State Highway Asset Management Plan 2012–2015

This plan describes the services that our state highway system provides now and in the future, how we intend to manage the assets we use, and how we intend to fund the work that is needed.

NZ TRANSPORT AGENCY
WAKA KOTAHI

New Zealand Government

State Highway Asset Management Plan 2012–15

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More information

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Foreword

The state highways, valued at $25 billion, are an essential asset for the productivity of New Zealand. They provide efficient and reliable travel to almost half of all vehicle traffic and 70% of freight traffic. We run 24/7 services to ensure that traffic flows well and we respond to events as soon as we can.

This plan covers maintenance, operations and improvements provided by the NZ Transport Agency, making it a complete picture of how we operate, maintain and improve the network in order to continue to deliver its vital role safely and efficiently.

It closes out a step change in our work that was highlighted by the Office of the Auditor-General, while also incorporating our Customers First approach, which links customer input from focus groups and consultation with the Automobile Association (AA) and the Road Transport Forum (RTF) with our programmes of works.

While the State Highway Asset Management Plan is just a document, we will be aligning our everyday work with its guidance in order to deliver true value. This is a challenge for us to make a meaningful difference in better achieving our targets. To do this we will require another step change in order to align all our efforts only where we can demonstrate a clear need for work as well as the efficiency of the work.

We look forward to demonstrating the practice.

Colin Crampton
Group Manager of Highways and Network Operations for the NZ Transport Agency

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1 Introduction

New Zealand's state highway network is extensive and diverse. Although it is only a small part of the country's total road length, it carries the majority of its traffic and is a vital contributor to the country's economy. Accordingly, the assets and expenditure of the NZ Transport Agency (NZTA) are significant and require robust management. The primary business of the NZTA is to assist road users to plan and make trips across the state highway network as reliably and safely as possible for the minimum long-term cost. The State Highway Asset Management Plan describes how our network of assets provides these services now and in the future, and how we effectively and efficiently manage them.

This plan draws on the more detailed Regional Asset Management Plans. It informs our different audiences, such as NZTA staff and the NZTA Board, the Ministry of Transport, road user groups and stakeholders, and the government, about our objectives and how we will achieve them. It links our high-level statutory and strategic objectives with our day-to-day business processes, operations on the network and our investment decisions. Taking an asset management approach also means that we recognise the consumption of assets over time. It helps us better understand the longer term implications of decisions we make about assets today – and helps to ensure costs are incurred at the optimal time now and in the future.

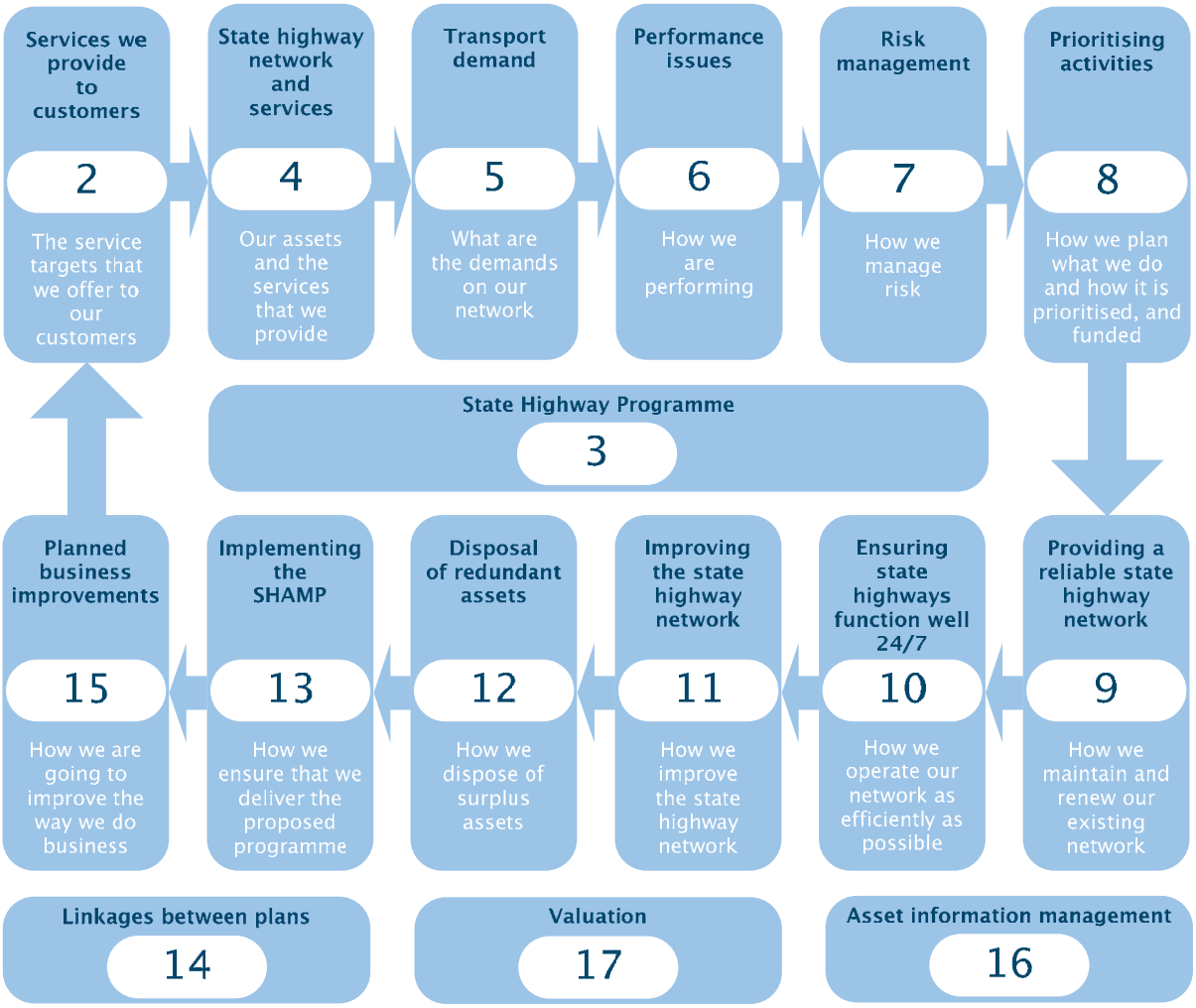
Scope

The State Highway Asset Management Plan covers the infrastructure assets that form the state highway network, including carriageways, structures, drainage features, traffic facilities and lighting, traffic management and other services. It covers all forms of expenditure, beginning with capital investment and including the operation, maintenance, renewal and disposal of assets.

This asset management plan is set out according to the flow shown in figure 1.1. This is the framework we use to make asset management decisions. The process starts with the services offered to customers using the state highway network, and considers the current and future demand on the network, its performance and the risks to those services, all of which inform how we prioritise our actions. This process is used to build our maintenance and renewals, operations, improvements and disposal plans, which comprise the state highway programme. Then we consider how we ensure the programme is delivered to target and how we can improve our process before the next cycle begins.

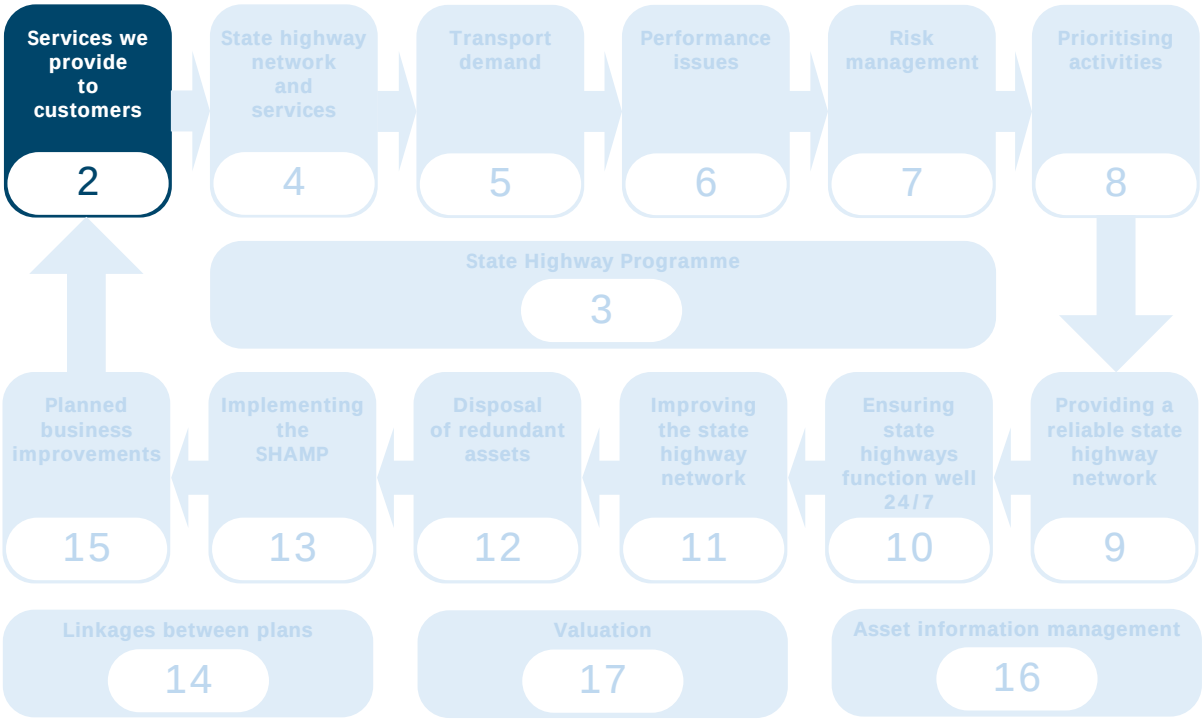
The State Highway Asset Management Plan forecasts our long-term capital and operational funding needs, enabling the government to plan for adequate provision. The plan provides a robust, 10-year forward works programme

Figure 1.1 The NZTA's State Highway Asset Management Plan



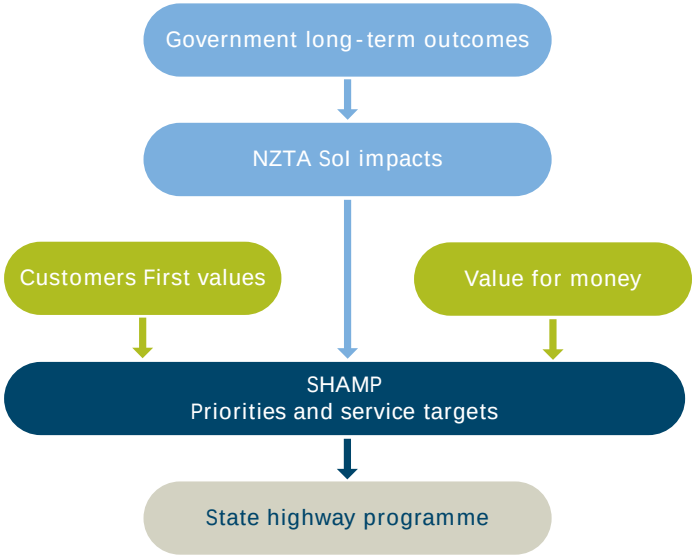
Note that the numbers in figure 1.1 relate to the sections in this document.

2 Services we provide to customers



The services the NZTA provides to customers are led by statutory requirements and strategic direction from the government, in particular from the *Government policy statement on land transport funding 2012/13–2021/22* (*Government policy statement*). This direction feeds into the NZTA strategies and associated documents that address our strategic priorities (such as improved safety, reliable journeys and freight efficiency), including the *Statement of intent*, the Investment and Revenue Strategy, the draft State Highway Network Strategy and the draft Network Access and Use Strategy.

Figure 2.1 State highway programme inputs



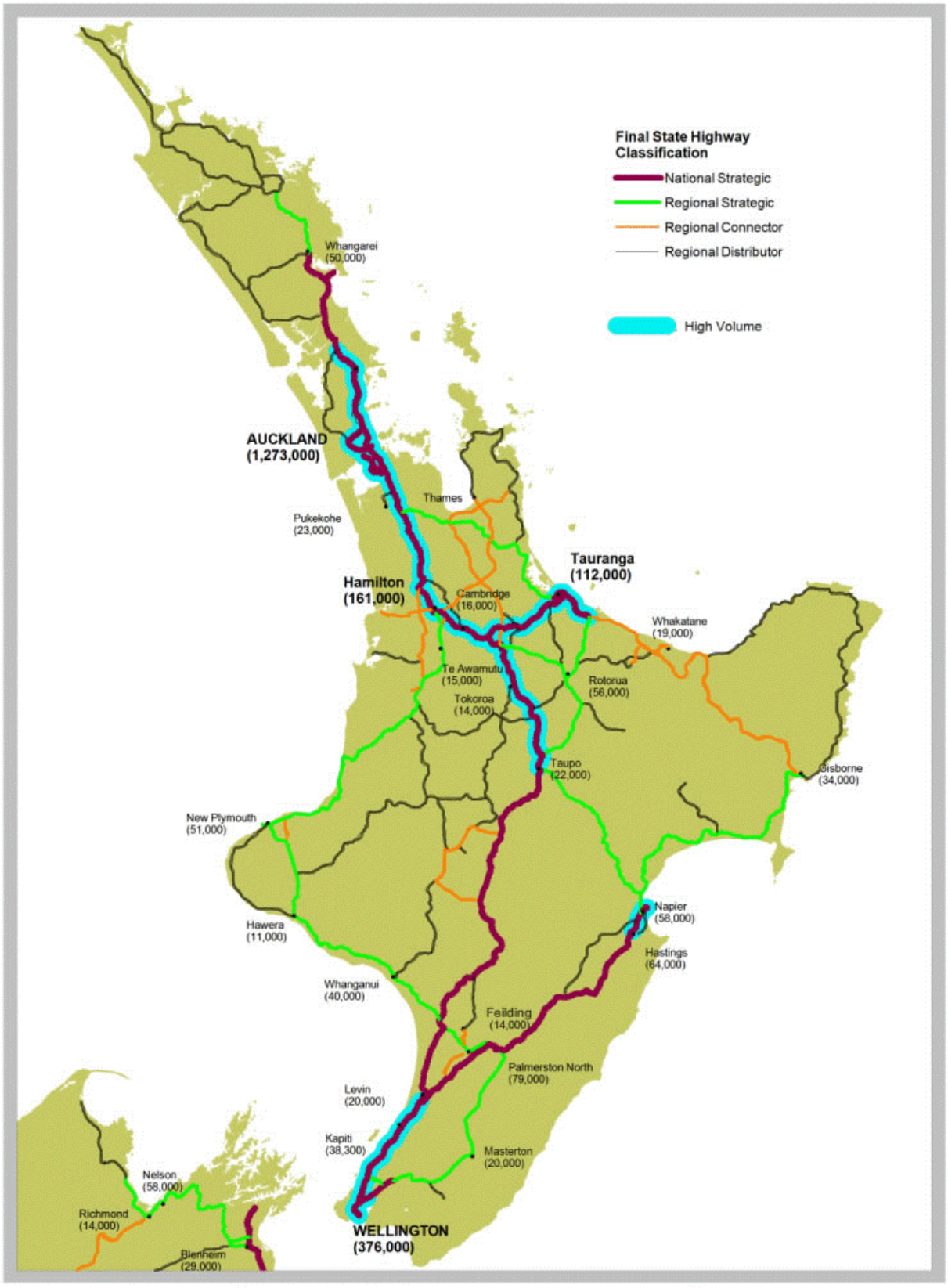
We developed the service targets for this plan by integrating the *Statement of intent* impacts and customer service values. These are shown in table 2.1. However the State Highway Network Strategy and our long-term level of service targets are still to be finalised.

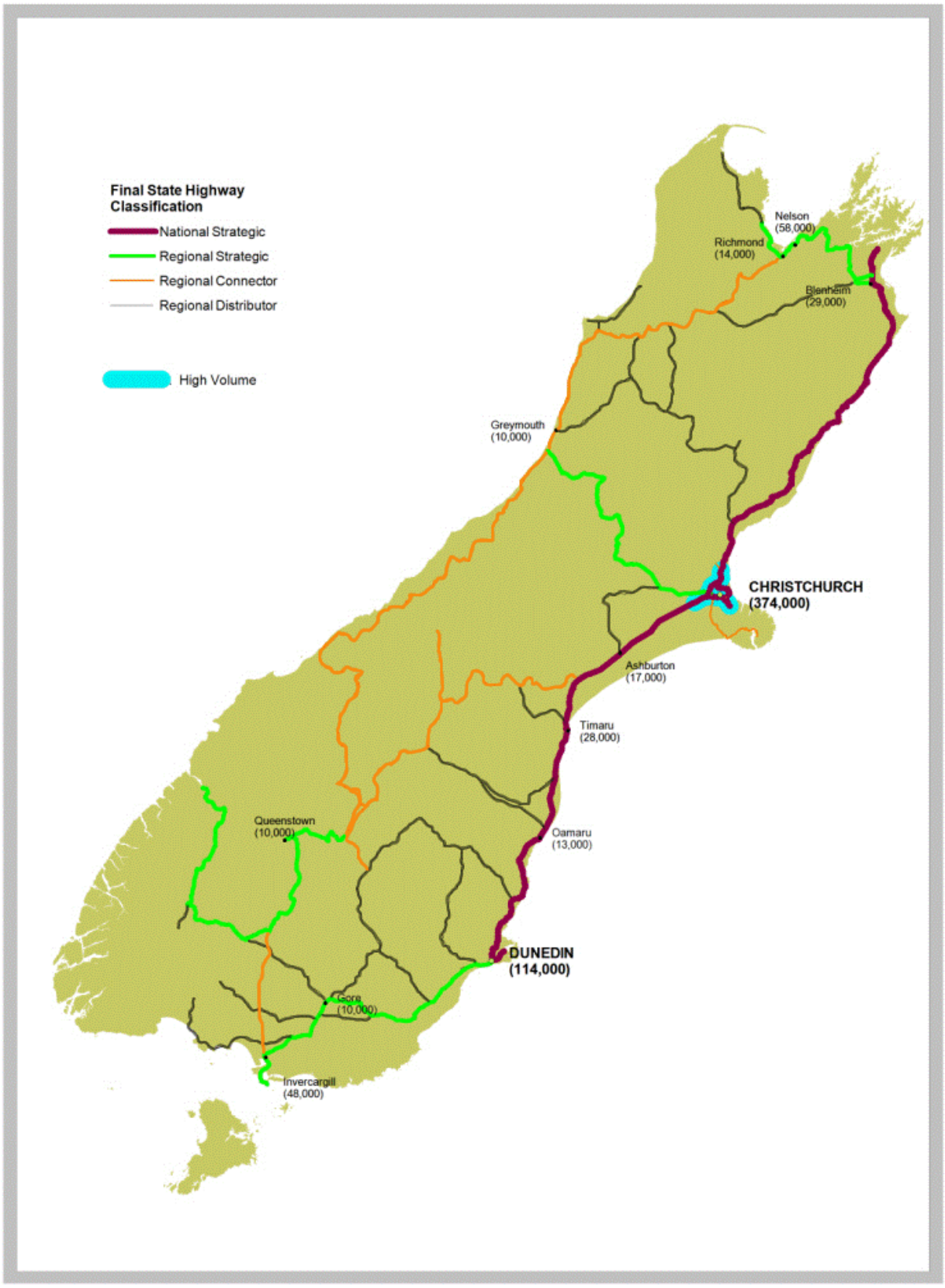
Table 2.1 Customer-focused service targets covering network performance

Targeted service	State highway classification	
	National Strategic (High Volume)	National Strategic
Speed environment	**High speed** (100km/h motorway/ expressway, 80–100km/h rural, 50–70km/h urban)	**High speed** (80–100km/h rural, 50-70km/h urban)
Journey time reliability	**Reliable & improving**, RoNS substantially complete by 2021 Improved traffic operations **Targeted** capacity improvements to release full benefits of prior investment	**Reliable**, some **moderate improvement** **Targeted** capacity and passing opportunity improvements on corridors
Passing opportunities	**Good opportunities**, typically provided by multi-lane roads or passing lanes	**Good opportunities**, typically provided by multi-lane roads or passing lanes
Access control	**Controlled/ limited** – expressways, **limited access/tightly managed** – other roads	**Controlled/ limited** access and generally **tightly managed**
Traffic management	**Proactive management**, through intelligent transport systems (ITS), traffic control centres	**Proactive management** of holiday and other events/incidents
Safety performance rating	**Generally 4 star** safety rating, some 3 star accepted	**3 to 4 star** safety rating
Road width	**Width supports speed environment**	**Width supports speed environment**
Intersections	**Grade-separated intersections** on **busiest lengths**. **Widely spaced** intersections	**Widely spaced** intersections
Road safety improvements	**Targeted prevention** of crashes and protection from harm	**Targeted prevention** of crashes and protection from harm in high-risk areas
Condition	**Proactive management** of low noise, smooth, high friction surfacing as needed, pavement integrity	**Proactive management** of typically skid resistant, smooth, high friction surfacing as needed, pavement integrity
Maintenance intervention	**Prevention** of failures, **rapid response** to make safe & repair faults	**Prevention** of failures, **proactive management** of faults

State highway classification		
Regional Strategic	Regional Connector	Regional Distributor
Moderate to high journey speed (typically 70–90km/h rural, 50km/h urban), targeted speed to suit topography	**Current speed environments maintained when safe** (typically 60–90km/h rural, 50km/h urban), **targeted speed** to suit topography/ road configuration	**Current speed environments maintained when safe**, (typically 50–80km/h rural, 50km/h urban), **targeted speed** to suit topography/ road configuration
Reliable, minor congestion accepted in peak traffic periods **Targeted capacity and passing opportunity improvements on corridors**	**Mostly reliable**, but will be predictable with the public informed of expected changes. Moderate peak congestion **Specific** improvements targeted at high-priority bottlenecks	**Predictable**, some time of day/season variability accepted. Moderate peak congestion **Specific** improvements targeted at high-priority bottlenecks
Targeted passing lanes on high-volume routes, targeted passing opportunities where topography warrants	**Current configuration maintained**, **targeted** passing opportunities where topography warrants	**Current configuration maintained, targeted** passing opportunities where topography warrants
Local access limited and carefully managed for journey time reliability & safety	**Access minimised but permitted** as long as it is safe and has little impact on journey time reliability	**Access minimised but permitted** as long as it is safe and has little impact on journey time reliability
Targeted event/incident management	**Targeted** event/incident management	**Targeted** event/incident management
3 to 4 star safety rating	**2 to 3 star** safety rating	**2 to 3 star** safety rating
Width supports speed environment	**Width and speed environment compatible**	**Width and speed environment compatible**
Current configuration generally maintained	**Current configuration generally maintained**	**Current configuration generally maintained**
Targeted at high-risk areas. Safety upgrades for high-risk intersections	**Specific improvements targeted** at high-risk locations. **Emphasis on education & enforcement, speed management**	**Specific improvements targeted** at high-risk locations. More **emphasis on education & enforcement, speed management**
Active management of high skid resistance, treatment of out-of-context roughness, pavement integrity	**Prioritised renewal programme**	**Current** pavements **maintained,** renewals prioritised
Prioritised repairs to make roads safe and allow access	**Prioritised repair programme**	**Prioritised repair programme**

Figure 2.2 State highway classification




Final State Highway Classification
National Strategic
Regional Strategic
Regional Connector
Regional Distributor
High Volume
Nelson (58,000)
Richmond (14,000)
Blenheim (29,000)
Greymouth (10,000)
CHRISTCHURCH (374,000)
Ashburton (17,000)
Timaru (28,000)
Queenstown (10,000)
Oamaru (13,000)
DUNEDIN (114,000)
Gore (10,000)
Invercargill (48,000)

Strategic and governmental background

Statutory requirements

The NZTA complies with national statutory requirements such as the Land Transport Management Act 2003, the Resource Management Act 1991 and the Government Roading Powers Act 1989.

Government policies

The draft *Government policy statement* describes the government's 10-year plan for land transport. Overall, the government wants a state highway network that is better used, more efficient, less congested and safer, and that supports economic growth.

Other recent documents, such as *Connecting New Zealand* and the *National Infrastructure Plan 2010*, provide a broader context for the *Government policy statement*.

NZTA strategies

The NZTA has a number of guiding strategies surrounding government direction and the State Highway Asset Management Plan, including the Network Planning Strategy and the Investment and Revenue Strategy.

Statement of intent

The *Statement of intent* (the NZTA's agreement with the government) lists eight desired impacts for long-term improvement from all transport providers and state highways.

Table 2.2 Desired impacts for long-term improvement in *Statement of intent*

Desired impact	Key progress indicator	Target
1. Better use of existing transport capacity	Number of vehicle kilometres travelled per network kilometre (vkt/km)	Increase
2. More efficient freight supply chains	Average daily measured weight of freight vehicles (tonnes)	Increase
3. A resilient and secure transport network	Number of resolved road closures with a duration of 12 hours or longer	Decrease
4. Easing of severe urban congestion	Number of minutes delay per kilometre during morning peak – Auckland	Decrease
5. More efficient vehicle fleets	Average diesel and petrol consumption (litres) per 100 vehicle kilometres travelled	Decrease
6. Reduction in deaths and serious injuries from road crashes	Number of road deaths and serious injuries per 100 million vehicle kilometres travelled	Decrease
7. More transport mode choices	Percentage of survey respondents who consider public transport as a good option for all of their work or study trips in Auckland	Increase
8. Reduction in adverse environmental effects from land transport	Diversity of macro invertebrates, eg insects, found in receiving environments (macro invertebrate community index)	Increase

Safer Journeys

The government's road safety strategy, Safer Journeys, was released in 2010. It identifies issues of high, medium and continuing concern. The strategy is based on a Safe System approach that recognises human fallibility and vulnerability and envisions a safe road system that protects humans from death and serious injury.

As a key partner in the Safer Journeys strategy, our work involves improving and managing the network to help prevent crashes, and monitoring and assessing crashes that do occur in order to track trends and improve our prevention strategy. The ultimate goal is to reduce the number of deaths and serious injuries from road crashes. This decline *is* occurring and is forecast to continue.

We work to improve the network to reduce the number of crashes on state highways (by focusing on the three key crash types – run-off road, head-on and intersection). These include improving geometric design, providing adequate roadsides, assisting driver behaviour, and providing quality, skid-resistant surfaces to aid braking, improve grip and reduce aquaplaning.

Customers First

Our customers' expectations of our services are continually growing and we must respond, focusing capital and operational activities on areas that deliver maximum effectiveness. To better understand the needs of our customers and combine their views with our planning, we developed an engagement programme called 'Customers First'. Its aim is to identify the key outcomes customers want and incorporate these expectations in our overall strategic intent. This allows us to identify both the best actions to undertake and where best in the country to deliver them.

Engaging with our customers

We use a number of methods to engage with our customers, including user satisfaction surveys and targeted stakeholder engagement on specific plans and proposals.

Our stakeholders include national organisations, local and central government, and community groups. Our largest stakeholders (the Automobile Association and the Road Transport Forum) were consulted during the development of the State Highway Asset Management Plan.

Our customer segmentation model identifies different customer groups and appropriate methods of engaging with them:

- *neighbours*: consultation and the suite of customer services offered by the NZTA
- *suppliers*: forums and commercial arrangements
- *key stakeholders*: regular relationship meetings
- *road users*: market research approach in the form of our Customers First project, which aims to encourage regular engagement.

Customer-focused values

Through the engagement with our customers we identified a series of 'customer values' that our customers associate with the state highway network. These values are in addition to bottom-line expectations, such as the state highway network being available whenever they want to make trips. These customer values and bottom-line expectations together identify our customers' expectations of the state highway network. We were able to group these values into three categories:

- safer journeys
- efficient and reliable journeys
- social and environmental responsibility.

Customers' expectations

By combining the feedback from different customer and stakeholder groups we are able to better understand and even measure our customers' views on both what values are more important than others and how we are currently performing in those areas. This in turn allows us to validate our planning, and gives us insights into how best to improve overall customer satisfaction. From this we developed a strategy map (figure 2.3) that shows for each customer value:

- where our customers want us to be – the green bar
- where we are now – the orange bar
- where we will be in 10 years – the red bar.

Based on our offering we identified the NZTA's actions for each customer value (see figure 2.3). This will feed into the technical levels of service against which we can monitor our work. Where targets are not currently being achieved, there is a service gap that is addressed through our actions, as identified in this State Highway Asset Management Plan.

What we offer on the state highway network is based on the network's importance to our customers, our knowledge of the network and its ability to contribute to our customers' expectations (eg through limited funding). At times we will meet our customers' expectations, and at others we have set targets that are above or below their expectations, due to our detailed understanding of the contribution each value makes towards the NZTA's overall objectives.

Figure 2.3 Customers First strategy map

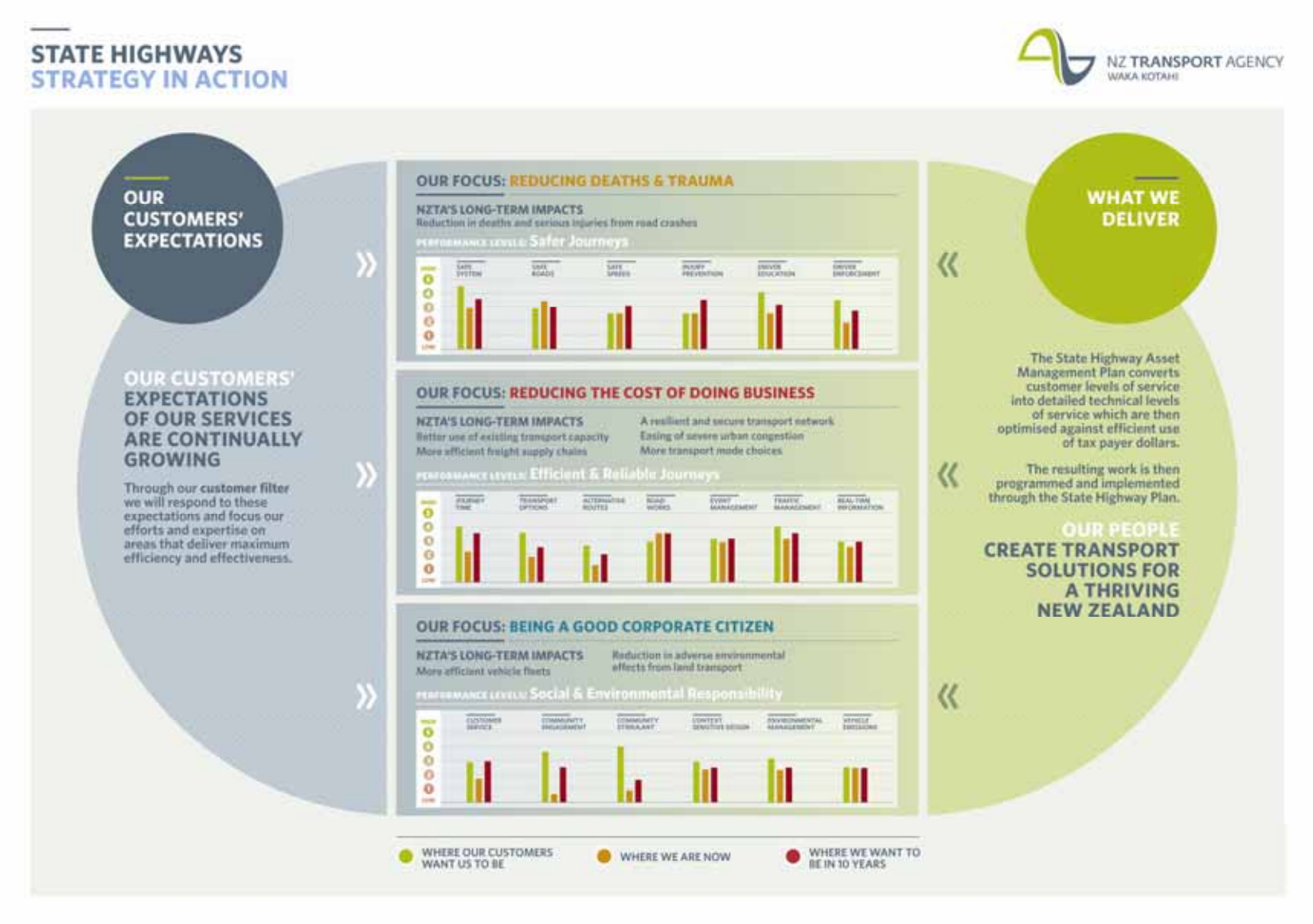


Table 2.3 Achieving our customer-focused values

Customer-focused values	NZTA actions that will achieve the value outcomes	Link to impact statement in *Statement of intent*	
Safer journeys			
Safe systems	We will adopt and embed the Safe System approach to reduce high-severity casualties by reducing the frequency of crashes on the state highway network.	6. Reduction in deaths and serious injuries from road crashes	
Safe roads	We will maintain the road surface and roadsides so they are safe to drive on, reduce high-severity crashes and are more forgiving of driver error.		
Safe speeds	We will manage speeds on our network appropriate to the conditions and environment, by providing users with road markings, signage, speed limits and other information to safely drive the network.		
Injury prevention	We will adopt and embed the Safe System approach to reduce high-severity casualties by reducing the severity of outcomes of those crashes that do occur on the state highway network.		
Driver education	We will provide drivers with messages on conditions and risks and work with our partners to educate road users about safe driving to encourage compliant and safe road use.		
Driver enforcement	We will work with our partners who carry out enforcement of those drivers who endanger other state highway users.		
Efficient and reliable journeys			
Journey time	We will work to ensure customers can complete a journey within an expected time and in an efficient manner.	7. More transport mode choices	1. Better use of existing transport capacity 2. More efficient freight supply chains 4. Easing of severe urban congestion
Transport options	We will deliver priority access to assist alternative transport options, thereby helping to reduce car volumes.		
Alternative routes	We will ensure the maximum availability of the state highway network.		
Roadworks	We will minimise the number and duration of planned roadworks closures and minimise the impact of them during heavy traffic periods (eg long weekends).	3. A resilient and secure transport network	
Event management	We will manage planned and unplanned events and clear incidents in a timely manner to minimise disruption across the state highway network.		
Traffic management	We will work to ensure the duration of a trip between any two points in any urban area is consistent from day to day, whether on a motorway or another type of state highway, at any given time and circumstance.		
Real-time information	We will deliver accurate, intelligible and accessible on-road and pre-trip traveller information, informing customers of their travel options and the levels of service they can expect on the state highway network.		

Customer-focused values	NZTA actions that will achieve the value outcomes	Link to impact statement in *Statement of intent*
Social and environmental responsibility		
Customer service	We will provide appropriate customer service and respond to our customers in a timely manner.	NZTA requirements under the Land Transport Management Act 2003
Community engagement	We will consult and engage with communities affected by our activities and be clear on our future plans.	
Community stimulant	We will ensure state highways respond to community priorities and deliver expected services, including public amenities and local priorities and peculiarities around walking and cycling, schools, etc.	
Context-sensitive design	We will ensure state highways meet the urban design protocol and requirements of the Historic Places Trust.	8. Reduction in adverse environmental effects from land transport
Environmental management	We will work to keep state highways free from graffiti and litter and meet all consent requirements under the Resource Management Act 1991 and encourage use of sustainable products.	
Vehicle emissions	We will work with our partners to minimise vehicle emissions.	5. More efficient vehicle fleets

Timeframe

We will work towards these service targets over the next 10 years. Our current plans include major projects (mainly projects relating to the roads of national significance – RoNS) that will address the most significant service gaps, and many smaller projects, not all of which have been identified.

The programme is likely to change over time as our strategies are updated, as customers' expectations change, as growth pressures shift, and in response to the economic climate, performance results and changes in the environment. Where it is appropriate to the scale of the investment decision, we aim to predict the effect of such changes in advance.

We will use the strategy map concept, and the State Highway Network Strategy and the Network Access and Use Strategy once they are finalised in 2012, as a reference for future consultation on the outcomes our customers want us to provide.

Technical service targets

Technical service targets are precise, quantified indicators used to establish the expectations of suppliers and to monitor performance in detail.

Example: Road surface condition index, indicating how much deterioration has occurred

We use state highway classifications and the location and function of roads to guide what appropriate facilities we provide. On tourist routes, we ensure that adequate rest areas are provided, while on expressways we concentrate on providing safe and efficient travel. In urban areas we meet the urban design protocol while maintaining facilities and services.

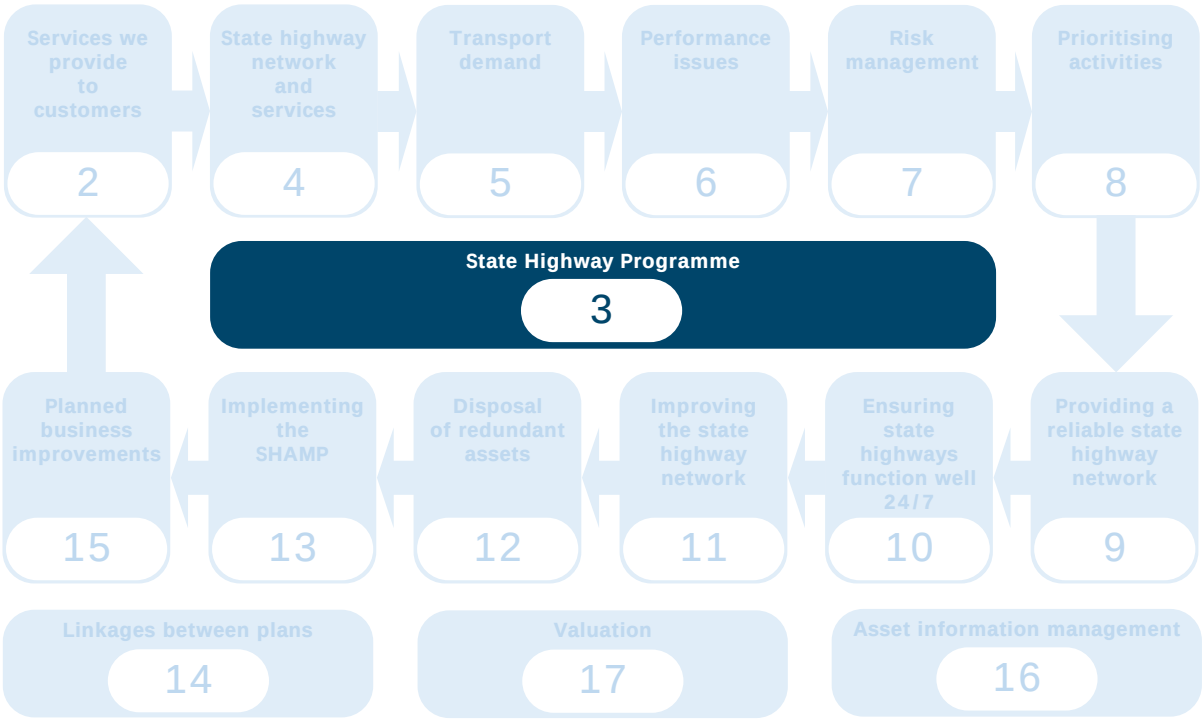
Meeting our service targets

Some state highway assets may be performing at a level above or below the minimum specified, in which case we must understand the reasons for the gap and identify how best to close it. Where we are providing a service different from that specified, we will prioritise works to provide a controlled change in services.

We monitor achievement of our technical service targets to identify the need for work. As customer expectation develops and our technical processes improve, we gradually change our technical service targets.

Over time, trends in these measures will form a robust basis for assessing our management of the network. As we improve about 2% of the state highway network each year, the services offered on most state highways will typically be similar from one year to another.

3 Proposed service achievements, programmes and funding



This chapter summarises our focused and achievable proposed service offer for the operations, maintenance, renewals and expansion of the state highway network. More detail is provided in chapters 9–11. The expenditure associated with these programmes must fit within our allocated budgets, and chapter 8 offers more detail on our prioritisation process to achieve this.

Service offer

The State Highway Asset Management Plan takes the principles of the Draft State Highway Network Strategy and Draft Network Access and Use Strategy and converts them into work programmes through our customer values into our high-level service targets. These set state highway performance targets that link to customer benefits relating to safety, journey time and environmental values.

We maintain and renew the existing network to ensure it works as well as it can, and use operations and improvements to meet gaps in our service performance.

Proposed programmes

Our asset operations, maintenance, renewals and capital programmes for the three-year period commencing 2012/13 are summarised below. The contents of each of these programmes are discussed in further detail in each of their associated sections.

Maintenance and renewals

We will rehabilitate 504 kilometres and reseal 3617 kilometres of state highways in the next three years. We will also maintain and renew structures, drainage and traffic services assets. This programme will generally maintain current levels of service, although the quantities of repairs will increase, particularly on low classification state highways.

Operations

We currently actively manage 29% of state highway traffic, allowing relief to our most congested networks. We will continue to do this through advanced traffic management systems, advanced traveller information systems, improvements to major tunnel management systems, and improved enforcement of non-compliant vehicles.

We plan to expand these services to our other high-traffic urban networks that could benefit from these active operations.

Improvements

We will improve the network by delivering the types of projects shown in table 3.1.

Table 3.1 Network improvements over 3 and 10 years, by project type

Project type	3-year programme (millions)	Indicative 10-year programme (millions)
Essential infrastructure	$100m	$240m
Roads of national significance	$2500m	$9300m
Optimisation projects	$120m	$455m
Safety improvements	$250m	$1000m
High-productivity motor vehicle routes	$45m	$75m
Other improvements providing significant benefit	$350m	$2200m

These types of improvement will be targeted along the roads of greatest need. They will help us achieve the following 10-year benefits.

Table 3.2 Ten-year benefits from indicative state highway improvement programme

Fatal and serious injuries saved	100–120 per year after the 10th year
Travel time savings in net present value	$14 billion
Average programme benefit–cost ratio	3.51

Programme

It has been our standard practice over recent years to over-programme the improvement programme. This has been done to good effect and has allowed us to manage our programmes to the set financial targets by:

- allowing us to react to time-related risk events that delay the progress of planned activities, by having other projects ready to substitute
- compensating for general over-optimism by anyone in the supply chain, often referred to as optimism bias (things often take longer than you think they will).

Taking this approach also allows us to manage down towards year-end, rather than having to try to accelerate in the fourth quarter to make full use of funds.

Table 3.3 National state highway programme 2012–15

Programme types	2009–12	2012/13 (millions)	2013/14 (millions)	2014/15 (millions)	2012–15 (millions)
Maintenance **9 Maintenance and renewals**	**$710m**	**$242m**	**$246m**	**$252m**	**$739m**
Renewals **9 Maintenance and renewals**	**$600m**	**$185m**	**$186m**	**$190m**	**$561m**
Network operations **10 Ensuring state highways function well 24/7**	**$82m**	**$28m**	**$29m**	**$29m**	**$86m**
Improvements **11 Improving the state highway network**		**$900**m	**$1,100m**	**$1,300m**	**$3,300m**
Total		**$1355m**	$1,561**m**	$1,771**m**	$4,686**m**

Funding

The 2012 *Government policy statement* indicates that we must continue to tightly control and target our spending to achieve economic productivity and growth from our work. Indicative levels of funding for future years are shown in the *Government policy statement* across our main activity classes, and we will continue to work within these in delivering our programme.

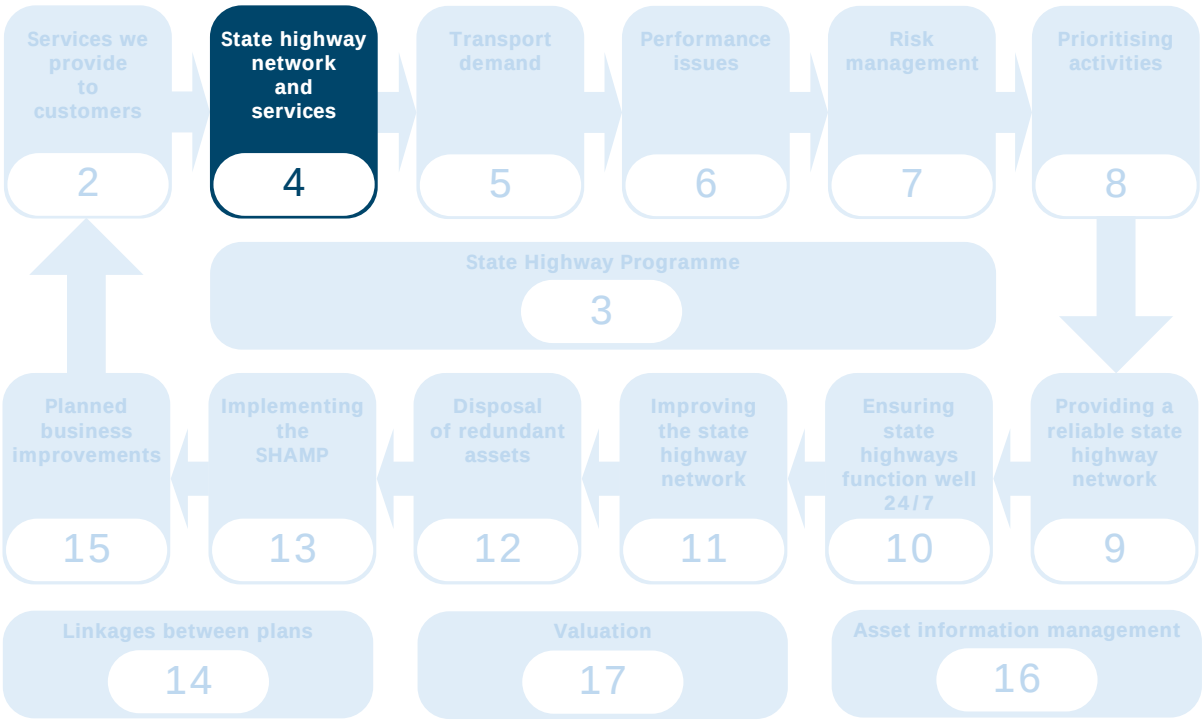
In order to deliver maximum value for money, we have considered alternative maintenance and renewal programmes, with differing levels of funding and consequence for the levels of service delivered to our customers. These are discussed in chapter 9. The improvements programme we have developed delivers benefits as soon as it can within the funding available.

In developing our programme, we have assumed the following:

- future network growth – 2.5% each year
- inflation – 3.0% each year
- targeted efficiency changes will accrue
- remaining regional funding is allocated by the time periods required.

The funding available for the state highway programme will be confirmed when the National Land Transport Programme (NLTP) 2012–15 is adopted in mid-2012.

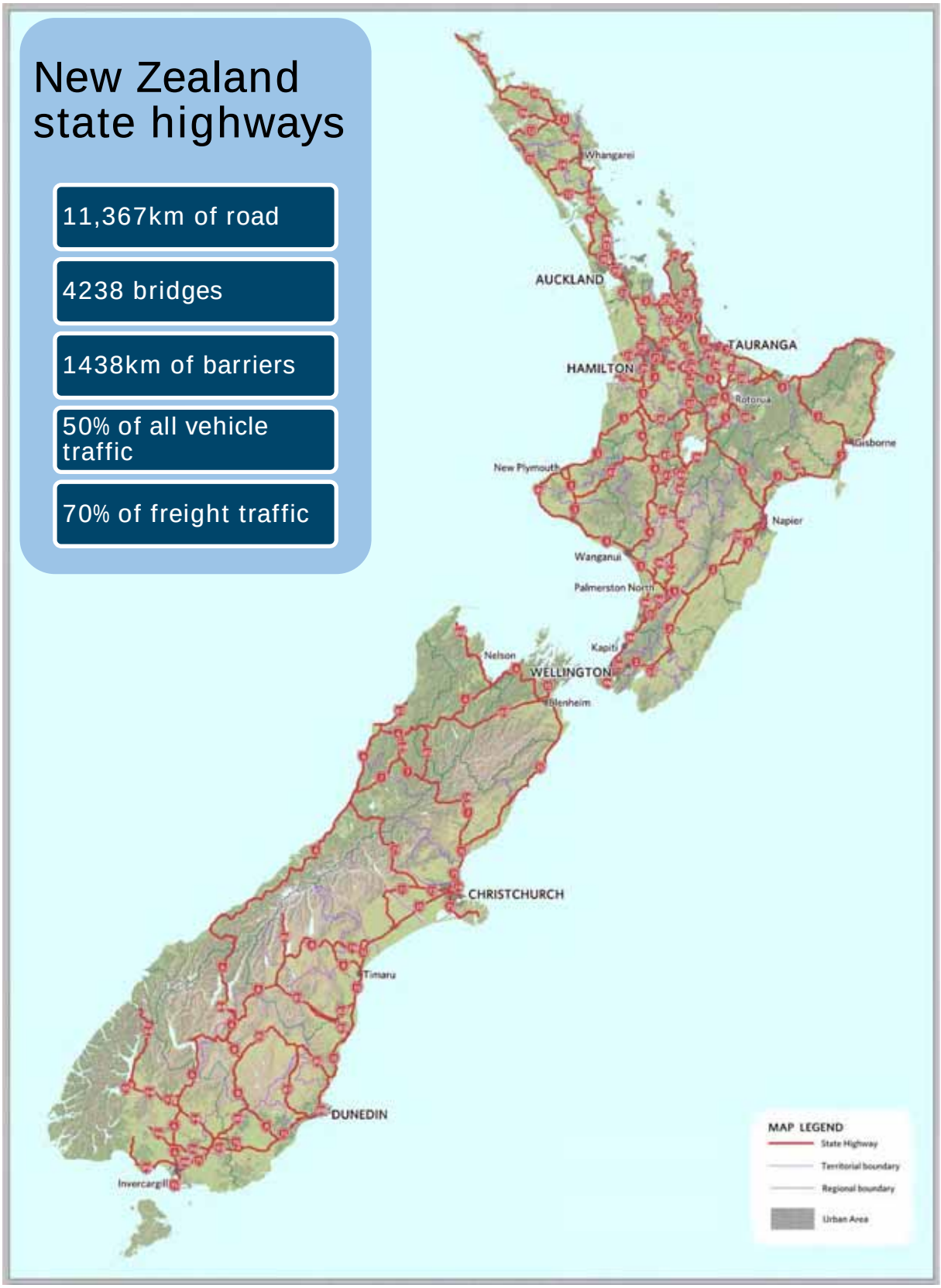
4 State highway network and services



The state highway network is a significant national asset, made up of $25 billion worth of physical structures, including 11,367 kilometres of roads, 4238 bridges and 1438 kilometres of barriers. While our state highways make up only 10% of New Zealand roads, they transport 50% of the country's traffic. As well as constructing, monitoring and servicing the physical infrastructure, the NZTA delivers a suite of network services that help the roads cope with the increasing numbers of people travelling on them – maximising the return on our investment in assets.

These services are delivered proactively, to increase the benefits to customers (be they related to travel time, journey reliability, safety or driver comfort) without constructing new roads, or reactively, in the form of identifying and reacting to failures in an efficient, standardised way. We work with other network operators and transport agencies to provide these services across the network.

Figure 4.1 New Zealand state highways



Services

Optimising traffic

We use a number of tools and techniques to understand and optimise traffic flow, including:

- regular engagement with customers
- event and traffic management (eg lane control, ramp metering), and travel demand management (eg public transport, regional hub solutions)
- monitoring of the movement of dangerous goods
- detection and enforcement of speeding, overweight and over-dimensioned vehicles, and incorrect use of restricted routes, while minimising the impact on compliant vehicles
- automated solutions to enhance crash prevention and post-crash investigation.

The NZTA operates national traffic operations centres in Auckland and Wellington, which play a vital role in day-to-day travel experiences. The centres manage our urban networks, coordinate responses to incidents and emergency events, and manage traffic signals, CCTV cameras, tunnel operational systems and variable message signs throughout the country.

While our assessment criteria are not as comprehensive as we would like, we know anecdotally that our current services provide significant benefits, and we are looking to extend them to more of the network. We intend to manage more of the network actively and to work with local authorities to ensure consistency across the network, and to assess the efficacy of this work.

Ensuring safe journeys

The NZTA has a duty to the public and to those working on our roads to provide notice of any hazards. The *Code of practice for temporary traffic management* defines the signs and processes around road hazards and is used by all road controlling authorities in New Zealand. To prevent negligent behaviour, we also keep a register of persons qualified to manage the safety of work on roadways.

Managing incidents

Incidents, emergencies and weather events can significantly affect network services. We use our Coordinated Incident Management System to manage responses to incidents that involve multiple agencies (eg police and ambulance services).

We respond to incidents on the state highway network both reactively and proactively:

- Crashes or other unplanned incidents require traffic operations centres to notify emergency and repair services, contact radio stations and update websites. At the same time, staff and contractors on the ground put up signs and implement detours when required.
- Events such as large concerts and sporting events involve preparatory work, such as displaying signs, and venue and project liaison. This ensures the safe and congestion-free movement of spectators.
- For our most complex networks we have prepared a number of management responses. These responses reflect the controls and communications required for different levels of incident. This means when an expected incident occurs on our network our staff can use these responses to quickly put in place the required controls to minimise the adverse effects on the traffic using our network.

Weather monitoring

Through our partnership with the MetService, 41 stations across the country forecast and monitor the weather. This information is used to manage roads and keep them open as long as possible during winter.

Real-time information

We help users plan their journeys each day by providing real-time information via:

- a freephone service for information on closures and delays
- message boards displaying travel times
- websites showing traffic incidents and conditions (distributed by other agencies)
- traffic alerts to cellphones and email addresses
- radio bulletins.

With our contractors, we provide contact centres to receive fault notifications from customers and distribute related information back to them.

0800 - 4 - HIGHWAYS

Land-use development

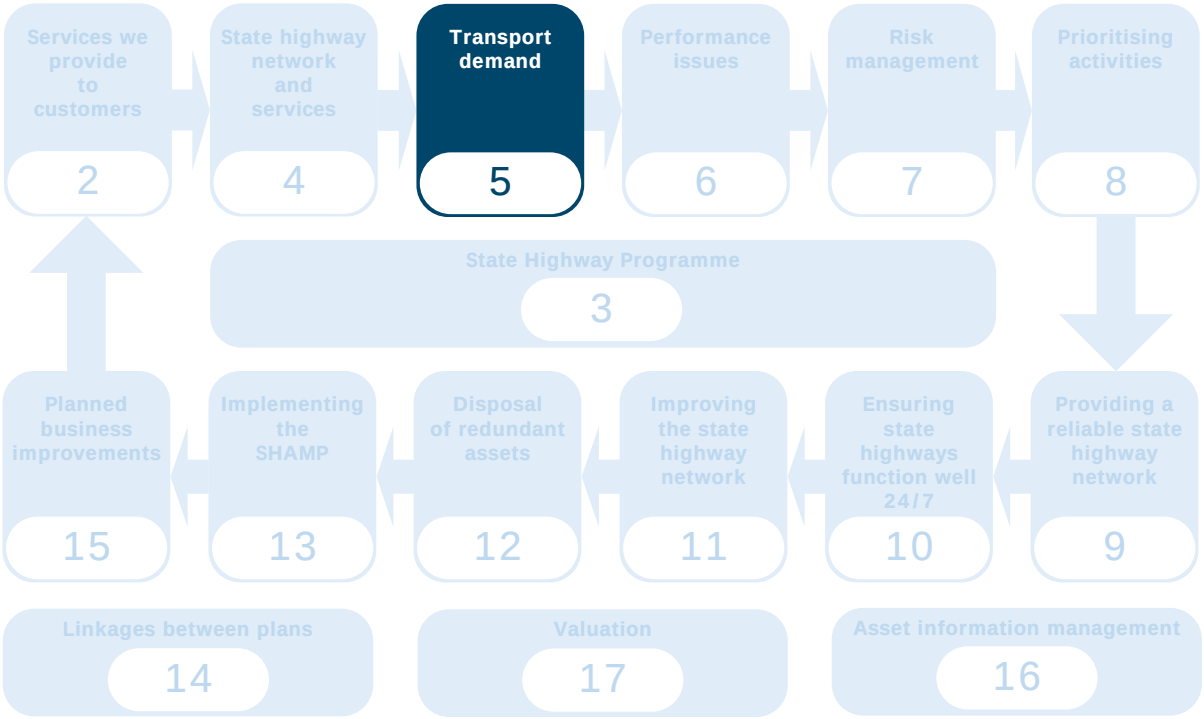
We manage the number of access points across the network appropriate to classification, and ensure all points meet high standards for location and design. We do this by working with our neighbours and local councils on safety issues and new developments.

About 60% of our network is gazetted as a limited access road, the legislation for which requires us to license all access points (eg driveways) and to set appropriate conditions for their use. We have a robust process for approving any new accesses to our network. When considering developments, we work with developers to ensure that accesses are in the safest possible locations and that the development will not have undue effects on our network.

Working with others

We work with other network operators and transport agencies to coordinate our activities to ensure maximum total gain for users. With Auckland Transport we have established the Joint Traffic Operations Centre, which enables us to take a ‘one network’ approach to managing traffic on the entire Auckland network, not just the state highways.

5 Transport demand



In order to know what state highway services will be required in the future, we must understand the factors that affect transport demand and how they are likely to change. Shifts in demand tell us where we should increase or decrease our levels of service. We regularly and carefully monitor the current situation in order to forecast future demand.

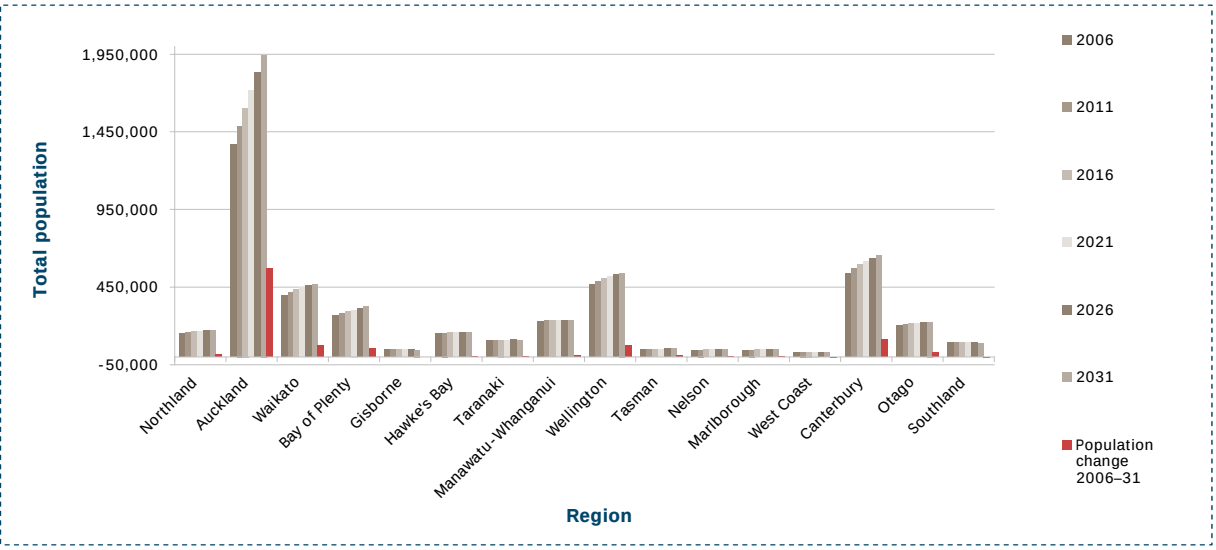
Demand on the network is influenced by regional, national and global factors such as oil prices, economic trends, population and demographic shifts, and climate change. These affect future demographics, current backlogs and network pressure points – issues that influence our work when there is insufficient capacity to accommodate the growth in traffic without further intervention.

Issues such as population growth, economic growth and vehicle technology are all categorised as either strategic or tactical issues and are managed by the State Highway Network Strategy and/or the State Highway Asset Management Plan.

Short- and medium-term demands

Population growth and demographic change

Figure 5.1 Population by region, 2006–2031



New Zealand's population is expected to grow to 5 million by 2020. Most growth will be concentrated in the upper half of the North Island, particularly in Auckland, Waikato and the Bay of Plenty. Major metropolitan areas are expected to experience higher residential densities, with associated higher levels of congestion.

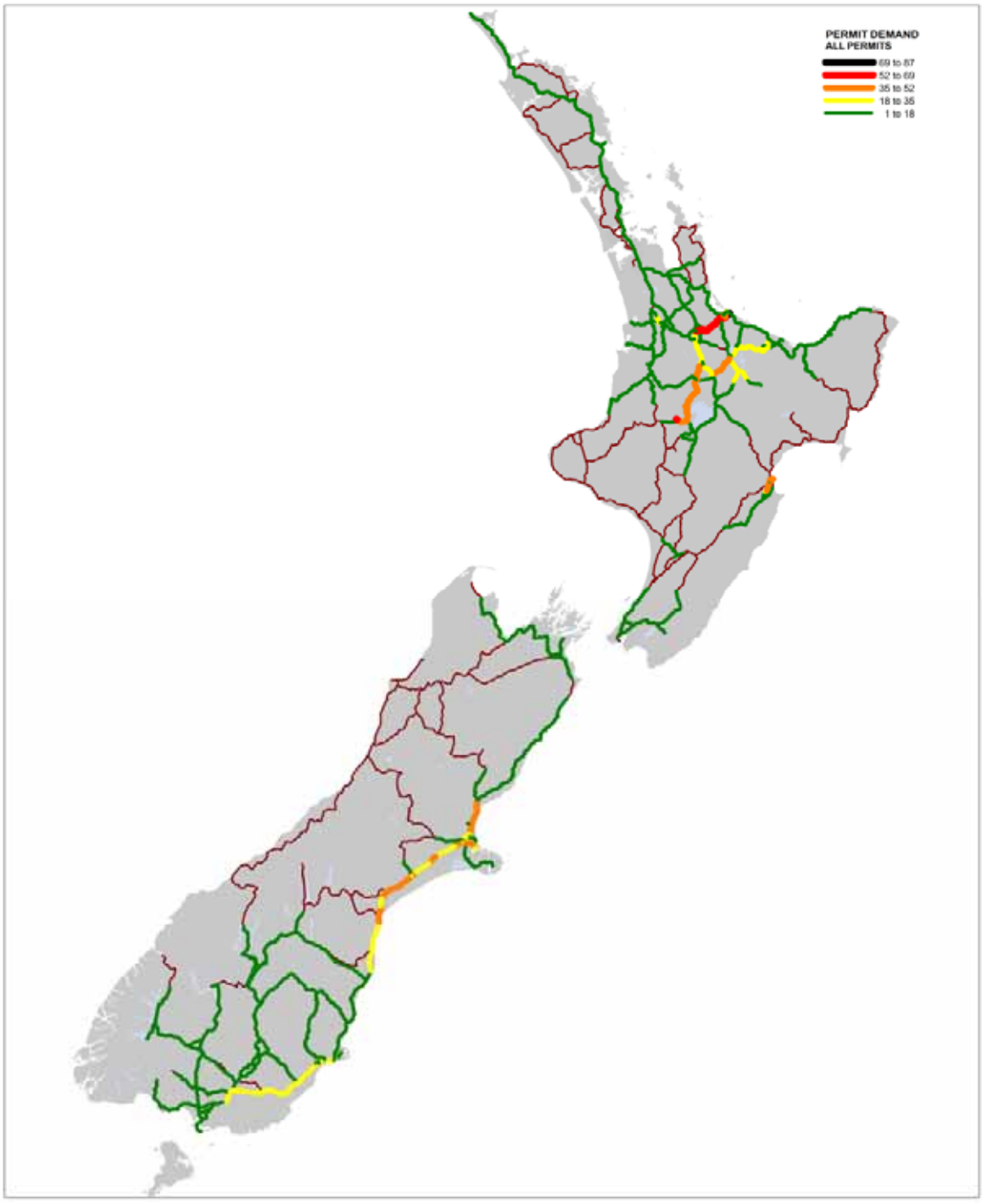
Economic growth and changes in freight requirements

We track economic growth predictions for their possible implications for state highway freight traffic. Freight traffic affects the weight capacity of our roads, and in some cases (eg the Auckland–Hamilton route), width of roads. Over the next 30 years, metropolitan freight will be dominated by small, high-frequency shipments on increasingly congested networks. In rural areas, moving primary products from farms to ports and airports will continue to dominate. It is critical for the country's economic health that state highways are able to meet freight demands, and the highway classification system reflects this. The highest classification roads – those that provide for significant freight movement – will receive a high level of route security and service from the NZTA.

Vehicle dimensions and mass changes

The NZTA has approved the use of high-productivity motor vehicles on routes where there is demand and high uptake. This recent legislative change will allow larger and heavier trucks on the network, increasing wear and resulting in shorter asset lives and increased replacement costs. This will likely be restricted to existing freight routes or localised short-haul highway sections.

Figure 5.2 Demand for high-productivity motor vehicle permits based on applications received



Auckland – new relationships and growth challenges

While the NZTA's short-term focus is the success of the new Auckland Council and Auckland Transport, the significant long-term transport challenges of worsening congestion and a growing population will need to be addressed to ensure Auckland is a globally competitive city. Freight capacity is another issue: national estimates indicate significant increases in the volume of future freight movements over the next 20 to 30 years. Dealing with these issues will require innovative funding and investment approaches by the NZTA and Auckland Transport to bring about network improvements on both state highways and local roads.

Other metropolitan areas

Other cities have their own demand issues. The topography and limited availability of routes in and out of Wellington affects road users in that city, and roads of national significance (RoNS) projects and tunnel investigations are underway in response. Hamilton is an increasingly important transport hub, and until the Waikato Expressway and the Southern Links are completed, the existing state highway network into and through the city will need to manage the increasing conflicts of local and intra-regional traffic.

Tauranga's population of 120,000 is predicted to grow to 200,000 by 2051; this growth, combined with the transport impacts of the Port of Tauranga, is a key transport issue to be balanced there. In response, the NZTA is constructing the Tauranga Eastern Link road, part of the RoNS programme.

The Christchurch earthquakes caused major transport network disruptions, and re-locations of people, schools and business resulted in changed travel patterns and traffic congestion. The most noticeable change has been the increase in orbital movements on the western side of the city, including the ring road and the state highway western corridor. This supports the current and future importance of the Christchurch RoNS projects.

As the Christchurch re-build gains momentum, there will be increased activity on routes with debris removal, transport of building material and construction services. We will continue to work closely with our partners, the Christchurch Earthquake Recovery Authority, Christchurch City Council and the Stronger Christchurch Infrastructure Re-building Team, to minimise traffic disruptions.

Urbanisation and land-use planning

The NZTA works closely with local government and other stakeholders to integrate future land uses with transport planning. We undertake demand and capacity modelling on a multi-modal network-wide basis, allowing us to identify the roles of each transport service and provider for meeting the demands of that network.

Tourism

State highways on specific tourist routes have a number of factors that we must consider, understand and manage to meet the demands of tourists and local traffic alike:

- For tourists, both international and national, the journey is an important part of their New Zealand experience (not just the destination). And predictable travel time is important to ensure they can catch their plane or ferry or arrive at their intended destination when they expect.
- Drivers may wish to make scenic stops, so we work with local landowners and councils to provide suitable amenities.
- Tourists are often driving on unfamiliar roads that must be safe and self-explaining for their travel.
- Distances between New Zealand towns are greater than many tourists are used to. We try to inform drivers of distances until they can next stop for fuel or a comfort break.

- Drivers of camper vans often travel slower on state highways and this can lead to driver frustration. Education about driver courtesy and providing opportunities for other vehicles to pass is an important consideration on tourist highways.

Tourism is a significant area of economic growth and makes an important contribution to the New Zealand economy. This is recognised within the state highway classification system.

Long-term demands

Vehicle technology

Advances in vehicle technology have greatly improved road safety. Future advances may further continue this trend, leaving customers to view journey time improvements as a more important element of our role. Further, vehicle fuel efficiencies may mean that oil price increases and environmental concerns do not have such a significant impact on transport users' travel choice.

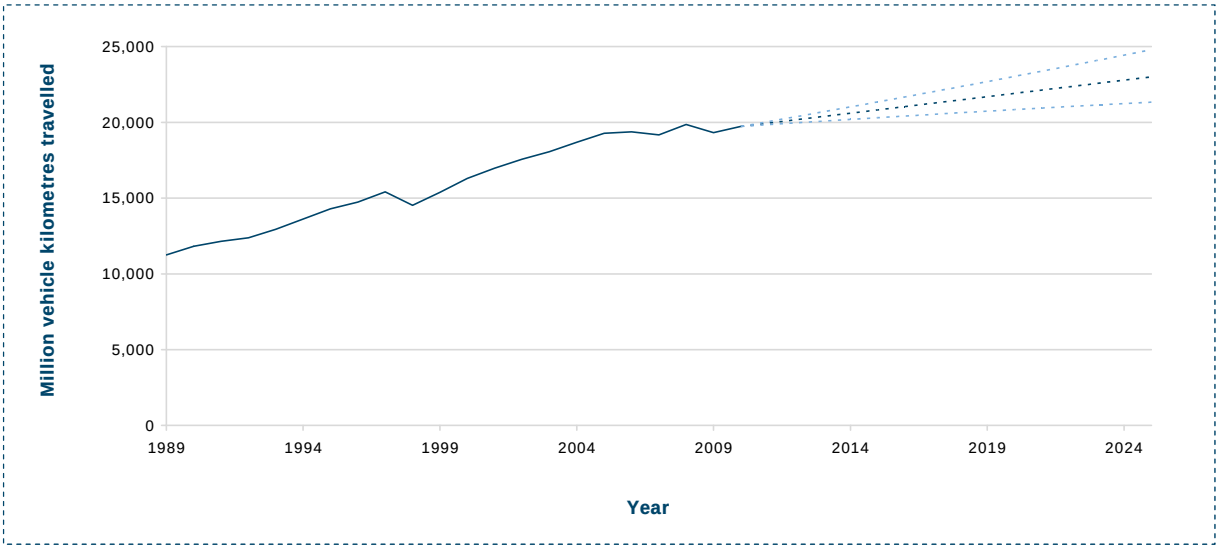
Technological change – implications for customer service

Changes in technology are accelerating, and customer and business demand for customised service offerings and real-time information is likely to increase.

Traffic demand

Historic demand

Figure 5.3 Traffic growth on state highways



Although we have experienced significant increases in traffic over the last 20 years, this has slowed over the last three to five years. Average growth over the last 10 years has dropped from 21% overall and 31% for heavy vehicles, to 2.3% and 2.4%, respectively, over the last five years. However in the last year heavy vehicle trips have increased by 5%, indicating a recovery from the 2008 recession.

Heavy vehicles make up approximately 8–9% of vehicle kilometres travelled, and this has risen steadily in the last 20 years. The tonnages moved are a significant measure of economic production. Monitoring heavy vehicles is important to state highway capacity and safety, and such vehicles have a significant impact on road structural deterioration. Recent methodology developments have allowed us to calculate reasonably accurate annual figures for the network pressure from heavy vehicles.

Current demand

The NZTA has a comprehensive traffic-monitoring methodology to assess traffic volumes, vehicle types and vehicle weights on the state highway network. Approximately 80 sites around the country provide information on seasonal variation patterns and measure peak-hour traffic flows. Four of these sites weigh vehicles at normal traffic speed, providing data on axle, axle group and gross vehicle mass. Some 1400 portable short-duration traffic-counting sites collect data one to four weeks each year, and about 120 continuous count sites are managed by regional contracts.

Figure 5.4 Traffic volume, 2011

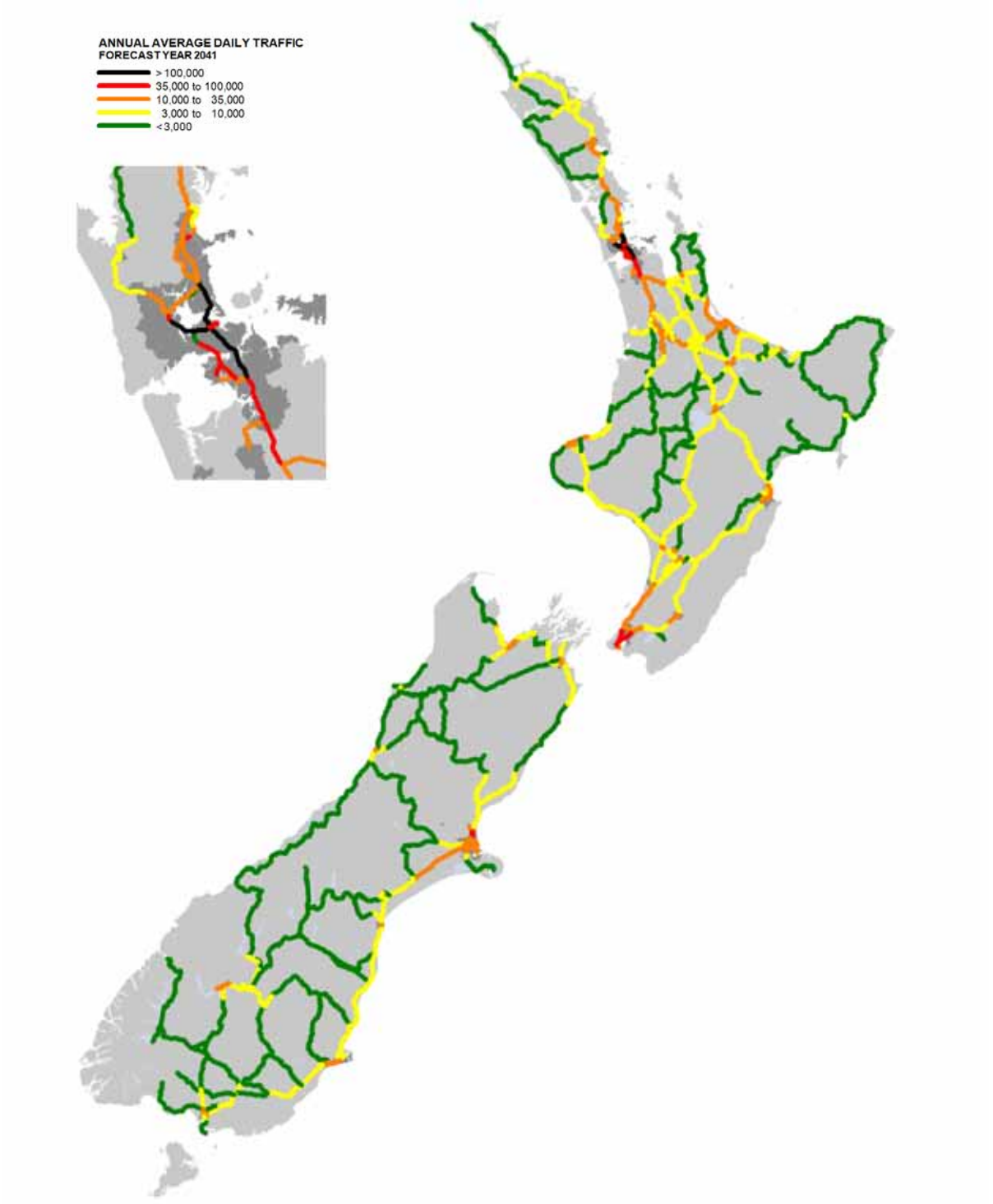
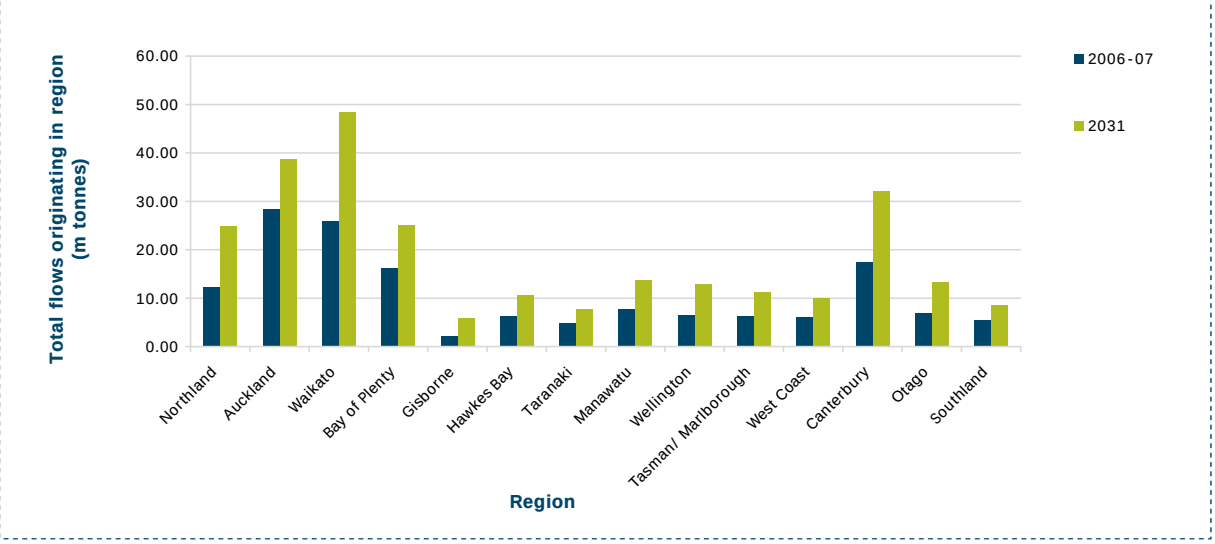


Figure 5.5 Freight generated by region, 2006–07 and 2031 (with 20-year forecast)



Source: Ministry of Transport, NZ Transport Agency and Ministry of Economic Development (2008) *National Freight Demands Study*, page vii, www.transport.govt.nz/research/Documents/FreightStudyComplete.pdf

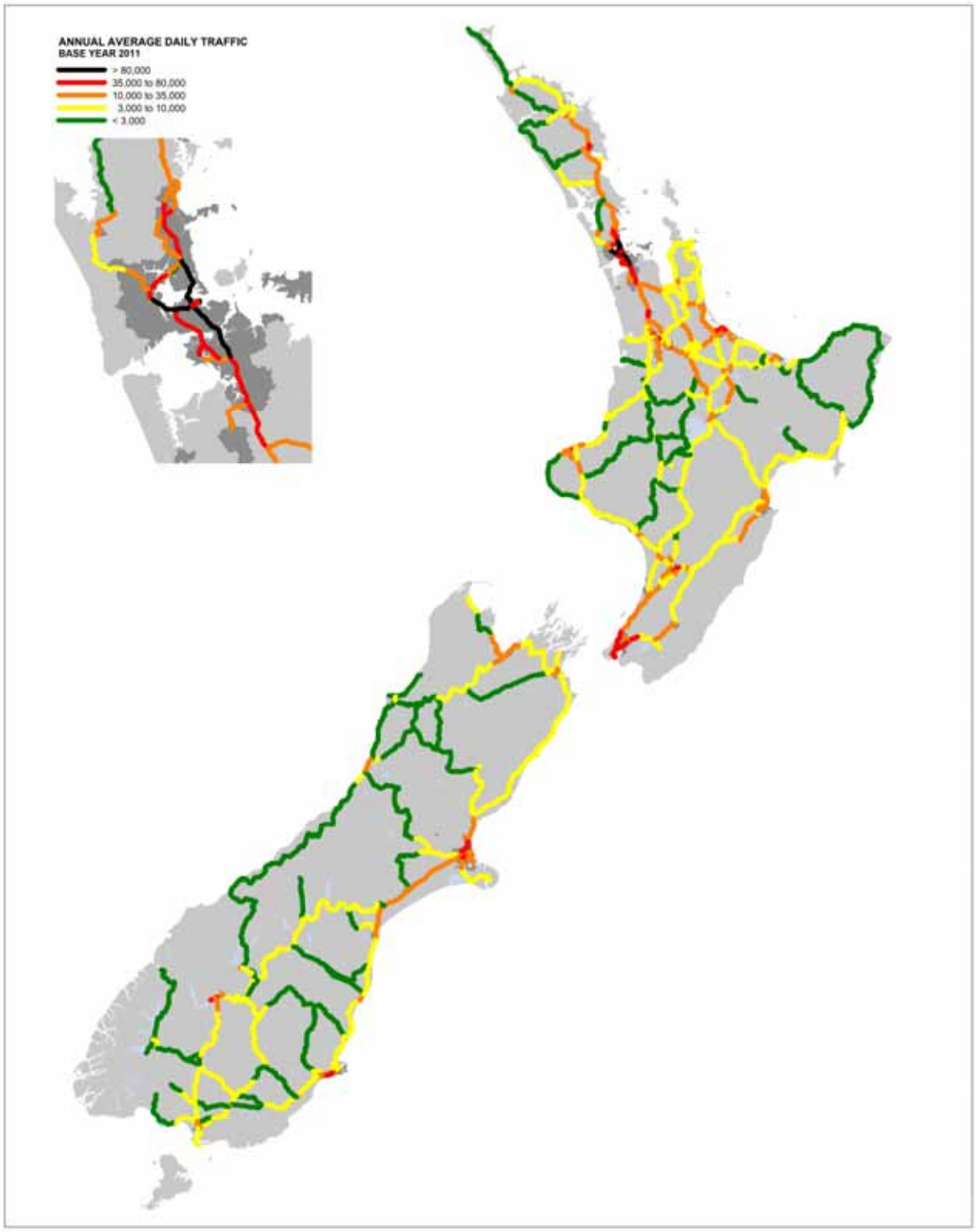
Future demand

These traffic forecasts were derived considering the demand for and capacity of other transport networks and services. We expect significant differences in growth between areas. In our 30-year forecast, the upper North Island is expected to grow at the greatest level, in line with the population changes and economic growth in the Auckland, Waikato and Bay of Plenty regions. We also expect significant growth in traffic volumes around major population centres in the Hawke's Bay, Wellington, Christchurch, Dunedin and Queenstown.

Each region assesses the effects of future growth and changes in demand on its local network, with national transport planning support. These assessments are presented and discussed corridor by corridor in the Regional Asset Management Plans, which identify performance deficits that then trigger a programme response. The national perspective is built up from the regional assessments and responses.

These forecasts are based on the growth on the network continuously over the last 5 to 10 years. However we recognise that there are a number of issues that may mean that these forecasts may not materialise. These include: oil price volatility, technological change and national and local land use patterns that may change and adjust to responses to changes in the global economy and markets.

Figure 5.6 Traffic-volume forecast, 2041



Responses to demand

Networks using advanced traffic management

We use traffic management tools such as ramp signalling, lane management and electronic information signage to maintain service on state highways. These services are described further in chapter 10.

Information supply requests for service

Traveller information systems have the potential to improve the operation of the transport network and raise the perceived quality of travellers' experiences by providing timely and effective traveller information. This information will allow travellers to compare travel modes and routes, the costs of travel and journey times, allowing them to plan their journeys better. The demand for traveller information systems is greatest in the areas in which we have already provided significant services.

We measure the volume of use for our existing traveller information systems. Our 0800 contact centre and our website both provide road users with the opportunity to check the latest traffic conditions and then plan their journeys.

Figure 5.7 NZTA traffic information website page views, 2010

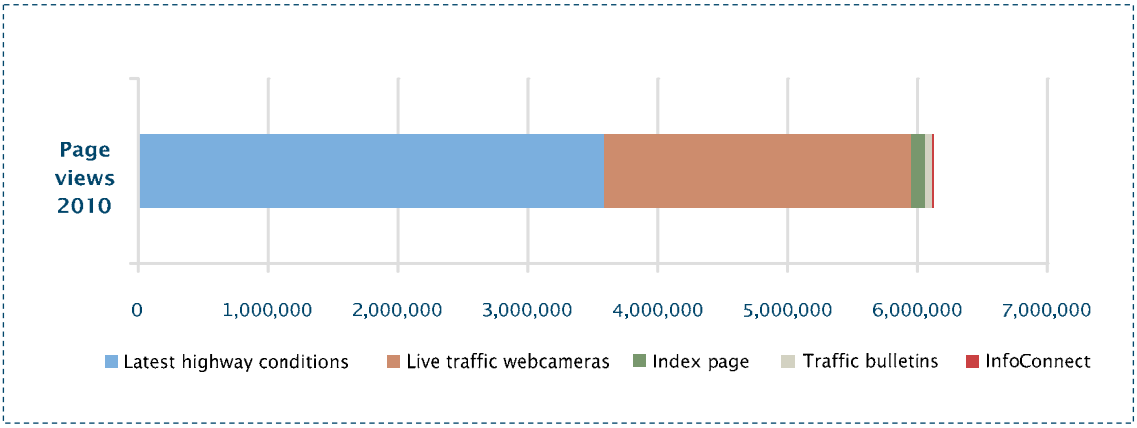
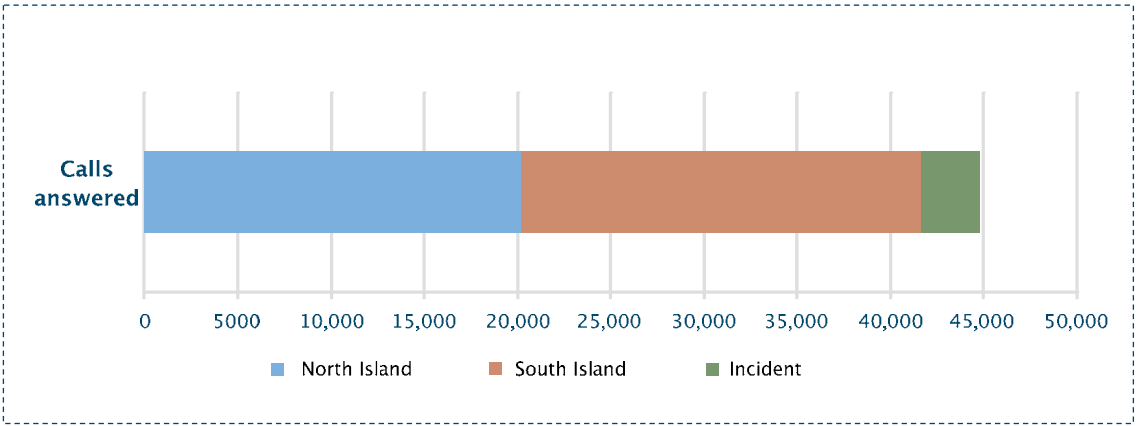


Figure 5.8 Call volumes to 0800-4-HIGHWAYS, 2010



Programme response

We have identified a wide range of demand drivers, both growth and non-growth related. Our response is based firstly on understanding and quantifying the changes at national and regional levels. Secondly, we assess the most appropriate solutions in terms of value for money, alignment with our service offer and the risk of service failure. Depending on the specific issues, this will result in changes to our operations, maintenance, renewals or capital improvement activities, which then need to be prioritised.

Increased traffic volumes will mean a greater demand for our traffic operations and traffic information systems, and for smarter ways of operating the network. These changes will also affect our maintenance and renewal activities and need for improvements on the network. In chapter 8 we discuss our prioritisation process for these works. Chapters 9, 10 and 11 outline our response to the forecasted growth over the next 10 years.

6 Performance issues

This chapter holds the NZTA's current performance up against the critical issues identified in the *Statement of intent* and the four key values: Safer Journeys, Efficient and Reliable Journeys, Social and Environmental Responsibility and Value for Money. We identify gaps in current performance and offer methods and recommendations for improving services.

Statement of intent issues

For details on how the NZTA is performing in our eight areas of long-term improvement (listed in table 2.2) refer to the *Statement of intent.*

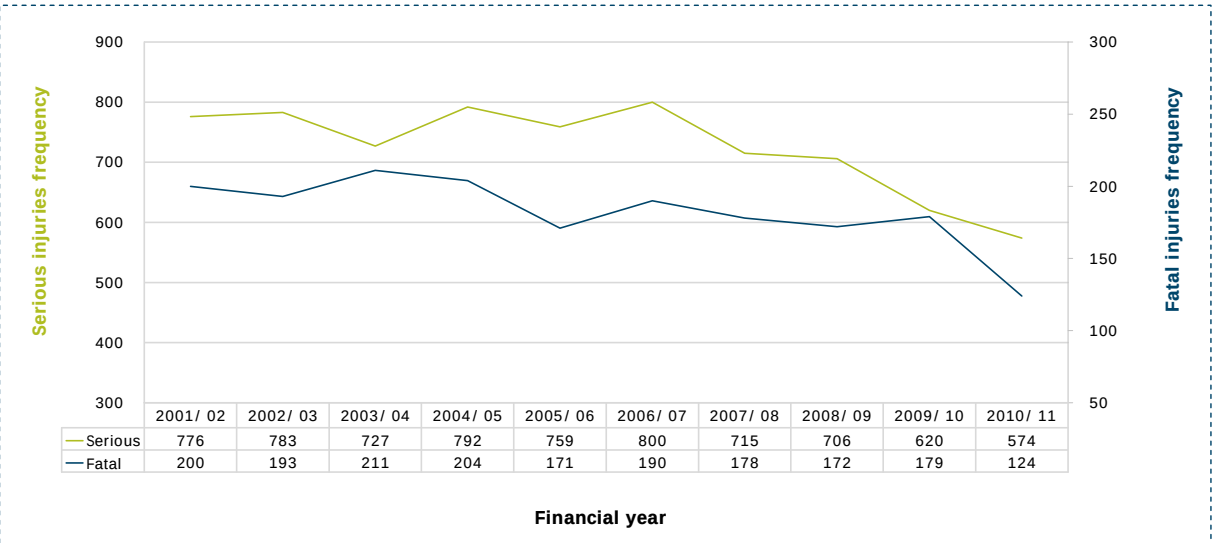
Safer Journeys

Figure 6.1 Performance levels for Safer Journeys

Our customers have told us that they would like us to do more in terms training and informing drivers and using enforcement to keep the worst drivers off the road. We will work with our partners, such as the New Zealand Police and the AA, to inform drivers about the levels of risk and their responsibilities. Together we will explore opportunities for improved and alternative enforcement strategies and greater use of intelligent transport systems.

However, we will continue to improve the roads with the highest crash rates by targeting the following three crash types: run-off road, head-on and intersections. In the NZTA's Road Safety Strategic Plan, the state highway priorities being focused on are high-risk rural roads and high-risk intersections, speed management and motorcycle black routes in particular.

Figure 6.2 State highway fatal and serious casualties



	2001/ 02	2002/ 03	2003/ 04	2004/ 05	2005/ 06	2006/ 07	2007/ 08	2008/ 09	2009/ 10	2010/ 11
Serious	776	783	727	792	759	800	715	706	620	574
Fatal	200	193	211	204	171	190	178	172	179	124

Road safety is a critical part of our work, and our performance in this area is not perfect – while our current programme of work is improving road safety, 180 people still die on state highways each year, and we need to bring about further improvements.

KiwiRAP

KiwiRAP (the New Zealand joint agency Road Assessment Programme) is one of the vital tools in rating the safety of the rural state highway network based on historic crash data (risk maps) and the star ratings. Star ratings provide a database of the physical road safety attributes along 10,000 kilometres of rural state highway network. These, combined with our KiwiRAP Analysis Tool (KAT) and the *High-risk rural roads guide*, allow us to better target our road safety efforts, in particular to address the three prime crash types.

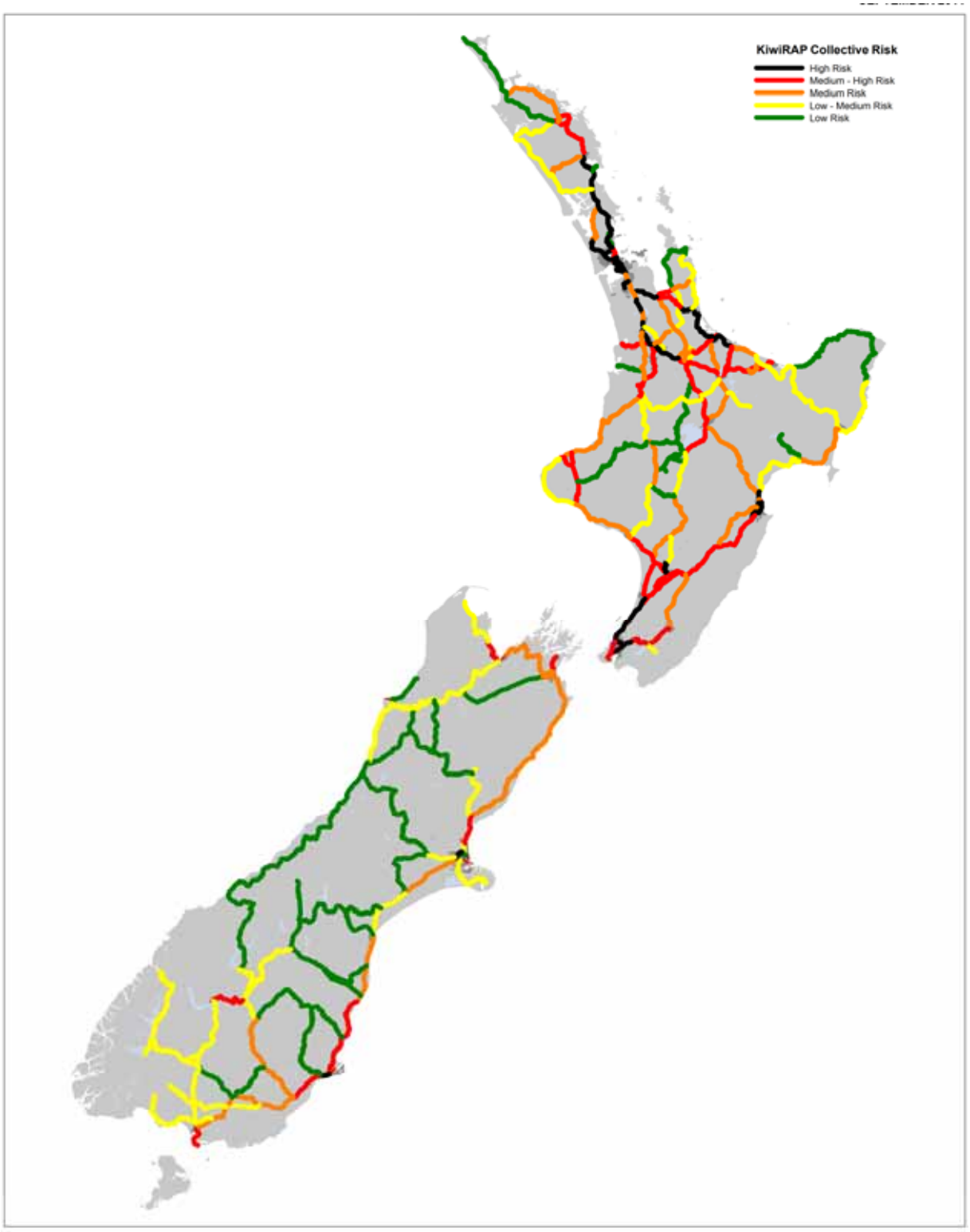
With the resources available, the NZTA is most able to contribute to reducing the greatest number of crashes by prioritising engineering solutions on highly trafficked, high-risk roads.

We will be targeting our safety engineering works, such as median and side barriers, along the routes that have a medium–high (**RED**) and high (**BLACK**) collective risk, as shown in table 6.1. On routes with high personal risk but lower traffic volumes we will work with our partners to provide lower-cost solutions, such as improved speed management and driver information and awareness.

Table 6.1 KiwiRAP star ratings

KiwiRap star rating	1★	2★	3★	4★	5★
Length of state highway	0%	39%	56%	5%	0%
Vehicle kilometres travelled	0%	33%	40%	28%	0%

Figure 6.3 KiwiRAP collective risk



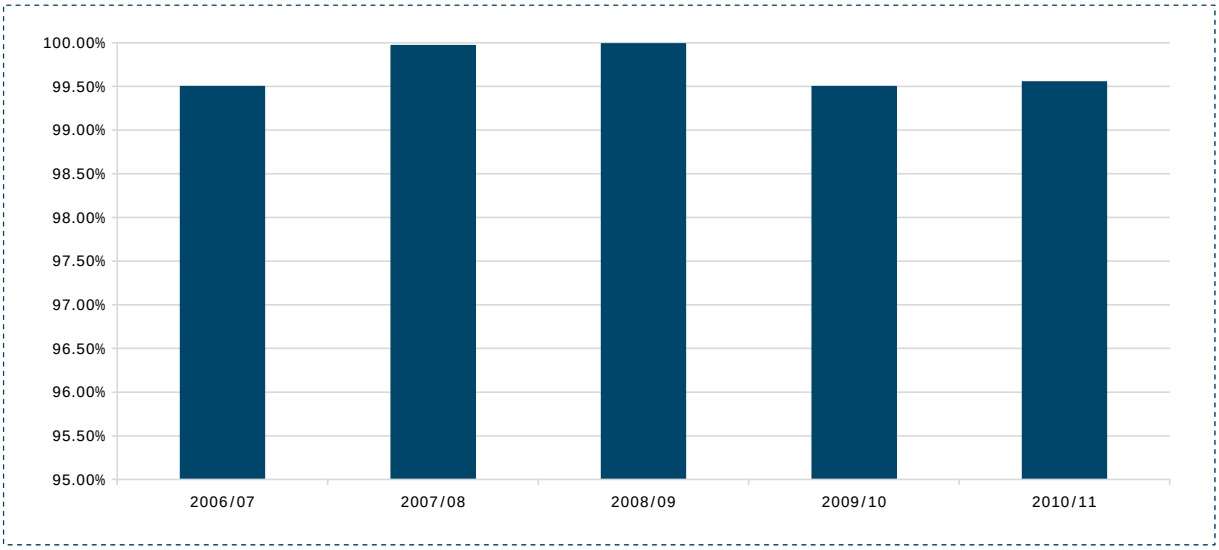
Efficient and reliable journeys

Figure 6.4 Performance levels for efficient and reliable journeys

Our customers want to have more reliable journeys when using our highways, particularly in Auckland. Because this issue involves state highways and local roads, we need to work with our partners and take a whole-of-network approach to our operations and management.

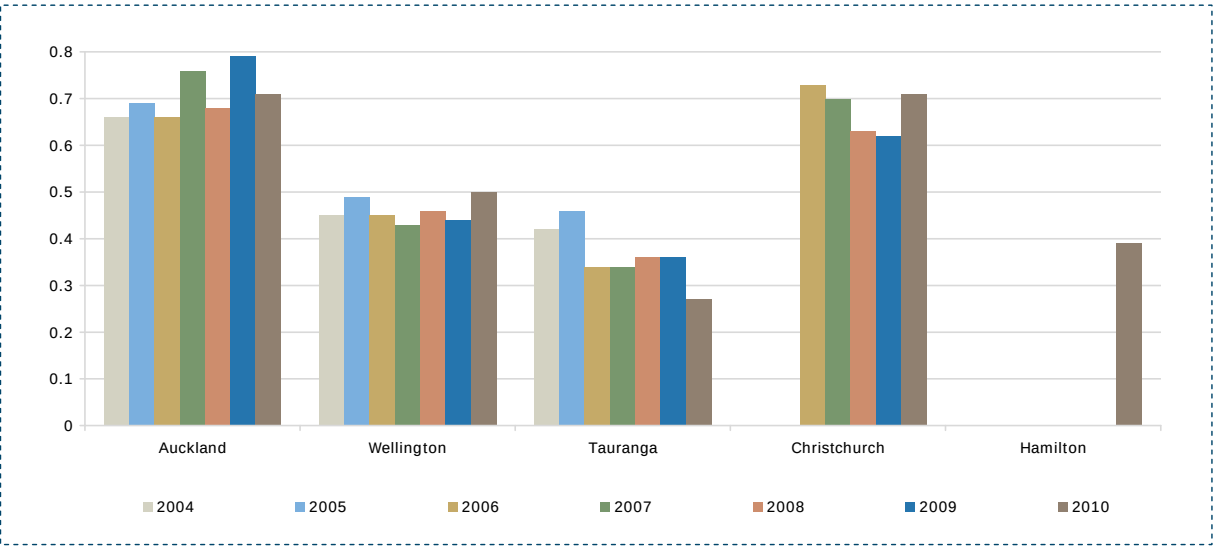
It is how we manage the network when incidents or events occur that most concerns our customers. Further, as traffic volumes continue to grow on these highways, even small disruptions can cause significant bottlenecks and delays. Effective operation of our traffic operations centres, incident management, response timeliness and management of worksites are also increasingly important to maximising capacity, particularly during or near peak periods.

Figure 6.5 Network availability, 2006/07 to 2010/11



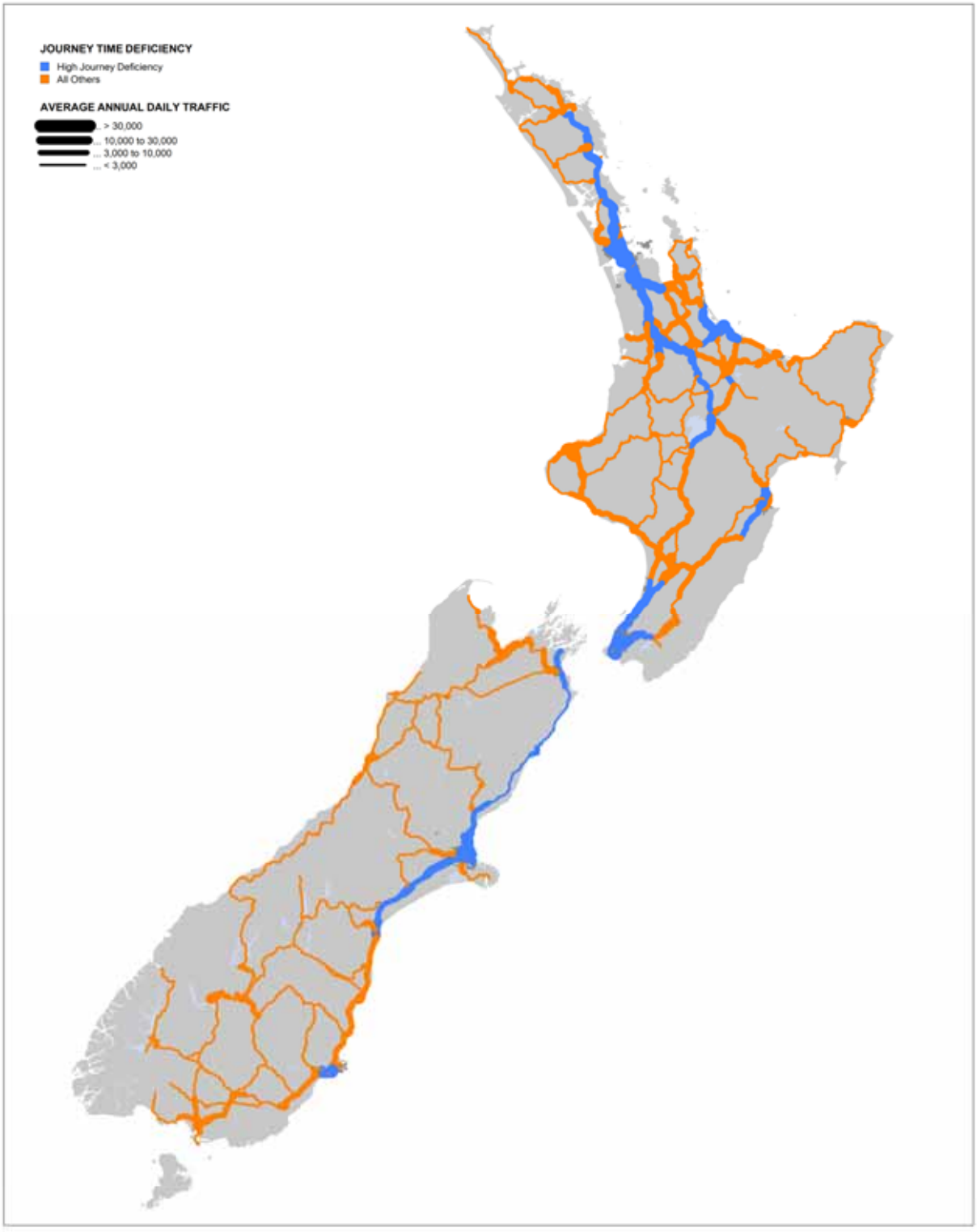
Our main urban centres experience severe congestion at peak times and after incidents. We are increasing the capacity of the network through new high-capacity connections, and by making more extensive use of active traffic management such as ramp signals and traveller information systems to improve traffic flows on these roads.

Figure 6.6 Comparison of morning peak congestion indicators, 2004–2010



The current roads of national significance programme is a key part of meeting the service gap that currently exists with regard to journey reliability and efficiency on nationally strategic roads. Further we have identified the routes on which travel time deficiencies occur and where, if action isn't taken, travel times are forecast to deteriorate to unacceptable levels. These are the routes that the NZTA can address reasonably in the next 10 years.

Figure 6.7 Journey time deficiency map



Social and environmental responsibility

Figure 6.8 Performance levels for social and environmental responsibility

We proactively work with private and public sector organisations to deliver integrated transport outcomes, in an attempt to minimise our adverse social and environmental impacts. Recent years have seen a focus on improving public transport, especially in Auckland, and the perception of our performance is constantly improving.

However, our customers have said our engagement with them is not satisfactory; we will focus attention in this area accordingly, although we acknowledge that we cannot always meet the, sometimes conflicting, expectations of the public when engaging with them.

Value for money

We constantly consider how to deliver the *Statement of intent*'s desired impacts in the most effective and efficient manner, to obtain the best value for money.

Figure 6.9 Cost per million vehicle kilometres travelled (vkt), 2001/02 to 2014/15

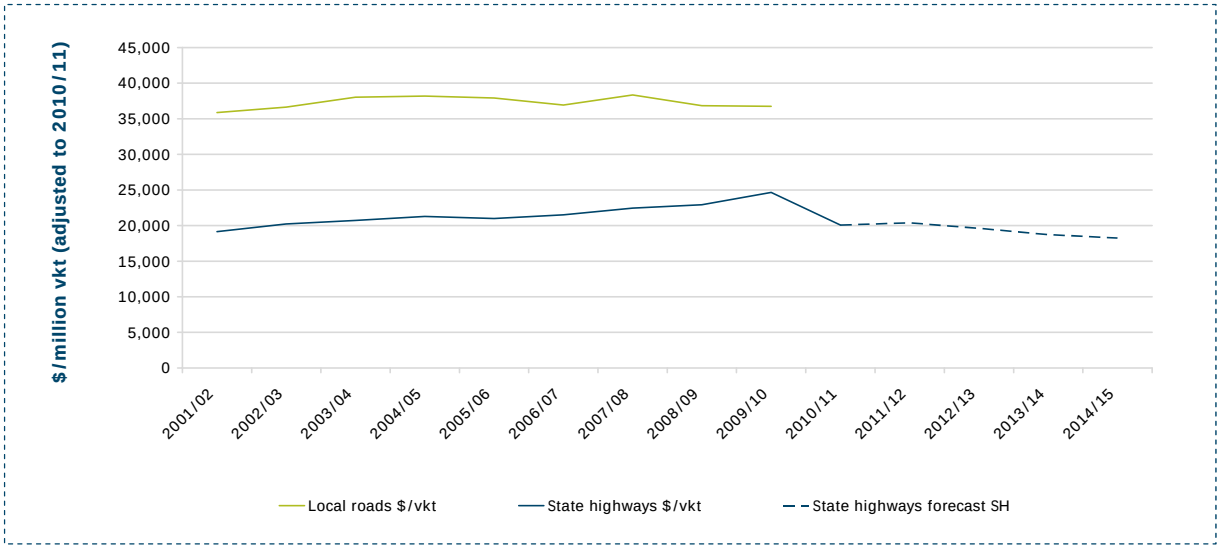
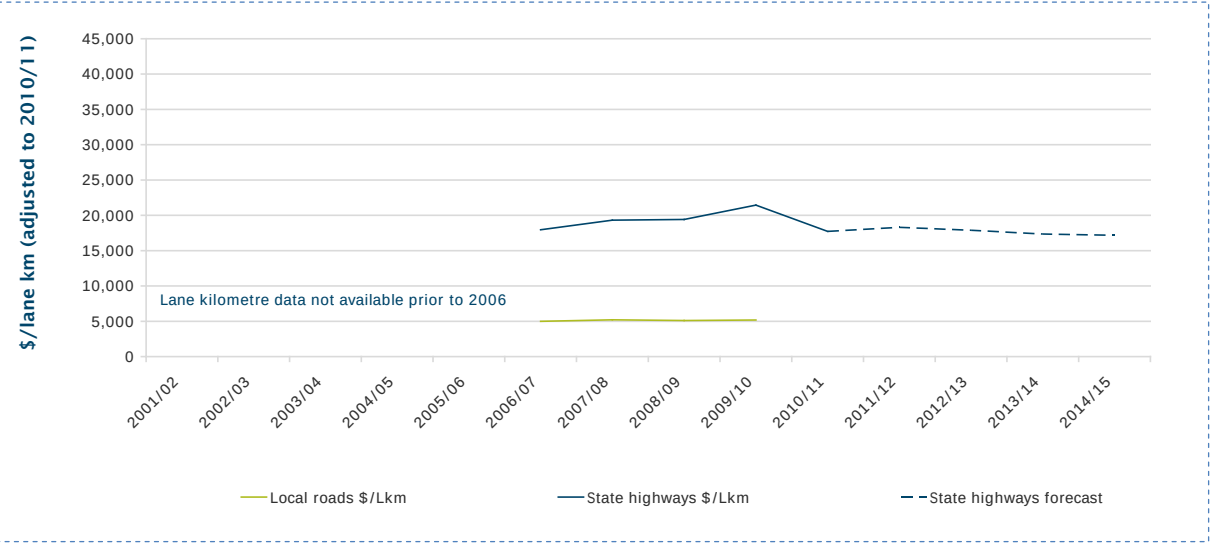


Figure 6.10 Cost per lane kilometres, 2001/02 to 2014/15



We can demonstrate value for money in our maintenance and operations activities through analysing the costs of our works relative to the volume of traffic. This is relatively flat over time, and overall condition of the network has not suffered. In this period both the number and complexity of the assets we need to maintain have grown, and traffic demand has increased. Further the state highways are half as expensive when compared with local roads in this way.

The performance measurement and monitoring framework helps provide further evidence of value for money. We apply this at a contract level to ensure we deliver the desired outcomes at the optimum value for money. This allows us to demonstrate our performance and to show generic trends at a regional level.

Our procurement process helps us to select the most appropriate method to gain reduced market rates, while maintaining healthy local competition. We also audit and monitor contracts to continually improve the value for money we deliver.

7 Risk management

Risk management is a fundamental facet of the NZTA's operation, as it is for all companies. Risks occur at strategic, portfolio, project and operational levels, and each requires a different management tactic. When we indentify, analyse and assess risks, a evaluation is then made on whether it is possible to eliminate them completely, whether we should mitigate but retain some residual risk, or if we should accept the full possible impact and decide whether to have the resources to respond appropriately, should the need arise.

NZTA risk management

AS/NZS ISO 31000/2009 Risk management – principles and guidelines is the guiding standard that informs the NZTA's framework for risk management. Our risk management processes are specified in a number of documents that apply to internal staff and suppliers.

Managing state highway risks

Managing state highway risks relates both to asset improvement and asset management. We contract out professional services and physical works, and our contracts stipulate the requirements for risk management conduct, to be done in accordance with the provisions in *AC/MAN/1 Transit Risk Management Process Manual*. We hold a risk register for our key risks, and use it as a tool to help manage them.

Table 7.1 Business-as-usual risks that we manage on the state highways

Risk	Control	The NZTA's treatment
Strategic risks		
Risk of a lack of or deferred funding	• NLTP / RLTP • Planning, programming and funding manual • Procurement manual • Cost estimation manual (SM014)	We anticipate what level of funding (and hence activity) we can operate at for the next 3 years. We also have confidence that our planned programme once adopted will be funded as expected.
Risk of unanticipated occurrence of a natural event, eg flood, earthquake, landslip, avalanche, bush fire, adverse weather	• Civil Defence Emergency Management Act 2002 • Coordinated Incident Management Systems • NZTA Risk Management Framework 2010–13 • Risk management process manual • Asset protection and strengthening measures	We work closely with our partners to ensure we plan for these events and are able to respond rapidly when required. We monitor events that can be anticipated and pre-position resources accordingly.

Risk	Control	The NZTA's treatment
Portfolio and network risks		
Risk of catastrophic failure of a network structure	• State highway maintenance contract proforma manual • Bridge and other structures inspections • Bridge inspection and maintenance manual	We have contingency measures in place to maintain the availability of the state highway network. This includes emergency response teams, Bailey bridges, etc.
Risk of pollution and/or negative impacts on flora and fauna	• Environmental policy manual • Erosion and sediment control standard for state highway infrastructure • NZTA consent compliance management system • Planning policy manual for integrated planning & development of state highways • Stormwater management	We minimise the effect of our activities on the natural environment.
Risk of damage to the asset	• State highway geometric design manual (draft) • NZ supplement to the 2004 Austroads pavement design guide • Land transport rules	We ensure our assets are fit for purpose and we work with our partners to enforce the road rules.
Risk of premature deterioration or obsolescence of the asset	• State highway maintenance contract proforma manual • Annual NZTA inspection regime • Fortnightly network inspections	We monitor and understand loadings on our assets. This allows us to understand and track asset deterioration and identify assets with reduced life spans. These assets can then be renewed or replaced at the most appropriate time.
Risk of overspend	• Cost estimation manual (SM014) • Project management manual • State highway construction contract proforma manual (SM031) • State highway professional services contract proforma manual (SM030)	We are able to identify and forecast any overspend early. Our procurement and project management teams balance available funding and project commencement to ensure we do not exceed our funding.

Risk	Control	Impact to NZTA at a high level
Project and operations risks		
Risk of schedule slippage	• Project management manual • State highway construction contract proforma manual (SM031) • State highway professional services contract proforma manual (SM030)	We identify slippages early and escalate alternatives to ensure we deliver our funded programme outcomes.
Risk of sub-optimal design and/or construction practices or materials	• Procurement manual • Project management manual • State highway construction contract proforma manual (SM031) • State highway professional services contract proforma manual (SM030) • Quality standard TQS1 & TQS2 • NZTA material specifications	We specify suitable standards and enforce them rigorously.
Risk of failure of integration of new projects with existing asset	• Procurement manual • Project management manual • State highway construction contract proforma manual (SM031) • State highway professional services contract proforma manual (SM030) • State highway geometric design manual (draft) • Bridge manual • NZ supplement to the 2004 Austroads pavement design guide	We have guidelines and standard details for integrating and transitioning new improvements with existing assets. Further we have handover processes that enable both project teams and asset managers to highlight possible issues.
Risk of failure to gain property access	• Procurement manual • Project management manual • State highway construction contract proforma manual (SM031) • State highway professional services contract proforma manual (SM030) • Public Works Act	Our long-term programming allows us to commence property access negotiations in advance and identify potential delays early. If necessary, we escalate alternatives to ensure we deliver our funded programme outcomes.
Risk of poor contract execution and ensuring outcomes are fit for purpose	• Procurement manual • Project management manual • State highway construction contract proforma manual (SM031) • State highway professional services contract proforma manual (SM030) • Supplier quality management	We specify suitable standards. Should they not be met, we have contractual processes of correcting mistakes or omissions.

Other significant risks

Workforce planning

Ensuring a high level of capability is a key challenge. Current economic conditions have eased the labour supply, and an ageing workforce will mean a loss of skills due to retirement. We will continue to develop a strong culture of engagement and professionalism to address these challenges through talent management, succession planning, and identifying areas of skill shortage.

Climate change

The effects of climate change on infrastructure and services present a major challenge over the next 30–40 years. We are monitoring changes in this area (with expert guidance from the Ministry for the Environment) and dealing with it as a risk management issue.

Volatility in fuel prices

Crude oil prices impact the use and management of the land transport system, affecting changes in demand, revenue streams and input costs. Global trends suggest that oil prices will continue to rise and become more volatile. The NZTA must be flexibly positioned to respond to these challenges.

Other economic factors

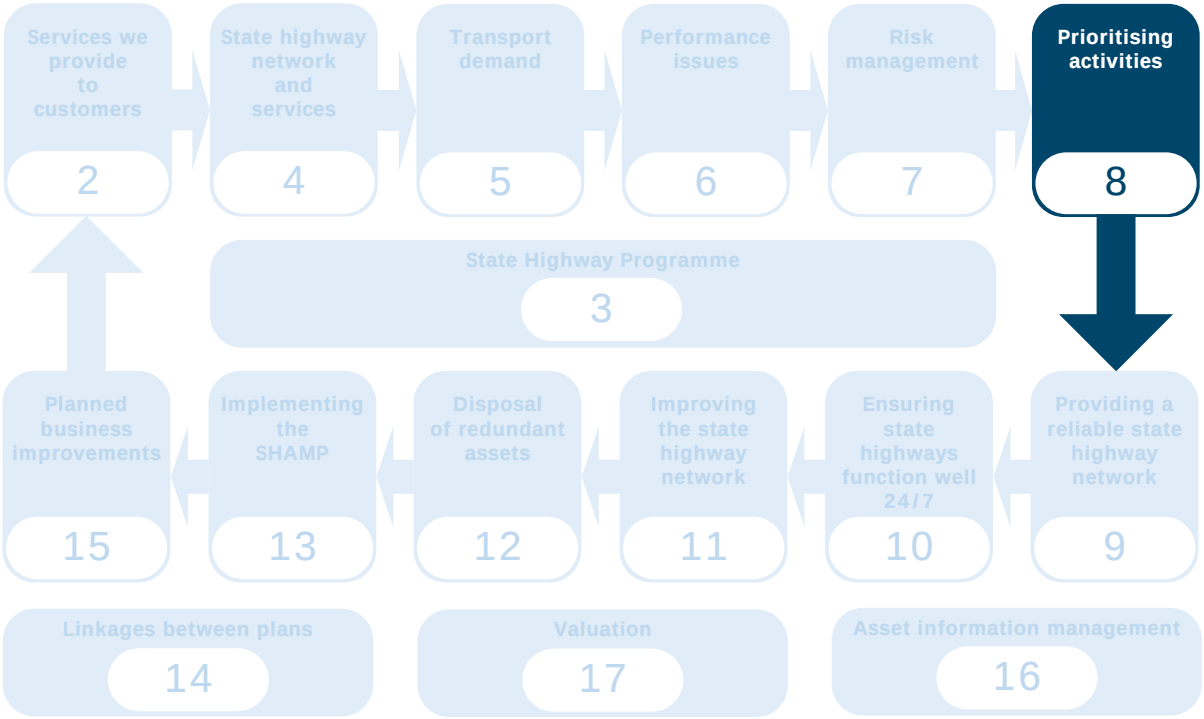
The construction industry's focus on the Canterbury rebuild will likely fill capacity in the sector, meaning that the highly competitive pricing the NZTA has benefited from over the last few years is expected to retreat. However, as part of our management of price-related risks, the NZTA has many long-term contracts with secure costs in place.

The budget for the current programme of works includes an estimated rate of inflation of 3% each year over the next three years. If it rises above this figure, we may face further constraints on our available budget, and therefore the level of activity we can operate at.

Emergency management and response planning

Some risks can never be entirely eliminated; in these situations we must be prepared to respond to situations when they occur. The NZTA is a 'lifeline utility' under the Civil Defence Emergency Management Act 2002 and has incident management systems in place in coordination with the emergency services. Emergency response work is undertaken to repair and restore roads following events such as earthquakes and slips. An allocation of funds is set aside each year in the National Land Transport Programme for this and the NZTA holds a stock of Bailey bridges that can be deployed in emergencies involving loss of, or weakened, structures from landslips and washouts.

8 Prioritising activities



We have implemented a rigorous prioritisation process to extract maximum value for money from our operations, maintenance and capital improvements programmes. We will continue to use this to optimise safety and journey times for road users. From it, we establish the programme of works that delivers maximum benefits for the investment. The process involves:

- targeting the most important issues
- identifying where we can make the greatest difference (generally the most trafficked roads)
- identifying the best suite of responses we can implement to fix the current and looming problems
- optimising each element of this suite of responses to make changes that will bring about the biggest difference for the least cost.

We prioritise each element of our programme, so that it makes the appropriate contribution, at the right time, in the right way and for the right cost.

The *Government policy statement* guides transport investment in three directions: economic growth and productivity, value for money and road safety. The prioritisation framework of the draft Investment and Revenue Strategy reflects these three directions.

This is applied in detail using the procedures in the *Planning, programming and funding manual*. This sets how to optimise projects, for example.

Developing and delivering a targeted programme

The prioritisation process starts with planning our programme of works, where we focus on projects that deliver the widest benefits with the greatest impact.

We identify which state highways should be the focus for improvement by considering the classification, role and service targets for each, its current journey time performance and safety risk rating, and our capacity to address the service gap between target and actual performance.

We focus our activities on state highway corridors where we can have the greatest impact on economic development by improving the journey time and reliability (see figure 6.8), or where the greatest impact on safety can be delivered by improving those state highways with the worst collective risk (see figure 6.4).

This ensures that the largest service gaps are the highest priorities, and that they are closed in an effective and efficient manner when the investment can be justified.

Corridor planning/connecting state highways and local roads

We develop our programme through the three planning processes shown in table 8.1.

Table 8.1 Planning processes that lead to programme for corridor planning/connecting state highways and local roads

Network plans • Cross agency • Multi-modal • Incorporate land-use • Define sub-networks/corridors • Set required role and function of each agency and transport corridor in the network
Corridor plans • Describe how the road is going to be developed and managed to deliver its role • Set specific service targets, such as speed environment, feasible improvements and maintenance targets • Identify route-long treatments • Outline a programme of feasible improvements • Detailed enough to enable development of operations, maintenance and improvement plans
Maintenance, operations and improvement plans • List in detail the activities that will efficiently implement the specific service targets set in the corridor and network plans • Coordinated across corridors and work types • Reflected in asset management plans every three years

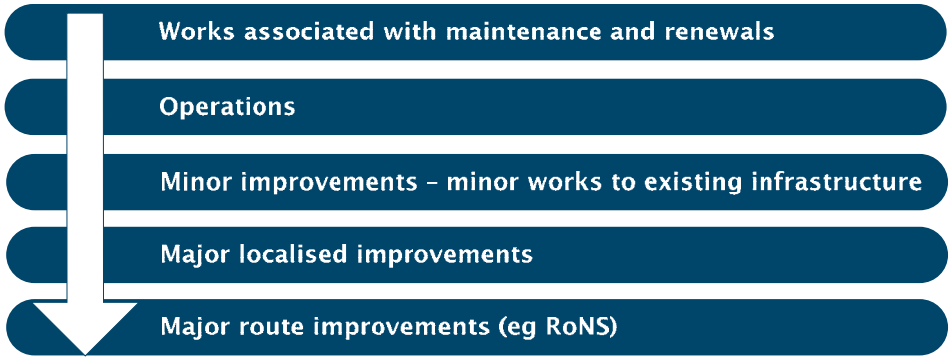
The state highway improvement programmes are created by a collaborative process involving regional planning teams and asset managers. Opportunities and needs are identified from performance monitoring of condition and demand, and increasingly from regional network and corridor plans. These then eventually feed back into regional land transport programmes and, ultimately, the National Land Transport Programme.

Regional Network Plans and Corridor Plans allow us to understand regional and corridor issues, in terms of integrated transportation requirements both on the NZTA's state highway network and local authority road networks. From these plans we identify service gaps for a complete journey and plan with our partners how we should each be working to best address these gaps.

Corridor plans focus more on the specific role of the state highway within the network plan. These highlight the specific locations on a distinct network that have service gaps that require improvements, set out where and when we expect to improve networks and where we won't. They also highlight what scale of improvement would be most suitable in terms of performance over the greater network, including local roads. From these, specific maintenance, operations and improvement plans can be created.

Selecting the right type of response

Figure 8.1 Hierarchy of intervention



When investigating solutions to close gaps in services, we consider all potential options and select the best value-for-money option. To determine this we look at all options and consider the cost–benefit ratios for each, selecting the one with the most enduring benefits and optimal whole-of-life cost.

Within improvements and operations we can respond at various scales, as shown in figure 8.1, aiming to address issues using the least intrusive project first. We use the processes of the *Planning, programming and funding manual* and our internal quality assurance processes to ensure we're managing and developing the network in the most efficient and effective manner possible. –

Prioritising responses at the right time

Funding is planned and allocated within three-yearly cycles through the National Land Transport Programme, allowing medium-term certainty and avoiding costly resource reallocation.

We prioritise transport activities for inclusion in the National Land Transport Programme by the three criteria from the Investment and Revenue Strategy, ranking each activity high to low, to create a priority order:

- **Strategic fit** – 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.
- **Effectiveness** – The effectiveness assessment considers how the proposed solution helps achieve the potential identified in the strategic fit assessment, and the purpose and objectives of the Land Transport Management Act 2003. Higher ratings are provided for those proposals that provide long-term, integrated and enduring solutions.
- **Economic efficiency** – 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 provides a basis to rate the economic efficiency for improvements and new initiatives. Non-monetised benefits that are not included in the benefit–cost ratio may be considered by the NZTA Board in support of the economic efficiency assessment.

We consider external factors too, but generally our programme reflects the priority order of the Investment and Revenue Strategy.

Apply prioritisation processes

We use different factors when it comes to prioritising different aspects of work on the state highway network.

Maintenance and renewals

We carry out maintenance and renewals works in order to ensure the state highways deliver their service targets for three key areas of performance (in order of priority):

- **Network security** – We carry out works to ensure the condition of each highway continues to deliver the primary function of each state highway, ie providing road users with access between local, regional and national destinations, thus helping provide a resilient and secure transport network.
- **Safety** – We ensure that the state highways are safe to drive along, helping to reduce deaths and serious injuries from road crashes, eg by targeting works to improve skid resistance and ensuring barriers are in good condition.
- **Comfort benefits** – Through our programme of maintenance and renewals works targeting accessibility, we will also improve the travel experience of our road users by improving comfort factors across the state highways, such as smooth travel exposure.

The maintenance and renewals programmes aim to achieve similar levels of service to those currently delivered within the flat *Government policy statement* budgets by offsetting growth with efficiency gains.

We prioritise this work according to the likelihood and consequence of a failure to deliver our target levels of service, always aiming for the network to deliver target levels of services consistently. We carry out maintenance and renewals in a manner that allows us to intervene as infrequently as possible and that minimises long-term costs. The need for work is defined by inspection and by trends of condition, performance and maintenance.

These interventions are prioritised according to the highway classification:

- On lower classed roads, we will provide maintenance interventions as close to the time of asset failure as possible, while minimising the actual risk of asset failure.
- Conversely, on higher classification roads the consequence of failure is such that neither the NZTA nor our customers can accept this occurring because of the traffic disruption that would be caused. Therefore, we time our interventions earlier to ensure that the asset continues to deliver the desired service at all times, while still demonstrating optimal whole-of-life costs.

Our priorities when planning this process are:

- providing targeted services to customers
- minimising life-cycle costs.

Structures

We identify structural maintenance by inspection and prioritise deterioration into high, medium and low priority categories based on an engineering assessment of the importance of the work and the potential consequences of not doing the work. Generally all high-priority work is implemented, plus a portion of the medium and low priority works to ensure that there is not a significant backlog.

Our bridges are only replaced when they are in very poor condition and the net present value of repairs is greater than the replacement cost. The justification is prepared by the regional bridge consultants with an engineering report on the condition and forward options for repair and replacement. The

justification is reviewed by the NZTA National Structures team and allocated a high priority as essential infrastructure, scour or seismic retrofit.

We have similar prioritisation processes that also apply to other structures, such as tunnels, retaining walls and gantries.

We prioritise other bridge improvements, such as bridge widening, using the Investment and Revenue Strategy alongside other improvement projects. Only those with high priority will be programmed for implementation.

We also have a separate seismic retrofit programme that has been active for 10 years. The initial prioritisation was based on a specific screening programme that identified the risk, importance and consequences to provide a national ranking. The higher-value and lower-cost seismic linkage projects have been given higher priority based on their greater value. The initial ranking is then followed by a detailed seismic assessment and improvement options selected based on perceived value. Our current programme has been reduced to existing commitments because of funding constraints and the prioritisation process is being reviewed. Similarly we have a scour retrofit programme that has been developed based on an initial screening of bridges that identified and ranked scour risk.

New bridges are usually implemented as part of roading improvement projects that are prioritised using the Investment and Revenue Strategy.

Active traffic operations

Our traffic operations serve two purposes: to make better use of our existing infrastructure by improving traffic flow; and to respond appropriately when events or incidents occur by directing traffic away from and around the incident. Our prioritisation and implementation of traffic operations tools is based on delivering the target levels of service associated with the state highway classification described in chapter 2 and on our assessment criteria. This enables consistent application across the network, thus delivering a familiar environment to road users.

Our Traffic Operations Strategy ensures we get the best value from our existing assets and systems, and helps identify where we need to invest to close service level gaps.

Highway improvement responses

Improvements are focused on routes with significant service deficits where the greatest impact can be made for the greatest volume of traffic, so projects are mostly on national and regional strategic state highways. Therefore the form of most other roads will remain as they are now except at significant safety black spots or journey bottlenecks.

The programme reflects increased multi-modal network-wide planning and state highway corridor planning. This gives better outcomes for our customers by ensuring that state highway improvements are coordinated with improvements to adjacent networks, and that all improvements make a meaningful difference to our customers along a corridor. This supports the Safe System approach.

A hierarchy of strategies ensures improvements provide maximum benefits to the network. We translate these strategies into plans that reflect factors such as land use, services, transport planning, urban design and environmental management. The plans take our network performance and service gaps (now and future) and identify the appropriate solutions.

Initial identification of network improvements is done at a regional level, using a 'top-down' analysis of corridor safety, journey and environmental service issues compared with a 'bottom-up' approach that considers issues of individual locations (eg crash black spots). Potential options are reviewed, the most appropriate solution is chosen and estimate construction costs are developed.

At the regional level, we prioritise projects to target the largest service gaps – those that benefit the wider transport network, followed by those that will present corridor improvements. Finally, we consider localised improvements. Within this last list we give precedence to smaller projects that demonstrate value-for-money solutions.

While we will not improve or upgrade (eg by widening carriageways) the lowest category highways for service reasons if they are meeting their service targets, we may consider suitable investment if it will reduce long-term whole-of-life costs.

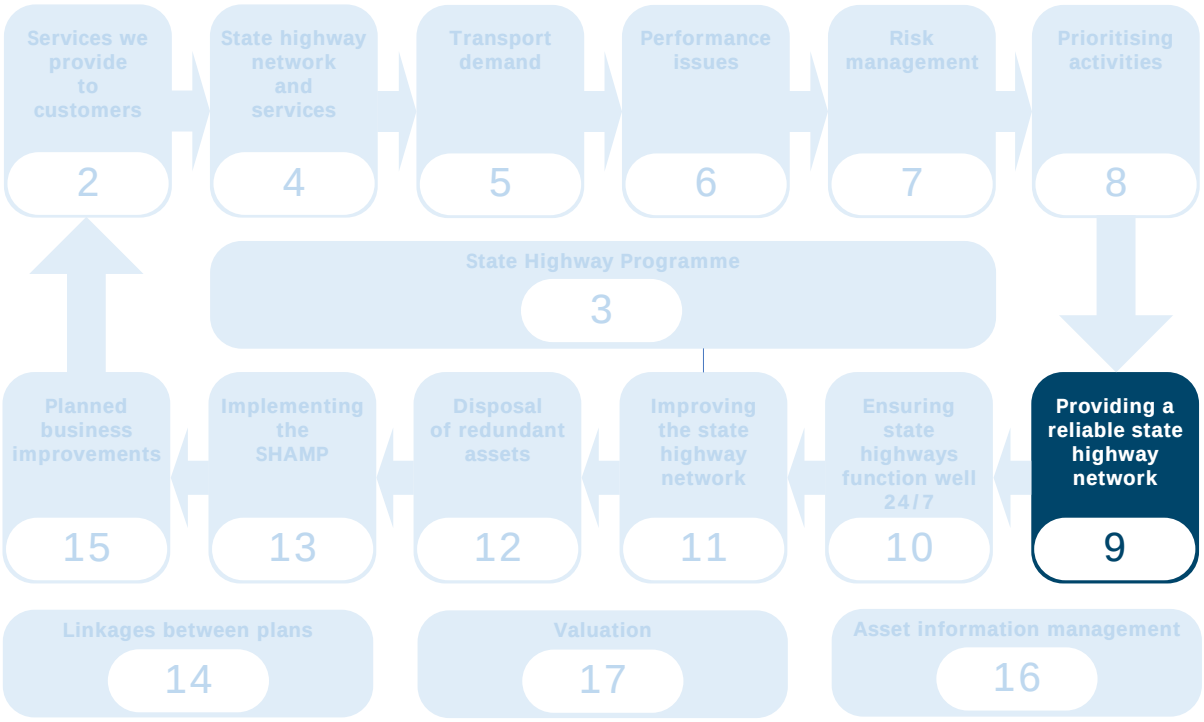
Roads of national significance

The government has identified seven essential state highways that are linked to New Zealand's economic prosperity, called roads of national significance:

- Puhoi to Wellsford – SH1
- completing Auckland's Western Ring Route – SH16 and SH20
- Victoria Park Tunnel, Auckland – SH1
- Waikato Expressway – SH1
- Tauranga Eastern Link – SH2
- Wellington Northern Corridor – SH1
- Christchurch motorways.

The NZTA is charged with upgrading these nationally strategic highways within the next 10 years to deliver travel time and congestion benefits, thereby giving effect to the *Government policy statement*. The projects will help us meet the journey reliability and efficiency service gaps that currently exist on nationally strategic roads.

9 Providing a reliable state highway network



Our aim is to ensure that all work is needed and that it is efficient and effective:

- Work is needed when the condition of an asset deteriorates so that service targets are at risk. The amount of work depends on demand, which increases the rate of decay, the asset condition, external events such as weather, and the availability of assets.
- Work is effective when they address the service problems completely, for the least long-term cost.
- Work is efficient when it is executed with least adverse impact cheaply.

We preserve the current state highway assets through routine maintenance and renewals. This important aspect of our work ensures the state highway network remains as close as possible to the target levels for three key areas of performance: network security, safety and driver comfort.

Maintenance and renewals are timed to reduce the risk of service failure from deterioration in asset condition. Accordingly, sufficient investment in this area is crucial.

For all areas of the network (pavements and surfaces, structures, drainage and traffic services), the maintenance process includes some or all of the following steps. Using the appropriate combination of each ensures acceptable whole-of-life costs and minimal risk to service targets:

- **Routine maintenance** – regular work to keep assets in adequate condition, generally done proactively. This work reduces future deterioration and ensures service levels are maintained.
- **Inspection of asset condition** – when a fault is discovered, the site is made safe, alternative services are provided and reactive maintenance is programmed. As conditions worsen and increasing repairs are required to maintain services, renewal works are programmed.
- **Evidence-based assessment** – asset condition data gathered is reviewed and assessed, along with historic and current trend data, to predict the appropriate timing of programmed maintenance or renewal.

- **Reactive maintenance** – unprogrammed activities such as repairing potholes.
- **Asset renewal/replacement** – larger-scale activities that replace or renew the existing infrastructure, such as resurfacing sections of the state highway.
- **Deferral** – decisions to defer potential works are based on the risk of service failure and additional costs, and are considered by local NZTA staff using their experience, knowledge and engineering judgement. We monitor the success of these decisions to improve our intervention decisions.

How our maintenance and renewals programmes are optimised

We prioritise our maintenance activities to ensure services are delivered for the best balance of risk, maintenance and renewal expenditure for each category of road required to meet service targets. The process steps used to optimise interventions in order to deliver levels of service and manage risk in the delivery of these standards (in general) follow established leading practice, as set out in the standards and guidelines on our standards register and in our contract procedures:

- Establish the minimum highway assets condition to deliver the prescribed levels of service for the category of road.
- Analyse condition trends over time (reviewing patterns of deterioration and improvement, in particular).
- Predict the expected short-, medium- and long-term performance and condition of asset groups, given forecast demand and current condition.
- Analyse different maintenance or rehabilitation treatments and intervention levels for their effect on road asset conditions, given forecast demand and current condition, and whole-of-life costs. Select the best budget scenarios.
- Identify the optimum intervention cycle to achieve and sustain acceptable asset condition at minimum life-cycle cost.
- Recognise the requirements arising from additional assets or projects coming out of their maintenance period.
- Prioritise the future maintenance and renewals based on the amount of asset deterioration expected and the impact that it will have on service levels and whole-of-life costs.
- Validate proposed works and timing by onsite inspection.
- Nationally prioritise work proposals.

We use this process to balance the conflicting requirements of meeting our target levels of service, working within our budget and managing the risk to our customers.

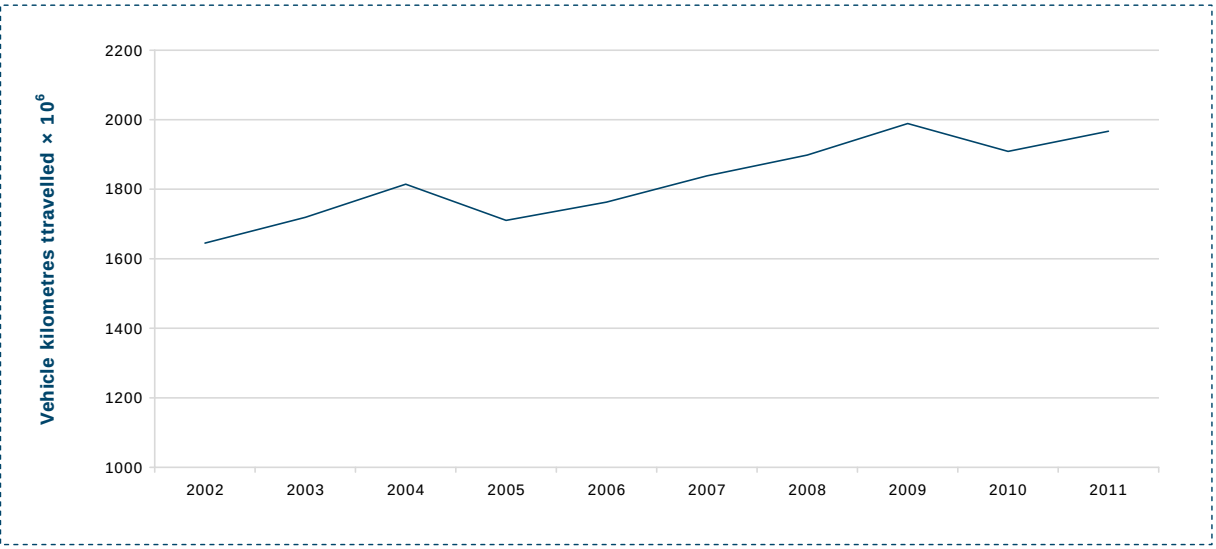
The network is in a reasonable condition in most aspects, and our recent levels of work have been enough to maintain it in a reasonable and constant condition. However, with increases in demand but static funding, we now have a challenge to introduce sufficient efficiency gains to offset the 2.5% increase in asset base each year, 3% growth in traffic volume and forecast 3.75% increase in input price each year, to meet all budget targets. The exact outcomes of this situation are unknown, and the NZTA will monitor it carefully to ensure risks are managed.

Meeting increased demand

Increasing freight

Pavement and surfacing management costs are affected not only by increases in the length of state highway and vehicle kilometres travelled, but mostly by the increase in freight vehicles, vehicle dimensions and mass limits.

Figure 9.1 National equivalent standard axels travelled, 2002–2011



Our pavements are designed in terms of lifetime equivalent standard axle (ESA) load. A standard axle carries 8.2 tonnes; cars therefore contribute an insignificant amount to pavement loading. The ESA travelling on our network has been rising steadily. As the relationship between axle load and damage done to the pavement is exponential we continue to monitor the effects of these increased loads on our network closely. The NZTA also ensures that the ensuing charges to the freight industry are shared equitably.

We use a variety of methods to control traffic loading and use, including working with the Police Commercial Vehicle Investigation Unit. This unit is responsible for monitoring all areas of the commercial vehicle industry, and monitors vehicle weights, load dimensions and transport of dangerous goods against standards. Our weigh-in-motion sites capture and record axle weights and gross vehicle weights as vehicles pass over them, providing excellent data with minimal interruption to road users.

We pass information from our weigh-in-motion sites regarding infringement of prevalent times or vehicle types to the Police Commercial Vehicle Investigation Unit to help them target their work better, especially in the case of persistent offenders. Of concern is the high proportion of overweight vehicles that cause rapid deterioration of pavements and pass an inequitable proportion of cost onto other road users.

Increasing assets

We are expecting to see significant increases in our asset due to investment in the roads of national significance over the next 10-year funding period. For instance, our programme of works will result in an additional 588 kilometres of state highway, around 10,306 metres of bridge structures and 5500 metres of tunnels, as well as numerous other structures and traffic services assets. These extra assets will immediately require additional operational management and ongoing maintenance as well as long-term renewal costs on top of that being carried out on our existing network.

Further infrastructure built over the past decade requires maintenance and renewal for the first time.

Pavements and surfaces

Our surfaces affect all three key performance areas: network security and reliability, safety and driver comfort. The annual State Highway Pavement Condition Report summarises skid resistance, texture, surface condition, roughness and rutting, the results of which feed into our maintenance and renewals forward works programme. Because road surface deterioration affects all aspects of its performance,

when we treat one of these with a maintenance intervention many of the other aspects are repaired sooner than appears necessary owing to their connection to other, more immediate demands. We have consistently kept all indicators at their target levels, but increases in demand will affect our ability to continue to do so.

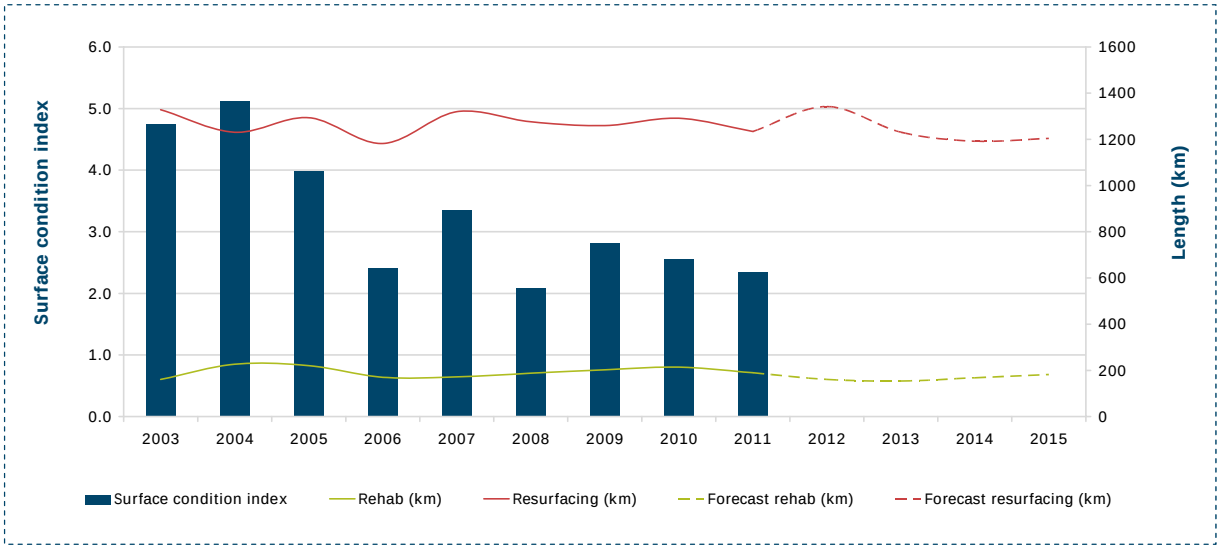
Network security and reliability

At the most basic level, having pavements and surfaces in adequate condition provides customers with a secure and reliable network – a key measure for the state highway network. Poor surface condition indicates that the integrity of the pavements is at risk; should this worsen and asset failure occur, the network will no longer be secure or reliable.

The Surface Condition Index is a general measure of the state highway pavement and surface condition, combining the condition data collected from visual surveys and the annual high speed data survey. In a simplistic sense, the index indicates the number of faults on a length of road. A lower score represents a better condition road. The reduction in the score of this index over the last 10 years shows that the condition of our highways has generally improved as we have increased our investment in it; over the last four years the condition has been relatively stable.

Surface Condition Index performance

Figure 9.2 Surface condition index historic performance



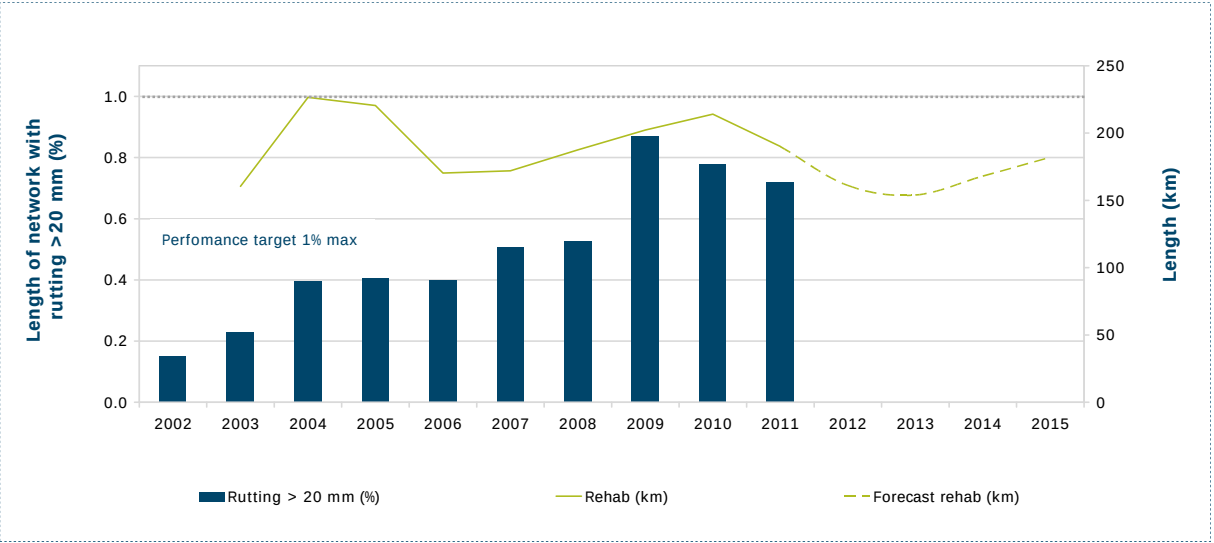
We are satisfied our current performance is at an appropriate level. Having reviewed our historic works lengths, we would expect that an annual range of approximately 1200–1250 kilometres of resurfacing works and 170–220 kilometres of rehabilitation works (see figure 9.3) would be sufficient to maintain the Surface Condition Index at an acceptable level. However, while this indicator is an important aid to ensuring the structural integrity of our pavements is preserved, it is generally not our prime driver for programming works.

Ruts form in vehicles' wheel paths and increase with time as the ongoing passage of heavy loads worsen the road structure. They are a symptom of pavement deterioration, so must be kept in check to ensure network integrity. Although increasingly challenged by ruts, our efforts over the last three years, including the government's roading stimulus package, have led to improvements.

The improvement in the rutting proportion in 2010 and 2011 demonstrates that the amount of rehabilitation work carried out in 2009 and 2010 was higher than that required to maintain the network structural integrity on average, while the drop in rehabilitation length in 2006 and 2007 resulted in an ongoing rise in the proportion of network rutting. We therefore believe that the ideal level of rehabilitation length lies between these boundaries.

Condition of pavement rutting

Figure 9.3 Proportion of national network with rutting >20mm, 2011–2011



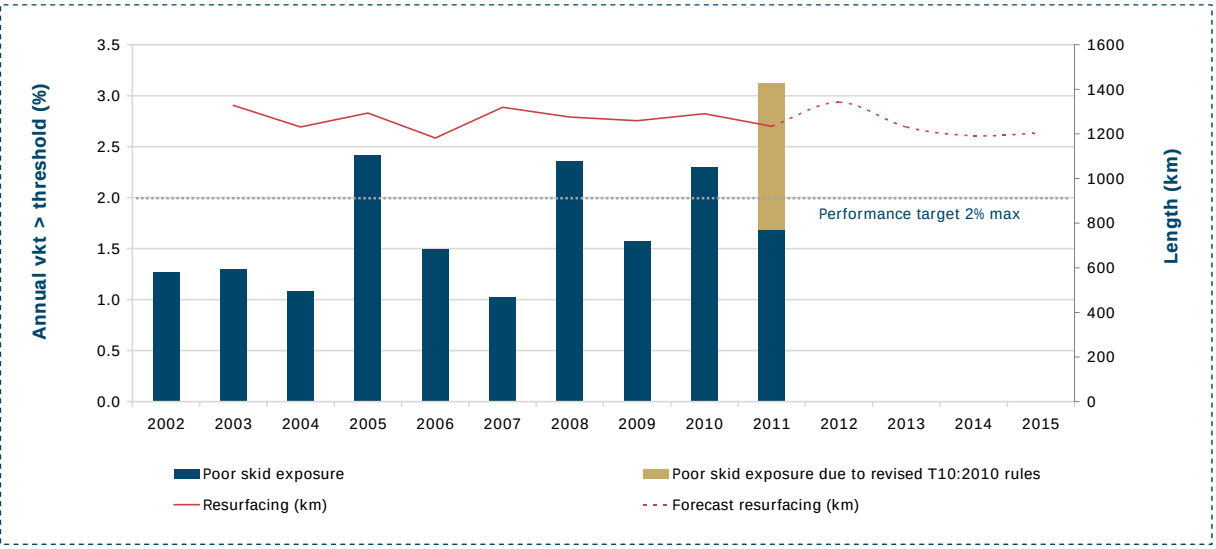
When we reviewed these figures further, we identified that a historic annual rehabilitation length of 170 kilometres or less has allowed us only to maintain the level of network rutting. When we have invested additional funding in renewals, allowing us to rehabilitate lengths greater than this figure, we have improved the network rutting. We will therefore continue to identify the appropriate amount of rehabilitation to optimise the future investment regime and to maintain desired levels of service.

Safety

Ensuring roads provide high skid resistance is an important safety measure. We have achieved a fairly constant service target in this area in recent years and in general have met our targets. We have recently improved our process for determining the requirements for skid resistance, by better identifying state highway curves where high skid resistance lowers crash risk. This means more roads have sub-target skid resistance, and as funding has remained static, service gaps have occurred. To cope with this, we are prioritising our works by focusing on those routes with the greatest skid deficiency and highest traffic.

Condition of surface skid resistance

Figure 9.4 National good skid exposure vehicle kilometres travelled (vkt) below threshold level, 2002–2015



The trends show that we have been achieving a fairly constant service target over time and in general have just exceeded it. In the last few years we have found it more difficult to meet our targets. Over the same period, we have increased our length of resurfacing works to around 1275 kilometres. Despite this increased length of resurfacing we have not been able to deliver our good skid exposure target adequately.

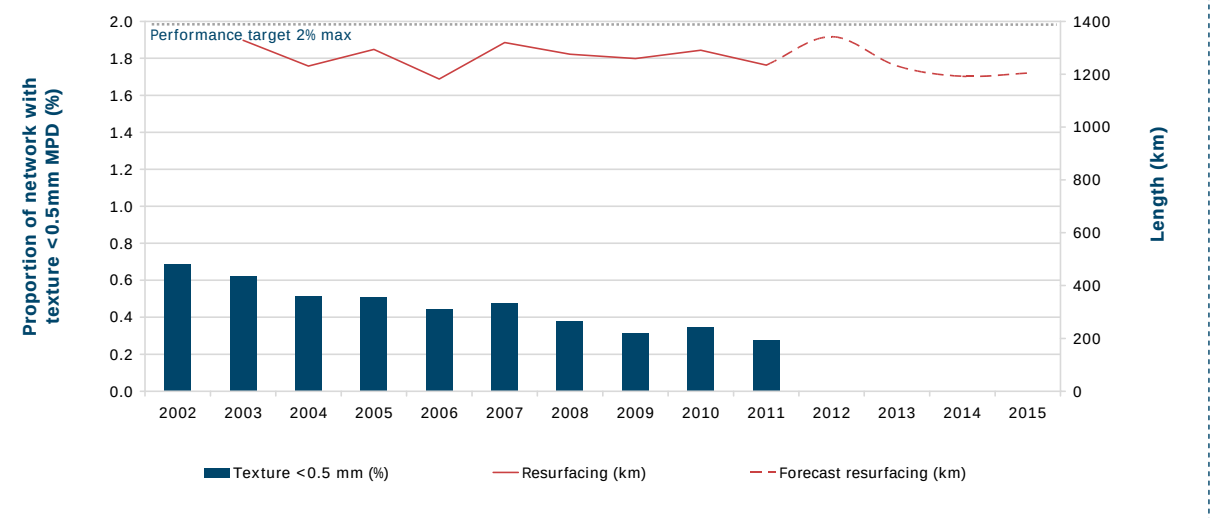
We believe this is due to increasing traffic volumes, which cause more rapid degradation of the skid resistance across the network, and increased vehicle numbers, particularly freight at sites not meeting our target. Of particular concern to us is the more rapid rise in heavy vehicles, which will promote more rapid flushing and polishing of the chips.

We intend to target funding at those specific sections of the state highway where there is a high risk from reduced skid resistance, those with high traffic volumes and those with the largest gap between the actual and target skid resistance. This means we should achieve better results by better targeting but some roads will still have sub-target skid resistance.

As well as providing improved skid resistance, adequate surface texture reduces the safety risks created by wet surfaces, as it prevents aquaplaning of vehicles travelling at high speeds in wet weather. This measure is closely linked with skid resistance and we interpret these sets of data together to identify management tactics.

Condition of surface texture

Figure 9.5 Proportion of network with texture <0.5mm MPD (mean profile depth), 2002–2011



Our highway textures have improved over time as we have increased our investment in resurfacing works. This has been due to increased reseals to address skid resistance rather than texture treatments. Such improvement appears to indicate that we may have been over-investing, but is in fact because a large proportion of our resurfacing works have been focused on improving the skid resistance of the network, while also improving texture. We need to continue this work to improve skid resistance, but also need to focus on minimising flushing on the network, which is considered one of the major risk areas of our pavements.

In high-volume and motorway areas we use porous asphaltic surfacing. This special surfacing allows water to drain through it, which reduces water ponding and spray, while still protecting the pavement. It also reduces tyre–road noise.

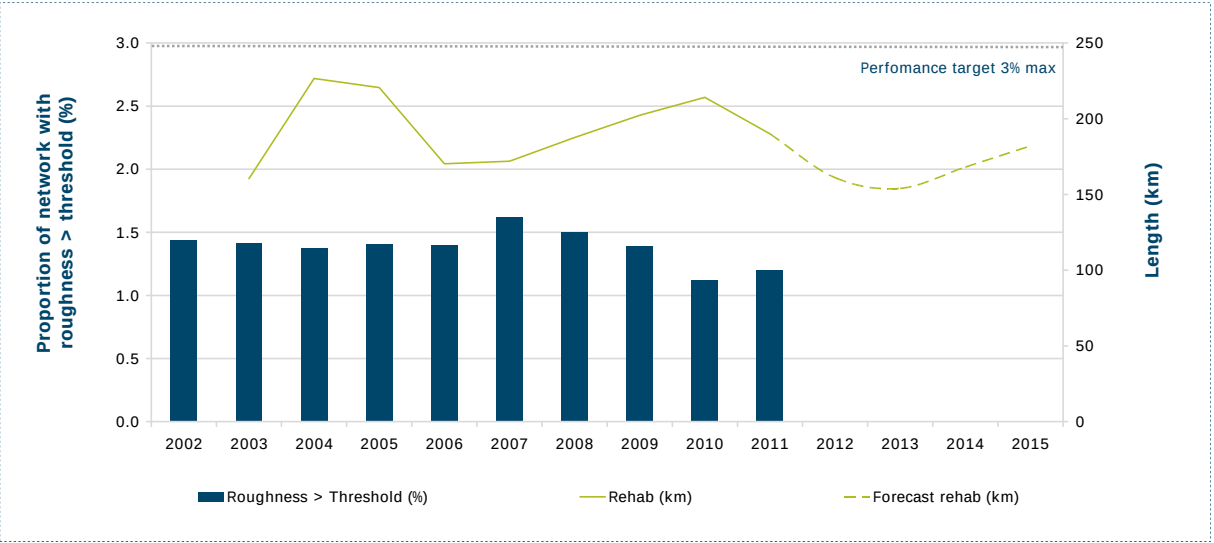
While rutting generally indicates deteriorating pavements, extreme rutting is also a safety concern, with aquaplaning resulting from large water pools in deep ruts. We fill ruts as a reactive maintenance treatment to reduce the safety hazard they pose.

Driver comfort

Driver comfort is primarily measured by roughness and is an area in which we have exceeded our targets as a by-product of other work rather than an over-investment. In general, this measure is performing well, with a slight improvement due to additional funding in 2009 and 2010. This improvement in roughness ceased in 2011, when we reported a slight drop in our performance. We therefore believe that we have been investing in rehabilitation works at a suitable rate (on average around 170–215 kilometres each year) over the last three to four years that as a side benefit the network roughness is maintained. However, we do not consider roughness to be an important driver for these works due to our current high performance.

Condition of pavement and surface roughness

Figure 9.6 Proportion of network with roughness less than threshold, 2002–2011



However, out-of-context roughness remains a concern and is targeted with spot maintenance treatments at bridge approaches and soft spots, particularly those affecting truck ride.

Pavement programme

Table 9.1 shows our proposed programme of rehabilitation and resurfacing, an effective schedule of works that provides excellent value for money.

Table 9.1 Proposed pavement renewals lengths

Renewal type	2009–12 (km)	2012/13 (km)	2013/14 (km)	2014/15 (km)	2012–15 (km)
Resurfacing	**3866**	1231	1182	1204	3617
Pavement rehabilitation	**565**	154	168	182	504

Our proposed programme has anticipated an average annual length of 1206 kilometres of resurfacing works. We intend to implement the same works target as in 2009–12, in order to improve our network's good skid exposure and maintain the protection of our pavements at a suitable Surface Condition Index level.

In order to protect our pavements and maintain the appropriate Surface Condition Index level, we will target resurfacing works at those sections of pavement where our inspections identify asset condition deterioration issues such as cracking that can lead to long-term damage of the pavement.

With the programmed level of expenditure we believe we will still struggle to meet our good skid exposure target, despite our improved targeting of resurfacing works.

While we may carry out resurfacing on neighbouring sections to take advantage of low marginal costs, we will only do so where there is an immediate skid resistance issue or where it is the lowest whole-of-life cost to do so.

Our rehabilitation programme is based around an average annual length of 168 kilometres. Our historic performance suggests that we should be aiming for approximately 170–220 kilometres of rehabilitation works to maintain or improve the condition of the state highway network rutting and

roughness. We believe the proposed lengths will ensure we meet our service targets for network availability, while maintaining each of our indicators below their performance target. In addition, our programme of works will provide our road users with safety and smooth travel exposure benefits.

Structures

The quality of our structures affects our performance in the areas of network security and reliability and safety. The greatest safety risk on the network tends to be associated with structures: a collapsed bridge or structure will have more extreme implications than a failed road surfacing. Similarly, barriers and guardrails have a significant impact on crash risk on the network.

The NZTA's bridges and culverts on the state highway network generally provide a very good level of service. It is summarised as follows:

- All structures have Class 1 (current maximum legal) load capacity.
- Nine bridges have vertical clearances less than 4.55m. Most of these are greater than 4.4m and therefore do not create a significant restriction for legal vehicles.
- Approximately 17% of bridges fail to meet current desirable width requirements. These narrow bridges do not materially reduce traffic capacity nor are they resulting in significant crashes, so no widening works are planned.
- The introduction of a new Vehicle Dimensions and Mass Rule to allow increased freight loads has resulted in limited benefits to date because of critical weaker bridges. So we are proposing to strengthen key bridges in our improvements programme. This is referred to as the Vehicle Dimensions and Mass Project for High Productivity Motor Vehicles.

Further they are in good condition based on the following justifications:

- Regular engineering inspections of all structures help us target works.
- The outstanding maintenance work programme is relatively small, includes only lower-priority works and is relatively constant.
- The average bridge age is less than 40 years. This is less than half the expected average bridge life.
- Historic, current and forecast maintenance costs are consistently low, at about 0.4% of the bridge replacement value.
- Forecast bridge replacements due to condition are very low over the next 15 years. The assessed, indicative annual forecast bridge replacement cost due to condition only is in the order of $10 million per year. This equates to about 15% of the current annual depreciation of $61 million.

Table 9.2 Current and forecast annual structures programme

Work category	Annual cost 2010/11	Percentage of replacement cost	Forecast annual cost over 10 years
Routine maintenance	$10 million	0.2%	0.2%
Structural maintenance and component replacement	$11 million	0.2%	0.2%
Renewals	$115 million	2.2%	0.2%

Overall our state highway bridges and culverts:

- provide a very good level of service that has seen small improvements over the last 10 years with a reduction in bridge postings
- are in good condition; this has been maintained at a reasonably constant level over the last 10 years based on the same average age of 40 years and similar budget levels for maintenance and renewals
- currently have relatively small forecast maintenance, renewals and improvements budgets
- will continue to maintain the same condition with a small growth in asset numbers and a small improvement to performance over the next 10 years.

Drainage

Well-maintained drainage removes water from our pavements and surfaces, thereby extending their lives. The NZTA has limited data on drainage assets, meaning we rely on historic expenditure trends backed up by field knowledge and experience to establish funding needs. We carry out prioritisation on a site-by-site basis, considering the highway classification, safety risk, environmental impact and risk to the provision of service to our customers. The prioritised list is assessed against the available budget to create a programme of works. Drainage work is also often undertaken in association with pavement or culvert work, and maintenance is carried out routinely. Our current maintenance processes for non-pavement assets are not perfect and should be improved. This improvement project will incorporate smarter thinking on maintenance activities and expenditure.

Storm events will increasingly be an issue for drainage: higher storm intensities are expected to result in greater stormwater flows in certain parts of the country, requiring increased drainage capacity. This will increase operational costs such as cleaning and storm-damage restoration. Another key issue is increasing pressure to manage stormwater run-off to achieve higher environmental standards and meet resource consent conditions.

Traffic services and other assets

Traffic service assets include signage, barriers, lighting and intelligent transport systems (ITS). We generally treat this area with reactive maintenance at a predictable rate, often when the asset fails, eg replacing barriers as they are damaged. Doing this work reactively is the most cost-effective method, with minimal risk to the user.

Our allowance for this work is based on asset age, asset condition inspections and historic replacement rate data. Although asset inspections are carried out, there is a limited input into the scheduling of current and future works because it is cheaper to schedule replacement for when they get old rather than analysing the inspection data against any potential savings from reprogramming works.

A number of recent issues are driving pressure on maintenance costs in this area. A recent focus on improving the effectiveness of delineation assets has seen the use of audio-tactile paint on state

highways, which has increased renewal costs in comparison with traditional paint. We have also made significant increases in installing barriers along high-volume routes and high-crash-risk sites. We are entering a phase where many assets are reaching the end of their design life, but we anticipate that we can extend their life cycles to minimise replacement expenditure, while at the same time maintaining services. We will ensure the assets are monitored regularly during this phase.

Some of our ITS assets are reaching the end of their design lives. These assets are generally technology based, meaning they have a short design life and high replacement cost. We are therefore forecasting to increase our renewal programme to reflect this.

While we are being prudent with this increase in works by trying to extend these assets' design lives, some electronic assets perform a critical function, meaning they will need to be replaced pre-emptively. Given the rapid advances in technology, renewal of these assets typically also involves upgrading associated infrastructure. We will continue to monitor the deterioration of this type of asset and plan our future responses accordingly.

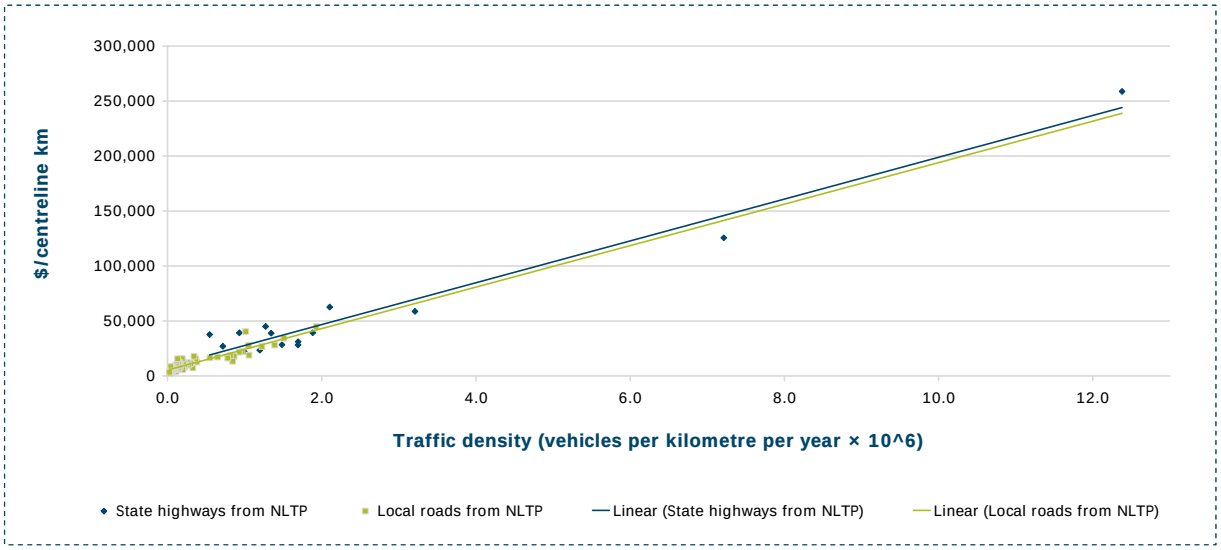
The proposed programme

Benchmarking

To assess and demonstrate our performance, we carry out a benchmarking review of our programme against local authorities, between networks and looking at trends over time. This review uses publicly available data from the SmartMovez website (www.smartmovez.org.nz). In order to compare the state highway network with local authority networks on a like-for-like basis, we review the maintenance and renewals costs on the basis of vehicle kilometres travelled (vkt). This allows us to evaluate our network on a comparative basis with others experiencing similar traffic. In our most recent review we compared 2009 data for land transport funding as the most recent year with full data available.

Figure 9.7 shows the graphical representation of our comparison, revealing that the NZTA state highway funding from the National Land Transport Programme is on average very similar to that of local authorities. When all costs for local authority roading expenditure were included, the typical spend per vkt was almost double that for the state highway network.

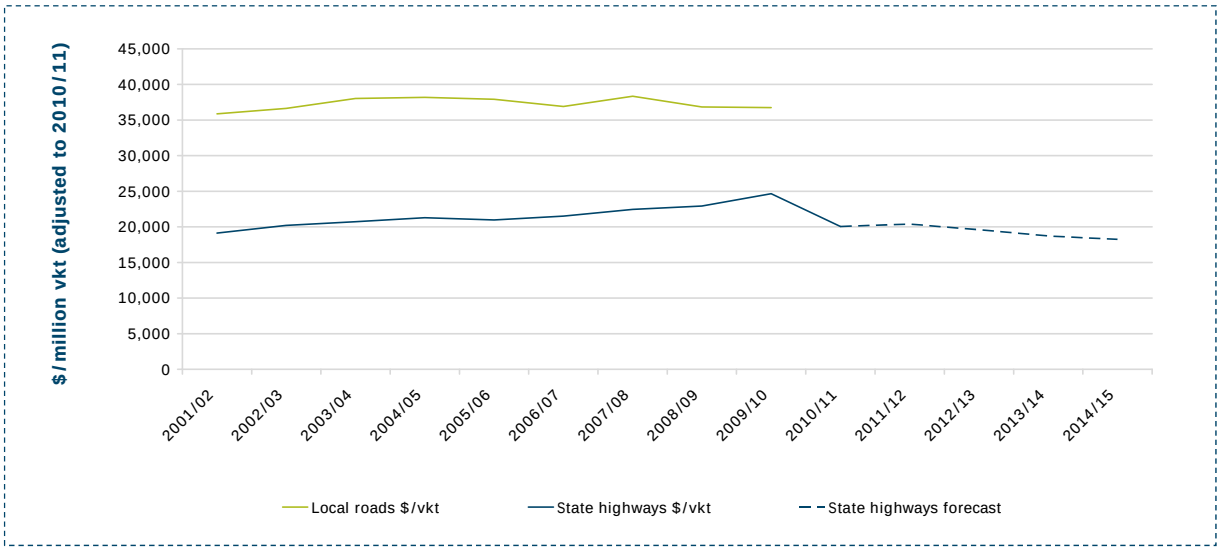
Figure 9.7 Comparison of state highway and local authority costs per vehicle kilometres travelled (vkt)



Note: NLTP = National Land Transport Programme

Figure 9.8 shows a comparison of the trend for the cost per million vkt of the state highway and local authority roading networks. We have subtracted the costs of emergency works, reactive maintenance and administrative costs, which are not comparable owing to inherent differences between the local authority and state highway networks. The graph shows that both the state highway and local authority roading costs per vkt are remaining relatively consistent, with the state highway costs being significantly lower than those of the local authorities.

Figure 9.8 Trend of local authority and state highway costs per vehicle kilometres travelled (vkt)



Figures 9.7 and 9.8 demonstrate that maintenance and renewals of the state highway network are being carried out in an efficient manner, when compared to the costs associated with local authority roads across the country. We believe that this comparison is particularly valid, as the state highway network carries a higher proportion of heavy vehicles than the local authority network with the associated deterioration continuing to be managed efficiently.

Performance over time

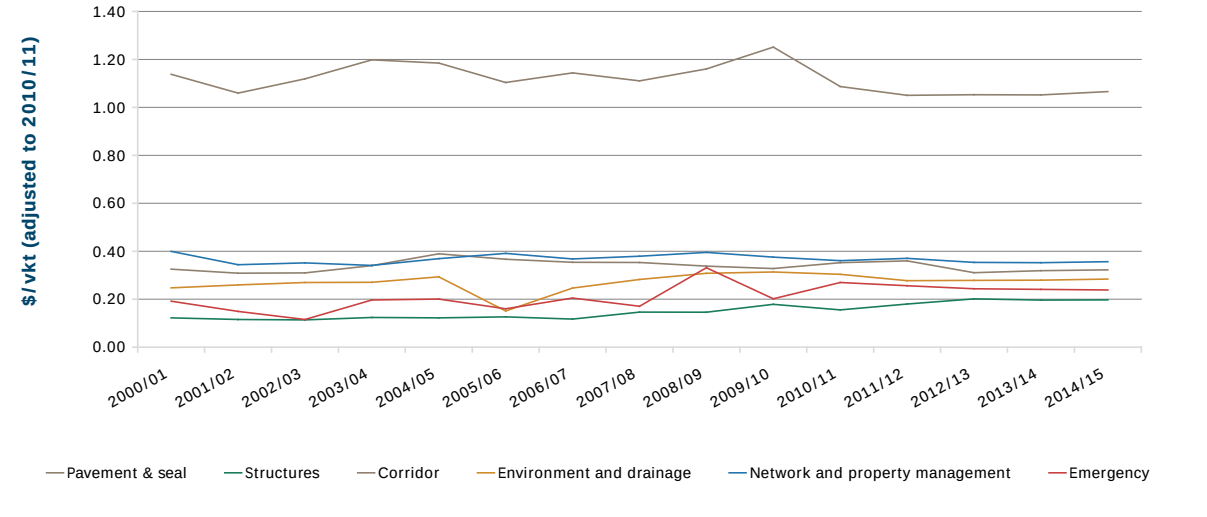
We have shown that traffic volumes and loads using the state highways have increased; additionally our asset base has grown by about 2.5% per year. Assuming we continue to operate in an efficient manner,

our costs would be expected to rise at a rate no faster than that driven by the additional demand on our network.

Over the last 10 years our state highway maintenance, operations and renewals costs have generally risen slowly. The exception to this is our pavement and seal costs, which have shown a significant increase of around 25%.

We reviewed these state highway costs against the actual increase in vkt over the same period. Figure 9.9 shows that our maintenance, operations and renewals costs have been steady, with our corridor costs showing savings over the last five years. In addition, pavement and seal costs have remained consistent at or around $1.20 per vkt. Although the costs have risen slightly over the last two years shown, we are confident that this will drop back for 2011 based on our expected final budget and vkt figures.

Figure 9.9 Trend in state highway spend per vehicle kilometres travelled (vkt), 2000/01 to 2014/15



This shows that our maintenance and renewals works on the state highway network are continuing to be carried out in an efficient manner. Our performance has continued to be delivered at a steady rate, with increasing asset numbers.

Funding

The current 2012 *Government policy statement* states that we must continue to focus on tightly controlled, targeted spending. We have taken the current funding level and applied it forward, with no amendment to the allocated maintenance budget in future years. This means we will spend $433 million each year to maintain and renew the state highway network. Cost pressures are likely to affect the programme significantly from 2012–15.

There are pressures with this restricted-budget programme, in that we are committed to providing excellent levels of service as well as bringing about $135 million of efficiency gains. There are risks involved with this, and the NZTA will carefully monitor the programme as it is implemented to ensure target levels of service are maintained.

We have built our maintenance and renewal programme to meet flat budgets. We will do this by stretching asset lives and targeting efficiency gains, which will offset increases in input price, asset quantity and demand on our network. We may get the balance between stretching lives and repairs wrong, causing additional works being required, or we might not achieve the efficiency gains required, in which case we will need to defer needed works. In the third year of the programme there may be increased service disruption due to increased size and frequency of repairs.

Efficiency gains and commitments

Our aim is always to either lower the cost of carrying out our maintenance works or improve the quality for the same cost. By doing this we are able to deliver the targeted customer service level at a lower price. Our proposed programme targets continued efficiency gains of 6% each year. We make these gains by benchmarking, following procurement processes and encouraging staff and contractors to seek innovative solutions to problems.

We use procurement, value assurance and risk management processes and technical manuals to ensure we're planning improvements efficiently. We have recently improved our processes so that we collect data on maintenance and renewals that will allow us to understand our cost rates (eg $ per km treated) in a consistent manner nationwide. This will allow us to compare our performance across the regions and to monitor trends over the coming years.

The NZTA has long-term maintenance contracts with a number of suppliers. As the contracted prices increase each year, the remaining budget for other maintenance works drops, meaning we need to manage our operations and maintenance budgets in more sophisticated ways to meet these restrictions. One option is to prematurely end or renegotiate contracts, though both these alternatives have significant costs that may counteract any savings.

Alternative programmes

We have optimised our proposed programme based on risk of failure to deliver the target service level. We only have deterioration models for pavements to demonstrate the efficiency of this, but are confident that we can operate the state highway network without the need for additional resources. For our structures, we have used our structures rating assessments to generate a risk-based programme.

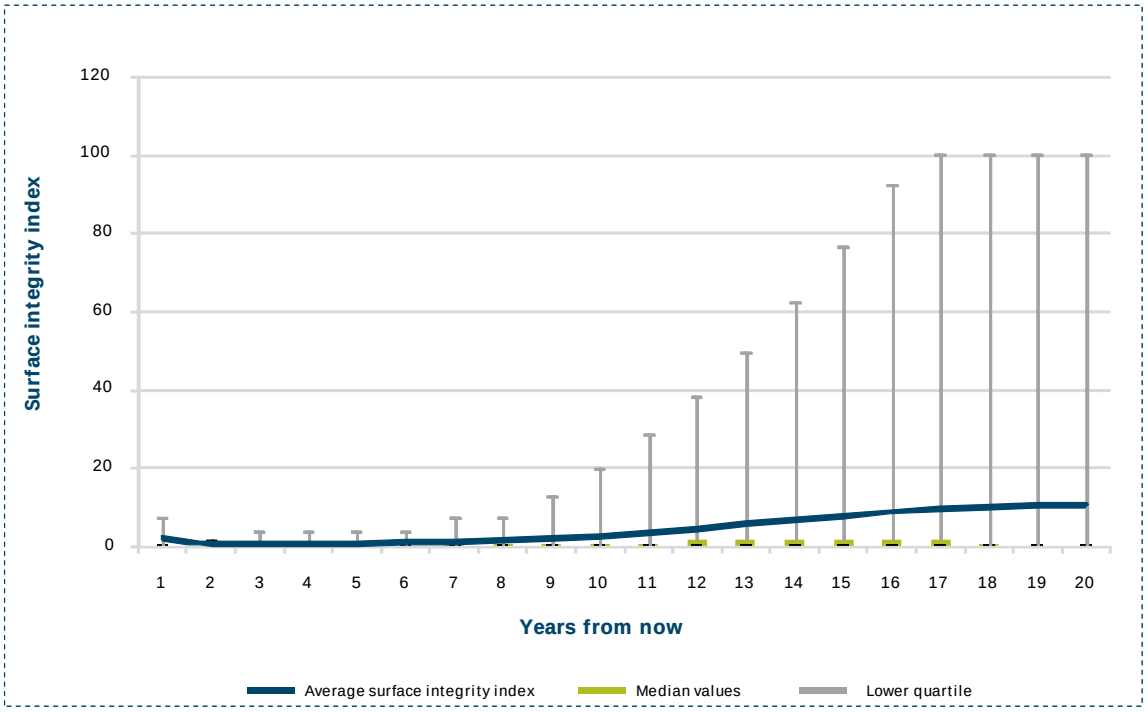
We have also considered the implication of three alternative funding regimes:

- current funding remaining consent
- current funding plus increases to cover inflation and additional assets coming online
- funding is increased to the level required to meet all the desired customer service levels at acceptable risk.

We have analysed our proposed programme based on risk of failure to deliver the target service level. In this we considered the implication of three funding scenarios during the next three-year period.

We found our pavements are insensitive to short-term changes in work quantities, but that a longer-term continuation of the current constant funding will lead to a decline in the asset condition. This decline will mean a significant worsening in the surface condition of the worst performing roads as repairs proliferate and a drop in the overall average condition.

Figure 9.10 Modelled surface integrity index condition trend for constrained budget level



The box and whisker graph indicates that the worst 5% of the network surface will start to deteriorate rapidly after about year 10.

Priorities within lower funding level

If less funding is available we will do fewer works for amenity and safety reasons. This will result in visible reductions in our target service level.

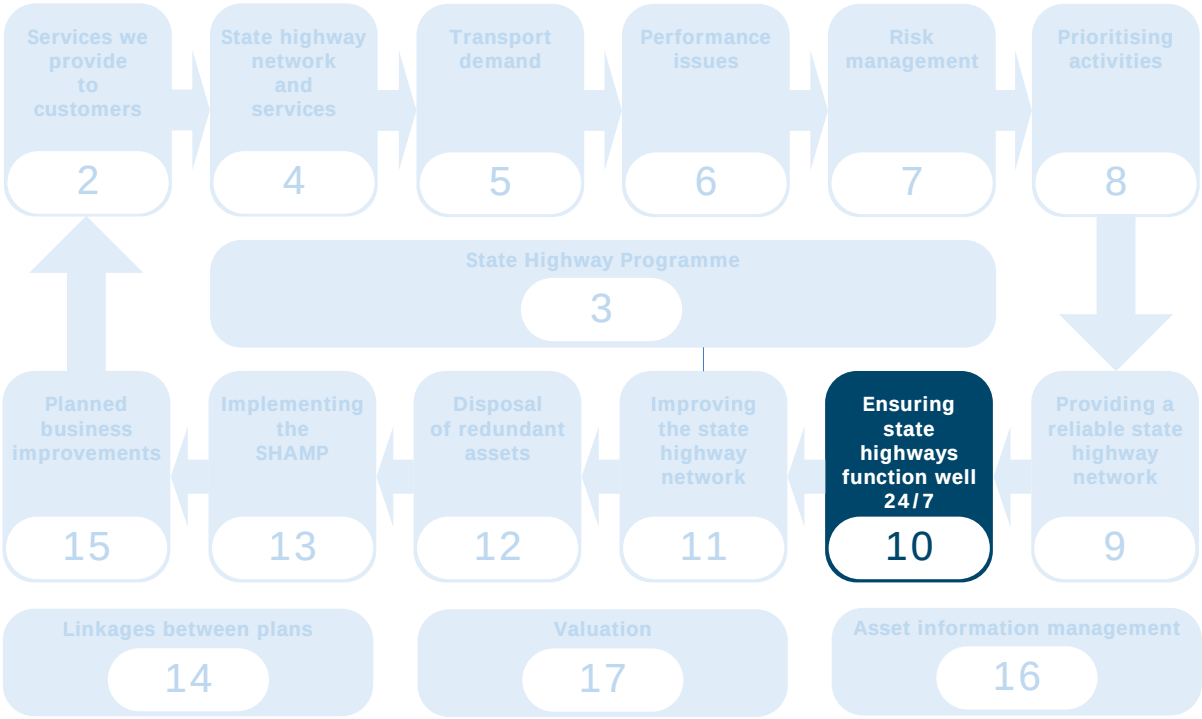
Within the area of amenities, we would look at cutting back our works to the minimum required under the law to meet our resource consents. This would result in a dramatic change in the level of service delivered, meaning significantly less work in areas such as vegetation and graffiti control. These reductions will affect fire safety in rural areas, be a major factor for customer service and have an impact on the NZTA's reputation across all regions.

To reduce maintenance work quantities carried out for safety reasons, we will not renew audio tactile line markings or signs for reflectivity reasons, and will allow line markings to fade. If necessary, we will also invest less in improving the skid resistance of our roads through our resurfacing programme. These measures would result in a reduced level of service for safety, with the potential for increased crash rates and accident severities.

Priorities with additional funding

With additional funding, we would target further treatments for skid resistance in our surfacing programme and increase our contribution to the NZTA's Safe System approach to land transport.

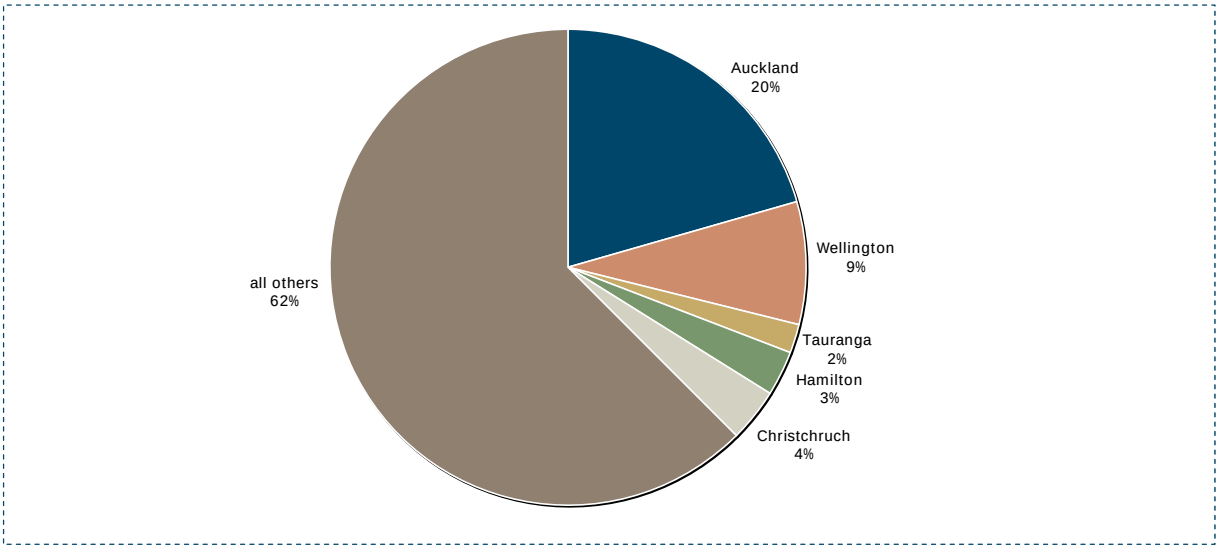
10 Ensuring state highways function well 24/7



Physical assets are only part of the state highway network. The traffic operations managed by the NZTA – both proactive and reactive – support the kilometres of roads, bridges and other infrastructure that make up the network, allowing road users to plan and make trips reliably and safely. We plan to adopt a consistent, whole-of-network approach both in terms of the state highway network and with other road controlling authorities (RCAs) to ensure customer-driven services are provided. This part of our work connects to the draft Network Access and Use Strategy, particularly in terms of making better use of the existing network and influencing behaviour (via traveller information systems). Through traffic operations we will also deliver services that help increase the efficiency of freight and traffic movements.

We currently provide active traffic management services to Auckland and Wellington cities, which together make up 29% of all state highway vehicle traffic. We plan to improve our current service as well as expand these services to those places that need it.

Figure 10.1 Percentage of vehicle kilometres travelled (vkt) under advanced traffic management



Maximising network capacity

We provide customers with easily accessible and up-to-date information on journeys, so that they can choose the time, route and mode that suits them best. We also provide traffic management solutions that enable traffic to flow smoothly, thereby increasing the effective capacity of the network and making it an efficient method of improving our services for road users.

Population growth, migration to urban areas and increased private vehicle ownership have resulted in increased congestion in New Zealand's main centres. Traffic operations allow us to deliver and maintain our target levels of service through smarter operation of the existing network, via technology, processes and systems. Predominantly this involves the use of intelligent transport systems (ITS) such as ramp signalling, lane management and electronic information signage.

We also provide education programmes and up-to-date travel information, which maximises the effective capacity of the network, improving travel time and in turn giving some safety benefits.

Investment in technology and improved driver behaviour delivers value-for-money results in two ways: firstly, all roads work better when actively managed; and secondly, by increasing capacity, we can reduce the need for capital investment.

To ease demand on our network in major urban areas, we actively manage planned works on our network, manage traffic flows (eg through optimising the sequencing of traffic signals), provide real-time travel information to motorists and provide for alternative modes of transport provided by others. These not only improve network capacity, but also reduce congestion, save energy and improve air quality. We continue to improve these techniques and investigate international best practice to enhance the network to meet current and future demand. We have had considerable success in this area and will build on it by ensuring we adopt a consistent approach across the network in the way these techniques are applied and how the associated assets are operated. We plan to extend these benefits to other parts of the network and to manage events and incidents on a nationally consistent basis.

The majority of traffic operations on the network are proactive. For instance, controlling and improving traffic flows is a proactive measure, while reactive management covers incidents, emergencies and weather events, although with advanced warning, we can proactively manage the wider effect of these by preparing for and responding to them well. We have developed a range of contingency plans so we can respond rapidly to common events in the best way.

Initiatives to maximise the network capacity and service delivery in urban areas include:

- increased priority for public transport (eg bus lanes, park-and-ride schemes)
- priority lanes – buses, freight, taxis, high-occupancy vehicles
- improved pedestrian and cycleway facilities
- better communication and improved travel choices, eg journey information signs
- ramp signalling
- network plans
- variable message signs, variable message speed signs and lane-control signs.

Traffic operations centres

Traffic operations centres in Auckland and Wellington coordinate traffic management across our network – both in congested urban centres and in managing planned and unplanned events throughout the country. This ensures that road users are better informed throughout the network and there is consistency in network management. More information about these services can be found in chapter 4 and is documented in our Traffic Operations Centre Plan.

Future focuses for Traffic Operations Centres include:

- integrated Traffic Operations Centre approach to ensure national consistency and standards
- shared functionality between centres
- Auckland Traffic Operations Centre will also fulfill National Traffic Operations Centre function, providing travel information and national event management across New Zealand.

Intelligent transport systems

Intelligent transport systems are based on three core factors: information, communications and integration. These systems inform operators and road users so they can make better decisions.

We will continue using these systems, as they bring about real benefits for our customers. One example is ramp signalling on the Auckland urban motorway. Filtering traffic onto the motorway based on real-time data enables smoother traffic flows, greater capacity, reduced and more consistent journey times and safety risks as well as reduced the environmental effects from heavy braking and accelerating. We have seen a 15% improvement in travel speeds and a 5–15% increase in vehicle flow on the motorway.

ITS, like other technologies, will increasingly be part of the everyday lives of New Zealanders. We aim to realise a wider range of transport-related applications and services to our customers, by allowing new kinds of information and interaction to be added to the increasing amount of autonomous mobile, in-vehicle and roadside devices being used.

Vehicle technology is changing rapidly, and stability control in vehicles is a recent example of technology affecting road safety. Vehicle manufacturers are now testing devices such as in-car monitors that detect and warn drivers of speed limits. The NZTA is alert to technology developments that can better manage traffic flows and protect drivers against crashes.

Approach

We will expand our use of active traffic management to those places that need it (because of severe congestion) and those where it has worked well in the past; our approach is documented in the NZTA's *Action plan for integrating our traffic operations*. We will monitor the benefits of this expansion and review the forward programme accordingly.

Some key areas of focus will be:

- better integration when managing the state highway and local road networks in Auckland and Wellington
- regular customer engagement
- advanced traffic management systems, integrating event management, traffic management and travel demand management
- advanced traveller information systems and national delivery of pre-trip and in-trip information to users through various channels (eg web, radio, portable devices)
- improvement of major tunnels and upgrade of the tunnel management systems
- heavy vehicle performance tracking
- improved enforcement of non-compliant vehicles, while minimising the impact on compliant vehicles
- vehicle-to-infrastructure communications solutions; delivering automated safety solutions to enhance crash prevention measures and post-accident investigation
- real-time pricing systems and development of alternative funding mechanisms.

Managing events and incidents

At times, the state highway network suffers from reduced or interrupted services. Major urban areas suffer from congestion during peak periods and from planned events, incidents and emergencies. Rural areas are more likely to be affected by weather and natural hazards, affecting journey time and/or route selection. We mitigate these with traffic operations such as:

- weather stations recording real-time information
- information relayed to the road user about current conditions and impact on the journey
- information distributed by variable message signs, radio and the website.

We have a number of systems, plans and processes in place that allow us to respond rapidly to unplanned incidents, including coordinated incident management systems, specific incident and weather management plans for critical sections of the network, local agreements with emergency services, civil defence procedures and contractor agreements. We prepare for events, monitor them and have communication systems in place to receive information and distribute it from police, the public and other civil defence providers. These systems work effectively and our intention is to increase our work in this area.

Traveller information systems form our key area of expansion, and we are focusing on those that significantly benefit both the NZTA and the public, have highly favourable benefit–cost ratios, and have relativity low costs (allowing us to do more for less).

11 Improving the state highway network

In order to meet the eight priorities outlined in the *Statement of intent*, we focus on addressing the journey time and safety gaps that currently exist on the state highway network. Nationwide corridor studies provide a range of responses, which are then prioritised using the Investment Revenue Strategy and programmed to construct within the expected funding. Our prioritisation process ensures the work undertaken makes the greatest difference to the largest number of travellers.

The resulting state highway improvement programme addresses the expectation of the *Government policy statement*, responds to our deficits as outlined by our customers, and represents value for money as it has been prioritised in accordance with the *Planning, programming and funding manual*. We select the projects that provide the greatest impact, regardless of where they are in the country.

We target our works to the roads where we can make the greatest difference. KiwiRap collective risk maps show the areas with the highest crash rates, which is where we target our safety improvements. Our journey deficiency maps show the routes on which our feasible capacity and passing improvements will have the greatest impact (ie those with the highest volume and traffic growth). We also target significant black spots and bottlenecks.

The proposed programme

The full list of the projects in our proposed 10-year programme is in the appendix.

The improvement programme has the following components, delivering on the impacts in the *Government policy statement*:

- essential infrastructure
- optimisation projects
- high-productivity motor vehicle improvements
- safety improvements
- roads of national significance.

Essential infrastructure

To ensure the network remains secure and resilient we include essential infrastructure works. These activities include replacement of critical bridges, tunnels and other structures that need to be replaced within five years to keep routes open.

Optimisation projects

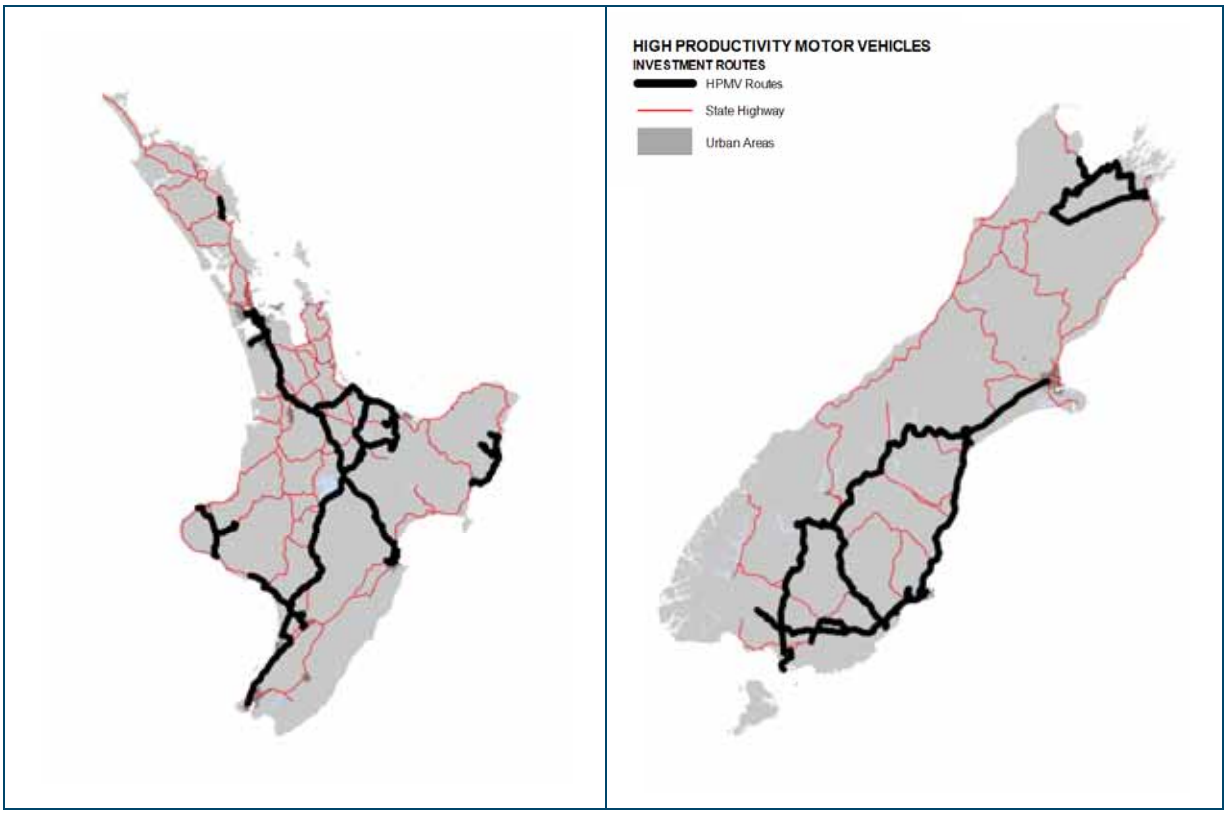
To make better use of our existing infrastructure, ease severe congestion and give better journey time reliability we include activities that:

- optimise the network and increase the effective capacity of the congested Auckland, Wellington and Christchurch networks through improved active traffic management
- reduce the adverse impacts of incidents through improved nationwide incident management
- increase the capacity of the Auckland and Wellington networks at current bottlenecks to release the full network capacity where there is demand.

High-productivity motor vehicle improvements

To increase the efficiency of freight supply chains the programme includes strengthening works required to allow high-productivity motor vehicles to operate across the golden triangle and other routes with high potential impact and use.

Figure 11.1 High-productivity motor vehicle investment routes



Safety improvements

To reduce the numbers of fatal and serious injuries the programme has:

- two safety demonstration projects (on State Highway 2 and in the Coromandel) to embed the Safe System approach into our programme and fulfil our Safer Journeys Action Plan obligations
- other safety-focused activities, including safety-focused maintenance, minor improvements, safety retrofit and small to medium projects which are in total at the upper end of the *Government policy statement*'s safety expenditure range of $150 million to $240 million each year from all activities.

Roads of national significance

The development of roads of national significance contributes significantly to increasing the efficiency of freight supply chains and to reducing the numbers of fatal and serious injuries.

Table 11.1 Projects in the programme as part of the roads of national significance

Key

 Investigation

 Property

 Design

 Construction

Roads of national significance	Project	Current phase	2012–15	2015–18	2018–22
Puhoi to Wellsford	Puhoi to Warkworth RoNS – Detailed Design and Construction				
Puhoi to Wellsford	Warkworth to Wellsford RoNS – Detailed Design and Construction				
Waikato Expressway	Rangiriri Section				
Waikato Expressway	Cambridge Section				
Waikato Expressway	Tamahere Section				
Waikato Expressway	Long Swamp Section				
Waikato Expressway	Hamilton Section				
Waikato Expressway	Huntly Section				

Roads of national significance	Project	Current phase	2012–15	2015–18	2018–22
Wellington Northern Corridor	Wellington RoNS – 1. Airport to Mt Victoria Tunnel				
Wellington Northern Corridor	Wellington RoNS – 2. Basin Reserve Improvements				
Wellington Northern Corridor	Wellington RoNS – 3 Terrace Tunnel Duplication				
Wellington Northern Corridor	Wellington RoNs – 4. Ngauranga to Aotea Quay				
Wellington Northern Corridor	Wellington RoNS – 5. Transmission Gully				
Wellington Northern Corridor	Wellington RoNS – 6. Mackays to Peka Peka				
Wellington Northern Corridor	Wellington RoNS – 7. Peka Peka to Otaki				
Wellington Northern Corridor	Wellington RoNS – 9. Otaki to Levin				
Canterbury Motorways	Groynes to Sawyers Arms 4-laning				
Canterbury Motorways	Sawyers Arms to Wairakei Rd 4-laning				
Canterbury Motorways	Wairakei Rd to Yaldhurst Rd 4-laning				
Canterbury Motorways	Yaldhurst Rd to Waterloo Rd 4-laning				
Canterbury Motorways	Western Belfast Bypass				
Canterbury Motorways	Northern Arterial Rural with QE2				
Canterbury Motorways	Southern Motorway Halswell Junction Road to Waterholes (Stage 2)				
Canterbury Motorways	SH1 Waterholes to Rolleston 4-Laning (Stage 3)				

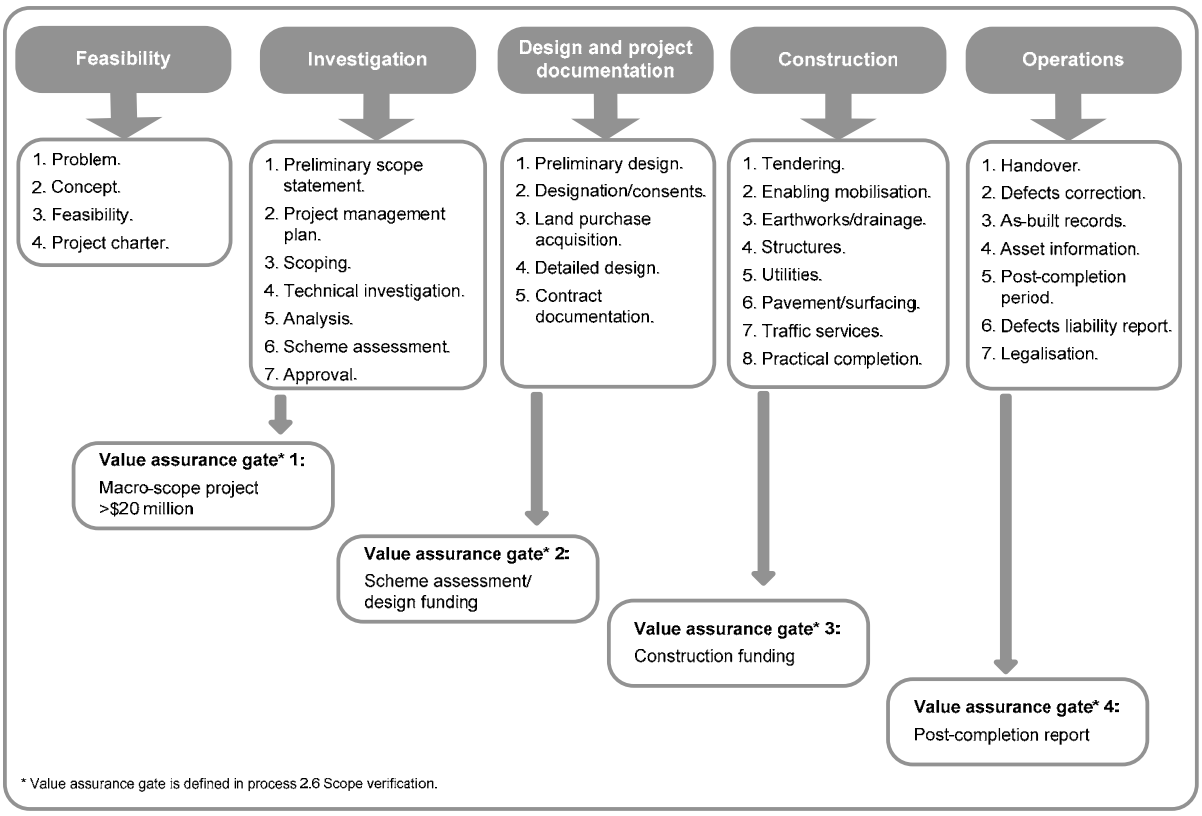
Programme benefits

Table 11.2 Ten-year benefits from indicative state highway improvement programme

Fatal and serious injuries saved	100–120 per year after the 10th year
Travel time savings in net present value	$13,928 million
Average programme benefit–cost ratio	3.51

How benefits are realised

Figure 11.2 Process for developing our individual improvements



Where possible, we will group projects along corridors, to avoid a scattered effect and to maximise meaningful impacts. Depending on the scale of the projects, we manage our works on a programme basis. Delivering programmes of smaller improvements in an aggregated manner gains efficiencies in planning and execution. We manage the following on a programme basis:

- essential infrastructure replacement
- minor safety works
- high-productivity motor vehicle routes.

These will be coordinated in relation to each other, to the general improvements programme and to the roads of national significance, to ensure that the synergies between programmes are identified and captured. The main forum for this is the Regional Asset Management Plan and the work done during its development.

Where possible we will also work with local authorities to coordinate our programmes of work to seek efficiencies and greater network outcomes through collaboratively delivering projects.

Funding for improvements

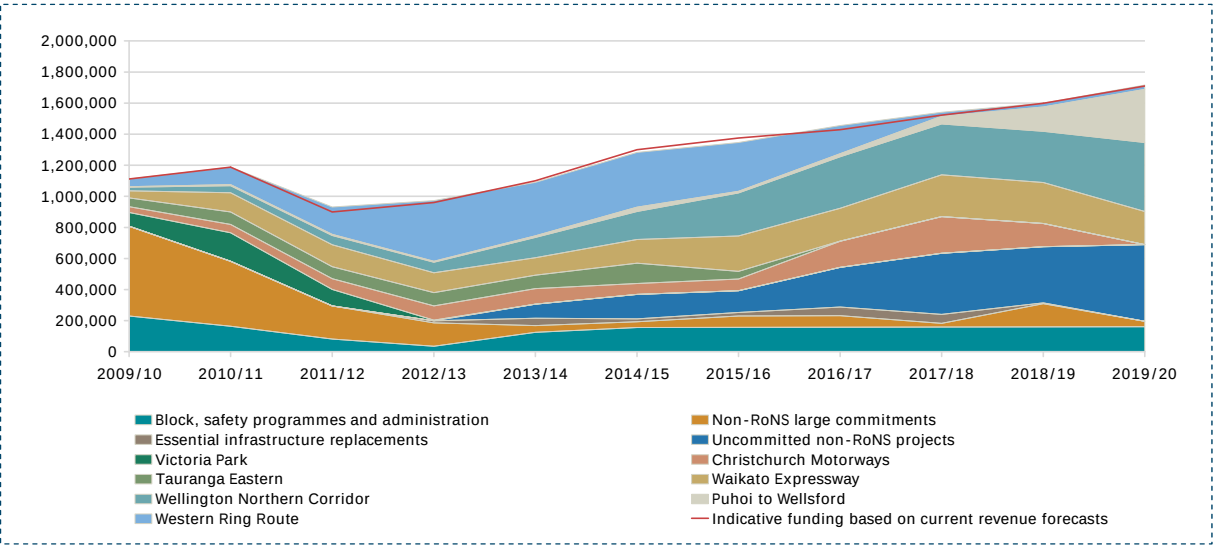
The *Government policy statement* shows a funding range of $2.725 billion to $3.65 billion over the next three years. We have targeted our proposed programme at $3.3 billion. Table 11.3 shows what we will fund from this.

Table 11.3 Network improvements over 3 and 10 years, by project type

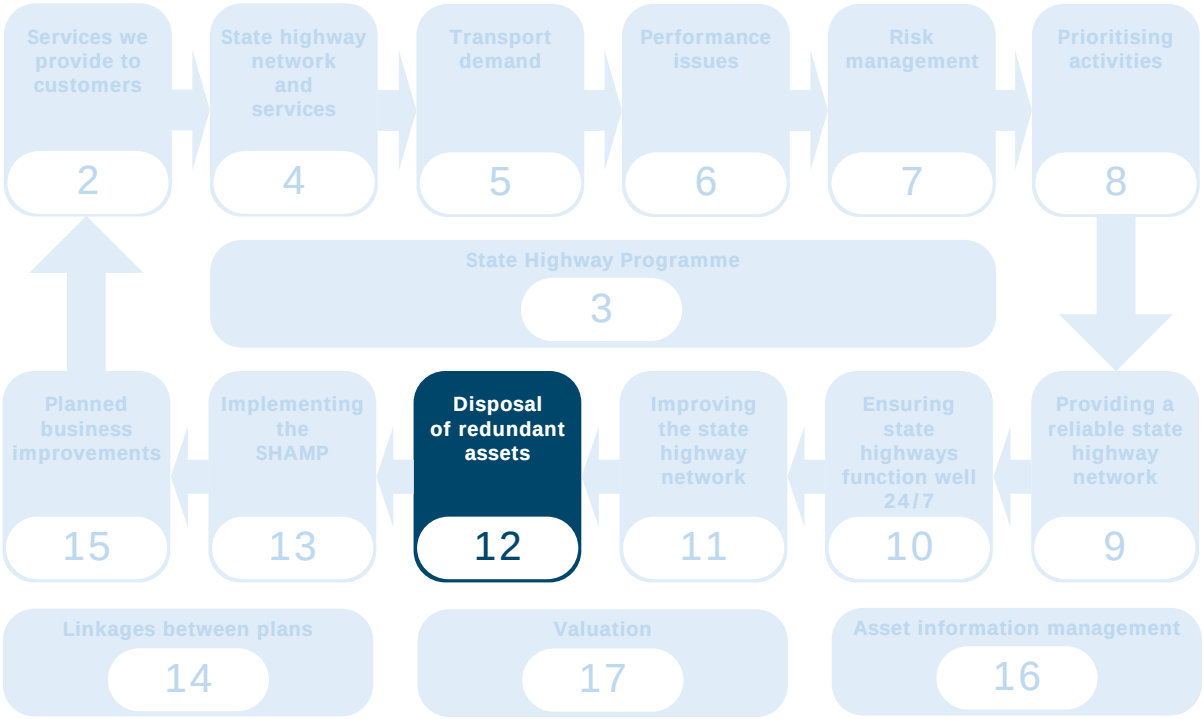
Project type	3-year programme	Indicative 10-year programme
Essential infrastructure	$100 million	$240 million
Roads of national significance	$2.5 billion	$9.3 billion
Optimisation projects	$120 million	$455 million
Safety improvements	$250 million	$1 billion
High-productivity motor vehicle routes	$45 million	$75 million
Other improvements providing significant benefit	$350 million	$2.2 billion

We can add to this pool through supplementary funding from tolls, public–private partnerships and project financing. We annually screen our state highway projects for funding opportunities.

Figure 11.3 Forecast of spending across improvements programme



12 Disposal of redundant assets



While most assets are simply replaced by reconstruction at the end of their life, others must be actively managed. Assets that will remain with the NZTA must be actively managed to avoid becoming a liability in the future, while assets no longer required for state highways will often be transferred to other parties, which requires careful management. The costs for asset disposal are included in the initial budgets for a project.

Many assets are simply disposed of, typical examples being structures, drains, signs, street lights or pavement material. In some cases, it is more cost-effective to retain assets that are no longer required, rather than to invest in removing them; however, these must be carefully managed. For example, bridges that are no longer used must be monitored because the materials deteriorate and the bridges may collapse. We retain redundant assets where doing so is economically sensible and where they pose no safety risk.

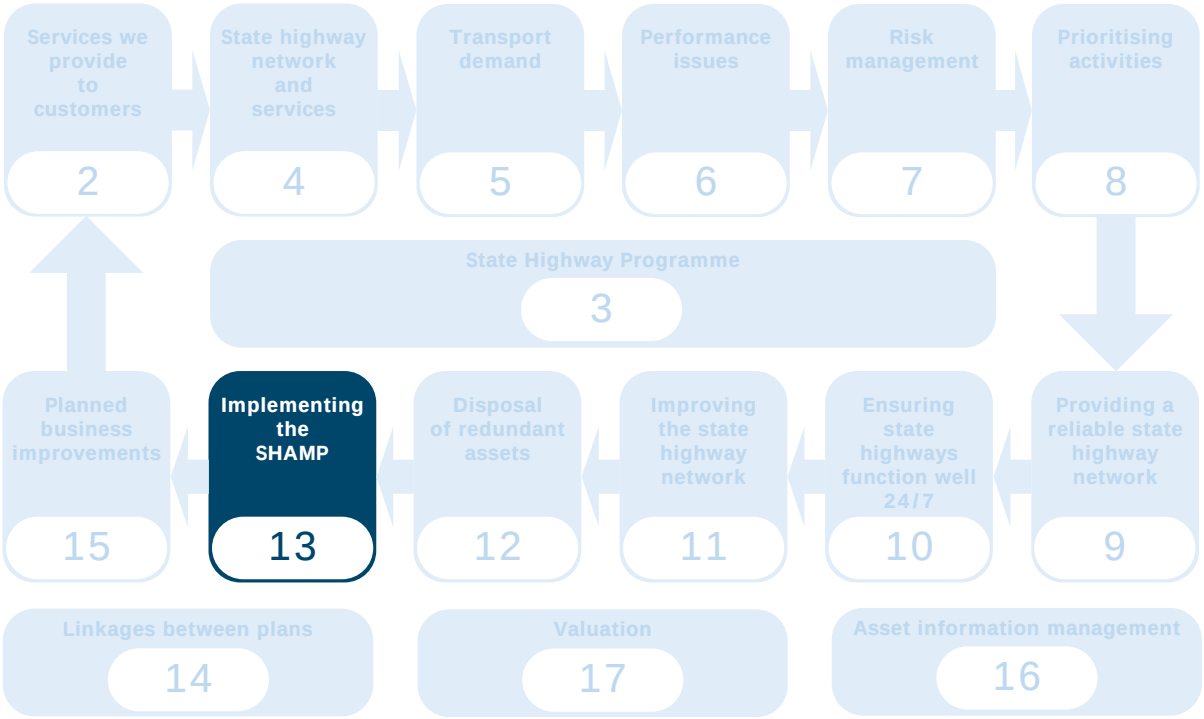
When developing new routes and structures, we endeavour to purchase only the land required for the alignment. In some cases this isn't possible, leaving us with surplus property on completion of the construction. Any surplus land must be offered back to other government agencies or local authorities if they have a public work requirement or to the previous owner, under the Public Works Act 1981. If not required for these purposes it is first offered to other government agencies for other requirements and then would end up being sold by public tender. This process can take 1 to 2 years to work though and is difficult to programme for.

Property acquisition is bulk funded by the National Land Transport Fund (NLTF) according to state highway plan project priorities. The proceeds from the disposal of any surplus land are fed back into the NLTF for reuse in the transport sector.

The property strategy for each project describes the purchase and likely sale requirements, which continue to develop throughout the project's life.

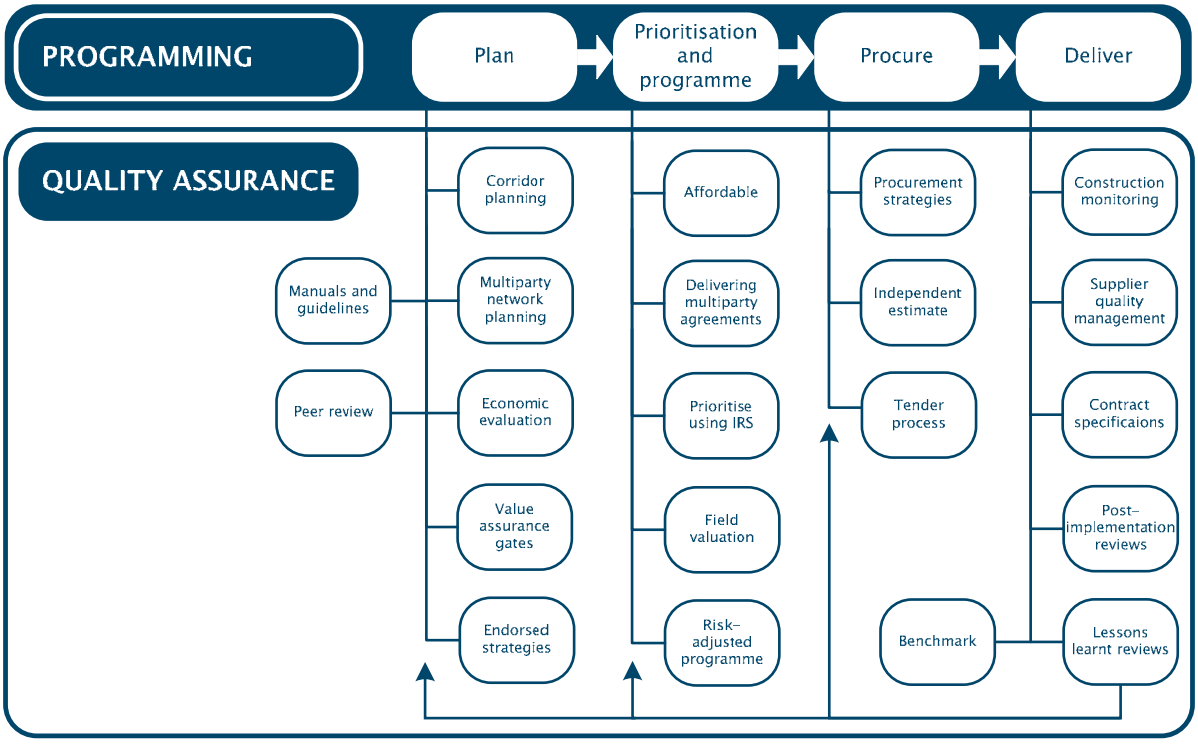
When the construction of a new asset will require the old one to be handed over, the conditions of the handover process, along with both parties' agreement, will be detailed in the project plan. We plan arrangements for roads that require ongoing access and local authority ownership and management in advance, such as through a Memorandum of Understanding process. Within these we develop and implement agreed plans for the partial or full regeneration of old alignments to an agreed state. This is particularly relevant in sensitive areas, such as national parks or Department of Conservation areas, but can also form a part of property agreements. Sometimes local roads become state highways or vice versa; this process is described in the *State highway control manual*.

13 Implementing the State Highway Asset Management Plan



Once in the State Highway Asset Management Plan, each project proposal is put forward for funding approval (usually made by regional decision-making teams and approved by the Board of the NZTA), then implemented. The NZTA works with relevant parties to ensure each project happens at the right time, in the right way and for the right price. We ensure our programmes of work happen by planning, prioritising, programming and procuring, and we ensure quality in each of these processes by implementing tools such as peer review, tenders and Contract Management Reviews.

Figure 13.1 Processes for programming and quality assurance



Planning

The Planning and Investing for Outcomes initiatives are a shift from delivering activities to influencing land-use planning, partnering for investment and enhancing performance. Outcome investment should be in accordance with the Land Transport Management Act 2003, the *Government policy statement* and the NZTA's *Statement of intent*, and deliver services to state highway customers, public transport users, cyclists and pedestrians.

In order to support delivery, we develop standards, specifications and guidelines, procure consultant services and assist other agencies.

Network and corridor planning encourages a focus on integrated planning and coordinated strategies, plans and packages to deliver the best transport outcomes. While good urban design provides context-sensitive solutions and integration with surrounding land use.

The Value Assurance Gate Process establishes quality assurance checks and balances throughout a project life cycle. Project managers consult with national experts in professional service to confirm plans and designs are in accordance with standards, specifications and guidelines.

The NZTA recognises that our quality assurance process is not perfect, and we are aware of how we can improve it.

Prioritisation and programming

Our three-yearly planning and development cycle aligns budgeting and planning through the *Statement of intent* and National Land Transport Programme. During the intervening years we reprioritise based on any variations to our drivers. Our programming phase translates these mid-term plans into the annual plan – a programme for implementation. Our annual plan is an essential tool that provides certainty on our activity for the year – and the expenditure connected to it.

To prioritise our programme we use the principles and processes described in chapter 8. These give effect to the Investment and Revenue Strategy and comply with the processes of the *Planning, programming and funding manual*.

Once we have prioritised our works we use field testing such as Review and Priority Team inspections (RAPT tours) and technical reviews to validate the decision process we have used to prioritise our programmes.

It has been our standard practice over recent years to over-programme. This has been done to good effect and has allowed us to manage our programmes to the set financial targets. There are a number of reasons for over-programming, as shown below:

- to compensate for general over-optimism by project managers, often referred to as optimism bias
- to allow us to react to time-related risk events that delay the progress of planned activities, by having other projects ready to substitute.

Taking this approach also allows us to manage down towards year-end, rather than having to try to accelerate in the last quarter to make best use of the funding available.

For these reasons it is prudent for us to maintain a steady state in our over-programming, so we are able to react quickly to these risks, should they occur. If these risks do not occur, or our progress occurs ahead of planned, new projects will remain as un-approved until such time as funding within the approved funding envelope is available. It is important to note that over-programming is not the same as over-spending, and we remain committed to delivering within the budget targets set.

Procurement

Our approach to procurement comes from the broad government policy and principles, which include value-for-money open-competition opportunity for domestic and international suppliers, legislation compliance, and legal and ethical considerations. Activity selection, funding and procurement combine to contribute to the delivery value for money. This involves achieving desired outcomes and quality, on time and at the lowest whole-of-life cost. This cannot happen if procurement is managed in isolation. We approach procurement strategically to ensure a cohesive, long-term view.

Our Portfolio Procurement Strategy 2010 establishes a proactive, future-oriented approach to implementing state highway projects. Its purpose is to identify a sustainable mix of delivery models and outline where they are to be used. Its aim is to provide best value for money in the NZTA's delivery of works and services on the transport network, to the satisfaction of our customers, in a sustainable way. This reflects the fact that procurement processes have developed over the years, and more developments are planned.

In order to deliver programmes of works, we procure both professional services and physical works. We have contract proformas for professional services, asset improvements and maintenance works that set out standard contracts for procuring services based on the NZTA's current best practices. One key part of our project delivery process is the engagement of independent estimators to review and benchmark our contract estimates.

Our 2009 *Procurement manual* describes how we engage external services and defines three broad delivery models for asset improvement, maintenance or renewal projects. Each has a different approach to contracting, work methods and risk allocation; the appropriate model is the one that delivers best value for money and that helps achieve our strategic priorities.

We will continue to improve our procurement practices and to reduce our long-term costs, ensuring both our maintenance and asset improvement activities are carried out to maximise the network's potential, asset lives extend, and the performance of the network improves.

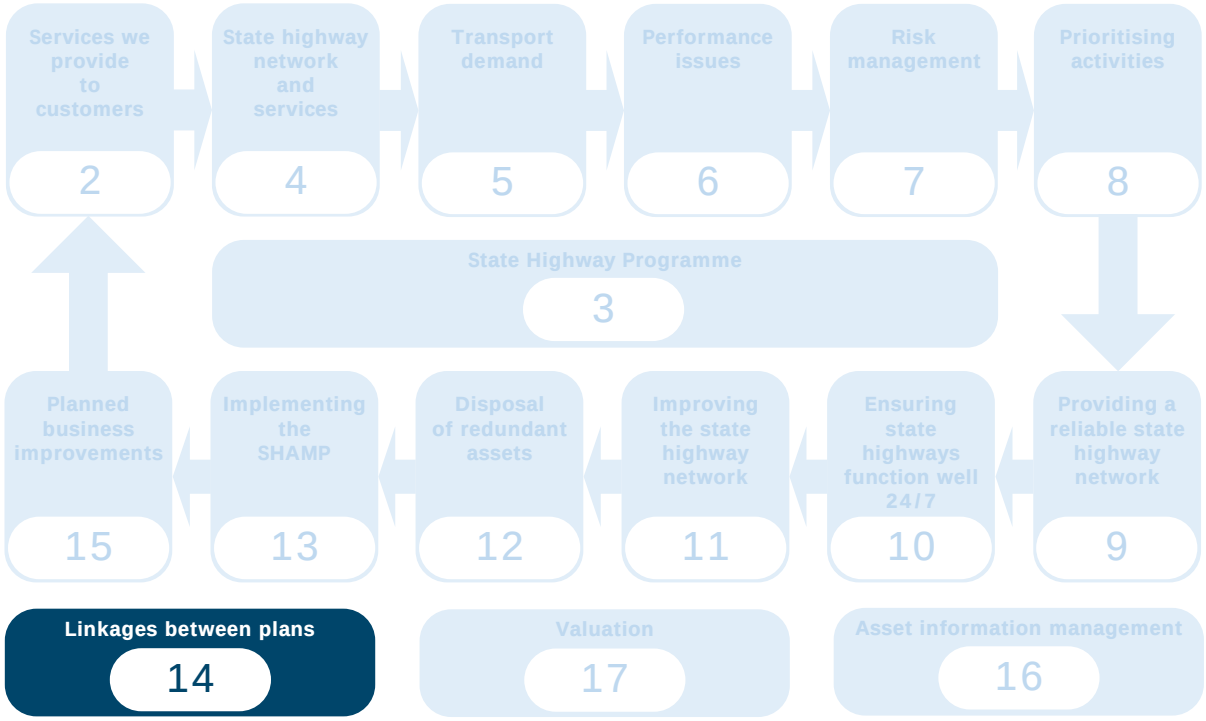
Delivery

The NZTA continues to assess programme quality, which includes safety, quality, budget, programme and customer interface, throughout construction. Our suppliers have quality management systems, through which they deliver work to our required standards; they will also provide regular monitoring reports to the NZTA.

A series of manuals specify project management best practice, contractual requirements and detailed requirements for asset management, improvement, renewals, operations and maintenance. These are available on the NZTA website.

A suite of Post-Implementation and Lessons Learnt Reviews provide feedback once a project is completed. This allows us to feedback continuous improvement into other projects.

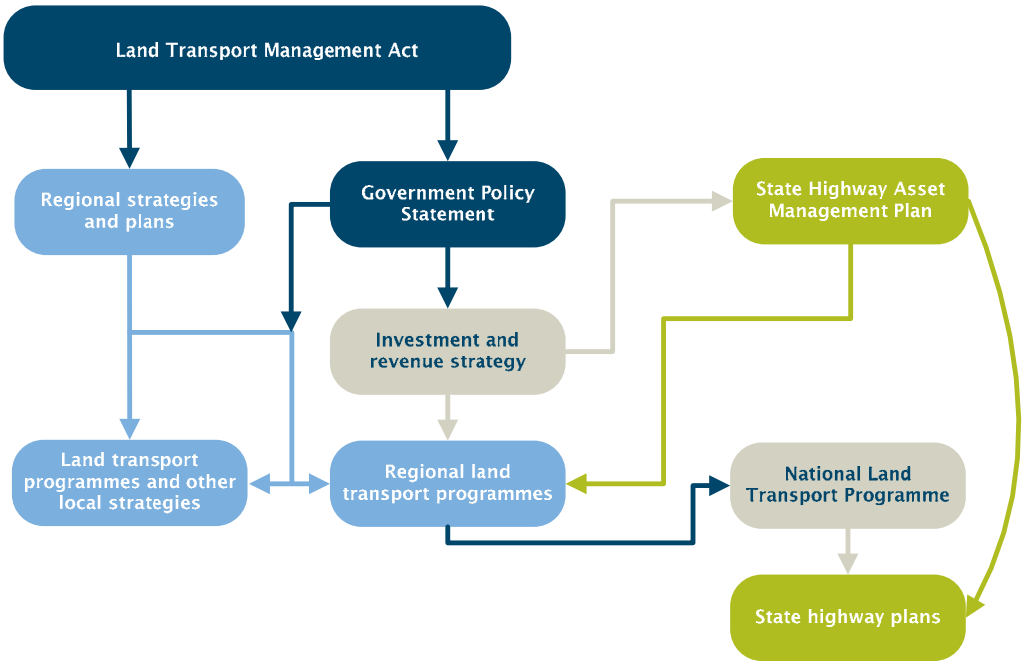
14 Links between plans



State highway plan

The State Highway Asset Management Plan contains the 10-year programme for inclusion in the National Land Transport Programme process. The State Highway Plan is the yearly implementation plan for the programme within the State Highway Asset Management Plan.

Figure 14.1 Linkages between plans and strategies to develop the state highway programme



Other asset management plans

The NZTA operates through 10 regional offices. The state highway network itself is divided into 24 network management areas, with each regional office responsible for a number of these. We aim to provide consistent service targets appropriate to classification across our network, regardless of location.

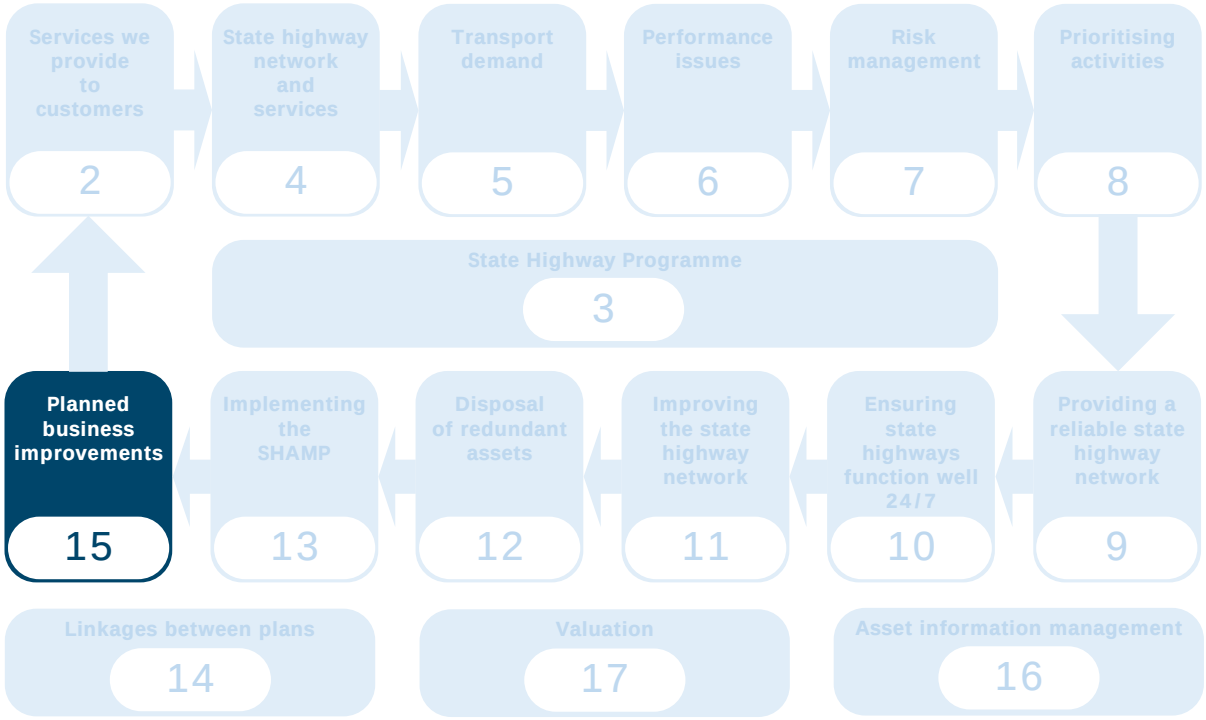
Regional Asset Management Plans serve an important purpose, reflecting the specific local needs, geology variations and land-use challenges of each region. The plans describe the local state highway context, the technical service targets, the performance of the network and its relationship with other networks, the key risks, asset deterioration, and how all of these issues are addressed. For example, Auckland's regional plan reflects the city's heavy traffic challenges, whereas Otago's focuses on severe winter weather. These plans aid communication between staff and suppliers of the NZTA in identifying customer needs and substantiating work programmes.

A third category – Special Asset Management Plans – exists for assets such as the Auckland Harbour Bridge. These plans provide the level of focus required to manage specialised, high-risk assets.

As a national document the State Highway Asset Management Plan serves several purposes in relation to Regional and Special Asset Management Plans:

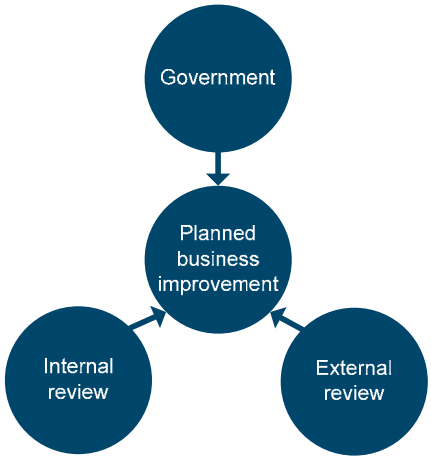
- It provides direction to which Regional Asset Management Plans and Special Asset Management Plans both respond and provide more specific details relating to implementation.
- It defines key outcomes (such as safety or journey time), technical service targets, funding constraints, asset life-cycle context, and prioritisation framework.
- It summarises national programme needs based on an assessment of local needs taken from the Regional Asset Management Plans.
- At a national level, it considers alternative programme sizes, in order to understand and document the longer-term consequences of different investment strategies.

15 Planned business improvements



We are continually identifying, prioritising and implementing asset management improvements in order to continue to reduce the cost of doing business and the cost of compliance.

Figure 15.1 Business improvements



Programme-wide improvements come from government instruction (such as the maintenance and operations taskforce, letter of expectation and *Government policy statement*), external audits and our internal change programme that drive standards, strategies, planning activities and the review of internal processes (5 star programme). Our own internal reviews and audits also feed into day-to-day business improvements, which are made frequently.

Business improvement

National improvement initiatives are identified in the State Highway Asset Management Plan and supported by regional plans. We improve our asset management practices over time, ensuring the most effective use of resources and leading to improved investment decision-making.

Table 15.1 Business improvement drivers and responses

Driver	Response	Outcome(s)
Government direction		
A sharper and broader focus on value for money from the *Government policy statement*	Road Maintenance Industry Taskforce chaired by the NZTA	A programme of coordinated initiatives that will have a major impact on how we manage our business in the future through expected identified improvements
Letter of Expectation from the Minister	Professional Services Review Transport Planning Review Maintenance and Operations Review Project Life Cycle Review Other Headway projects	
External audit		
Office of the Auditor-General report on the NZTA: Information and planning for maintaining and renewing the state highway network	Coordinated improvement plan linked to identified areas of poor improvement	Improved use of asset information to make management decisions
	Review of new intermediate outcome monitoring measures for completeness covering the whole state highway network and linkages to the *Statement of intent* and customer values	Desired behaviours are encouraged through understanding our business better
	Review our revised technical service targets for completeness covering the whole state highway network and linkages to the intermediate outcome monitoring measures	
	Ensure all ITS assets are defined and correctly entered into RAMM (our asset database) to allow future reporting	Better planning of ITS assets maintenance and renewal
	Continue to develop our calculation of equivalent standard axle (ESA) across the network to allow these figures to be included in future SHAMP documents	Improved understanding of loading-based deterioration across the network to drive management decisions
	Finalise national condition rating scoring system for bridges and structures based on a new inspection and reporting method	Improved targeting of prioritised maintenance and renewal spending on structural assets
Internal process		
NZTA State highway classification and draft State Highway Network Strategy	Review reporting against the new service targets	Service targets in place across different classes of highway
	Ensure alignment of new intermediate outcome monitoring	Service targets are reflected in our

Driver	Response	Outcome(s)
	measures and revised technical service targets with the contract specifications and ensure nationally consistent application	contract specifications
Shift towards Planning and Investing for Outcomes (P&I Streamlining project)	5 star review process in partnership with Auckland Transport	Our funding process is directed to where we can best impact our stated aims
Resource Management Act 1991	Use CSVue (our resource consent management database) to manage compliance better	Reduced number of consents sought and improved visibility of performance against the conditions
Revised T10 skid resistance specification	Confirm the effect of the new T10 skid resistance standard on our measurement of good skid exposure	improved targeting of maintenance and renewal activities at key sections of state highway network
Identified issues with current data collection technique	Investigate our data collection techniques to better identify flushed/bitumen-contaminated sites	Improved reporting of texture and flushing performance issues, and targeting of maintenance and renewals
NZTA Lessons Learnt Reviews	Review and implement formal process for the collation and dissemination of risk lessons learnt	Local actions and national policies reflect lessons learnt
Safer Journeys	Develop a deficiency register for barriers and intersections and prioritise actions	High-risk deficiencies are addressed in a timely manner
Identified lack of clarity regarding distribution of reactive maintenance funding	Improve how reactive maintenance tasks are recorded and planned	Greater visibility as to how reactive tasks are broken down so we can better manage our maintenance and renewals funding
Information Systems Strategic Plan	Replace the Financial Management system, and implement a standard GIS platform across the NZTA	Provide the opportunity to better manage projects and contracts, and manage and use asset information

Monitoring improvement plan progress

We assess the overall effectiveness of these plans in improving asset management practices, helping us focus efforts and ensure commitments are being delivered at regional and national levels. For the ministerial-driven improvements we have clear reporting and accountability structures in place through our senior leadership team. Audits result in improvement action plans and results are reported against agreed timeframes.

Our internal reviews are prioritised and an improvement plan is in place, committing to achievable goals and monitoring through our Value Added Teams.

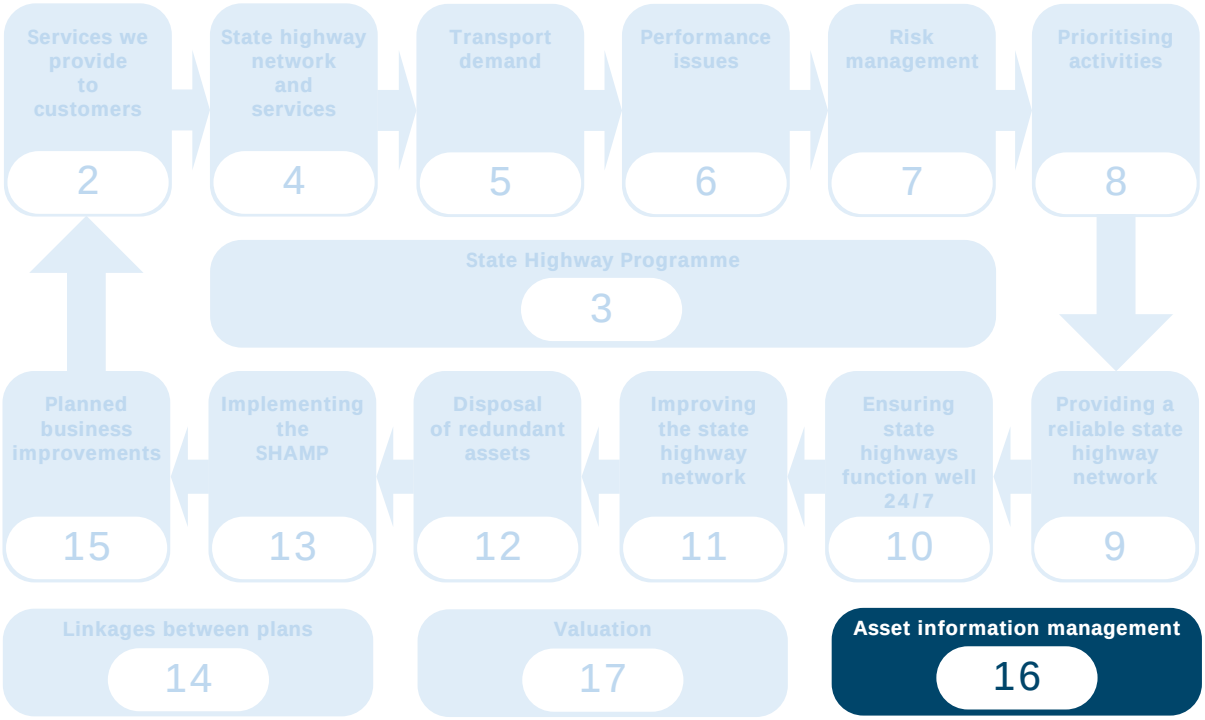
Day-to-day improvement

Business reviews and audits help us assess and therefore improve our business. These include:

- cyclical Contract Management Reviews carried out by an external auditor
- reviews of lessons learnt of all investment activities and funding sizes
- technical reviews that focus on a specific asset type
- whole-network inspections of review and prioritisation teams, focusing on maintenance requests for the forthcoming year
- regional office audits.

These day-to-day improvements can have significant impacts on every aspect of how we do business, and will provide the inputs for the next State Highway Asset Management Plan.

16 Asset information management



Understanding location

Information on our network must be properly referenced for it to be of value to the NZTA's business. The NZTA's location referencing system is based on linear displacement along the highway. This approach requires a rigorous system based on known, fixed reference points on the network and accurately calibrated distance measurement devices in order to be successful. Full details are in the *Location referencing system manual* (SMO51).

In recent years, the development of improved information technologies (eg GPS, telecommunications) means that opportunities for enhanced information management (data collection, analysis and reporting) techniques are possible. The NZTA is implementing such developments where benefits can be gained.

Asset inventories

The NZTA's asset data requirements are summarised in the *State highway database operations manual* (SMO50) and the *Bridge manual*. Traditionally our asset inventory has focused on pavements, surfacing and bridges, and information gathering and management has been less consistent for other assets – we need to improve this. The following software systems are used to store the information:

- RAMM – a commercially available system used to store pavement, surfacing and miscellaneous asset information
- Bridge Data System – an NZTA-built software system containing inventory and structural data on bridges
- Kete Document Management System – a repository for all state highway documents, to include 'as built' information on the NZTA's structures
- the NZTA's Traffic Monitoring System.

Supporting systems

The inventories are supported by a number of systems that help display the data or manage specific aspects of the network's operations. These systems include:

- EXOR Location referencing system – used in managing the state highway network model
- NZTA GIS viewer – used to display all asset location data
- network video viewer – allows users to view location-referenced video of any part of the network on their PC (condition measures are also available to view along with video)
- various spreadsheet and tabular approaches for specific, non-standard or local requirements
- DTMS – programme for pavement condition and deterioration modelling.

To ensure information in its systems is robust, the NZTA operates various quality management processes. In particular, we have an inventory collection accreditation system requiring that all data in RAMM is entered only by accredited personnel.

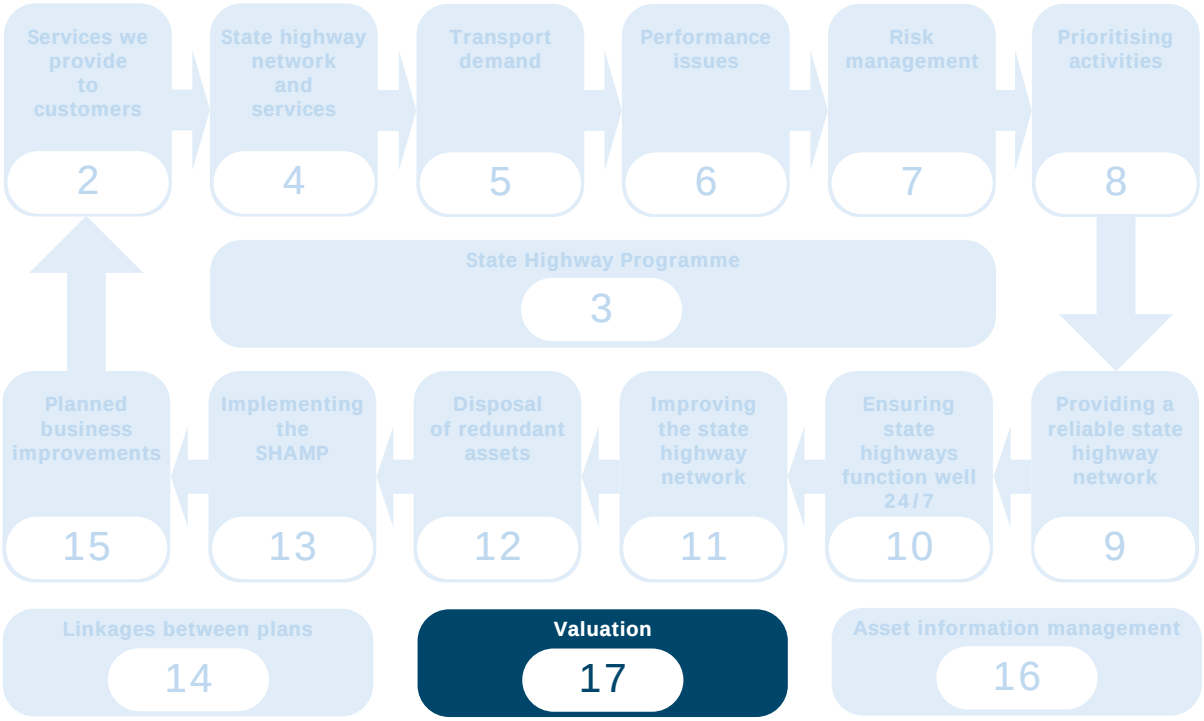
Asset data quality

	Quality of our information			
Asset type	**Age**	**Condition**	**Deterioration**	**Performance**
Pavements				
Surfaces				
Bridges				
Other structures				
Drainage				
Barriers				
Signs				
ITS assets				

Key

Good 	Fair 	Poor 

17 Valuation



State highway network valuation

Every year, the NZTA submits a valuation report for the state highway network and its assets to the Office of the Auditor-General. This is a statutory obligation.

In the valuation report, we outline what state highway assets we own, their value and the depreciation incurred against those assets. The valuation and depreciation become components in the crown accounts.

Local authorities are required to fund the decline in service potential of infrastructure assets. The NZTA as a crown entity is not. In theory however, there should be alignment between the value of depreciation and expenditure on renewal if condition measures are steady (indicating the asset is not being consumed).

How we value the state highway network

To calculate the value of the state highway network, we extract information from our asset registers on quantity, age and life of assets. We use current unit rates, which we obtain from regional NZTA offices, along with the extracted asset information to assess the valuation.

Each year approximately $1 billion is spent creating new assets and renewing existing ones. Most of the expenditure occurs on capital projects that span several years. This means that at the end of the financial year there is no asset in any register that represents the investment (the asset is not complete, or even begun in some instances). This is CAPEX.

Where this expenditure has occurred in previous years it is classified as Work in Progress and the yearly spend is indexed to represent the spend of the current year.

The Optimised Depreciation Replacement Cost of the state highway and its assets consists of:

- Sum of assets in registers (at 30 June of the previous financial year) × unit costs
- + sum of all previous years' CAPEX on live, incomplete projects
- + sum of current year's CAPEX.
- 2010/11 = $30.7 billion

As our assets are largely not new a depreciation factor is applied to take this into account. Ideally we would know enough about the age and condition of our assets to accurately predict the life remaining. Currently we use life remaining or the design life for the majority of our assets (by value). Where this has not been possible assets have been assessed as 50% through their lives. The exceptions are land and pavement formations that don't depreciate.

The Optimised Depreciated Replacement Cost of the state highway consists of:

- Sum of assets in registers (at 30 June of the previous financial year) × unit costs × % life remaining
- + sum of all previous years' CAPEX spend on live (incomplete) projects
- + sum of current year's CAPEX spend.
- 2010/2011 = $25.1 billion.

Asset valuation

Our primary asset register is RAMM.

Table 17.1 Assets recorded in RAMM

Asset type	Replacement value	Depreciated value
Formation	$7056 million	$7056 million
Pavement	$3968 million	$3060 million
Pavement surfacing	$1151 million	$607 million
Drainage	$1116 million	$622 million
Other structures	$1092 million	$902 million
Traffic facilities	$1474 million	$861 million

Table 17.2 Assets contained in asset registers other than RAMM

Asset type	Replacement value	Depreciated value
Bridges	$5986.00 million	$3523.00 million
Bailey bridges	$15.50 million	$15.32 million
Culvert structures	$493.00 million	$303.00 million
Traffic Management Unit and tolling assets	$15.70 million	$13.38 million
Land	$8324.00 million	$8324.00 million

For asset registers other than RAMM, refer to chapter 16.

Relevance to asset management processes

The valuation process usefully highlights gaps in asset data quality and completeness. When the CAPEX project is complete the value is removed from CAPEX and should ‘appear’ as the asset’s value in the asset registers. Discrepancies in value from year to year have been attributed to ‘missing’ assets that have not been registered. Accurate asset valuation requires good knowledge of the condition of assets and the rate at which they deteriorate. This same information helps inform good asset management planning.

18 Appendix – National programme

Project information			2012–15 Regional Land Trasnport Programme profile			
Region	**SH number**	**Project**	**Strategic fit**	**Effective-ness**	**Efficiency**	**IRS priority order**
Auckland	1	HPMV – SH1 South Auckland to Tauranga – Auckland	High	High	Medium	2
Auckland	1	Constellation to Greville NBD 3-laning	High	High	Medium	2
Auckland	1	Main H/wy – Ell H/Wy NB Aux	High	Medium	High	2
Auckland	16	St Lukes I/C Upgrade	High	Medium	High	2
Auckland	1	McKinney Road / Wech Drive Intersection improvements	High	Medium	High	2
Auckland	1	Warkworth Stage 1	High	Medium	High	2
Auckland	1, 16, 20	Average Speed Enforcement	High	Medium	High	2
Auckland	1, 16, 20	ATMS Stage V	High	Medium	High	2
Auckland	1	Greville Interchange Grade Separation	High	Medium	High	2
Auckland	1	Waitemata Harbour Crossing (Designation only)	High	High	Low	3
Auckland	1	Constellation to Orewa Busway Extension (Designation Only)	High	High	Low	3
Auckland	18	Upper Harbour Highway I/C Upgrade	High	Medium	Medium	3
Auckland	1	Hill Rd to Takanini Sthbd 3-laning	High	Medium	Medium	3
Auckland	1	Takanini to Papakura 6-laning	High	Medium	Medium	3
Auckland	1	Takanini I/C Upgrade	High	Medium	Medium	3
Auckland	16	Brigham Creek – Railway Rd Median Barrier	High	Medium	Medium	3
Auckland	16	Trigg Rd – Factory Rd Median Barrier PFR	High	Medium	Medium	3
Auckland	1	Puhoi to Warkworth RoNS Detailed Design and Construction	High	Medium	Low	5
Auckland	1	Warkworth to Wellsford RoNS – Detailed Design and Construction	High	Medium	Low	5
Auckland	22	Drury to Glenbrook Wire Rope Median Barrier	High	Medium	Low	5
Auckland	20	Old Mangere Bridge	Low	Medium	High	7
Bay of Plenty	2	Maunganui-Girven Rd Intersection Improvements (MGI)	High	High	High	1
Bay of Plenty	2	SH2 Northern Corridor Safe System Programme	High	Medium	High	2
Bay of Plenty	2A	Hairini Link – Stage 4	High	Medium	Medium	3
Bay of Plenty	29	Soldiers Road Realignment + IS	High	Medium	Medium	3

Project information			2012–15 Regional Land Trasnport Programme profile			
Region	**SH number**	**Project**	**Strategic fit**	**Effective-ness**	**Efficiency**	**IRS priority order**
Bay of Plenty	2	Maketu/Rangiuru Intersection Upgrade	Medium	Medium	High	4
Bay of Plenty	29	Tauriko Upgrade	High	Medium	Low	5
Bay of Plenty	2	SH2 / SH29 Te Maunga Intersection Improvements	High	Medium	Low	5
Bay of Plenty	30	Rotorua Eastern Arterial	Medium	Medium	Medium	6
Bay of Plenty	2	Waitahanui Bridge Replacement	Medium	Medium	Medium	6
Bay of Plenty	2	Katikati Bypass	Medium	Medium	Low	8
Bay of Plenty	2	Tauranga Northern Link	Medium	Medium	Low	8
Bay of Plenty	2A	Hairini Link – Stage 3	Low	Medium	Low	10
Canterbury	1	Yaldhurst Rd to Waterloo Rd 4-laning	High	High	Medium	2
Canterbury	1	Sawyers Arms to Wairakei Rd 4-laning	High	High	Medium	2
Canterbury	1	Wairakei Rd to Yaldhurst Rd 4-laning ECI	High	High	Medium	2
Canterbury	1	Western Belfast Bypass	High	High	Medium	2
Canterbury	1	SH1 Waterholes to Rolleston 4-laning (stage 3)	High	High	Medium	2
Canterbury	1	Southern Mwy HJR to Waterholes (Stage 2)	High	High	Medium	2
Canterbury	74	Northern Arterial Rural with QE2	High	High	Medium	2
Canterbury	1	Groynes to Sawyers Arms 4-laning	High	High	Medium	2
Canterbury	74	Lyttelton Tunnel Safety Retrofit (Deluge) System	High	Medium	High	2
Canterbury	1	Woodend Corridor Improvements	High	Medium	Low	5
Canterbury	75	Halswell Rd 4 Laning and PT improvements	Medium	Medium	Medium	6
Canterbury	82	Waitaki Bridges No1 And 2 Replacement	Low	Medium	High	7
Canterbury	1	Greta Valley North Realign	Medium	Medium	Low	8
Canterbury	73	Mingha Bluff to Rough Creek (Large upgrade)	Medium	Medium	Low	8
Gisborne	35	HPMV SH35 Gisborne Route 1 – Tolaga Bay/Matawhero to Port	Medium	Medium	High	4
Hawke's Bay	50	HB Expressway Pakowhai & Links Rd Interchange	High	Medium	High	2
Hawke's Bay	2	Waitangi Washout Bridge Replacement	Medium	Medium	High	4
Hawke's Bay	5	Tarawera Hill Realignment and PL's	Medium	Low	Medium	8
Manawatu-Whanganui	1	Wellington RoNS – 9. Otaki to Levin	High	High	Low	3

Project information			2012–15 Regional Land Trasnport Programme profile			
Region	**SH number**	**Project**	**Strategic fit**	**Effective-ness**	**Efficiency**	**IRS priority order**
Manawatu-Whanganui	2	Tahoraiti Railway Crossing	High	Medium	Medium	3
Manawatu-Whanganui	2	Whakaruatapu Stream Bridge Replacement & Realignment	High	Medium	Medium	3
Manawatu-Whanganui	1	HMPV – SH1 Desert Road to Centreport Wellington	High	Medium	Low	5
Manawatu-Whanganui	57	Millrick-Kendall Realignment	Medium	Medium	Medium	6
Manawatu-Whanganui	2	Manawatu Hill Realignment	Medium	Medium	Medium	6
Marlborough	1	SH1 Weld Pass Realignment	High	Medium	High	2
Marlborough	1	Dashwood Overbridge	High	Medium	Medium	3
Marlborough	1	SH1 Wairau Bridge Replacement	Medium	Medium	Medium	6
Nelson	6	Nelson Southern Link	Medium	Medium	Low	8
Northland	1	Brynderwyn North Median Barrier	High	Medium	High	2
Northland	1	Brynderwyn north Waipu Gorge Road – Artillery Rd Curves	High	Medium	High	2
Northland	1	Waipu to Brynderwyn (Combined) Median Barrier	High	Medium	High	2
Northland	1	SH14 Intersection Improvement	High	Medium	Medium	3
Northland	10	Pekerau Road SW	High	Medium	Medium	3
Northland	1	Akerama Curves Realign & PL	Medium	Medium	High	4
Northland	1	Snake Hill Realign	Medium	Medium	High	4
Northland	1	Tarewa I/S Improvements and Tarewa to SH14 4 Laning	High	Medium	Low	5
Northland	1	Southend Ave to Rewa Rewa Rd 4-laning	Medium	Medium	Medium	6
Northland	1	Loop Rd Nth to Smeatons Hill Sl	Medium	Medium	Medium	6
Northland	1	Turntable Hill Realign	Medium	Medium	Medium	6
Northland	1	Selwyn Ave to Fourth Ave 4-laning Stg 2	Medium	Medium	Medium	6
Northland	14	Ounuwhao Rd Realign	Medium	Medium	Medium	6
Northland	14	Bends North of Te Wharau Sl	Medium	Medium	Medium	6
Northland	1	SH14 I/S to Raumanga Valley Rd 4-laning	Medium	Medium	Low	8
Otago	8	Beaumont bridge replacement	Medium	Medium	High	4
Otago	6	Kawarau Falls Bridge	Medium	High	Low	6
Otago	1	Caversham Highway Improvements: Stage 2	Medium	Medium	Low	8
Otago	1	Hillend – Balclutha Realignment	Low	Medium	Medium	9
Otago	1	Deborah Realignment	Medium	Low	Low	10

Project information			2012–15 Regional Land Trasnport Programme profile			
Region	**SH number**	**Project**	**Strategic fit**	**Effective-ness**	**Efficiency**	**IRS priority order**
Southland	94	Homer Tunnel Safety Improvements	Medium	Medium	High	4
Southland	1	Edendale Realignment	Medium	Medium	Medium	6
Taranaki	3	Normanby Overbridge Realignment	Medium	Medium	High	4
Taranaki	3, 44, 45	Vickers Road to New Plymouth City	Medium	Medium	Low	8
Taranaki	3	Midhurst Rail Overbridge Replacement & Realignment	Low	Medium	Low	10
Waikato	2	SH2 Pokeno to Mangatarata Safe System Retrofit Demostration Project – Full Corridor	High	High	Medium	2
Waikato	1	Rangiriri Section	High	High	Low	3
Waikato	1	Long Swamp Section	High	High	Low	3
Waikato	1	Cambridge Section	High	High	Low	3
Waikato	1	Tamahere Section	High	High	Low	3
Waikato	1	Hamilton Section	High	High	Low	3
Waikato	1	Huntly Section	High	High	Low	3
Waikato	1	SH1 Cambridge to Piarere Safe System Improvements	High	Medium	Medium	3
Waikato	1	Taupo to Desert Road Strategic Improvement Package	High	Medium	Medium	3
Waikato	2	Maramarua Deviation (SH2)	High	Medium	Low	5
Waikato	2	Kopuku Realignment	High	Medium	Low	5
Waikato	1 & 3	Hamilton Southern Links	High	Medium	Low	5
Waikato	26	Kirikiri Stream Bridge Replacement (Large)	Medium	Low	High	7
Wellington	1	Inner City Bypass Upgrade	High	High	Medium	2
Wellington	1	Mt Victoria Tunnel - Safety Improvements	High	Medium	High	2
Wellington	1	Wellington RoNs - 4. Ngauranga to Aotea Quay	High	High	Low	3
Wellington	1	Wellington RoNS - 2. Basin Reserve Improvements	High	High	Low	3
Wellington	1	Wellington RoNS - 6. MacKays to Peka Peka	High	High	Low	3
Wellington	1	Wellington RoNS - 7. Peka Peka to Otaki	High	High	Low	3
Wellington	1	Wellington RoNS - 5. Transmission Gully	High	High	Low	3
Wellington	1	Wellington RoNS - 1. Airport to Mt Victoria tunnel	High	High	Low	3
Wellington	1	Wellington RoNS - 3 Terrace Tunnel Duplication	High	High	Low	3
Wellington	1 & 2	Ngauranga to Linden (P2G)	High	High	Low	3

Project information			2012–15 Regional Land Trasnport Programme profile			
Region	**SH number**	**Project**	**Strategic fit**	**Effective-ness**	**Efficiency**	**IRS priority order**
Wellington	1	Ruahine Street Interim Improvements	High	Medium	Medium	3
Wellington	1	SH1 MacKays Crossing to Cent.Highway Safety Improvements	High	Medium	Medium	3
Wellington	2	SH2 Carterton to Masterton Safety Improvements	High	Medium	Medium	3
Wellington	2	SH2/58 Grade Separation	High	Medium	Medium	3
Wellington	2	SH2 ATMS Ngauranga to SH58	Medium	High	Medium	4
Wellington	1	SH1 Otaihanga to Waikanae Safety Improvements	High	Medium	Low	5
Wellington	1	Memorial Park	Low	Low	Low	11
West Coast	6	Taramakau Road/Rail BR	Medium	Medium	Medium	6
West Coast	6	Gates of Haast Realign	Low	Medium	Low	10

Further information

This plan describes the services that our state highway system provides now and in the future, how we intend to manage the assets we use, and how we intend to fund the work that is needed.

The state highway network is both extensive and diverse. Although it is only a small part of the country's total road length, it carries the majority of the traffic. The NZ Transport Agency's asset base and annual expenditure are very significant. This plan provides a robust view of the level of investment and the national importance of the network.

Our contact details

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