SNZ projections are based on the scenario of medium fertility, medium mortality and medium migration rates. They are not exact forecasts but are a measure of future population change by applying such assumptions over the entire projection period.

The last decade has seen little growth in the City's population and the medium projection is for the trend of minimal growth to continue over the next two decades.

Table 2 summarises the projected Porirua City populations and households from 2012 to 2022. The SNZ Medium series have been used, for 'general planning' purposes, for the 2012-22 LTP period, as shown:

Population Projection for 2012-22 LTP Period - Porirua City		
2012	2016	2022
52,940	53,900	54,820
Households Projection for 2012-22 LTP Period - Porirua City		
17,680	18,400	19,300

Table 2 - Population and Household projections

The population growth, shown above, is relatively modest. The effects on Porirua roads of the opening of the Transmission Gully motorway will have a much greater effect on traffic volumes and patterns than modest population growth. This is demonstrated in the traffic demand figures in Section 1.3.

The effect of traffic growth in new subdivisions is effectively accounted for at the time of subdivision through planning control. The Code of Practice relating to the design and construction of subdivisions requires all predictable traffic demand to be accommodated.

Although population growth projections are important in traffic demand estimations, changes in social patterns may have a more significant effect. Such change is readily measured through annual traffic counting and public surveys.

Population growth and subdivision effects have been taken into account in the overall projection of traffic demand in Porirua.

1.3.3 Changes in Social Patterns

Changes in social patterns can also have a significant effect on traffic demand. Whilst population change may indicate growth in an area, it may not necessarily reflect any appreciable increase in traffic.

Changes in social patterns are measured through surveys, including customer satisfaction surveys, and direct counting of actual traffic volumes.

Traffic surveys are carried out by Porirua City Council. The frequency of traffic counts are as per the following schedule, shown in Table 3 below.

Road Hierarchy	Frequency of Traffic Counts
Primary arterials and other strategic routes	Six monthly
Distributors, Collectors	Annually
All other roads excluding some minor cul-de-sacs	Five yearly

Table 3 - Frequency of traffic counts on Council's roading network

1.3.4 Industrial and Commercial Growth

Commercial and heavy vehicle movements have a significant effect on the integrity of roads and are a primary consideration in the design of pavement strength and road surfacing. Industry in Porirua is currently experiencing growth and this is expected to continue at a significant rate, anticipated to be prompted by the improved regional access provided by the construction of the Transmission Gully motorway. This anticipated growth has been incorporated into the traffic modelling figures shown in Section 1.3.

Prospective industrial or commercial development is of interest, due to the potential effects on the roading network. Initiatives to ensure that the impact of these activities on existing infrastructure is minimised or controlled are:

- zoning of land to ensure that activities are appropriate to how the land is able to be serviced and the capacity of existing services
- control of activities through the Resource Consent process
- study of the effects of existing land use and the capacity of the infrastructure to meet its needs.

The projected changes in commercial and industrial use in Porirua have been taken into account in the overall demand calculations for Porirua transport.

High Productivity Motor Vehicles

The government is introducing a new system for allowing 'High Productivity Motor Vehicles' (HPMVs) on the New Zealand Roding network. HPMVs are normally slightly heavier (they may be around 50 tonnes rather than the normal limit of 44 tonnes) or slightly longer than current limits to allow repeated loads to be carried on specific routes. The Council is liaising with NZTA and local hauliers about this system, and is assessing the impact HPMVs will have on roading pavements and structures.

1.3.5 District Plan Effects

Zone changes influence the way land is used and similarly affects utilisation of the road network. Zone changes mainly occur in areas of undeveloped or under utilised land, predominantly rural land.

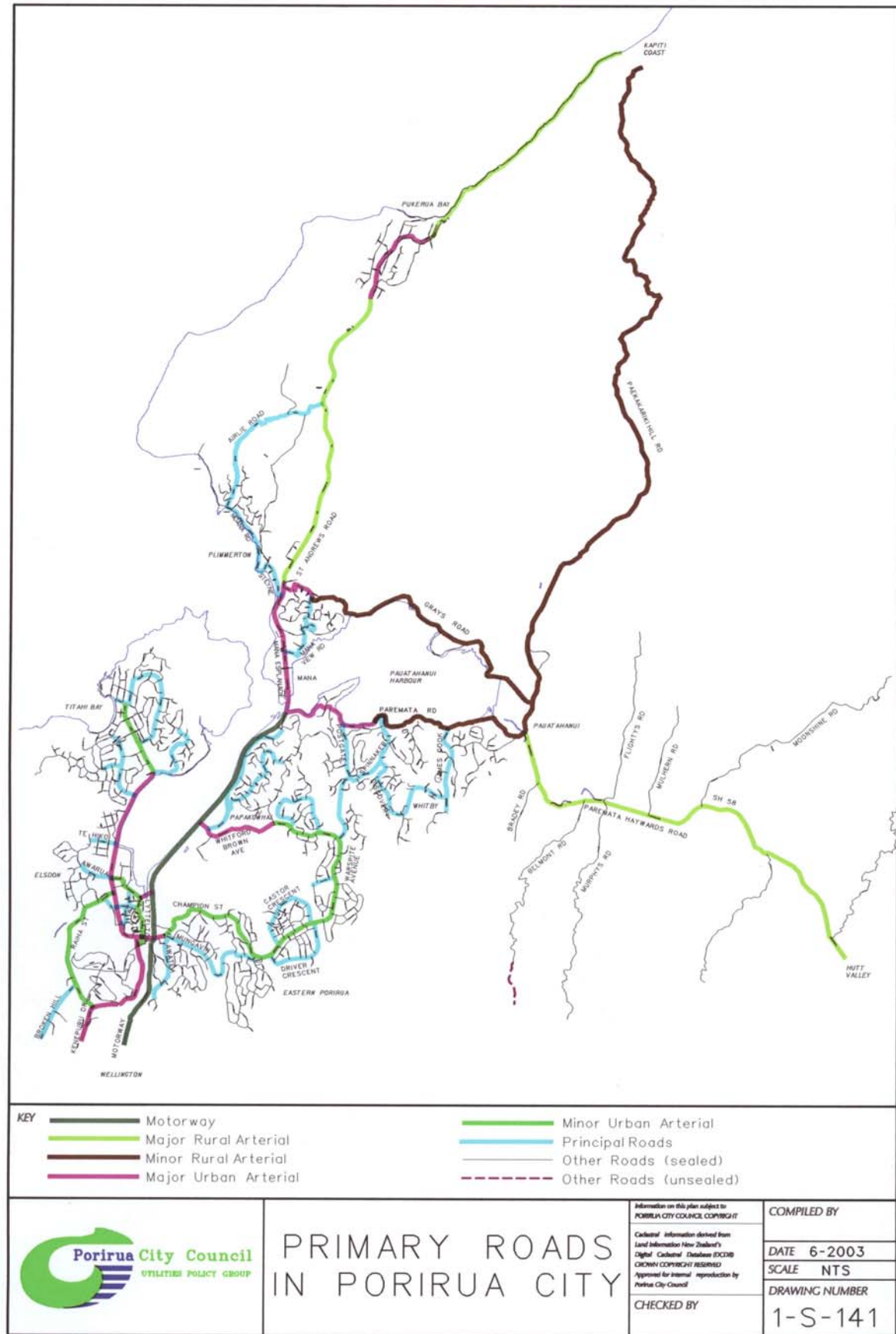


Figure 2 - Council hierarchy of roads

Initiatives taken to cater for future growth in these areas include the design and implementation of minimum road widths, during the reconstruction or new construction of roading assets. These aspects are captured within the re-zoning application processes, and are considered by Council in relation to the long-term Porirua Development Plan. Comments on zone changes are provided by the Roding department, to ensure the long-term integrity of the network.

1.3.6 Demand Management

The Council's Demand Management Strategy promotes the best utilisation of roading assets and reduces the need to physically increase their capacity, strength or performance in the following ways: -

Education

Education of the public can assist with prolonging the economic life of existing assets and reduce the need to provide new assets. Such campaigns may include, discouraging parking on footpaths, encouraging legitimate use of disabled person car parks, and promoting parking in appropriate parking (time) zones.

Promoting Efficient Modes of Transport

Encouraging the use of public transport, car sharing and alternative forms of transport such as cycling can reduce demand on congested roads or at congested intersections, thereby reducing or deferring the need to upgrade assets. These activities are outlined in the Porirua Transportation Strategy document.

Road Hierarchy/Traffic Management

Establishing a road hierarchy system and managing traffic flow allows demand to be managed through a network that provides; efficient routes, confines major negative effects (particularly noise) to specific routes and allows growth on individual streets to occur in a more predictable manner.

The Council's road hierarchy system is illustrated on the maps on Figure 2 - Council hierarchy of roads.

The use of traffic calming and signage for route identification are other strategies used to control traffic demand. Traffic calming reduces traffic speed appropriately for the surrounding environment, and discourages higher volumes and congestion by through traffic. Calming is used primarily in areas such as the CBD. Signage assists drivers with route identification and also encourages traffic to follow a more appropriate and direct route to its destinations.

Installation of roundabouts and traffic signals on primary routes are also methods used to control the flow of traffic and ensure efficiency of the route by minimising delay.

1.3.7 Oil Price

There is a potential for higher oil prices to lower demand for road use, and increase demand for public transport use. The Council, in association with Greater Wellington Regional Council, will monitor this possible change in demand, and form funding and implementation strategies to address this issue.

1.3.8 Transmission Gully Motorway

Figure 3 - Overview of the preferred route of Transmission Gully shows an overview of the preferred route of Transmission Gully, whilst Figure 4 - Overview of the potential Kenepuru interchange and Figure 5 show the locations and configurations of intersections and link-roads at Kenepuru and at the James Cook interchange.

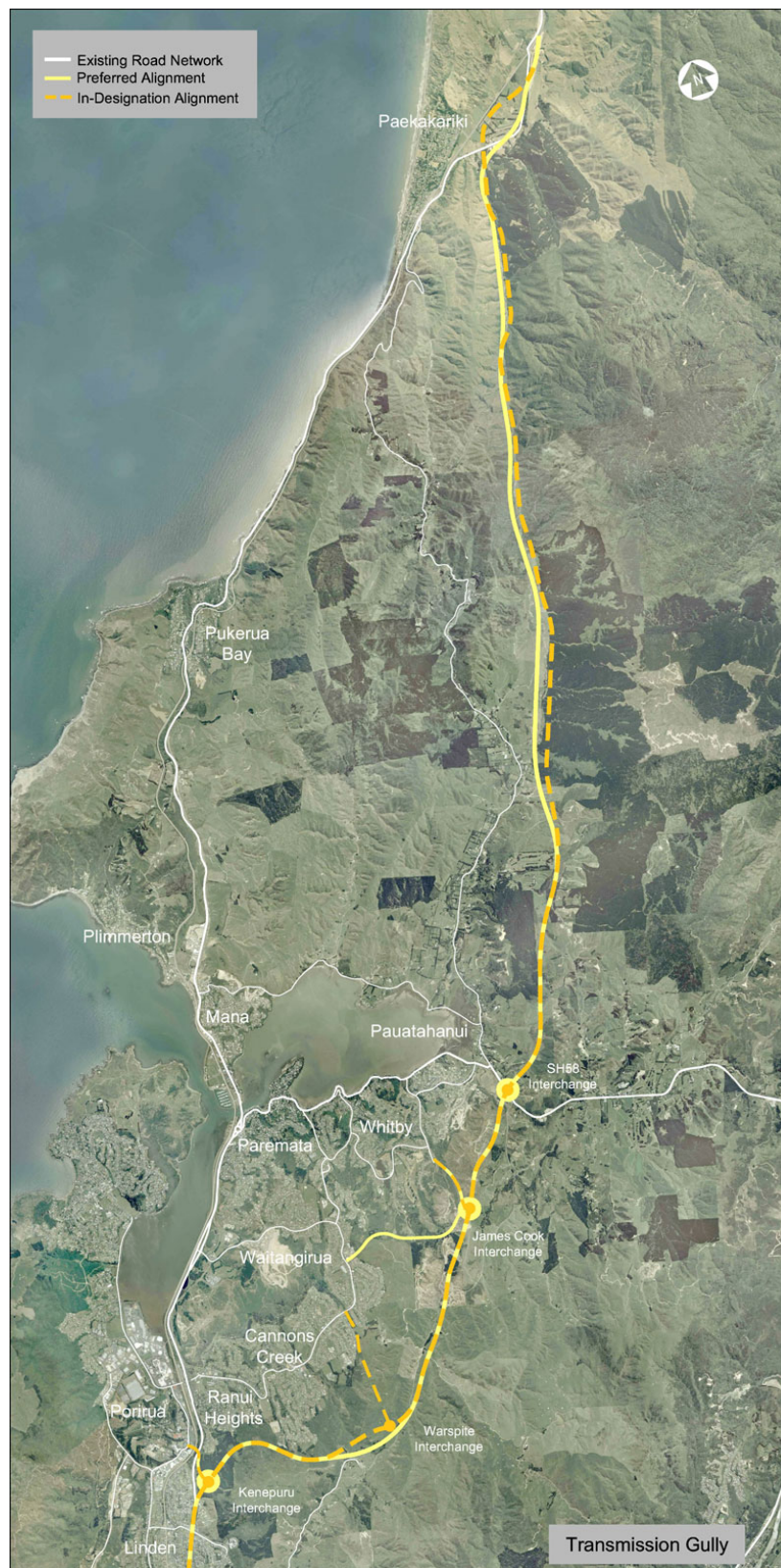


Figure 3 - Overview of the preferred route of Transmission Gully

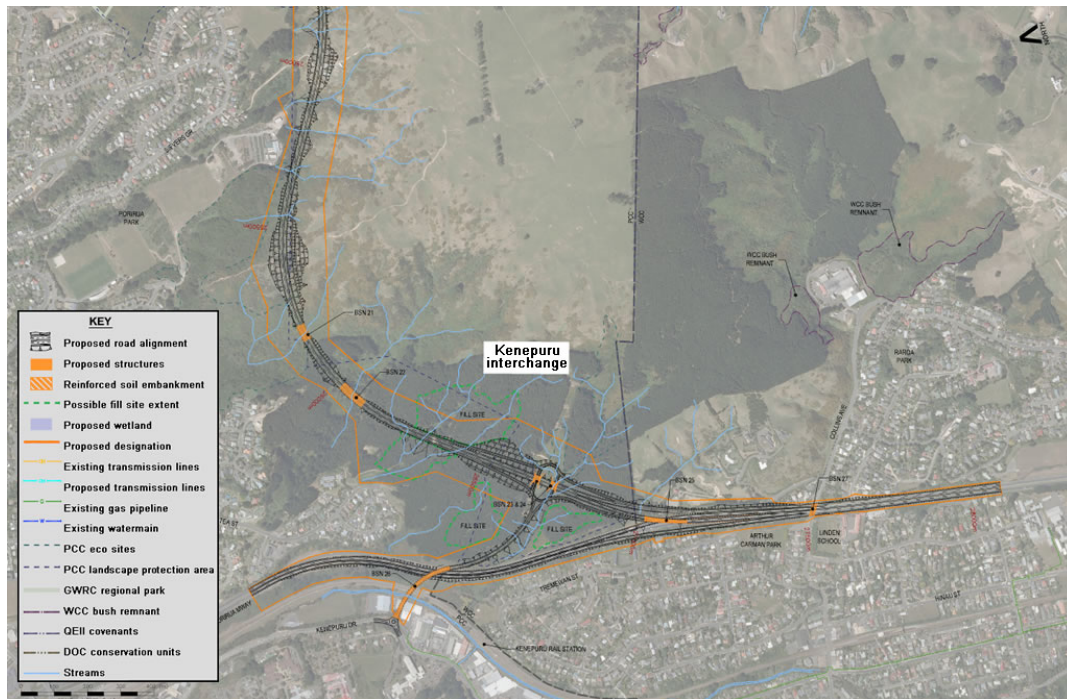


Figure 4 - Overview of the potential Kenepuru interchange

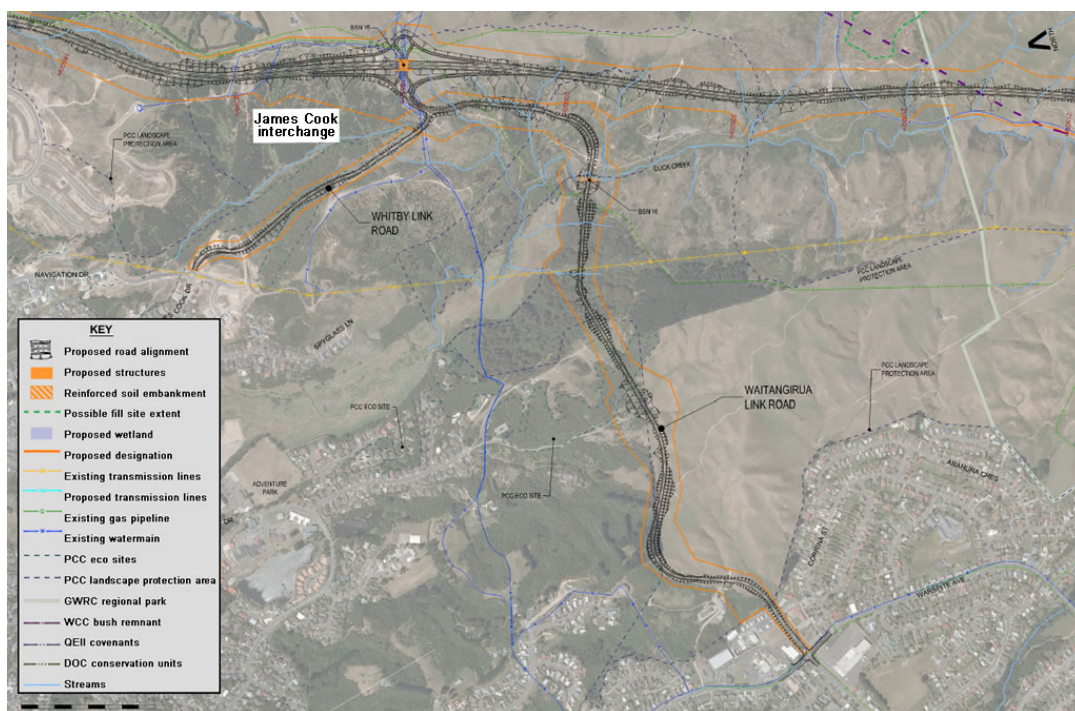


Figure 5 - Overview of the potential James Cook interchange and Whitby and Waitangirua Link Roads

It should be noted that the 'Kenepuru Link' shown in Figure 4 will be State Highway. The Whitby and Waitangirua link roads are intended to be local rural arterial roads, built by the time that the Transmission Gully Motorway opens. The funding of the construction of these link roads is an item presently a point of discussion between NZTA and Council.

The NZTA Transmission Gully project team have produced projections of future traffic flows, as a result of the construction of the Transmission Gully project. These projections were based on GWRC traffic models, and are the most likely to give 'best fit' projections.

It is anticipated that the Transmission Gully project will enhance access to, and around, Porirua, and will have significant positive effects on economic growth in the Porirua area.

Traffic demand, incorporating data from NZTA's traffic modelling of the effects of Transmission Gully are shown in the 'Overall Projected Demand on the Roding Network' section.

1.3.9 Overall Projected Demand on the Roding Network

The following traffic flow estimations have been produced taking into account: -

- NZTA's traffic modelling for the Transmission Gully Motorway.
- Council's estimations of population growth.

Traffic demand on the roading network is as shown in Table 4. The figures given for the year 2026 include for traffic flows produced after the opening of the Transmission Gully Motorway. It should be noted that capacity analysis (see Section 3.3.1) has only been conducted on key arterials and nodes on the network.

Road	2006 baseline AADT	2026 Estimate	2031 Estimate	2041 Estimate	Carriage way Capacity
Prosser Street at Intsct with Titahi Bay Road	5,918	6,818	7,218	7,418	30,000
Raiha Street at Intsct with Upper Main Drive	5,683	6,883	7,383	7,883	30,000
Broken Hill at Intsct of Raiha Street	4,690	6,590	6,890	7,090	30,000
Raiha Street North of Broken Hill Intsct	7,136	10,136	10,136	11,136	30,000
Main Road South of Raiha Street Intsct	14,928	14,928	15,928	16,928	30,000
Kenepuru Drive South of Bowland	16,043	24,043	25,043	25,043	30,000
Kenepuru Drive North of Bowland	17,850	17,850	17,850	18,850	30,000
Lyttelton Avenue East of Kenepuru Drive Intsct	1,230	2,390	2,650	2,930	30,000
Kenepuru Drive South of Titahi Bay Road Intsct	24,049	22,049	22,049	23,049	30,000
Champion Street North of Mungavin Ave Intsct	6,681	7,021	7,541	7,631	30,000
Mungavin Avenue East of Champion St Intsct	16,379	18,379	18,379	18,379	30,000
Mungavin Avenue West of Champion St Intsct	24,853	26,853	27,853	27,853	60,000
Titahi Bay Road on Mungavin Overbridge	39,953	39,953	39,953	39,953	60,000
Titahi Bay Road West of Kenepuru Intsct	24,376	32,376	33,376	33,376	60,000
Titahi Bay Road Sth of Lyttelton Ave Traffic Lights	15,955	16,955	16,955	16,955	60,000
Titahi Bay Road South of Prosser St Intsct	15,117	18,117	18,117	18,117	60,000
Titahi Bay Road Adjacent To Elsdon Park	17,405	20,405	21,405	21,405	30,000
Titahi Bay Road North of Te Hiko St Lights	18,205	19,205	20,205	20,205	30,000
Awarua Street East of Titahi Bay Road Intsct	6,195	7,050	7,150	6,950	30,000
Semple Street East of Titahi Bay Road Intsct	8,706	9,706	11,106	11,106	30,000
Parumoana Street West of The Ramp	12,776	12,476	12,576	12,376	30,000
Parumoana Street South of The Ramp	15,514	16,514	17,514	17,514	30,000
Lyttelton Avenue North of Walton Leigh Avenue	6,952	8,532	8,932	9,232	30,000
Walton Leigh Avenue North of Titahi Bay Road	11,245	12,955	13,155	13,155	30,000
Omapere St, Warspite to Postgate	7,714	6,814	6,914	6,914	30,000
Postgate Dr, Bosun tce to SH58	6,728	4,728	4,728	4,628	30,000
Spinnaker Dr, Bosun Tce to SH58	2,368	2,288	2,308	2,288	30,000
Discovery Dr, Spinnaker to James Cook	5,766	6,576	6,606	6,646	30,000
James Cook Dr, Discovery to Joseph Banks	3,428	1,778	1,778	1,778	30,000
James Cook Dr, Joseph Banks to SH58	3,522	2,092	2,102	2,092	30,000
Joseph Banks Dr, Navigation Dr to SH58	3,090	3,368	3,448	3,488	30,000
Grays Rd, SH1 to Pope St	6,358	3,068	3,148	3,188	30,000
Paekakariki Hill Rd, SH1 to Grays	2,252	1,102	1,112	1,132	30,000
Airlie Rd	1,497	1,537	1,567	1,657	30,000
Moana Rd	2,657	2,837	2,867	2,877	30,000
Oak Avenue - zone	150	150	150	150	30,000
Tirowhanga Rd - zone	320	230	230	230	30,000
Eskdale Rd, West of Lauderdale	580	580	580	580	30,000
Eskdale Rd, East of Lauderdale	517	337	337	347	30,000
Tweed Rd, South of Halladale -without zone	140	150	150	150	30,000
Papakowhai Rd, South of Tweed -without zone	140	150	150	150	30,000
Papakowhai Rd, North of Tweed	290	120	120	130	30,000

Table 4 – Estimated traffic demand on the roading network

Please note section 3.2 regarding the theoretical capacity of the roading network, particularly at intersections, including Council's present work to assess more accurately capacities of the network, and work to address areas where demand will exceed capacity in the future.

1.4 Desired community outcomes and levels of service

1.4.1 Rationale for Council Involvement

The Council is involved in transport asset management as a direct consequence of its role as owner of public land for roading purposes. The Council has a statutory role and powers as a Road Controlling Authority and has direct accountability to residents for local transport networks.

The transport network plays a critical role in the Council's services to the community. A safe and effective transport network is an important element in achieving the goals of the Strategic Plan. The transport activity provides for the maintenance and improvement of roads, bridges, footpaths, access ways, street-lighting, graffiti control, and provision for patrolling of time-restricted parking spaces.

1.4.2 Desired Community Outcomes

Transport and Roding functions of Council contribute to the following Community Outcomes, as outlined in the Annual Plan, as shown in Table 5: -

	Transport	Subsidised Roding
Multicultural and creative		
Strong families young and old		
Active and healthy	Yes	
Learning for life		
Prosperous		
A safe city	Yes	Yes
Sustainably designed and built	Yes	Yes
A valued and natural environment		Yes
Well connected and on the move	Yes	Yes

Table 5 - Council's desired community outcomes for transport and subsidised roading activities

1.4.3 Levels of Service and Targets

The Council's transport activity involves the maintenance of roads and bridges to ensure that the movement of vehicles is safe and efficient. It also includes major drainage control, emergency work, renewal of footpaths, safety projects and preventative maintenance.

These desired outcomes are included in the Annual Plan outputs and key performance indicators as outlined below. All targets are reviewed against industry best practice. The targets set in this plan are largely the same as those in the most recent past versions of this plan, to allow for consistency of measurement between Plans.

The desired community outcome of "safe and efficient transport..." is measured in terms of efficiency and public satisfaction by specific measures for areas of the transport network, as detailed below. All measures are relevant to achievement of "economic growth and employment. Measure 10 – 'Percentage of restricted City Centre card parks available' is especially relevant to the economic health of the City Centre for businesses, employees and visitors.

What service is Council going to provide?	How will Council measure the service it provides?						
	Measure	Actual	Target				Source
		2010/ 11	2011/ 12	2012/ 13	2013/ 14		
Roads and bridges							
Roads and bridges are adequate for the movement of all vehicles in a safe and efficient manner.	1. Percentage of residents satisfied with the road network	76%	80%	80%	80%	NRB Survey	
	2. Number of maintenance requests per 1000 households	New measure	80%	80%	80%	Council Database	
	3. Percentage of roads passable and open ¹ to traffic throughout the year	99.9%	99%	99%	99%	Maintenance Contractors Reports	
	4. Ride quality as measured by "Smooth Travel Exposure" for sealed roads	New measure	Hold rating	Hold rating	Hold rating	Consultant Report	
	5. Response Time to fix reported potholes for routine sites	5 days	5 days	5 days	5 days	Council Call Centre monthly report	
	6. Performance by roading maintenance contractors	New measure	75%	75%	75%	Contractors Performance Monitoring Matrix	
Road Safety program.	7. Number of Community Road Safety Education Projects ³ developed and run	7	5	5	5	Management Report	
	8. Participants in road safety projects are satisfied with the program	95%	85%	85%	85%	Project Participant Evaluations	
	9. Number of reported crashes involving an injury across the city per year	100	90	90	90	NZTA Report	
Pedestrian, cycle and transport facilities							
Networks of footpaths and cycle ways that enable safe movement of pedestrians and cyclists.	10. Distance of footpath renewals as per the roading maintenance contract	New measure	100%	100%	100%	Contractors Reports	
	11. Percentage of residents satisfied with footpaths and walkways	78%	80%	85%	85%	NRB Survey	
City centre and suburban shopper car parking							
Parking available for shoppers in the City Centre.	12. Percentage of restricted City Centre car parks available. ⁴	25%	15%	15%	15%	Annual Carpark Survey	
<div>1 'Passable and open' means at least one lane open, except where an authorised road closure is in place or maintenance activities are required.</div> <div>2 Smooth Travel Exposure (STE) is a measure of the percentage of vehicles travelling on roads with a roughness of less than 150 NAASRA (National Association of Australian State Road Authorities) counts per km.</div> <div>3 A 'Road Safety Education Project' is a programme developed to address key road safety issues in response to areas of concern as identified by the Land Transport Safety Authority.</div> <div>4 Availability is measured as the proportion of spaces that are unoccupied during peak hours on each day, averaged over a six- day period.</div>							

Table 6 - Current and Planned and Key Performance Indicators

1.4.4 Emergency Response

In case of any emergency event, the Council has to ensure that all of its assets are able to provide safety to their users. It is accepted, however, that some of these assets may function at a reduced level during and after an emergency.

The Council's emergency response for its transport network is contained in the 'Utilities Major Emergency Response Plan,' DRAFT April 2012.

1.5 Negative effects

The transport asset in Porirua does have some negative effects on the community and environment. These are: -

- Air quality effects from vehicle emissions
- Adverse effects from surface water run-off
- Noise generation from road vehicles
- Crashes on the transport network.

The above negative effects have both an economic and wellbeing cost to the community. The Strategy described in section 1.2 outlines the push towards active transport (walking and cycling) and the use of public transport. These initiatives will lessen the negative effects outlined above, but will not eliminate them.

The Council will address the negative effects of the transport asset in the following ways:

1.5.1 Air Quality

Both NZTA and Greater Wellington Regional Council (GWRC) have conducted air quality monitoring as follows: -

NZTA

Passive monitoring of NO₂ (as an indicator of traffic emission pollution) near State Highways has been carried out nationally by NZTA. As part of this study, monitoring of NO₂ has been carried out on Mungavin Avenue, around 30m from the Mungavin Roundabout, between 2007 and 2009. The results of the monitoring showed between 17 and 20 microgrammes per m³ of NO₂ in the air during summer periods, and roughly half of those levels in wintertime periods (Ambient air quality (nitrogen dioxide) monitoring network report 2007-2009. NZTA, New Zealand). These values reflect well against the WHO guideline levels of 40 microgrammes per m³. As these measurements were taken at a location that is likely to show the highest (or near the highest) NO₂ concentration in the Porirua area, it can be assumed that the air pollution in and around the remainder of the Porirua roading network is well below levels that would cause concern.

GWRC

GWRC have also completed air quality monitoring. However, this monitoring has centred on Linden (at the north end of the Wellington City Council area), and has been focussed on gathering information relating to air pollutants from household activities (such as domestic woodburners). Whilst no road-side air quality monitoring has been undertaken by GWRC, air pollution levels measured at Linden Park are well within national standards and guidelines for air quality.

The Porirua City Council will continue to assess the results of the air quality monitoring studies, and address concerns if pollutant levels rose to concerning levels.

1.5.2 Effects From Surface Water Run-Off

Pollution from road water run-off includes things such as; fuels, additives, oil, grease and brake and tyre residues. These pollutants contain a variety of toxic components, including heavy

metals and organic compounds. Research indicates that environments such as closed harbours and estuaries (the Porirua Harbour and Pauatahanui Inlet) are most susceptible to adverse effects from road runoff. Although it is not possible to specifically relate the cause of harbour pollution to roading activities (as other activities in Porirua also create pollutants), it is clear that control of road-related pollutants is a priority.

The management of the Harbour is an issue of key importance to Porirua City Council. The Council has been liaising with GWRC to monitor the pollution levels in the Harbour. The Harbour is currently showing elevated levels of some of the above contaminants and the Council is working to reduce contamination levels.

Road water run-off contaminants are managed by regular road sweeping and sump (drainage sumps at the sides of the road) emptying. The road sweeping and sump emptying tasks are detailed in Section 3.5 of this Plan.

1.5.3 Noise Generation from Road Vehicles

Noise is generated from road vehicles as a result of the interaction between the road surface and vehicle tyres. In general terms, chipseal surfaces are 'noisier' than smoother asphalt surfaces. The amount of noise generated from different types of surface is explained in more detail in section 2.3 (regarding Council's strategy for where asphalt and chipseal are placed as road surfaces). (See also NZTA Transport Noise website: <http://acoustics.nzta.govt.nz/management/low-noise-road-surfaces> .)

As noise from roads cannot be entirely eliminated, it is to be minimised through the use of asphalt surfaces on roads where the traffic demand is above 10,000 AADT.

1.5.4 Crashes on the Transport Network

Crashes on the transport network are detailed in section 3.4. The Council's work to improve the transport network is largely driven by efforts to improve the safety of the physical road network alongside community education activities. The targets for road safety are provided in section 1.4.

The Council is not able to eliminate crashes on the road network. However, by following road safety strategies the Council will be able to minimise the negative effects of crashes on the transport network.

1.6 Key issues to take forward from Asset Management Strategy and Planning

Key issue	When?
Performance against targets to be monitored.	Annually
Updates are required from NZTA (for air quality monitoring) and GWRC (for harbour water quality) for monitoring against environmental limits.	Annually
Demand for the roading network is to be monitored against network capacity.	Triennially

2 Whole-life Cost Approach

2.1 Providing Long-term Value for Money

This Plan seeks to ensure the maximum whole-of-life value from the Council's roading asset. This is achieved through the use of maintenance strategies understanding the condition of the roading asset, and planning an appropriate maintenance regime. Key to this approach is the quality and timing of maintenance works, as detailed within the following section.

2.2 Asset Valuation

2.2.1 Objective

The objective of the transport asset valuation is to provide appropriate information for financial reporting. The values derived affect the costs assigned to depreciation of the roading asset, and are key in calculating what budgets are required for the long-term maintenance of the asset.

2.2.2 The Basis of Valuation

An asset valuation of the transport network was carried out by Opus International Consultants in July 2011. The resulting Valuation Report, summarised in Table 8 describes the valuation methodology and details the supporting data used in its preparation. The asset valuations are summarised in Table 7.

The valuation has been completed in accordance with the following standards and guidelines:

1. ICANZ Financial Standard Number 3 (FRS-3)
2. NZIAS 16 Property, Plant and Equipment
3. NZ Property Institute's Valuation Standard 3 (VS-3).
4. NAMS Group Infrastructure Asset Valuation & Depreciation Guidelines

Depreciation Basis and Rates	Years
Basecourse	40 – 100
Top surface (seal)	14 – 18
Footpaths	60
Kerb and Channel	50
Signs	0 – 15
Street and Traffic Lights	5 – 30
Bridges	70 - 100

Table 7 - Depreciation basis and rates

2.2.3 Asset Valuation

The valuation treatment for assets is set out as follows: -

Asset Type	Service Area	Basis of Valuation *
<i>Infrastructure Assets</i>	Land	Market value
	Buildings	DRC
	Plant	DRC
	Reticulation	ODRC
	Road formation	RC
	Road pavement and subgrade	ODRC
	Traffic facilities	ODRC
	Bridges	ODRC
<i>Ordinary Fixed Assets</i>	Land	Market value
	Buildings	Market value
	Plant (other)	Market value
*DRC = Depreciated Replacement Cost, ODRC = Optimised Depreciated Replacement Cost RC Replacement Cost		

Table 8 - Valuation Basis by Asset Type

Asset	Gross Optimised Replacement Cost (\$)		Optimised Depreciated Replacement Cost (\$)		Annual Depreciation (\$)	
	RAMM 2009	RAMM 2011	RAMM 2009	RAMM 2011	RAMM 2009	RAMM 2011
Bridges & Large Culverts	\$14,317,000	\$15,321,043	\$12,304,000	\$12,874,083	\$143,000	\$153,292
Drainage	\$2,170,000	\$5,760,340	\$1,085,000	\$2,880,188	\$31,000	\$100,777
Footpath & Accessways	\$26,842,000	\$29,211,878	\$13,446,000	\$14,631,452	\$425,000	\$471,343
Markings	N/A	N/A	N/A	N/A	N/A	N/A
Minor Structures	\$1,719,000	\$1,855,719	\$760,000	\$779,970	\$35,000	\$38,521
Railings	\$25,000	\$34,672	\$2,000	\$10,288	\$1,000	\$1,566
Surface Water Channel	19,464,000	\$24,403,629	\$9,732,000	\$12,201,817	\$389,000	\$488,073
Signs	\$1,771,000	\$1,297,514	\$885,000	\$648,761	\$118,000	\$100,332
Street Lighting	\$8,644,000	\$8,722,499	\$3,788,000	\$3,652,705	\$288,000	\$290,716
Traffic Signals (Controller)	\$114,000	\$122,443	\$57,000	\$61,221	\$8,000	\$8,163
Formation	\$49,663,000	\$54,119,638	\$49,663,000	54,119,638	\$0	\$0
Basecourse Rural	\$3,536,000	\$3,827,668	\$1,768,000	\$1,913,834	\$41,000	\$44,937
Basecourse Urban	\$19,330,000	\$21,140,204	\$9,665,000	\$10,570,102	\$235,000	\$257,865
Sub-base	\$22,981,000	\$25,207,786	\$22,981,000	\$25,207,756	\$0	\$0
Surface Structure	\$17,625,000	\$18,026,309	\$7,988,000	\$6,495,443	\$1,051,000	\$1,050,954
Unsealed Basecourse	\$9,000	\$9,639	\$2,000	\$2,410	\$1,000	\$1,205
Carparks	\$1,170,000	\$1,261,597	\$815,000	\$876,182	\$18,000	\$19,163
Pedestrian Crossings & Underpasses, Miscellaneous	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	\$189,380,000	\$210,322,578	\$134,941,000	\$146,925,849	\$2,784,000	\$3,026,907

Table 9 - Road asset valuation

In addition to the above, it should be noted that the land value of the roading land in Porirua has been valued, in 2011, at \$478,698,000.

2.3 Pavement Maintenance

2.3.1 Brief Description of the Pavement Structure

The road structure normally consists of a 'surface' (chipseal, asphalt or slurry seal), the 'pavement' (crushed stone compacted into hard layers, known as road base and sub-base) and the 'formation' (the rock or soil beneath the sub base).

After a number of years, the pavement layers may become more compacted (from the continual load exerted by vehicles running over it) and can become relatively strong and hard. Conversely, if the pavement layer becomes saturated with water, it can become soft leading to failures in the road surface. It is important to ensure that the pavement is well drained, and is 'sealed' from water ingress. This 'seal' normally comes from chipseal or asphalt layers. A pavement is typically designed to last 25 years, however, well constructed and drained pavements are often found to last 50 to 100 years. Chipseal is expected to last 13-20 years and an asphalt surface is expected to last 15-25 years. This means that the overlying surface may be renewed a number of times before the underlying pavement requires renewal.

Changing drainage patterns and traffic loading over time will affect the underlying formation and pavement layers. In such cases the road base may become weak/soft causing the overlying road surfacings to flex and fail. When this happens potholes are created and road surfaces crack, leading to high maintenance costs.

Additionally, the pavement layer of a road can fail locally (in small areas). Local failure can be due to a number of reasons including; poor original compaction, local under-strength materials in the pavement, or irregularities in the pavement caused by trenching in the area.

Surfacing failure may also be caused from the top surface simply becoming 'worn out' (very smooth or polished and slippery) or cracked from traffic use. As bitumen becomes older, it can crack, allowing water into the pavement below; this can lead to pavement failure if the surface is not renewed.

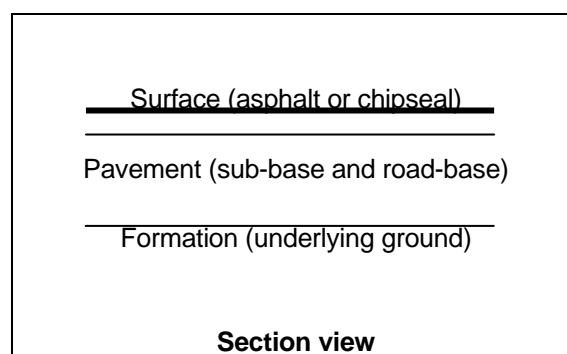


Figure 6 - Section view of the road pavement

2.3.2 Maintenance Strategy for Pavements

Most of the Council's roads were constructed as part of the government housing programme in the 1960s and 1970s and are well within their life expectancy. The maintenance strategy followed by the Council is to repair sections of failed pavement in association with modifying the contributing cause of failure (changing drainage patterns adjacent to the layer or by resealing the road surface) as and when failures occur. The Council will continue with this strategy until more widespread failures of the pavement require a larger area of treatment. The expected failure of the pavement layer is not expected to occur 'en mass' as soon as the pavement

reaches an age of, say, 80 years old. Because of this, it is considered acceptable to continue with a strategy of monitoring and replacing sections of the pavement layer as and when issues become apparent. These works are not anticipated to be reactive in nature, as the monitoring of the pavement will allow longer term planning prior to any required works. In the very long term (starting in around 20 - 40 years), the rate of pavement failure, and the cost of pavement renewals, may be expected to increase.

In the areas where small-area dig-outs are necessary to replace pavements, and dependent on the scale (size) of the dig-out, it can be appropriate and cost effective to replace the road surface with asphalt.

It is recommended that the Council continue with the strategy of local 'dig-outs' and repairs of small areas of failed pavement, where they exist and consider area treatments (where larger areas are dug out and replaced) where this is the "best whole of life maintenance option".

2.3.3 Strategy for Placement of Asphalt and Chipseal

The following is a summary of key technical differences between the cost and placement of chipseal and asphalt surfaces.

<u>Chipseal</u>	<u>Asphalt</u>
Life expectancy = 13 – 20 ⁺⁺ years	Life expectancy = 15 – 25 ⁺⁺ years
Total cost /m ² to PCC of placement = \$3.30-3.95*	Total cost /m ² to PCC of placement = \$29-32* (if no subsidy)
Quicker, but 'Messier' application	Quieter (by around 3 decibels)
Noisier	Smoother surface (for cyclists)
	'Cleaner' application
	Often preferred by the community
	Asphalt is required in some locations, such as CDB, tight turn and industrial areas.

* Figures obtained from current roading contract.

⁺⁺ Current industry practice.

As a result of the above issues, Council resolved, most recently on 4 June 2010, to place chipseal on all locations where it was technically feasible, as this provides the best balance of level of service requirement with budget requirements. A map of locations that technically require asphalt is as shown on the mapping in Appendix 3, Section 8.3. All locations that are not marked as requiring asphalt are to be chipsealed.

2.3.4 Strategy for the Maintenance of Unsealed Roads

Unsealed roads (sometimes called 'gravel roads') are those that do not have a sealed (chipseal or asphalt) surface. Presently within the Porirua City Council area, only one rural road – Harris Road – is unsealed. Whilst it remains unsealed, the maintenance strategy is to grade (smooth out the road) periodically to ensure that it meets an acceptable standard. For the longer term, and as more development continues along the road, with the collection of developer contributions, the strategy is to seal the road. This will be carried out once sufficient developer contributions have been made.

2.4 Maintenance Strategy for Roding Structures

Roading structures include the following: -

- Road bridges
- Retaining walls
- Pedestrian underpasses
- Drainage culverts (over 3.2m² in cross-sectional area).

Whilst most Council roading assets have design lives of between 10 and 50 years, roading structures are different in that they are high-value items, and normally have design lives of 100 years. This means that they deserve particular maintenance attention to ensure that they reach their potential life span.

All structures are inspected annually to ensure that long-term deterioration aspects are understood for each structure, and that maintenance interventions are taken at appropriate times. In addition, inspections and repairs are carried out, as required, after events such as crashes which may have affected the structure.

Given the high value and long life-span of structures, it is worthwhile to consider the following aspects when managing a roading structure: -

2.4.1 Inspection for Scour

Screening for scour (river bed action) beneath the structure and affect on foundations is carried out. This aspect is particularly important in view of climate change effects, where more intense rainfall patterns may have significant scour implications. Scour screenings are taken annually on Council roading structures. Scour issues identified as a result are to be carried into maintenance plans or addressed immediately if the issue is severe.

2.4.2 Seismic Screening

The risk of Council's roading structures being affected by an earthquake within their life-span makes it worth ensuring that structures will perform well in a seismic event. Structures constructed after 1975 have been built to 'modern' seismic codes. Older structures have been designed to previous (and less rigorous) codes. It is considered a priority that Council conduct seismic screenings of all roading structures.

2.4.3 Remaining Life Analysis

Some structures can be affected by chemical processes within the concrete of the structure, sometimes termed 'concrete cancer', which is very difficult to treat. Such processes can seriously impact upon the remaining life of a structure. Screening the Council roading structures is important to ascertain what each structure's remaining lifespan is.

2.5 Maintenance Strategy for Other Roding Assets

2.5.1 Footpaths and cyclepaths

Footpaths were constructed alongside, and at the same time, as the roading network. Having lower traffic levels, they are generally expected to last longer than road surfaces, however they do suffer greater deformation and cracking due to softer underlying pavements. In general terms, footpaths are expected to last nominally up to 100 years, with deformed or cracked sections to be repaired as required. For a map of the cyclepath network, see Section 8.2.

2.5.2 Other Transport Assets

Apart from pavements, footpaths and roading structures, the Council's roading assets include the following:-

- Traffic signals
- Road signs
- Road markings
- Street lighting (with power supply systems)
- Drainage systems
- Crash barriers
- Vegetation (on the sides of roads).

All of the above items require 'whole of life' management to ensure that they have appropriate life-spans, and are maintained adequately. Each item has its own maintenance cycle and is maintained accordingly.

2.6 Key issues to take forward from Whole-life Cost Justification

Key issue	When?
Asset valuations to be updated	Triennially
Chipseal vs. asphalt areas to be updated, according to chipseal failures	Annually
Routine structures inspections to include scour screening	Annually
Seismic screening and remaining life of structures studies to be carried out, better informing future Transport AMPs	Within 2011/2012, according to budget availability

3 Lifecycle delivery

3.1 Asset Creation / Acquisition

3.1.1 Initial Asset Creation

New Council roading assets are created regularly, with the construction of small items such as traffic islands, streetlight poles or the installation of road signs. Larger assets, like new roads, are only occasionally created (see network improvements, section 3.6 below). The most common reason for the Council gaining additional roading network is due to new developments. The one exception to this general rule regards the acquisition of former State Highway assets. Development and State Highway acquisition methods are described in more detail below.

Renewals and new capital projects are planned in advance and must gain Council sign-off and a roading subsidy from NZTA prior to implementation. They are normally included within the Council's LTP, and have been subject to public consultation.

3.1.2 Road Asset Acquisition

Developments

The Council's "Code of Land Development and Subdivision Engineering: 2010", the New Zealand Standard for Land Development and Subdivision Engineering NZS 4044: 2004, and the District Plan ensure that all new development complies with the strategies and objectives of the Roding Network.

The Transport Asset Management Plan ensures that new assets are adequately sized and constructed, and that provisions are made for public transport through transport routes and alternative forms of transport such as the construction of cycle ways, footpaths, and pedestrian accessways.

Developers must comply with the above legislation and codes, in order to gain permission to develop. Once developments are complete, the Council has the opportunity to inspect the finished works prior to final acceptance. In this way, the Council acquires new parts of roading network which will meet the required standard. The Council will then maintain the new section of road as part of the roading network.

State Highways (as a result of the Transmission Gully Motorway)

On the completion of the construction of the Transmission Gully Motorway, the existing State Highway 1 (Paekakariki to Linden) and State Highway 58 (Paremata to Pauatahanui interchange) will become local Council roads. These significant sections of road will then become the responsibility of Council to maintain. These factors have been taken into account in the production of the maintenance plans and financial forecasts within this Plan.

3.1.3 Consents

The Council's Transportation Group must apply for resource consents like any other operating individual or organisation in Porirua. According to the nature of the consent, these must be applied for from either the Greater Wellington Regional Council or Porirua City Council.

Two specific resource consents that are currently open for the Council's Transportation Group are: -

Plant or Area	Type of	Consent	Date Issued	Expiry Date	Issuer	Comments
---------------	---------	---------	-------------	-------------	--------	----------

	Consent	Number				
Grays Road	Land Use	24891	12/10/2005	12/10/2040	GWRC	Gravel Extraction
Outer Bridges	Land Use	25050	23/2/2006	23/2/2041	GWRC	Gravel Extraction

Table 10 - Roading resource consents presently open

3.2 Asset Description

This Plan covers all roading assets within the Porirua City boundaries, except State Highways and private roads, which include carriageway, kerb and channel, footpaths, cycle ways, berms, traffic facilities, street-lighting, pedestrian precincts, road reserve amenities and structures - such as bridges and retaining structures.

As at 28 June 2011, Council's roading asset consists of a total length of 243.3km of sealed road and 0.85 km of unsealed roads. The City also has a total of 21 bridges. Three major bridges link the eastern and western suburbs with the State Highway 1 and the remaining 18 bridges have a span of less than 22 metres. Of these 18 bridges, 16 are located in rural areas.

Porirua's street network is dominated by State Highway 1, which runs north-south through the middle of the City, and State Highway 58 which runs east-west, connecting the Hutt Valley with State Highway 1. The City's roading network has been developed on a topography that can be described generally as rolling.

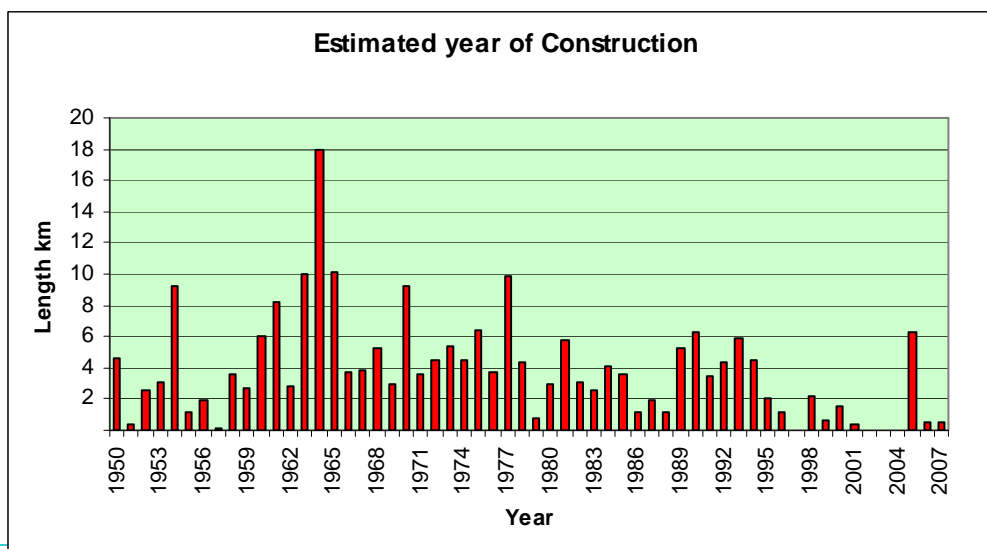
Prior to 1950, few urban areas of the City with the exception of Plimmerton, Pukerua Bay, Paremata and parts of Titahi Bay, were developed. In the 1950s and 1960s a major government housing development took place in Porirua East, Cannons Creek, Waitangirua, Ascot Park, Elsdon and Titahi Bay. In the 1970s, 1980s and 1990s private urban subdivision took place predominantly in Papakowhai, Camborne and Whitby. The result of this development is that over two-thirds of the City's street work has been constructed to modern street standards with lower standards in parts of Plimmerton, Pukerua Bay and Paremata.

The ownership of the majority of the City's rural roads was taken over from the Hutt County Council in 1988. At that time, the roads were mainly low traffic minor rural roads built to historical standards. The two major rural roads are Grays Road and Paekakariki Hill Road. Other rural roads include Belmont Road, Murphy's Road, Flighty's Road, Mulhern's Road, Moonshine Road, Bradey Road, Harris Road, Jones Deviation Road, Airlie Road and a few secondary roads.

Although the 0.85km of unsealed rural roads are currently maintained to an acceptable standard, the option of sealing these remaining roads will be studied and implemented as traffic volumes increase and funds are made available.

Figure 7 - Estimated Year of Construction

An analysis of the age of the roads is shown in Figure 7. There is very little information available on roads constructed before 1950.



3.2.1 Length of Route Types

Figure 8 shows the distribution of roads into arterial, distributor and local roads and service lanes. This diagram shows that 115.8 km (48%) of the network consists of local roads. This is considered typical for an urban local authority.

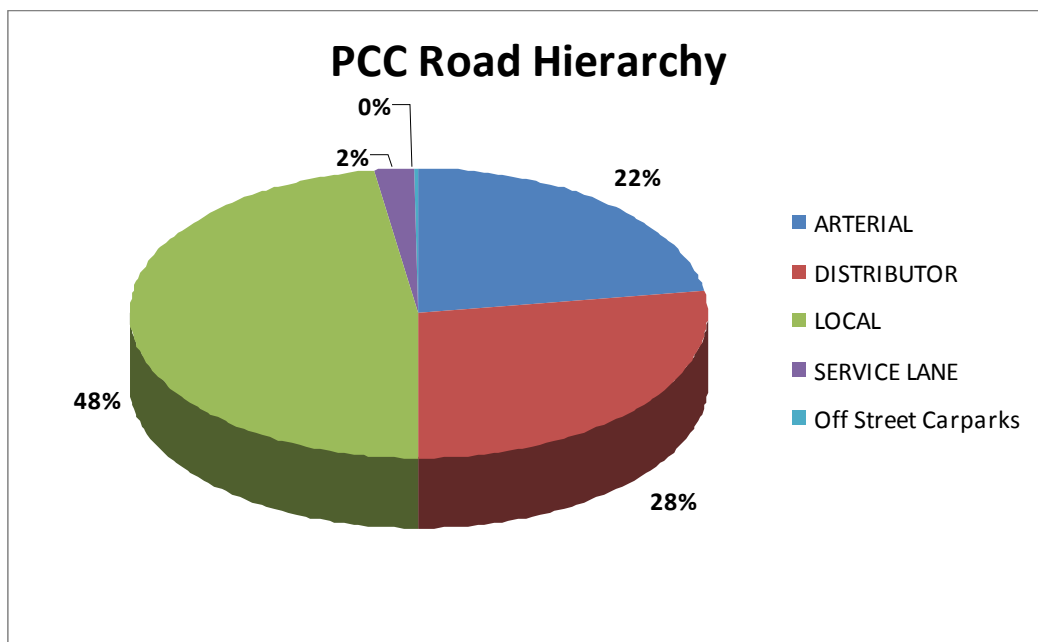


Figure 8 - Proportion of roads by road hierarchy

3.2.2 Surface Types

The network is mainly urban, with approximately 64% chipseal surfaces. Figure 9 shows the length of the distribution of the surface types for the network.

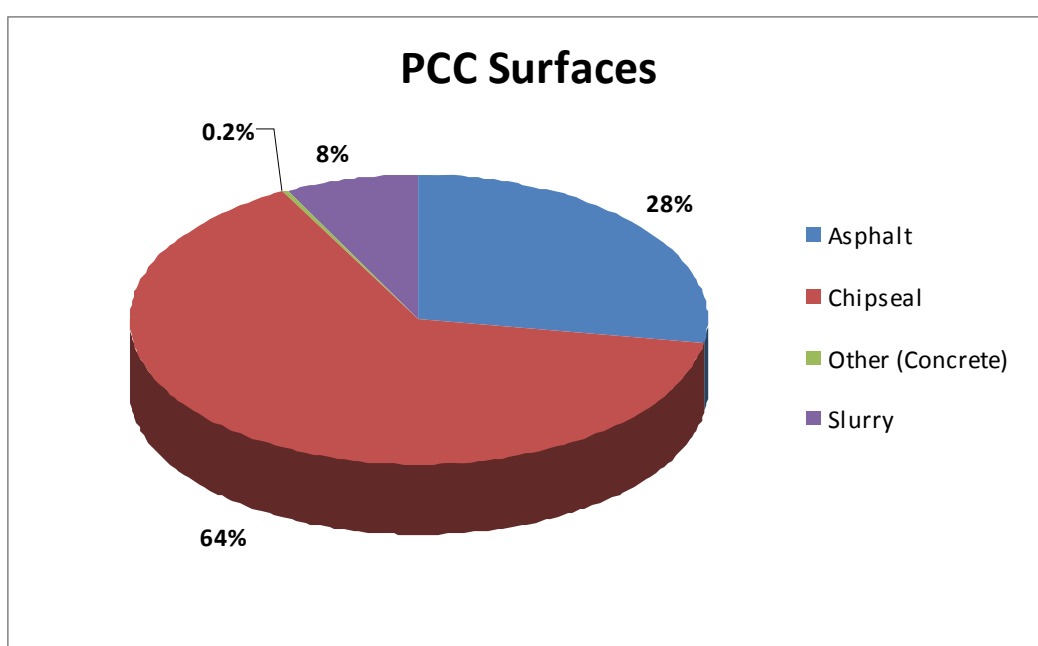


Figure 9 - Surface type Distribution

3.3 Existing Asset Capacity

3.3.1 Existing Capacities

Table 4 in section 1.3 details the expected demand on the roading network. The table shows a theoretical capacity of the individual roads. Caution should be taken when interpreting the theoretical capacity of the roads however, as: -

- The stated capacity assumes that roads are clear of obstructions or traffic features such as pedestrian crossings
- The effect of intersections is not taken into account. Some intersections may become congested with the flows stated above.

Further modelling will be undertaken by Council to assess the traffic demand effects on the roading network, which will be complete by 2012.

3.3.2 Capacity Management

Techniques used to ensure optimum utilisation of the Council's roading assets may include one or more of the following:

Improvements to Under-capacity Assets

A broad range of traffic management measures can be used to increase capacity. Measures include; improved intersection control, construction of slip roads or merge lanes at intersections to prevent unnecessary delay to through traffic, construction or creation (through signage) of bypass routes to spread the load to under-utilised routes, or construction of shorter routes. Such measures may also require improvements to the physical characteristics of assets if they are to accommodate increased use and maintain a satisfactory level of service. Physical improvements may include widening, or straightening to facilitate use by a broader range of vehicles and to reduce travel time through safer or shorter routes.

Reducing Capacity of Under-utilised Assets

In some instances, it may be economic to reduce the capacity of under-utilised assets. An example of this is narrowing low volume carriageways for the provision of car parking or cycle way / footpaths.

Managing Use by Regulation or Legislation

Legislation and regulation can affect the rate of consumption of the road asset, particularly by restricting use and minimising excessive deterioration caused by inappropriate use. Legislative controls may include restriction of vehicle type, weight, dimension, speed, or parking control. Examples of legislative controls currently in place (which are in addition to government imposed traffic and heavy vehicle regulations) are the speed and weight restrictions on the Airlie Road Bridge. Council uses these controls as and where required to optimise the management of the asset.

3.3.3 Summary

The local roading network in Porirua will continue to have adequate traffic capacity for the next few years. This assumes that the construction of the Transmission Gully Motorway proceeds. Council is presently performing an assessment of traffic flows, particularly at intersections, based on the traffic demand information provided by NZTA.

3.4 Asset condition

Condition Surveys were carried out on all road surfaces and footpaths in the Porirua area during April and May 2011. These surveys have informed the following section of this Plan.

Regarding the condition of other assets, current asset data has been used for the development of this Plan.

3.4.1 Pavements

Figure 10 and Figure 11 demonstrate that the average network roughness and the condition index of surfaces have improved since 2008. Whilst this is encouraging, the data presented in Table 11 suggests that the surface's asset lives achieved are less than would normally be expected.

Council will be conducting further investigations into the reasons for these apparently conflicting results in order to produce a robust long-term plan for planning pavement and surface maintenance works.

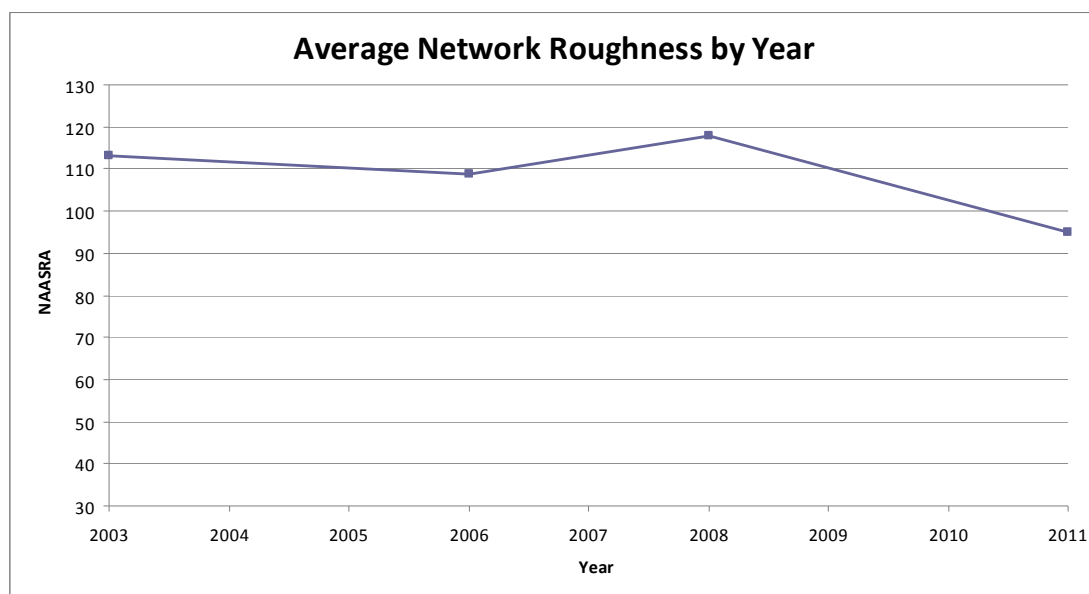


Figure 10 - Average Network Roughness by year

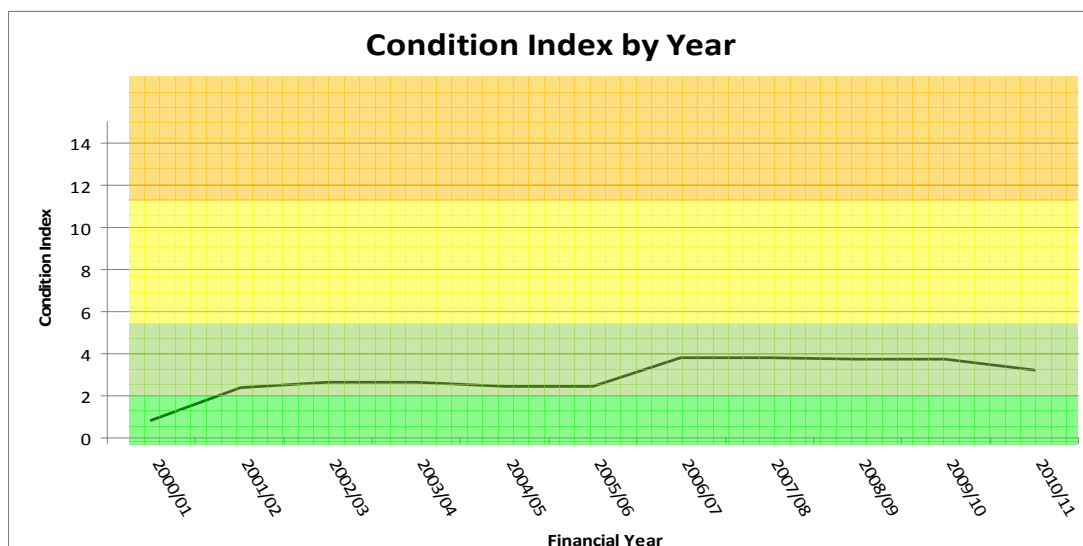


Figure 11 - Surface Condition Index by Year

Road Hierarchy	Achieved Lives (years)		Lengths used in calculation (m)		Overall lives Achieved (yrs)
	Asphaltic Surfaces	Chip Seals	Asphaltic Surfaces	Chip Seals	
ARTERIAL	7.56	9.17	21637	61653	8.76
DISTRIBUTORIAL	9.01	11.16	9019	71772	10.92
LOCAL	11.25	10.48	10466	58204	10.60
SERVICE LANE	12.32	9.59	1260	2603	10.48
Network Mean:					10.06

Note: This is a weighted mean of the achieved lives of reseals only.
Seals that achieved less than a year were excluded from this analysis.

Table 11 - Surfacing lives achieved (years)

3.4.2 Structures

The City's three major bridges link with State Highway 1 and the remaining 18 bridges having spans of less than 22 metres. Additionally, Council owns and manages four footbridges and seven subways. Structures, their condition, and remaining life (as of July 2011) are shown in Table 12.

Road Bridges				
Bridges (Urban)	Type	Span	Condition	Remaining Life
Mungavin Bridge (North)	Post-tension concrete box girder	185 m	good	63 years +
Mungavin Bridge (South)	Pre-cast pre-stressed beams	185 m	excellent	93 years +
Ocean Parade	Single span concrete deck	4 m	good	53years
Steyne Avenue	Pre-stressed concrete unit deck	11 m	good	43 years
Te Whakawhitinga	Pre-stressed concrete girder	86 m	excellent	93 years +
Pauatahanui Stream Bridge	Steel And Timber	16	good	43 years
Bridges (Rural)				
Airlie Road	Timber truss and decking	22 m	poor	1 year
Belmont Road No. 1	Pre-stressed concrete deck units	8 m	excellent	93 years +
Belmont Road No. 2	Twin concrete pipe culvert	6 m	good	53 years
Flighty's Road	Concrete beam and deck	9 m	good	53years
Grays Road No. 1	Concrete box culvert cells	9 m	good	43 years
Grays Road No. 2	Concrete box culvert cells	7 m	good	43 years
Grays Road No. 3	Triple concrete pipe culvert	4 m	good	43 years
Moonshine Road No. 1	Pre-stressed concrete deck units	16 m	excellent	83 years
Moonshine Road No. 2	Pre-stressed concrete deck units	16 m	excellent	83 years
Moonshine Road No. 3	Timber deck on steel/timber beams	7 m	fair	43 years
Moonshine Road No. 4	Pre-stressed concrete deck units	9 m	excellent	83years
Paekakariki Hill No. 1	Concrete box culvert	5 m	good	43 years
Paekakariki Hill No. 2	Concrete box culvert	4 m	good	43 years
Paekakariki Hill No. 3	Concrete box culvert	5 m	good	43 years
Bradey Road	Pre-stressed concrete deck units	18 m	excellent	93years +

Foot Bridges				
Kenepuru	Pre-stressed concrete T-beam		good	55 years
Papakowhai	Steel beams and columns		good	45 years
Paremata	Steel trusses		good	35 years
Pukerua Bay	Bailey panels		excellent	25 years
Subways				
Walton Leigh Avenue	Concrete		Good	
Paremata Road	Concrete		Excellent	
Postgate Drive	Concrete		Good	
Spinnaker Drive No. 1	Concrete		Good	
Spinnaker Drive No. 2	Concrete		Good	
Discovery Drive	Armco galvanised steel		Fair	
James Cook Drive	Concrete		Good	

Table 12 - Structures and their condition

All the road bridges, with the exception of the Airlie Road Bridge, are in good or excellent condition. Airlie Road Bridge is reaching the end of its useable life and is scheduled for replacement within 2011/12.

All structures are inspected annually, and maintenance carried out in accordance with the findings. Specific larger-scale maintenance is known to be required, and is being programmed within the maintenance regime, as follows: -

- Mungavin South – painting to side panels
- Mungavin North – repair to eastern joint.

All footbridges are in a good to excellent condition. The reason why repainting is categorised as a major work is due to the high cost, complexity, and the necessity for large amounts of traffic management.

3.4.3 Footpaths

The cumulative total footpath length in Porirua City is approximately 295 km. The City's footpaths are constructed predominantly of concrete (approximately 80%) and the remaining are sealed or paved, so they can be expected to have long lives.

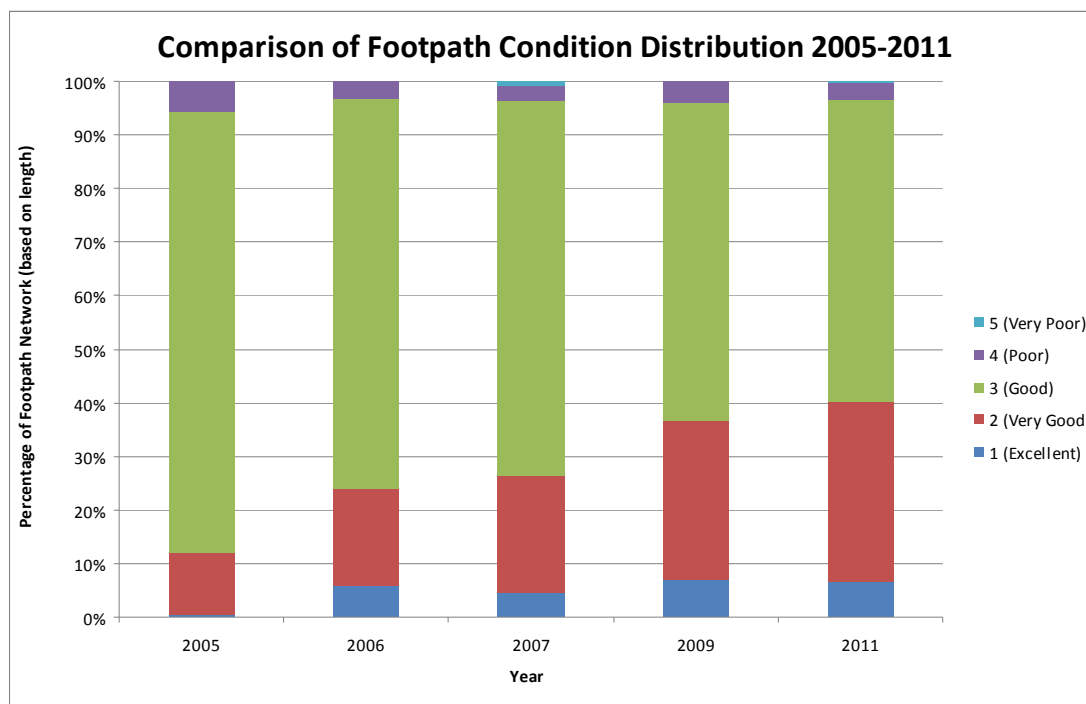


Figure 12 - Comparison of Footpath Condition Distribution 2005-2011

As can be seen in Figure 12, the condition of footpaths is steadily improving in Porirua. Work will continue to minimise the lengths of poor and very poor footpaths.

Accessways

City Council roading assets include 17.9 km of street to street accessways and approximately 8.3 km of high and low-level footpaths that are remote from the carriageway. These will be maintained to the same level of service as footpaths.

It should be noted that many accessways do not have streetlighting. As a long-term (10 to 20 year) goal, Council intends to provide lighting to these areas.

3.4.4 Other roading assets

Streetlights

The Council owns around 5,100 streetlights, located both within and outside the road reserve.

Power supply lines to streetlights are provided mostly by Wellington Electricity (WE*) but in one area of Aotea Block the power supply lines are owned by Waikato Electricity Ltd. In general, the demarcation point between power supply assets (owned by the power provider) and streetlight assets (owned by Council) is the fuse located in the panel at the base of streetlights. It should be noted that, some older models (generally installed in the 1960s and 1970s) of streetlight poles do not have fuse panels, so the demarcation point for such streetlights is at the lantern itself.

Due to the relatively short life-span of streetlight light bulbs, inspections and maintenance of the system are conducted regularly, and appropriate budget levels allowed for the replacement of parts. Due to the age of the various streetlight assets, there is a range of types of light bulbs installed across Porirua City. Due to consistency and ease of maintenance, redundant lanterns are replaced with units more consistent with the remainder of the network as and when they fail.

The Council is aware of developing streetlight technologies globally, in particular the Light Emitting Diode (LED) streetlights which may prove to have longer lifespans and less power requirements. The Council is monitoring developments in this area.

Culverts

The roading networks include a total length of 3.7 km of culverts, the majority of them being on rural roads. Maintenance and inspection of culverts is carried out on a cyclical programme.

Signs

Throughout the street network there are a large variety of signs totalling approximately 6,300. Although Council owns many signs within the City, only traffic signs are maintained under the transport budget.

The condition of traffic signs are rated using five rates from excellent to very poor. Figure 13 shows that in from the last recorded data, almost all signs are in average or better condition.

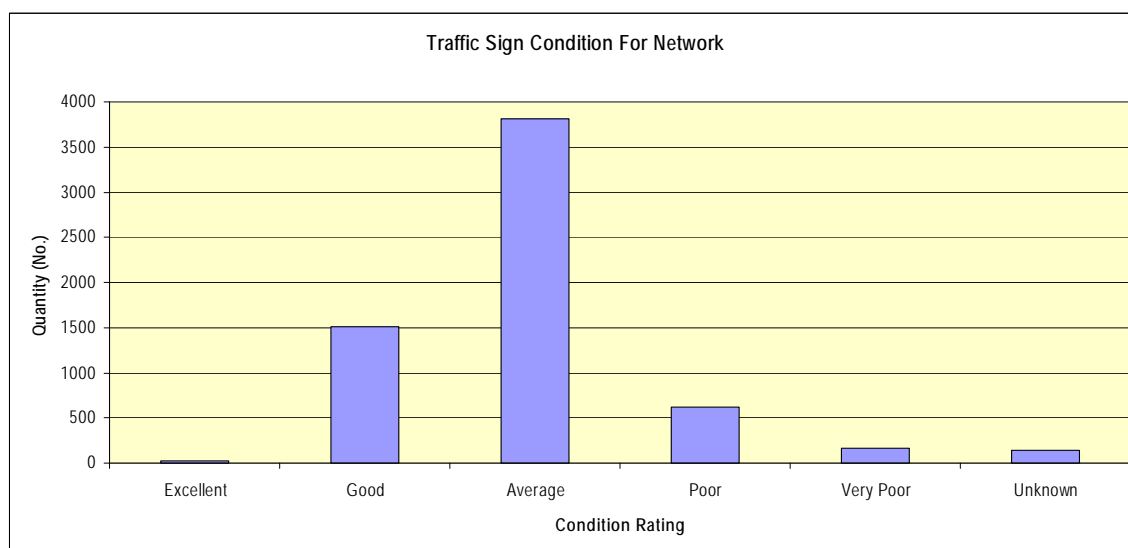


Figure 13 - Sign conditions for the network

Bus Shelters

Bus shelters provide a service to ratepayers, they are maintained by the Greater Wellington Regional Council.

Off-street Carparks

The City Roading networks include 15 off-street car parks with a total area of 20,871 m². Off street car parks are considered as part of the Council roading asset and are maintained to the same standard.

Commuter Car Parks

Porirua City has four commuter car parks. The largest is located at the Porirua railway station, two are at Paremata (east and west) one is in Plimmerton, and there are two others at Mana and Pukerua Bay. These commuter car parks are maintained by the Council but are 100% funded by the Greater Wellington Regional Council.

Traffic Signals

The Council owns two sets of traffic signals, at the intersection of Titahi Bay Main Road and Lyttelton Avenue and at the intersection of Titahi Bay Road and Wi Neera Drive. The 'technological' items within the lights (electrical items and the lights themselves) have relatively short design lives, and are inspected and replaced accordingly. The remaining hardware (traffic signal poles, traffic islands etc.) are maintained according to normal street furniture requirements.

The operation of the traffic signals are subject to ongoing review, to meet the changes in traffic volumes at the intersection. Renewal of many of the components is programmed to ensure the long-term functionality and to minimise the ongoing maintenance costs of the signals.

Road Safety

As shown in Table 5, road safety is one of the key indicators of performance of the Council roading asset, and is given a high priority regarding assessment of condition and in terms of future improvements.

Road safety is monitored through the consideration of historic crash statistics and through information from a variety of sources including; by members of the public, safety reviews, the Police, other Council staff members and other sources. The 'condition' of the road system in terms of safety is assessed from these sources of information.

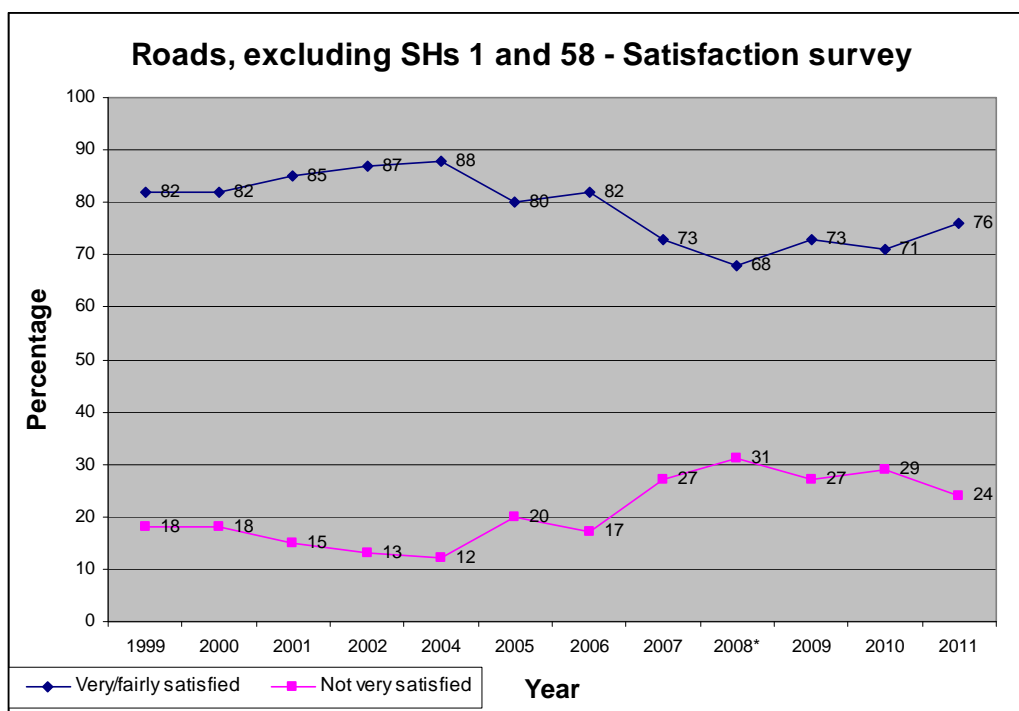
The number of injury road crashes in 2010 was 100, just above the 'Key Performance Indicator' level of 90 per year. Council continues to work to improve the physical road network to improve road safety alongside the Community Safety activities run by the Council.

The process for identifying and selecting potential physical safety improvements works is outlined in Section 8.2.

3.4.5 Customer satisfaction

Road Quality

The latest National Research Bureau Survey undertaken and published in March/April 2011 is seen as a good indicator of the public user perception of the quality of the roading network. The results of this survey are shown below. With regard to the roads, it identified that 76% of residents were either satisfied or fairly satisfied compared to the peer group of 80%. Of Porirua, this was lower than the 80% target shown in Table 6. The percentage not very satisfied was 24% compared to the peer group of 20%.

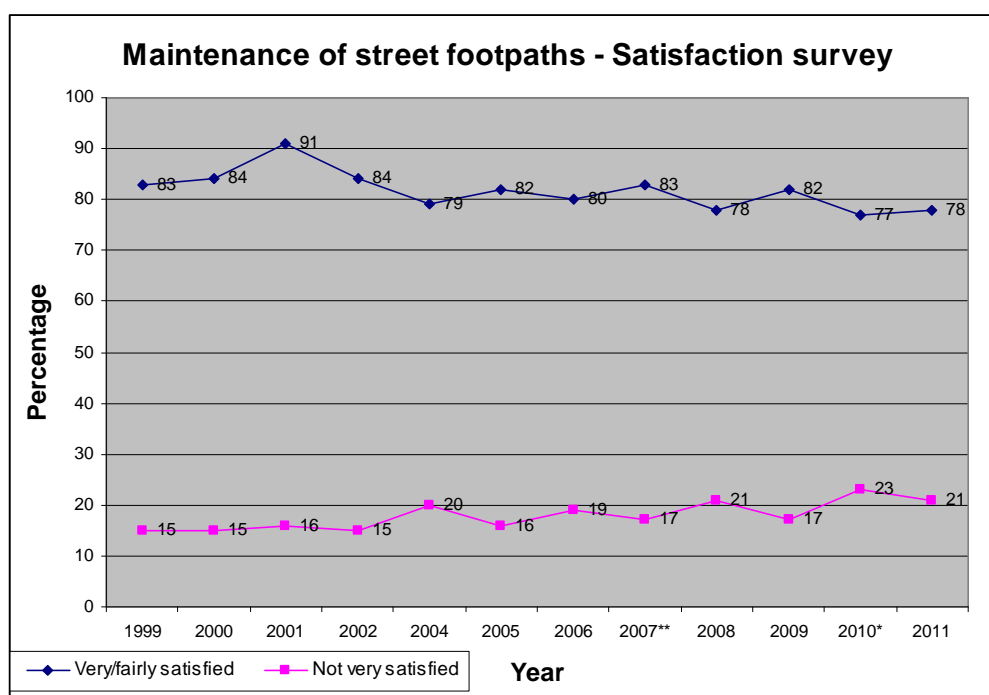


* prior to 2008, State Highways were not specifically excluded

Figure 14 - Roading Satisfaction Survey - 2011 NRB

Footpaths

The NRB survey with regard to footpaths, shows 78% (42% + 36%) were either fairly satisfied or very satisfied, compared to 80% for the peer group. For Porirua, this was lower than the 80% target. The percentage not satisfied was 21% compared to 19% for the peer group. In recognition of resident's desire for higher standards and the higher targets set by other Councils in the peer group, a higher satisfaction target of 85% has been set for 2013 onwards and the annual footpath renewal target has been increased.



* 2007-2009 readings refer to ratings for footpaths in general

** readings prior to 2007 refer to satisfaction with walkways and footpaths

Figure 15 - Maintenance of street footpaths - Satisfaction Survey - NRB 2011

3.5 Asset maintenance and renewals

3.5.1 Road Surface and Pavement Renewals

This Section explains how the annual resealing and shape correction programme is being developed, and outlines likely maintenance and budget requirements in the following years.

As the expected lifespan of a road surface plays an important role in the planning and costing of the resurfacing programme, the condition rating (see section 3.4) of the pavements has been analysed to assess when sections of road will require maintenance. The ideal expected life of the treatment materials of the Council's roads is shown in Table 13. Analysis has shown however that asset lives are substantially shorter than this, as shown in Table 11.

Material	ADT<500	ADT>500
Chip seal	18 yr	14 yr
Asphaltic concrete	18 yr	15 yr
Slurry	10 yr	8 yr
Void fill	10 yr	5 yr

Table 13 - Road Surfaces Expected Lives – Nationally

The reduced apparent lifespan of the road pavements is an issue that will be investigated during 2011/12. These investigations will lead to an evidence-based forward works plan.

A preliminary study conducted by MWH in July 2011 noted that the quantity of pavement and surfacing maintenance carried out in the years 2008-2011 has not been sufficient to maintain the pavements to an acceptable level, meaning that an increased quantity of work will be required in the coming years to 'catch-up' on the backlog of work. Although the deterioration of the road surface is becoming more apparent from the latest (2011) roughness and condition survey, the cause of this deterioration is to be investigated properly prior to making the forward works plan of pavement and surfacing maintenance and renewals for the following years. For this plan, an indicative sum has been budgeted for in 2012-15 and beyond. These figures will be updated once the testing and analysis have been completed. The provisional budget sums have been included in Section 3.7.

See Section 4.2 for a more detailed description of how surface maintenance works are identified and programmed.

Predictions of budget requirements for years beyond 2015/16 have been made only in broad terms as predictions of pavement and surfacing failures at this stage will be inaccurate, and therefore will not provide informed planning or financial certainty.

3.5.2 Structures maintenance

Aside from normal structures maintenance activities, a number of specific structures maintenance items have been included within the budgets shown in Section 3.7. These items have been deferred for some time, and are now considered priority works: -

- Mungavin Bridge South crack sealing – both ends of eight pier heads (indicative cost \$35,000).
- Mungavin Bridge North – replace expansion joint at east end, at expansion joints EF and GH, repair concrete channel and paint concrete parts (indicative cost \$207,000).
- Mungavin Bridges North and South – paint handrails (indicative cost \$100,000).
- Papakowhai footbridge - treat rust on west ramp (indicative cost \$20,000).

3.5.3 Other Roothing Maintenance

Non-pavement roading assets are renewed according to their condition and need for renewal. Most items have defined design lives and this is used as a guide for renewals programmes. The key items that require renewals are: -

- Street lighting
- Traffic signs
- Road markings and delineation
- Drainage assets.

The plan for renewing these assets is captured alongside the pavement asset in Section 3.7.

Drainage Sump Cleaning and Maintenance

In terms of maintenance, the cleaning (emptying) of sumps is an ongoing cyclic activity, with those sumps shown in Figure 16 being cleaned twice per year, all others are cleaned once per year. Enviropods (a 'sock' placed in a sump) provide additional environmental protection by preventing sand and silt run-off into the stormwater pipework system, and are used in specific higher potential sedimentation areas. These enviropods require additional management procedures to ensure they provide the required protection.

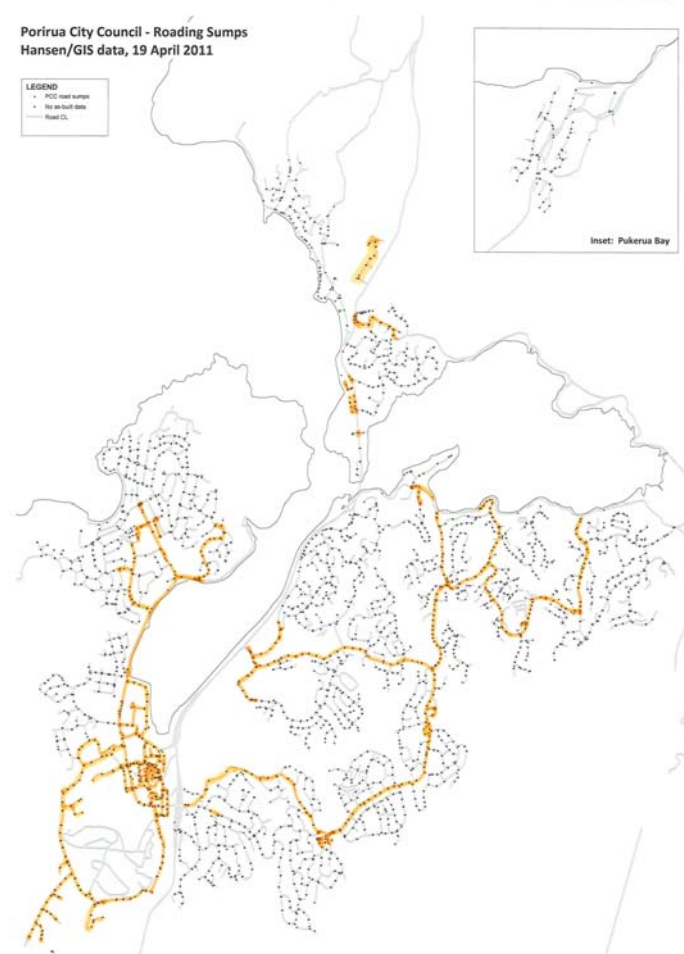


Figure 16 - Roading sumps to be cleaned twice per year

Street Lighting

Another major cost for Council is streetlighting. This includes the costs for power, streetlight inspections, streetlight maintenance and some capital works. A sum of \$37,000 (plus inflation) for minor upgrades and to replace dangerous streetlight poles has been included from the 2012 through to 2022.

The gross costs of street lighting (maintenance and power) in the year **2011/12** have been budgeted at **\$750,000** p.a. It is expected that the annual cost will increase in the future due to power price increases and the number of light poles will be added to the networks from newly vested roads.

3.5.4 Professional Services

The in-house Professional Services Business Unit which administers the roading responsibility within the Council is estimated to cost **\$200,000** p.a. This figure is matched within Section 3.7 against the specific item on which the professional fees will be carried out.

3.6 Network improvements

Network improvements can generally be included in one of the following descriptions: -

- large capital works (valued over \$250,000).
- minor safety works (single items valued at up to \$250,000).

Network issues, the process of identifying potential future works, and improvement plans are as follows.

3.6.1 Current Network Issues (overview)

Congestion on State Highway 1 and safety and route security issues with the present route through Pukerua Bay and along the coastal section of Centennial Highway dominate roading issues in Porirua. Some congestion is also apparent at the Kenepuru Drive / Titahi Bay Road intersection.

Solutions to problem areas on strategic routes in eastern and northern Porirua are dependent on the timing of State Highway improvements. When the Transmission Gully Motorway is constructed, traffic flows on Grays Road and Paekakariki Hill Road will be reduced. This will result in a reduction in northbound traffic from the Hutt Valley using local roads. Traffic flows in eastern Porirua and Whitby will also be altered on existing principal routes. This is detailed in the Demand Analysis, section 1.3, above.

Increasing traffic demand from development in the northern part of the central city area continues. This is putting additional demand on some of the central city intersections.

The Porirua Development Plan indicates which areas of Porirua are likely to be developed in the future and has implications for road demand. It provides a 'picture' of what the city may eventually look like – areas where people may live, work and play. It is also intended to guide change within the city, founded on principles of sustainable development. Roding issues are assessed at the time that areas are opened up for development. However, decisions on existing roading maintenance upgrades take future developments into account and are sized to suit.

A study, currently being undertaken by Opus Consultants, on behalf of NZTA, is examining road capacities in the Porirua area, particularly around the SH1/Whitford Brown intersection and

around the SH1/Mungavin Road intersection. This study will further clarify the key network 'pinch points', and will aid in programming further network improvements. Of particular interest in this study are the roundabout at Titahi Bay Road/Kenepuru Drive and the Okowai/Papakowhai Road/Whitford Brown area.

3.6.2 The Transmission Gully Motorway and Links

An overview of the route of the Transmission Gully Motorway, and of the proposed link-roads, is included in section 1.3 of this AMP.

The changed traffic loadings as a result of the opening of Transmission Gully will alter the rates at which the various Council roads will deteriorate. These factors have been taken into account in calculating the Council maintenance and renewals costs for forthcoming years.

3.6.3 Potential Roothing Improvements – Prioritisation process

Large projects

Regarding the prioritisation of potential larger (above \$250k in value) roading upgrades/improvements, the Council will, in principle, adopt the upcoming NZTA system of ranking through the 'strategic fit (including community issues)', 'effectiveness' and 'economic efficiency' criteria. These criteria are detailed in Appendix 5, Section 8.5 of this plan. Such projects also need to be set against the context of other Council priorities (non-transport), and prioritized in the LTP process.

Assessment of the prioritisation of projects against the above criteria will be carried out by a Council internal 'roading project prioritisation committee'. The committee comprises of the Technical Services Manager, the Manager Strategic Assets and Buildings, the Infrastructure Operations Manager and the Senior Asset Manager – Roothing.

The ranking of potential roading improvement projects is presented in Appendix 6, Section 8.6.

Minor Works

For 'Minor Safety Works' (projects below \$250k total value), the Council will adopt the selection criteria outlined in the Council paper titled 'Minor road safety projects procedures', ratified by Council on 29 September 2009, and included in Appendix 2, Section 8.2. In order to assess against those stated criteria, the minor-works selection committee will meet, normally on an annual basis, to assess and prioritise future minor works on Porirua roads. The minor works selection committee comprises: the Senior Asset Manager – Roothing, the Technical Services Manager, the Road Safety Coordinator and the Special Project Engineer. Section 8.2 also outlines the process by which the selection committee will assess potential projects.

3.6.4 Potential New Local Large Roothing Projects

For the long-term future, the top-five ranked potential new roading projects in the Porirua area are as follows. The full list can be viewed in Appendix 6, Section 8.6: -

	Title	Strategic fit Ranking	Effectiveness ranking	Economic efficiency	Estimated Cost
1	Transmission Gully Link Roads - new road	H	H	H	TBA
2	Airlie Rd Bridge replacement	M	L	H	\$1,400,000

3	Titahi Bay Rd/ Kenepuru Dr - Intersection improvement	M	L		TBA
4	Whitford Brown/Papakowhai - intersection improvement	M	L		TBA
5	Okawai/ Whitford Brown - Intersection improvement	M	L		330,000

Table 14 - Potential new large roading projects

Aotea Block

The Aotea Block continues to be an area of residential development, and an area where new roads are being constructed. It is anticipated that approximately 4 km of additional road will be vested in the Council from Aotea Block by 2015 from new developments.

3.6.5 Road Safety

The Council uses all possible means to reduce the number of casualties through:

- Undertaking the minor safety projects
- Coordination with the Community Groups and Organisations
- Undertaking the community safety projects

Coordination with the community and undertaking community safety projects is an ongoing task carried out by the Council Technical Services team. Costs for these programmes are subsidised by NZTA to a level of 75% for 2111/12. A summary of these costs is included in Section 3.7.

3.7 Maintenance, renewals, capital improvements summary – 10 year plan

Below is the summary of the proposed works to be carried out from 2012 to 2021 on NZTA subsidised Transportation activities.

Transport Ten-Year Financial Forecast (Uninflated \$ x 1000)												
Category	Project / Item	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Capital Expenditure Programme												
Renewal of Local Roads (1)	High Risk	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$16,333
	Medium Risk	\$1,933	\$1,933	\$1,933	\$1,933	\$1,933	\$1,933	\$1,933	\$1,933	\$1,933	\$1,933	\$19,333
	Low Risk	\$2,633	\$2,633	\$2,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$1,633	\$19,333
Minor Improvements	Minor safety works	\$186	\$182	\$201	\$147	\$150	\$153	\$156	\$150	\$153	\$157	\$1,634
New Projects (2)	Transmission Gully M/way Link roads	\$0	\$33	\$540	\$200	\$2,375	\$2,554	\$93,078	\$0	\$0	\$0	\$98,780
	Titahi Bay Rd sea wall	\$1,194	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,194
	New intersections	\$0	\$0	\$0	\$33	\$340	\$0	\$0	\$122	\$124	\$0	\$619
	Seismic upgrades	\$100	\$200	\$200	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$500
	Housing NZ urban renewal	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$1,082
Capex Sub-total	High Risk	\$3,221	\$2,157	\$2,682	\$2,122	\$4,606	\$4,448	\$94,976	\$2,013	\$2,019	\$1,898	\$120,142
	Medium Risk	\$3,521	\$2,457	\$2,982	\$2,422	\$4,906	\$4,748	\$95,276	\$2,313	\$2,319	\$2,198	\$123,142
	Low Risk	\$4,221	\$3,157	\$3,682	\$2,122	\$4,606	\$4,448	\$94,976	\$2,013	\$2,019	\$1,898	\$123,142
Operational Expenditure Programme (Subsidised and non-subsidised) (5)												
Maintenance And Operation Of Local Roads - Local Roads (3)		\$1,661	\$1,553	\$1,875	\$1,802	\$1,844	\$1,888	\$1,932	\$1,778	\$1,824	\$1,872	\$18,029
Demand Management And Community Safety		\$315	\$323	\$331	\$339	\$347	\$355	\$364	\$372	\$381	\$390	\$3,517
Transportation Studies and Planning		\$20	\$21	\$21	\$22	\$23	\$23	\$24	\$24	\$25	\$25	\$228
Emergency and Preventative Maintenance		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Non-subsidised (4)		\$933	\$954	\$987	\$969	\$993	\$1,016	\$1,041	\$1,066	\$1,091	\$1,118	\$10,167
Opex - Sub-total		\$2,930	\$2,851	\$3,214	\$3,132	\$3,206	\$3,282	\$3,360	\$3,240	\$3,321	\$3,405	\$31,942
Grand Total (Capex + Opex)	High Risk	\$6,151	\$5,008	\$5,896	\$5,254	\$7,813	\$7,730	\$98,336	\$5,253	\$5,340	\$5,303	\$152,084
	Medium Risk	\$6,451	\$5,308	\$6,196	\$5,554	\$8,113	\$8,030	\$98,636	\$5,553	\$5,640	\$5,603	\$155,084
	Low Risk	\$7,151	\$6,008	\$6,896	\$5,254	\$7,813	\$7,730	\$98,336	\$5,253	\$5,340	\$5,303	\$155,084

(1) - Includes: Sealed road resurfacing, Sealed road pavement rehabilitation and Traffic service renewals

(2) - Less Airlie Road Bridge replacement 2011/12

(3) - Includes traffic services, sealed pavement, routine drainage and environmental maintenance and network asset planning

(4) - Includes car parks, canopy, footbridge and footpath maintenance

(5) – Operational expenditure includes direct costs only

**Table 15 – Ten-year expenditure programme – RECOMMENDED
AMP JULY 2011**

Capital Expenditure Programme (Uninflated \$ x 1000)												
Category	Project / Item	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Renewal of Local Roads		\$1,227	\$1,363	\$1,855	\$988	\$1,813	\$1,654	\$1,328	\$1,219	\$1,225	\$1,104	\$13,776
Minor Improvements	Minor safety works	\$186	\$186	\$186	\$186	\$186	\$186	\$186	\$186	\$186	\$186	\$1,857
New Projects	Transmission Gully M/way Link roads	\$0	\$0	\$0	\$0	\$2,000	\$2,000	\$25,376	\$0	\$0	\$0	\$29,376
	Titahi Bay Rd sea wall	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	New intersections	\$0	\$0	\$33	\$340	\$0	\$0	\$0	\$0	\$0	\$0	\$373
	Seismic upgrades	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Housing NZ urban renewal	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$108	\$1,082
Capex total		\$1,521	\$1,657	\$2,182	\$1,622	\$4,107	\$3,948	\$26,998	\$1,513	\$1,519	\$1,398	\$46,465

Note: Adopted funding in the 2012-2022 LTP for Transport is based on the high risk scenario

Application of Operating Funding (Subsidised and non-subsidised - Inflation adjusted \$ x 1000)												
	Item	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
	Payments to staff and suppliers	\$3,428	\$3,545	\$3,589	\$3,704	\$3,673	\$3,781	\$3,923	\$4,091	\$4,283	\$4,490	\$38,506
	Finance Costs	\$294	\$255	\$216	\$182	\$159	\$298	\$447	\$1,418	\$1,384	\$1,349	\$6,003
	Internal Charges Applied	\$1,364	\$1,411	\$1,432	\$1,442	\$1,399	\$1,421	\$1,463	\$1,517	\$1,655	\$1,823	\$14,928
	Other operating funding Applications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Total	\$5,086	\$5,211	\$5,237	\$5,328	\$5,230	\$5,500	\$5,833	\$7,026	\$7,322	\$7,663	\$59,436

Table 16: Transport Capital and Operating Expenditure Programmes – FUNDED LTP 2012-2022
(as shown in the final 2012-2022 LTP Financial Impact Statements)

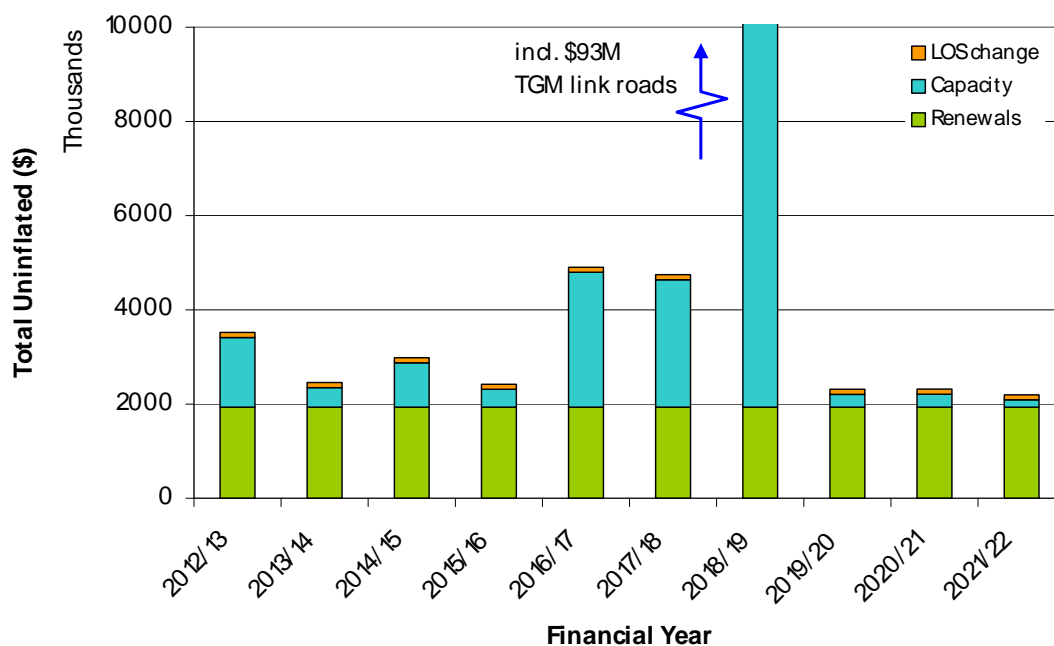


Figure 17: Summary of Capital Expenditure Programme (Medium Risk Scenario)

3.8 Changes made to the Draft AMP renewals programmes

The following table lists the changes made to the renewals programme between July 2011 and June 2012 when the Council's Long Term Plan was finalised.

Project	Change (\$)	Risk	Mitigation
Renewal of Local Roads	-\$2,557K	<ul style="list-style-type: none"> Increased failures Increased long term maintenance expense Transport disruption to sections of the community 	<ul style="list-style-type: none"> Programme backlog spread over longer period Increase maintenance budgets Review in 2015
Minor safety works	+\$223K	N/A	N/A
Transmission Gully M/way Link roads	-\$69,404K	<ul style="list-style-type: none"> Level of New Zealand Transport Agency funding is less than anticipated 	<ul style="list-style-type: none"> Continued work with NZTA to increase certainty of funding level Review in 2015
Titahi Bay Rd sea wall	-\$1,194K (Project not funded)	<ul style="list-style-type: none"> Pedestrian transport route not enhanced 	<ul style="list-style-type: none"> Review in 2015
New intersections	-\$246K	<ul style="list-style-type: none"> Upgrades not carried out Traffic delays and congestion at peak times 	<ul style="list-style-type: none"> Traffic demand management Monitor traffic volumes and travel times Review in 2015
Seismic upgrades	-\$500K (Project not funded)	<ul style="list-style-type: none"> Older structures vulnerable to failure due to seismic action 	<ul style="list-style-type: none"> Seismic assessments Emergency repairs Review in 2015

Table 17: Changes to Project Budgets – LTP 2012-2022

3.9 Long Term Plan 2012 -2022, Asset Management Issues

Porirua City Council has assets of over \$1 billion and it plans to invest \$126.75 million in capital works for its major strategic assets, namely Water Supply, Wastewater and Stormwater (the “3 waters”) and Transport over the next 10 years of the Plan. This capital expenditure is for building or replacing the city’s major assets.

Each group of assets has an Asset Management Plan (AMP) which is a key planning tool for the maintenance, renewal and increased capacity of these assets. Renewals are the replacement programmes for existing assets and currently for the “3 waters,” asset renewals are predominantly funded through loans. Any proposed increased capacity for these assets is also loan funded.

Beyond the 10 years of this Plan the renewals of the “3 waters” assets will increasingly be funded from depreciation reserves which are a result of a Council decision in 2009 to begin to rate fund for the depreciation of these assets.

The Council has now had in place for several years a programme of monitoring and data collection of the condition and performance of its “3 waters” pipelines and of its roading network. Detailed analysis of the Council’s strategic asset information has enabled the Council to predict and benefit from an accelerated asset replacement programme.

An evaluation of projects was determined against the risk of failure, level of service, statutory obligation, continuity of service and the relative impact on aspects of social, economic, environmental and cultural wellbeing.

By investing in the renewals programme, it is expected that the level of risk will reduce over the ten-year period improving the reliability of service to the customer. In evaluating the risk of failure in the network it is noted that a failure of a component in one part of the network may affect a few houses or a large catchment depending on the criticality of that component in the network. Therefore assessing risk considers the worst case of a large scale impact.

The Council’s programme of data collection, performance monitoring and reporting is ongoing and able to identify any need to revisit asset upgrades and renewals programmes. In the event of any unforeseen asset renewal requirements the Council has the ability to draw on cash reserves in the first instance before looking to other funding options.

The level of the Council’s debt (and its ability to borrow) is such that, in the event asset renewal work needs to be brought forward, there is adequate capacity to fund such projects either through the use of reserve funds or through loans or a combination of both. Throughout the ten years of the LTP the ratio between operating revenue and interest expenses does not exceed 6.2%, which is well within the limit set by Council’s Liability Management Policy of 15%.

The comparative work and risk assessment also concluded that water services renewal expenditure was a key issue for the Council’s focus and is to be managed along the following priorities:

- **Water Supply pipeline renewal** – this will reduce escalating operating costs associated with attending to pipeline breaks and water loss
- **Manage sewer flows by renewal of the telemetry monitoring equipment** – this ensures that the maximum capacity of the pipe network is achieved, which reduces the risk of sewage overflows from the pipe network
- **Reducing infiltration of stormwater into the sewer network** – this would reduce the number of bypasses at the treatment plant, overflows of the sewer line and operational cost of the sewer system
- **Upgrade the stormwater network at known locations of under-capacity** – this would reduce the incidents of flooding occurring during rainfall events.

The Transport (roading) renewal programme has been maintained at current levels of service over the life of the 10-year LTP. The Transmission Gully Motorway programme will see the Council investing \$35.3 million in construction of two Link Roads associated with this development.

Outside of the strategic infrastructural assets, the Council continues to provide significant investment in Community and Leisure assets such as the playing surface upgrades and

walkways. It is forecast to invest \$18 million in Community and Leisure assets over the next 10 years.

The Council plans to invest \$126.75 million in capital works for water supply, wastewater, storm water and transport over the next ten years of the plan.

The Council's infrastructure is relatively young in terms of its lifecycle which is reflected in the mix of infrastructure investment;

- 46% of the ten-year investment will be in renewing ageing assets which are reaching the end of their economic life,
- 38% in increasing capacity of infrastructure to meet the demand from growth, and
- 16% to improve the level of service.

Capacity increases and improvements to level of service often involve replacing or renewing an ageing asset. It should be noted that the renewals programmes targets those sections or elements of the network that have been identified as operating at greatest risk.

Various risk scenarios have been developed by using industry based risk assessment process that take account of both the likelihood and consequence of failure. For assets operating at a high risk there is up to a 50% chance of a significant failure occurring in a 12-month period which could lead to a loss of service to customers. For water supply, this may be a burst watermain pipe. In the case of wastewater, a discharge of sewage onto land as a result of stormwater entering a broken pipe or blocked sewer pipe creating a risk to health and the harbour. By investing in the renewals programme, it is expected that the level of risk will reduce over the ten-year period improving the reliability of service to the customer.

Council has managed its risk to loss or failure of a service over the last four years by:

- Having a prioritised and appropriately funded renewals programme,
- Responding to significant outages using the Council's maintenance staff and established local contractors who are resourced to repair breakages,
- Reprioritising the renewals programme, and
- In the event of a major failure in part of the network which is not included in the ten year capital works programme, the Council has maintained a borrowing capacity so it is able to respond with additional investment.

Customer surveys have shown that this approach has maintained a high level of customer satisfaction with the water services. In the case of water supply, the Council is seeing evidence of a reduction of breaks leading to fewer water outages. The Council will continue to manage the service risk in this manner.

Councillors have indicated the priority for investment based on the level of relative importance of activities to achieve service delivery. This is summarised in the table below. It is investment over time that will result in a reduction in risk in terms of reliability and quality of services delivered. Moving the four core infrastructure services to a medium risk scenario would require an additional \$7 million over 10 years or an additional 1.5% rate increase per year.

Summary of priorities for investment and the relative risk to service delivery

Asset Class	Budget Priority Note 1	Service Delivery Risk Note 2	
		Present (2011/12)	Planned (2012-22 LTP)
Water Supply	Important	High	Medium
Wastewater	Critical	High	Medium – High
Stormwater	Critical	High	Medium
Transport	Important	High	High
Note 1	Councillors have determined priorities for investment based on the level of importance of activities to achieve service delivery		
Note 2	Investment over time will result in a reduction in risk in terms of reliability and quality of the services delivered		
Definition of risk	Significant failure of an asset resulting in loss of level of service is: High up to 50% chance of occurring in next 12 months Medium up to 30% chance of occurring in next 12 months Low up to 5% chance of occurring in next 12 months		

The table below shows a summary of capital expenditure on renewals across the asset network classes.

Activity	Total 10 Years \$'000	Year 1 12/13 \$'000	Year 2 13/14 \$'000	Year 3 14/15 \$'000	Year 4 15/16 \$'000	Year 5 16/17 \$'000	Year 6 17/18 \$'000	Year 7 18/19 \$'000	Year 8 19/20 \$'000	Year 9 20/21 \$'000	Year 10 21/22 \$'000
Stormwater services	428	0	0	0	0	0	0	0	135	142	150
Wastewater Management	21,661	1900	2006	1924	1974	2055	2143	2239	2348	2470	2602
Water Supply	13,232	1465	1320	1299	1011	1516	1340	1400	1468	1210	1203
Transport	16,308	1227	1405	2015	1461	2054	1935	1608	1530	1590	1483
Total	51,628	4592	4732	5238	4446	5625	5417	5247	5481	5412	5439

3.10 Asset Disposal

There are no roading or transport related assets that are being considered for disposal over the next ten years at this stage.

It should be noted, however, that as roads are resurfaced (particularly asphalt roads), the top surface of the road may be removed, effectively 'disposing' the asset. This is part of the renewals process, and is captured in financial terms through the depreciation system.

3.11 Key issues to take forward from Lifecycle Delivery

Key issue	When?
Review asset capacity	Triennially
Update asset condition information	Triennially
Identify future minor safety works	Annually
Monitor customer satisfaction	Annually
Update renewals programme	Annually
Update future improvements plan	Annually

4 Asset Knowledge Systems

4.1 Asset Knowledge Standards

In order to manage its roading system, the Council must have a thorough understanding of its asset. NZTA also requires local authorities to maintain good asset records in order that councils may make informed decisions on maintenance activities and future improvements. NZTA's standards, that are required of asset knowledge systems, are as follows: -

<u>Inventory data</u>			
The road asset management system must include an inventory of the road assets, and a record of maintenance renewal and improvement activities. The inventory data must include the following:			
Traffic features	Road condition	Road features	Other
<ul style="list-style-type: none"> - traffic volumes - traffic facilities - traffic loadings 	<ul style="list-style-type: none"> - surfacing and rehabilitation profile - condition rating - roughness 	<ul style="list-style-type: none"> - carriageway - shoulders - pavement layers - drainage facilities - structures - street lights 	<ul style="list-style-type: none"> - asset age - features - design lives - costs - treatment history
<u>Roughness and condition rating surveys</u>			
Roughness and condition rating surveys of all sealed roads must be undertaken at least every second year.			
Condition rating surveys of all sealed roads carrying more than 500 vehicles per day are to be undertaken annually.			
<u>Renewal and improvement projects</u>			
The inventory database must be updated as soon as practicable after any project that affects the network is completed.			
<u>Training certificate required</u>			
In order for road condition rating work to be eligible for funding assistance, the raters acting on behalf of the [Road Controlling Authority] are required to hold a current certificate issued by the New Zealand Institute of Highway Technology (NZIHT)...			
<u>Treatment selection</u>			
Treatment selection shall be based on a methodology, accepted by the NZTA, that takes into account the following (at the very least):			
<ul style="list-style-type: none"> • The road structure • The surface type and age • The measured condition, including roughness • Traffic volumes • Intervention criteria related to the above agreed with the NZTA. 			

NZTA Planning, programming and funding manual, section F7.9.

Although the above are NZTA's requirements, the Council agrees with these standards and have adopted them.

In addition to the above, local authorities are required to value their asset at least once every five years. However, the Council normally revalue the roading asset once every three years in order to fit in with planning and funding cycles.

4.2 Asset Knowledge Systems

The Council maintains two main asset-knowledge systems in 'RAMM' and 'Hummingbird'. Additionally, the Council uses a number of asset analysis models for treatment selection and traffic modelling. These systems are described below.

4.2.1 Roothing Asset Database – Road Assessment Maintenance Management

The Road Assessment Maintenance Management (RAMM) system is a comprehensive database, which contains data relating to road names, carriageway widths and lengths, shoulders, surface water channels, drainage, traffic facilities and signs, footpaths and berms, pavement layers and surfacing. It is a database that is capable of storing all of the information required to supply a comprehensive record of the roading asset and its condition.

Although there are other products available internationally for roading asset information management, all New Zealand local authorities and the New Zealand Transport Agency use RAMM as their asset information maintenance management system. This ensures consistency of approach and standards in asset information systems. The system is web-based, meaning that all information is loaded and retrieved through a 'web portal'. The actual hardware storing the asset information is held at RAMM's central database in Auckland. The use of this system reduces the in-house costs associated with maintaining data.

Despite the widespread use of the RAMM system, the Council does periodically review the use of this system to ascertain whether there are other asset information systems available that would be appropriate to the task and possibly more economical to use. None have, as yet, become apparent.

RAMM includes a pavement treatment selection programme that is designed to assist the selection of pavement maintenance and rehabilitation strategies. The programme uses condition rating data, together with inventory information such as pavement surfacing, traffic loadings, roughness readings and age of surfacing to list recommended treatments for each road section. This treatment selection programme is generally run annually and is set up to run using a target roughness figure of 110 NAASRA counts per kilometre for urban and rural roads, together with a B/C (benefit/cost) ratio value of at least four. The resulting treatment option recommendations are checked in the field for validity and an annual resealing and shape correction programme is determined.

Traffic volumes are determined from an annual traffic count, which is undertaken at approximately 80 sites around the city. From these counts, the 'Average Annual Daily Traffic (AADT)' is determined. Traffic volumes on the balance of the network are then estimated, then both counted and estimated data are entered into RAMM. A full list of roads and traffic counts has been published on the Council website.

4.2.2 Data Management System – Hummingbird

Hummingbird is Council's electronic information storage system. In addition to being the information repository across Council, it is also the system used to store all relevant historic roading data including: -

- 'As-built' drawings of roading structures
- Associated transport strategy documents
- Council papers
- Other relevant roading information.

4.2.3 Other Knowledge Systems

In addition to the above knowledge systems, Council use of other roading asset knowledge systems include: -

- NZTA Crash Analysis System. This system captures information on crashes on the Porirua roading network (as for all New Zealand roads), and is managed by NZTA. It is one information source Council uses to inform potential future improvements.
- NZTA / Council maintenance boundaries. This paper document, signed by both the NZTA Wellington Regional Office and Porirua City Council sets out the boundaries of maintenance responsibility between the two parties.

4.2.4 Analysis Models

Pavement Deterioration Model

The pavement deterioration model dTIMS CT (Deighton Total Infrastructure Management System – Concurrent Transformation) is a predictive modelling system that analyses road maintenance strategies. It is of particular use in comparing different road surfacing maintenance regimes, such as 'high maintenance investment' few ongoing emergency repairs vs. 'low maintenance investment' many ongoing emergency repairs. The analysis is based on data extracted from the RAMM database. This tool, therefore, informs best financial approach for the management of the maintenance of a roading network and is run periodically, typically at the time of production of the Forward Works Programme for pavement maintenance.

Transportation Model

GWRC maintains a traffic modelling programme called WATSM, which has been used to model traffic volumes in the Wellington region. This model has been used in the planning of the Transmission Gully Motorway. It is a tool that is being constantly refined for use for predicting the effects of changing traffic demand on the roading network. NZTA have created and run extensive models for predicting the traffic flows on Transmission Gully, which have informed the traffic demand predictions included in Section 1.3 of this Plan.

The Council will ensure that it continues to align with best-practice traffic modelling in the Wellington region.

4.3 Asset Knowledge and Data

As seen in Section 4.2 above, the majority of Council's roading records are stored on the RAMM database. This is a stable database, providing a large quantity of data which provides for a variety of analysis methods and outcomes. The quality of the data is generally high. However as in most large databases, there are instances of error. Further to a review of Council's RAMM in May 2011, MWH found 56 items requiring attention within the database. Of these, 11 were high priority, 30 were medium priority and 15 were low priority. The issues included records with invalid roughness ratings, invalid road IDs and drainage locations that appeared to be outside the road carriageway. MWH assessed that it would take around 130 hours of work to address these issues fully.

It is anticipated that the above errors will be addressed in due course, further improving the quality of data held in the Council RAMM database. This will provide further confidence in the analysis outputs from this data.

4.4 Key issues to take forward from Asset Knowledge Systems

Key issue	When?
Review whether RAMM is the best asset information tool for Council's use	Triennially
Audit RAMM asset information completeness and accuracy	Triennially
Repair known data anomalies in RAMM and maintain accurate data input	Initial repair in 2011 with annual maintenance thereafter

5 Organisation and People

5.1 Organisational Structure and Culture

5.1.1 Organisation structure

The Council is presently undergoing an organisational review. It is, therefore, not possible to include the intended organisational chart until the completion of the review. Future Transportation Asset Management Plans will contain a relevant organisation chart.

5.1.2 Organisation culture

Two key factors should be kept in mind regarding Council's work on the transportation infrastructure: -

- It is investing ratepayers' money into local assets. Works are *for* the community and budgeted appropriately.
- Asset decisions are taken for the long-term optimisation of the network. Long term optimisation and lowest whole of life costs are favoured over short-term measures.

The above factors guide the culture of work in the Council Roading department.

5.2 Individual Competence and Behaviour

5.2.1 Competence

The Roading Asset Manager is a Chartered Engineer, and a member of the Institution of Professional Engineers New Zealand (IPENZ) or a body of equivalent international standing.

All other Council roading staff must be qualified to a level that matches their fields of responsibility.

5.2.2 Behaviour

The standard of behaviour of Council staff is defined in the Porirua City Council Code of Conduct.

5.2.3 Keeping Abreast of Changes in the Roading Industry

Advances in technology may offset training costs through deferring maintenance of the assets, or through systems improvements. They also improve management of the assets and ensure that asset use is optimised. Strategies to take account of technology advancements include:

1. Staff training in new technologies, design standards, philosophies and products.
2. Keeping informed on new technological advances through technical group membership (e.g. Wellington RAMM User Group, Ingenium), membership of professional organizations (e.g. Institution of Professional Engineers New Zealand, IPENZ) and attendance at Road Controlling Authority Forums.

3. Keeping informed of new construction techniques, often through the above mentioned publications, and also through contact from appropriate manufacturers or suppliers.
4. Research of alternative products that may extend serviceable life and defer replacement. It should be noted that new products are normally only acceptable if they have a proven history of performance, generally not less than 10 years, in a situation similar to that which the product is proposed to be used.
5. Use of computer software for improved maintenance assessment through modelling and analysis.
6. Keeping abreast of NZTA's manuals and systems changes.

5.3 Contract and Supply Management

5.3.1 In-house and contracted out items of work

Council delivers its roading asset management through the following mechanisms: -

Activity	Delivery mechanism
Asset Management	In House
Community safety	In House
Structures inspections and management	In House
Associated road strategy and maintenance issues	In House
Physical works contract management	In House
Operational aspects of managing Porirua roads (overweight permits, temporary traffic management plans etc.)	In House
Maintenance physical works	Contracted
Physical renewals and improvements	Contracted
Specialist technical and asset management advice	Contracted

Based on the workload and requirement for a long-term understanding of many aspects of the roading asset, it is considered prudent to keep much of the asset management functions in-house, as shown above. This also helps Council officers to work closely with Councillors in setting long-term roading strategies.

Aspects of work on the roading network that are more generic and require large budgets, such as physical works, are contracted out in order to achieve best value for money.

5.3.2 Roothing Maintenance Contract

The following maintenance activities are included in the scope of works for maintenance contracts. The contract periods are normally for three years, with the right of renewal for another two periods of one year. The present contract started in 2010. The maintenance contract covers the following activities:

- Pavement maintenance (strengthening, shape correction, minor patching)
- Drainage
- Vegetation control (on the road reserve)
- Street sweeping

- Road sump cleaning
- Road marking
- Weed spraying
- Kerb and channel
- Street-lighting
- Traffic signal
- Pedestrian accessway and off-street car park maintenance.

5.3.3 Procurement of roading services

The Council follows NZTA's Manual of Competitive Pricing Procedures (CPP) for the above physical works and professional services contracts.

5.4 Key issues to take forward from Organisation and People

Key issue	When?
Update roading staff training requirements	Annually
Develop and maintain relationships with NZTA	Ongoing
Develop partnership with maintenance contractor	Ongoing

6 Risk, Confidence Levels and Review

6.1 Risk Assessment and Management

6.1.1 Risk identification and treatment

The Council's process for risk identification and treatment is detailed in Appendix 4, Section 8.4. The full Transportation Risk Matrix is also provided in this section. This matrix was as produced from a Risk Workshop held in May 2011. The key risks identified are as follows: -

RISK	POSSIBLE IMPACT	ACTION TO ADDRESS RISK
Future funding for Transmission Gully motorway removed.	Effects to the development of Porirua and on future funding levels.	Advocate with NZTA for continued priority funding and progress on this key project.
Change in governmental Levels of Service requirements.	Road network wide implications with potential major financial / budgeting impacts.	Liaise with NZTA regarding any potential future changes and work transparently with the community.
Damage to street furniture due to overdimension load movements.	Relatively low-cost but potentially repeated damage to Council property.	Liaise with house-moving companies in the area.
External contractors damage Council roads.	Physical damage requiring costly repairs, or general accelerated deterioration of the Council roading network.	Implement management systems for this function.
Death or serious injury contributed to by poor physical road features.	Major effect to community.	Continue work on reducing roading risk, particularly on high-risk roads.

Table 18 - Summary of roading risk matrix

The above actions are to be addressed during 2011/12, along with actions from the other risks identified in the risk matrix.

6.2 Assumptions and Confidence Levels

6.2.1 Assumptions and data confidence

Assumptions

The following assumptions have been made in preparing the expenditure forecasts:

- All expenditure is stated in dollar values as at 1 July 2011 which reflects current contract rates over the 10 year planning period.
- Development works are based on anticipated sub-divisional development and traffic growth.
- Renewal programmes have been based on available condition and performance information and treatment selection programmes.
- The renewal programme aims to maintain the current level of service and condition of assets. This is gradually increasing to allow for new assets accrued annually and any ageing assets.

- Assumptions have been made as to the average useful lives and average remaining lives of the treatment materials (see Section ?).
- The future estimates are developed to project level in the first three years and in outline for at least the next seven years.

The forecasts have been based on current funding thresholds and subsidy levels. Significant potential changes to the forecast may result from:

- Changes in contract rates due to variations in costs and supply / demand issues, contracting policy and service delivery agreements and in NZTA's minimum intervention criteria and subsidy levels.
- Anticipated traffic growth and development being exceeded
- Better information on condition and performance trends
- Changes in Council or Government policy (i.e. accounting policy, NZTA level of funding).

Data confidence

Figure 18 and Figure 19 demonstrate Council's assessment of data confidence and financial data confidence levels, as used in the preparation of this Asset Management Plan. As seen in Sections 3.4 and 4.3, specific plans are in place to improve asset information and asset deterioration rates / asset performance. The improvement of these two aspects will significantly improve confidence on other aspects of the management of the asset.

Confidence over financial data is harder to secure. This is due to the re-tendering of roading maintenance contractor every three to five years, and the uncertainty produced by fluctuating interest rates in the banking system. The confidence levels shown in Figure 19 below reflect this.

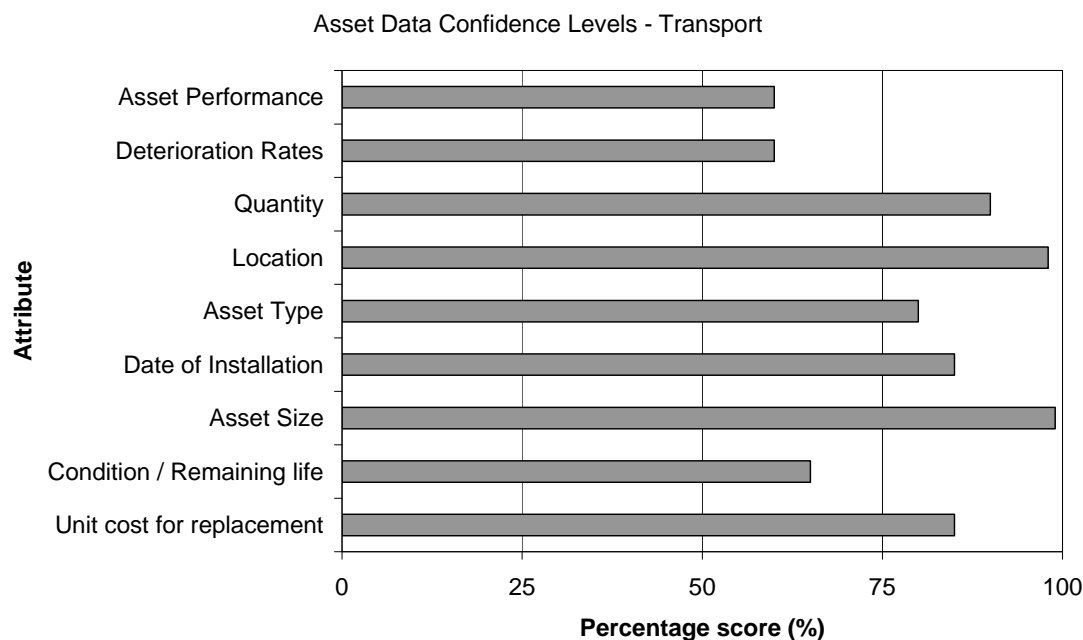


Figure 18 - Asset data confidence levels - Transport

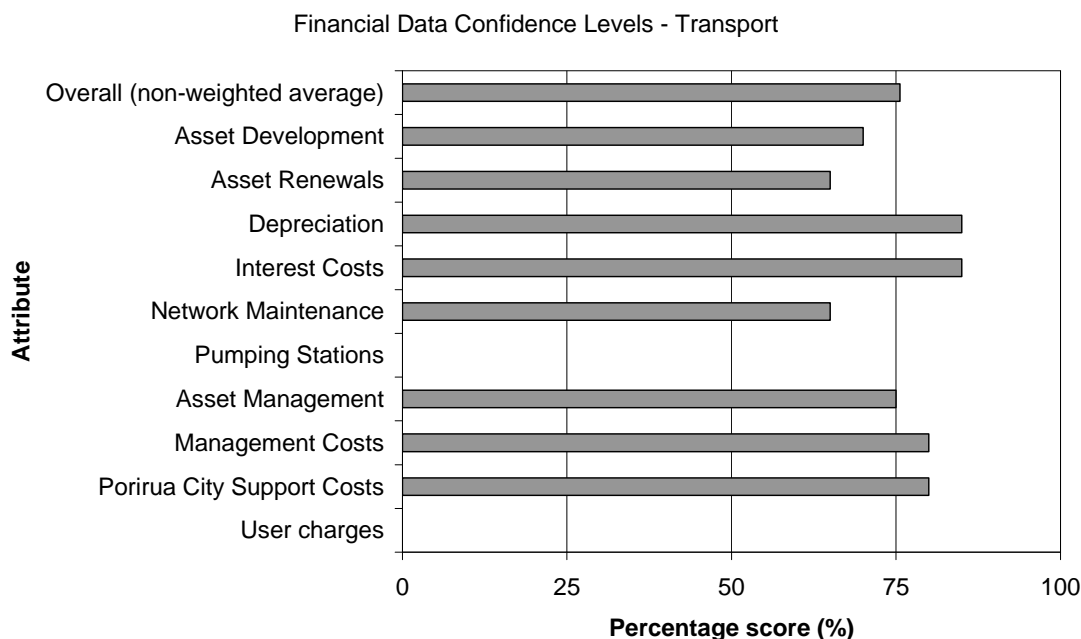


Figure 19 - Financial data confidence levels - Transport

6.3 Future Improvements to this Plan

There are several aspects of the Plan which have been identified as requiring further information, to help further develop the asset management plan and to enable improved management of the roading assets. The programme for implementation of this work is shown in Table 19 below.

In summary, the following general areas (A-E) require work to ensure the improvement of future issues of this Asset Management Plan.

6.3.1 Improvement of Asset Data Quality

Several elements of the asset register information held on RAMM have not been actively maintained and the quality of the underlying information has become unreliable. The data gaps and anomalies have been identified, and will be addressed during 2011 and 2012. This is a key task, as decision making is carried out largely on the basis of the data held in RAMM. See Section 4.3 for more details on this issue.

In addition to improving the quality of the asset data, surveys will be required to establish the condition of the underlying pavement layers of the roading network. This will only be possible through physical testing. The results of tests will be loaded into RAMM, which will inform future dTims and works programmes.

6.3.2 Structures management

Two studies are considered necessary on the Porirua roading network structures: -

- A seismic assessment
- A 'remaining life' study.

The above studies will provide better information on the long-term management of these Council assets.

6.3.3 Network capacity

As outlined in Section 3.3, Council requires a better understanding of what areas of the network will become traffic-saturated, and when. This will allow a greater understanding of where network upgrades will be required, and when they should be delivered by. This work can be carried out in tandem with the work of NZTA, from their Transmission Gully and Whitford Brown intersection studies. This will allow the Council to take advantage of traffic models that have been developed in the area, without the full budget requirements for running the models with its own resources.

6.3.4 High Risk Rural Roads

NZTA is currently producing a document which will aid the identification of High Risk Rural Roads. Developments in this area will be watched by the Council in case recommendations become apparent that affect, particularly, Paekakariki Hill Road and Grays Road.

6.3.5 Update of the Utilities Major Emergency Response Plan

Porirua City Council has produced the Utilities Major Emergency Response Plan – DRAFT April 2012. That plan details specific planning and response measures applicable for each of Council's utility services in the event of various types of disaster or emergency. This supersedes the 2007 version of the document, and takes into account local transport restoration proposals and actions required under Wellington Civil Defence & Emergency Management Group plans relevant to these assets.

6.3.6 Improvements Summary

The following table lists the key elements of the improvement plan and a target completion date for these activities.

Task	Activity	Priority	Target completion date	Council officer responsible for delivery
1	Improve RAMM Database	1	2011	Roading Asset Manager
2	Physical testing of pavement layers	1	2011	Roading Asset Manager
3	Run pavement deterioration model (DTims)	1	2011	Roading Asset Manager
4	Run traffic capacity model to establish roads and intersections that will become saturated, when	2	2011	Roading Asset Manager
5	Transport Strategy – complete	2	2011	Technical Services Manager
6	Develop plan for High Risk Rural Roads – Grays Road and Paekakariki Hill Road		2012	Roading Asset Manager
7	Develop Utilities Major Emergency Response Plan	2	2012	Roading Asset Manager
8	Structures 'remaining life' study	2	2013	Roading Asset Manager
9	Structures seismic assessment	2	2013	Roading Asset Manager

Table 19 - Summary of improvements to this Plan

7 Financial Requirements

A forward works programme has been developed for transport activities, and is presented in Section 3.7 of this Plan. The programme includes cost estimates of activities. Some over-riding financial considerations must be taken into account in planning activities, as detailed in this section.

7.1 Economic Life and Depreciation

Council's policy is to apply depreciation to assets which have a limited lifespan. For example, a road bridge is assumed to have a 100 year life, and the cost of construction of the bridge is assigned across that period to allow an even spread of costs. In this way, Council is able to smooth roading costs across many years.

Looking across all roading assets, the remaining economic life for roading assets and their corresponding depreciated replacement costs have been determined after considering the remaining life and deterioration, and from taking into account guidance from the NAMS manual and Council engineering staff. All assets were depreciated using the straight-line depreciation method as required in the September 2002 amendment to the NZ Infrastructural Asset Valuation and Depreciation Guidelines.

Depreciation costs are included in the LTP are calculated from the Roothing Valuation in Section 2.2 of this plan. Depreciation is not calculated within this Plan.

7.2 Funding Streams and Mechanism

The City's transport network is part of a national and regional transport network. The national benefits are recognized through the significant subsidies that the Council receives from the NZ Transport Agency. The level of subsidy is 44% for maintenance activities of the transport network and 54% for capital upgrades and minor safety works programmes. Whilst the above subsidy covers some cost, the remainder of the roading budget is taken from rates, as collected by Council. It should be noted that NZTA only subsidises transportation network items. Non-transport items that do not attract a subsidy include, for example, recreational footpaths. A full breakdown of what exactly attracts NZTA subsidy is included in the NZTA document "Planning, programming and funding manual".

NZTA funds within three-year cycles, the last of which was for 2009/10 to 2011/12. Once the total sum for road maintenance and renewals has been negotiated and adopted by NZTA and Council, the overall budget of activities can be moved within this three-year cycle, as required. In general, it is considered optimal to have smoothed budgets across years. However, there is the ability to move budget within these three-year cycles.

In addition to the above funding sources, where new subdivision or development work requires upgrading to the roading network, the subdivider or developer may be required to contribute a proportion of the upgrading cost in accordance with the degree of benefit they receive. The Council's District Plan (1999) provides the basis for a financial contribution policy that complies with the RMA.

8 Appendices

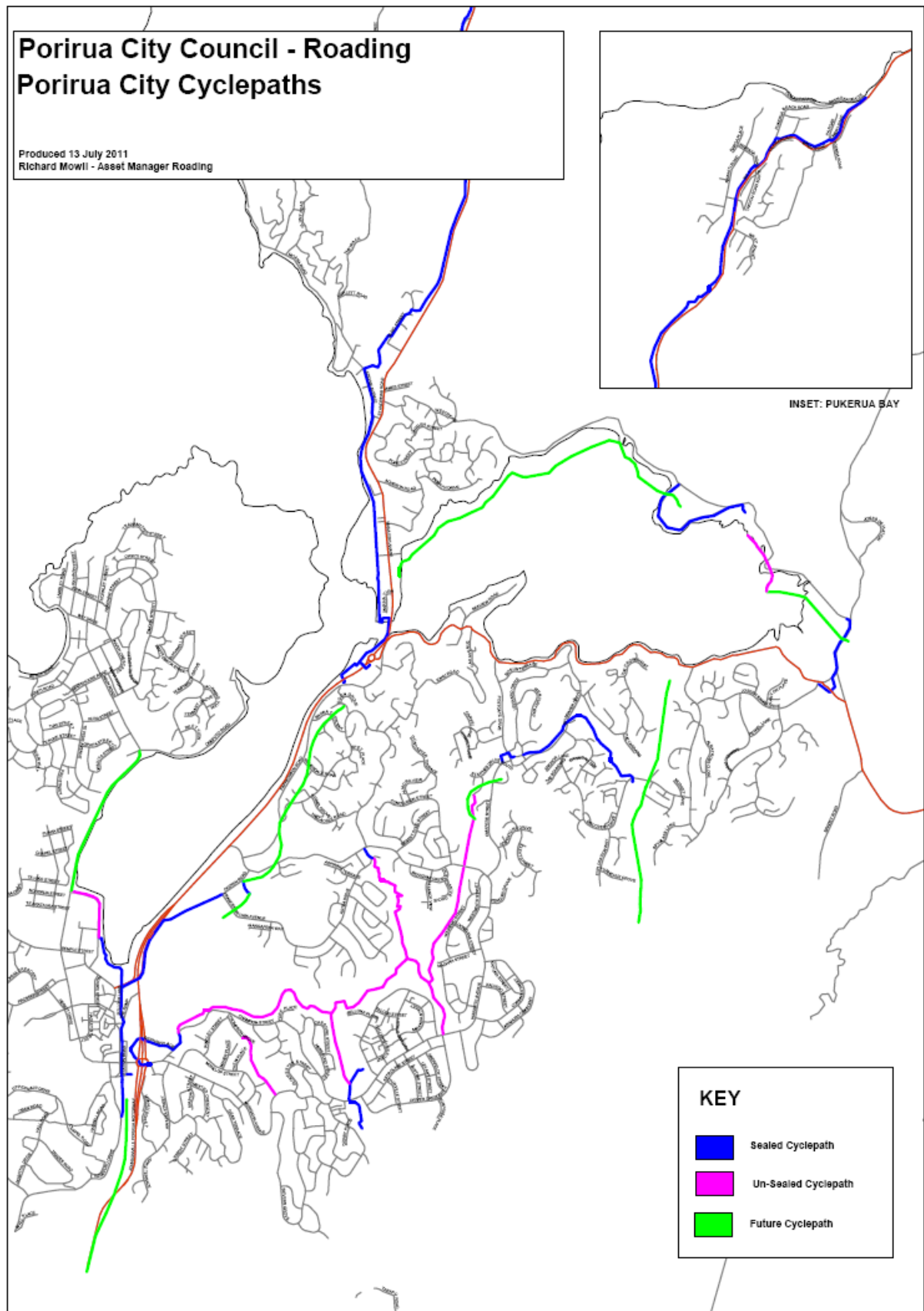
8.1 Appendix 1 - Glossary or Definition of Terms

The term...	is defined as...
AADT	Annual average daily traffic
Abutment	An end support of a bridge or similar structure
Affected community	In relation to a proposed activity, means a group of people who are affected by the proposed activity because of living, studying or working in close geographical proximity to the proposed activity.
Alignment	The horizontal or vertical geometric form of the centreline of the carriageway.
Arterial road	Usually a larger road, that runs between a 'distributor road' and a state highway, or between distributor roads.
Basecourse	The layer of material constituting the uppermost structural element of a pavement, immediately beneath the wearing course; or the graded aggregate that can be used in such a layer.
Benefit cost ratio (BCR)	The ratio that compares the benefits accruing to land transport users and the wider community from implementing a project or providing a service, with that project's or service's costs.
Berm	The edge of a road reserve between the kerb or surface water channel and property boundary, exclusive of footpath.
Bridge	A structure designed to carry a road or path over an obstacle by spanning it. This includes culverts with a cross-sectional area greater than or equal to 3.4 square metres.
Carriageway	That portion of the road devoted particularly to the use of travelling vehicles, including shoulders.
CBD	Central Business District.
Chip seal	A wearing course consisting of a layer or layers of chips originally spread onto the pavement over a film of freshly sprayed binder and subsequently rolled into place.
Collector road	Usually minor roads (residential or commercial) that are the start/end points of journeys. These can connect with distributor roads.
Community programme	A development and delivery, at the community level, of activities addressing safe and sustainable use of the land transport system.
Culvert	One or more adjacent pipes or enclosed channels running across and below road formation level having a cross-sectional area less than 3.4 square metres.
Cycle lane	That portion of the carriageway devoted to the use of cycles only and marked accordingly (but which may occasionally be crossed by motor vehicles, turning at intersections or driveways or manoeuvring into parking spaces).
Cycle path	A separately formed path designed specifically for the use of cycles, to which motor vehicles do not have access.
Demand management	Demand management is a generic classification of strategies that encourage more efficient and sustainable travel and transport behaviour. Demand management has the objective of encouraging motor vehicle users to use alternative means of transport when appropriate while also reducing total vehicle kilometres travelled. This includes freight transport as well as personal travel.
Direction sign	A sign placed usually at an intersection to direct traffic along a route or toward a destination.
Distributor roads	These 'medium sized' roads usually connect the smaller collector roads with other collector roads, or to the larger arterial roads.

dTims	The 'Pavement Deterioration Model' (dTims) is a computer model/programme used to analyse different road funding scenarios.
Emergency reinstatement	The work required to reinstate a road facility damaged by a sudden and unexpected event.
Financial year	The 12 months beginning on 1 July and ending on 30 June.
First coat seal	The initial seal placed on a prepared base course.
Footpath	That portion of road reserve set aside for the use of pedestrians only.
Furniture	A general term to describe features placed on or near the road to improve safety and assist drivers. Furniture includes barriers, guard rails, lighting, parking meters, poles, posts, signs, lights, etc.
Guard rail	A rail erected to restrain vehicles from physically leaving the road, including wire-rope barriers.
GWRC	Greater Wellington Regional Council
Information sign	A sign for the purpose of giving information, not being a warning or regulatory sign.
Kerb	The border of rigid material, usually raised, which is formed at the edge of a traffic lane or shoulder.
Kerb and channel	Combined kerb and drainage channel.
Land transport	Transport on land by any means that the infrastructure, goods and services facilitating that transport, including: <ul style="list-style-type: none"> - coastal shipping (including transport by means of harbour ferried or ferries or barges on rivers or lakes) and associated infrastructure. - the infrastructure, goods and services (including education and enforcement), the primary purpose of which is to improve public safety in relation to that transport.
Local road	Any road, other than a state highway, in the district, and under the control, of a territorial authority.
Long-Term Pplan (LTP)	Long-term Council Community Plan in accordance with section 93 of the Local Government Act 2002.
Marker post	A post placed at the side of the road, equipped with a reflector to assist night driving.
Minor and ancillary works	Works associated with a local road that are determined by the NZTA to be minor and ancillary roading works; but does not include in-house professional services or works associated with a state highway.
Minor safety	Projects of less than \$50,000 in value for the physical works that address a specific road safety concern in a specific location.
New road	Includes a lane that is added to an existing road.
(the) NZTA	The New Zealand Transport Agency established under section 93 of the
Pavement	The road structure that is constructed on the subgrade and supports the traffic loading.
Pavement markings	Any markings on the road to control traffic movement or parking.
Pedestrian crossing	A specially marked area giving right of way to pedestrians crossing the road.
Pothole	A hole in the pavement, frequently rounded in shape, and greater than 70mm in diameter, resulting from loss of pavement material.
Procurement	The purchase of works, goods or services.
Professional services	Technical inputs to an activity undertaken by persons skilled in fields relevant to that activity.
Project	An activity that has a defined start, end and scope.
RAMM	Road Assessment and Maintenance Management system.
Retaining wall	A wall constructed to resist lateral pressure from the adjoining ground or to maintain in position a mass of earth.
Road	An area formed for vehicular traffic to travel on. The term 'road' describes the area between kerbs or surface water channels and includes medians, shoulders and parking areas.

Road controlling authority	The Minister, Department of State, Crown entity, state enterprise or territorial authority that controls the road.
Road reserve	A legally described area within which facilities such as roads, footpaths and associated features may be constructed and maintained for public travel.
Roundabout	An intersection of two or more carriageways at a common level where all traffic travels around a central island, which induces weaving movements in lieu of direct crossings.
Rural	An area within a permanent speed limit greater than 70 km/hr.
Running course	A thin layer of loose stone that protects the basecourse of an unsealed road.
Scour	Where a water channel such as a river or stream cuts into or under a section of earth, or under a section of a structure.
Second coat seal	A chip seal placed on top of a first coat sealed surface.
Shoulder	That portion of the carriageway outside the traffic lanes.
Slurry seal	A road surface treatment consisting of a mixture of bitumen emulsion and fine aggregate.
State highway	A road, whether or not constructed or vested in the Crown, that is declared to be a state highway under section 11 of the National Roads Act 1953, section 60 of the Government Roadings Powers Act 1989 (formally known as the Transit New Zealand Act 1989), or under section 103 of the LTMA; and includes: <ul style="list-style-type: none"> - all land along or contiguous with its route that is the road. - any part of an intersection that is within the route of the state highway. - for the purposes of regional land transport programmes, the National Land Transport Programme and any expenditures approved under section 20 of the LTMA by the NZTA, a proposed state highway.
Street	A road within an urban locality.
Substructure	The piers and abutments (including wing walls) of a bridge, which support the superstructure.
Sump	A drainage item placed normally within the channel adjacent to the kerb that collects sand and gravel prior to stormwater being released to the stormwater pipe system. The resulting sand and gravel can then be cleared periodically.
Superstructure	That part of a bridge structure that is supported by the piers and abutments.
Surface water channel	An open drain or ditch along the side of the road that collects water running off the road's surface.
Sweeping	The removal of loose material from the carriageway.
Traffic lane	A portion of the carriageway allotted for the use of a single line of vehicles.
Traffic island	A defined area within a road, usually at an intersection, from which traffic is intended to be excluded and which is used for control of vehicular movements and for pedestrian refuge.
Traffic volume	The number of vehicles flowing in both directions past a particular point in a given time (e.g. vehicles per hour or vehicles per day).
Urban	An area within a permanent speed limit of less than or equal to 70 km/hr.
Water channel	A channel for the purpose of conveying water, whether lined or unlined.
Wearing course	The surface layer of a pavement intended for skid and abrasion resistance.
Wing wall	The wall extending an abutment, as in a bridge, for retaining the side slopes of earth fill.

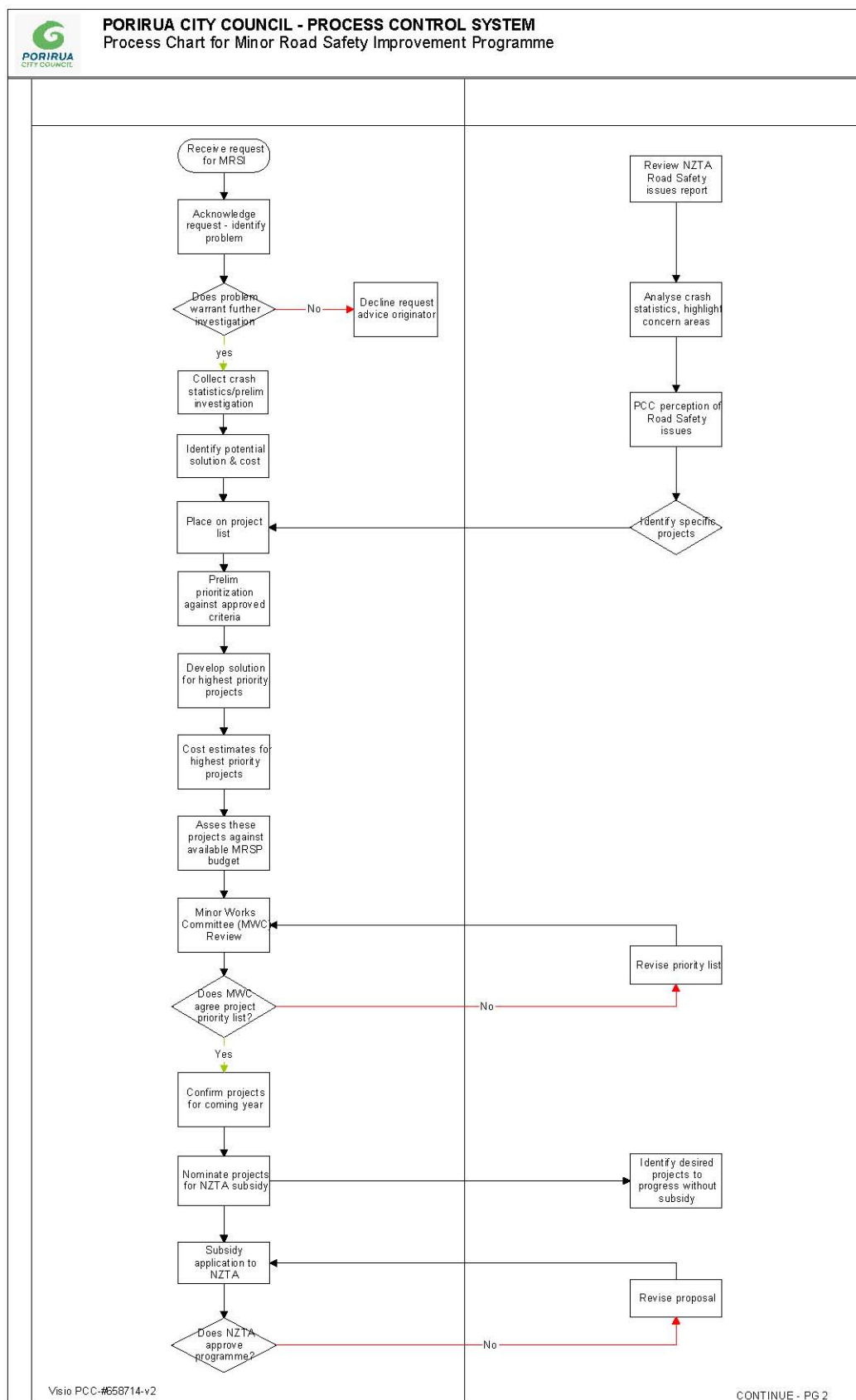
8.2 Map of Porirua cyclepath network

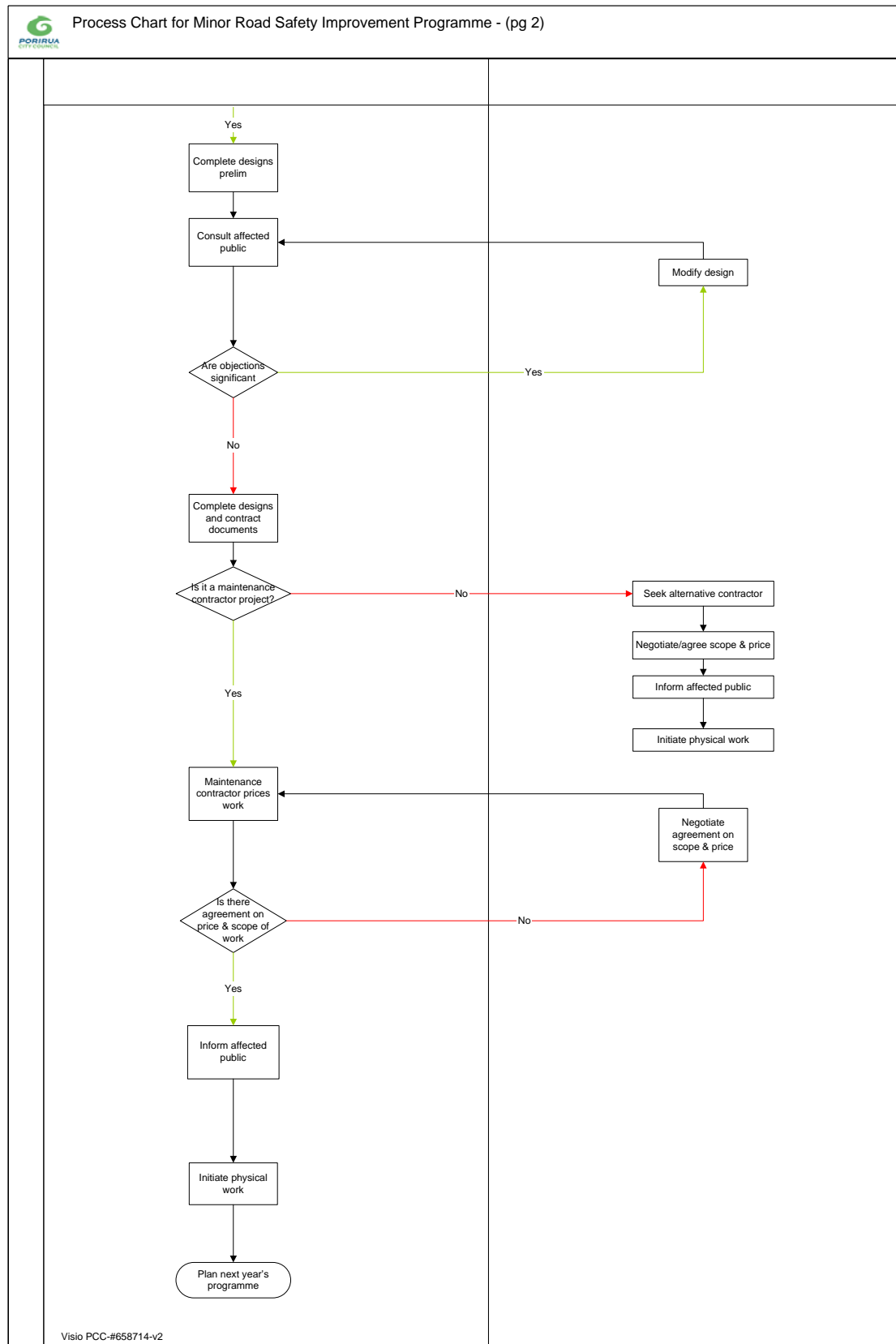


Appendix 2 - Minor Works selection process and criteria

8.2.1 Selection process

The following is the process chart for identifying Minor Road Safety improvement projects.





8.2.2 Prioritisation of Minor Safety Projects

Minor Safety Projects are prioritised using the following guidelines.

High Priority is given to

- Projects arising from Crash Accident Studies
- Projects located at high accident sites
- Pedestrian facilities in Eastern Porirua (high child pedestrian accident rate)
- Pedestrian facilities near schools, kindergartens and public transport facilities
- Projects with easily implemented solutions

Medium Priority is given to

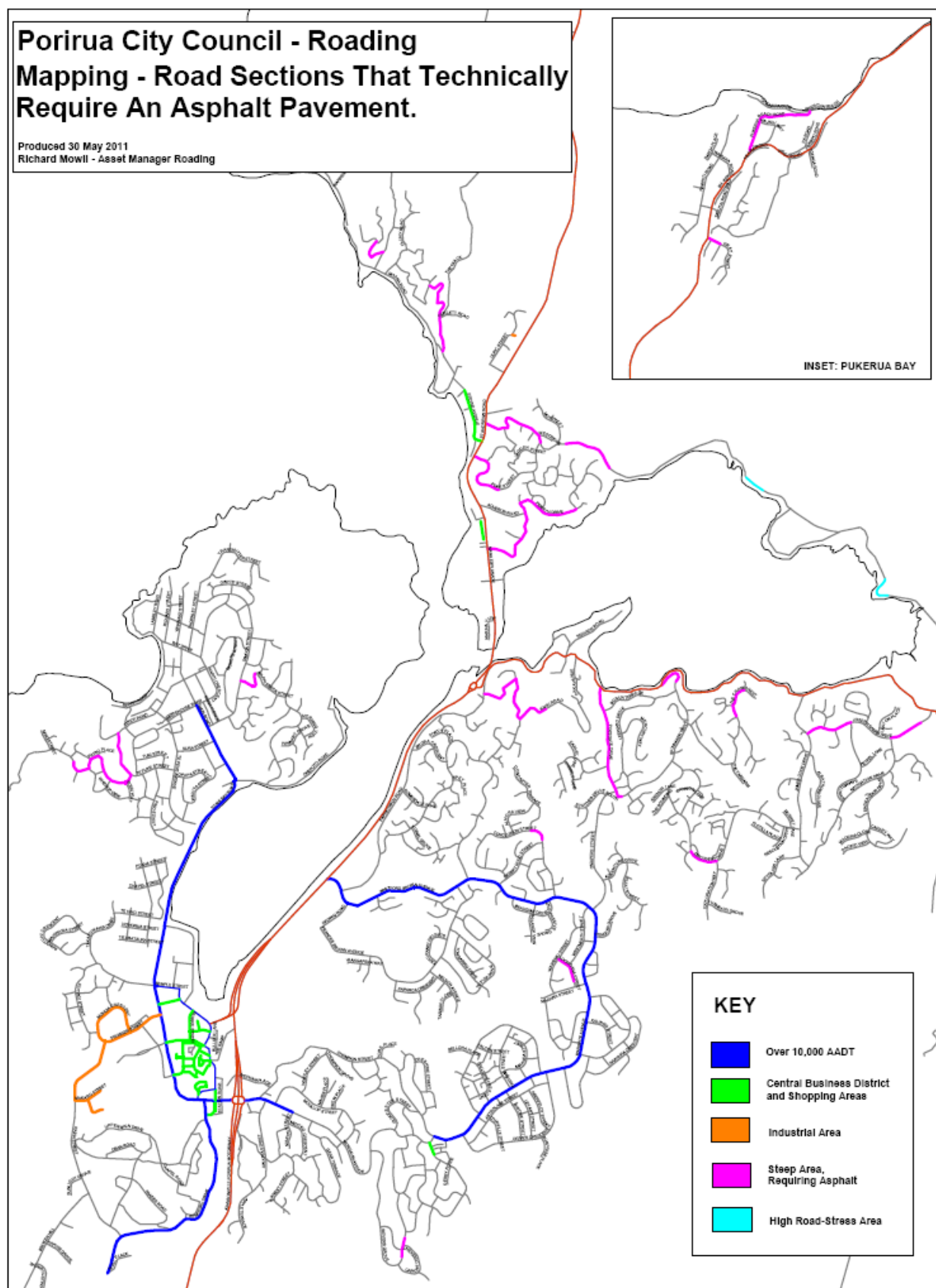
- Projects requested by a significant number of people
- Projects arising from programmed safety inspections and safety audits
- Projects that are linked to other projects (e.g. urban renewal)
- Projects with high benefits and low costs

Low Priority is given to

- Projects requested several years ago, with no recent repeat requests
- Projects requested by an individual
- Projects on low volume roads
- Projects with low benefits and high costs
- Time-consuming projects (studies, reviews, etc)

(This set of criteria was adopted by Council in September 2004.)

8.3 Appendix 3 - Chipseal and asphalt placement locations



8.4 Appendix 4 - Risk Management Framework and Matrix

8.4.1 Risk Framework

Risk Management Process

The adopted risk management process is consistent with Australian/New Zealand standard AS/NZ 4360 which defines risk assessment and management.

Risk Analysis:

The likelihood and impact ratings used to determine initial risk ratings are defined in Table 20 and Table 21 respectively.

Code	Descriptor	Description (probability)
A	Almost certain	The event could occur in most circumstances, e.g. 90% + chance of occurring in the next 12 months (or in 9 out of every 10 years).
B	Likely	The event will probably occur in most circumstances, e.g. 70% chance of occurring in the next 12 months (or in 7 out of every 10 years).
C	Moderate	The event should occur at some time, e.g. 50% chance of occurring in the next 12 months (or in 5 out of every 10 years).
D	Unlikely	The event could occur at some time, e.g. 20-30% chance of occurring in the next 12 months (or in 2-3 out of every 10 years).
E	Rare	The event may occur only in exceptional circumstances, e.g. up to 10% chance of occurring in the next 12 months (or once in 10 years).
F	Extremely Rare	The event may occur only in extremely exceptional circumstances, e.g. up to 2% chance of occurring in the next 12 months (or once or less in 50 years).

Table 20 Risk Probability Ratings

Area of Impact	Factor	1 - Extreme	2 - Major	3 - Moderate	4 - Minor	5 - Insignificant
		Council sued or fined or otherwise liable for more than \$20M	Council sued or fined or otherwise liable for \$5M - \$20m	Council sued or fined or otherwise liable for \$250k - \$5m	Council sued or fined or otherwise liable for up to \$250k	Council prosecuted for minor offence.
Legal	Legal	Catastrophic environmental damage of national importance. Prosecution. Long term study. Impact permanent.	Serious environmental damage of national importance. Prosecution. Long term study. Impact not fully reversible.	Serious environmental damage of national importance. Prosecution expected. Impact reversible within 10 yrs	Serious environmental damage of local importance. Prosecution probable. Impact fully reversible within 1 yr.	Minor localised environmental damage. Prosecution possible. Impact fully reversible within 3 months
Corporate Image	Political	Appointment of a Commissioner.	Decision-making process breaks down.	Council delays decisions.	Breakdown in the relationship between the Council and the CE	
	Image		National adverse political comment for 1 month plus.	Regional adverse political comment for several days.	Local adverse political comment for one week	Local adverse political comment.
			Negative national multi media coverage for 1 month plus.	Negative national multi media coverage for several days.	Negative national media coverage for two days.	Negative national media coverage.
		Negative international multi media coverage for 1 month plus.	Negative international multi media coverage.			
	Councillor/ Management Time		Image	Unplanned collective 30 days of Councillors' or Management's time.	10-15 days of Managers' time.	Up to 2 days of Managers' time.
Service Delivery	Service Delivery	Water supply and sewage out for city for several days +.	Water supply and sewage out for two suburbs for one week.	Water supply and/or sewage out for city for one day.	Water supply and/or sewage out for 2 suburbs for one day.	
			Water supply contaminated.			
		Permanent loss of solid waste facility.	Public amenity closed for one month or more.	Public amenity closed for 2 weeks or more.	Public amenity closed for 1 week or more.	Public amenity closed for less than 1 week.
					Systematic customer complaints, or complaints relating to more than one business area.	Isolated customer complaints.
					Repeated service standard failure or one that affects multiple people.	Isolated service standard failure.
Financial - PCC	Financial	Unplanned loss or cost to reinstate of \$3.5M or greater.	Unplanned loss or cost to reinstate between \$1.75m - \$3.5m.	Unplanned loss or cost to reinstate between \$1.0M - 1.75m.	Unplanned loss or cost to reinstate between \$500k - \$1m.	Unplanned loss or cost to reinstate less than \$500k.
		Ongoing loss of \$400k pa.	Ongoing loss \$200- \$400k pa.	Ongoing loss \$100K- \$200k pa		
Financial - Community	Financial	Catastrophic consequential loss in the community (>\$20 M)	Major consequential loss in the community (\$5 M - \$20 M)	Significant consequential loss in the community (\$1 M - \$5 M)	Some consequential loss in the community (\$250,000 - \$1 M)	Minimal consequential loss in the community (<\$250,000)
Community Health and Safety	Community		People in several suburbs ill through contaminated water or similar.	People in 2-3 suburbs ill through contaminated water or similar.	People in one suburb ill through contaminated water or similar.	Several people ill through contaminated water or similar.
		Multiple loss of life or city-wide epidemic	Loss of life or widespread long-term hospitalisation.	Hospitalisation required	Medical treatment required	
			Dissatisfaction of community measure needs to be included?			

Table 21 Measures of Consequences of Failure

Risk Evaluation

The matrix of likelihood and consequence of failure ratings shown in Table 22 below is used to assess the level of risk, ranking events as low, moderate, significant or high risk.

Likelihood	Consequences				
	1- Extreme	2- Major	3- Moderate	4- Minor	5- Insignificant
A- Almost certain	H	H	C	C	C
B- Likely	M	H	H	C	C
C- Moderate	L	M	H	C	C
D- Unlikely	L	L	M	H	C
E- Rare	L	L	M	H	H
F- Extremely rare	L	L	L	M	M

Table 22 Risks Priority Rating Matrix

This allows all asset and corporate risks to be compared and ranked. The risk policy specifies the following broad treatment strategy for the levels of risk:

L = Low Risk:	Manage by routine procedures
M = Moderate Risk:	Management responsibility must be specified
H = High Risk:	Risk & management strategy identified in AM plan. Failure management plans available
C = Critical Risk:	Risk & management strategy identified in AM plan. Failure management plan specifically addressing event in place.

Example risk rating

Taking a risk from the following risk matrix as a worked example: -

The risk of 'injury or traffic delay on the roading network due to under design of culvert capacity' was considered by the Roothing Risk Committee to have a 'minor' consequence, as it would lead to a potential injury in which medical treatment would be required. The likelihood of such an event was considered to be 'Moderate', or potentially happening once every 2 years. Plotting the minor consequence against the moderate likelihood on the Risk Evaluation matrix (above), it was found that this was therefore a 'Moderate' risk. Therefore, according to the table above, management responsibility must be specified (the Roothing Asset Manager).

Other risks are analysed in the same manner as above.

8.4.2 Rooding Risk Matrix

LOS Service Failure	Asset Group	Caused by	Sector consequence						Likelihood	Risk	Existing	Treatment
			Legal	Corporate image	Service delivery	Financial - PCC	Financial - community	Community health and safety				
Organisational												
PCC eng. dept fails to meet city's needs	All	Loss of corporate knowledge of PCC systems	Insignificant	Minor	Moderate	Minor	Insignificant	Insignificant	C	H		Succession planning
PCC eng. dept fails to meet city's needs	All	Taking community's advice over professional guidance	Insignificant	Minor	Minor	Insignificant	Insignificant	Insignificant	C	M		
PCC eng. dept fails to meet city's needs	All	PCC roading dept does not 'connect up' internally	Insignificant	Minor	Moderate	Minor	Insignificant	Insignificant	C	H		Current organisational review may address
PCC eng. dept fails to meet city's needs	All	Follow haphazard maintenance regime	Insignificant	Minor	Moderate	Minor	Minor	Minor	C	H		External peer review of plans to be undertaken
Progs. Not implemented	All	Lack of professional staff	Minor	Moderate	Moderate	Moderate	Insignificant	Minor	C	H		
AM plans fail to meet city's needs	All	Poor project management	Moderate	Moderate	Moderate	Moderate	Minor	Minor	D	M		
PCC eng. dept fails to meet city's needs	All	Service delivery processes inadequate	Moderate	Moderate	Moderate	Moderate	Minor	Minor	E	M	Annual condition rating data	Cont'd focus on improving processes and data

LOS Service Failure	Asset Group	Caused by	Sector consequence						Likelihood	Risk	Existing	Treatment
			Legal	Corporate image	Service delivery	Financial - PCC	Financial - community	Community health and safety				
Financial / budgeting												
		Fail to maximise roading subsidy contribution	Insignificant Minor	Minor Minor	Insignificant Minor	Minor Moderate	Insignificant Insignificant	Insignificant Insignificant	D C	M		Liaise with NZTA re investigation future changes
Progs. Not implemented failure	All	Inadequate funding allocation to structures	Minor	Moderate	High	High	Minor	Moderate	B	H		Strong AMPs with clear funding reqts
			Minor	Minor	Moderate	Moderate	Insignificant	Insignificant	E			
Widespread road deterioration External age	Pavements	Under-funding (political causes)	Insignificant Minor	Moderate Moderate	Moderate Moderate	Major Extreme	Insignificant Moderate	Insignificant Insignificant	D E	H	Annual condition rating data	As above Ensure correct signage
Widespread road deterioration	Pavements	Under funding (lack of asset knowledge) only removed	Minor Insignificant	Moderate Moderate	Major Moderate	Extreme Major	Insignificant Insignificant	Insignificant Insignificant	D E	H	Annual condition rating data	Advocate with NZTA for continued priority funding
General asset												
		Damage to street furniture due to oversized load movements	Minor Minor	Moderate Minor	Minor Moderate	Moderate Moderate	Minor Insignificant	Insignificant Insignificant	E A	C		Liaise with NZTA re moving any potential future changes
Progs. Not implement'd	All	Loss of asset data from RAMM request for Levels	Minor Minor	Insignificant Minor	Moderate Major	Minor Major	Insignificant Insignificant	Insignificant Insignificant	E C	M		Ensure RAMM data backed-up NZTA over potential
		External contractors damage PCC roads Dispute over requirements	Minor	Moderate	Moderate	Major	Insignificant	Insignificant	A	C		Implement and manage systems for this function
			Minor	Moderate	Moderate	Insignificant	Insignificant	Insignificant	D			
Serious injury / negative image	Footpaths	Poor surface finish requirements	Moderate	Moderate	Moderate	Insignificant	Insignificant Moderate	Insignificant Moderate	D	M	Inspect	Ensure proper maintenance regime in place

LOS Service Failure	Asset Group	Caused by	Sector consequence						Likelihood	Risk	Existing	Treatment
			Legal	Corporate image	Service delivery	Financial - PCC	Financial - community	Community health and safety				
Serious injury / negative image	Streetlights	Lack of street and accessway lighting	Minor	Insignificant	Minor	Insignificant	Insignificant	Major	E	H		Review LTSA records for previous incidents as a result of lighting
Progs. Not implement'd	All	Unavailability of contractors	Minor	Moderate	Moderate	Moderate	Insignificant	Minor	C	H		
AM plans fail to meet city's needs	All	Due to new developments outstripping increases in budget	Minor	Moderate	Moderate	High	Minor	Minor	C	H		Ensure developer contributions contribute to cost of new infrastructure
Traffic delays	Signage	Misdirection	Insignificant	Insignificant	Minor	Insignificant	Insignificant	Insignificant	E	L	Catalogue list of offending signs	
Traffic delays	Roading	Inadequate roading capacity	Insignificant	Moderate	Major	Insignificant	Moderate	Insignificant	D	H	Monitor seasonal pattern of delays	Conduct traffic modelling studies
No parks	Parking	Lack of parking	Insignificant	Moderate	Moderate	Insignificant	Minor	Insignificant	E	M	Wardens monitor parking use	
		Cause pollution of harbour from roading source	Major	Minor	Minor	Minor	Moderate	Moderate	B	H		Monitor pollution levels

LOS Service Failure	Asset Group	Caused by	Sector consequence						Likelihood	Risk	Existing	Treatment
			Legal	Corporate image	Service delivery	Financial - PCC	Financial - community	Community health and safety				
Natural hazards												
Injury / traffic delay		Tree falls on road	Minor	Minor	Minor	Minor	Insignificant	Insignificant	B	H		Monitor vegetation
		Road subsidence due to storm	Minor	Minor	Minor	Minor	Insignificant	Insignificant	C	M		
Serious injury / negative image	Major natural disaster	Major routes closed down for undetermined period	Extreme	Moderate	Major	Extreme	Extreme	Major	E	H		Ensure pre-plans created and maintained
Injury / traffic delay	Culverts	Under design of culvert capacity	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Minor	C	M	New culverts must meet standards	Review of structural capacity and traffic usage
		Structure failure from seismic action	Insignificant	Major	Major	Moderate	Moderate	Insignificant	F	M		Investigate seismic strengthening requirements
Road safety												
Death/serious injury	Road network	Peak in High Risk Rural Road fatalities	Moderate	Moderate	Insignificant	Minor	Insignificant	Insignificant	C	H		Reduce risk on High Risk Roads
Death/serious injury	Road network	Unacceptably high rate of death/injury on roads	Minor	Moderate	Insignificant	Minor	Insignificant	Insignificant	E	M		Continue road safety initiatives
Death/serious injury	Road network	Poor existing physical road features	Moderate	Minor	Major	Moderate	Minor	Minor	C	C		Reduce risk on High Risk Roads

8.5 Appendix 5 - Large Project Prioritisation Criteria

'Strategic Fit' Assessment, including Community Issues

A strategic fit assessment considers how an identified problem, issue or opportunity aligns with the NZTA's strategic investment direction. Strategic fit ensures that the activities the NZTA approves for funding address issues that are significant from a national perspective.

Guidelines are provided for the assessment of the terms shown in **bold** in the high, medium and low columns below.

Note: The criteria below replace the previous criteria for the 'seriousness and urgency' assessment factor.

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
New and improved infrastructure for state highways and local roads	<p>Roads of National Significance, including local and/or services identified¹ as critical to the operation of a RONS</p> <p>Potential for a major contribution to national economic growth and productivity on:</p> <ul style="list-style-type: none"> ○ Freight routes including designated routes for High Productivity Motor Vehicles ○ Tourism routes ○ Urban arterials critical for maximising access to significant markets, areas of employment or economic growth. <p>Potential to significantly reduce the fatal & serious crash risk on a high rural road or a high risk urban intersection including:</p> <ul style="list-style-type: none"> ○ Part of a high risk motorcycle route treatment programme ○ Safe system demonstration projects 	<p>Potential for significant reduction in fatal and serious crash risk</p> <p>Potential for significant improvements on key routes in <i>one or more of</i>:</p> <ul style="list-style-type: none"> ○ Journey time reliability ○ Congestion in main urban areas ○ Capacity constraints ○ Network security and resilience 	All other

¹ These roads and/or services will be identified by the NZTA RONS network plans in consultation with relevant stakeholders.

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
Walking and Cycling facilities	<p>Part of a Model Walking/Cycling Community ² with the objective to reduce congestion in main urban areas.</p> <p>Promotion and education activities for walking and cycling within a model community</p> <p>Potential for significant improvements in safety for pedestrians and cyclists at high risk urban intersection and on mixed use arterials</p>	<p>Potential for significant improvements in <i>one or more of</i>:</p> <p>Safety for pedestrians and cyclists</p> <p>Links to complete or complement existing key walking and cycling networks with the objective to reduce congestion in main urban areas</p> <p>Uptake of walking and cycling in major urban areas</p>	All other
Public transport infrastructure	<p>Potential for significant improvements in <i>one or more of</i>:</p> <ul style="list-style-type: none"> ○ Peak time public transport patronage in major urban areas with severe congestion; and ○ Optimising public transport services and infrastructure 	<p>Potential for significant improvements in <i>one or more of</i>:</p> <ul style="list-style-type: none"> ○ Transport choice in major urban areas, particularly for those with limited access to a car or who are vulnerable to changes in fuel prices ○ Public transport network and interchange capacity constraints in major urban areas ○ Transport interconnections and ease of changing modes in major urban areas ○ Safety ○ Network security and resilience 	All other

² Refer to NZTA Model Communities

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
Public transport services	<p>Potential for significant improvements in <i>one or more</i> of:</p> <ul style="list-style-type: none"> ○ Peak time public transport patronage in major urban areas with severe congestion; and ○ Optimising public transport services and infrastructure; and ○ Fare box recovery rates 	<p>Potential for significant improvements in <i>one or more</i> of:</p> <ul style="list-style-type: none"> ○ Transport choice in major urban areas, particularly for those with limited access to a car or who are vulnerable to changes in fuel prices ○ Transport interconnections and ease of changing models in major urban areas ○ Safety ○ Network security and resilience ○ Reducing the adverse environmental effects from land transport 	All other

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
Renewal, maintenance and operation of state highways and local roads	Potential to make better use of existing infrastructure on key routes and to optimise levels of service for network security, resilience and safety	Potential for timely intervention to meet agreed levels of service on existing infrastructure for: <ul style="list-style-type: none"> ○ Safety in terms of deaths and serious injuries ○ Network security and resilience ○ Managing adverse environmental effects from land transport ○ Efficient network management 	All other
Road user safety (this has replaced demand management and community programmes)	Road user behaviour change activities: <ul style="list-style-type: none"> ○ Specified in the Safer Journeys Action Plan ○ Or delivered through <ul style="list-style-type: none"> * national programmes in a Safer Journeys area of high concern * local programmes ³ for a community at high risk ⁴ activities required to initiate the Safer Journeys First Actions for: <ul style="list-style-type: none"> ○ Young drivers ○ Alcohol and drugs ○ Motorcycling 	Road user behaviour change activities delivered through: <ul style="list-style-type: none"> ○ National programmes in a Safer Journeys area of medium concern ○ Local programmes for: <ul style="list-style-type: none"> * a Safer Journeys area of medium or high concern * a community at medium risk ongoing activities required to deliver Safer Journeys	All other

³ Includes national activities to support local programmes

⁴ Territorial authorities identified in the 'Communities at risk' register as having a high risk for a particular safety issue will get 'high strategic fit' for an initiative or programme that address those particular issues

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
Transport Planning	<p>Potential to apply the best practice planning processes set out in the medium criteria to one or more of the following:</p> <ul style="list-style-type: none"> Addressing the impacts the impacts of RONs on local and other state highway networks (where these studies are required) Extracting maximum value from transport services and infrastructure Aiding understanding of a Safer Journeys area of high concern or the delivery of a Safer Journeys key action Network optimisation in areas projected to experience significant demographic or industrial change Improve journey time reliability and easing congestion in urban areas Enabling the establishment or development of freight routes or tourism routes, including those for High Productivity Motor vehicles 	<p>Potential to apply best practice planning processes including:</p> <ul style="list-style-type: none"> Providing long term, strategic local, regional and national planning Ensuring integration between transport planning, land use and other infrastructure Creating opportunities for better integration within and between transport modes Making better use of existing services and infrastructure Managing adverse environmental effects from land transport Adopting a coordinated approach with relevant stakeholders <p><i>And</i></p> <p>Focussed on areas where there is a medium strategic fit under the activity class(es) that are likely to be the outputs of the planning</p>	All other
Sector Training and Research	<p>Research in the key areas of:</p> <ul style="list-style-type: none"> Valuation of the economic growth and productivity benefits of land transport activities and their management The benefits of integrated planning Network optimisation and extracting maximum value from services and infrastructure The implementation of the Safer Journeys action 	<p>Research that addresses two or more of the following areas:</p> <ul style="list-style-type: none"> Transport demand management Sustainable land transport Safety, security and public health Environmental impacts of land transport 	All other

	<p>plan</p> <ul style="list-style-type: none"> o Improving journey time reliability and easing congestion in urban areas o Training in the key areas of: o Safe System capability needs o Transport economic evaluation o Travel demand management, with a focus on congestion relief 		
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'Effectiveness' assessment

The effectiveness assessment considers the contribution that the proposed solution makes to achieving the potential identified in the strategic fit assessment, and to the purpose of the LTMA and the relevant NZTS objectives. Higher ratings are provided for those proposals that provide long term, integrated and enduring solutions.

Guidelines are provided for the assessment of the terms shown in **bold** in the high, medium and low columns below

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
All activity classes	<p>Evidence is provided to demonstrate that the activity or combination of activities delivers on <i>each</i> of:</p> <ul style="list-style-type: none"> Meets all of the low and medium effectiveness criteria Improves integration within and between transport models, where appropriate to the activity Provides a solution that integrates land transport, land use and other infrastructure, where appropriate to the activity Supports networks from a national perspective, where appropriate to the activity Is an optimised transport solution 	<p>Evidence is provided to demonstrate that the activity or combination of activities delivers on <i>each</i> of:</p> <ul style="list-style-type: none"> Meets all the low effectiveness criteria Is part of an accepted strategy, activity management plan or macroscope Is significantly effective in achieving the potential identified in the 'strategic fit' assessment. Provides a long term solution with enduring benefits appropriate to the scale of the solution Provides a solution that considers land use strategies and implementation plans, where appropriate to the activity 	<p>Evidence is provided to demonstrate that the activity or combination of activities delivers on <i>each</i> of:</p> <ul style="list-style-type: none"> The potential identified in the 'strategic fit' assessment, including the regional dimension of the GPS impacts The purpose of the LTMA and the relevant NZTS objectives <p>Has considered:</p> <ul style="list-style-type: none"> * All relevant problems, issues and opportunities * All appropriate alternatives and options * Opportunities for collaboration * Any adverse effects or impacts <ul style="list-style-type: none"> Is an affordable solution Avoids duplication of activities The scale of the proposed solution is appropriate to the potential identified in the strategic fit assessment

'Economic Efficiency' Assessment

The economic efficiency assessment considers how well the proposed solution maximises the value of what is produced from the resources used. The benefit cost ratio (BCR) provides a basis to rate the economic efficiency for projects and packages. If a proposed solution has demonstrable non-monetised benefits that are not included in the BCR, then these should be taken into account and may, if the NZTA considers these benefits to be significant, result in a higher rating.

Activity Class	Strategic Fit Assessment Criteria		
	High	Medium	Low
All activity classes	Benefit cost ratio greater than or equal to 4.	Benefit cost ratio greater than or equal to 2 and below 4	Benefit cost ratio greater than or equal to 1 and below 2 Benefit cost ratio lower than 1 will only be considered for funding in exceptional circumstances and at the discretion of the NZTA Board.

5 For assessment of road operations, maintenance and renewal programmes and passenger transport programmes, alternative methods may be used in place of BCR

8.6 Appendix 6 - Potential large roading projects

Projects ranked, according to highest strategic fit/effectiveness, economic efficiency highest.

	Title	Strat. fit	Effect -iveness	Econ effic	Estimated Cost	BCR	Comments
1	Transmission Gully Link Roads - new road	H	L				Investigation, design, gaining of consents and construction of link roads connecting Porirua with new interchanges to be built as part of the Transmission Gully Motorway project. CONSTRUCTION TO START IN 2016.
2	Airlie Rd Bridge replacement	M	L		\$1,400,000	99	Replacement of the existing single-lane timber truss bridge with a tow-lane bridge to meet traffic demand. CONSTRUCTION TO START BY 2012.
3	Titahi Bay Rd/ Kenepuru Dr - Intersection improvement	M	L				Increased traffic requires redesign of this intersection. INVESTIGATION TO START BY 2016.
4	Whitford Brown/Papakowhai - intersection improvement	M	L				PROGRESS DEPENDS ON NZTA REVIEW, UNDERWAY IN 2011.
5	Okawai/ Whitford Brown - Intersection improvement	M	L		330,000		Okowai Road currently serves only Aotea College and Gear Homestead and the T-intersection is adequate for current traffic volumes. As the Aotea block develops further to the south more traffic will use this road and an upgraded intersection will be required. PROGRESS DEPENDS ON NZTA REVIEW, UNDERWAY IN 2011.
6	Kenepuru stream cycleway - cyclists	M	L				Kenepuru Strm cycleway: Continue to Tawa to meet up with WCC path. INVESTIGATIONS START IN 2012.
7	Raiha/Kenepuru - intersection improvement	M	L				NO START DATE IDENTIFIED.
8	Onepoto-Wi Neera Drive walkway/cycleway	M	L				A harbour edge walkway from Wi Neera Drive to Onepoto advances the walkway network of the city
9	City Centre direction signage for pedestrians	M	L				
10	Titahi Bay/Lyttelton - intersection improvement	L	L				
11	Flighty's Road Bridge improvement/replacement	L	L				
12	Moana Road Sea Walls	L	L		100,000		The seawall along Moana Road has a number of areas where stones have been loosened by sea action. Upgrade required.
13	Titahi Bay Road - retaining walls / structures	L	L		\$1,200,000		Accelerate the work done to repair retaining walls/ structures above and below city roads
14	Airlie Road - rural road upgrade	L	L				
15	Belmont - rural road upgrade	L	L		\$314,000		Slips repairs (road stabilisation start 2006/07); signs and marking, removal of dangerous trees, drainage works: culvert (new and extension of existing), channel.

16	Bradey - rural road upgrade	L	L		n/a		Signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing), channel.
17	Flighty's - rural road upgrade	L	L		n/a		Signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing) channel.
18	Grays Rd - rural road upgrade	L	L		\$45,000		Signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing), channel.
19	Harris - rural road upgrade	L	L		\$149,000		Seal 1.5km (started 2006/07 and completed by June 2009, rate 500m per annum); signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing), channel.
20	Jones Deviation - rural road upgrade	L	L		\$23,000		Signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing), channel.
21	Moonshine - rural road upgrade	L	L		\$198,000		Scours repairs (start 2007/08); signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing) channel, concreted water table channel sumps.
22	Mulhern Rd - rural road upgrade	L	L		\$211,000		Signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing) channel.
23	Murphy's - rural road upgrade	L	L		\$158,000		Signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing), channel.
24	Paekakariki Hill Rd - rural road upgrade	L	L		\$418,000		Slips repairs (start 2008/09); signs and marking, removal of dangerous trees; drainage works: culvert (new and extension of existing), channel.
25	Champion/Mungavin - cyclists	L	L				Champion St/ Mungavin roundabout: Section down to the entry under the motorway. There is no shared bike track, path is narrow and road section has no shoulder or safe access.
26	Parumoana roundabout - cyclists	L	L				Multiple issues to be addressed.
27	Accessways Lighting		L		150,000		There are many accessways in the City between streets that are unlit. Some of these have bends along them and are particularly dark. The cost of providing lighting mid way along these accessways is high as long lengths of cabling are required.
28	Airlie Road Footpath	L	L				
29	City Centre Promenades for pedestrians		L		300,000		This project is for the provision of an easily identified pedestrian route from the railway station and the old part of the city centre shopping area past Te Rauparaha Park to Pataka, the Megacentre and the Harbour.
30	Jillett / Morere Accessway		L				
31	Muri Road Footpath	L	L				
32	Titahi Bay Road - pedestrian under/over pass	L	L				
33	City centre revitalisation		L				
34	Housing New Zealand Urban Renewal		L				Investigation, design and programme of construction for renewed urban transport amenities to improve the living environment for residents
35	Mungavin Bus/Rail interchange		L				

36	Prosser Street Carpark		L				
37	Titahi Bay/Onepoto/Kahutea - intersection improvement		L				
38	Titahi Bay/Prosser - intersection improvement		L				
39	Titahi Bay/Te Pene - intersection improvement		L				
40	Kenepuru / Main Drive Hospital - Intersection improvement		L				
41	Jellico Realignment to Parumoana Roundabout - intersection improvement		L				
42	Eskdale Road - road extension		L				
43	Whitby link - road extension		L				
44	Routeburn Rd to Warspite - road extension		L				
45	Pauatahanui by-pass - road extension		L				
46	Aotea Block Southern Connection - new road		L				
47	Raiha Street - promotes as alternative route, signage & intersection improvements		L				