Attachment 1 – Part A to Report 14.602

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WELLINGTON REGIONAL LAND TRANSPORT PLAN 2015

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

CONTENTS

INTRODUCTION

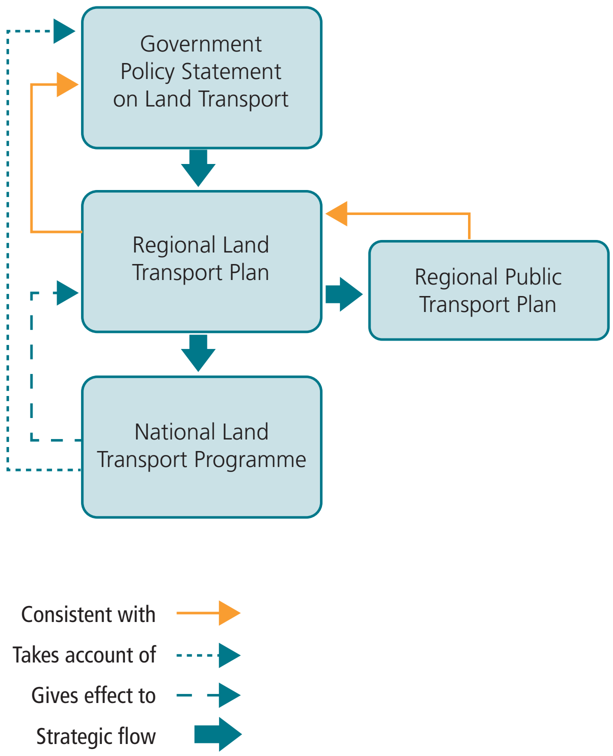
This Regional Land Transport Plan (RLTP) is a statutory document that must be prepared every six years as required by the Land Transport Management Act (LTMA) 2003 (as amended in 2013).

The RLTP must contribute to the purpose of the LTMA which seeks 'an effective, efficient, and safe land transport system in the public interest'. It is also required to be consistent with the Government Policy Statement (GPS) on land transport.

The RLTP informs the development of the National Land Transport Programme (NLTP) by identifying the priorities and key improvement projects for the Wellington region. The NZ Transport Agency is required to take account of the RLTP when preparing the national programme.

The diagram below illustrates where the RLTP sits in relation to the other key transport planning documents at a national and regional level.

Figure 1



In addition to the core transport planning documents, the RLTP is required to take into account any national energy efficiency and conservation strategy and any relevant national or regional policy statements, or regional plans under the Resource Management Act.

National strategic direction

As described above, the key national level document that this RLTP must be consistent with is the GPS. In relation to the purpose of the LTMA which seeks 'an effective, efficient, and safe land transport system in the public interest' the following guidance is provided in the GPS:

For the purpose of the GPS 2015, a land transport system is:

- **effective** where it moves people and freight where they need to go in a timely manner
- **efficient** where it delivers the right infrastructure and services to the right level at the best cost
- **safe** where it reduces the harms from land transport
- **in the public interest** where it supports economic, social, cultural and environmental wellbeing

The overall national strategic direction for land transport, as described in the GPS 2015 is:

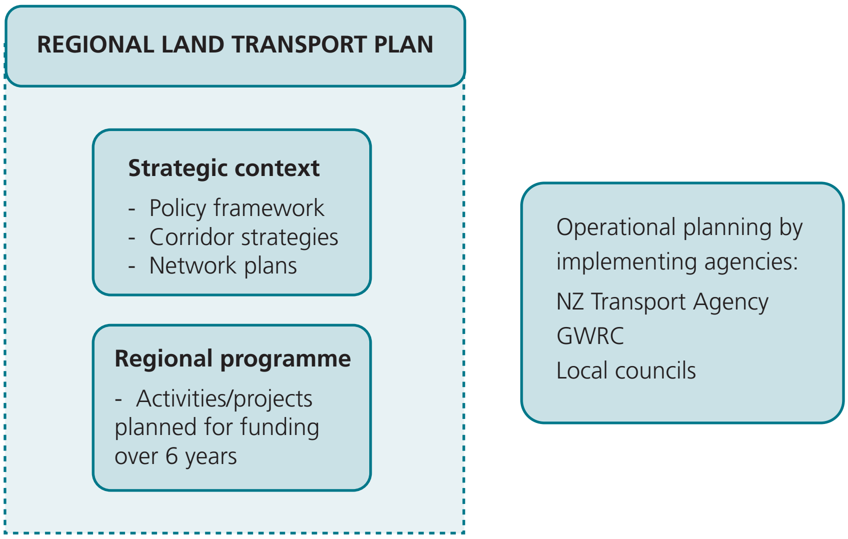
- To drive improved performance from the land transport system by focusing on:
  - economic growth and productivity
  - road safety
  - value for money

The GPS provides further guidance on how government plans to invest to achieve this direction.

Structure of the Regional Land Transport Plan

The RLTP comprises two key parts as shown in the figure below.

Figure 2



The **strategic context** provides the policy framework and strategic case for the developing and investing in the region's land transport network. This forms the strategic 'front end' of the RLTP and will include the statutory objectives, policies and measures required by the LTMA 2003.

The **regional programme** sets out the programme of proposed land transport activities over a six year period. It also includes a 10-year financial forecast.

The RLTP also includes an assessment of how the plan meets the various statutory requirements in the LTMA, together with a description of the approach to monitoring, variations, and a policy outlining when a variation will be considered to be significant.

Governance

The RLTP has been developed by the Regional Transport Committee (RTC), a standing committee of the Greater Wellington Regional Council (GWRC). The RTC includes the mayors of each territorial local authority in the region, together with a representative from NZ Transport Agency and two representatives from GWRC (one of whom is the RTC Chair).

Determining transport network priorities

Investment in the transport network often involves consideration of the various trade-offs between transport modes and outcomes.

This plan seeks to provide strategic guidance for those considerations by:

- Identifying the key regional transport issues , describing the core problems and the benefits of addressing those problems.
- Outlining the strategic principles and priorities for the development of each of the key transport corridors in the region, including how the different modes are expected to work together as part of an integrated solution.
- Developing a set of network plans for strategic roads, public transport, walking and cycling which set out the hierarchy and identify priorities for development of each network.
- Identifying the key projects and packages that will implement the identified strategic direction and their relative priority.

Local network priorities - The development of local area 'Network Operating Plans' will be an important tool to aid consideration of the investment and operational trade-offs at a local scale and identifying the appropriate priorities for each mode along particular streets at particular times of the day.

SUMMARY OF STRATEGIC APPROACH

Vision – 'To deliver a safe, effective and efficient land transport network that supports the region's economic prosperity in a way that is environmentally and socially sustainable'

A balanced approach will be taken to move the region towards this long term vision, with a mix of investment aimed at progressing towards the range of outcomes sought for the region's transport network.

This strategic approach recognises that the transport system has different roles and uses at different times of the day and week, and that there are often trade-offs between transport objectives. The goal is to have more people using public transport, walking and cycling- particularly at peak times when the transport network is in high demand – but also recognising that these modes will not suit or even be an option for many trips.

It will be important to continue to improve the different elements of our transport network to achieve multimodal solutions that effectively support the region's economic growth and community wellbeing.

A summary of the overall strategy for development of the region's transport network is described below under each of our key strategic objectives:

A high quality, reliable public transport network

A high quality (frequent, comfortable, safe, and easy to use) and reliable peak period public transport network will provide an efficient method for moving large numbers of people at peak times (with associated de-congestion benefits) along corridors where the transport network is in high demand and capacity is an issue. Continuing to improve off-peak accessibility will ensure that the public transport network provides a good base level of service for community accessibility purposes.

Ongoing investment in the region's rail network is an important part of this strategy. Rail is a very efficient way to move large numbers of people over longer distances and we will continue to build on the region's established rail network which links many communities within the region along several key corridors to the north of the Wellington City CBD. The priority is to improve rail's reliability, capacity and frequency, and over the longer term the aim is to further improve journey times and reach.

Buses play an important role in the region's transport network and will continue to do so in future. They support the rail network with connecting feeder services and provide core public transport services in many areas. Bus Rapid Transit (high quality, high capacity buses running in dedicated lanes) along the public transport priority spine in central Wellington and beyond will provide fast and reliable journeys through the Golden Mile/CBD and to the southern and eastern suburbs.

Key improvement areas for public transport include:

- Continued modernising of public transport vehicles
- Measures to improve journey times and service reliability
- Enhancing the quality of stations, stops and interchanges
- Improving pedestrian access to public transport stops and stations
- Improving public transport fare, information and ticketing systems
- Improving the design of public transport networks to be more effective and efficient
- Ensuring value for money through new performance based operating contracts
- Maintaining and enhancing park and ride facilities
- Using customer feedback to improve the network
- Promoting public transport use

A reliable and effective strategic road network

The region's strategic road network provides vital connections between sub-regional centres within the region, and links the region with the rest of the North Island and the South Island via the Cook Strait ferry.

Strategic roads are key connections for freight and enable people to access jobs, schools, shops and other facilities. Severe traffic congestion can impact negatively on access and create blockages that result in people using less suitable or inefficient alternatives. Congestion will be addressed by a range of measures including optimisation and capacity improvements. Investment in our strategic road network will recognise the importance of improving its safety and reliability.

Key improvement areas for the strategic road network include:

- Infrastructure improvements along key strategic routes
- Improving the region's connection to the north through implementation of the Wellington Roads of National Significance (RoNS)
- Improving the safety of the road network
- Providing better east-west connections within the region
- Minimising congestion, including through mode shift to public transport, walking and cycling
- Advocating for the ability to use road pricing tools

An effective network for the movement of freight

Providing an efficient freight network will support the region's economic stability and future growth. To ensure the transport network provides effectively for freight, continued improvements are planned to the road and rail networks along key freight routes. Opportunities to enhance the efficiency of freight movements will also be supported.

Key improvement areas for freight include:

- Infrastructure improvements along key freight routes, road and rail
- Facilitating high productivity motor vehicles on key freight routes
- Improving access to key freight destinations such as the port and international airport
- Implementation of the Wellington RoNS
- Studies to better understand freight movements within the region
- Identifying locations for potential facilities such as freight hubs, inland ports, freight storage, heavy vehicle parking
- Encouraging use of public transport at peak times to free up capacity on the road network for freight
- Encouraging use of rail for suitable freight tasks

A safer system for all users of our regional transport network

An important goal is ensuring that people can move about the region safely. A safe system approach to road safety will be used to address all aspects of regional road safety and to help move us towards our improved road safety targets. This involves measures to address safer drivers, safer vehicles, safer roads, and safer speeds.

The Swedish approach to road safety known as 'Vision Zero' [1] is based on the principle that no loss of life is acceptable. This thinking has been incorporated into the road safety approach in this plan. An ongoing reduction in serious and fatal crashes is sought with the long term goal of a transport system free of fatalities. A key principle of 'Vision Zero' is recognising that people make mistakes. The safe system approach aligns well with this principle by addressing all the different elements influencing road safety. It does not remove people's responsibility for road safety, but seeks to ensure a combination of road/roadside design, speeds and vehicle design that take human fallibility into account.

Key improvement areas for safety include:

- Safety infrastructure improvements – such as median barriers, and improvements as part of wider road projects (including the Wellington RoNS)
- Road safety education and promotion
- Speed limit reviews
- Advocacy for legislative change - for example, relating to driver licensing, blood alcohol levels, and vehicle safety standards
- Promoting use of public transport as a safer mode of transport
- Safe cycling and walking infrastructure.

An increasingly resilient transport network

The transport network needs to be resilient to low impact events (such as traffic crashes, landslips, storms) and high impact events (such as major earthquakes), as well as incremental longer term impacts and trends (such as climate change and fuel price/availability).

Key improvement areas include:

- Identifying key lifelines and transport infrastructure vulnerabilities (road and rail) and progressing mitigation projects to address resilience issues
- Implementing the Wellington RoNS and a new east-west link between SH2 and SH1 to improve network resilience and provide alternative routes.

A well planned, connected and integrated transport network

Good integration between modes and between services contributes to seamless and efficient journeys for transport users. Well integrated land use and transport is critical to ensure the liveability of our region and supports an efficient and effective transport network.

1 http://www.visionzeroinitiative.com/en/

Key improvement areas include:

- Improving integration within and between modes through projects such as integrated ticketing for public transport, improved station/stop/interchange design, more park and ride spaces, and cycle parking at railway stations
- Advocacy for integrated land use and transport planning through processes such as district plan changes and resource consents
- Adoption of appropriate design standards to guide the development of new subdivisions and infill development, including lot layout, street design, integration of active and public transport modes, and parking standards.

An attractive and safe walking and cycling network

We will continue improving walking and cycling networks, particularly for short trips, so that they provide a safe and attractive transport option. Walking and cycling trips contribute to efficient use of the transport network, and have many wider benefits for our community. While most roads and footpaths provide walking and cycling networks, we need to continue to improve the safety and quality of these facilities. We will also need to continue installing new infrastructure for pedestrians and cyclists such as cycle lanes, off-road paths, and crossing facilities to provide a good level of service.

Key improvement areas include:

- Providing a network of safe and attractive walking and cycling facilities
- Improving integration with public transport services, stops and stations
- Advocating for higher priority of pedestrian and cyclist road safety funding
- Advocating for good walking/cycling provisions in new land use developments
- Promotion and education to improve active mode use and safety.

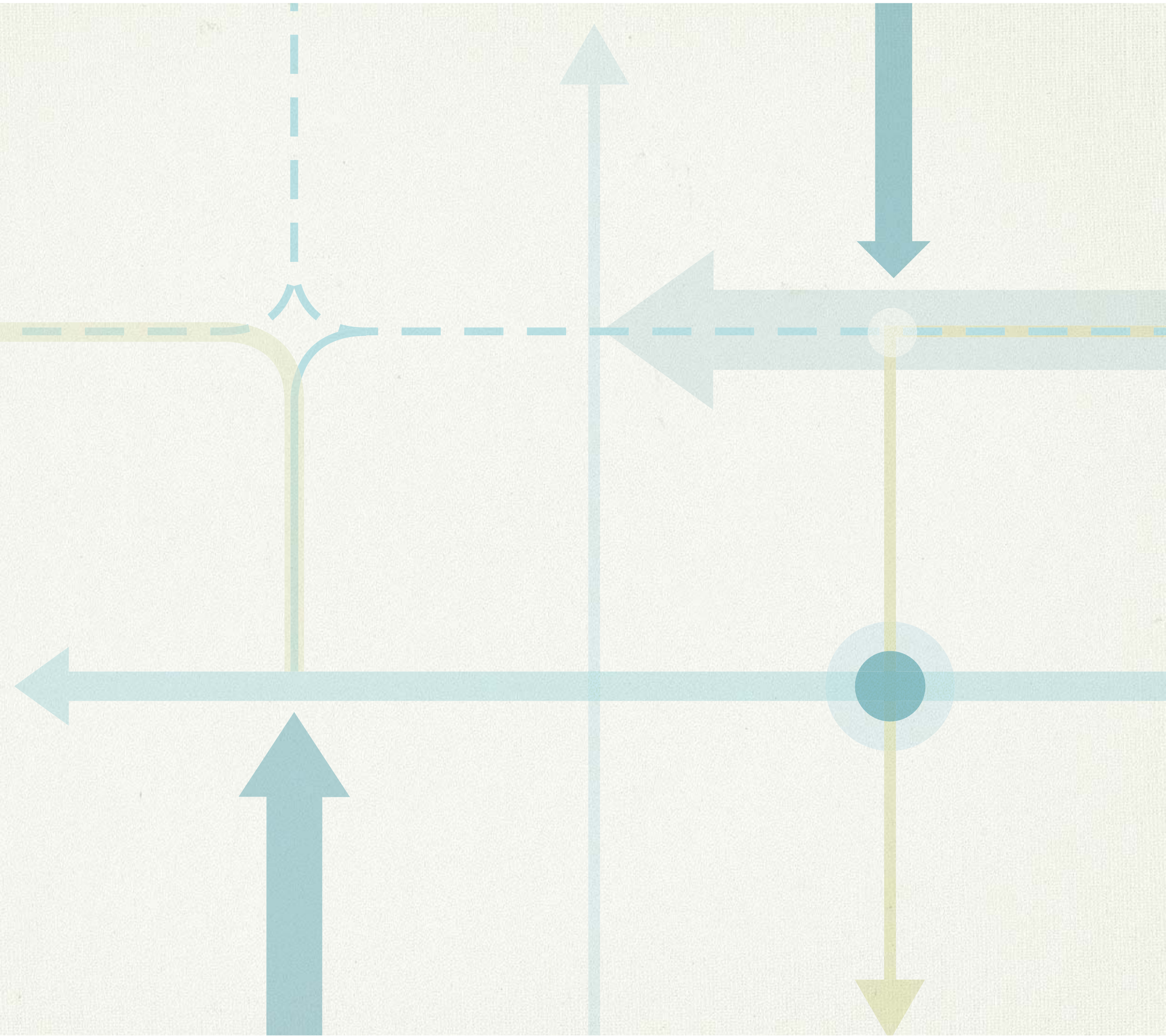
An efficient and optimised transport system that minimises the impact on the environment

We want to develop and use our transport network as efficiently as possible, so that we are getting optimal benefit from the investment whilst minimising the environmental impacts. Our strategy involves influencing how and when people travel, supporting new technologies, and using tools to make the best use of the network.

Key improvement areas include:

- Promoting awareness of travel options and benefits through programmes such as travel plans for schools and workplaces, Active a2b, Let's Carpool website, and events/campaigns.
- Supporting and promoting technologies and policies to reduce the demand on the transport network such as teleconferencing facilities, fast broadband access, car-share schemes and flexible work hours.
- Supporting technologies that reduce the impact of transport on the environment - such as electric vehicles, alternative fuels and fuel efficient vehicles.
- Implementing network management techniques and intelligent transport systems to optimise road network performance
- Managing travel demand through pricing measures such as parking charges and road tolling. Advocating for availability of road pricing of the existing network
- Improving and promoting the use of public transport, walking and cycling, particularly during peak periods.

POLICY FRAMEWORK



A. VISION

The RLTP vision is:

'To deliver a safe, effective and efficient land transport network that supports the region's economic prosperity in a way that is environmentally and socially sustainable'

To achieve this, the regional transport network will provide a high level of access, reliability and safety for both passengers and freight travelling within and through the region to support economic development and improve productivity. The regional transport network will be developed in a way which recognises the vital national role of Wellington as the capital city and the region's geographical position on the northern side of Cook Strait.

Access to and between key destinations such as Wellington City Central Business District (CBD) and other regional centres, CentrePort, Wellington International Airport and Wellington Hospital will be quick, easy, reliable and safe. Traffic congestion will be managed at levels that balance the need for access against the ability to fully provide for peak demands due to community impacts and cost constraints.

In urban areas there will be viable alternatives to travel by private car for most trips. Walking or cycling will be an attractive option for short and medium length trips. Pedestrian and cycling networks will be convenient, safe and pleasant to use.

Public transport will provide an attractive option for an increasing number of people, particularly at peak times along key commuter corridors. Public transport trip times, reliability, cost and comfort will compete favourably with private cars for a majority of commuter trips. The public transport system will effectively connect people with key destinations. All public transport services will have a high level of accessibility, including physical access, access to information and simple streamlined ticketing.

People will need to travel less because they have access to excellent telecommunications, local job opportunities and the opportunity to live closer to their main destinations for work and play. More vehicles will run on renewable fuels that are non-polluting. People's travel choices will recognise the risk and impact of climate change and diminishing non-renewable resources.

Effective safety measures, behaviour change campaigns and other interventions will help to ensure that no one is killed or seriously injured when travelling within or through the region.

More bulk freight will be moved by rail and coastal shipping when economically viable.

B. TRANSPORT NETWORK PRESSURES AND ISSUES

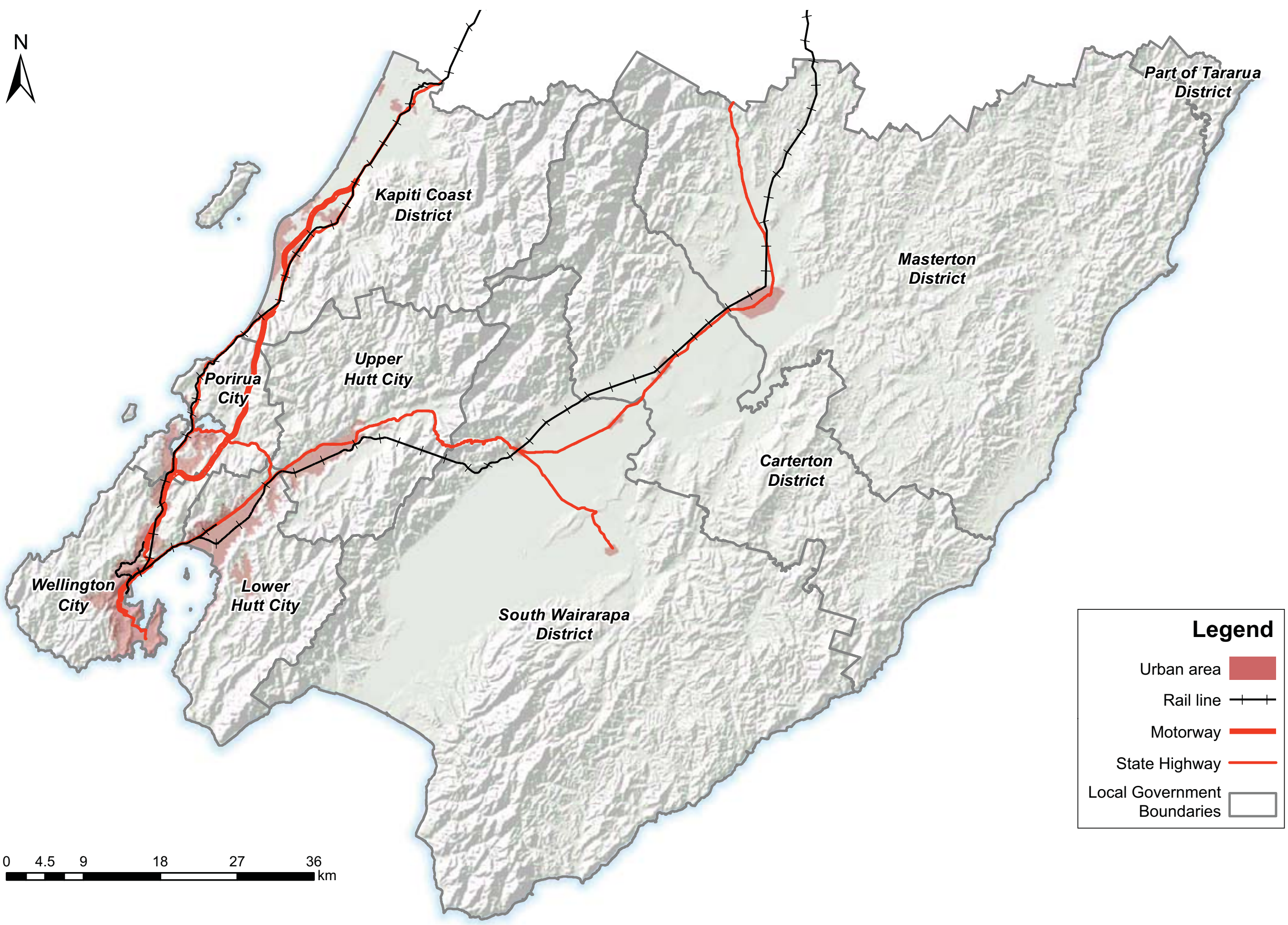
The regional transport network provides vital access for people and freight to key destinations including the Wellington City CBD, regional centres, CentrePort (Wellington's sea port), Wellington International Airport, and Wellington's regional hospital in Newtown. It also links the region to the rest of New Zealand.

State Highway (SH) 1 and the North Island Main Trunk (NIMT) railway line enter the region near Otaki in Kapiti Coast and extend southwards through Porirua and northern Wellington to the Wellington City CBD. The railway line ends at the Wellington Railway Station at the northern end of the CBD and from there bus services continue along the core public transport network through the CBD to outlying suburbs. SH1 continues through to Wellington International Airport.

SH2 and the Wairarapa Line railway enter the region north of Masterton and extend south-west through Wairarapa, the Hutt Valley and on to merge with SH1 at Ngauranga and the NIMT line at Kaiwharawhara. Other rail connections extend from the Wellington Railway Station to Johnsonville and Melling.

SH58 provides a vital east-west link between SH1 and SH2, connecting Porirua and Lower Hutt. SH53 provides access between Featherston and Martinborough.

Figure 3



The Wellington region's topographic and geographic constraints mean it has developed a relatively compact urban form along the region's transport corridors. This supports a good public transport network and has led to one of the highest levels of per capita public transport use in Australasia.

Local arterial roads provide important access to the state highways, major areas of employment and sub-regional and local centres. Buses and general traffic share many routes with cyclists and pedestrians. Local roads also cater for local traffic and access within districts, including access to private property.

The region includes Wellington City, New Zealand's capital city, and a number of other large urban centres and suburban areas through to districts that are largely rural in character and have different transport system issues and requirements compared to urban and suburban areas.

A summary of the key challenges and issues affecting the region's transport network is outlined below.

Network capacity constraints and issues

The capacity of both SH1 and SH2 steadily increases as they move south through the region until they merge at Ngauranga, creating a six-lane motorway between this point and Aotea Quay (CentrePort/ferry terminals). The Ngauranga Gorge interchange is a major pinch point that limits the amount of traffic that can access or exit Wellington City at peak times.

Other areas of constrained capacity include:

- Otaki (SH1 – during public holidays)
- Waikanae to Paraparaumu (SH1)
- Paekakariki to Pukerua Bay (SH1)
- Ngauranga to Aotea Quay (SH1)
- Terrace Tunnel to Cobham Drive (SH1)
- Approach to Melling Interchange (SH2)
- Petone to Ngauranga (SH2).

Between Aotea Quay and Wellington International Airport, SH1 has a large number of signalised intersections plus two tunnels (Terrace and Mt Victoria) that act as capacity constraints along with a number of other pinch points such as the Basin Reserve, Vivian Street and Ruahine Street. As the state highway crosses local commuter routes the resulting congestion has knock-on effects for local roads and affects the reliability of bus services.

East-west connectivity is serviced by SH58 to the north and the Ngauranga Interchange to the south, leaving a considerable 'gap' in the regional network for travel between Porirua/north Wellington and the lower Hutt Valley. This results in longer travel times (compared to travel times between other centres) and contributes to congestion at the already busy Ngauranga Interchange.

SH2 Rimutaka Hill Road between Upper Hutt and Wairarapa involves several sharp turns and narrow road widths with associated safety issues, particularly where heavy freight vehicles are forced to cross the centreline at some locations. The necessary reduced speed through this part of the network also leads to increased travel times. The road is also prone to closure and landslips during stormy weather.

On the local road network, buses and general traffic experience slow and variable travel times, particularly in Wellington City, during peak periods due to:

- a high number of signalised intersections
- high traffic volumes
- bus-on-bus congestion in the central city
- interaction between multiple road users – cars, buses, cyclists, pedestrians
- narrow streets in a geographically constrained urban environment.

For rail, the Kapiti, Hutt and Johnsonville lines are important commuter routes, bringing over 13,000 people into the Wellington CBD for work in the morning peak.[1] The NIMT railway line also plays a significant role in moving bulk freight from across the North Island to the Interislander terminal and Port and then on to the South Island or overseas. Key rail infrastructure constraints include:

- Single track sections on the NIMT railway line between Paekakariki and Pukerua Bay and single track on the Hutt Valley/Wairarapa railway line between Trentham and Upper Hutt limit the number of commuter and freight train trips that are available at peak times
- A lack of passing loops on the rail network affects scheduling flexibility.

Reliability and resilience

The Wellington region's geography has helped to shape its relatively compact urban form and linear transport network, with associated benefits in terms of transport system efficiency. However, it is this form that has left the region largely reliant on two highways and two railway lines for access, with limited alternative routes. The reliability and resilience of the transport network are therefore key issues for the region.

Reliability is a measure of the predictability and variance of transport travel times from one day to the next.

Resilience relates to how susceptible the region's transport network is to being severely disrupted during a major event such as an earthquake, and how long it might take for key routes and lines of communication to be re-established in the aftermath of such an event. It is also a measure of the ability of the region's transport network to cope with day-to-day 'incidents' such as road traffic accidents and temporary slips.

1 Greater Wellington Regional Council, Wellington Public Transport Annual Cordon Survey – 2014 data

The region is susceptible to individual incidents causing significant delays – particularly at the following locations:

- SH1 between Kapiti/Porirua and Wellington City (particularly the narrow section between Pukerua Bay and Paekakariki)
- SH2 between Ngauranga and Petone (the only direct link between Hutt Valley and Wellington City)
- SH58 – the only practical east-west link between SH1 and SH2.

In terms of local routes, the following suburbs in Wellington City have limited access:

- Miramar
- Eastern suburbs
- Brooklyn
- Karori
- Northern suburbs.

In Lower Hutt, access to a number of suburbs could be severed due to limited (and sometimes vulnerable) local road access – for example, Wainuiomata and Eastbourne. In Wairarapa, access to the town of Martinborough relies heavily on SH53 which is vulnerable to flooding at some locations.

Several sections of the strategic transport network are particularly vulnerable to the impacts of a storm surge. In the longer term, they are also prone to sea level rise from climate change. These include:

- SH1 Pukerua Bay to Paekakariki
- SH1 Cobham Drive
- SH2 Ngauranga to Petone
- SH58 along Pauatahanui Inlet

This vulnerability was highlighted when the June 2013 storm closed the rail line between Ngauranga and Petone for several days. This storm created significant delays on the state highway and had an estimated economic impact of between $12 and $43 million.[1]

Several sections of SH1 and SH2 – Paekakariki, Ngauranga Gorge, Rimutaka Hill road – and SH58 are also prone to disruption should a major storm or earthquake occur, mostly from landslides.

Analysis undertaken by the Wellington Lifelines Group predicted that a major earthquake could isolate and fragment the region. Restoring access to the various areas of the region is estimated to take anywhere from three days to 10 weeks. Road access to the Wellington CBD may take an estimated 120 days to restore.[2]

1 Ministry of Transport, November 2003, The transport impacts of the 20 June 2013 storm
2 WeLG/WREMO, March 2013, Transport Access – initial project report

Population and employment

Census 2013 data show that the Wellington region's population has increased at a similar rate to the national average (about 10% between 2001 and 2013). This rise has been faster in Wellington City and Kapiti than elsewhere in the region. In absolute terms, Wellington City (191,000) and Lower Hutt (98,000) account for nearly two-thirds of the region's population. The Wellington CBD population has grown by 45% since 2001.

The high growth rates in Wellington and Kapiti are primarily a result of:

- large housing and employment developments at Paraparaumu and Waikanae
- new subdivisions in Wellington's northern suburbs
- a large number of new apartment dwellings in and around the Wellington CBD.

Under a 'medium' future population growth forecast, which is representative of how the region has tracked in the recent past, a further 10% increase in population is forecast to occur between 2013 and 2031, with a continued focus of growth in Kapiti and Wellington City. [3]

Development along the Wellington City growth spine is likely to result in lower car dependency. In the CBD specifically, growth is also likely to encourage a higher active mode share resulting from shorter commuting distances, limited parking options, and ease of access to amenities.

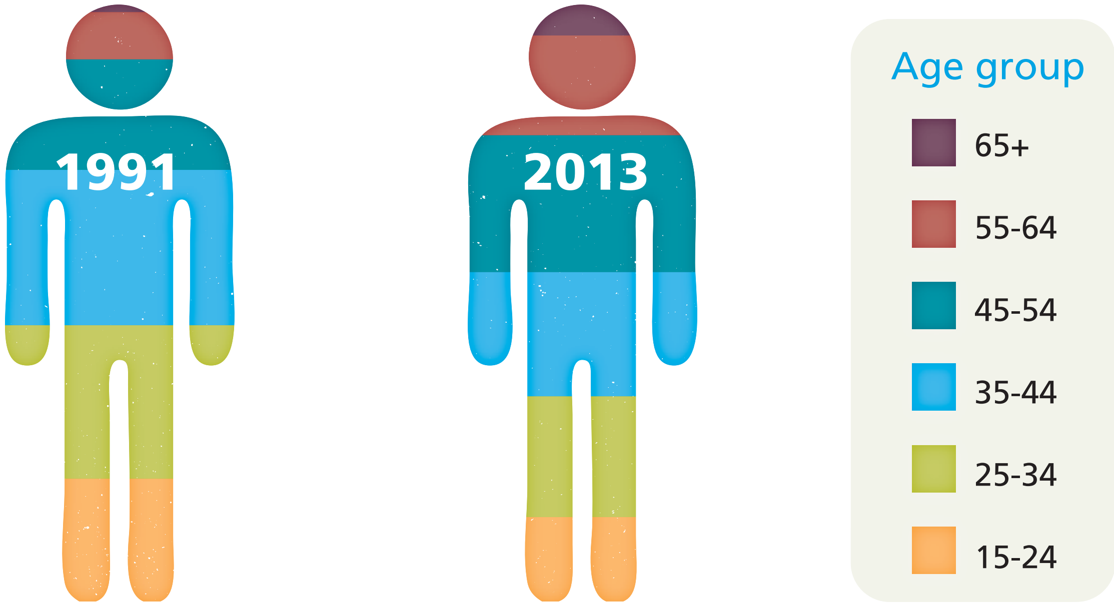
The Wellington region's population is ageing. Between 2001 and 2013 the percentage of the total population aged 65 years or over increased from 11.1% to 13.2% while other age groups have decreased in proportion or remained relatively constant.[4] These trends are likely to continue into the future as the baby-boomer generation reaches retirement, average life expectancy continues to increase and birth rates remain low.

Forecasts suggest that there may be a 36% increase in the number of people aged over 65 living in Wellington City between 2013 and 2025. [5] If a similar increase were to occur across the rest of the region, the percentage of the region's population aged over 65 may increase from 13.2% in 2013 to nearer 17% in 2025.

People are also working later in life. The proportion of the New Zealand labour force aged 65 years and over has increased from 1.5% to 5.4% over the past decade.[6] This trend is expected to continue as more people continue working into their late 60s and 70s.

3 Based upon Statistics New Zealand Local Authority projections
4 http://profile.idnz.co.nz/greater-wellington/five-year-age-groups
5 http://forecast.idnz.co.nz/wellington/population-age-structure
6 Statistics NZ Labour Force Survey

Labour force by age



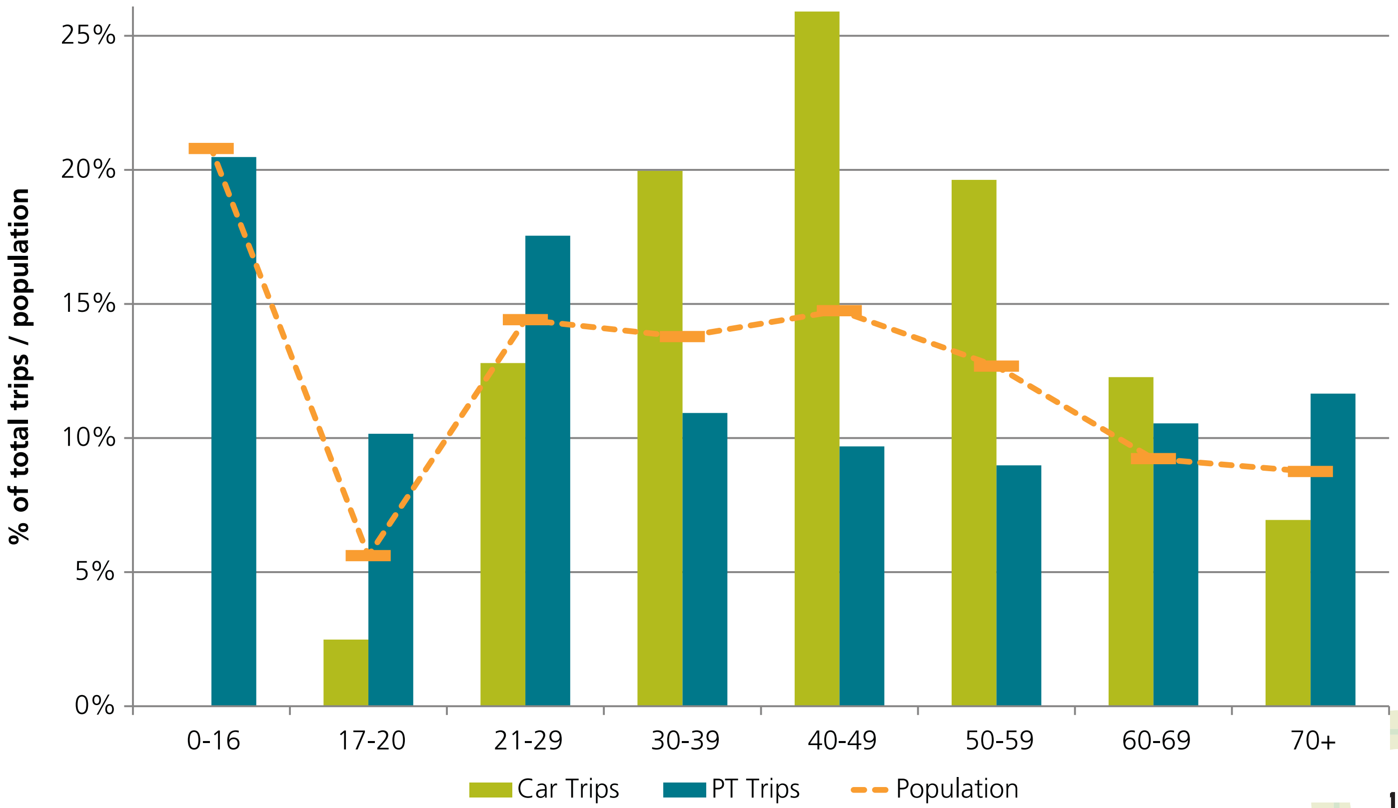
An ageing population may result in an increase in off-peak travel demand, particularly for public transport. This, however, needs to be balanced against the fact that the percentage of the overall population categorised as being in the labour force is likely to remain constant through time.

Different age groups have different travel patterns. In general terms, young people (0 – 24 years) place more demand on public transport, working professionals (24 – 60 years) drive more and older people (60+ years) have a higher demand for public transport.[1]

1 Stephenson, J and L. Zheng (2013) National long-term land transport demand model. NZ Transport Agency research report 520.

Figure 4. Percentage of annual car trips, annual PT trips and regional population, by age group (2013)

Source: NZ Ministry of Transport / UK Department for Transport/ Statistics NZ



Another emerging trend is people taking advantage of technological improvements in communications – internet, mobile phones, cloud computing – to work remotely, reducing the need to travel. The 2013 Census shows a small increase in persons working from home (compared with 2006), a trend that is likely to continue into the future.

The net result of the demographic and lifestyle changes detailed above, whilst subject to a degree of uncertainty, is likely to be a future where only relatively minor changes in travel patterns occur and average per capita car and public transport trip rates also remain relatively unchanged.

Alongside population, employment is another key driver of travel demand. The spatial distribution of both employment and population determines how much travel people have to do in order to reach their place of work.

There was a 3% reduction in employment across the region between 2008 and 2012 due to the economic slowdown. However, over the longer term there has been an overall 13% increase in the number of people employed between 2001 and 2013. Wellington (approx. 56%) and Lower Hutt (approx. 18%) have a greater percentage of the region's jobs than they have of the region's population,[1] explaining some of the current commuter travel patterns across the region.

1 Based upon Statistics New Zealand Local Authority projections

Regional employment is anticipated to grow at a slightly faster rate (12%) than population (9%). The forecasts show that, in percentage terms, employment growth (unlike population growth) will be more evenly spread between the local authorities within the region.[2]

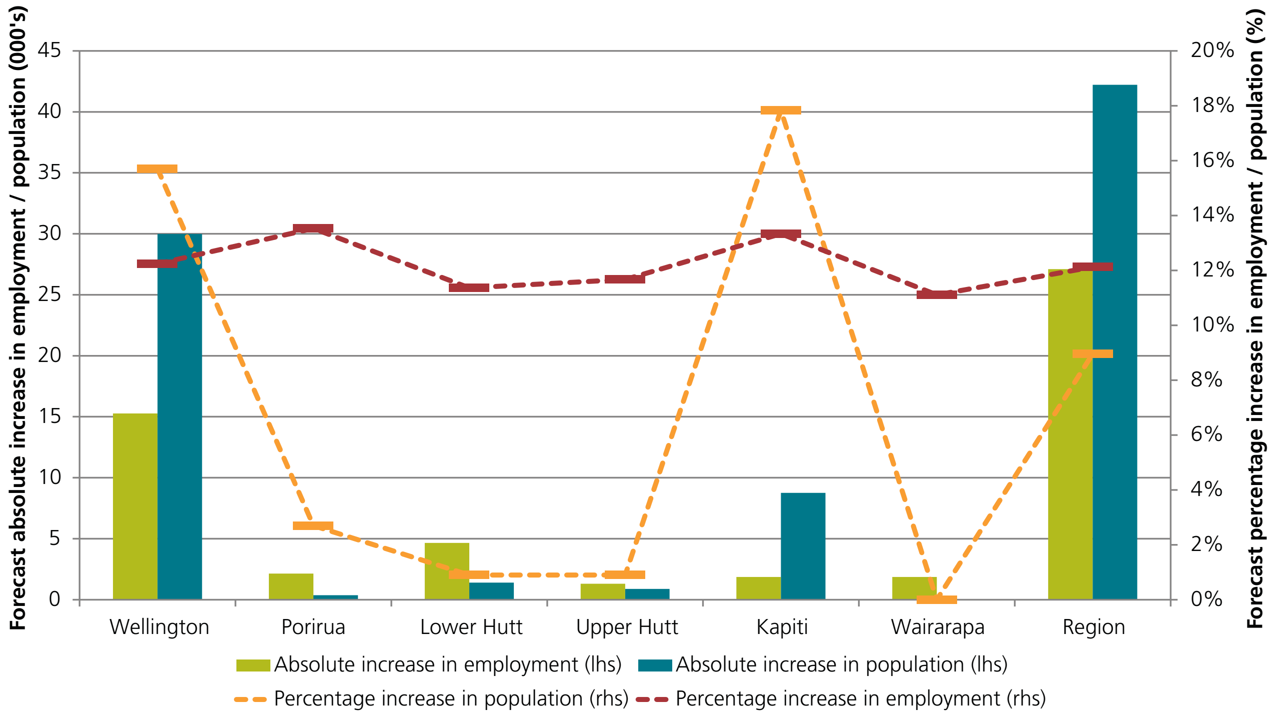
In absolute terms, however, most new jobs are likely to be added in Wellington City CBD, placing an even greater reliance on the transport network for getting people to/from their place of work.

GDP is forecast to grow across the whole region at an even rate of 1.8% per annum, a rate similar to the average growth rate of the past 20 years.[3] Historically, growth in GDP and vehicle kilometres travelled (VKT) was closely linked. In recent years, however, GDP and travel demand appear to have started to 'decouple', with GDP having risen over the past 10 years whilst VKT has remained relatively static. As a result of this emerging trend, it is likely that future increases in travel demand will be linked to a range of factors other than just GDP growth, including population and employment in specific areas.

2 Based upon Statistics New Zealand Local Authority projections
3 NZ Treasury long term trends and forecasts

Figure 5. Forecast growth in the Wellington region's population and employment, 2013 to 2031, by local authority area

Source: Statistics NZ



Travel patterns

Looking at Census journey to work data for the Wellington region, between 2001 and 2013 there has been a large observed increase in the number of journey to work trips made by active modes (36%) and a moderate increase in journey to work trips made by public transport (20%). By comparison, the number of journey to work trips undertaken by car increased by only 5% during the same period. Placed in the context of an increase in population of 11% between 2001 and 2013, there has been a per capita increase in active mode and public transport journey to work trips and a per capita decrease in car journey to work trips over this period.

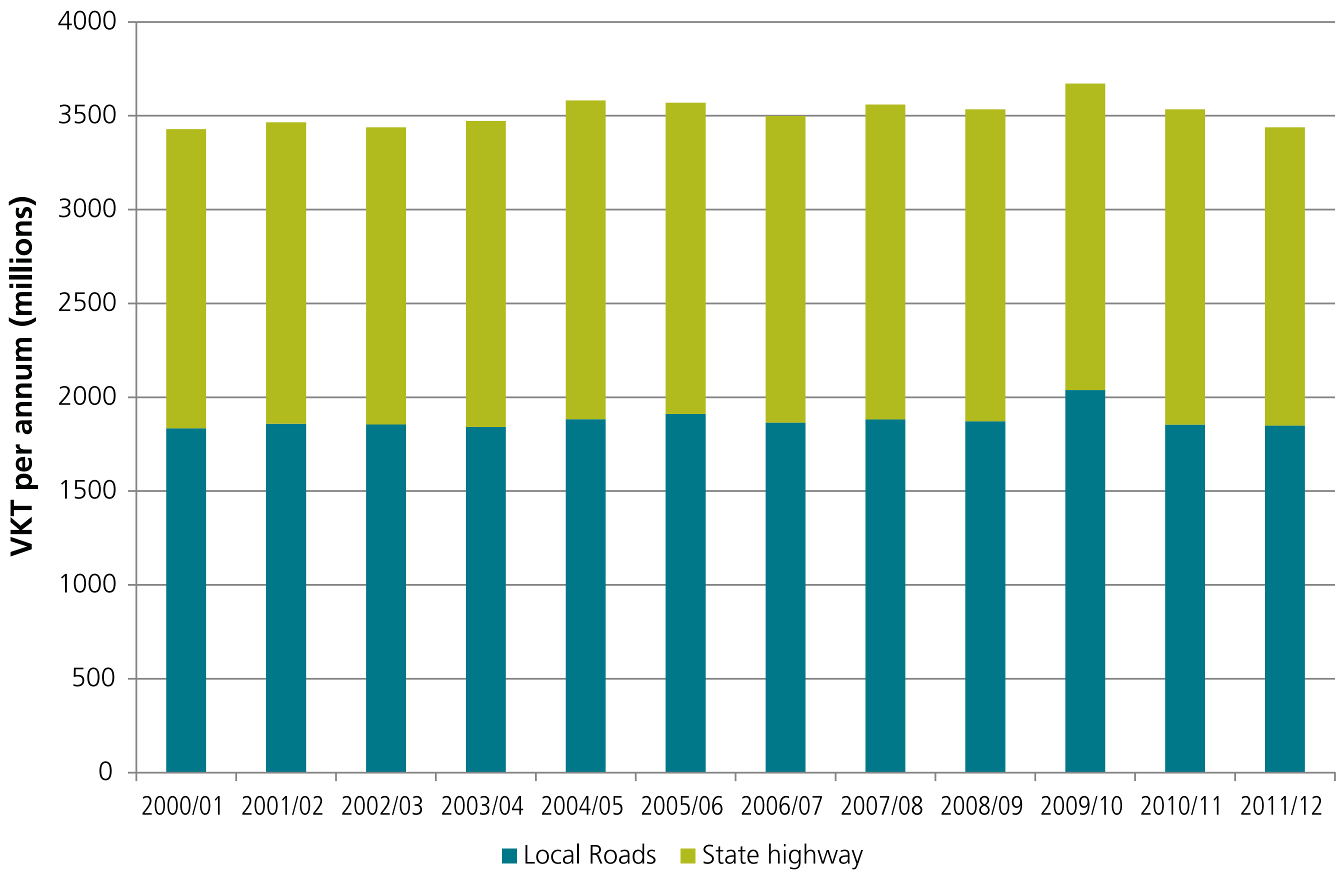
Nationally, growth in vehicle traffic volumes (car and HCVs) on state highways began to slow around 2000, despite the HCV component of this growth continuing to grow at a fast rate. Since 2005, total traffic volumes on the state highway network have decreased by around 1%.[1] Given that HCV traffic during this period increased by about 3%, the implied decrease in car trips is around 2%. This is similar to trends observed in many other developed countries during this period.

This trend does, however, mask steady growth along a few corridors through New Zealand, which is correlated well with GDP growth. ANZ's Truckometer[2] shows steady growth in HCV traffic along key roads, attributing it mainly to agricultural output. This indicates that specific routes associated with the movement of agricultural goods are becoming busier, while other sections of the network are experiencing a drop in use. The net result is a static trend in overall vehicle kilometres travelled.

1 NZ Transport Agency, State highway traffic data booklet
2 http://www.anz.co.nz/commercial-institutional/economic-markets-research/truckometer/

Figure 6. Vehicle kilometres travelled per annum, Wellington region, 2000 to 2012 (all vehicles)

Source: http://www.transport.govt.nz/ourwork/tmif/transport-volume/tv001/



Annual vehicle kilometres travelled on region's roads

2001 2013

In the Wellington region, VKT on state highways has remained broadly static over the past decade to 2011/12.[1] A similar trend can be observed for travel volumes on local roads, indicating that shorter distance local vehicle trips have also remained largely static.

Approximately 1.15 million vehicle-based trips (car, road freight and public transport combined, excluding rail freight) are made every day across the region.[2] Around half of daily public transport trips and 40% of daily car trips occur during the morning and evening peak periods. Around 80% of peak period trips are commuter trips whilst most off-peak trips are shopping and leisure related.[3]

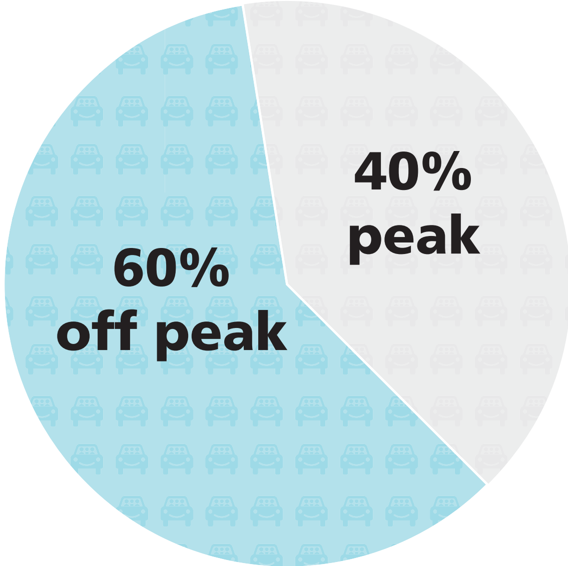
Looking at all journey to work trips categorised by originating local authority area, Wellington City and Lower Hutt have the highest public transport mode share at 20% and 16% respectively.[4] Public transport accounts for between 11% and 13% of all journey to work trips originating from Kapiti, Porirua and Upper Hutt. Only 5% of journey to work trips originating from the Wairarapa are made by public transport.

1 Ministry of Transport, Transport Monitoring Indicator Framework, TV001
2 Estimate: Wellington Transport Strategy Model
3 Sourced from Greater Wellington Regional Council Wellington Transport Strategic Model
4 Census JTW analysis (excluding persons who work from home or did not travel to work on the Census day)

Volume of vehicle based trips

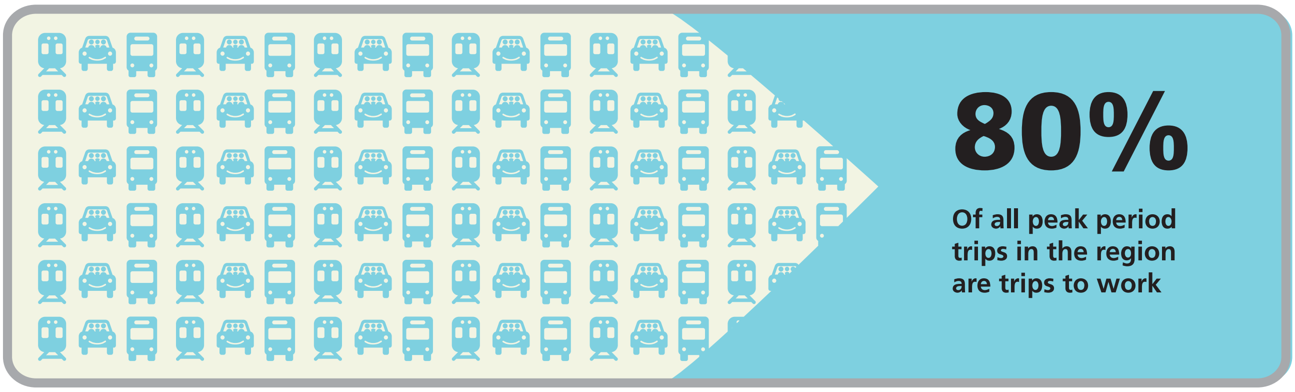
Peak and off peak demand

Public transport trips



Car trips

Commuting during the peak

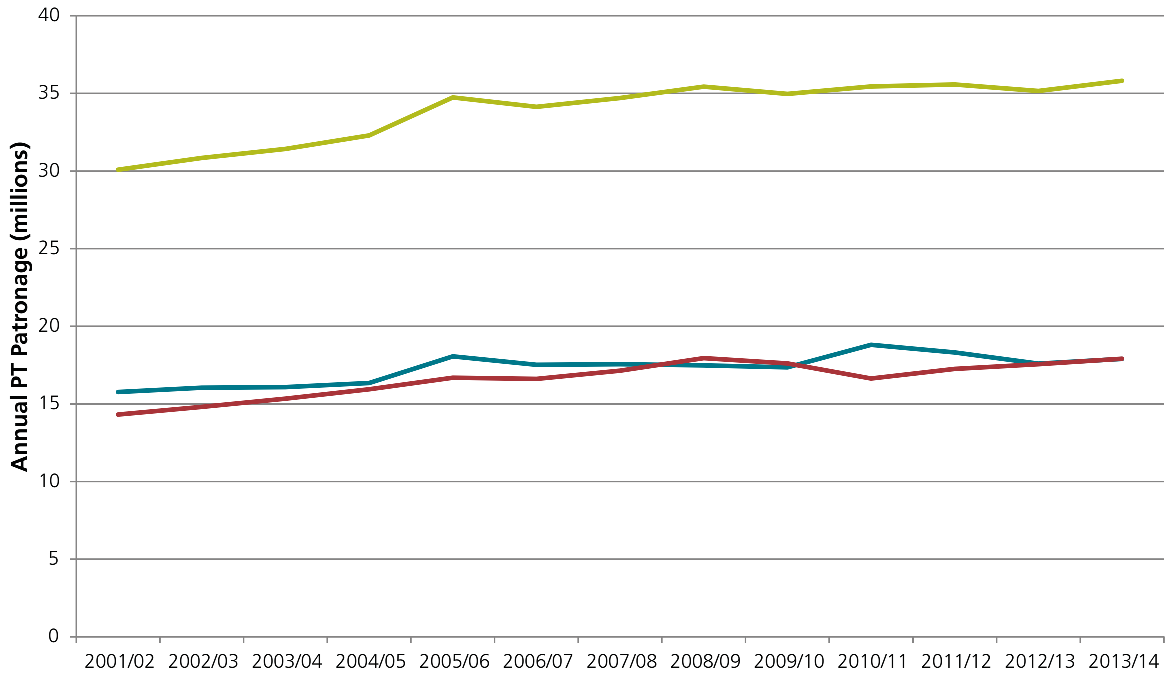


Travel patterns vary between the local areas within the region:

- According to the Census, around 70% of journey to work trips have both their origin residence and destination workplace within the same local authority area
- Wellington City dominates the region, accounting for 46% of journey to work trips by origin residence and 60% of journey to work trips by workplace destination
- 26% of region wide car journey to work trips, 56% of region wide active mode journey to work trips (walking/ cycling) and 78% of region-wide public transport journey to work trips have their destination workplace in the Wellington CBD
- Over 50% of journey to work trips originating from Upper Hutt are destined for workplaces outside of the local area, with Lower Hutt and Wellington City the primary destinations
- Over 50% of journey to work trips originating from Porirua are destined for workplaces outside of the local area, with Wellington City the primary destination
- The rail network accounts for around 45% of journey to work trips from local authority areas other than Wellington City to destination workplaces within the Wellington CBD, highlighting the importance of the rail network as a means of transporting people to/from Wellington CBD and taking pressure off the strategic highway network

Figure 7. Annual Regional PT Patronage (millions)

Source: GWRC patronage data



Public transport

Total regional public transport patronage has increased between 2001 and 2013 from around 30.5 million trips per annum (2001) to 35.2 million trips (2013), an increase of 17%. Growth in off-peak trips (23%) has been greater than growth in peak trips (12%). This growth rate is slightly higher than the growth in population, implying that the number of boardings per capita has increased. However, growth in patronage was considerably higher between 2001 and 2005 (15.5%) than between 2005 and 2013 (1.2%). [1]

While the global financial crisis can in part help to explain lower public transport growth rates between 2005/06 and 2012/13, other possible factors include:

- Historical rail reliability issues. However, rail reliability started to improve in late 2010, accompanied by a relative uplift in rail patronage that has continued through 2012 and 2013
- Slow and unreliable bus journeys of some routes, a result of traffic congestion affecting buses
- A significant increase in the popularity of active modes between 2005/06 and 2012/13, drawing some patronage away from public transport

Public transport usage, measured in terms of annual boardings per head of population, is already higher in Wellington than in most other Australasian cities[2] (and over double Auckland's figure). Further increases in public transport patronage will become more difficult due to the existing level of use and attractiveness of public transport, and the relatively small percentage of the population whose travel behaviour can be influenced. This explains why considerable investment is often required in order to generate what might appear to be a small change in public transport mode share.

Looking at journey to work trips to the Wellington CBD from the various local authority areas in the region, Wellington City itself generates the most vehicle-based trips to the Wellington CBD and has the lowest public transport mode share of trips to the Wellington CBD (29%)[3] compared with the other local authorities in the region, showing that the private car is still attractive for relatively short distance trips from the surrounding suburbs to the Wellington CBD, contributing to the traffic congestion that affects both highways and local roads through the city.

By comparison, Kapiti, Hutt Valley and Porirua have a public transport mode share of between 44% and 50% for journeys to work where the destination workplace is in Wellington CBD.[4] Given that most of these trips are undertaken by rail, this data further highlights the importance and effectiveness of the rail network in managing peak period congestion throughout the region.

Despite planned road investment through the Wellington RoNS programme, public transport patronage is forecast to increase out to 2025 as a result of planned public transport investment, parking constraints in Wellington City CBD, and more people expected to be living in locations that favour walking, cycling and public transport use.[5]

1 Greater Wellington Regional Council patronage data
2 http://chartingtransport.com/2010/11/13/public-transport-patronage-trends/
3 Census journey to work data
4 Census journey to work data
5 Greater Wellington Regional Council, 2014, Development of Future Scenarios (WP4)

More people walking and cycling to and from Wellington City CBD

Active modes

The active mode share of all trips in the Wellington region is higher than comparable figures for other regions and is also higher than the national average figure. [1]

Overall, active modes have increased in popularity in recent years. Morning peak period active mode trips to the Wellington CBD have shown the most growth with the number of pedestrian and cycle trips increasing by 20% and 64% respectively between 2001 and 2013, resulting in the combined walking/cycling mode share to the Wellington CBD during the morning peak period increasing from 17.7% in 2001 to 21.0% of all CBD trips for 2013.[2]

The potential to increase the cycle mode share further is limited by safety issues and a lack of dedicated cycling infrastructure. The regional strategic cycling network contains some on-road and off-road cycle lanes, but these lanes are often discontinuous and do not always provide an acceptable level of service. The most significant gap in the regional cycling network is between Ngauranga and Petone.

For pedestrians, a key issue is severance caused by physical barriers – such as major roads, railway lines, rivers or hills – with limited crossing facilities. Other issues include conflict with other road users, particularly within busy urban areas where available space is constrained. Factors such as footpath widths, crossing facilities, priority at intersections, shelter, and signage all affect the safety and amenity for pedestrians in urban areas.

1 2013 Census data
2 Wellington City Council CBD Cordon Survey

Given the ‘critical mass’ effect that cycling and walking is starting to generate, combined with recent lifestyle changes, the increasing propensity for people to live close to work and the likelihood that the location of future residential development may favour active modes, it is likely that travel demand across both active modes will increase further in the future.

Freight

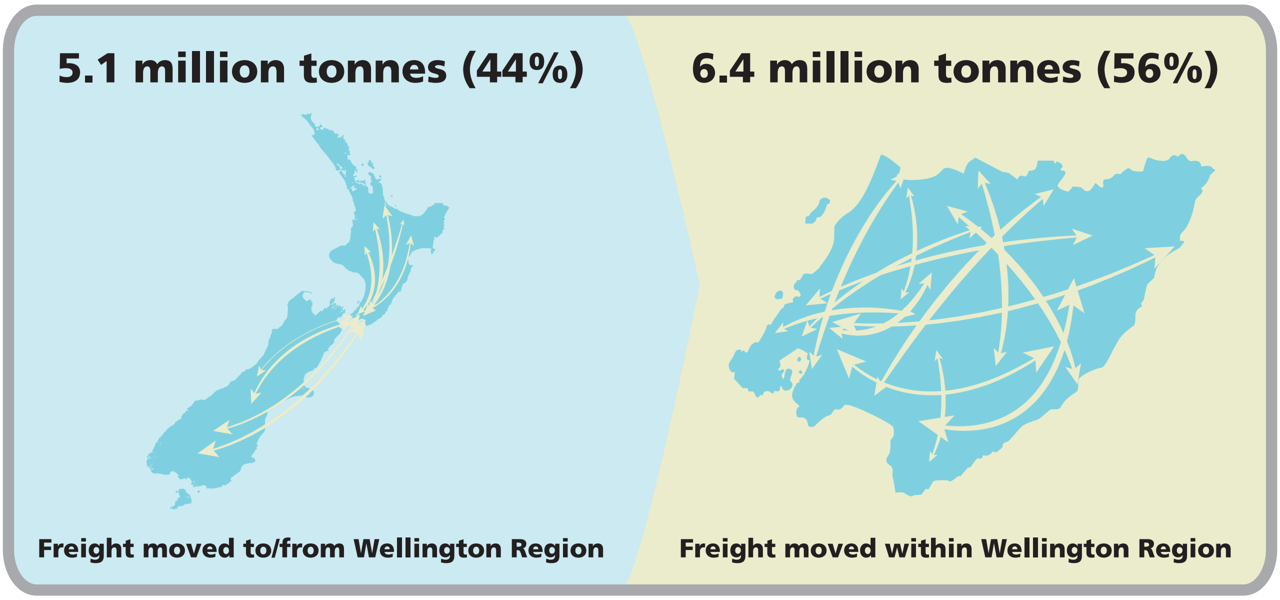
Freight includes anything transported as part of a commercial arrangement – from a courier delivery to the movement of logs, containers and heavy machinery. Over the period from 2008 to 2014 the amount of freight transported throughout New Zealand has increased slowly, with a slight decrease in 2009 that can be directly attributed to the global financial crisis. However, there have been some major growth areas within this overall freight trend including the growth of exports and increasing rail freight mode share.

The growth of rail freight reflects increases in output of some major commodities – particularly milk, dairy products and logs – for which rail offers competitive advantages over road transport, as well as the investments made as part of the KiwiRail Turnaround Plan.[3]

Freight trips to and from the Wellington region amounted to 5.1 million tonnes in 2012 while purely internal road and rail trips carried 6.4 million tonnes. [4]

3 Ministry of Transport. “National Freight Demand Study” March 2014. http://www.transport.govt.nz/research/nationalfreightdemandsstudy/.
4 Ministry of Transport. “National Freight Demand Study” March 2014. http://www.transport.govt.nz/research/nationalfreightdemandsstudy/.

Freight movement in 2012



Wellington is a major freight hub between the North and South Islands and for the export of bulk freight (predominantly primary products). SH1 and the NIMT railway line are the main transport corridors for freight to the region from the North Island. The section of SH2 south of Petone is also a significant freight corridor. Inter-island ferries connect road and rail freight with the South Island (around 2.0 million tonnes and 0.9 million tonnes in 2012 respectively). Other types of coastal shipping carries freight from Wellington's CentrePort to other New Zealand or international ports.

There is a significant volume of log freight from the lower North Island to Wellington's CentrePort. A new KiwiRail service from Wairarapa that started in March 2012 allows for up to 80,000 tonnes of the logs to be moved by rail to CentrePort per year.[1] However this still only accounts for 16% of logs coming from the Wairarapa, with the rest currently being transported by road.[2]

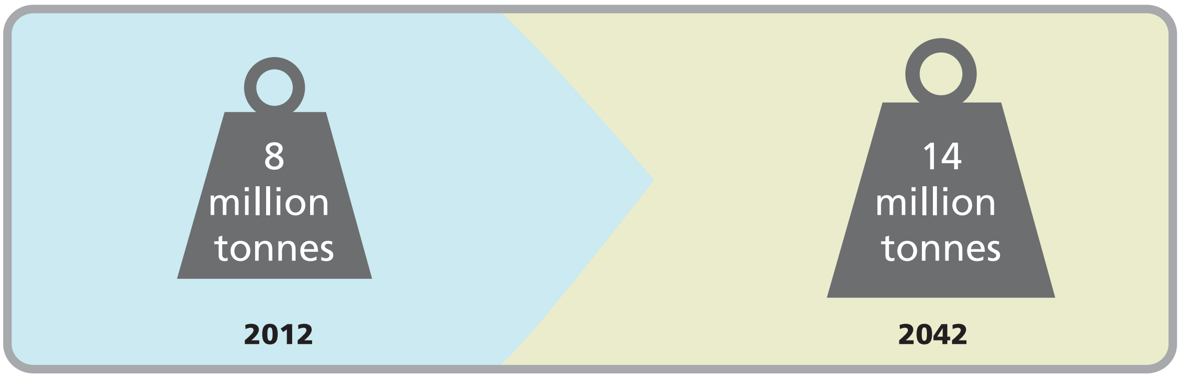
In Wellington, road freight is affected by traffic congestion in urban areas as well as slow and variable travel times along SH1 and SH2. Access to the Interislander terminal and CentrePort is sub-optimal and capacity constrained at certain times, with conflicts between freight and commuter traffic a significant issue. Limited physical capacity at the port and ferry terminals themselves is also a constraint likely to affect freight efficiency and future growth.

As the capital city and a major urban hub, much of Wellington's freight movement consists of short trips within the region. This includes freight trips between key industrial and distribution hubs within the region, the movement and distribution of goods related to Wellington's service and

1 Sourced from CentrePort Wellington media release 1 March 2012. http://www.centreport.co.nz/latest-news/new-rail-service-for-growing-centreport-log-trade

2 Grow Wellington data

Projected freight growth in Wellington



retail industries, and other light freight movements such as home deliveries. This type of freight movement has different characteristics and needs compared with longer distance and higher volume bulk freight. It is affected by congestion on strategic roads to/from the port, but also on routes across central Wellington city and on other parts of the local road network.

Moving freight from road to rail is really only feasible and practical for some longer distance bulk freight, but is important to support an efficient transport system with associated decongestion, safety and environmental benefits.

New Zealand's freight task (tonnage) is projected to increase by around 58% over the period 2012 to 2042.[1] In the Wellington region the projected freight growth is around 75%, from about 8 million tonnes to 14 million tonnes by 2042. This will place additional pressure on the region's transport network and ensuring reliable, timely and efficient freight movement under this future scenario will be an important challenge to address.

1 Ministry of Transport. "National Freight Demand Study" March 2014. http://www.transport.govt.nz/research/nationalfreightdemandsstudy/.

Traffic congestion

When demand is greater than available capacity, travel times on the region's roads can be slow and variable. Such a scenario regularly occurs during the AM peak and, to a lesser extent, PM peak periods, resulting in congestion that reduces the level of service to private vehicles, delays emergency vehicles and increases costs for freight transport. Other factors that affect congestion levels are weather patterns, crashes and construction or maintenance activities.

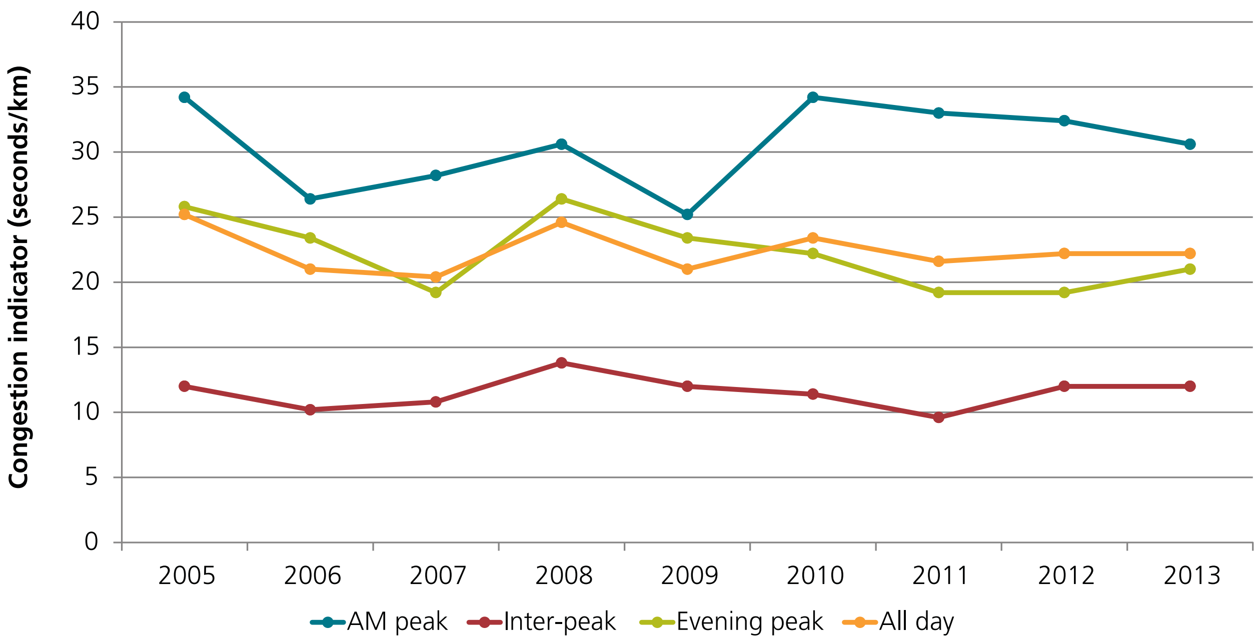
Congestion on the road network can also affect the reliability and attractiveness of bus services in areas where bus priority lanes are not provided. It can also negatively affect the amenity of people living along transport corridors and other road users (namely cyclists and pedestrians) through noise and vehicle emission pollution.

Between 2003 and 2013, average congestion indicators covering the strategic road network have remained relatively unchanged across all time periods.[2] This indicates that regional congestion has remained relatively unchanged despite economic and population growth and correlates well against traffic volumes/VKT which also remained largely static during this period. Despite this flat trend, severe congestion currently occurs along some key sections of the network and is expected to worsen in the future due to additional traffic volumes generated by population growth.

2 NZ Transport Agency - Travel Time Surveys

Figure 8. Comparison of Wellington congestion indicators

Source: NZTA Travel Time Surveys



Looking at strategic roads across the whole region, congestion is worst in the morning (AM) peak period, with the average delay per kilometre travelled varying between 25 seconds and 35 seconds during the period from 2003 to 2013. Whilst the trend of the four-year period from 2010 to 2013 shows a gradual decrease in congestion, peak congestion levels are still elevated compared with other time periods and the all day average.

The inter-peak (IP) congestion levels are the lowest of all the time periods and have remained relatively consistent between 2003 and 2013, ranging from around 10 seconds to 15 seconds delay per kilometre travelled. Evening (PM) peak average congestion levels varied between 19 seconds and 26 seconds delay per kilometre travelled during the period 2003 to 2013.[1] Congestion is not restricted just to weekday peak periods – increasingly, congestion is becoming a problem in certain locations at the weekend.

Key pinch points on the road network where demand exceeds capacity include:

- Along SH1 through the region - the narrow stretch between Paekakariki and Pukerua Bay, Ngauranga Gorge and the SH1 merge with SH2, Terrace Tunnel, Mt Victoria Tunnel, and Ruahine Street.
- Along SH2 through the region – Melling, SH2 merge with Petone Esplanade, and the stretch between Petone to Ngauranga.

These sections are currently at capacity during peak times on the weekday and in some cases at weekends. This results in severe congestion on those and adjacent parts of the strategic road network.

When comparing Wellington's congestion levels with those of other cities in Australasia, Wellington ranks relatively well,[2] experiencing less congestion than either Auckland or Christchurch. Improvements planned for the state highway and public transport networks out to 2035, combined with low forecast growth in traffic volumes, are likely to result in congestion remaining the same or even improving despite continued steady economic and population growth.

Lifestyle and working patterns

Data has recently emerged highlighting potential structural changes in people's travel behaviour that have occurred between the late 1990s and the present day. One manifestation of these changes is an apparent decoupling between gross domestic product (GDP) and VKT that has been observed across the developed world, including within New Zealand. Whilst an element of this change is thought to be attributed to the effects of the global financial crisis, some changes pre-date this and can be considered more structural in nature.

1 Greater Wellington Regional Council, 2012/13 Annual Monitoring Report on the RLTS

2 http://www.tomtom.com/lib/doc/trafficindex/2013-1101%20TomTomTrafficIndex2013Q2AUNZ-mi.pdf

Over a third of Wellington City's population growth since 2001 occurred within the Wellington City CBD and was primarily accommodated within new apartment developments.[3] The rising popularity of living in the CBD encourages people to make more trips by active modes (and, to a lesser extent, public transport) and fewer trips by motor vehicle. The 2013 Census highlights these trends, showing an increase in active mode/public transport trips and a decrease in car trips associated with the Wellington City CBD and surrounding areas.

Changing demographics also affect travel patterns. As has been documented previously in this section, New Zealand has an ageing population as people are living longer and the 'baby boomers' are moving into their retirement years. Balanced against this is the fact that people are also working later in life, resulting in an increase in the total number of trips made by people in this age group.

Younger generations (who are more likely to live in high density urban areas) appear to have lower rates of car ownership than has historically been the case and are becoming less likely to obtain drivers licences during their teenage years. However, this should be considered in the context that this age group comprise a relatively small percentage of the total population and total trips made.

Lifestyle trends such as the increasing popularity of working from home (enabled by technological improvements - internet, mobile phones, cloud computing) are also starting to influence travel patterns, providing people with the ability to work remotely and thus reducing their need to travel.

The extent to which these trends will continue into the future is subject to debate. The balance of evidence suggests that a likely future might be one where demographic and lifestyle changes do not result in significant changes in travel patterns, with growth in travel demand linked more closely to population rather than economic growth.

Costs and affordability

A future 'high oil price' scenario is believed to be more likely given the increasing costs of extraction and increasing oil consumption in emerging economies. Rising prices in this scenario could outweigh future vehicle efficiency improvements and vehicle fleet composition changes.

Demand for petrol and diesel is generally thought to be relatively inelastic, which means that for most trips people will tend to absorb steady price increases without much change in behaviour. Increasing prices, however, will make the cost of transport less affordable if they outstrip wage increases – particularly for those on low or limited incomes. This will eventually suppress the growth of vehicle-based transport, encourage the use of active modes for more short to medium distance trips, and reinforce the trend towards higher density living closer to employment centres.

3 Census data 2013

Higher density, inner city living is more expensive in terms of property related costs. However, associated transport costs are lower since people can use active modes more and need to travel less. Living further from city centres generally means lower property costs but higher transport costs and more car dependence.

Public transport fare prices are likely to continue rising over time under the current policy setting. However, in a high oil price scenario, the relative cost of car travel will rise faster than both GDP and public transport fares. This will make public transport relatively more affordable over time, especially if GDP rises at a faster rate than fares.

Road safety

The total number of road user injury casualties recorded across the region during 2013 (excluding cyclist and walking injury casualties) was 897, a record low when looking at historic information dating from 1997.[1]

From 2001 to 2013, there was a gradual increase in road user casualties between 2001 and 2007 followed by a steady decline in injury casualties thereafter.

1 NZ Transport Agency, Crash Analysis System

There were 18 fatal and 115 serious injury casualties in the Wellington region reported in 2013.[2] Overall, the trends for fatal and serious casualties are similar to total injury casualty trends.

These reducing trends are likely to be due to a combination of road safety measures, including targeting accident black spots, safety infrastructure improvements, police enforcement, road safety educational programmes and campaigns, and improved vehicle safety standards. In addition, lower speed limits have been applied to many parts of the region's road network (including parts of the state highway network) and the police have introduced a much lower tolerance towards speeding.

Cycle injury casualties across the region doubled from 75 in 2000 to 150 in 2008, before dropping between 2008 and 2013 (100). When placed in the context of a doubling of cycling trips between 2000 and 2013, the risk to any individual cyclist has slightly reduced between 2000 and 2013.[3] The majority of cyclist injury casualties occur in Wellington City as this is where most cycle trips take place.

2 NZ Transport Agency, Crash Analysis System

3 Greater Wellington Regional Council, 2012/13 Annual Monitoring Report on the RLTS

Figure 9. Annual regional injury casualties, all road users (exc. walking and cycling), by local authority area, 1997 to 2013

Source: NZ Transport Agency, Crash Analysis System

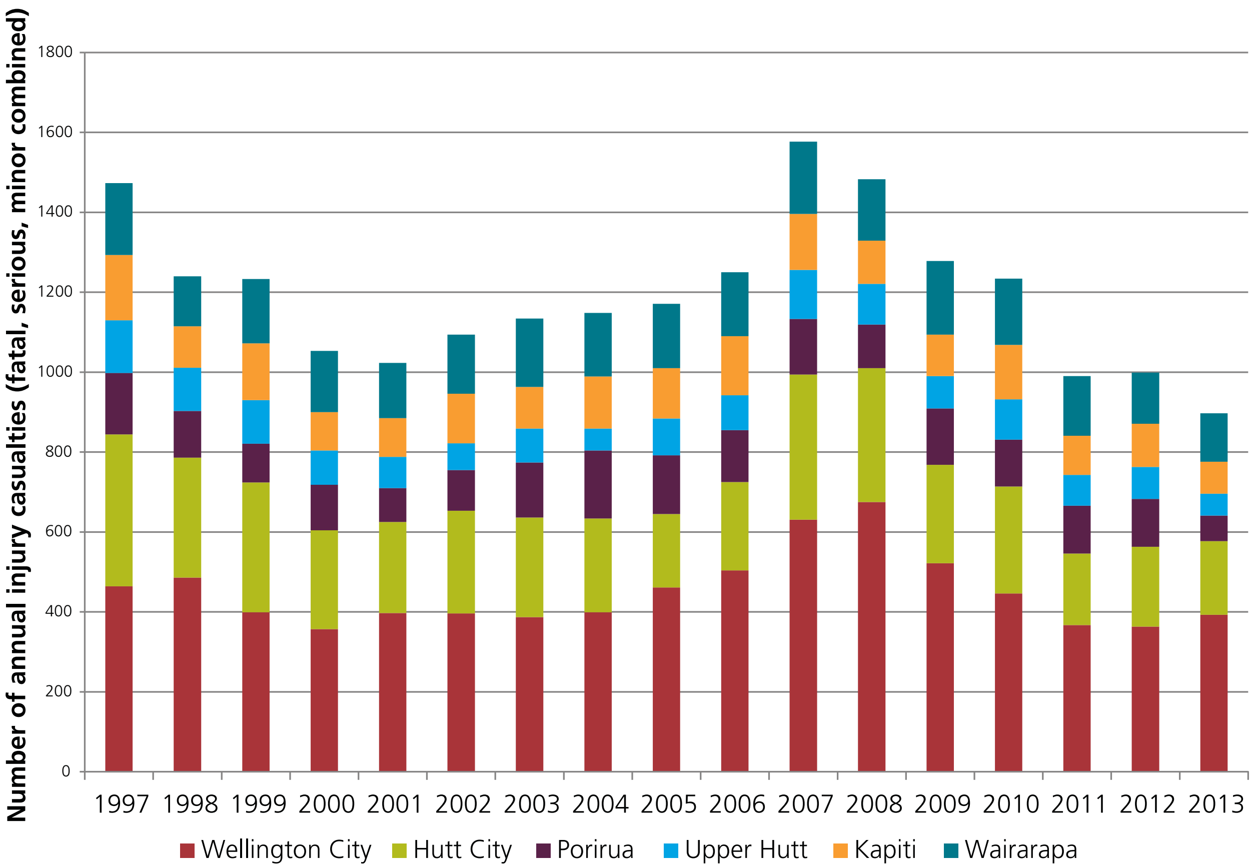
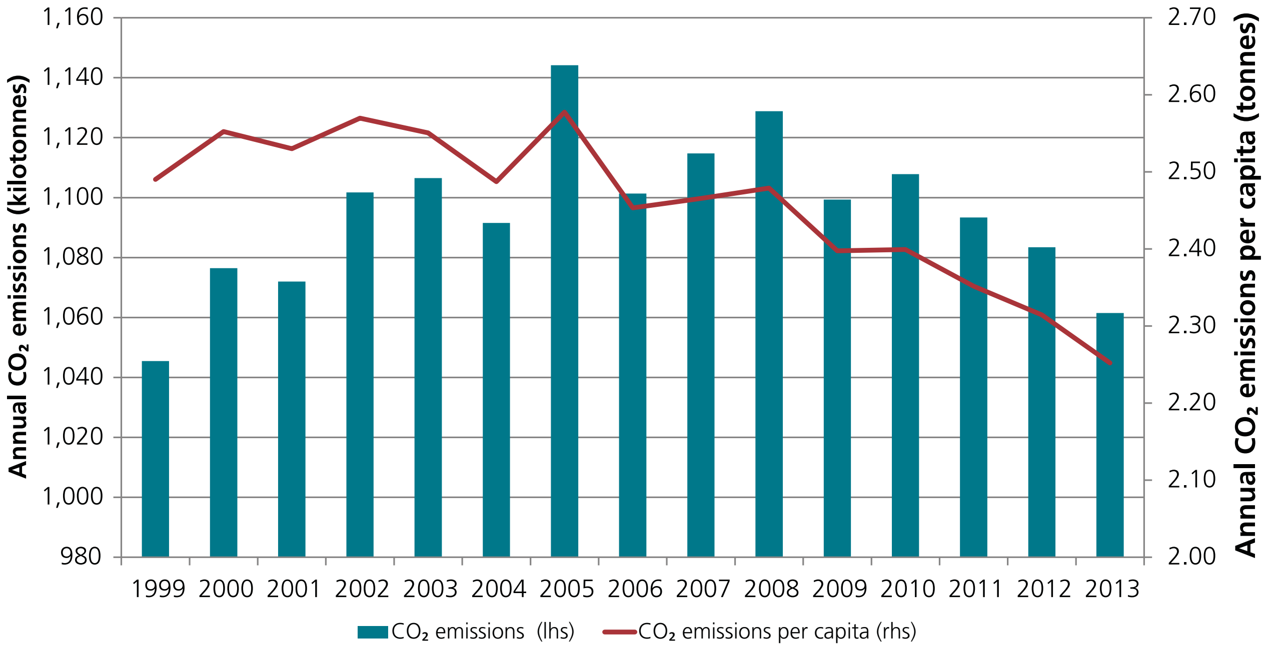


Figure 10. Annual regional transport-generated CO_2 emissions, 1999 to 2013



Despite this recent downward trend, the Wellington region has the second and first highest personal risk for cyclists and motorcyclists respectively compared with other regions in the country. Casualty numbers remain disproportionally high given the relatively low number of these trips compared to other transport modes.

The NZ Transport Agency's 'Communities at Risk' analysis identifies patterns associated with different parts of the region. Wairarapa is overrepresented in terms of crashes involving young drivers, alcohol, and excessive speed. Wellington City and Hutt City are overrepresented in terms of vulnerable road users such as pedestrians, cyclists and motorcyclists. Wellington City is also notable for the higher risk of crashes at intersections. Kapiti Coast is overrepresented in terms of crashes involving older road users.[1]

Whilst the number of pedestrian injury casualties has fluctuated in recent years, there has been an overall slight downward trend between 2000 and 2013,[2] which should be placed in the context of an increasing number of walking trips. It is thought that these recent improvements are partly due to the development of safer pedestrian zones around busy urban nodes, improved infrastructure (crossings, speed cameras, designated slow speeds zones) and driver/pedestrian education campaigns.

Road safety as a concept covers most aspects of the land transport system. It includes motor vehicles using the road network (including trucks, public buses, and motorcycles), pedestrians and cyclists using the road network (including shared paths), and motor vehicles at rail crossing. The NZ Transport Agency monitors incidents and accidents on the rail system nationally – the occurrence of serious or fatal casualties for rail passengers or staff is very low.

Climate change and carbon dioxide emissions

Climate change is a global problem, however many of the impacts of climate change are highly localised – the effects over the coming decades are expected to vary considerably from one area to another. In the future, New Zealand is expected to suffer from more extreme weather patterns and a rise in sea level leading to damaged infrastructure.[3]

The Wellington region contributes to this global environmental issue through the consumption of non-renewable fossil fuels and the consequent production of greenhouse gas emissions. For the region, fossil fuel use is primarily for transport purposes.

Despite regional population and economic growth occurring between 1999 and 2013, transport-related greenhouse gas emissions rose between 1999 and 2005 before declining between 2005 and 2013. The most recent year (2013) saw regional transport-related carbon dioxide emissions at their lowest level since 1999.[4] When expressed in per capita terms, annual transport-related carbon dioxide emissions have fallen by around 10% between 1999 and 2013.

1 Available at: http://www.nzta.govt.nz/resources/communities-at-risk-register/docs/register.pdf
2 Greater Wellington Regional Council, 2012/13 Annual Monitoring Report on the RLTS
3 IPCC, 2013: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
4 Greater Wellington Regional Council, 2012/13 Annual Monitoring Report on the RLTS

Future transport-generated emissions will be governed by a number of factors:

- Population and employment growth rates, which will determine future travel demand
- Mode choice – public transport generates lower emissions (per passenger kilometres travelled) than the private car. Active modes generate no emissions
- Vehicle fleet composition – more efficient, more environmentally friendly vehicle engines will have lower emission rates. The Ministry of Business Innovation and Employment (MBIE) forecasts that fuel efficiency will improve by around 20% over the period to 2035
- Taxation and government policy – increases in fuel duty, a congestion charge, road tolls or a carbon tax and various registration/import charges for more efficient vehicles, if introduced would affect travel demand and transport-generated carbon dioxide emissions
- Travel demand 'saturation' – emerging evidence suggests that people's propensity to travel is already reaching a saturation point, with per capita trip rates perhaps having reached a peak.

Uncertainties associated with forecasting assumptions make it difficult to accurately forecast levels of future transport-related emissions. However, given our knowledge of recent trends and future forecasts, it is likely that transport-generated emissions will continue to decrease into the future.

Air and water quality

The air contaminants monitored are particulate matter (PM10), carbon monoxide (CO) and nitrogen dioxide (NO2) which are by-products of fuel combustion and are known to have adverse human health effects when their concentrations in air exceed guidelines.

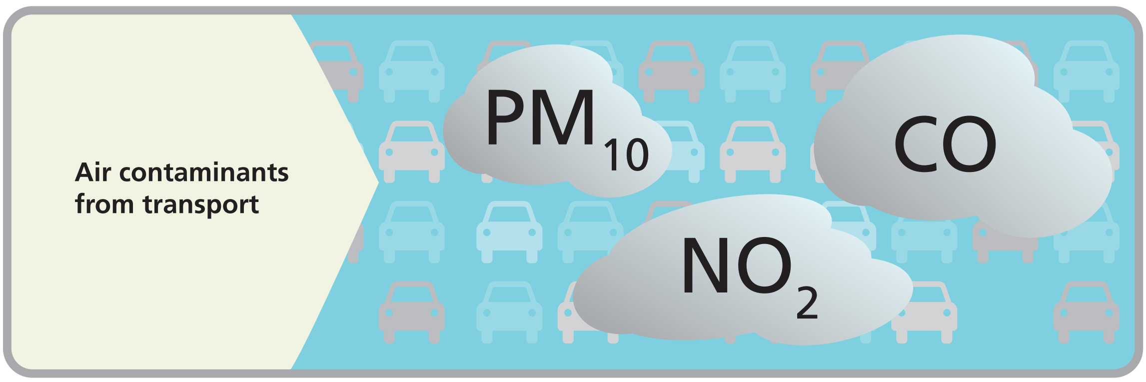
The air quality monitoring site located in the Wellington CBD indicates that concentrations of NO2 and CO were well within national standards and have been at 'acceptable' levels or better throughout the monitoring period. Particulate concentrations have exceeded the national standard only on one day throughout the entire eight-year monitoring period from 2005 – 2012.[1]

Pollutant concentrations have been found to vary considerably by time of day, day of the week and month of the year. Maximum daily levels of CO and NO2 coincide with the peak periods of traffic intensity. However, more traffic data is required in order to fully explore the relationship between pollutant concentrations, meteorology and vehicle counts.

Surface water contaminants from the road network include fuels, additives, oil, grease, and brake and tyre residues. These contain a variety of toxic components including heavy metals and organic compounds. The presence of dissolved metals in many urban streams has been detected, with some concentrations above national water quality guidelines. It is currently not possible to isolate the impacts of road runoff on the environment. However, sediment quality, water quality and ecological health monitoring around the region indicate that some contaminants, which can be derived from road runoff, are present at elevated concentrations.

1 Greater Wellington Regional Council, 2012/13 Annual Monitoring Report on the RLTS

Impact of transport on air quality



Health impacts

In addition to air pollution associated with transport, discussed under the heading above, wider health impacts and benefits can be linked to the way the transport system is planned and developed.

Noise and vibration are important considerations for new transport corridors or new land use adjacent existing corridors. The volume and flow of traffic, speed of traffic, and proportion of heavy vehicles are all factors that influence the extent to which noise and vibration affect communities.

Physical inactivity is a significant issue affecting the health of communities in the region and nationally. Opportunities to engage in physical exercise as part of a trip or daily commute can have important health and wellbeing benefits for the individual. Trips made by walking and cycling, and also public transport (where walking or cycling forms part of the trip) provide this opportunity.

Transport also affects the wellbeing of people and communities by providing for social interaction and promoting social cohesion. A lack of transport options can lead to social isolation, and often impacts on young adults and the elderly in particular.

Integrated transport and land use planning

Land use patterns and integration with transport networks have a significant influence on travel demand. Historically, land use development in the Wellington region has been strongly integrated with transport infrastructure. Many communities were originally developed around tramlines and rail lines. However, over time, growth pressures have seen areas of urban sprawl within the region that are not easily served by public transport and where longer travel distances limit opportunities to make trips by walking or cycling. This has been balanced more recently with a trend for more inner city living, driven by a range of factors and facilitated by current planning documents.

The transport and land use planning framework in the Wellington region is currently fragmented, making achieving integrated planning and decision-making difficult. Transport planning is governed by the Land Transport Management Act, with this Regional Land Transport Plan providing the strategic regional direction for the transport network. There are many other transport plans developed by GWRC, NZ Transport Agency and local councils relating to the management and operation of the various parts of the transport network. Land use planning is governed by the Resource Management Act and the Regional Policy Statement provides the strategic regional guidance on land use development issues. Below this sit a large number of statutory and non-statutory plans at the local level including district plans, structure plans/master plans, and growth strategies.

A regional spatial plan would assist in achieving an agreed plan for strategic growth across the region and improved integration between transport infrastructure and land development.

Summary

The Wellington region has a relatively compact urban layout and linear transport network with development along the region's transport corridors.

The Wellington region has one of the highest per capita uses of public transport in Australasia.

The share of active mode trips in the Wellington region is higher than the national average.

The Wellington region has less congestion than New Zealand's other major cities of Auckland and Christchurch.

Key trends affecting Wellington regional transport out to 2041

- Population growth is steady and expected to continue, and strongest in Wellington City and Kapiti.
- Steady economic growth is forecast throughout the region, with Wellington CBD expected to continue to dominate regional employment.
- Fuel prices are expected to continue to rise, and under a 'high oil price' scenario could outweigh future vehicle efficiency improvements and vehicle fleet composition changes.
- Active mode use is increasing, and is likely to continue, boosted by the growth of inner city living and other lifestyle changes.
- Public transport use and state highway VKT have been relatively flat over the past decade, but are likely to increase in line with growth in population and employment.
- Congestion on the road and rail network has been fairly consistent over the last decade. Planned and ongoing capacity and efficiency improvements to the state highway network (such as the Wellington RoNS) and the public transport network, with low traffic growth, are expected to reduce congestion.
- An ageing population and people working later in life which will impact on travel requirements, while the trend for younger people is away from reliance on travel by private car.
- The volume of freight moved nationally is expected to grow. Wellington will continue to be a major freight hub for movements between the North and South Islands.
- Road safety is improving. However, cyclist and motorcyclist casualty numbers are disproportionally high compared with other modes of transport and other parts of New Zealand.
- Transport-generated greenhouse gas emissions have been relatively static overall over the five-year period to 2013, despite growth in population, and the steadily decreasing trend in per capita emissions is expected to continue.

C. PROBLEM DESCRIPTION

A problem definition workshop was held to assist in defining the key transport-related problems in the Wellington region including identifying the causes behind these problems and the issues that result.

The process followed was:

- to identify current and future issues in the region
- to group the range of issues under common heading themes
- to develop a high level problem statement for each theme

The range of issues identified was consistent with that described in the previous section entitled 'Transport network pressures and issues' of this Plan. These issues were then grouped under broad theme headings.

These broad subject themes were:

- Economic growth
- Road safety
- Resilience
- Liveability

Working through each theme the group identify the problem statement for each theme area in terms of a **cause** and **consequence**.

The resulting problem definitions were developed:

Economic growth

Transport inefficiencies lead to suppressed regional economic growth and productivity.

Road safety

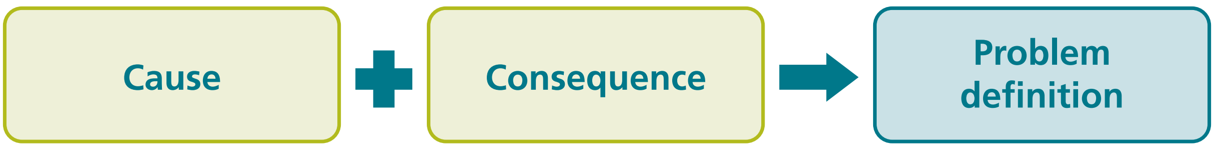
Transport infrastructure deficiencies and poor user behaviour leads to a sub-optimal regional road safety performance.

Resilience

Regional infrastructure that is vulnerable to disruption by unplanned events is potentially resulting in an unacceptable cost of severance and restricted ability to recover over time.

Liveability

Poor delivery of transport and land use can result in a deteriorating living environment and reduced transport choices for the region's population.



D. OBJECTIVES AND OUTCOMES

The following diagrams show the connection between the problems faced by the region's transport network, the benefits of addressing the problem, the strategic objectives and outcomes sought.

This will provide an important context when considering the programme of projects/packages that we plan to invest in, particularly for new improvement activities, to ensure that they are targeted at addressing a particular problem and are based on a clear strategic case for investment.

Measures and targets have been developed for each outcome, to monitor progress. These are set out in the next chapter 'Measuring Progress'.

Figure 11

	PROBLEM	BENEFITS	STRATEGIC OBJECTIVES	OUTCOMES SOUGHT
ECONOMIC GROWTH	Transport inefficiencies lead to suppressed regional economic growth and productivity	Efficient and reliable access and movement for people and freight to and from key regional destinations	**A high quality, reliable public transport network**	Increased public transport use Improved public transport accessibility for all Improved quality of the public transport fleet Improved public transport reliability and journey times
			A reliable and effective strategic road network	Reduced severe road congestion Improved reliability of the strategic road network
			An effective network for the movement of freight	Improved freight efficiency Increased proportion of freight moved by rail
SAFETY	Transport infrastructure deficiencies and poor user behaviour leads to a sub-optimal regional road safety performance	A safe road system increasingly free of death and serious injury	**A safe system for all users of the regional transport network**	Improved regional road safety Increased safety for pedestrians and cyclists
RESILIENCE	Regional infrastructure that is vulnerable to disruption by unplanned events is potentially resulting in an unacceptable cost of severance and restricted ability to recover over time	The transport network provides increasingly secure routes and good access to and within the region allowing it to recover following an unplanned event	**An increasingly resilient transport network**	Improved transport infrastructure resilience to disruption from unplanned events A transport network that supports the restoration of access and regional recovery after a major event Reduced regional economic risk
LIVEABILITY	Poor delivery of transport and land use can result in a deteriorating living environment and reduced transport choices for the region's population	People have a range of options to access work, education and other services The region is an attractive place to live, work and play	**A well planned and integrated transport network**	Improved land use and transport integration Improved integration between transport modes
			An attractive and safe walking and cycling network	Increased mode share for pedestrians and cyclists Improved level of service for pedestrians and cyclists
			An efficient and optimised transport system that minimises the impact on the environment	Reduced harmful emissions from transport Increased private vehicle occupancy

E. MEASURING PROGRESS

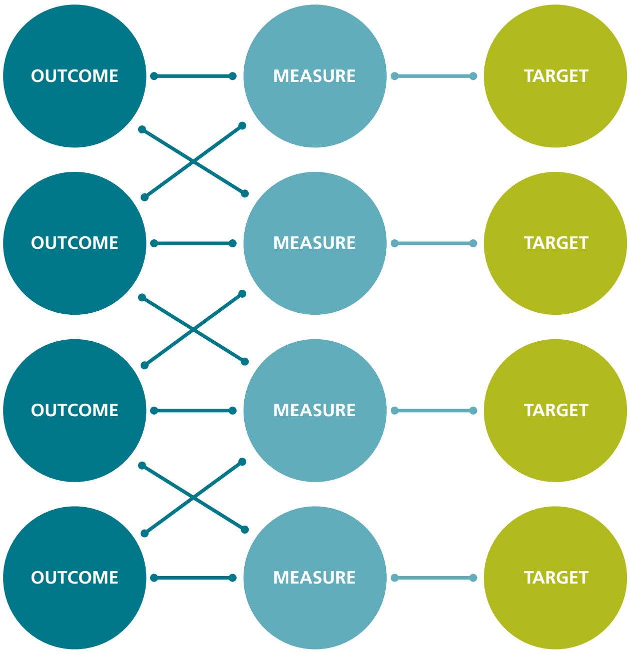
Measures and targets have been developed for each of the desired outcomes in this plan. These enable the monitoring of progress towards the RLTP's vision and desired outcomes.

A **measure** describes the 'unit' or data set that will be used as an indication or reflection of progress in relation to a particular outcome, - for example, number of public transport trips, volume of emissions, or number of casualties.

A **target** is the identified number or trend that describes the 'magnitude' of progress or direction that is sought in relation to that measure, - for example, whether an increase or decrease is sought, and how far/fast it is sought.

It is important that the targets are specific and measurable. The measures and targets presented are the best proxy that we currently have to monitor progress against the relevant outcome areas.

In many cases, a measure will be relevant to more than one outcome - for example, the number of cyclist casualties is a measure of both improved cyclist safety and improved regional road safety. However, to avoid duplication, the measures and targets have been structured to sit alongside the primary outcome to which they relate.



Approach to setting targets

The 2025 strategic targets for each outcome have been developed based on a number of different factors. These include:

- Future scenarios modelling and analysis
- Past and current trends
- Future spatial distribution of population and employment
- Planned infrastructure investment
- Other variables – e.g. vehicle fleet efficiency, GDP forecasts, fuel price, public transport fares.

A number of the targets are based upon an 'expected future' scenario. The 'expected future' assumes the following by 2025:

- Bus Rapid Transit, new Wellington City bus network (outcome of Wellington City Bus Review) and bus priority measures
- Optimisation of the Golden Mile for public transport
- Rail Scenario 1 improvements (from Regional Rail Plan)
- All Wellington RoNS projects, including a solution at the Basin Reserve
- No per capita increase in trips across all modes - trip growth linked to population growth (7-8% between 2013-2025)
- Population growth focused in Wellington City and Kapiti.

The rationale for each target is explained in the right hand column of the tables below.

Figure 12. Outcomes, measures and 2025 targets under each strategic objective area

‘A high quality, reliable public transport network’				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Increased public transport use	Annual public transport boardings per capita	72 boardings in 2013	**Increase to at least 76 boardings**	• Targets are based upon an ‘expected future’ scenario[1] • All targets equivalent to a growth in public transport trips of around 15% between 2013 and 2025, greater than the forecast 7% population growth • Means limited/no growth in car trips at peak times, particularly to CBD, equivalent to a decline in per capita terms • Targets will be influenced by location of future residential development • Growth in public transport mode share is tempered somewhat by the increasing attractiveness of active modes
	Public transport mode share of journey to work trips (Census)	16.6% in 2013	**Increase to at least 17.8%**	
	Public transport mode share of trips crossing Wellington CBD cordon (AM peak)	33.1% in 2013	**Increase to at least 34.7%**	
Improved public transport accessibility	Population living within 500m of a core[2] bus service or 1km of a rail station	41.6% in 2013	**Improvement towards at least 50%**	• Influenced by the revised Wellington City bus network (2017 implementation) • Will be influenced by future service reviews including Hutt Valley, Kapiti, Porirua - with likely focus on the concept of core routes and all-day network
	Population living within 500m of any bus stop or 1km of a rail station	84.9% in 2013	**Improvement towards at least 88%**	
	Accessibility to public transport network for all users	2013 standards of vehicle, infrastructure, parking and facilities, as captured by the RPTP and Rail Asset Management Plan	**Continual improvement** in physical accessibility and standards of vehicles, infrastructure, parking and facilities	• A rolling programme of rail and bus infrastructure renewal/ upgrades is assumed, as outlined in the Regional Public Transport Plan (RPTP) • Higher quality infrastructure and facilities will make public transport more attractive and more accessible for all users, including the transport disadvantaged
Improved quality of public transport	Public transport vehicle fleet emissions	2013 Emissions - g/km travelled – to be confirmed	**At least a 50% reduction** in vehicle fleet emissions	• Influenced by removal of oldest and least efficient diesels from the fleet[3] and replacement with the most fuel efficient vehicles (Euro V/VI or better) • Assumes a phased introduction of next generation vehicles within the next 10 years – e.g. hybrid/electric • Larger buses, as part of the Bus Rapid Transit scheme, may result in a smaller vehicle fleet
	Overall satisfaction with Wellington region’s public transport system (all modes)	83% (2014 Customer Satisfaction Survey)	**At least 90%**	• A measure designed to look at overall satisfaction with the region’s public transport network, covering fleet, facilities, on-time performance and customer services • An improvement in the public transport fleet, facilities and infrastructure should lead to improved levels of satisfaction and higher patronage

1 Refer to the description of ‘expected future’ scenario at the beginning of this chapter, under the heading ‘Approach to setting targets’.

2 Defined as high-capacity, frequent, all-day services within urban areas that meet all-day travel demand and reduce congestion on the major transport corridors. They operate at least every 15 minutes during the day, and often more frequently during busy periods. Currently includes routes 1, 2, 3, 11, 110, 120,130, 220. Services defined as core services will be changed depending upon services reviews.

3 Or refurbishment of engines with clean technology to prolong service life and reduce emissions to current Euro V standards

Improved public transport reliability and journey times	Peak period public transport travel times on core routes	tbc (from RTPI and rail timetables)	A **continuous improvement** in peak period public transport travel times on core routes	• Targets are based upon an 'expected future' scenario[1] • The 2014 GWRC customer satisfaction survey highlighted the importance of 'reliability' to encourage more public transport use • Assumes that a 100% Matangi fleet and infrastructure improvements delivered under Rail Scenario 1 will improve rail reliability and punctuality • Optimisation of the Golden Mile, minor bus priority measures, stop rationalisation, the Bus Rapid Transit network and the revised Wellington City bus network will help to deliver improved bus travel times and improved bus reliability
	Peak period bus travel time variability along core routes	tbc (from RTPI)	A **continuous improvement** in peak period bus travel time variability along core bus routes	
	Rail service punctuality (trains arriving at final destination within 5 minutes of scheduled arrival time)	94% in 2013	**At least 96%**[2] of rail services reach their final destination within 5 minutes of their timetabled arrival time	

1 Refer to the description of 'expected future' scenario at the beginning of this chapter, under the heading 'Approach to setting targets'.
2 To be confirmed following rail contract discussions

'A reliable and effective strategic road network'				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Reduced severe road congestion	Average peak period travel speed on selected strategic routes	Rolling average speed of **46.2 kph (2012 to 2014)**	A 10% increase in 3 year rolling average travel speeds	• Targets are based upon an 'expected future' scenario[3] • The strategic routes assessed by the NZ Transport Agency biennial surveys and the basis for the monitoring of this target are as follows: - 1 – Waikanae to Wellington Airport (SH1) - 2 – Upper Hutt to Wellington CBD (SH2) - 3 – SH58 – Paremata to Haywards Road - 4 – Karori to Bowen Street - 5 – Wellington Railway Station to Island Bay - 6 – Wainuiomata to Petone • New technology may present the opportunity to expand this set of routes used to monitor progress to capture areas of the region such as the Wairarapa • Targets are influenced by: - Capacity improvements delivered by the RoNS projects - Increased public transport patronage and active mode trips in urban areas - Minor safety improvements and optimisation of the existing road network
Improved reliability of the strategic road network	Average peak period travel speed variability on selected strategic routes	The rolling average peak period day-to-day variability was **+/-16%**[4] (2012 to 2014) This means that peak period travel speeds across the surveyed routes ranged from 16% faster than the average to 16% slower than the average	A 25% reduction in the 3 year rolling average day-to-day travel speed variability to **+/- 12%**	

3 Refer to the description of 'expected future' scenario at the beginning of this chapter, under the heading 'Approach to setting targets'.
4 The comparable inter-peak variability figure, generally taken as being a benchmark for relatively uncongested conditions, was 13% between 2012 and 2014

‘An effective network for the movement of freight’				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Improved regional freight efficiency	Average all day travel speed on important regional freight routes	Rolling average speed of 54.9 kph (2012 to 2014)	A **10% increase** in 3 year rolling average travel speeds	• Targets are based upon an ‘expected future’ scenario[1] • The three assessed freight routes are: - 1 – Paremata to Seaview (via SH58) - 2 – Paremata to Seaview (via Ngauranga) - 3 – Seaview to CentrePort • The current surveyed routes are reflective of both the core freight routes within the region and the areas of the network where freight trips are most likely to experience delays that will affect trips beyond the core routes • The future Wellington RoNS schemes should improve travel speeds and reduce travel speed variability along SH1 between Waikanae and Ngauranga • The future Petone to Grenada link road should improve travel speeds and improve reliability between Porirua and Seaview and between Seaview and CentrePort • Whilst minor network optimisation projects may generate small improvements in travel speeds and reliability, achieving these targets is largely dependent upon the Wellington RoNS projects and Petone to Grenada link road
	Average all day travel speed variability on important regional freight routes	The rolling average peak period day-to-day variability was +/-12%[2] (2012 to 2014) This means that peak period travel speeds across the surveyed routes ranged from 16% faster than the average to 16% slower than the average	A 25% reduction in the 3 year rolling average day-to-day travel speed variability to +/- 9%	
Increasing proportion of freight transported by rail	Percentage of long distance freight volumes moved by rail (Ministry of Transport Freight demand studies (5 yearly))	Freight travelling to / from the region by rail in 2012 was 18.33 million tonnes	**An increasing proportion of long distance freight moved by rail**	• Assumes that ongoing investment by KiwiRail and GWRC, including elements of the Regional Rail Plan – Rail Scenario 1, will remove some rail capacity constraints and improve the efficiency of the rail freight network, enabling more long distance freight to be moved by rail.

1 Refer to the description of ‘expected future’ scenario at the beginning of this chapter, under the heading ‘Approach to setting targets’.
2 The comparable inter-peak variability figure, generally taken as being a benchmark for relatively uncongested conditions, was 9% between 2012 and 2014

‘A safer system for all users of our regional road network’				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
An increasingly safe road network for all users	Killed and seriously injured totals, measured on an annual basis against a 5 year rolling average (CAS data)	5 year average between 2009 and 2013 = 183.4	**At least a 50%** reduction in 5 year average	• A continuous focus on safety, both in terms of infrastructure and education, improved road safety considerably between 2005 and 2013 and it is envisaged that this focus will continue into the future • The 2025 targets are similar to the rates of improvement seen between 2005 and 2013 • The 2025 targets align well with similar NZ Transport Agency national targets which seek a similar reduction over a similar period • New Zealand’s per capita road traffic casualty rates are still elevated compared to other western countries such as Sweden and Great Britain, suggesting that further progress can be made • The 2025 targets signal a step towards a ‘Vision Zero’ scenario • These challenging targets can be achieved through: - Continued implementation of the government’s ‘Safer Journeys’ strategy and application of the safe systems approach - Targeted infrastructure safety improvements - Education and training programmes - An increasingly modern and safe vehicle fleet - Legislative changes - Speed management - More public transport use and less car use - Investment in safe cycle facilities and more pedestrian and cycle friendly urban centres
	Total casualties on an annual basis against a 5 year rolling average (CAS data)	5 year average between 2009 and 2013 = 1079.8	**At least a 50%** reduction in 5 year average	
Increased safety for pedestrians and cyclists (vulnerable road users)	The number of vulnerable road user casualties (cyclists and pedestrians) killed and seriously injured annually against a 5 year rolling average (CAS data)	5 year average between 2009 and 2013 = 56.5	**At least a 50%** reduction in 5 year average	

'An increasingly resilient transport network'				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Improved transport infrastructure resilience to disruption from unplanned events	Proportion of the region covered by an adopted regional risk register	0% in 2014 (separate council risk registers exist but not a regional register)	**100%** (agreed risk register by 2017, agreed prioritisation methodology by 2019).	• In the shorter term, the region will be heavily reliant upon restoration and emergency plans to recover from a major event. However, the goal over the medium/longer term is an increasingly resilient transport network that involves reduced time to restore critical access and places less reliance on any restoration and emergency plan • A more resilient transport network relies on a comprehensive understanding and assessment of the relevant risks. An agreed, prioritised regional resilience risk register is sought to influence project prioritisation and ensure a coordinated approach to improving resilience • A clear list of regional priorities for addressing identified transport network risks is expected to assist with unlocking central government funding support for projects with resilience benefits • A number of planned infrastructure projects will contribute significantly to improved network resilience by providing alternative routes designed and located to be more robust in a major event • Ongoing preventative maintenance and seismic strengthening of the transport network also contributes to improved resilience **Note**: The Wellington Lifelines Group (WeLG) and the Wellington Region Emergency Management Office (WREMO) set the deliverables and levels of service in relation to major event recovery
A transport network that supports the restoration of access and regional recovery after a major event	Estimated time to reopen key road connections to and within the region and to key recovery facilities	Existing (2014) emergency plan estimates	**Continuous reduction** in the number of estimated days to reopen the transport network following a major event	
Reduced regional economic risk	Proportion of the region covered by an adopted and comprehensive regional restoration and emergency plan	Existing (2014) regional restoration and emergency plan(s)	**100%**	

'A well planned, connected and integrated transport network'				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Improved land use and transport integration	Population living within 500m of a bus stop or 1km of a rail station	84.9% in 2013	**Continual improvement** towards **88%**	• Targets are based upon an 'expected future' scenario[1] • The number of people living in areas well served by public transport (for example - along the Wellington City growth spine) has increased over recent years. This trend is likely to continue into the future under the framework of current local growth and land use planning documents • Bus services may be refined in the future to serve new residential developments, subject to funding, where the density and demand support this
Improved integration between transport modes	Number of secure[2] cycle parking spaces at railway stations	100% increase in cycle parking spaces at stations over the five year period 2009 - 2013	**Increase** by **50%**	• Encouraging more people to cycle to train stations will extend the reach of rail services throughout the region. Provision of good cycle parking (secure, convenient, sheltered, well lit) at stations is important to support an increased uptake and supply needs to keep up with potential demand • The 100% growth over the 5 year period to 2013 should be viewed in the context of a relatively low base provision. The significant growth is the result of a new approach to cycle parking which has seen a mix of cycle racks, cages, and lockers provided – rather than just lockers which were more expensive and needed more space

1 Refer to the description of 'expected future' scenario at the beginning of this chapter, under the heading 'Approach to setting targets'.
2 Secure cycle parking is defined as either bike lockers or covered bike racks in well-lit, visible areas within close proximity to stations entry / exits points, preferably covered by CCTV cameras

'An attractive and safe walking and cycling network'				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Increased mode share for pedestrians and cyclists	Proportion of journey to work trips (Census)	Walking 11.6% in 2013 Cycling 2.9% in 2013 Steady increase between 2001 and 2013	**13.6%** of journeys to work will be made by foot **3.7%** of journeys to work will be made by bike	• The targets are based upon an 'expected future' scenario[1] together with analysis of past and future active mode trends and influencing factors • Wellington City currently accounts for 75% of active mode trips within the region and accounted for nearly all recent growth in active mode journey to work trips • It is likely that Wellington City will continue to be the main driver of growth in active mode trips, however the popularity of active modes is likely to increase elsewhere in the region in the future • Planned future investment in cycle infrastructure should generate increase in cycle trips • The increasing popularity of inner city living may see growth in active mode trips come at the expense of growth in PT trips • The 2025 targets for increasing walking/cycling **mode share** are equivalent to the following percentage **increases in trips**: - Journey to work trips (Census) - 26% increase in walking trips and 37% increase in cycling trips - Urban trips (Wellington CBD cordon) - 19% increase in walking trips and 36% increase in cycling trips • Because the Census only takes place every 5 years, the comprehensive Wellington CBD cordon survey, covering all modes, is used to provide an indication of progress towards Census based targets in the interim years • Opportunities to gather similar cordon data for other urban areas in the region will be investigated to gain a better understanding of changes in journey to work travel patterns in these areas between Census years
	Proportion of urban trips (Wellington CBD Cordon Survey)	Walking 18.4% in 2013 Cycling 2.6% in 2013 Steady increase between 2001 and 2013	**20.1%** of trips crossing the CBD cordon are walking trips **3.6%** of trips crossing the Wellington CBD cordon are cycling trips	
Improved level of service for pedestrians and cyclists	Perceptions of level of service (annual GWRC perceptions survey)	Walking = 90% in 2013 Cycling = 50% in 2013 Little change between 2001 and 2013	**95%** and **60%** level of service rating (pedestrian and cycling respectively)	• Wellington City is by far the biggest market for walking and cycling, thus its performance has a major influence on this strategic outcome • Wellington City Council's plans to invest in cycling infrastructure, combined with urban speed limit reductions, make the road environment more attractive for pedestrians and cyclists. This is likely to be reflected positively in the perception of active mode levels of service in future
Increased use of active modes in journeys to school	Use of active modes in journeys to school at schools participating in the regional school travel plan programme (annual GWRC survey)	27% - foot, 13% - cycle, scooter or skateboard (4 year rolling average 2010-2013)	**Continually increasing** use of active modes	• The long term trend has seen a significant reduction in the proportion of school children walking and cycling to school over time. However, over recent years, the percentage of school children using active modes to travel to school has increased • This recent increase is thought to be due in part to targeted school travel planning programmes, cycle skills courses and safety improvements targeted at children walking and cycling to work • The school travel plan programme currently covers around 25% of schools in the region and seeks to continually increase this year on year, into the future • Combined with planned investment in cycle infrastructure, an increase in use of active modes for children travelling to school is sought between 2013 and 2025

1 Refer to the description of 'expected future' scenario at the beginning of this chapter, under the heading 'Approach to setting targets'.

'An efficient and optimised transport system that minimises the impact on the environment'				
Outcome	**Measure**	**Baseline**	**2025 Target**	**Comment/Rationale**
Reduced harmful emissions from transport	Transport generated emissions (per capita)	2.31 tonnes transport generated CO_2 per capita in 2013 13% reduction in per capita CO_2 emissions from 2005 - 2013	**15% reduction** in annual per capita CO_2 emissions	• Targets are based upon an 'expected future' scenario[1] where future growth in vehicle trips is broadly linked to population growth • Government policies are targeted at regulating emissions and providing incentives for people who drive cleaner, more fuel efficient vehicles • Assumes vehicle efficiency improvements of up to 20% over the 10 year period to 2025 • Policies to encourage more public transport use and seeking a low emission public transport fleet will contribute to these targets • Projections suggest a decrease in transport-generated CO_2 emissions, expressed in both per capita and absolute terms
	Transport generated emissions (absolute)	1,061 kilotonnes transport generated CO2 in 2013. 7% reduction in total annual transported-generated CO_2 in Wellington region 2005 - 2013	**10% reduction** in total annual CO2 emissions	
	Concentrations of harmful transport generated pollutants	5 year rolling average (2009 to 2013) for NO_2 across the regional automatic monitoring stations. 23.5 (µg/m3) at GWRC's Wellington central monitoring station	**A reduction** in the average concentration (measured as a 5 year rolling average) of harmful transport-generated emissions (NO_2 + others) at automatic monitoring stations	• Harmful pollutant emissions generated by transport are likely to decrease as vehicle standards improve and cleaner engine technologies focus on removing harmful particulates from emissions • GWRC will continually improve its monitoring framework to allow monitoring of the pollutants CO, PM_{10} and $PM_{2.5}$
Increased private vehicle occupancy	Peak period private vehicle occupancy.	1.39 people per vehicle in 2013 (Wellington CBD cordon)	Gradual increase in private vehicle occupancy to **1.45**	• Assumes increases in parking costs above inflation rates, as has historically been the case • Incentives and initiatives to promote car sharing/carpooling along with increasing fuel and parking costs are likely to have some small positive influence on this target

1 Refer to the description of 'expected future' scenario at the beginning of this chapter, under the heading 'Approach to setting targets'.

F. POLICIES

Strategic Objective: **A high quality, reliable public transport network**

	Policies
PT 1.	The wide benefits of public transport will be recognised when planning the transport network including network efficiency, land use and transport integration, and contribution to environmental, social, economic and health outcomes.
PT 2.	The public transport network will be continually improved to ensure that public transport services: a. go where people want to go, at times they want to travel b. provide competitive journey times c. provide value for money d. are easy to understand and use e. are safe, comfortable and reliable f. provide flexibility, allowing people to change their plans.
PT 3.	The public transport network will include core, local, and targeted services.
PT 4.	Public transport will be increasingly accessible through the provision of improved information, facilities, and services that are available to all members of the public.

Strategic Objective: **A reliable and effective strategic road network**

	Policies
SR 1.	Network management tools will be promoted to optimise the efficiency of the transport network and address traffic congestion.
SR 2.	Legislation changes will be sought through advocacy to central government to allow consideration of road pricing as a tool to manage demand.
SR 3.	Key strategic corridors will be developed, maintained and protected in a manner consistent with their role and function.
SR 4.	Arterial and local road traffic will be separated where practicable.
SR 5.	East-west transport links between the Western and Hutt Corridors will be improved.

Strategic Objective: **An effective network for the movement of freight**

	Policies
F 1.	The transport network will be maintained and developed to provide efficient and effective freight movements.
F 2.	Effective and efficient connections will be provided to the region's principle economic growth and productivity areas, such as the Wellington City CBD and regional centres, Wellington's port and international airport.
F 3.	Freight routes for the movement of high productivity vehicles will be identified.
F 4.	The regional rail network will be developed to support transportation of freight by rail.

Strategic Objective: **A safe system for all users of the regional transport network**

	Policies
RS 1.	Regional road safety will be continuously improved based on a safe system approach involving a package of measures targeting safer road users, safer vehicles, safer roads and roadsides, and safer travel speeds.
RS 2.	Existing road network safety standards will be maintained or improved.
RS 3.	Improved safety for vulnerable road users (including pedestrians, cyclists, and motorcyclists) will be prioritised.
RS 4.	Road safety will be an important consideration when prioritising the maintenance and improvement of the transport network.
RS 5.	Public transport will be promoted as a safe mode of travel.

Strategic Objective: **An increasingly resilient transport network**

	Policies
R 1.	The resilience of the regional transport network will be continuously improved by identifying, prioritising and addressing current network risks and vulnerabilities.
R 2.	New transport infrastructure will be designed to be resilient to both low impact high probability (LIHP) and high impact low probability (HILP) events.
R 3.	The transport network will be developed recognising the critical role it plays in providing access for communities after a major natural hazard or seismic event.
R 4.	Addressing transport network security risks will include the development of alternative routes.
R 5.	The transport network will be developed in a manner that improves its resilience to longer term changes.
R 6.	The level of service of the regional transport network will be continuously monitored, and improved as necessary.
R 7.	Adequate expenditure on road and rail maintenance will be sought to ensure an acceptable level of service on the existing transport network.

Strategic Objective: **A well planned, connected and integrated transport network**

	Policies
I 1.	The transport network will be managed and developed in a way that recognises and provides for all modes of transport in an integrated manner.
I 2.	The current and planned future Strategic Transport Network will be identified and protected in territorial authority planning documents.
I 3.	The critical role of the Strategic Transport Network in providing national and regional accessibility and supporting economic growth will be recognised when considering the impacts of new land use development.
I 4.	Transport planning processes will take account of major recreational, tourist and freight traffic flows.
I 5.	An integrated approach will be taken to investment in those parts of the Strategic Transport Network that cross regional boundaries, through collaboration with neighbouring regional councils and territorial authorities.
I 6.	Land use development will be well integrated with transport infrastructure, including denser development located around public transport nodes and along key public transport corridors to minimise dependence on private vehicles.
I 7.	New transport infrastructure will be designed and located to enhance access, be consistent with the region's urban design principles as set out in the Regional Policy Statement, minimise community severance issues, and take account of the special values of local areas.
I 8.	The regional transport network will be developed to support the growth aspirations of the Wellington Regional Strategy, including supporting a strong Wellington City CBD and regional centres.
I 9.	The transport system will be managed and developed in a way that supports a compact, well designed and sustainable regional form, consistent with the policies of the Regional Policy Statement.
I 10.	Walking, cycling and public transport services will be provided for as part of new land use development, consistent with relevant best practice guidance.
I 11.	The social, health, environmental and economic impacts of major new transport projects will be assessed as part of the programme or indicative business case stage of the project development.

Strategic Objective: **An attractive and safe walking and cycling network**

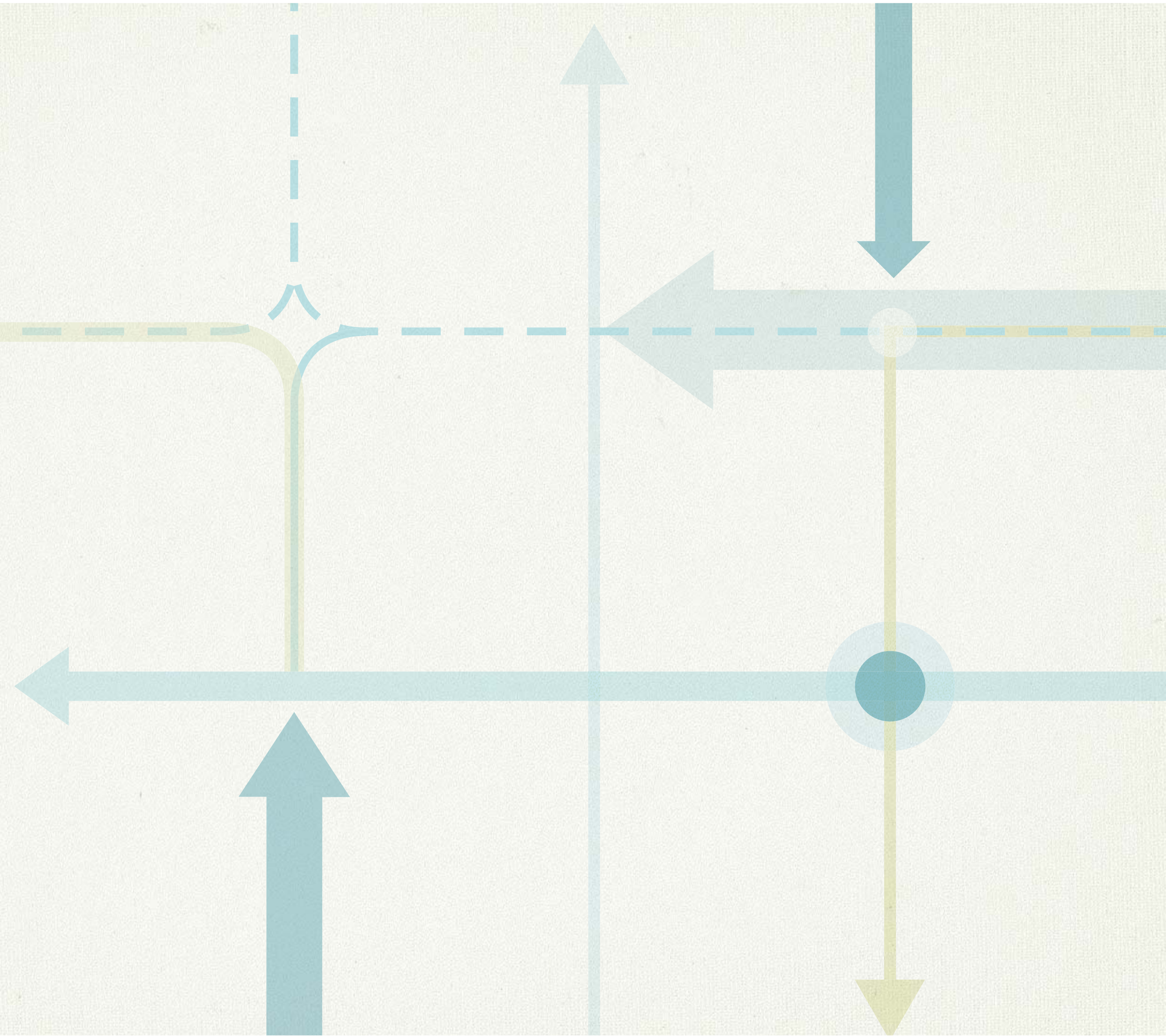
	Policies
WC 1.	The cycling and pedestrian networks will be continuously improved so that they are safe, attractive and well integrated with other modes.
WC 2.	An increased uptake of cycling and pedestrian modes will be promoted, particularly for short trips.
WC 3.	The transport system will be managed and developed to improve pedestrian and cyclist safety and personal security.
WC 4.	New roads will include appropriate infrastructure design to facilitate safe and attractive walking and cycling trips.
WC 5.	Gaps and deficiencies in the strategic walking and cycling networks will be continuously addressed.
WC 6.	Cycling facilities will be designed to provide a high level of service on key routes to support an increase in cycling mode share.

Strategic Objective: **An efficient and optimised transport system that minimises the impact on the environment**

	Policies
E 1.	A set of regional transport models will be developed, maintained, and enhanced to provide robust information on the current and future transport system and support effective planning and decision making.
E 2.	Reduced reliance on motor vehicles, particularly single occupancy vehicles, will be supported through implementation of appropriate tools, measures and policies.
E 3.	Travel demand management policies and programmes will support travel patterns that smooth demand over the busiest times of the day to better use public transport and road network capacity.
E 4.	The use of transport modes that are not dependent on fossil fuels, including active transport modes, will be supported.
E 5.	Best practice design, construction and maintenance standards will be used during the implementation of transport infrastructure projects, to minimise adverse impacts on the environment.
E 6.	Initiatives that contribute to ongoing improvement of the vehicle fleet, to reduce greenhouse gas emissions and improve air quality, will be supported.
E 7.	Parking provisions in district plans should be reviewed to ensure they provide flexibility and do not result in an oversupply of parking as part of new residential or commercial development.
E 8.	Local parking policies should be developed and reviewed to set out a clear hierarchy for the use and management of on-street space in town and city centres to prioritise active modes, public transport, special purpose and short-stay parking.

Attachment 1 – Part A to Report 14.602

CORRIDOR STRATEGIES



THE STRATEGIC CASE FOR INVESTMENT BY CORRIDOR

This section sets out the strategic approach to future investment in the region's key transport corridors – Western, Hutt, Wairarapa and Ngauranga to Wellington Airport.

A number of pieces of work have assisted with informing the understanding of the problems and issues in each transport corridor. These include: analysis of trends and issues at a regional and corridor level; strategic and modal studies; feedback from councils, transport operators, user groups and the community; and, monitoring of indicators through the Annual Monitoring Report.

These strategies set out multimodal solutions to address the key problems and challenges for the particular corridor, including consideration of how each corridor integrates with the wider regional transport network. In most cases they consider a medium term horizon.

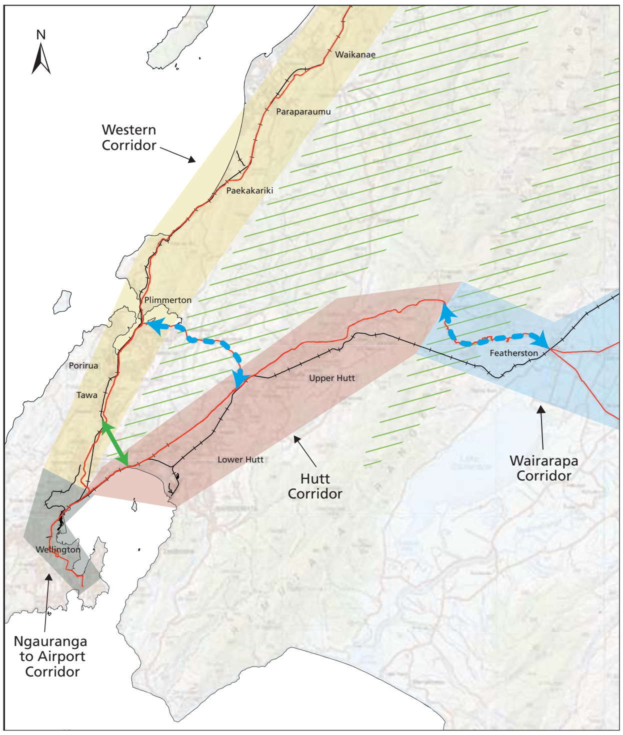


Figure 13

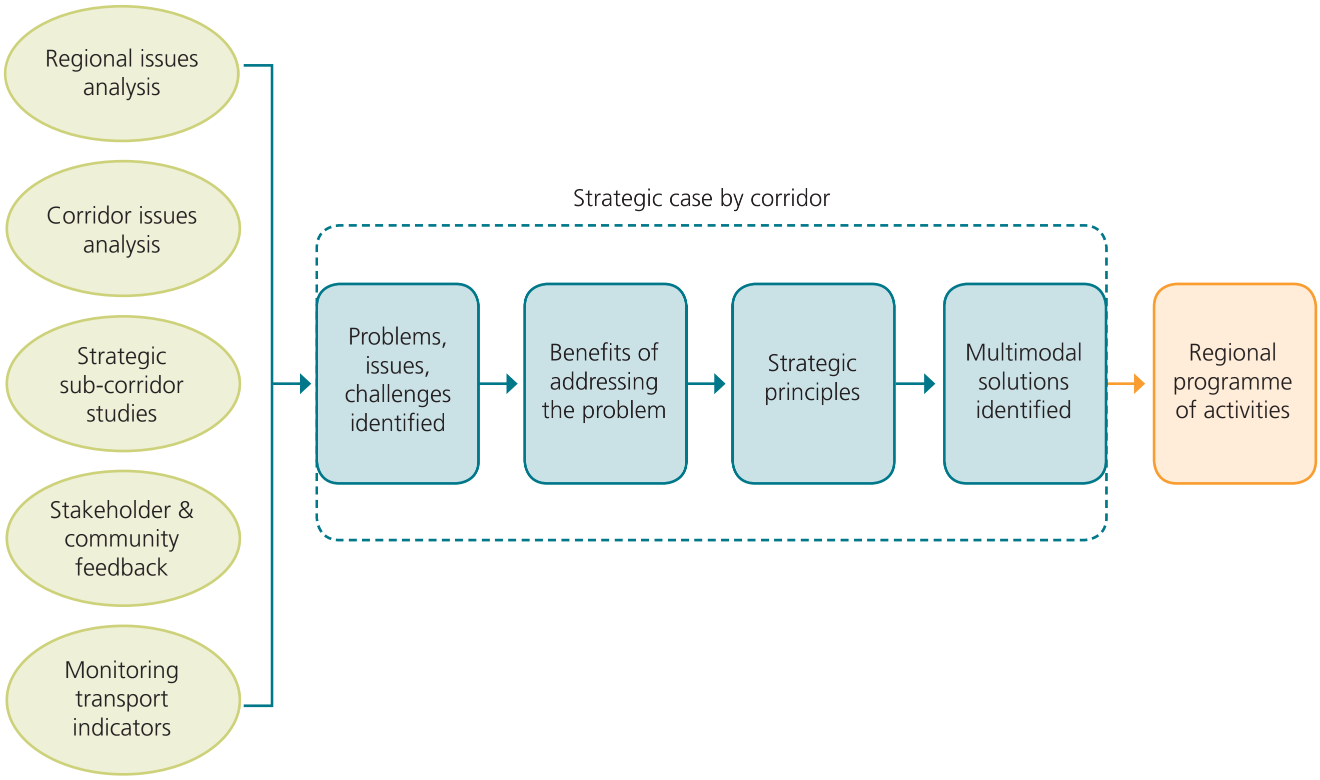


Photo: NZ Transport Agency

1. NGAURANGA TO AIRPORT CORRIDOR STRATEGY

This corridor starts at the Ngauranga interchange and continues through the Wellington City CBD to Newtown (including the regional hospital), the eastern suburbs and Wellington International Airport. It includes SH1 major arterial routes, the railway line where the NIMT and the Hutt/Wairarapa railway lines merge and through to Wellington City rail terminals, and key routes for passenger transport, walking and cycling.

1.1 LONG TERM STRATEGIC VISION FOR THE NGAURANGA TO AIRPORT CORRIDOR

Along the Ngauranga to Airport Corridor, access to key destinations such as CentrePort, Wellington City CBD, Wellington Hospital and the international airport will be efficient, reliable, quick and easy. Passenger transport will provide a very high quality, reliable and safe service along the Wellington City growth spine and other key commuter routes. The strategic road network will provide an effective corridor for through trips and access to key destinatiosn, including freight trips. Traffic congestion through the corridor will be managed at levels that balance demand against the ability to fully provide for peak demand due to community impacts and cost constraints, and the provision of an efficient and effective public transport system. Maximum utilisation of the existing network will be achieved by removal of key bottlenecks on the road and rail networks.

1.2 CONTEXT

This transport corridor travels through the higher density urban environment of central Wellington City, providing access to the region's primary employment centre, to the key freight destinations of the port and airport, and to the regional hospital. The corridor serves a range of activities from office, retail, education, leisure and residential with an associated range of trip types. Commuter trips dominate the network at peak times.

1.3 THE PROBLEM

Space constraints and a concentration of activity through this transport corridor lead to slow and unreliable journey times during peak and off-peak periods. This results in conflict between different users of the transport network and the different transport modes, affecting the safety and attractiveness of those modes. This is forecast to continue into the future as a result of population and employment growth.

1.4 BENEFITS OF ADDRESSING THE PROBLEM

- **Economic growth supported** - efficient and reliable access to and through the CBD and central Wellington City as a crucial employment centre for the region and to other key destinations for freight and tourism such as the port and international airport.
- **Integrated transport and land use** - efficient and effective travel options to support current and future urban growth areas in the city, including inner city living and intensification along the growth spine from Johnsonville to Kilbirnie.
- **Accessible and liveable city** – the central city street network provides good access for all transport modes (including freight) while providing a safe, pleasant and attractive environment for shopping, education and leisure activities.

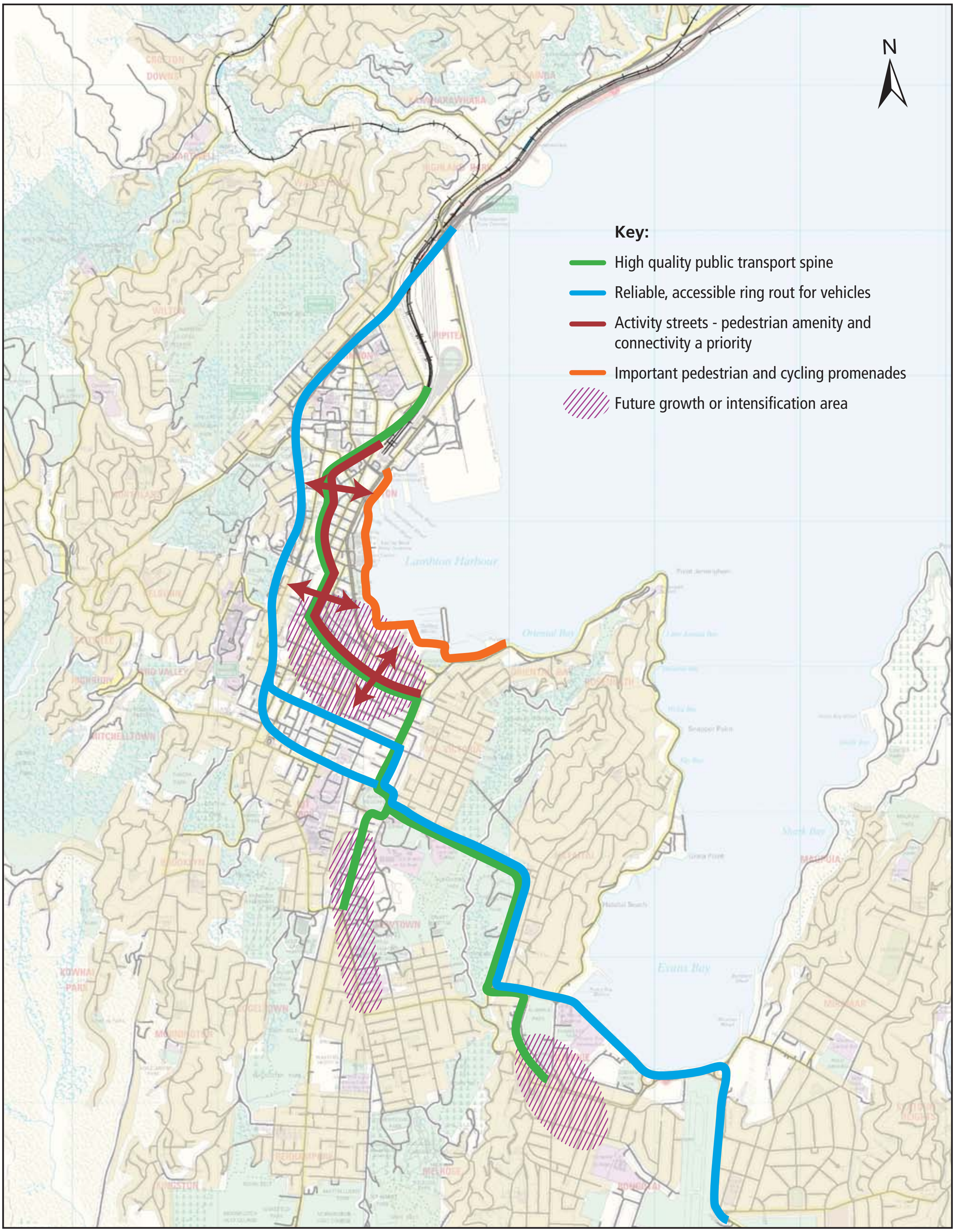
1.5 STRATEGIC PRINCIPLES – NGAURANGA TO AIRPORT CORRIDOR

The following strategic principles have been identified for the development of this transport corridor to address the above problems and challenges through a multimodal approach:

- a high quality and high frequency passenger transport 'spine'
- a reliable and accessible 'ring' or bypass route for vehicles
- inter-connected and convenient local street, walking, cycling and passenger transport networks
- highly accessible and attractive 'activity' or shopping streets

A key philosophy underlying these strategic principles is the need to optimise use of the transport network, while ensuring that the different role of various parts of the transport network is strengthened and the conflict between modes is minimised. For example, without a reliable and accessible ring road for vehicles, traffic will be encouraged to look for alternative routes, such as the quays and around Oriental Bay to Evans Bay, resulting in greater conflict with cyclists and pedestrians using these routes.

Figure 14. Strategic principles – Ngauranga to Airport Corridor



1.6 STRATEGIC RESPONSE - NGAURANGA TO AIRPORT CORRIDOR

A package of measures, across all transport modes and networks, are proposed for this corridor consistent with the key strategic principles.

Developing a high quality and frequency public transport priority 'spine'

Bus priority measures will be established along the Golden Mile and on core routes as a first step towards the development of a high quality, high frequency public transport priority spine. This will be progressively developed into a Bus Rapid Transit network, over the next 10 years, subject to satisfactory business cases being developed.

Implementing safety and capacity improvements to SH1

Safety and capacity improvements to SH1 from Ngauranga to Wellington International Airport will be investigated and constructed to reinforce its role as a high quality and reliable ring route for east-west traffic. The key measures include:

- Intersection improvements at Cobham Drive and Troy Street
- Capacity improvements along Ruahine Street and Wellington Road, and duplicating the Mt Victoria Tunnel
- Removing traffic lanes from the waterfront route and concurrent duplication of the Terrace Tunnel.

Addressing conflicting transport demands at the Basin Reserve

Improvements at the Basin Reserve will be implemented to: improve public transport reliability and journey times; allow a future dedicated public transport corridor (consistent with the identified public transport priority spine); provide for efficient local traffic movement; provide a quick and reliable east-west route for state highway traffic; and, improve connectivity and safety for cyclists and pedestrians.

Reallocating traffic between Ngauranga and the CBD

Some of the existing general traffic lanes on Hutt Road between Ngauranga and Thorndon will be reallocated for bus lanes to support faster and more reliable bus journey times from the north. At the same time improved peak capacity will be provided on SH1 between Ngauranga and Aotea Quay through active traffic management measures and increased capacity.

Improving key walking and cycling routes

Improvements will be made to walking and cycling facilities in this corridor, to improve the level of service and safety. These include:

- Implementation of a Wellington City walking and cycling policy
- Investigating improvements at Wellington Railway Station to improve walking connections to buses and the pedestrian network.
- Improving walking and cycling facilities through Mt Victoria Tunnel
- Investigating and implementing improved cycling and walking connections between Wellington City and Hutt City (via Ngauranga) consistent with the vision of the Great Harbour Way/Te Aranui o Pōneke concept.

Continuing a programme of travel demand management measures

An ongoing programme of travel demand management measures will be undertaken throughout the region, aimed at reducing the number of car trips (particularly with single occupants) and encouraging alternative travel options by public transport, walking and cycling and promoting other behaviours such as carpooling, teleconferencing, and flexible workplace policies.

Identifying and addressing network vulnerabilities

All organisations responsible for managing and operating the region's land transport network will work together to identify key vulnerabilities in the transport network that may affect the ability of the wider network to resume service after disruption caused by an incident or event.

Solutions to address these network vulnerabilities and to improve overall transport network resilience will be identified and funding for packages of improvements through the NLTP will be sought.

1.7 TIMING AND SEQUENCING CONSIDERATIONS - NGAURANGA TO AIRPORT CORRIDOR

The relative timing and sequencing of key measures within this corridor is very important.

The immediate priority for the corridor is to implement priority measures along the public transport priority spine, to continue improving provision for walking and cycling along key routes, and to resolve the conflicting transport demands at the Basin Reserve. This will help to support more walking, cycling and public transport use in the corridor as a first step.

The concurrent implementation of bus lanes on Hutt Road and peak lanes on SH1 south of Ngauranga are also an early priority to assist with bus service reliability from the northern suburbs.

Longer term priorities for the corridor involve implementation of a high quality, high frequency public transport system through the spine, and projects which will improve the safety and capacity of SH1, to support the important strategic role of each of these routes in the local and regional transport network.

Photo: NZ Transport Agency

2. WESTERN CORRIDOR STRATEGY

This corridor generally follows SH1 and the NIMT railway line from the regional border north of Otaki through to Ngauranga/Kaiwharawhara. The main east-west connections are SH58 and the interchange for SH1 and SH2 at Ngauranga.

2.1 LONG TERM STRATEGIC VISION FOR THE WESTERN CORRIDOR

Along the Western Corridor from Ngauranga to Otaki, SH1 and the NIMT railway line will provide a high level of access and reliability for passengers and freight travelling within and through the region in a way which recognises the important strategic regional and national role of this route. These primary networks will be supported effectively by local and regional connector routes.

A high quality rail service will accommodate the large number of people using public transport to commute along this corridor during the peak period. Bus services and park and ride facilities will provide additional access for the community.

Traffic congestion through the corridor will be managed at levels that balance demand against the ability to fully provide for peak demand due to community impacts and cost constraints, and the provision of an efficient and effective public transport system. Maximum utilisation of the existing network will be achieved by removal of key bottlenecks on the road and rail networks. Effective safety measures on the road and rail networks will ensure that no one is killed or injured as a result of network deficiencies when travelling in this corridor.

East-west connections between this corridor and other corridors and regional centres will be efficient, reliable and safe.

2.2 CONTEXT

This transport corridor is the primary route for inter-regional freight and tourism trips from the north, connecting through to Wellington City, the port and airport. It also provides for significant volumes of commuter trips from within the region, between local centres and through to the Wellington City CBD.

While the majority of Kapiti's working residents are employed within Kapiti, Wellington City is the dominant commuter destination for people who travel outside Kapiti for employment. Porirua City, Lower Hutt and Palmerston North are also key employment attractors for Kapiti residents.

Growth in the Kapiti Coast has been driven by an expanding service sector, including: retail trade, health care and social assistance, education, accommodation and food services, and construction.

2.3 THE PROBLEM

Local trips, commuter trips and freight all compete for road space through this corridor leading to congestion and unreliable journey times, both during peak times and at other times such as weekends and holiday periods.

High traffic volumes along SH1, combined with numerous 'at grade' intersections (requiring vehicles to cross high volume and/or high speed traffic flows, with or without traffic signals) and property accesses (north of Porirua), lead to significant road safety issues. Both the road and rail network are particularly vulnerable to natural hazards and impacts from seismic events between Pukerua Bay and Paekakariki, where the narrow transport corridor is wedged between the hills and the sea. The lack of any alternative north-south route through the corridor means that a natural event or traffic incident on SH1 often results in severe delays and disruption to the wider network.

2.4 BENEFITS OF ADDRESSING THE PROBLEM

- **Economic growth supported** - efficient and reliable access to Wellington City as the region's key employment centre, sub-regional centres such as Porirua and Paraparaumu, and to other key destinations for freight and tourism such as the Wellington CBD, the port and the international airport.
- **Improved resilience** - a robust transport corridor with good route alternatives and a range of travel options resulting in a reduced cost to the region from delays and disruption associated with natural hazards, events or incidents affecting the transport network.
- **Improved road safety** – a reduction in the number of road crashes throughout the corridor.

2.5 STRATEGIC PRINCIPLES – WESTERN CORRIDOR

The following strategic principles have been identified for the development of this transport corridor to address the above problems and challenges through a multimodal approach:

- A reliable, high capacity, modern and attractive rail network supported by effective bus services
- A safe, effective and reliable state highway corridor - attracting through trips off the local road network
- A resilient transport corridor, with good route options and alternatives, including east-west connectivity
- Well connected, safe and convenient walking and cycling networks, with good strategic links between them.

These strategic principles work together to provide an optimised solution. A high quality rail corridor will ensure a good proportion of commuter trips are made using public transport, increasing the efficiency of the transport system as a whole during peak times. However, public transport is not suitable for all trip types and a reliable and effective state highway corridor is needed to provide for other trips, including freight trips into and through the Wellington region from the north.

2.6 STRATEGIC RESPONSE – WESTERN CORRIDOR

A package of measures, across all transport modes and networks, is proposed for this corridor consistent with the above strategic principles.

Implementing safety and efficiency improvements to SH1

A number of projects are proposed to provide improved safety and efficiency outcomes for SH1 through the Western Corridor. Along SH1 between Tawa and Otaki, this involves provision of a new parallel route that will go around rather than through communities, and that will avoid key pinch points such as the narrow coastal stretch of existing SH1 between Paekakariki and Pukerua Bay. These will be median divided expressways designed to modern safety standards, with grade separated interchanges. The key measures include the following Wellington RoNS projects:

- Transmission Gully highway
- MacKays to Peka Peka
- Peka Peka to Otaki

Associated with the RoNS are improvement works to local roads to provide enhanced access for local communities and well as improving freight links.

Work will also be needed to investigate and agree any future changes to the existing SH1 corridor once the new Wellington RoNS are operational and the existing road becomes a local road through the state highway revocation process.

Continued improvements to deliver a modern, reliable, and accessible rail system

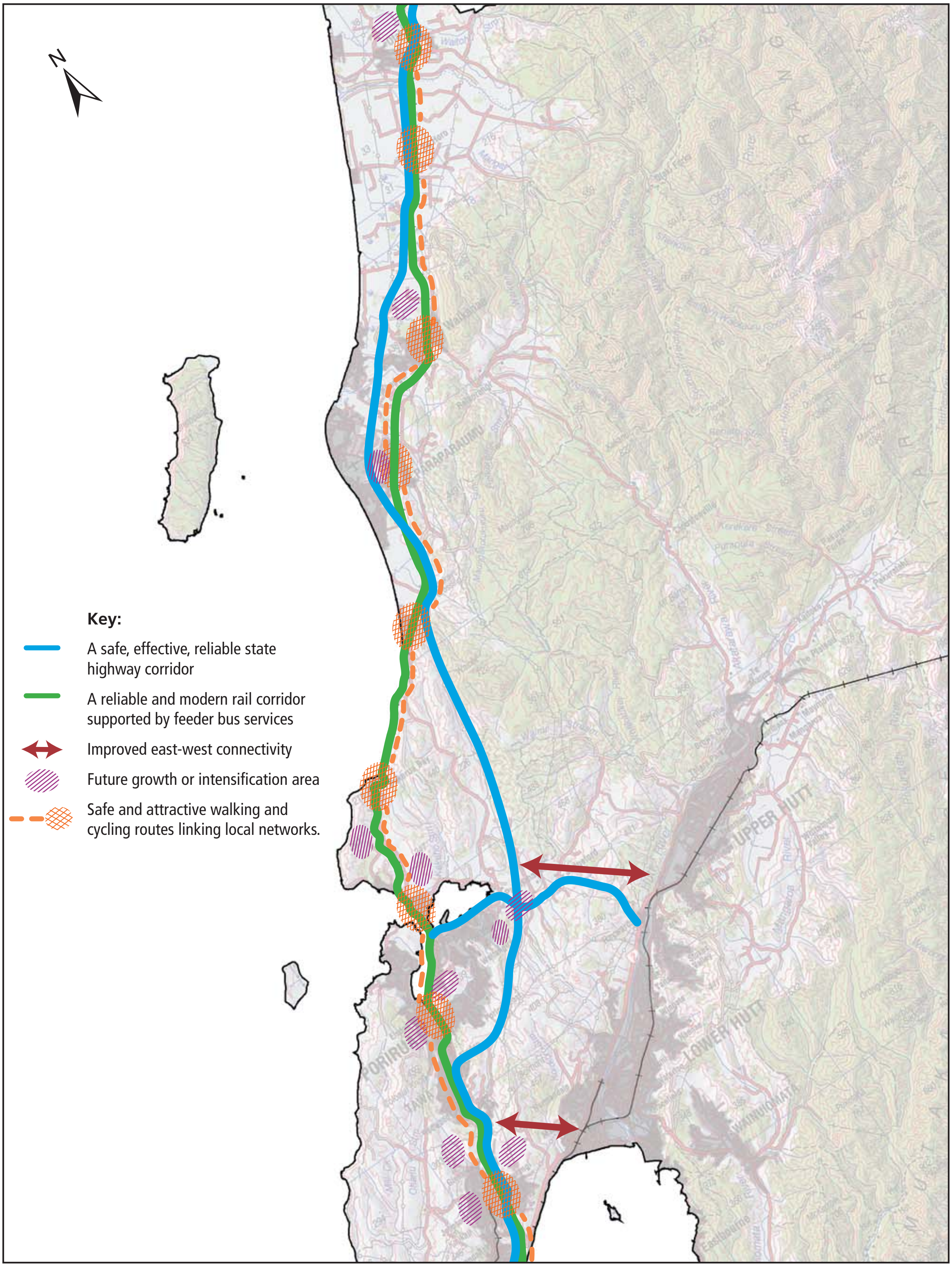
Over recent years, significant investment has been made in the rail system through this corridor to improve track and signalling systems and rolling stock to address reliability issues. This has included double tracking and extension of the electrified urban commuter network to Waikanae. Ongoing investment in the rail network through enhanced service patterns and infrastructure upgrades will be important to ensure that public transport remains an attractive and competitive mode choice in future.

The approach to the long term development of the rail network is identified through the Regional Rail Plan which includes an 'implementation pathway'. Rail Scenario 1 is the next stage of investment and will be implemented over the short to medium term. The key measures for this corridor under Rail Scenario 1 include:

- A new service pattern to optimise capacity
- Turnback facilities at Porirua and Plimmerton
- Signalling and track upgrades through Tawa Basin
- Other infrastructure improvements such as safety at level crossings and 'park and ride' facilities.

In the longer term there are several potential investment scenarios identified in the Regional Rail Plan. These are described as Rail Scenario 2, Rail Scenario A and Rail Scenario B. They provide different levels of emphasis on capacity, journey times, and network expansion to respond to changing external pressures and community needs.

Figure 15. Strategic principles – Western Corridor



Addressing road safety on the strategic road network

Outside of the Wellington RoNS projects, a number of other measures are proposed to contribute to a safer strategic road network through this corridor. The key measures include:

- Extending the median barrier on the existing SH1 route between Centennial Highway and MacKays Crossing.
- Improving pedestrian facilities across existing SH1 at Pukerua Bay and Otaki.
- A package of targeted safety improvements between Otaihanga and Waikanae along the existing SH1 route.
- A package of targeted safety improvements along SH58, including intersection upgrades, passing lanes, road realignment, median barriers and other safety works.

Improving connectivity and safety of key walking and cycling routes

Projects to provide safe and attractive walking/cycling facilities along strategic routes and across road and rail corridors will be pursued to improve connections between communities. The key measures include:

- Improving connections to the Ara Harakeke shared walk/cycleway by providing new or upgraded walkway/cycleway facilities from Tawa in the south and from Paekakariki in the north.
- Investigating walking and cycling links as part of the Wellington RoNS projects, to look for opportunities to provide new facilities along and across the new SH1 alignment, or along the existing SH1 alignment as part of the revocation process. This includes development of a cycling route through Queen Elizabeth Park connecting Paekakariki and Raumati.

Improving east-west connectivity between this corridor and the Hutt Valley

The investigation and construction of a new link road between SH1 and SH2 (known as the Petone to Grenada link road) will be progressed to provide more direct and efficient access between centres in the Western and Hutt corridors, and to contribute to greater route alternatives and improved network resilience. This link road will also reduce congestion on SH1 and SH2, provide future access to the Lincolnshire Farm growth area, and may accommodate more direct east-west public transport services.

Major safety upgrades along SH58, the existing east-west connection between the Western Corridor and Hutt Corridor, are proposed.

Identifying and addressing network vulnerabilities

All organisations responsible for managing and operating the region's land transport network will work together to identify key vulnerabilities in the transport network that may affect the ability of the wider network to resume service after disruption caused by an incident or event.

Solutions to address these network vulnerabilities and to improve overall transport network resilience will be identified and funding for packages of improvements through the NLTP will be sought.

2.7 TIMING AND SEQUENCING CONSIDERATIONS – WESTERN CORRIDOR

An immediate priority for this corridor is to address identified safety issues and walking/cycling improvements along the existing SH1 route, and build on recent rail improvements by optimising capacity to provide for projected patronage growth, and increasing freight capacity and speed.

Whilst some of the Wellington RoNS projects have already commenced, it will be around 2018 before the first of these is likely to be completed and operational. Consequently, the associated safety and reliability improvements, walking/cycling improvements and benefits associated with revocation of the existing SH1 route will not be fully realised until the medium term.

Longer term, the need for the rail system to provide an attractive and competitive public transport option for commuters will become increasingly important as the RoNS projects become operational. To ensure public transport continues to maintain and grow its share of commuter trips through this corridor, and to maintain the reliability benefits of the new SH1 route in the future, continued investment in rail network improvements will be crucial.

3. HUTT CORRIDOR STRATEGY

This corridor generally follows SH2 and the Wairarapa railway line from Ngauranga in the south through to Te Marua, Upper Hutt in the north. It includes east-west connections between SH1 and SH2, and major arterial local roads, key public transport, and walking and cycling routes within the corridor.

3.1 LONG TERM STRATEGIC VISION FOR THE HUTT CORRIDOR

Along the Hutt Corridor from Ngauranga to Upper Hutt, SH2 and the Wairarapa railway line will provide a high level of access and reliability for both passengers and freight. These primary networks will be supported effectively by local and regional connector routes.

High quality rail and bus services will accommodate a majority of commuters along this corridor during the peak period. Comprehensive bus services and adequate park and ride facilities will provide additional access for the community.

Effective safety measures on the road and rail networks will ensure that no one is killed or injured when travelling in this corridor as a result of network deficiencies.

East-west connections between this corridor and other corridors and regional centres will be efficient, reliable and safe, providing resilient options for all trips.

3.2 CONTEXT

This transport corridor connects the cities of Upper Hutt, Lower Hutt and provides access to and from Wellington City. Freight volumes through this corridor are significant, particularly at the southern end where freight from the Seaview/Gracefield industrial area makes up around 10% of daily traffic movements along Petone Esplanade, connecting onto SH2.

While a majority of Hutt Valley residents work within the Hutt Valley, and travel between local centres for that purpose, Wellington City is a key employment destination, generating significant volumes of commuter journeys. The manufacturing industry is the largest employment generator in the Hutt Valley, followed by significant employment in construction, retail, education and health sectors.

3.3 THE PROBLEM

Conflicting demands for freight and commuter trips through this relatively narrow and constrained corridor, particularly the southern end between Petone and Ngauranga,[1] leads to traffic congestion and unreliable freight and commuter journeys.

The transport infrastructure through this corridor is highly vulnerable to natural hazards which can impact on the resilience of the wider regional network.

Limited connections between this corridor and the Western Corridor add to the pressure on the transport network, with freight and other trips needing to travel via the Ngauranga Interchange.

The design and form of the existing east-west link, SH58, contributes to a relatively poor road safety record. In addition, large volumes of high speed traffic travel along SH2 through multiple at-grade intersections with significant safety implications.

3.4 BENEFITS OF ADDRESSING THE PROBLEM

- Economic growth supported – reliable access between key centres in the Hutt Valley, and to the CBD and the port for employment and freight purposes; more direct and efficient journeys between key freight and employment destinations.
- Improved resilience - a robust transport corridor with good route alternatives and a range of travel options resulting in a reduced cost to the region from delays and disruption associated with natural hazards, events or incidents affecting the transport network.
- Improved road safety – a reduction in the number of road crashes throughout the corridor.

1 Traffic along SH2 builds up from relatively low levels north of Upper Hutt (18,000 per day), through to around 70,000 vehicles per day south of Petone. Around 30,000 of these join SH2 from the Petone Esplanade, with a relatively high proportion (around 10%) being heavy commercial vehicles.

3.5 STRATEGIC PRINCIPLES – HUTT CORRIDOR

The following key strategic principles have been identified for the development of this transport corridor to address the above problems and challenges through a multimodal approach:

- A reliable, high capacity, modern and attractive rail corridor supported by effective bus services
- A safe, effective and reliable SH2 corridor
- Good east-west connections linking SH2 with SH1 to the west and the Seaview/Gracefield industrial area to the east
- A resilient transport corridor, with good route options and alternatives
- Well connected, safe and convenient walking and cycling networks, with good north-south and east-west links between centres.

These strategic principles all work together and complement each other to provide an optimised transport corridor solution. Improving the state highway corridor without parallel improvement of the rail corridor would not address the challenges in this corridor or the strategic direction for the region. A high quality rail corridor encourages a proportion of commuter trips to be made using public transport, increasing the capacity of the road network during peak times for freight and other trips not suited to public transport.

3.6 STRATEGIC RESPONSE - HUTT CORRIDOR

A package of measures is proposed for this corridor consistent with the above strategic principles.

Implementing safety, reliability and efficiency improvements to SH2

A number of projects are proposed to provide improved safety, reliability and efficiency outcomes for SH2. The key measures include:

- Improvements to interchanges at SH2/SH58, Melling and Kennedy Good Bridge intersections to address the poor safety record of these locations, improve travel times, and improve access to the Hutt city centre. This will include construction of short to medium term improvements at the above intersections to improve safety and capacity, and medium to longer term construction of grade separated interchanges. (Improvements at Melling intersection will be designed and timed to work alongside planned flood protection works and will give consideration to improving access to Melling railway station.)
- Ongoing minor safety works will be progressed along SH2 through the corridor including installing median barriers, removing or minimising roadside hazards, and improving road friction at intersections. This will include a programme of measures to address any pinch points and safety hazards for on-road cyclists.
- Longer term, further measures will need to be investigated along the northern part of the corridor. These may include intersection improvements on SH2 north of Maoribank to address safety issues and planned future growth (including those areas identified in Upper Hutt City Council's Urban Growth Strategy[1]) and additional capacity from SH2 Silverstream through to Maoribank. The first section to be progressed should be between SH2 Silverstream and Moonshine Road, which is expected to be a four lane layout to expressway standard.

Improving east-west connectivity

The investigation and construction of a new link road between SH1 and SH2 (known as the Petone to Grenada Link Road) is proposed to provide more direct and efficient access between centres in the Western and Hutt corridors. This link road will directly reduce the demand and associated traffic congestion on SH2 between Petone and Ngauranga. It will also provide future access to the Lincolnshire Farm growth area, will provide an alternative route for enhanced resilience and route security, and may accommodate more direct east-west public transport services.

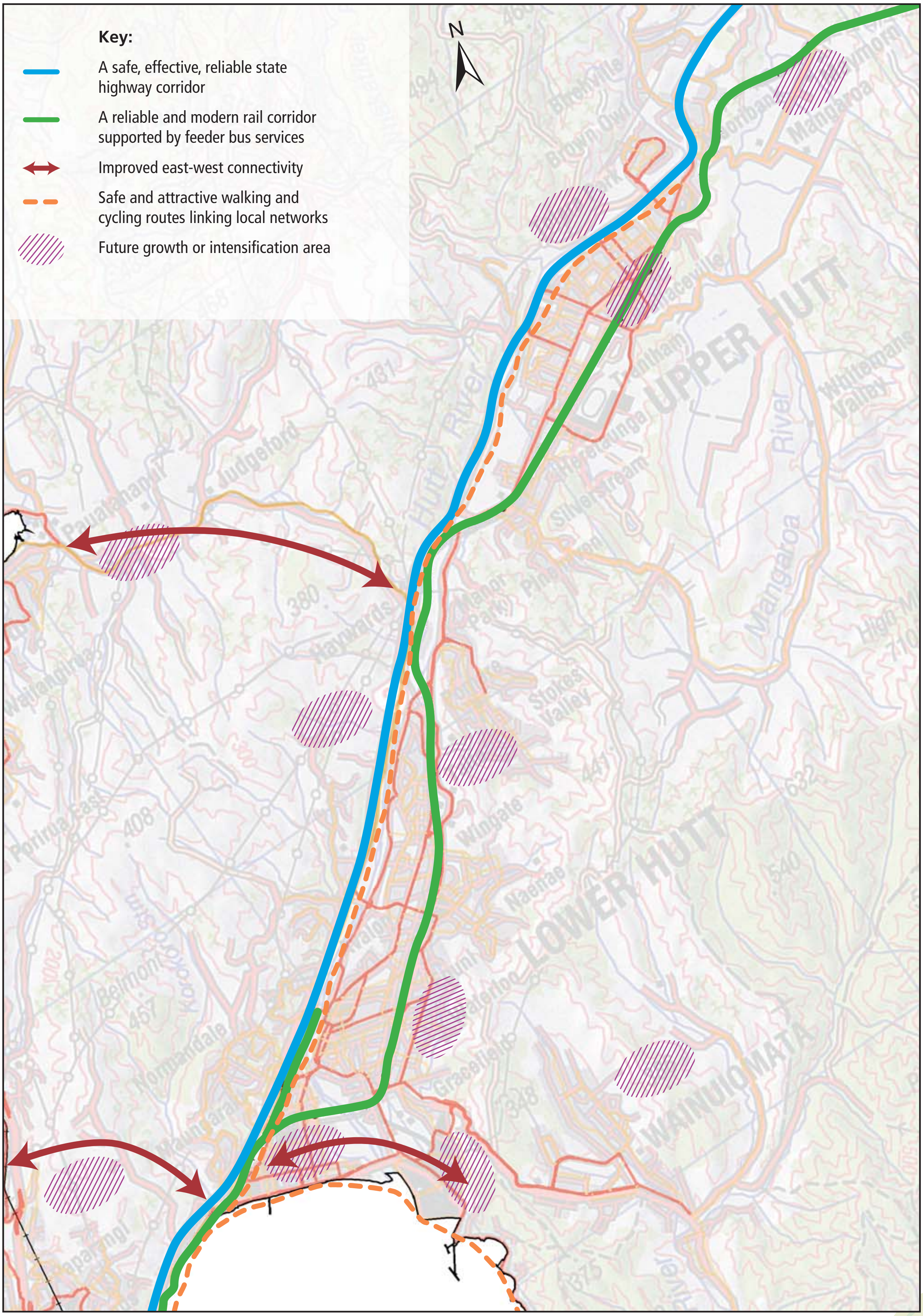
Improving access between SH2 and the Seaview/Gracefield industrial area in the shorter term will be addressed through improvements to the Petone Esplanade to maximise traffic efficiency and improve pedestrian and cyclist access to and along the foreshore. In the medium term the options for increasing capacity are a major upgrade of the Petone Esplanade or an alternative route further inland, known as the Cross Valley Link. The preferred option is the new inland Cross Valley Link as this is likely to be most effective and is most consistent with other community outcomes relating to amenity and use of the Petone foreshore. The timing of this new road should be closely linked to the construction of the Petone to Grenada Link Road.

SH58 provides the current primary east-west connection between the Western Corridor and Hutt Corridor. In the short to medium term, the focus is on improving the safety of this route through a major package of improvements. These safety upgrades should be designed so that they are not contrary to future capacity upgrades.

An alternative east-west link, to the north of SH58, is Akatarawa Road. This is a longer, narrower and winding route, but does contribute towards network resilience by providing an alternative route. Further consideration will be given to the funding feasibility of upgrading this route over the longer term.

1 http://www.upperhuttcity.com/planning/urban-growth-strategy/

Figure 16. Strategic principles – Hutt Corridor



Continued improvements to deliver a modern, reliable, and accessible rail system

Over recent years, significant investment has been made in the rail system through this corridor to improve track and signalling systems and rolling stock to address reliability issues. The approach to the long term development of the rail network is identified through the Regional Rail Plan which includes an 'implementation pathway'. Ongoing investment in the rail network through service patterns, infrastructure upgrades and rolling stock replacement will be important to ensure that public transport remains an attractive and competitive mode choice in future.

Rail Scenario 1 is the next stage of investment and will be implemented over the short to medium term. The key measures for this corridor under Rail Scenario 1 include:

- A new service pattern to optimise capacity
- Double tracking Trentham to Upper Hutt
- Upgrade of Upper Hutt Station
- Other infrastructure improvements such as safety at level crossings and enhanced 'park and ride' facilities.

Beyond 2020 there are several potential investment scenarios identified in the Regional Rail Plan. These are described as Rail Scenario 2, Rail Scenario A and Rail Scenario B. They provide different levels of emphasis on capacity, journey times, and network expansion to respond to changing external pressures and community needs.

Improving connectivity and safety of key walking and cycling routes

Projects to provide safe and attractive walking/cycling facilities along strategic routes and across road and rail corridors will be constructed to improve connectivity between communities and key centres.

The key measures include:

- Fixing the 'gap' in the strategic cycle network between Petone and Ngauranga through provision of a high quality, safe and attractive pedestrian/cyclist facility linked to the existing local footpath/cycle networks to the north and south.
- Continuing to improve and implement off-road and recreational walking and cycling facilities and tracks to provide alternative options for walking and cycling trips. These include progressing implementation of the Great Harbour Way and Upper Hutt Rail Corridor Cycle Link, and continued improvement of the Hutt River Trail.

Identifying and addressing network vulnerabilities

The vulnerability of the southern section of the Hutt Corridor, between Petone and Ngauranga, to storm events has been demonstrated in recent years. This critical section of the transport network is expected to be subject to increasing risks in future as a result of sea level rise and more frequent storm events.

All organisations responsible for managing and operating the region's land transport network will work together to identify key vulnerabilities in the transport network that may affect the ability of the wider network to resume service after disruption caused by an incident or event.

Key areas for investigation in this corridor include:

- Improving future resilience of the key transport and life lines corridor between Ngauranga and Petone in relation to seismic events, natural hazards and climate change impacts
- Seismic strengthening of road/rail bridges on key strategic routes
- Investigation and construction of a resilient east-west route that provides alternative route options in the event of a major event.

Solutions to address these network vulnerabilities and to improve overall transport network resilience will be identified and funding for packages of improvements through the NLTP will be sought.

3.7 TIMING AND SEQUENCING CONSIDERATIONS – HUTT CORRIDOR

An early priority for this corridor is to improve the safety and efficiency of the SH2 and other existing key strategic roads such as Petone Esplanade and SH58.

Addressing the gap in the strategic walking/cycling network between Petone and Ngauranga is also an early priority, although achieving an optimal solution may involve a longer timeframe.

In the medium term, addressing the need for better east-west links between SH2 (Petone) and SH1 (Grenada), and between Seaview/Gracefield and SH2 will be a priority.

Longer term, capacity upgrades of SH2 will be investigated including full grade separation at major intersections, along with expansion of the rail network to meet future growth and demand.

4. WAIRARAPA CORRIDOR STRATEGY

This corridor generally follows SH2 from north of Te Marua, Upper Hutt, over the Rimutaka Hill through to Mount Bruce north of Masterton, and the Wairarapa railway line from north of Maymorn, Upper Hutt through to Masterton. It also includes SH53 between Featherston and Martinborough.

4.1 LONG TERM STRATEGIC VISION FOR THE WAIRARAPA CORRIDOR

The local road network will provide access to the state highways and the rail network, which in turn will connect these areas with the Wellington City CBD and other regional centres. Basic, but reliable, local passenger transport (and Total Mobility) services will be easily accessible.

4.2 CONTEXT

This transport corridor travels through a largely rural landscape with a number of small rural towns. Primary and manufacturing industries are the key economic drivers, with growth also occurring in the tourism sector. While SH2 through the Wairarapa Corridor does not carry the high general traffic volumes seen in other corridors, it does carry a relatively high proportion of heavy vehicles.

Around 90% of Wairarapa resident's currently live and work within Wairarapa but there is a growing trend for people to live in Wairarapa and work in Wellington City or other parts of the region, so the importance of providing for longer distance commuters is gradually increasing.

4.3 THE PROBLEM

The state highway network (SH2 and SH53) provides the primary road link between and through Wairarapa's rural townships and there is often a conflict between the need to provide for through traffic to move effectively along SH2 (including freight) and the need to provide a safe and pleasant pedestrian environment within the townships. A forecast increase in future freight volumes, particularly from logs, will exacerbate this conflict and could result in worsening safety and amenity issues.

A network of local roads provides connections to the state highway network – however these are often not designed to accommodate high volumes of freight and larger freight vehicles. Local roads and parts of the state highway network are often vulnerable to natural hazards.

4.4 BENEFITS OF ADDRESSING THE PROBLEM

- Economic growth supported – efficient access provided for movement of freight between key production and manufacturing sites in Wairarapa and destinations in the rest of the region, including CentrePort. Safe and easy access to Wairarapa attracts visitors for events and tourism purposes from outside the region and from other parts of the region.

- Improved road safety – a reduction in the number of road crashes throughout the corridor, reducing the associated social cost.

- Improved resilience - a robust and reliable transport corridor that stands up well to natural hazards and seismic events resulting in reduced cost to the region from delays and disruption affecting the transport network.

- Accessible and liveable towns – the main street through Wairarapa's rural townships provide a safe, pleasant and attractive environment for workers, shoppers, visitors and residents.

4.5 KEY STRATEGIC PRINCIPLES – WAIRARAPA CORRIDOR

The following key strategic principles have been identified for the development of this transport corridor to address the above problems and challenges through a multimodal approach:

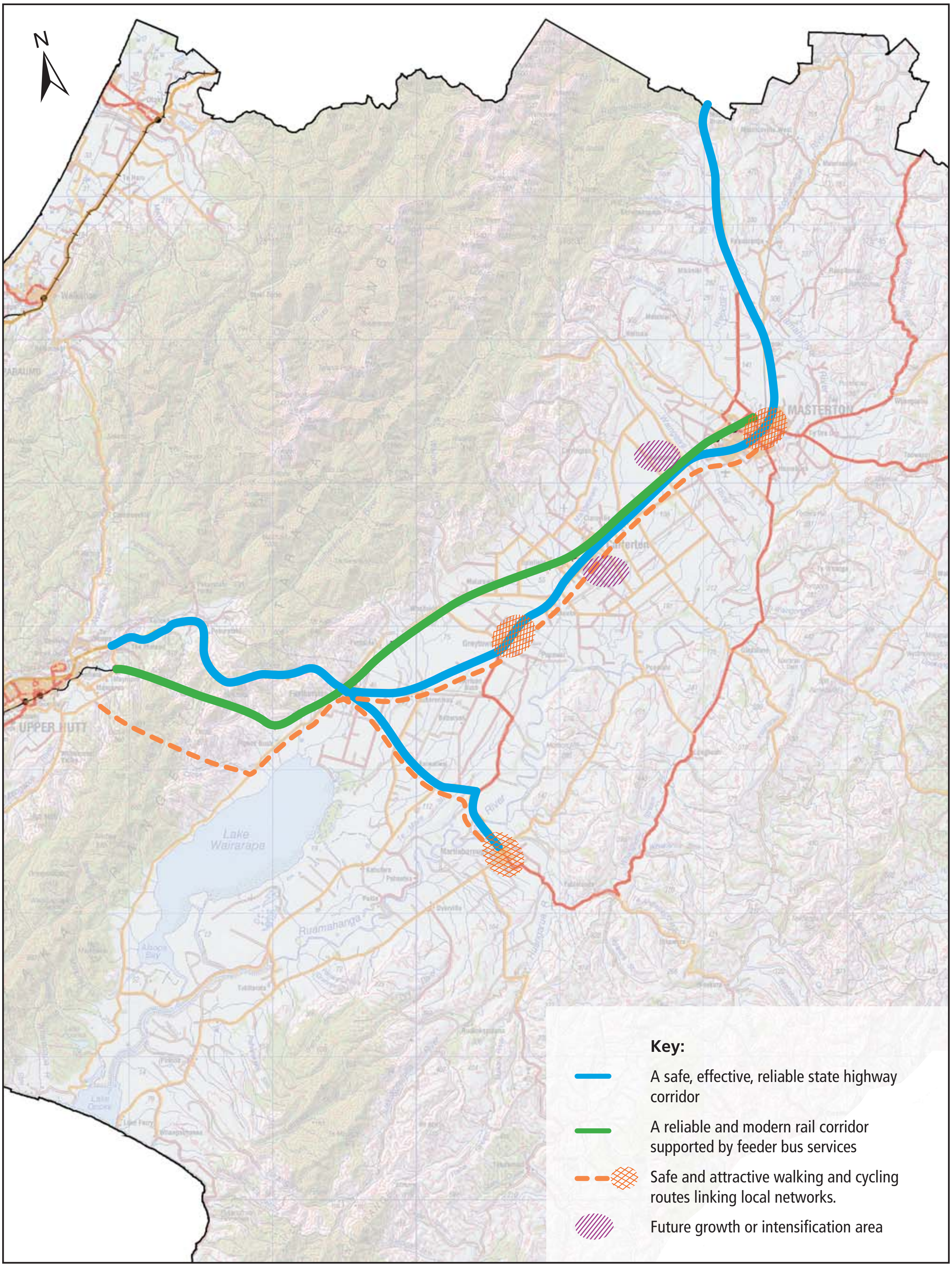
- A reliable and resilient state highway and strategic rural road network that provides safely for all trips including freight, motorcyclists and visitors.

- A modern and reliable rail corridor for freight and commuter trips supported by local bus connector services.

- Safe and attractive pedestrian/cycling environments within townships, together with safe walking and cycling networks connecting townships.

These strategic principles are all important and together contribute to an optimised transport corridor solution.

Figure 17. Strategic principles – Wairarapa Corridor



4.6 STRATEGIC RESPONSE – WAIRARAPA CORRIDOR

A mix of implementation measures, across all transport modes and networks, are proposed for this corridor consistent with the above strategic principles.

Implementing safety and reliability improvements to SH2 and the strategic road network

A range of engineering upgrades are proposed to address identified safety issues throughout the corridor. These include upgrading key intersections, median barriers, bridge upgrades or replacement, seal extension and other minor safety improvements.

Ongoing measures are required to continually improve the safety and efficiency of the Rimutaka Hill Road as a key route connecting Wairarapa with the rest of the region, with a focus on eliminating locations where freight vehicles are forced to cross the centre line due to insufficient road width and poor alignment.

These improvements will include provision for HPMVs which are able to move a larger volume of freight per vehicle, contributing to more efficient movement of road freight.

Addressing the impact of flood risk on the resilience of the transport network is planned through several bridge replacements/upgrades on SH53 (Waihenga Bridge and Tauherenikau Bridge)

The potential for traffic bypasses to remove heavy vehicle traffic from Wairarapa townships remain an important longer-term objective for this corridor to address the amenity impacts of heavy vehicles on SH2 through local town centres.

A modern and reliable rail corridor for freight and commuter trips supported by local bus connector services

Further upgrades to the rail carriages which operate between Wellington and Masterton are planned, along with other improvements to improve the reliability of these services. Recent reviews of rail and bus services have assisted in optimising the capacity and efficiency of the public transport network for commuters and for local connections. Future measures are likely to include improvements to park and ride facilities at stations.

Encouraging more freight to be carried by rail, particularly logs, is a key objective through this corridor given the safety and amenity issues associated with heavy vehicles travelling through the main street of townships and over the narrow and winding SH2 Rimutaka Hill road. This will involve ongoing collaboration between road controlling authorities, KiwiRail, CentrePort and other port and forestry companies.

Growth in log freight is expected in future and with around 80% of logs through Wellington's port originating in Wairarapa, this has the potential to significantly impact the transport network. The growth in log freight will result in increased maintenance requirements on the local roads linking logging areas with the state highway and adequate funding support will be needed to ensure these routes are able to be maintained to current standards. A road-rail transport hub at Waingawa will assist with the objective of moving more freight by rail. A freight bypass for logs from logging areas east of Masterton to the Waingawa road-rail transfer hub (south of Masterton town) will be an important measure to ensure effective freight access to this transfer hub and minimise the impact of heavy commercial vehicles through residential streets and shopping areas.

Safe and attractive pedestrian environments within townships, together with safe walking and cycling networks connecting townships

Measures for this corridor will focus on improving the safety of cycling networks within urban areas at locations with an identified crash risk, and ensuring that cycling connections between Wairarapa townships on state highways or high speed rural roads provide safe shoulder facilities for cyclists.

Continued development of off-road recreational cycle routes (such as Rimutaka Rail Trail) and on-road recreational routes (such as the NZ Cycle Trail) and connections to these will also be supported to provide additional cycle network connectivity for transport purposes.

Ongoing enhancement of the pedestrian environment within urban areas is proposed, including safety and amenity upgrades. Consideration of new pedestrian crossings, speed limits and traffic calming will be balanced with the needs of providing for through traffic on SH2 through these townships.

4.7 TIMING AND SEQUENCING CONSIDERATIONS

With increasing numbers of visitors travelling to Wairarapa for tourism and events, road safety is a high priority in the short term. Targeting safety black spots for pedestrians, cyclists and motorcyclists will be an important part of this.

Another short to medium term priority is to ensure that growing freight movements can be safely and effectively accommodated through the corridor. This will primarily involve a combination of infrastructure upgrades to address safety issues, resilience issues and to provide for HPMVs. It will also involve supporting an increasing share of freight being moved by rail.

Longer term, changing economic drivers within Wairarapa, and/or an increase in people living in Wairarapa and commuting to other parts of the region, may lead to changing priorities to accommodate different trip demands.

Photo: Anya Mowll

5. CONNECTIONS BETWEEN CORRIDORS

The corridor plans break down the region into smaller geographic areas that follow the core transport and urban corridors to enable a more focused examination of issues and solutions.

However in reality these corridors are integrated into the wider regional transport network. This encompasses both physical connections between the corridors (road and rail) and functional links.

Some of the important functional links between and through the corridors include:

- Freight, travelling from elsewhere in the North Island to and through the region, and onto the South Island or international destinations.
- Commuters, travelling to the Wellington City CBD (a key employment node for the region) and between regional centres, such as east-west trips between Porirua and the Hutt Valley.
- Tourism trips, by domestic or international visitors travelling to and through the region from other parts of the country.
- Unexpected events and incidents on one part of the transport network can often result in a significant impact on other parts of the network. For example, an incident on SH2 can result in long traffic diversions via SH1 and SH58, consequently leading to delays on other parts of the road network. Delay or temporary closure of branches of the rail network can result in additional congestion and significant journey delays on the adjacent road network.

From a physical perspective, some of the connections between corridors are constrained by the availability of routes including:

- East-west routes connecting the Hutt Corridor and the Western Corridor. Currently SH58/Greys Road and Akatarawa Road are the only direct transport connections between the Hutt and Western corridors.
- Connections between the Wairarapa Corridor and the Hutt Corridor. The SH2 Rimutaka Hill road is the only direct road link connecting Wairarapa with the rest of the Wellington region (although there is also a rail link using the Wairarapa rail tunnel).

The hilly and mountainous terrain and geometric constraints affecting all these routes mean that they are relatively steep, winding and narrow in form, resulting in a lower level of service and safety risks.

5.1 IMPROVING STRATEGIC CONNECTIONS BETWEEN CORRIDORS

The approach to improving the connections between corridors within the region is to:

- **Continually improve the safety and resilience of existing strategic routes**

  Ensuring that trips using these routes can be made safely will contribute towards improved regional road safety and will minimise the number of incidents affecting or closing these important intra-regional connections.

  The priority here will be SH58, followed by SH2 Rimutaka Hill road based on the respective traffic volumes using these routes.

  Akatarawa Road is not seen as a high regional priority based on relatively low levels of use.

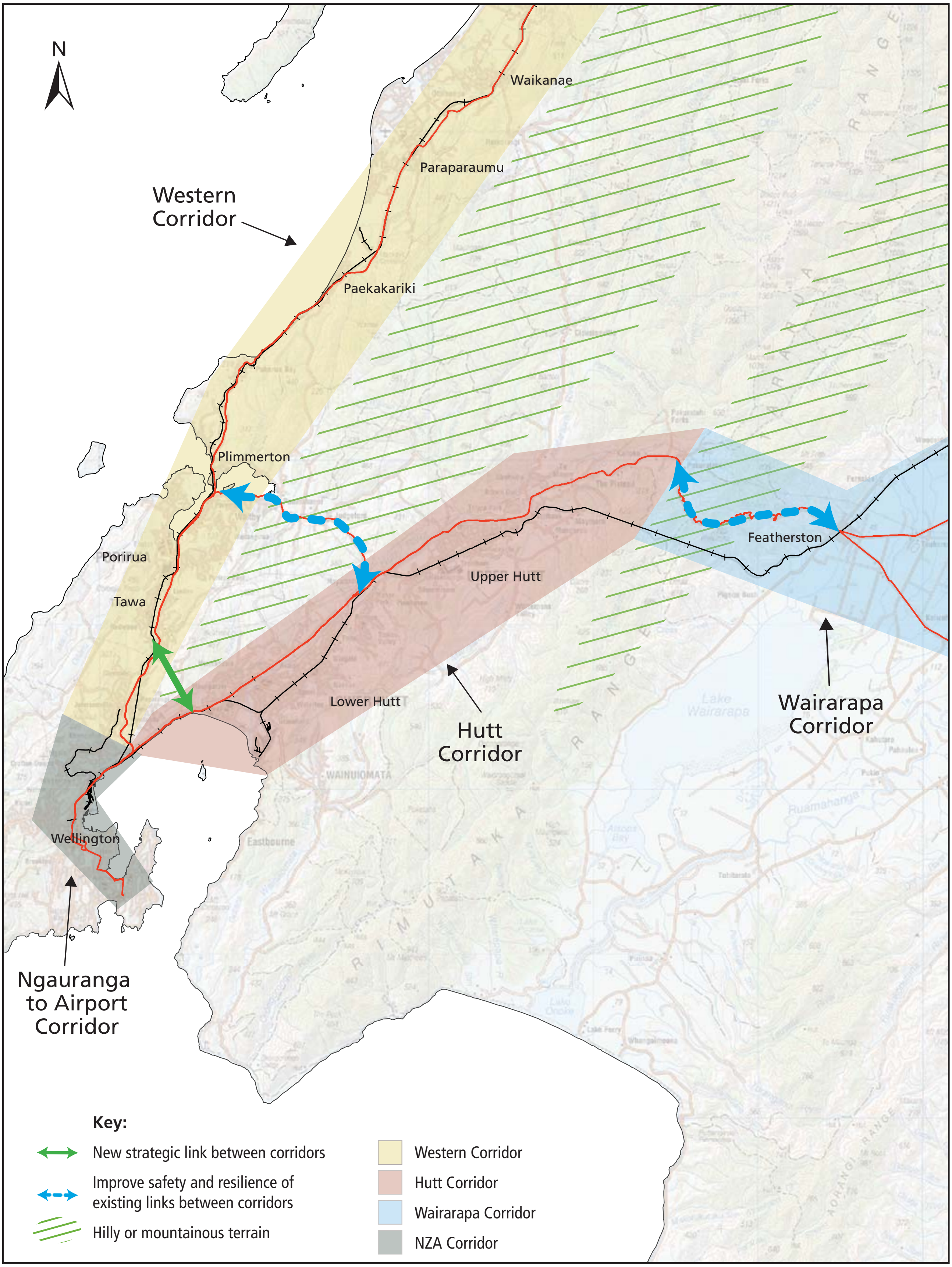
  The focus of these safety measures should be identified high risk locations and the section of SH58 between its intersection with Transmission Gully motorway and SH2 which is expected to see further increases in traffic volumes once Transmission Gully motorway is operational. Safety improvements along this part of SH58 should not restrict potential longer term capacity improvements.

- **Provide a new, more direct east-west connection between the communities of Lower Hutt (Hutt Corridor) and north Wellington/Porirua (Western Corridor)**

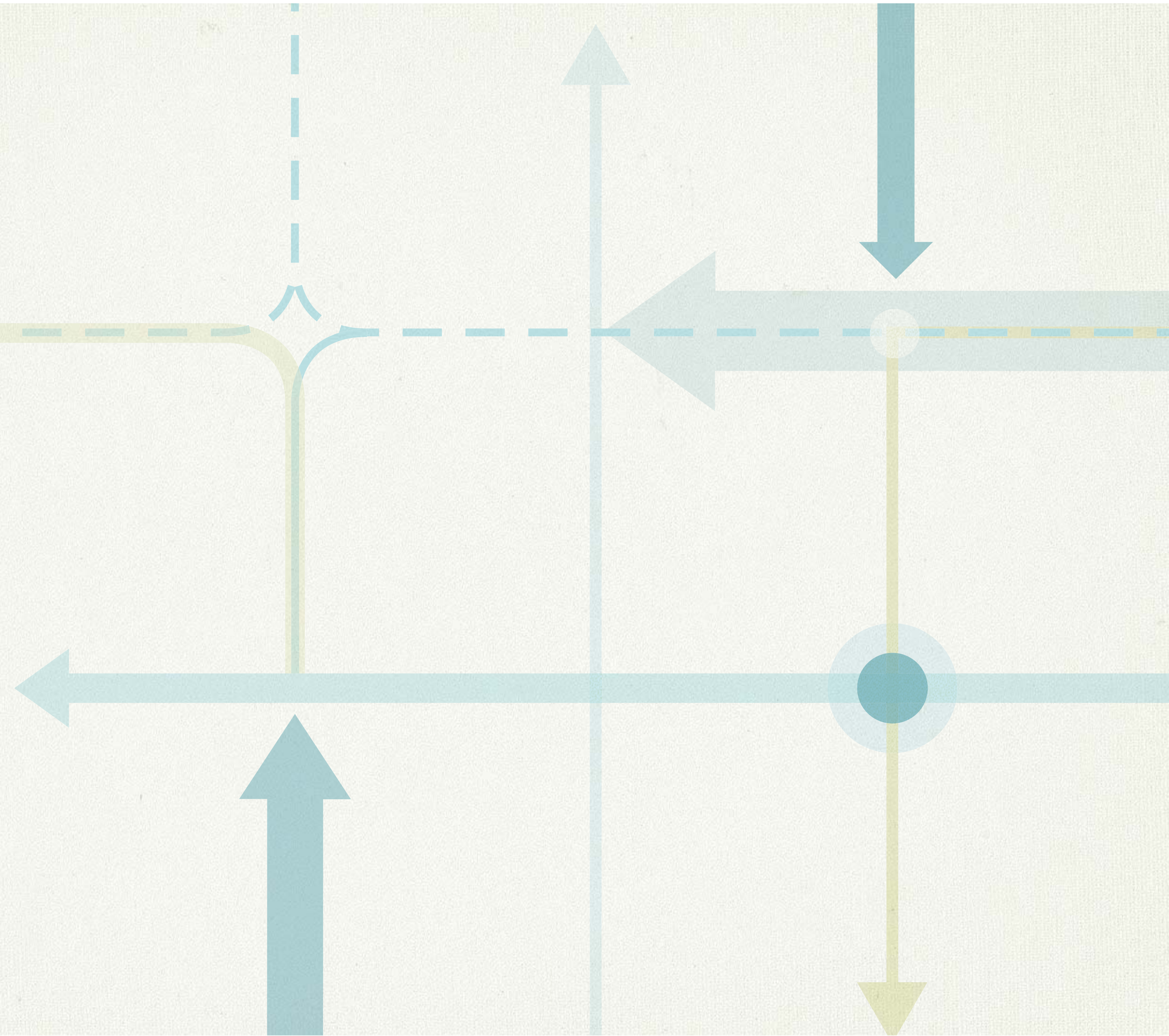
  This will significantly enhance connectivity between these regional communities and key freight destinations they contain. It will also provide an additional strategic route for access to the main urban areas of the region with significant overall transport network resilience benefits. Public transport services along this new route will also be investigated.

  A new east-west link will also relieve some congestion on SH1 south of Tawa and SH2 south of Petone - a key part of the strategic transport network that currently suffers severe congestion and which has significant capacity constraints.

Figure 18. Connections between corridors



NETWORK PLANS

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6. INTRODUCTION - THE ROLE OF MODES

To achieve a balanced and effective transport network, it is important to understand the role of the different modes in our transport system. The strategic role that each mode provides in the transport network is described below.

6.1 PUBLIC TRANSPORT

The public transport system[1] in the Wellington region needs to serve a dual strategic role.

- To provide peak period congestion relief and access to employment opportunities.
- To provide community access to services and facilities, particularly for people who do not have access to a private motor vehicle.

Public transport is an efficient way of moving people along core routes between common origins and/or destinations. This mode is particularly important during peak times when demand for space on the transport network is high and capacity is constrained. Providing alternatives to travel by car during these peak times provides congestion relief and efficient use of the available capacity, reducing the need for road investment. However, it is also crucial that we continue to invest in a reasonable level of service on a core all day network to provide community access to facilities and to support long term patronage growth.

Targeted services will provide access for groups for whom the regular public transport network is not adequate. This includes the Total Mobility service for people with disabilities, fare concession schemes and school bus services. In addition to its strategic roles, public transport has a number of wider benefits including being a relatively safe mode, and having energy efficiency benefits and reduced greenhouse gas emissions.

Passenger rail - In the Wellington region passenger rail provides services along core strategic corridors north of Wellington City CBD, primarily over medium to long distances, providing for access between regional centres and to and from the Wellington CBD.

1 Public transport covers scheduled services including the region's trains, buses and ferries.

Buses - Buses are able to connect people from many dispersed origins and destinations. In addition, buses provide core services along some strategic corridors. Buses form the backbone of the public transport system serving the southern, eastern and western Wellington City suburbs. Buses also have an important role in providing connector services to rail stations. Bus services cater effectively for trips over short to medium distances.

Harbour ferries - Harbour ferries provide another public transport option utilising the harbour to provide for quicker and more direct trips between some destinations and the Wellington CBD.

6.2 TAXI

Taxis provide a mobility alternative for those without access to a private vehicle where scheduled services or routes do not provide adequately for a particular trip. Taxis also complement public transport, walking and cycling by providing a back-up option for other modes in particular situations. The 'drop-off' and 'pick-up' nature of taxi trips can also help to reduce parking requirements.

Taxis play an important role in the GWRC Total Mobility scheme which provides subsidised door-to-door transport services for people who, because of a permanent disability, cannot use regular public transport services

6.3 PRIVATE MOTOR VEHICLES

Private motor vehicles have an important role in the movement of people between many origins and many destinations at diverse times. Private vehicle may be the only practical choice for distances that cannot be easily walked or cycled, or where the trip is not well served by public transport.

The flexibility and convenience of a private motor vehicle means it is often an attractive mode choice. Private vehicles are an important part of the transport network, and make up the majority of all trips. This mode is particularly suitable for off-peak trips for social and recreational purposes, when public transport alternatives may not be practical. Vehicles also provide for trips where goods or luggage need to be transported, for tradespeople, and where trips involve multiple destinations.

Unconstrained vehicle use, particularly at peak times, can however lead to severe congestion which adversely affects all road users, including buses and heavy freight vehicles, which share the same road space.

6.4 FREIGHT

The role of freight[1] is to provide for safe and efficient movement of goods within, to, from and through the region.

The two primary land freight modes are road and rail. Sea based transport including the inter-island ferries and coastal shipping are not directly considered in this plan but do also play an important role. Road freight has a key role in the movement of goods (including smaller volumes of freight) between varied origins and destinations. Rail freight has an important role in the movement of high volumes of goods over longer distances between key production and distribution nodes.

The Wellington region has a number of existing key freight hubs and destinations including Seaview/Gracefield, Porirua/Tawa, CentrePort and the Wellington City CBD. SH1, SH2 and SH58 provide the vital road connections for road freight movements between these key origins/destinations.

The NIMT and Wairarapa railway lines also provide crucial rail freight access to and from CentrePort for high volume freight such as logs and containers from surrounding areas. The NIMT line and inter-island ferry is a key link between the North and South Islands, with high volumes of freight passing through Wellington from Auckland, Waikato and other regions to the north, bound for South Island locations such as Christchurch.

However, most freight journeys within the greater Wellington region tend to be relatively short (less than 20km) and not easily transferred to rail.

A growing element of freight delivery is 'just in time', which requires efficient networks and reliable journey times. Providing efficient and reliable access along key freight routes is a priority. Where these routes are also in high demand for commuter trips during peak periods, a conflict can result between these modes.

6.5 WALKING

Walking has two key roles in the Wellington transport network:

- An efficient way of making short local trips
- A means to connect between modes and at either end of longer journeys by other modes.

As a transport mode, walking is also affordable, relatively safe and has positive health, fitness, social and environmental benefits.

Ensuring walking networks provide a good level of service, including safe, pleasant, and direct facilities is important to maximise the number of trips made by walking.

Good quality walking networks are particularly important in and around key employment and activity centres, to/from public transport nodes and within a 10-15 minute radius of schools, where the highest potential for walking trips exists. Providing good walking facilities along core strategic routes linking regional centres and key destinations is also important.

6.6 CYCLING

Cycling provides an important transport option over short to medium distances for trips between many origins and many destinations.

Cycling also contributes positively towards an efficient and sustainable transport network as it reduces congestion, is energy efficient, has minimal environmental impacts, is affordable, and has associated health and fitness benefits.

Ensuring cycling networks provide a good level of service, including safe, pleasant, and direct facilities is important to maximise the number of trips made by cycling.

Providing safe and attractive routes for cyclists along core strategic transport corridors, both within urban areas and between centres is particularly important as these routes provide core connections for many cyclists and generally carry higher volumes of general traffic, often at higher speeds.

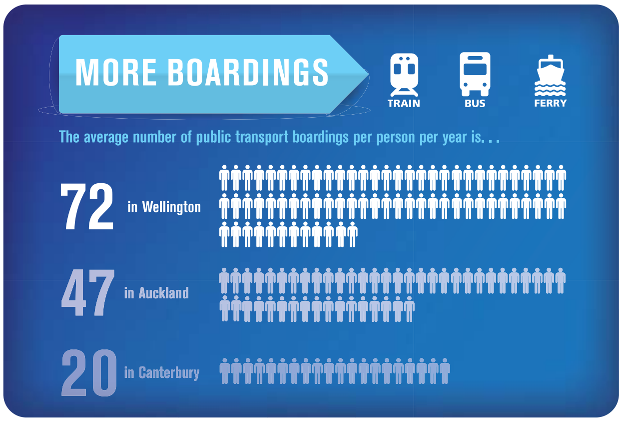
1 Freight includes anything transported as part of a commercial arrangement from a small couriered document to the movement of logs, containers and heavy machinery.

7. PUBLIC TRANSPORT NETWORK

7.1 INTRODUCTION

The public transport network in Wellington region (the Metlink network) is an integrated network of bus, train and harbour ferry services. The Metlink network supports efficient land use and a compact, well designed and sustainable urban environment by providing an alternative to private car use, particularly for longer journeys where walking and cycling are less attractive. It also has a vital role in providing transport for people who do not own private vehicles, are unable to drive or cannot use walking or cycling to access the goods and services they need.

Investment in the public transport network is just one element of the wider plan for improving the region's transport network, and needs to be considered as part of an integrated planning and investment approach.

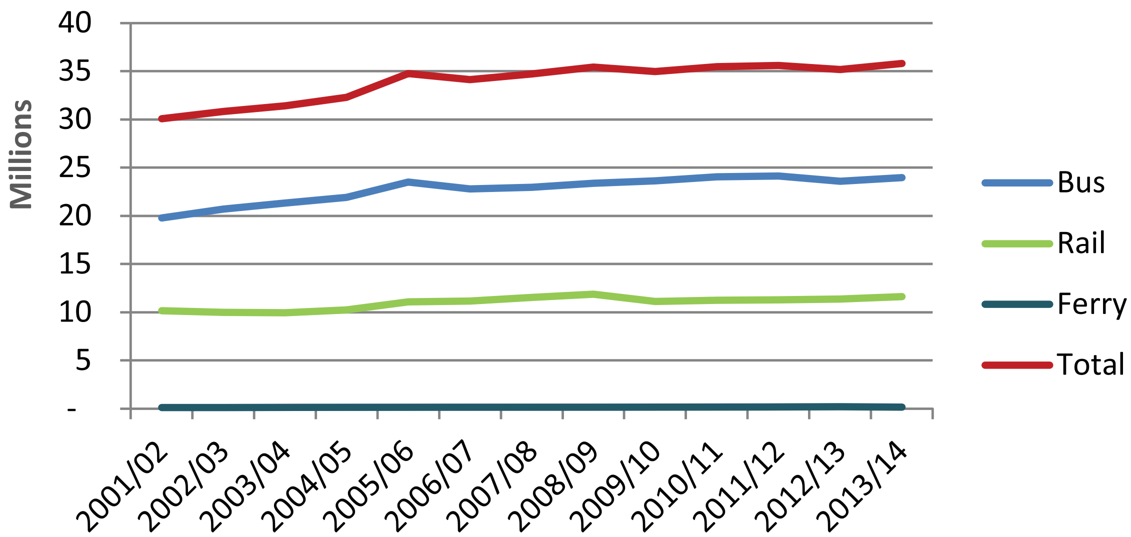


7.2 WELLINGTON'S PUBLIC TRANSPORT NETWORK

The Wellington region has a high-quality, well used public transport network of bus, train and harbour ferry services (the Metlink network). It consists of four railway lines, more than 100 bus routes, more than 200 school bus services, and harbour ferry services. Discounted taxi services provide travel support and assistance for people who have difficulty using the regular services.

Over 80% of the region's population live within 500 metres of a bus stop, train station or ferry terminal. Wellington residents are high users of public transport and Wellington has New Zealand's highest number of public transport boardings per person per year. This strong culture of public transport use resulted in 35.8 million passenger trips being taken during 2013/14. The Wellington region has seen strong growth in public transport patronage over the past decade, although this has flattened off since 2011.

Figure 19. Regional trend of patronage by different modes of public transport



Network Plans

The Metlink network consists of three layers: core routes, local routes and targeted services.

Core routes are the urban rail network and frequent bus services that form the network's backbone, linking areas of high demand with high-capacity, direct services with extensive operating hours.

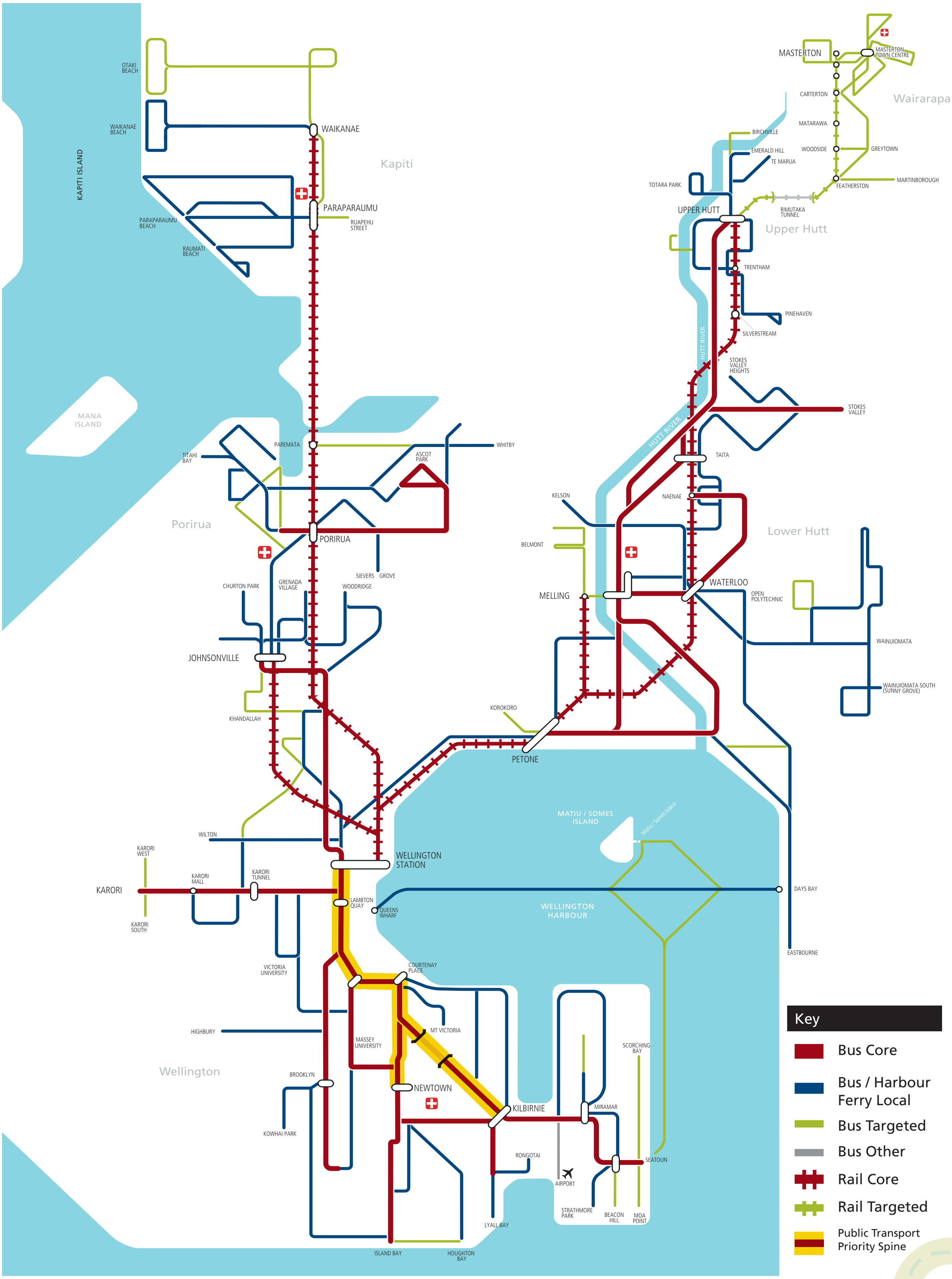
- **Core rail routes** provide high-capacity, long-distance, time-competitive commuter services connecting key urban areas across the region. Their primary functions are to reduce severe road congestion on State Highways 1 and 2 and meet the demand for travel from key suburban and town centres to the Wellington CBD during peak periods.
- **Core bus routes** provide high-capacity, frequent, all-day services within urban areas, reducing congestion on the major transport corridors and meeting the all-day travel demand. They operate at least every 15 minutes during the day, and often more frequently during busy periods.

Local routes include all-day medium- to low-frequency services connecting town and activity centres along the lower-demand corridors, providing local access to town and activity centres within the suburban areas. These routes complement the core network by covering areas it does not serve and by collecting and distributing passengers to and from it.

Additional **Targeted services** are provided to meet demand, including peak-only services, school services, night bus services, and community services that provide access to areas or link destinations where there is not enough demand to justify core or local routes.

The Wellington region's layered hierarchy of services is shown on Figure 20.

Figure 20. Wellington's future public transport network



Network Plans

7.3 THE NEED FOR INVESTMENT

It is not always affordable or desirable to continually increase the capacity of the road network in response to congestion and travel demand. Public transport is far more efficient at moving large numbers of people over long distances within the urban area than any other travel mode. It will therefore play an important role in providing for future travel demand. An effective and efficient public transport network will support future access to employment and markets with less impact in terms of land required for parking, and will be reasonably robust in the context of uncertainty over fuel costs, and other demographic and social changes.

Investment in the region's public transport system complements investment in the roading network by providing an alternative to car travel on congested motorways and arterial roads, freeing up space for freight and commercial use and for other trips that cannot be made by public transport.

To achieve this, the Wellington public transport network needs to be attractive to users, both in terms of the convenience of the service that is offered and the relative cost to users compared to the alternatives available.

Key factors that are commonly identified in public transport perceptions surveys as reasons that people do not use public transport more often include:

- longer journey times and poor reliability
- fare cost
- frequency of services
- comfort of stops/stations and vehicles

Investment in the day-to-day operation of the existing public transport network is crucial to ensure that it operates efficiently and effectively. For example, a lack of prior investment in Wellington's rail network up until around 2005 led to significant reliability issues, crowding, poor asset management, inadequate service frequency, and an uncomfortable travel experience for passengers. Significant catch-up investment in the rail network over more recent years has been focused on addressing these issues.

Results from perception surveys suggest that just over half of users believe that bus services are reliable. There has been a gradual decline in bus reliability over the six-year period to 2013. Buses use the road network and are affected by traffic congestion which impacts negatively on journey times and reliability. Investment in bus priority measures, particularly through congested urban streets, is crucial for improved bus journey times. Investment in a modern bus fleet, together with high quality stops and interchanges, is needed to provide comfortable and attractive public transport journeys.

A cost effective public transport system will help to keep public transport fares affordable and improve their competitiveness with the relative cost of car trips. Investing in network efficiency and integration improvements will be crucial to achieve this.

7.4 BENEFITS OF INVESTMENT

Public transport services are an essential part of Wellington's transport network, and contribute significantly to the region's liveability and economic productivity, primarily by:

- decreasing severe traffic congestion, particularly in the morning and afternoon peak periods, which in turn makes journey time reliable for other transport network users
- providing transport choices, including during off-peak periods
- contributing to reduction of CO2 emissions from transport
- enabling efficient land use and a compact, well designed and sustainable urban environment
- improving health and safety

Compared with single-occupant private car journeys, public transport trips are generally more energy efficient, generate fewer emissions and result in less congestion, particularly when the trips are well patronised and the public transport vehicles are well maintained. Public transport also has safety advantages over private cars, and provides health benefits by contributing to a more active lifestyle.

7.5 STRATEGIC RESPONSE

The long-term approach is to provide a modern, effective and efficient integrated public transport network that contributes to sustainable economic growth and increased productivity while also providing for the social needs of the community. This will require continued investment in and improvement of the Metlink public transport network so that services:

- go where people want to go, at the times they want to travel
- provide competitive journey times
- provide value for money
- are easy to understand and use
- are safe, comfortable and reliable
- provide flexibility, allowing people to change their plans.

In addition, investment is required to maintain the coverage of local and targeted services and in improving the accessibility of public transport by providing information, facilities and services that are available to all members of the public.

7.6 KEY NETWORK PRIORITIES

Figure 21. The key priorities for the public transport network are as follows:

Area	Priorities	Timing	Explanation
Rail network	Rail Scenario 1	Medium term	Improving the efficiency of the metro rail system by redesigning service patterns so that capacity and frequency are provided to match peak demand, improving the utilisation of rolling stock and other resources. This will be achieved by: • A new regularised (clock face) timetable with an enhanced morning peak-hour service • A new service pattern based on an inner-metro-style service originating from Porirua, Waterloo and Johnsonville stations, and an outer-suburban-style service originating from Waikanae, Upper Hutt and Masterton • Network hubs at the busiest stations – Waterloo and Porirua – and more metro services starting from these hubs (up to five trains per hour) during the morning peak period. More trains with fewer carriages in the peak period will give people more flexible travel options • More express trains from stations on the outer network
	Expand the Matangi fleet	Medium term	35 new Matangi trains will be purchased following the decommissioning and sale of the Ganz Mavag trains in 2016. This will provide a more modern, flexible and integrated electric rail fleet for the Wellington region.
	Expand park and ride facilities and improve stations	Ongoing	Expanding park and ride facilities for the train network will enable growth in rail patronage and extend the reach of the rail network. Short term priorities include Park and ride expansion at Tawa, Porirua and Petone stations. An ongoing programme of railway station renewal and development will ensure that station facilities increasingly contribute to a better overall journey experience for people using the rail network. Short term priorities include a third platform at Porirua and station improvements at Waterloo and Upper Hutt stations.
	Future rail upgrades	Long term	Once Rail Scenario 1 is complete, the preferred option is to proceed to Rail Scenario 2 (increasing supply), then Rail Scenario A (improving journey times), followed by Rail Scenario B (network extensions). However, a different order for these different scenarios may be appropriate depending on levels of demand and future patronage forecasts.
Bus network	Wellington City bus network	Short to medium term	Implementing the outcomes of the Wellington City Bus Review will provide a simpler network with more frequent services available to more people, with less service duplication and fewer buses on the Golden Mile. This should lead to increased patronage and improved cost effectiveness. New routes are expected to operate from 2017.
	Bus Rapid Transit (BRT)	Medium term	Implementation of a BRT network for Wellington City will be facilitated by the implementation of priority measures and high quality infrastructure along a public transport priority spine through central Wellington City (from Wellington railway station to Newtown and to Kilbirnie). It will also involve vehicle improvements. This will enable fast and reliable journey times for public transport users on core routes, particularly through the Golden Mile and to the southern and eastern suburbs, with the goal of these trips becoming increasingly competitive with the same journeys by car. The BRT network will be progressively introduced through: • The construction of dedicated bus lanes and priority measures, starting with the public transport priority spine • The introduction of a new bus network for Wellington City bus services (see above) • The rollout of a new fleet of bus vehicles that are modern, low emission, and high-capacity to meet future demand.
	Signage, bus stops and interchanges	Ongoing	Implementation of a programme of renewal and development for network signage, bus stops and interchanges. A medium term priority will be improving key interchange nodes (Wellington railway station, Newtown and Kilbirnie) associated with the new BRT system along the Wellington City public transport priority spine.
	Area based bus service reviews	Ongoing	Rolling bus service reviews across the region will be ongoing to ensure that networks and services respond to changing needs over time.

Fares and ticketing	Integrated ticketing	Medium term	Implementation of integrated fares and ticketing to provide an integrated way to pay across the whole Metlink network, allowing travellers to use the same payment system to buy single or multiple trips, or a journey using a number services. A simplified fare structure and new fare products will encourage more frequent use of public transport. The system will provide better information about the journeys people take, allowing better planning to meet travellers' actual needs. Network efficiency will be improved by better planning, faster boarding times, and the introduction of free transfers between services.
Service procurement	Implement the 'Public Transport Operating Model' (PTOM)	Short to medium	Implementation of a new approach to procurement of services that make up the Metlink bus and rail network through performance-based partnering contracts. This is expected to create an environment where goals and objectives are aligned through collaborative planning, joint investment, performance incentives, and shared risks and rewards.

Photo: Mark Edwards

8. STRATEGIC ROAD NETWORK

8.1 INTRODUCTION

The strategic road network forms the backbone of the region's transport network. It comprises the state highways and some higher volume local roads. It serves an important role for both inter-regional long distance trips and short to medium distance trips within the region, and provides access and connectivity for people and goods to key regional destinations (such as Wellington CBD, CentrePort, the regional hospital and international airport) as well as links between key regional centres.

Investment in the strategic road network is just one element of the wider plan for improving the region's transport network, and needs to be considered as part of an integrated planning and investment approach.

8.2 WELLINGTON'S STRATEGIC ROAD NETWORK

The strategic road network has been defined as those routes meeting the criteria for the top three tiers of the One Network Road Classification – 'National High Volume Roads', 'National Roads', and 'Regional Roads'.

To be included in a particular category a road must meet the agreed criteria and thresholds which include a combination of:

- Movement of people and goods - vehicle flows, heavy commercial vehicles, buses, and active modes

- Economic and social functions - links to key destinations such as ports, airports, hospitals, top tourist attractions, or provides the key link to adjacent regions

National roads are those that make the largest contribution to the social and economic wellbeing of New Zealand by connecting major population centres, major ports or international airports and have high volumes of heavy commercial vehicles or general traffic.

To be considered a 'National High Volume Road' a road must meet one of the high volume criteria for typical daily traffic or heavy commercial vehicles.

Regional roads are those that make a major contribution to the social and economic wellbeing of a region and connect to regionally significant places, industries, ports or airports. They are also major connectors between regions and in urban areas may have substantial passenger transport movements.

What is the One Network Road Classification (ONRC)?

The ONRC involves categorising roads based on the primary function(s) they perform

The ONRC is a nationally consistent classification system for the state highway and local road network

It has been formally adopted by NZ Transport Agency for use in the development of the NLTP 2015-18

It helps inform decisions about the associated customer level of service that a particular category of road should offer.

The existing strategic road network comprises:

- SH1 from Wellington Airport to just north of Otaki
- SH2 from Ngauranga Interchange to north of Masterton
- SH58 between SH1 and SH2
- SH53 between Featherston and Martinborough
- Adelaide Road, in Wellington between the Basin Reserve and John Street (Wellington Hospital)
- Aotea Quay and Waterloo Quay, in Wellington between SH1 and Hinemoa Street (CentrePort)
- Petone Esplanade and Waione Street, in Lower Hutt between SH2 and Seaview Road

These strategic roads are shown on Figure 22. Also shown are some of the existing challenges and planned new roads that will form part of the future strategic road network.

Figure 22. Wellington Region Strategic Road Network

8.3 THE NEED FOR INVESTMENT

Managing the region's transport issues (identified earlier in this plan) and achieving the broad outcomes envisaged, requires an integrated multimodal response. An important part of this overall approach is investment in improvements to the strategic road network – both in terms of infrastructure and operation.

The key areas which require future investment are set out below.

Sub-standard road design

Some sections of the strategic road network were not designed to accommodate the traffic flows they now carry and are no longer fit for purpose. At-grade, signal controlled intersections on some parts of the network (e.g. SH2 through the Hutt Valley and SH1 through Kapiti) can no longer safely accommodate the traffic demand. Some parts of network are undivided, have inadequate shoulders or poor road alignment and inconsistent road design.

These factors all increase the chances of road users being involved in a serious or fatal crash. This is illustrated by the large proportion of the strategic highway network rated as high or medium to high collective safety risk[1] as shown in the section 12 'Road Safety' of this plan.

Congestion and travel time variability

Roads which were designed for lower traffic volumes than those they carry operate inefficiently and create congestion issues. Key pinch points in the network that require vehicles to merge or involve conflict between different traffic movements can also significantly affect traffic flows.

Congestion on the strategic road network results in traffic delays and travel time variability during peak times on weekdays and on weekends and public holidays. While the long term trend in average congestion rates has been fairly consistent over time, severe congestion is occurring on some key sections of the network and is expected to continue due to future growth pressures. The morning peak period has consistently experienced the highest level of road congestion over recent years, and also has the highest levels of variability.

Congestion and journey time variability increases the cost of freight operations and delays commuters travelling to work by car or by bus, reducing the productivity of the region's economy. Unreliable travel times also affect visitors travelling to the inter-island ferry or international airport. Unexpected delays may cause people to miss travel connections which have reputational as well as economic impacts for the commerce and tourism sectors.

1 Annual average fatal and serious injury crashes per kilometre.

Transport and land-use conflicts

Some sections of the strategic road network carry high traffic volumes through residential and urban areas. These roads tend to have frequent intersections and often provide direct vehicle access to private property, which interrupt the flow of traffic, often resulting in delays and an increased risk of crashes occurring.

Where strategic roads carrying high traffic flows pass through urban areas and local centres they can also create a real or perceived barrier to local trips. This can make it harder for people to access local goods and services, impacting on amenity and connectivity.

In our region these issues have been identified along the following roads: SH2 through the Wairarapa townships of Featherston, Greytown, Carterton and Masterton; SH1 through Mana, Pukerua Bay, and the Kapiti Coast townships of Paraparaumu, Waikanae and Otaki; SH1 south of the Terrace Tunnel through central Wellington City to the airport.

When new strategic roads are constructed to bypass existing local centres and urban areas, it will be important to carefully manage new land use development to ensure that conflicts do not undermine the benefits of that investment. This may be a future issue for parts of Transmission Gully, Kapiti Expressway, and the proposed Petone to Grenada link road.

Lack of alternative routes

In many parts of the Wellington region the strategic road network also provides the function of a local road because there are no viable alternatives for making local trips within a district.

For example:

- SH1 through Porirua (linking Porirua city centre with suburbs to the east and north)
- SH1 through Kapiti (linking Paekakariki, Paraparaumu and Waikanae and Otaki)
- SH2 through Wairarapa (linking Featherston, Greytown and Carterton)

This can place additional pressure on those parts of the network, and result in modal conflicts between local trips made by foot, bike or horseback and longer distance vehicle trips.

The Wellington region's strategic road network also suffers from a limited number of route options between districts and key centres.

For example:

- SH2 between Ngauranga and Petone
- SH2 between Upper Hutt and Featherston
- SH2 between Masterton and destinations north of the region
- SH1 between Pukerua Bay and Raumati South
- SH1 between Waikanae and Levin
- SH53 between Featherston and Martinborough

This lack of route alternatives leaves the region vulnerable to disruption as a result of unplanned events such as a major traffic incident, natural hazard event or earthquake.

There are also limited connections between SH1 (Western Corridor) and SH2 (Hutt Corridor). The only strategic connections between these corridors are via Ngauranga (using SH1 and SH2) or via SH58, and there are constraints with both of these routes:

- SH2 between Ngauranga and Petone is susceptible to congestion. People travelling this route at peak times experience delays and unreliable travel times. This part of the network is also vulnerable to natural events such as storm surges, landslips and earthquakes.
- SH58 is located further north than the key employment and freight generating centres of Hutt City and Seaview and does not provide for direct trips between these areas and centres in north Wellington/Porirua.

This lack of connectivity increases the cost of moving goods between these parts of the region, limits employment opportunities and economic activity and reduces the resilience of the transport system to unplanned events.

8.4 BENEFITS OF INVESTMENT

The benefits of investment in the strategic road network will be:

- support for regional economy growth and improved productivity
- improved journey time reliability, and freight efficiency
- reduced risk of death and serious injury
- significantly improved resilience and quicker recovery following an unplanned event.

8.5 STRATEGIC RESPONSE

The strategic response is to:

(a) Manage strategic roads to provide a level of service consistent with their role and function in the region's road hierarchy, consistent with the One Network Road Classification.

(b) Develop new strategic roads to fill the identified strategic gaps in the transport network. The primary network gap is the lack of an effective east-west connection between Lower Hutt and north Wellington/ Porirua.

(c) Develop improvements to existing strategic roads or new strategic roads to:

- Improve design standards and safety
- Provide additional capacity – where necessary to reduce severe congestion and travel time reliability, and taking into account impacts on the wider multimodal transport network
- Improve resilience and reduce the risk of disruption
- Provide a high level of service for pedestrians and cyclists
- Connect effectively with local roads but reduce any overlap with local road functions on the strategic road network itself
- Improve access to key destinations, including CentrePort, Wellington International Airport, the Wellington CBD, and the regional hospital.

(d) Manage local roads to provide a level of service consistent with their role and function, including the role of local freight and tourism routes in supporting regional economic growth.

Photo: NZ Transport Agency

8.6 KEY NETWORK PRIORITIES

Figure 23. The key network priorities for strategic roads are as follows:

Strategic Road	ONRC	Regional Priority	Timeframe	Priority Focus	Explanation
SH1	National high volume	High	Short to medium	• Reducing congestion (primary) • Faster and more reliable journeys (primary) • Effective and efficient freight network (primary) • Enhanced road safety (primary) • Increased resilience (primary)	The Wellington RoNS programme between Wellington Airport and Otaki is the current focus of the Government's state highway funding for the Wellington region through the NLTP and will be central to delivering these outcomes. Along SH1 north of Tawa an alternative north-south strategic route will be constructed (Transmission Gully and the McKays to Peka Peka Expressway). This is expected to provide increased capacity, remove pinch points and will avoid conflicts with local urban areas. It will also contribute to significantly improving everyday transport network resilience and enable access to/from the region to be recovered much more quickly after a major natural event. Safety will be significantly improved through a range of factors including improved road alignment and design, median barriers and improved safety of intersections (e.g. through grade separation). South of Tawa freight access to CentrePort from the north is significantly impacted by traffic congestion between Ngauranga and Aotea during peak periods. The focus is on optimising capacity from the existing state highway corridor (e.g. through use of the shoulder to increase lane capacity and traffic management systems) to keep traffic moving smoothly during peak times. However, to significantly improve access to CentrePort additional southbound capacity through this section is required and options will be investigated as part of the Wellington RoNS programme. South of CentrePort the focus is to provide a strategic through route for trips to the Wellington International Airport and the eastern suburbs, and a 'ring route' around the city centre. Improvements are already planned for this part of the road network that focus on addressing capacity issues and pinch points through the city, which are currently preventing SH1 from effectively performing this role. These include optimising the SH1 Inner City Bypass, putting SH1 Buckle Street underground, addressing conflicting transport demands at the Basin Reserve, widening the Terrace Tunnel and providing additional capacity through the Mt Victoria Tunnel, Ruahine Street and Wellington Road. This will also have safety and local access resilience benefits, as well as enabling improved access and priority for public transport.

Strategic Road	ONRC	Regional Priority	Timeframe	Priority Focus	Explanation
SH2 Ngauranga to Melling	National high volume	High	Medium	• Reducing congestion (primary) • Faster and more reliable journeys (primary) • Enhanced road safety (primary) • Effective and efficient freight network (primary) • Increased resilience (primary)	Between Ngauranga and Petone the options for addressing capacity constraints are limited, and the preferred approach is to: • Develop a new link road between SH2 at Petone and SH1 at Grenada to remove a percentage of trips from SH2, reducing congestion, as well as providing an alternative and more resilient route option. • Enhance the level of service for public transport and active modes along this corridor, to provide additional capacity and reduce demand along the strategic road corridor. This will include completing a current gap in the strategic cycling and walking network through the provision of a new cycling/walking route along the seaward side of the rail corridor. This would also provide significant resilience benefits to the rail network and key lifelines (critical services, infrastructure, and utilities such as transport routes, gas, electricity, water, wastewater, fuel supply and telecommunications). Along the remainder of this section of SH2 through to Melling, the priority is to improve intersections to achieve greater efficiency and safety. This should result in all intersections being grade-separated (i.e. a bridge/flyover type interchange). Improvements are already planned along this part of the corridor, including a new grade separated interchange at Petone as part of the Petone to Grenada Link Road package, short term improvements at Melling intersection to improve flows and safety by reconfiguring lane layouts and restricting some turning movements.
SH2 Melling to north of Upper Hutt	National	Medium	Medium to long	• Enhanced road safety (primary) • Faster and more reliable journeys (secondary) • Effective and efficient freight network (secondary)	The focus is on improving existing intersections to ensure that they can safely accommodate the traffic carried along this route. This should include grade-separating the SH2/SH58 intersection, and improving high risk intersections between SH2/SH58 and Upper Hutt and those north of Upper Hutt that have seen increased use as a result of new subdivision and development. Investment should also focus on measures to reduce the risk of head-on crashes north of Upper Hutt where the traffic travels at high speeds along non-divided sections of SH2. A secondary priority is ensuring reliable journey times. Congestion and travel time delays occur at key pinch points in the network at peak times, affecting commuters and freight. This part of the network also forms a section of a HPMV freight route.
SH58	National	High	Short to medium	• Enhanced road safety (primary)	Improving the safety of SH58 is an important regional priority. This should include improvements to road geometry, design and intersections. Upon completion of the Transmission Gully (TG) motorway, traffic volumes on the section of SH58 between TG motorway and SH2 are expected to increase – the design of any safety upgrades need to take this into account.

Strategic Road	ONRC	Regional Priority	Timeframe	Priority Focus	Explanation
Petone to Grenada link road	National (proposed)	High	Medium	• Strategic connections (primary) • Increased resilience (primary) • Effective and efficient freight network (secondary) • Faster and more reliable journeys (secondary) • Reduced congestion (secondary)	A new strategic road link is planned to improve the connectivity between SH2/Lower Hutt and SH1/north Wellington. This is a high priority for the region as it will provide an alternative route between corridors when SH2 or SH58 are blocked or closed, reduce congestion along the constrained section of SH2 between Petone and Ngauranga and along SH1 Ngauranga Gorge, provide improved freight connectivity within the region, and enable improved access to employment opportunities, markets and a major industrial hub at Seaview.
SH2 north of Upper Hutt to north of Masterton	Regional	Medium	Ongoing	• Enhanced road safety (primary) • Effective and efficient freight network (secondary) • Reducing transport and land use conflicts (secondary)	This is a particularly hazardous section of road, with a high collective safety risk. SH2 Rimutaka Hill road traverses mountainous terrain, resulting in a narrow road cross section, unforgiving roadside environment and susceptibility to slips. The horizontal geometry makes the road difficult to negotiate at speed and difficult for larger heavy commercial vehicles to pass each other in opposite directions. SH2 Rimutaka Hill road forms part of an identified HPMV freight route and is the only road link between Wairarapa and the rest of the region. North of Featherston the focus is on improving the safety of the road network at identified high risk locations. Existing freight efficiency and community severance issues associated with heavy commercial vehicles travelling through the centre of Wairarapa townships will be exacerbated by expected freight growth and longer term solutions such as investigation of heavy vehicle bypasses may also need to be considered.
SH53 Featherston to Martinborough	Regional	Medium	Medium to long	• Enhanced road safety (primary) • Increased resilience (secondary)	While SH53 carries low traffic volumes, it provides a key regional connection between the town of Martinborough and SH2. Addressing any identified safety issues along this high speed, undivided route will be important to reduce serious and fatal crashes. Replacing the Waihenga Bridge over the Ruamahanga River will improve the resilience of the network. Major flood events affecting this river can close the bridge, severing access via SH53 to Martinborough which has limited alternative routes. Seismic strengthening of bridges along this route and alternative local road access routes may also be important for resilience.

Strategic Road	ONRC	Regional Priority	Timeframe	Priority Focus	Explanation
Petone Esplanade and Cross-Valley link	Regional	Medium	Short term (Petone Esplanade) Medium to long (Cross Valley Link)	• Increased capacity (primary) • Faster and more reliable journeys (primary) • Effective and efficient freight network (primary) • Reducing transport and land use conflicts (primary) • Enhanced road safety (secondary) • Increased resilience (secondary)	In the shorter term, the focus for investment will be on improving traffic flows along Petone foreshore. Longer term, the objective is to relocate traffic from the Petone Esplanade to a new inland Cross Valley Link which will improve the effectiveness of access to Seaview, address local access and amenity issues, and provide a more resilient route. Petone Esplanade is a local road that meets the volume and functional criteria for a regionally significant route. This route provides an important strategic link between the major industrial hub at Seaview and SH2. It is affected by significant congestion at peak times, causing delays to both freight and commuters. The location of this strategic link along the Petone foreshore has associated community severance and amenity issues. It is also very vulnerable to natural hazards and seismic events. The proposed Cross Valley Link will connect directly to the proposed Petone to Grenada Link Road.
Aotea Quay and Adelaide Road	Regional	High	Short to medium	• Increased capacity – multimodal (primary) • Faster and more reliable journeys (primary) • Effective and efficient freight network (primary) • Reducing congestion (secondary)	The priority for these routes will be improvements to provide effective and reliable access to important regional destinations of CentrePort and Wellington Hospital. Improvements will also need to reflect the role of these routes as urban roads within the local road hierarchy including provision of safe and connected facilities for pedestrians and cyclists, and priority for public transport services.

9. FREIGHT NETWORK

9.1 INTRODUCTION

Freight includes anything transported as part of a commercial arrangement – from a small couriered document carried by cycle messenger to the movement of bulk goods like logs and containers.

The reliable, timely and safe movement of freight to and through the region is critical to support the region's economic growth and productivity.

9.2 WELLINGTON'S FREIGHT NETWORK

The region's freight network consists of roads, railways and port infrastructure. The two primary freight modes in the Wellington region are road and rail.

Road-based freight is comparatively flexible, there are fewer route constraints and goods can be moved between many origins and many destinations. Road-based freight is generally the most cost effective option over short to medium distances.

Rail is primarily used to move bulk commodities where timing is less critical and trip distances are longer. Rail predominantly moves:

- bulk and containerised goods to and from ports and key freight producers
- long distance containerised goods between major cities
- shorter distance freight shuttles between inland ports and wharves

Other parts of the freight network, outside the scope of this plan, include air freight and sea freight. The land transport network play an important role in providing access to these other freight modes.

Air freight plays a relatively minor role in this region but may increase as a result of planned investment by Wellington International Airport. From the Wellington port, freight also continues onwards by sea.

Domestic sea freight can fit into three different categories:

- Inter-island ferry
- Coastal shipping
- International trans-shipments

Ferries provide a connection for road and rail freight between Wellington and Picton with services running throughout the day. Coastal shipping carries domestic freight on routes between multiple New Zealand ports. Trans-shipments carry international-bound freight to an intermediate New Zealand port before being loaded onto an international container vessel.

Figure 24 shows the regionally strategic freight routes and core feeder routes. The plan also shows the main freight interchanges, network constraints and locations where the movement of freight affects local communities.

Wellington acts as a freight hub within New Zealand, serving the movement of road and rail freight between the two islands. KiwiRail has developed the Wellington Freight Terminal close to the Interislander ferry terminal, which functions as an intermodal (rail, road, ferry) freight transfer hub.

Seaview is important nationally for the distribution of fuel oil. Approximately 80% of fuel used in New Zealand is imported and refined at Marsden Point, in the Northland region. The remaining 20% of fuel used in the country is imported through the major terminals of Mt Maunganui, Wellington (primarily Seaview) and Canterbury. Each year 340,000 tonnes of fuel is barged to Wellington from Marsden Point and 374,000 tonnes is imported from overseas. Refined fuel is then distributed from Wellington by road within the region and to other regions as far away as Hawke's Bay, Nelson and Canterbury.

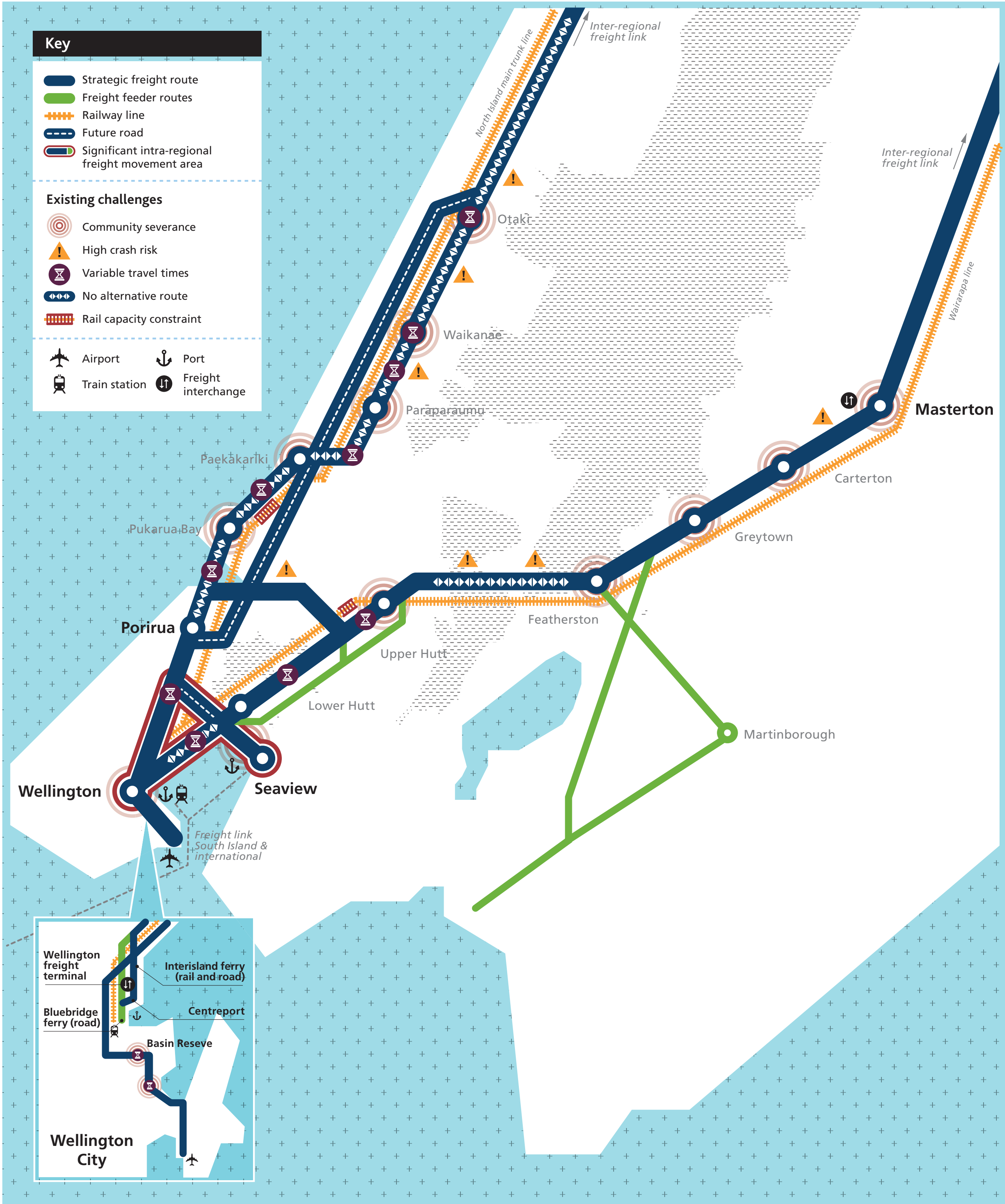
Freight traffic volumes on the strategic road network vary across the region. Heavy vehicle flows are greatest in the southern parts of the region. Over 2,000 heavy vehicle trips per day occur on:

- SH1 between Paremata and the Terrace Tunnel
- SH2 between Haywards the Ngauranga Interchange

SH1 generally carries a greater proportion of inter-regional freight trips both to the north and to the south. SH2 provides access to the industrial, warehousing and distribution areas in the Hutt Valley.

The most significant road freight movement in the region occurs between SH2 Petone and the port, and between SH1 north Wellington/Porirua and the port. Heavy vehicle traffic flows between SH2 and Seaview along the Petone Esplanade are also high. This core 'freight triangle' is shown on the map in Figure 24. These sections of the strategic road network also provide the key road connection into Wellington City for other types of trips and are affected by heavy congestion levels at peak times as a result of commuter traffic.

Figure 24. Freight Network



Freight demand

In 2012:[1]

- The amount of freight transported throughout New Zealand had grown slowly over the 7 year period 2008 to 2014, with a slight decrease in 2009 that can be directly attributed to the global financial crisis.
- 56% (6.37 million tonnes) of the freight tonnage was internal and did not enter or leave the Wellington region.
- The Wellington region was a net importer of freight bringing in 1.51 million tonnes more freight than was exported (2.04 million tonnes).
- Road transport was the dominant mode of transport accounting for around 70% of freight tonne kilometres nationally.
- Rail freight accounted for around 16% of freight nationally in terms of tonne kilometres. This was an increase of 1% since 2006/07.[2]
- Coastal shipping accounted for 14% of freight nationally in terms of tonne kilometres. This mode share was significantly less in volume (tonnage) than road and rail nationally (2% of total freight task).

Figure x shows the 2012 mode share of freight task (total tonnage) for the Wellington region.

Figure 25. 2012 Freight Mode Share, Wellington Region[3]

Mode	From	To	Within
Road	92.6%	74.4%	97.8%
Rail	5.4%	13.2%	2.2%
Coastal Shipping	1.5%	12.4%	0.0%
Total	100.0%	100.0%	100.0%

9.3 THE NEED FOR INVESTMENT

The Wellington region's economy and population is expected to continue growing at a modest rate, driving an increasing demand for the movement of freight to, from and within the region. This poses both challenges and opportunities associated with accommodating this growth.

Projected freight growth (2042):

- New Zealand's freight task (tonnage) is projected to increase by about 58% over the next 30 years to 2042, with freight volumes in the Auckland and Canterbury regions projected to grow by 78% and 73% respectively.
- Freight tonnage to Wellington is expected to increase by around 75%, from about 8 million tonnes to 14 million tonnes by 2042.[4]
- Although both imports and exports are expected to grow by 2042, it is expected that the Wellington region will continue to be a net importer.
- In general the modal shares are likely to be much the same as in 2012. Coastal shipping is expected to see the greatest increase in tonnage, although it will continue to carry only a small proportion (2%) of the freight task.

Network capacity

Goods moved by road are affected by the same challenges identified for the strategic roads network. Traffic congestion at peak times leads to travel time variability which in turn affects the efficiency of just-in-time freight operations and increases costs. Congestion of particular relevance to road-based freight movements is on SH1 south of Tawa, SH2 south of Petone, and between SH2 and Seaview.

Infrastructure constraints

Limited connectivity between SH1 and SH2 affects the efficiency of both intra-regional freight movements between regional centres and longer distance inter-regional freight movements to/from the region – for example, freight travelling from Lower Hutt to Palmerston North.

In some locations physical constraints such as topography and road geometry affect the ease of freight access and journey times. For example, road freight travelling between Wairarapa and CentrePort in Wellington City must use the Rimutaka Hill road which is steep, narrow and winding. There are some points along this route where it is not possible for two heavy vehicles travelling in opposite directions to pass each other comfortably. This has safety implications for those vehicles and other general traffic.

In some parts of the regional rail network, freight must compete for track time with commuter services. Where rail capacity is limited, commuter services are prioritised ahead of rail freight. Sections of single track, such as the north-south junction between Pukerua Bay and Paekakariki on the NIMT railway line and between Trentham and Upper Hutt on the Wairarapa Line, limit the times when rail freight may be moved and reduce the freight capacity of these parts of the rail network.

1 Ministry of Transport, National Freight Demand Study March 2014
2 Ministry of Transport, National Freight Demand Study March 2014, Table 5.1, page 203
3 Ministry of Transport, National Freight Demand Study March 2014, extracted from Tables 4.4 - 4.7
4 Calculated using data in the National Freight Demand Study, Ministry of Transport, 2014.

Access to CentrePort and the ferry terminals

Access to CentrePort and the Interislander ferry terminal is currently constrained. At peak times road-based freight accessing the port also becomes caught up in traffic congestion on SH1, Aotea Quay and Waterloo Quay. This congestion is primarily associated with the volume of motorists commuting to and from Wellington CBD, and causes unreliable travel times for freight. Rail freight is similarly constrained as frequent rail commuter services are prioritised ahead of freight movements. Increasing congestion will restrict the port's ability to grow. The level crossing on Aotea Quay also creates a conflict resulting in delays for road-based freight travelling to CentrePort and the Strait Shipping ferry terminal.

Ferry capacity

The main domestic rail-based containerised freight movement is between Auckland and Christchurch. All rail freight moved between these destinations moves between the North and South Islands by ferry. Demand for this movement is expected to grow considerably in future. The Interislander and Strait Shipping ferries also carry road-based freight. While there are around 80 truck exchanges with each ferry voyage, the Interislander terminal has limited space for trucks to park (23 spaces total). Greater capacity at the ferry terminals will be needed to support the growing freight business.

Port capacity

Storage capacity at CentrePort is constrained, particularly given its location adjacent to the Wellington City CBD. Growing freight demand and a possible move to larger ships is likely to require more efficient use of existing CentrePort land and possible development of offsite freight storage points or inland hubs.

Access to Seaview/Gracefield

Plans to increase the development intensity of industrial uses at Seaview / Gracefield are constrained by the capacity of local road links to SH2. The high levels of congestion along the Petone Esplanade create reliability issues for freight. The movement of heavy commercial vehicles along the Petone Esplanade also affects the amenity of the foreshore recreational area and limits the opportunity to maximise the recreational and development potential of this area.

Airport capacity

Wellington International Airport currently handles a low volume of freight and, whilst expected to grow, it will continue to be a relatively minor part of the overall freight task. The Wellington Airport Masterplan[1] identifies a series of infrastructure improvements at the airport to increase airfreight capacity including a possible future extension of the runway. These improvements need to be coordinated with improvements to the state highway around the airport, part of the Wellington RoNS project. The introduction of regular domestic flights to Kapiti Airport provides an opportunity for freight to come into the region via this airport as well.

1 http://www.wellingtonairport.co.nz/corporate/2030-masterplan/

Impacts on communities and the environment

Freight movements can have a range of impacts on communities including contributing to congestion, noise, vibration, air pollution, and amenity. These impacts are accentuated where key freight routes travel through urban centres or residential areas. Heavy commercial vehicles are also perceived as creating safety hazards for other road users including pedestrians and cyclists. Concern about environmental or safety impacts relates primarily to road-based freight. However, where railways pass close to residential dwellings they also have the potential to create noise and vibration disturbance.

Limited information about freight

Several recent studies have been conducted on the movement of freight throughout New Zealand. These include the Ministry of Transport's National Freight Demand Study 2014[2], NZ Transport Agency's Central New Zealand Freight Story and the freight matrix upgrade for GWRC's Wellington Transport Strategic Model. Information is also available from the HPMV route studies and sea freight import/export monitoring through the Ministry of Transport's online Freight Information Gathering System[3]. However, information gaps remain around the use of local roads for freight, the movement of light commercial vehicles, and the land use and policy mechanisms that support efficient freight supply chains.

9.4 BENEFITS OF INVESTMENT

The benefits of investment in the transport network which focuses on improving freight efficiency and reducing the impact of freight will be:

- support for regional economic growth and improved productivity
- reducing the cost of doing business and improving the attractiveness of the region for new businesses
- building Wellington's role as a freight hub given its central location within New Zealand
- support for liveable communities and reduced environmental impacts

2 http://www.nzta.govt.nz/about/newsletters/keeping-connected/3288/news.html

3 http://www.transport.govt.nz/sea/figs/

9.5 STRATEGIC RESPONSE

The strategic response is to:

a) Improve the strategic road network

b) Improve access to key freight hubs and freight infrastructure

c) Provide for increased use of HPMVs

d) Remove rail freight constraints

e) Support the development of inland port facilities

f) Reduce the impact of freight movement on communities and the environment

g) Encourage industry collaboration to improve freight efficiency

h) Address freight information gaps

9.6 KEY NETWORK PRIORITIES

Figure 26. The key network priorities for freight are as follows:

Priority area	Explanation
Improve the strategic road network	The Strategic Road Network chapter of this plan outlines the planned improvements to the road network that affect road freight. From a freight perspective, the priority is improvements that will address severe traffic congestion and journey time reliability on the strategic network on SH1 south of Tawa and SH2 south of Petone, where the highest levels of congestion and highest volume of heavy commercial vehicle movements occur. A new link between SH2 and SH1 (Petone to Grenada) will provide more direct connections for freight and remove some traffic from SH2 south of Petone. Addressing congestion and journey times in the above areas will benefit both shorter trips between centres and longer trips to/from Wairarapa, Kapiti or other regions.
Improve access to key freight infrastructure	**Freight access to CentrePort**, the Interislander ferry terminal, and Wellington freight terminal in Wellington City CBD is crucial as these form part of a crucial 'economic gateway' for the region and a major freight hub for freight movements between the two islands and for coastal shipping (domestic and international). However the current port area access is sub-optimal and the transport network at this location is showing multiple signs of stress. In relation to freight, the key problems in this area are: the operational conflicts between road and rail along Aotea Quay; poor connectivity between SH1 and the Interislander ferry terminal; poor quality of the Hutt Road bridge and Aotea Quay off-ramp; and minimal stacking capacity for vehicles using the Interislander services. Progressing solutions to address these issues is a regional and national priority. The impact of poor performing port access could potentially impact on inter-regional freight attractiveness and significantly constrain regional economic growth. **Freight access to Seaview** is also very important. Seaview is a significant industrial hub for the region, has an important national role in the distribution of fuel oil. Addressing significant congestion issues along Petone Esplanade and along SH2 between Petone and Ngauranga are a regional priority.
Provide for increased use of HPMVs	HPMVs are vehicles that carry greater loads and/or are longer than standard heavy commercial vehicles, allowing more goods to be carried by fewer vehicles. This will increase productivity and minimise the environmental impact of road freight operations. All of the state highways in the Wellington region are suitable for HPMVs, however most freight trips start or end on local roads, connecting freight generators or destinations with the strategic road network. Measures to accommodate HPMVs on the main local road feeder routes have been identified although some improvements are yet to be implemented. The full potential of HPMVs will not be realised until infrastructure constraints on local routes are removed. In the short term, the priority focus will be on the local feeder routes identified in Figure 24 of this plan.

Remove rail freight constraints	Rail infrastructure improvements that support rail freight are generally funded and implemented by KiwiRail. The Wellington Regional Rail Plan identifies infrastructure improvements as part of its future development pathway that will have benefits for both passenger rail and rail freight to address current rail network constraints. • Double tracking from Trentham to Upper Hutt is identified in 'Rail Scenario 1', and is signalled to be addressed in the medium term. • Addressing the single track section between Pukerua Bay and Paekakariki (known as North/South Junction Stage 2-3) involves removing one tunnel and building a bridge around the others and is identified in 'Rail Scenario A' to be addressed in the longer term.
Support the development of inland port facilities	The main opportunity within the region for an inland port is the continued development of a log transfer and storage site at Waingawa just south-west of Masterton. This has significant potential given that around 80% of logs arriving at CentrePort come from Wairarapa. Increased use of this inland port will assist with relieving pressure on CentrePort operations to some extent, as well as reducing the number of heavy vehicles using the strategic road network (SH2 Rimutaka Hill road in particular). Ensuring safe and effective access to this site from both state highways and local roads will be crucial to support its continued development.
Reduce the impact of freight movement on communities and the environment	Reducing the impact of freight on local communities and the environment, while still maintaining or enhancing freight effectiveness, will involve the following: • Development of alternative routes, ring routes or bypasses for strategic roads carrying heavy commercial vehicles to minimise the occurrence of heavy freight vehicles passing through the centre of towns/cities or residential areas. This is a particular issue in Kapiti and Wairarapa. • Supporting more freight being moved by rail where this is viable. Modernisation of the heavy commercial vehicle fleet is also likely to reduce the impact of freight on communities and the environment in relation to noise, emissions and safety.
Encourage industry collaboration to improve freight efficiency	Wider opportunities to improve freight efficiency (in addition to network development measures) - should be investigated. For example, reducing 'empty running' to improve efficiency. The import-export imbalance in Wellington and the specialised containers used to transfer fuel and logs could limit efficiency gains. Benefits in this area are usually achieved through industry collaboration and as a result of changing logistics practices.
Address freight information gaps	Addressing information gaps will allow better planning and integration of freight movements as part of regional and local transport planning. This will enable the freight benefits associated with particular projects to be more clearly identified as well as provide valuable information for measuring against strategic freight outcomes. Greater awareness of the freight sector will also contribute to several other key network priorities including improvements to the strategic road network, roll-out of HPMVs, development of inland port facilities, reducing the impact of freight movement on communities and the environment and encouraging industry collaboration.

10. WALKING NETWORK

10.1 INTRODUCTION

A safe, attractive, integrated and well-connected walking network is a key component of an efficient, effective and safe transport system. This network plan outlines the context for walking in the region, describes the main challenges and issues facing walking as a mode of transport, the need for and benefits of investment, and the strategic response and priority areas for improving the walking network.

Investment in the walking network is just one element of the wider plan for improving the region's transport network, and needs to be considered as part of an integrated planning and investment approach.

10.2 WALKING IN THE WELLINGTON REGION

A walking network consists of anything from footpaths in urban areas to separated walkway facilities parallel to strategic roads. It includes crossing facilities across roads, rivers and rail corridors. Walking forms part of almost every trip, whether it is to/from a carpark or bus stop/train station or as a primary mode.

This plan focuses on walking for transport purposes, rather than recreational purposes. However, there is a significant crossover, and recreational walking tracks often form part of the walking network for utility trips.

Data from the New Zealand 2013 census show that 11.7% of journey to work trips[1] across the region were on foot, an increase from 9.8% in 2001. The chart below shows the journey to work mode share over three census years for the region as well as by district.

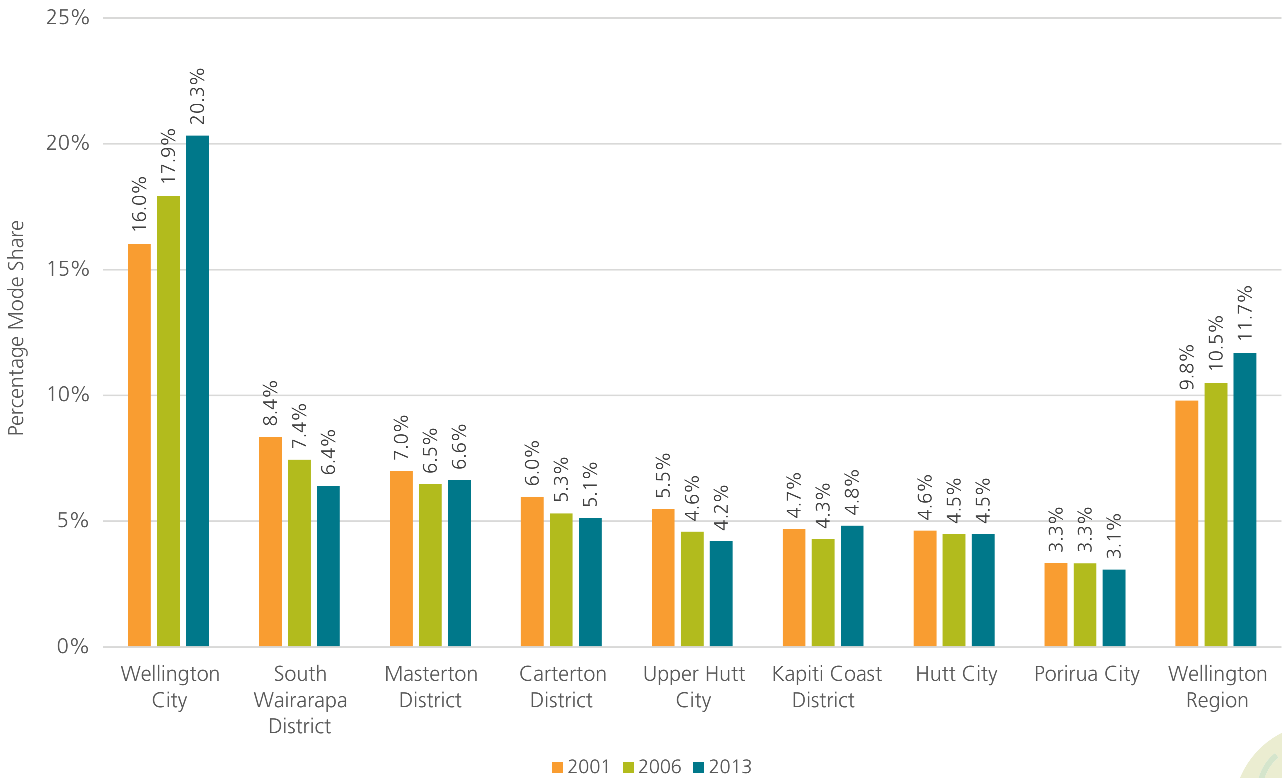
Wellington City has the highest walking/jogging mode share at 20% - it also has the highest population and employment density within the region with a high proportion of people that live within walking distance of work. This highlights the importance of where people live and work as an influence on mode choice.

The Ministry of Transport's Household Travel Survey records the active mode share of total trip legs by residents of main urban areas in the Wellington region. Active mode share

1 Excludes 'did not work' and 'worked from home' categories

Network Plans

Figure 27. Walking / Jogging Travel to Work Mode Share from Census Data



of all trips within urban areas in the region was 27% in the 2008-12 survey period; an increase from 23% in the 2003-07 period. The majority of active mode trips in the region are walking trips.

People generally choose to travel on foot for shorter journeys, often less than 2km in length. The percentage of trips less than 2km carried out on foot has gradually increased from 41% in 2004-08 to 48% in the 2008-12 Household Travel Survey period.

The most recent Household Travel Survey found that 31% of children aged 5 – 12 and 35% of those aged 13 – 17 walked to school in Wellington region. Nationally the proportion of children walking to school has gradually increased from 2008-12.

The average number of pedestrians walking into the Wellington CBD cordon is also increasing. In the 2013 morning peak there was an average of 14,754 pedestrians crossing the CBD cordon. This was a 12% increase from the numbers recorded in 2002.

10.3 THE NEED FOR INVESTMENT

The following section outlines the main challenges and issues in relation to walking in the region.

Lack of adequate walking facilities between key destinations

In some locations the existing environment makes walking unattractive or difficult. There are also locations where the design and/or maintenance of existing pedestrian facilities provide a poor level of service, making walking feel uncomfortable and/or unsafe.

When this occurs between communities or between significant destinations, this can significantly limit the number of walking trips that would otherwise be generated. Key strategic locations in the region where suppressed walking demand suggests the need for an improved pedestrian level of service have been identified and are shown on Figure 28. These are:

- Along SH1 between Haitaitai and the Basin Reserve, Wellington – poor level of service for pedestrians through the Mt Victoria Tunnel
- Along SH2 between Petone to Ngauranga – poor pedestrian level of service limiting the number of walking trips between the Hutt Valley and Wellington
- Along Middleton Road between Tawa and Churton Park - the absence of pedestrian infrastructure limits walking trips between these neighbouring suburbs

A low level of demand for walking trips in some locations means that the provision of dedicated pedestrian facilities cannot always be justified alongside strategic roads, particularly in rural locations. This may limit the use of walking for trips in these areas as people may not feel safe or comfortable walking along the road shoulder or the verge. Along some sections of the rural road network, no shoulder/verge is available and many of the bridges carrying strategic roads over rivers or railways make little or no provision for pedestrians.

Lack of safe and direct pedestrian crossing points

The lack of crossing points for pedestrians across strategic roads is also a significant challenge that can lead to community severance as a result of reduced pedestrian connectivity within and between communities. This is a particular problem where strategic roads pass through urban centres where pedestrian demand is greatest.

Key strategic locations in the region where a lack of pedestrian crossing facilities is leading to severance and reduced pedestrian connectivity have been identified and are shown in Figure 28. These are:

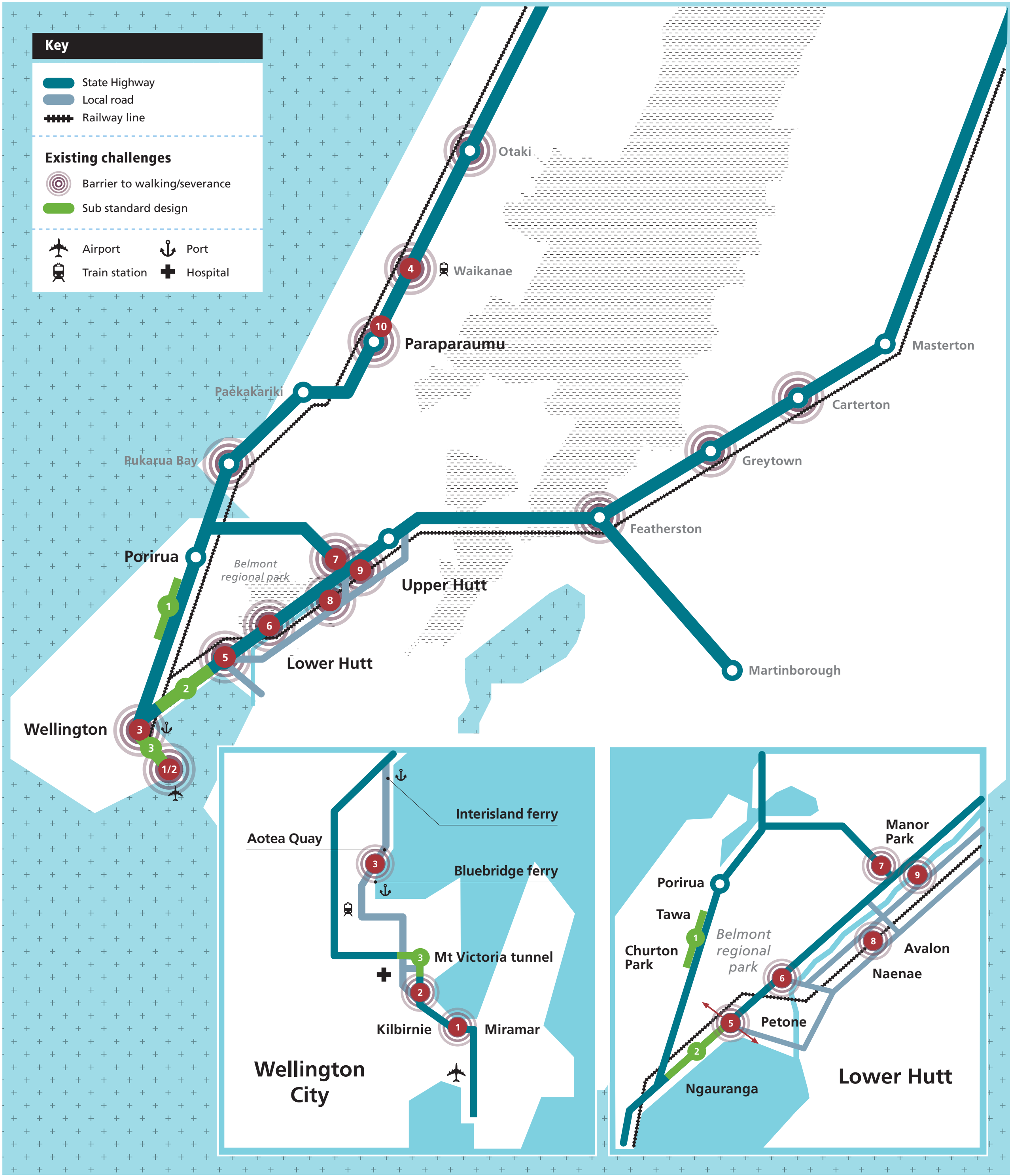
- SH1 Cobham Drive at Evans Bay, Wellington – between Kilbirnie and Miramar
- SH1 Ruahine Street at Goa Street and/or Wellington Road), Wellington – between Hataitai and Mt Victoria (Haitatai Park)
- Along Aotea Quay between the Interisland Ferry Terminal and CentrePort – the lack of a pedestrian crossing at its northern end also creates a barrier to crossing this road
- SH1 at Waikanae – between the town centre and the railway station
- SH2 at Cornish Street, Lower Hutt – between Petone and Belmont Regional Park
- SH2 at Dowse Interchange, Lower Hutt – between Lower Hutt and Maungaraki
- SH58 Haywards Hill Road, Lower Hutt – between Manor Park and Belmont Regional Park.

Future strategic roads including the SH1 Kapiti Expressway and Transmission Gully motorway have the potential to create new severance issues if pedestrian links over/under the new road are not appropriately designed as part of the design and construction stages.

Railway lines and rivers can also create a major physical barrier affecting the convenience of walking. While pedestrians may attempt to cross railway lines without a formal facility, this is discouraged for safety reasons. Rivers present a barrier forcing people to walk for longer or choose a different form of transport. Strategically significant locations where railway lines or rivers create a barrier to walking are shown in Figure 28 and listed below:

- Hutt Valley Railway Line, Lower Hutt – between Naenae and Wingate
- Hutt River at Manor Park, Lower Hutt
- North Island Main Trunk Line, Paraparaumu – between Tutanekai Street carpark and Buckley Grove linking Paraparaumu Domain and Lindale

Figure 28. Wellington Region Pedestrian Network



Top priorities

Sub-standard design

1. *no pedestrian facilities provided along Middleton Rd*
2. *along SH2 between Petone to Ngauranga*
3. *along SH1 through the Mt Victoria Tunnel*

Barrier to walking/severance

1. *across SH1 Cobham Drive at Evans Bay*
2. *across SH1 Ruahine Street at Goa Street*
3. *across Aotea Quay at north end*
4. *across SH1 at Waikanae station*
5. *across SH2 at Cornish Street*
6. *across SH2 at Dowse Interchange*
7. *across SH58 Haywards Hill Road*
8. *Hutt Valley Railway Line north of station at Naenae*
9. *Hutt River at Manor Park*
10. *across Kapiti Railway Line north of Paraparaumu*

Poor walkability within urban centres and town centres

'Walkability' is a measure of how friendly an area is to walking – it includes factors such as footpath quality and width, connectivity, level of pedestrian priority, street furniture, safety, lighting, and shelter. In our key urban centres walkability is often compromised by the competing demands of other transport modes and other infrastructure in the street environment.

Adequate footpath widths to accommodate high volumes of pedestrians can be difficult in locations such as Wellington City CBD or Lower Hutt city centre where the road corridor is constrained and competing demands for traffic lanes, bus lanes, cycle lanes and parking must all be considered.

Long wait times at signalised crossings as a result of high traffic volumes can result in pedestrians crossing against the signals or between formal crossing points, with associated safety risks. Large urban blocks sometimes create severance issues and reduced pedestrian connectivity within city centres.

In rural townships, such as through Wairarapa, the amenity and connectivity for pedestrians is negatively affected by the joint role of the state highway as both the main shopping street and the strategic through route for traffic, including heavy freight vehicles.

Land use development patterns that constrains walking opportunities

Distance is a key factor influencing whether a trip is walkable. Most walking trips are less than 2km. For longer distances, issues such as travel time, fitness and weather conditions start to become barriers. Compact urban form, mixed use developments, and residential development close to local centres, public transport and employment are all land use patterns that support walking as a viable travel option.

While some parts of the region's urban form are relatively compact with good walking access to bus or rail services, other areas have been developed in locations that have poor accessibility and with poor subdivision layouts, so that walking opportunities are constrained.

Pedestrian safety issues

The perception of pedestrian safety in the region is very good (72% of respondents to the 2012 GWRC transport perceptions survey felt safe when walking around the Wellington region). The relative risk of pedestrians being injured is low nationally and within the region, compared to other transport modes.

Therefore, while safety is unlikely to be a barrier preventing the uptake of walking, pedestrians are very vulnerable when they are involved in a crash with a motor vehicle, and pedestrian safety is an important issue that needs to be addressed.

Over the last 15 years the number of fatal and serious injury pedestrian casualties in the region has fluctuated, but with minor injury casualties generally decreasing.

Pedestrian casualties tend to be clustered in urban centres, predominantly on local roads. The largest number of pedestrian casualties occurs in Wellington City. This reflects locations where high levels of pedestrian activity occurs and often conflicts with high volumes of vehicle traffic on busy urban streets.

Pedestrians in Wellington City face a higher personal risk level of death and serious injury compared to pedestrians in other parts of the country. Wellington City is ranked as the third highest city/district in New Zealand for pedestrian risk in the 2014 Communities at Risk Register.

Safety is a commonly identified concern for parents participating in surveys as part of school travel plans, in relation to children walking to school. In addition, school age children are over-represented in the region's road safety casualty statistics.

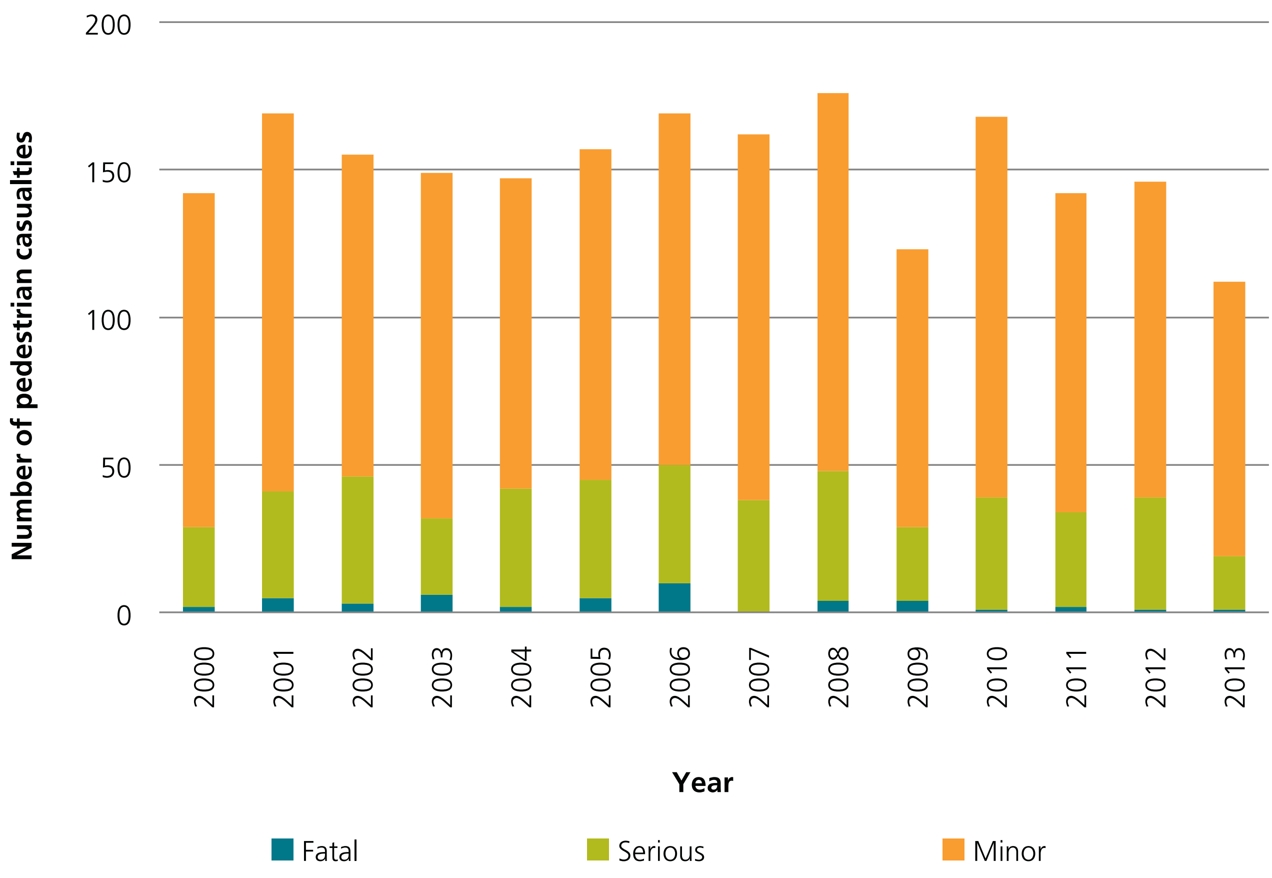
10.4 BENEFITS OF INVESTMENT

Walking is the most efficient mode choice for short trips from a transport network perspective. It is very energy efficient, involves no harmful emissions, is relatively safe, requires no parking space, and requires a relatively small infrastructure footprint. It is also an affordable and healthy choice for individuals. Investment in a good walking network will also contribute significantly to the liveability and attractiveness of a city and region for residents and visitors.

The key benefits of investment in the walking network will be:

- Improved transport choices and resilience
- Improved road safety
- Reduced congestion
- Reduced transport energy use and emissions
- Transport cost savings
- Healthier communities
- Improved liveability

Figure 29 Pedestrian casualties 2000 - 2013



10.5 STRATEGIC RESPONSE

The strategic response is to:

a) Develop improvements to the existing pedestrian networks to provide a level of service consistent with their role and level of use and to remove barriers to pedestrian safety and connectivity

b) Construct new pedestrian facilities or solutions to address identified gaps in the walking network

c) Ensure that land use planning documents encourage urban form and land use patterns that support walking as a feasible option and require new land use development to provide safe, attractive and connected facilities for walking

d) Support an increase in walking trips through promotion and education

10.6 KEY NETWORK PRIORITIES

Figure 30. The key network priorities for investment in the walking network are as follows:

Priority area	Explanation
Network Development Improving the existing pedestrian network and addressing significant infrastructure gaps	**Who develops the network?** Walking is predominantly a local activity for short trips. Local councils therefore have an important role in improving conditions for pedestrians. They maintain and improve their local walking networks in response to community needs. Local walking strategies should be developed to identify priorities and to ensure a process is in place for the ongoing review and improvement of local walking networks. The NZ Transport Agency is responsible for maintaining and improving walking facilities along and across the state highway network. GWRC and KiwiRail manage different elements of the railway network. These agencies need to continue to look at ways to remove barriers to walking along or across strategic transport infrastructure. It is important that all organisations responsible for walking networks work together to address issues of connectivity between communities and to key regional destinations. **Level of service** Consideration of pedestrian needs should be an integral part of street design. Improvements to the walking network will be constructed in accordance with best practice guidance and will include consideration of: • directness and connectivity • crossing facilities and wait times • amenity, shelter, lighting • safety and personal security • footpath quality and widths • signage and information • integration with public transport The appropriate pedestrian level of service for any area will depend on its role/function and degree of use. Development of the pedestrian network should take account of all types of pedestrians. **Priorities for improving walking infrastructure** The priority for investment in walking networks will focus on the following key areas: • walkable centres • connecting key destinations • addressing significant network gaps Investment in walking infrastructure should be targeted towards improving the safety and convenience of walking where there are already high levels of pedestrian activity, such as local and city centres. Investment should also be targeted towards enhancing routes that provide access to key destinations such as employment centres, public transport stops and interchanges, recreational facilities, education and healthcare facilities. Another investment focus should be addressing significant gaps in walking infrastructure level of service or significant barriers which are considered to be limiting the potential walking trips in those locations. In large city centres such as the Wellington CBD, the development of a transport hierarchy, such as a Network Operating Plan[1], is encouraged as a way of clarifying priorities along particular streets within the transport network. This can assist with the issue of competing demands and ensure that appropriate pedestrian priority is provided for. In rural town centres, the dual and often conflicting role of the main street as a destination to shop, eat, work and a strategic transport through route for freight and general through traffic needs to be considered in the design of the network. Street design and speed limits that improve pedestrian amenity and ensure safe crossing opportunities will be important. However, these need to be balanced with the needs of providing for effective movement of through traffic. Longer term it may be necessary to consider bypass options for these towns, particularly for heavy freight vehicles, if these conflicting needs cannot be adequately addressed.

1 A localised plan developed under the Network Operating Framework concept developed by the NZ Transport Agency

Land use planning New land use development supports walking as a feasible option and includes safe, attractive and connected facilities for walking	Local councils regulate land use activities through the development of district plans and processing resource consent applications. They therefore have a key influence on the way land is developed and the ability to ensure that new development supports walking and can sometimes facilitate development that addresses existing network deficiencies. Land use planning documents should include provisions to guide the location of new development to areas that can provide a high degree of accessibility, and to ensure new subdivision and development is designed to support walking as a viable option to access shops, education, employment and public transport.
Promotion and education Supporting and encouraging an increased uptake in walking trips	There are good opportunities to increase the uptake of walking by promoting the personal benefits of walking for individuals. Education programmes and campaigns will also be needed to support improved pedestrian safety. Education and promotional activities should also be designed to target particular groups or audiences. For example: • road safety skills in schools as part of school travel programmes • promoting walking when a person's circumstances change (such as a new home or job) • promoting walking as part of active transport programmes and events aimed at travel to work • promoting use of new pedestrian facilities. Education and promotional activities around the benefits of walking and pedestrian safety should be targeted at children and young people at a time when habits are formed, and should be maintained as children progress into adulthood to support a walking culture. School travel programmes are an important tool to understand and address some of the barriers to children walking to school – these are discussed in more detail in section 14 of this plan titled 'Travel Demand Management'. Campaigns aimed at reminding adults about safe walking behaviours, particularly in relation to crossing roads, are also an important element to support pedestrian safety. Improving information for walking will also support an uptake in use of walking for trips – for example, ensuring that good journey planning tools, maps and information are available. Forums that provide opportunities for organisations to share information about walking are also important. These provide for improved coordination and collaboration on walking projects, events, and campaigns throughout the region and for the sharing of ideas, information and best practice.


GIRO

11. CYCLING NETWORK

11.1 INTRODUCTION

Cycling provides an efficient and affordable transport option for short to medium distance trips. However, ensuring cycling is a safe and attractive option can be challenging in the context of many competing demands for road space. This network plan outlines the strategic context for investing in cycling and provides direction and priorities for development of the cycle network.

Investment in cycling is one element of the wider plan for improving the region's transport network and needs to be considered as part of an integrated planning and investment approach.

11.2 CYCLING IN THE WELLINGTON REGION

All roads within the region form part of the overall cycle network, however along key routes more specific cycle facilities are often provided. The length of cycle facilities within the Wellington region has been increasing over the last decade. In 2012, there were approximately 44km of on-road cycle lanes and 68km of off-road sealed cycle paths (shared and dedicated). There are also extensive lengths of unsealed off-road paths predominantly used for recreational cycling.

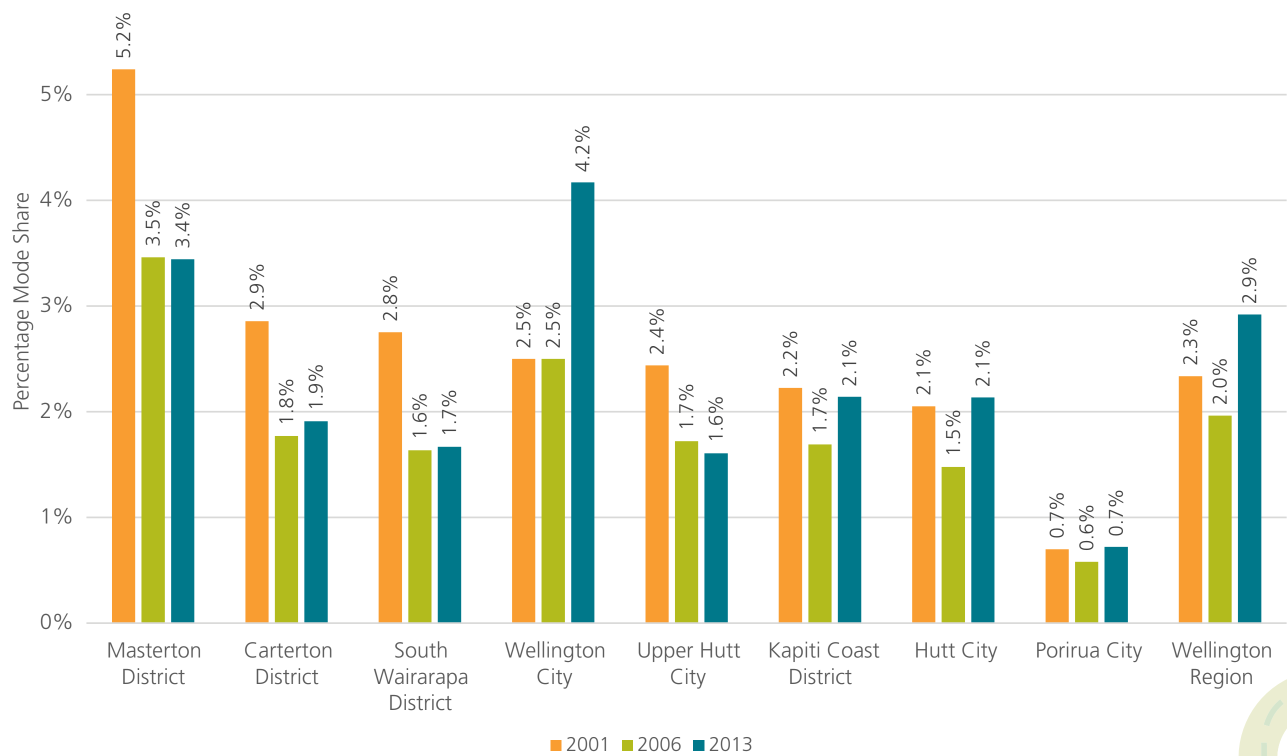
Compact, fully folding cycles can be carried on buses and trains in the region. Other cycles can be carried free of charge on a first come, first served basis on the region's passenger train services with the exception of specified peak services on the Kapiti and Hutt Valley lines. A limited number of cycles can also be carried on harbour ferry services and the Kelburn cable car. The number of cycle parking spaces provided at railway stations has doubled from 132 in 2009 to 294 by 2013.

Almost half of all households in the region have access to at least one bicycle. The New Zealand Household Travel Survey showed that between 2007 and 2011 the proportion of adults indicating they have cycled at least once in the last year increased from 27% to 34%.

The Household Travel Survey also indicates that cycling trips are getting longer and faster which reflects the increasing trend of cycling for fitness and reduction in cycling for shorter utility trips. The 2013 census showed that 2.9% of journeys to work in Wellington region[1] were by bicycle, up from 2.3% in 2001.

1 Mode share excludes "Did not work on census day" or "Worked from home" to emphasise the differences between each census year.

Figure 31. Cycling Mode Share 2001, 2006, 2013, by District and for Wellington Region



All local council areas, with the exception of Upper Hutt, South Wairarapa and Masterton had a greater cycling mode share for trips to work in 2013 compared to 2006. Cycling to work appears to be more popular in cities and larger urban areas than in rural districts. This may indicate that traffic congestion, slow motorised travel and higher parking costs in urban areas increases the relative appeal of cycling. Figure 31 shows this overall increase and highlights the large change within Wellington City. The number of cyclists observed crossing the Wellington CBD cordon in the morning peak grew incrementally by more than 70% between 2001 and 2013.

School travel plan data collected within the region indicates that the proportion of children that cycle to school is less than 4%. The Ministry of Transport[1] reports that nationally the proportion of children travelling to school by bicycle is significantly less than 20 years ago.

Figure 32 shows the aspirational network of regionally significant cycling corridors for the Wellington region. The regional cycling network has been identified based on the key corridors linking the region's communities, both commuter/utility routes and recreational focused routes.

There are two nationally significant recreational routes within Wellington region which form part of the NZ Cycle Trail. These are the Rimutaka Cycle Trail and the Wairarapa Valley Cycleway. In addition, the Makara Peak Mountain Bike Park is a nationally significant destination for recreational cycling. A regionally significant recreational route is the Great Harbour Way/Te Aranui o Pōneke, from Fitzroy Bay in the east to Sinclair Head in the west. Sections of both the Rimutaka Rail Trail and the Great Harbour Way have a dual utility/commuter and recreation role. Providing opportunities for recreational cycling will help to encourage the long term growth of cycling for transport.

Figure 32 also highlights a number of existing gaps in the regional network. In general, these network gaps or deficiencies have been identified as those sections of the regional cycling network:

- that do not have either an on-road cycle lane or an off-road cycle path
- that have a cycling facility that is significantly sub-standard (for example, the very narrow path shared with pedestrians along SH1 between Pukerua Bay and Paekakariki)

1 http://www.transport.govt.nz/assets/Uploads/Research/Documents/Comparing-travel-modes-2014-y911-final-v3.pdf

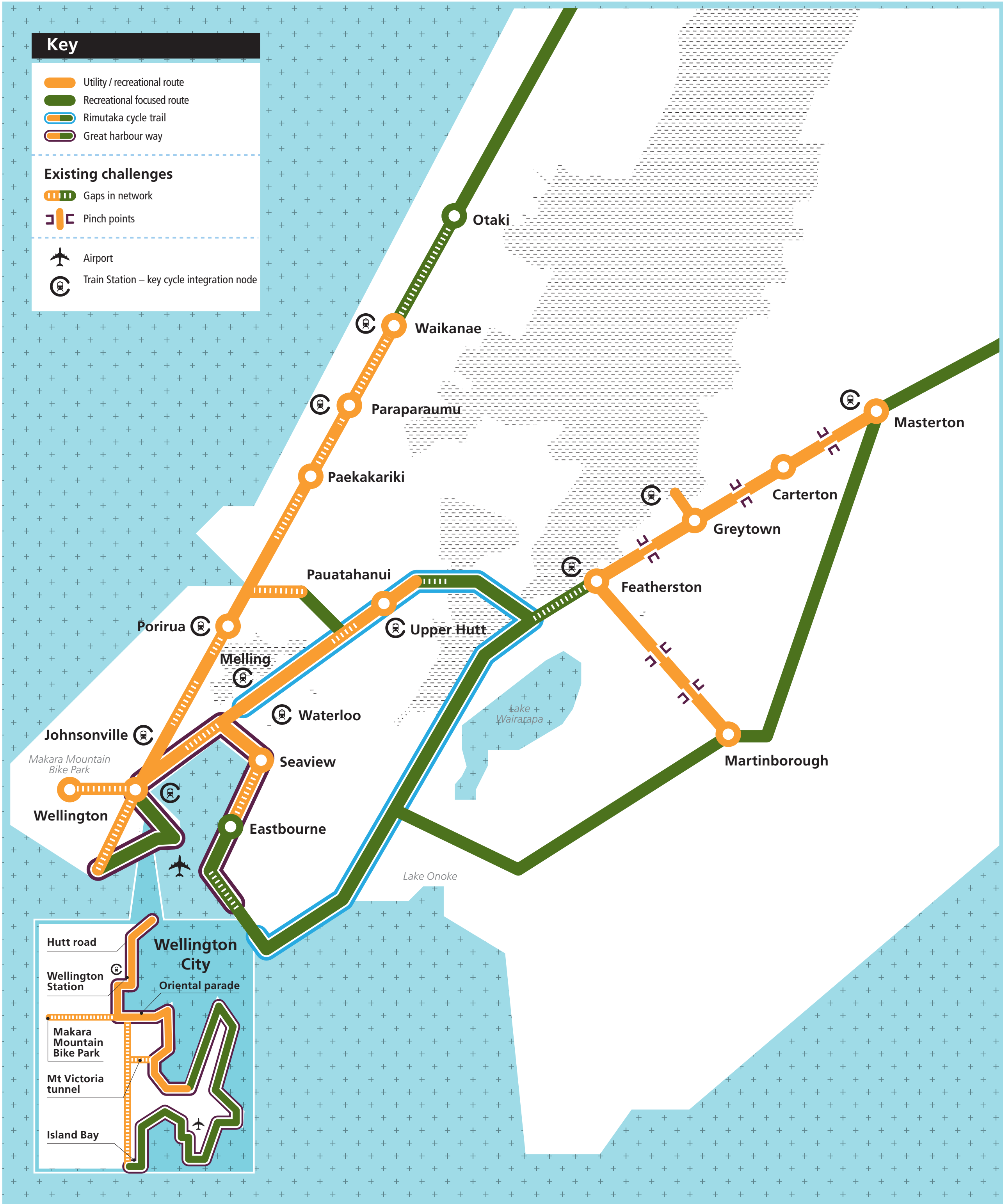
Some exceptions were identified where no facility is provided but where the adjacent traffic environment/speed or low level traffic volumes would make a dedicated cycle facility a lower priority in the context of the wider regional cycling network. For example:

- Around the Miramar Peninsular and south coast from Shelley Bay Road to Island Bay
- Martinborough – Masterton road
- Lake Ferry Road
- Western Lake Road

Pinch points on the cycling network are identified in Figure 32 where bridges force cyclists to share a narrow lane with high speed traffic.

The gaps and deficiencies identified in the map below are not intended to be comprehensive, but to give an indication of the most significant network gaps that currently exist. There are other parts of the regional cycling network where the level of service should be improved to provide a safer and more attractive cycling route. The expected level of service and priorities are outlined under the 'key network priorities' section of this plan.

Figure 32. Wellington Region Cycling Network



11.3 THE NEED FOR INVESTMENT

This section outlines the main challenges and issues in relation to cycling in the region.

Cyclists are relatively vulnerable to death and serious injury

Cycling has a number of associated health and wellbeing benefits. However, the relative risk of cyclists being injured is high compared to other transport modes and cyclists are relatively vulnerable to death or serious injury when a crash occurs. A cyclist fatality is more likely to result from a crash involving motor vehicles.

¬Over the last 15 years the number of fatal and serious injury cyclist casualties in the region has shown an increasing trend up to 2008, then a generally decreasing trend to 2013. Despite this trend, the number of serious and fatal cyclist casualties is still relatively high. Figure 33 shows the number of cyclist casualties recorded in the Crash Analysis System (CAS), but it should be noted that this only includes crashes where a motor vehicle is involved, whereas the majority of cycling crashes do not involve a motor vehicle.

Cyclists in the Wellington region have a greater than average[1] risk of being killed or seriously injured whilst cycling. The Communities at Risk Register 2014 identifies the Wellington region as having the second highest level of personal risk after the Auckland region. Wellington City is the part of the region where cyclists statistically have the highest risk of injury, the third highest area in New Zealand. There is also greater than average risk in Kapiti Coast and Hutt City.

Cycling is perceived as being unsafe, limiting the potential growth in cycling numbers

There is a strong correlation between the public perception of safety and uptake of cycling. People's motivations and barriers to cycling are relatively universal and perception of safety is a more important determinant of uptake than the real risk of injury.[2]

In 2012, a survey found that around half of respondents (49%) felt that cycling around the Wellington region was unsafe.[3] Only 22% thought it was safe cycling in the Wellington region.

In some parts of the Wellington region, cyclists are forced to mix with high traffic flows and/or traffic moving at high speeds, and to travel through busy intersections. Research into the type of cycling infrastructure needed to attract new cyclists found that high traffic volumes and proximity to fast moving traffic were key contributors to safety concerns and feelings of stress when cycling. It found that cyclists perceived that some level of separation from other traffic improved safety.[4]

Poor perceptions of safety are limiting the uptake of cycling and mean that the benefits of cycling for the community are not being fully realised. Cycling investment should seek to address the actual safety of cycling, which will in turn improve the perception of cycling safety and increase participation. Increasing the numbers of cyclists to develop a critical mass will contribute to greater visibility and awareness of cyclists by other road users, making it safer to cycle.[5]

An increasing number of inexperienced cyclists using the network in urban centres

In 2013 there were significantly more adult cyclists recorded than in 2006.[6] This means it is likely that there has also been an increase in inexperienced cyclists using the region's roads and cycling network. The increase in cycling is noticeable in our cities and larger urban areas where there is greater conflict with other road users. This combination of novice cyclists at locations with greater exposure to risk contributes to the overall safety risks associated with cycling.

The increased availability of electric bikes may open up cycling as an option for older and less fit people, and people who live in hill suburbs. With this increase come some additional safety issues relating to other road users accurately judging a cyclist's speed on an electric bike, and potential conflict on shared paths with pedestrians. Education, training and infrastructure improvements will need to respond to this evolving issue.

Providing for different types of cyclists[7]

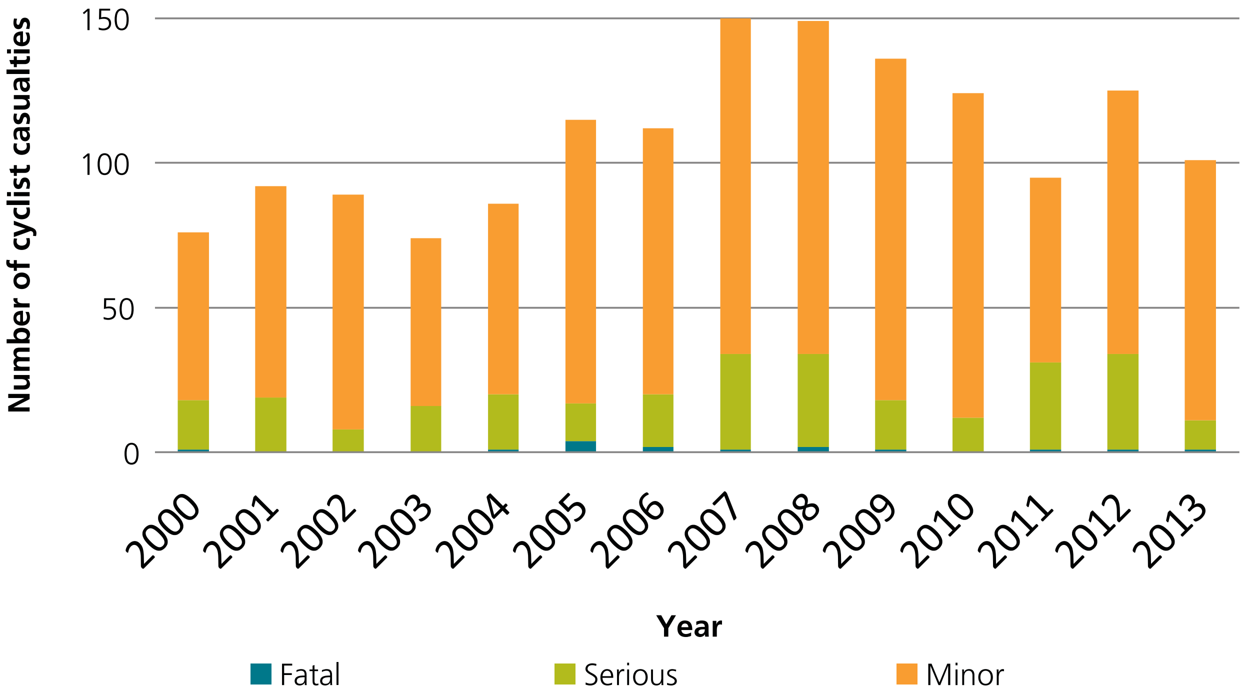
Cyclists prefer different types of riding environments depending on their trip purpose, age, and their level of experience.

Cycle commuters vary in skill, fitness and risk tolerance. Some are highly skilled and able to handle a variety of traffic conditions while others prefer off-road paths or low-stress roads and are willing to take longer routes to get to their destination. This can make development of the cycling network difficult and requires cycle facilities to be designed to take account of these differing needs.

Cyclists of all skill levels desire routes that are safe, convenient and pleasant. Convenience includes directness but also aspects such as the ability to pass through congested areas without delay and secure parking at trip ends. More experienced cyclists may prefer to use the road system regardless of traffic conditions as this provides a smooth riding surface and speed environment that they prefer. In some cases, parallel on-road and off-road options will be needed to cater for these different needs.

1 Compared to the New Zealand mean average of people killed or seriously injured per million cycling hours.
2 Parkin, J.; Ryley, T. J.; Jones, T. J. (2007). Barriers to cycling: an exploration of quantitative analysis. Civil Engineering: University of Bolton Institutional Repository.
3 Greater Wellington Regional Council, Transport Perceptions Survey 2012.
4 New Zealand Transport Agency. Research Report 449. Assessment of the type of cycling infrastructure required to attract new cyclists, 2011.
5 Turner, S. A.; Roozenburg, A. P.; Francis, T. (2006). Predicting accident rates for cyclists and pedestrians. Land Transport New Zealand Research Report 289.
6 NZ Census data
7 Adapted from Austroads AP-G88-11, Page 9.

Figure 33. Cyclist casualties 2000 – 2013. Source: NZTA CAS



11.4 BENEFITS OF INVESTMENT

There is an immediate need to invest in cycling for trip making or utility purposes to support the desired strategic outcome of more people cycling. Investment in cycling for recreation uses is also needed to grow cycling in the long term, as recreational cycling provides a gateway to utility cycling. Investing in recreational cycling routes provides opportunities for people to develop their cycling skills, to exercise and to keep fit. These benefits are realised over a longer period (i.e. as children grow up). Investing in recreational cycling will also help to support the growth of the regional tourism sector.

The key benefits of investment in the cycling network will be:

- Improved transport choice
- Improved road safety
- Greater transport system resilience
- Reduced congestion
- Reduced harmful transport emissions
- Healthier communities
- More recreation opportunities
- Increased tourism revenue

11.5 STRATEGIC RESPONSE

Addressing the key challenges requires investment in both cycling infrastructure and education/behaviour change programmes. Evidence shows that behavioural change activities have limited effect without also improving the cycling environment.

The strategic response is to:

a) Develop improvements to the identified strategic cycle network to provide an appropriate level of service consistent with its role, function and level of use (including suppressed demand).

b) Develop improvements to local road networks to improve the safety and level of service for cyclists travelling to/from the strategic cycle network and other key local destinations such as shops, health, education and recreational facilities.

c) Support an increase in cycling trips through promotion, education and skills training.

d) Ensure that land use plans encourage urban form and land use patterns that support cycling as a feasible option and require new land use development to provide safe, attractive and connected street layouts for cycling.

11.6 KEY NETWORK PRIORITIES

Figure 33. Cyclist casualties 2000 – 2013. Source: NZTA CAS

Priority area	Explanation
Network development Improving the strategic cycle network safety and level of service and addressing significant infrastructure gaps	**The regional cycling network** Regionally significant routes/corridors provide a core network for cycling and need to be fully integrated with local cycling networks. The regional cycling network should provide for inter-district travel connecting the main urban cycling networks, and should be developed to be safe, convenient and pleasant. A combination of the regional cycling network and key local cycling corridors should provide safe and easy access to destinations such as CBDs, hospitals, public transport nodes, healthcare and major education and recreational facilities. **Level of service of the regional cycling network** Cycling corridors that make up the regional cycling network should be developed to provide options for less experienced or lower skilled riders. However, these corridors must also provide options for more experienced cyclists who may wish to travel at greater speeds. The regional cycling network should ideally have some degree of separation from traffic. Where full separation is not achievable, partially separated lanes, on-road cycle lanes or quieter parallel routes should be provided. Ultimately the choice of facility will be subject to practical constraints and best-practice guidance. **Priorities for staged development of the regional cycling network** The regional cycling network will be developed incrementally by local councils and the NZ Transport Agency. Priority should be given to: • addressing personal risk of death or serious injury on the regional cycle network and other key commuter corridors in urban areas • addressing major gaps or deficiencies in the regional cycle network to provide greater route consistency and unlock greater benefits from the wider cycling network (e.g. between Ngauranga and Petone) • flagship routes, including nationally and regionally significant recreational routes that provide opportunities for positive media and promotional activities • providing for utility journeys less than 12km in length • commuting or utility routes with low gradient that involve less than 200m of climbing • providing separated cycling facilities on or adjacent to high volume, high speed highways and roads (e.g. between Peka Peka and Otaki) • routes that link up communities not well served by public transport **Integration with public transport** Improving the integration between public transport and cycling will support the uptake of both modes. For example: • Improving key cycle routes to/from train stations and providing good bicycle parking options will encourage more people to cycle to stations. This has the additional benefit of increasing the reach of public transport. • The ability to carry bicycles on public transport vehicles enables cyclists to make part of their journey by public transport. This also provides a safety net for when cyclists have a break down or face stormy conditions, and can help to overcome challenging distances or topography. The short term focus will be on enhanced integration with the rail network. Integration with the bus network is more challenging, but remains a longer term objective. Those railway stations that are strategically located on a regional cycle route are shown on Figure 32. These are stations particularly important from a cycling integration perspective. They have been identified based on their location at the end of commuter railway lines, where good cycle integration will significantly extend the reach of rail for adjacent communities, or where they provide a point of access to regional cycle trails. These stations will generally have good provision of secure cycle parking facilities.

Promotion, education and skills training Promoting the benefits of cycling to increase uptake and supporting cyclist safety through improved education, training and awareness.	**Promoting the benefits of cycling** Behaviour change programmes and campaigns will be used to encourage new cyclists by highlighting the benefits of cycling to the individual including: • improved health/fitness • saving money • convenience These programmes should be designed with an understanding of the different parts of society and with recognition that there may be different barriers for different ages, ethnicities or socioeconomic groups. Existing cyclists may have different information needs to new cyclists or those contemplating taking up cycling. To achieve a long term increase in cycling levels it is important to target not only people who are 'ready for action' but also people that may contemplate cycling in future. These people require greater information, motivation, or incentives to start cycling. People may also try cycling for a time and then stop for a time. Behaviour change programmes therefore need to be ongoing and continuous. Promotion of cycling will be carried out through school travel plans, cycling events, marketing campaigns, and promotion linked to the provision of new safe cycling facilities or targeted at people's change of circumstances (such as a new home or job). More details are provided in the travel demand management chapter of this plan. **Education and training** Education programmes are important to raise awareness of safety issues for existing and new cyclists, and awareness of other road users (drivers of cars, trucks, buses). Examples include driver/cyclist awareness and cyclist visibility education campaigns. Cycle skills training programmes (e.g. 'Pedal Ready') are an important priority to ensure that cyclists (new and existing) have the skills to ride safely when using the road network and cycling network. Education and training programmes should target issues specific to cyclists on electric bikes, including driver perception of travel speed and safe use of shared paths. **Improving information for cycling** Ensuring that good journey planning tools, maps and information are available for existing and new users of the region's cycle network will assist to increase the use of cycling for trips. Other information to improve cycling safety will be identified and made available, such as the assessment of bike lights.
Land use planning New land use development supports cycling as a feasible option and includes a safe, attractive and connected street layout for cycling	Local councils regulate land use activities through the development of district plans and processing resource consent applications. They therefore have a key influence on the way land is developed and the ability to ensure that new development supports cycling and can sometimes facilitate development that addresses existing network deficiencies. Land use planning documents should include provisions to guide the location of new development to areas that can provide a high degree of accessibility, and to ensure that new subdivision and development is designed to support cycling as a viable option to access shops, education, employment and public transport.

OTHER ACTION AREAS

12. ROAD SAFETY

12.1 INTRODUCTION

Safety should be at the core of the regional transport system. Measures to improve road safety should target every element of the transport system including safe road use, safe speeds, safe roads and roadsides, and safe vehicles.

Investment in road safety is one element of the wider plan for improving transportation outcomes within the Wellington region. This chapter describes the current state of road safety, sets out the main challenges facing the region and outlines the strategic response.

This plan will be implemented by the organisations represented on the Regional Transport Committee in collaboration with NZ Police and the Accident Compensation Corporation (ACC).

12.2 ROAD SAFETY IN WELLINGTON

The number of fatal and serious injury casualties in the Wellington region between 2002 and 2013 [1] is shown in Figure 35.

1 Data extracted from the NZ Transport Agency Crash Analysis System (CAS)

In 2013 there were 18 fatal and 115 reported serious injury casualties. Total fatal and serious injuries increased from 2002 to 2007. Since then there has been a generally decreasing trend to the lowest figure for a decade in 2013. This has occurred as both car ownership and car usage within the region has increased.

Despite this overall trend, the 18 fatalities in 2013 was the highest number killed since 2009 and significant effort is still required to move towards the Vision Zero outcome described in this plan.

Figure 36 shows total recorded minor, serious and fatal injuries across all road user types in the Wellington region by district for selected years between 2002 and 2013. The injuries per capita for 2012 and 2013, for each district, are also shown. The number of injuries was highest in Wellington City followed by Hutt City.

There is a much higher crash rate per capita in the Wairarapa than in other parts of the region. This may be due to the poorer design of roads and roadsides coupled with high speed limits, as reflected in the 2014 Communities at Risk register.

Figure 35. Fatal and serious casualties, Wellington Region

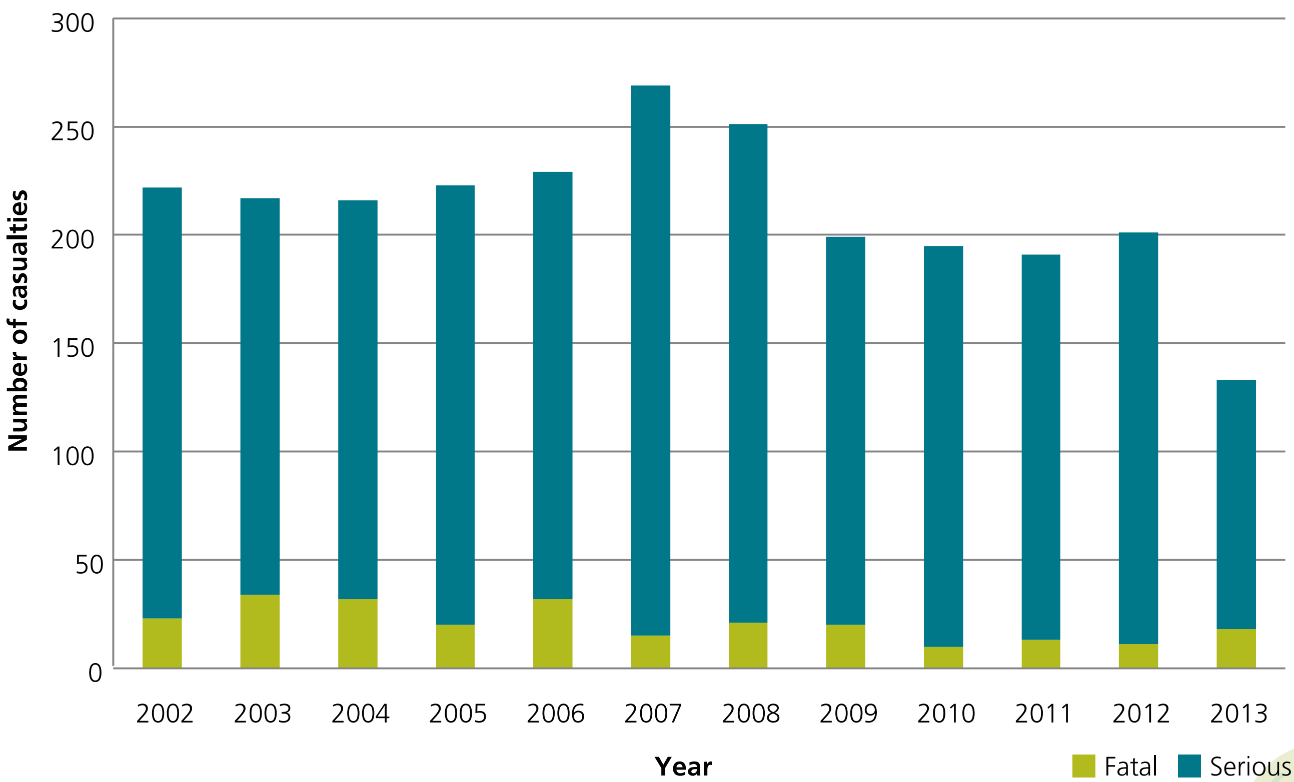
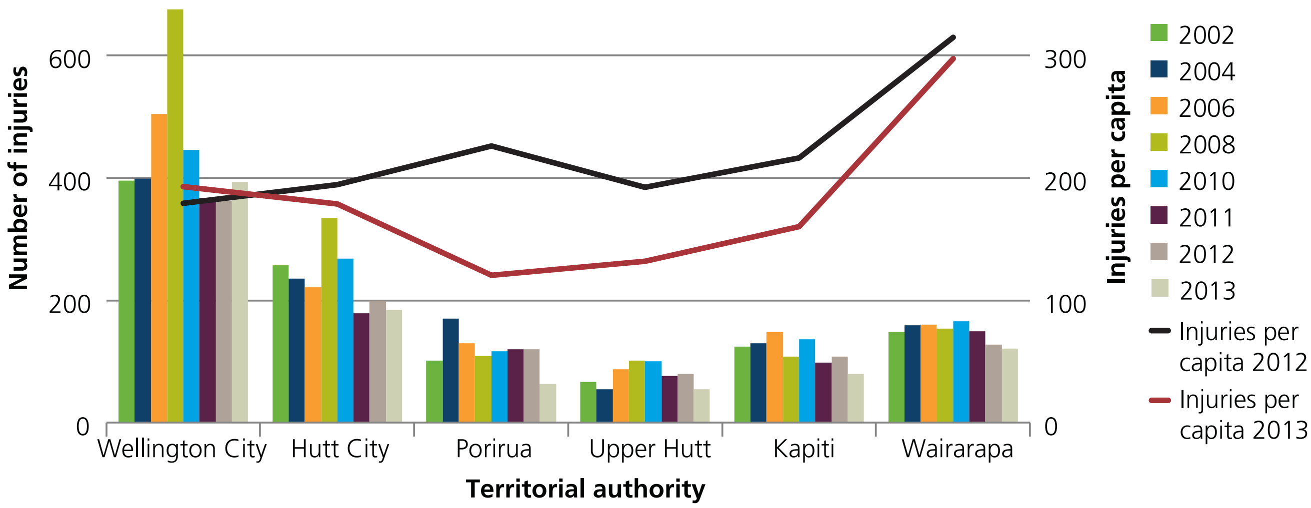


Figure 36. Total injuries and injuries per capita by city and district



12.3 THE NEED FOR INVESTMENT

This chapter highlights the road safety challenges facing the region and the expected benefits from investment in road safety measures.

Communities at risk: The NZ Transport Agency's 'Communities at Risk Register' identifies communities that are over-represented in terms of road safety risk. The register ranks communities by local authority area and compares them against the national average. This allows resources to be better targeted to where they are most needed. The Communities at Risk Register focuses on personal risk – a measure of the crash rate per VKT or per hours travelled.

Wellington region has the first and second highest personal risk for motorcyclists and cyclists[1] respectively indicating that safety for these modes is likely to be a region-wide problem.

The analysis also identifies patterns associated with different parts of the region:

- Wairarapa is over-represented in terms of crashes involving young drivers, alcohol, excessive speed, rural roads and restraint use.
- Wellington City is over-represented in terms of all vulnerable road users – i.e. pedestrians, cyclists and motorcyclists. Hutt City is also notable for high personal risk for motorcyclists.
- Wellington City is also notable for having a higher risk of crashes at intersections overall, and Carterton and Upper Hutt are identified as being of high and medium concern respectively for rural intersections.
- Kapiti Coast is over-represented in terms of crashes involving older road users.

1 It is important to note that the Communities at Risk Register is based on analysis of data from the Crash Analysis System (CAS) and does not include crashes that occur without involvement of a motor vehicle. This means that two-thirds of serious cyclist crashes, due to loss of control for example, are not captured in this analysis.

State highways - The New Zealand Road Assessment Programme, KiwiRAP, assesses the road safety of the state highway network. KiwiRAP analysis of the regional state highway network identifies that for most of the region, the overall personal risk is low with the exception of:

- SH2 between Upper Hutt and Featherston where personal risk is high
- Along SH53 and SH58 which have medium to low personal risk.

Analysis for the Wellington region shows the collective risk is high or high to medium for most of the region's state highways as shown Figure 37. The highest collective risk is:

- SH2 between Upper Hutt and Featherston
- Along SH58
- SH1 through Kapiti.

Collective Risk vs Personal Risk

Collective risk is a measure of the total number of fatal and serious injury crashes per kilometre over a section of road. On average, the higher the traffic volumes, the higher the collective risk.

Understanding collective risk can help us understand where the greatest numbers of crash reductions can be achieved through infrastructure improvement and enforcement.

Personal risk is a measure of the risk to each individual using the state highway being assessed. It takes into account the traffic volumes on each section of state highway.

Personal risk is often highest on lower volume, lower standard, mountainous roads.

Figure 37. Wellington Region Kiwirap Collective Risk Map

12.4 BENEFITS OF INVESTMENT

In addition to the unacceptable numbers of people killed and seriously injured on our roads, there are significant impacts of road crashes on families, the wider community and the health system. Most crashes are preventable and all make an economic impact. Nationally the social cost of crashes is estimated to be $3.8 billion each year. The ultimate benefit of investment will be a safer road system on which no one is killed and that is increasingly free of serious injury.

12.5 STRATEGIC RESPONSE

A system wide approach will be used to address safety issues. This involves targeting:

- Safe roads and roadsides
- Safe speeds
- Safe vehicles
- Safe road use

This approach is aligned with the national 'Safer Journeys' strategy[1] and a 'Vision Zero' philosophy.

Vision Zero is a Swedish approach to road safety based on the principle that no loss of life is acceptable. This approach seeks to reinforce the need for an ongoing reduction in serious and fatal crashes until the ultimate goal of no fatalities is achieved.

Safer Journeys, the national strategy guiding road safety improvements, seeks to establish the safe system approach within New Zealand. This works on the principle that it is unacceptable for a road user to be killed or seriously injured if they make a mistake. The safe system approach aims to create a forgiving transport system based on the recognition that:

- people make mistakes and some crashes are inevitable
- people are vulnerable and our bodies have limited ability to withstand crash forces
- we need to share responsibility between system designers, system maintainers and the people who use roads
- all parts of the system need to be strengthened including roads and roadsides, speeds, vehicles, and road use so that if one part fails, other parts will protect.

Adopting a safe system approach does not remove road user responsibility for road safety. It seeks to ensure that a combination of interventions are implemented that take account of human fallibility.

The key areas of intervention that will be used to address road safety issues in the region are as follows.

1 http://www.saferjourneys.govt.nz/

Figure 38

Safer speeds

Managing speed on the roading network to safe levels is crucial to reducing deaths and serious injuries because the outcome of all crashes is strongly influenced by impact speed.

Evidence shows a strong correlation between collision speed and risk of death or serious injury. This risk is elevated where an elderly person or heavy vehicle is involved. This relationship is shown in Figure 39 below.

Safer speeds will be achieved through a combination of engineering enhancements, education and enforcement.

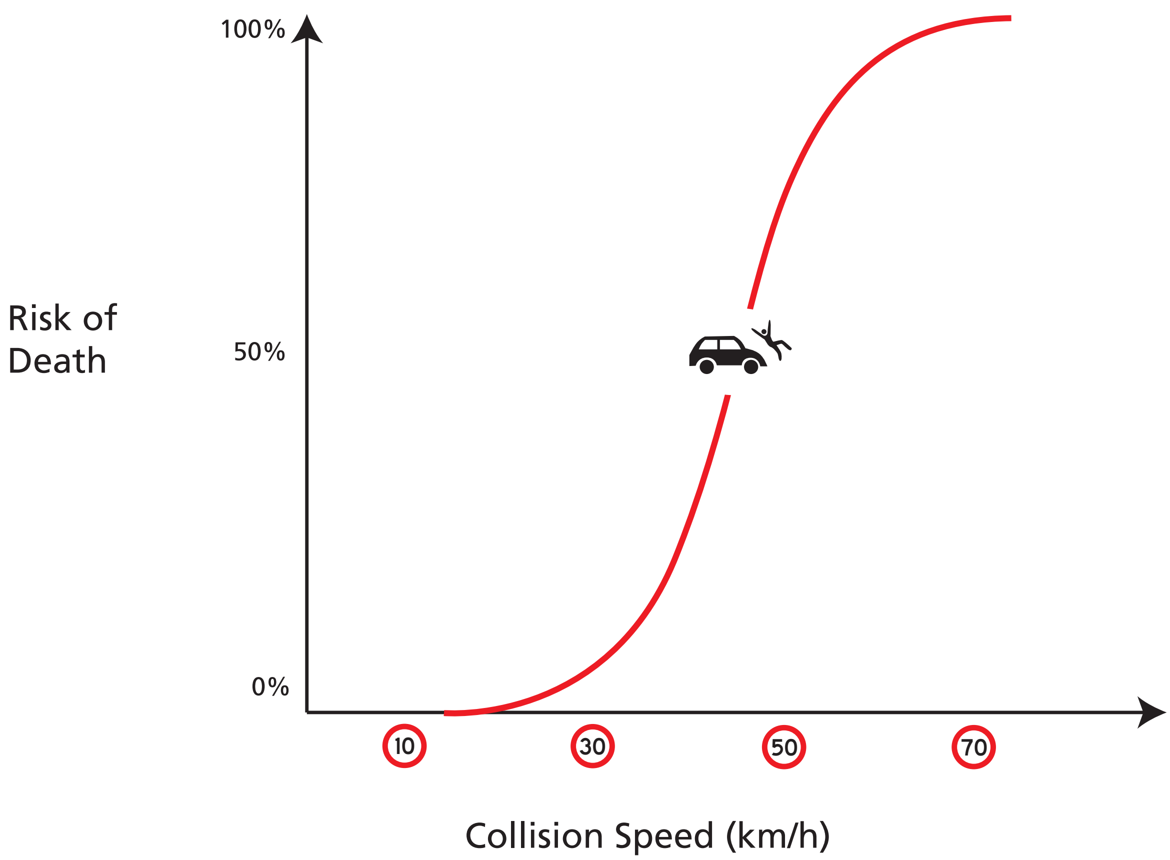
- **Engineering** - delivering safer speeds will involve measures to provide self-explaining roads through a combination of signage, road markings, road widths and street layouts. In some locations, such as around schools and through city or local centres, traffic calming or reduced speed limits will be more appropriate. It is important that the posted speed limit matches the road environment or risk.
- **Education and awareness** - consistent messages will be developed highlighting the importance of safe speeds and appropriate speed for different routes and road conditions. These messages will be communicated through road safety promotion and education campaigns including the provision of information/signage at locations with a history of speed-related crashes.
- **Enforcement** - use of speed camera enforcement at the most dangerous crash locations and targeted enforcement campaigns will be used to support speed awareness and education programmes.

Safer roads and roadsides

Much of the region's road network was built when there were fewer vehicles on the roads, travelling at lower speeds and existing road infrastructure needs improving to provide safely for higher volumes of vehicles travelling at faster speeds. Measures to achieve safer roads and roadsides will vary in scale according to the size of the problem and the assessed risk of death and serious injury. The design of engineering measures should take all road users, including pedestrians and cyclists, into account and consider the role and function of a road in the network hierarchy.

- **Road maintenance** - the importance of maintenance and operations in creating a safe road environment should not be overlooked. Maintenance is important in terms of ensuring smooth road surfaces, adequate surface friction, visibility of road signs and markings as well as the integrity of barriers and other road safety systems. Maintenance programmes may also be optimised to include low-cost safety improvements.

Figure 39



- **Forgiving road design** – continual enhancements are needed to make our roads and roadsides more forgiving. This may involve measures such as curve re-alignments, adequate shoulder widths, median barriers, safe passing lanes, relocation of roadside poles/lamp posts. These improvements will be important on those parts of the existing strategic network where current road design (narrow, sharp bends, no median barrier) contributes to the greater likelihood of more head-on crashes or run-off road crashes – e.g. along SH58 and along SH2 between Upper Hutt and Featherston.

- **Safer intersections** - there is a need to continually improve safety at urban and rural intersections. Measures will seek to improve the safety of all road users, including cyclists and pedestrians.

- **Intelligent transport systems** – these are a range of tools and systems that use technology to manage travel speeds on high-volume networks and provide drivers with live information about driving conditions, accidents and incidents affecting the transport network. Examples include variable speed signs or message boards, or 'ramp metering' which controls the rate at which traffic can enter a motorway from on-ramps.

Safe road use

As highlighted in the principles of a safe system approach above, people are fallible and will inevitably make mistakes when using the transport system, sometimes resulting in crashes. However, a combination of education and awareness programmes and enforcement tools will assist in minimising those mistakes and will encourage safe road use.

- **Road safety education and awareness** - education and awareness campaigns are needed as part of a package of measures to change attitudes and driver behaviour. These are normally targeted at a particular factor that causes crashes or leads to greater injury severity when a crash occurs. For example - drink/drug driving, distraction, giving way, speed, seatbelts, driver fatigue, visibility, and awareness of other road users.

  Whilst the NZ Police, the NZ Transport Agency and ACC will continue to deliver national campaigns, there is a need to complement these through appropriate delivery of local education and promotion campaigns. Efficient and cost-effective delivery of local campaigns is dependent on continued collaboration between Road Safety Co-ordinators across the region. Regular meetings and communications that ensure cross-pollination of ideas, sharing success and consistent messaging across the region, need to be adequately resourced.

- **Enforcement** – enforcement is a crucial part of improving compliance with driving rules and speed limits that are aimed at reducing death and serious injury. It is an important tool to reinforce appropriate behaviour alongside driver awareness and education programmes. Key enforcement focus areas include speed compliance, blood alcohol limits, traffic signal compliance (e.g. red light cameras) and illegal parking (particularly where this will enhance the safety of pedestrians or cyclists). The police are the primary agency responsible for enforcement. They are granted powers to enforce moving traffic offences. Territorial authorities are able to enforce stationary (parking) offences.

Safe vehicles

Another important element in a safe system approach is improving the safety of vehicles using the transport network. Improved safety features in vehicles help to reduce the likelihood of crashes and to reduce death and serious injury when crashes do happen. Examples of safety features present in modern vehicles include air-bags (driver, passenger, side/curtain), electronic stability control, autonomous emergency braking, lane departure warning, and motorcycle anti-lock braking systems.

- **Age of the vehicle fleet** - new light vehicles entering the New Zealand fleet with a five-star Australasian New Car Assessment Program (ANCAP) safety rating have increased from about 51% in 2009 to 71% in 2012. This highlights a rapid improvement in vehicle safety technology. However, the proportion of new vehicles in the total fleet is very low and the average age of New Zealand's vehicle fleet has increased from 12.5 years in 2009 to 13.2 years in 2011.

- **Whole-of-vehicle life cycle approach** – the national approach described under the Safer Journeys strategy is to adopt a whole-of-vehicle life cycle approach to address this issue. This is because safer vehicle choices are made by buyers, and a number of factors influence buying and maintenance decisions over the life cycle of a vehicle. This approach will involve:

  - Removing less safe vehicles from circulation – for example, incentivising scrapping old and/or unsafe vehicles

  - Improving the safety of vehicles coming into the country – for example, by using vehicle import standards to control the safety standards and features of new vehicles entering the fleet

  - Improving the safety of the existing vehicle fleet – for example, through warrant standards and processes, point of sale labelling and information, removing barriers to new technology uptake, incentivising and promoting safety retro-fits

  - Encouraging people to buy the safest vehicle they can afford.

- **Bicycle lights** – bicycles are also a type of vehicle and the key focus for improving the safety of cyclists from this perspective is promoting the use of high quality bicycle lights and considering the development of bicycle light standards

The mechanisms that can influence the uptake of vehicle safety technology and the age of the vehicle fleet are generally at the national level. The role of the organisations represented on the Regional Transport Committee in relation to safer vehicles is to support the national level initiatives to improve the New Zealand vehicle fleet and to improve safety within vehicle fleets under their influence – for example, an organisation's own vehicle fleet and public transport vehicles that make up the region's public transport fleet.

12.6 PRIORITY ACTION AREAS

GWRC, local councils and the NZ Transport Agency will work with NZ Police, ACC and other agencies to deliver coordinated and integrated road safety programmes and campaigns using a combination of engineering, education and enforcement.

The use of road safety action planning and risk-targeting programmes and models will be used to develop local road safety activities and packages that address areas of key concern nationally and regionally.

High national priority

The government's 'Safer Journeys 2013-15 Action Plan'[1] identifies a number of areas of 'high strategic priority'. These areas are set out below:

- Reducing alcohol/drug impaired driving
- Increasing the safety of young drivers
- Safe roads and roadsides
- Safe speeds
- Increasing the safety of motorcycling

In the Wellington region, road safety programmes and campaigns will be aligned with these key national priority areas, which are also important safety issues for the region.

In recent years the government has raised the driving age and changed legislation relating to the blood alcohol concentration (BAC) levels for people in control of a car. While the number of alcohol/drug-related fatal and serious injury crashes, especially for youth, has declined the problem remains a significant one. Messages relating to the impact of drink/drug driving will continue to be communicated nationally and across the region. This will involve road safety partners working closely with the police. In future drink/drug driving messages and campaigns should be more strongly targeted at communities where impairment is a greater issue. For example, in the Wellington region, Wairarapa is over-represented with crashes involving young people and/or those impaired by drink or drugs.

High risk intersections and high risk rural roads are the sub-set of 'Safe roads and roadsides' that are identified as a priority area in Safer Journeys.

In the region, Wellington City has the highest personal risk level at urban intersections and a rating of medium concern nationally. Carterton and Upper Hutt have the highest personal risk level in the region for rural intersections, and are nationally identified as being of high and medium concern respectively. In terms of loss of control and head-on crashes on rural roads, Masterton and South Wairarapa have the highest personal risk and rate as medium concern nationally. Road safety measures will be focused on improving the identified high risk intersections (urban and rural) and high risk rural roads in the region. Improving urban intersections will also benefit pedestrians and cyclists.

Managing speed on the road network is an important issue nationally and for the Wellington region. Our rural communities of Masterton, Carterton and South Wairarapa are among the areas of high concern nationally for speed. In our urban areas, speeds have a particularly significant impact at intersections and in areas with high densities of pedestrian and cyclist use. There is a strong correlation between the speed at impact and crash severity. Messages relating to safe speeds will therefore continue to be a focus of both national and local campaigns.

Improving the safety of motorcycling is an important region-wide issue, with the Wellington region having the highest level of personal risk for motorcyclists in the country. An increasing number of people in the region's urban centres, including Wellington City, are using motorcycles and mopeds to travel to work and education. Motorcyclist safety is recognised as an important issue for the Wairarapa Corridor, particularly on SH2 Rimutaka Hill road and on other parts of the road network through Wairarapa as a result of the increasing popularity of recreational trips by motorbike. Motorcyclists are particularly sensitive to road surface, surface friction, and are more vulnerable to collision with other traffic or roadside objects. The specific needs and vulnerabilities of motorcyclists should be actively considered when designing improvements to roads and roadsides and in relation to road maintenance programmes. Ongoing training and education is also very important to develop safe motorcycling skills.

1 http://www.saferjourneys.govt.nz/assets/Uploads/Safer-Journeys-Action-plan-2013-2015.pdf

High regional priority

An additional area of high priority for the region that is not covered by the high strategic priorities at the national level is:

- Improving cyclist safety

In the Wellington region, cyclists have a high level of personal risk, second only to the Auckland region. Road safety programmes and campaigns will seek to address this important regional safety issue. Addressing cycling safety in Wellington City will be a key focus given the high level of personal risk and growing number of cyclists. However, improving safety in other parts of the region will also be important to encourage more people to cycle.

Measures will include infrastructure improvements and education, awareness and skills training. Priorities for improving the safety of cycling are also highlighted in the cycling chapter of this network plan.

Safety on the Wellington RoNS

One objective of the Wellington RoNS project is to improve road safety. The construction of a new median divided expressway through the region - from Linden in the south to Otaki in the north - provides an important opportunity to significantly improve road safety in the Wellington region.

The design standards of the new road will almost eliminate the possibility of head-on crashes and run-off road crashes on SH1 between Wellington and Otaki. The new road is being constructed to have a four-star (out of five-stars) KiwiRAP rating. In addition, there will also be opportunities to address wider safety issues such as driver fatigue (through provision of additional rest and stopping facilities), and the appropriate separation of pedestrians and cyclists from fast moving traffic.

When existing sections of SH1 are revoked and become local roads, improving safety should be an important objective. This may include, for example, consideration of appropriate speeds to reflect the new role of the road, re-allocation of road space to provide enhanced walking and cycling facilities, and improved priority for pedestrians at signalised crossings and new crossing facilities. Through the Kapiti Coast, which is over-represented with crashes involving older people, there may be opportunities to reduce speed limits and to enhance the design of intersections on the revoked state highway route to make this a safer local link route option for older drivers.

Photo: NZ Transport Agency

13. NETWORK RESILIENCE

13.1 INTRODUCTION

The transport network can be vulnerable to a range of different unplanned events, leading to delays and disruption to access and mobility to and within the region. This plan describes the strategic approach for addressing the significant resilience issues facing the Wellington region's transport network.

Improving the resilience of the transport network to these unplanned events will allow access to be restored sooner and disruption to be minimised. All organisations responsible for planning, managing and operating the region's land transport network will work together to identify key vulnerabilities in the transport network that may affect the ability of the wider network to resume service after disruption caused by an incident or event.

13.2 WHAT IS TRANSPORT NETWORK RESILIENCE?

A resilient transport network is one which is designed, developed and maintained to recover quickly from unplanned events.

A transport network may be affected by both 'High Impact Low Probability' events and 'Low Impact High Probability' events. These may be natural hazard events ranging from a slip or surface flooding, through to a major earthquake or tsunami. Crashes that occur on the road network may also result in disruptions as a result of lane closures or an entire corridor being temporarily out of use.

Another aspect of transport network resilience is the need to be adaptable to potential future changes in climate patterns, sea levels, travel demands, technologies, fuel types, and lifestyles.

Low Impact High Probability

Natural hazard events such as landslips, storms, floods and incremental sea level rise

Transport related events such as road traffic crashes and other unplanned events and potential future trends such as fuel price shocks.

High Impact Low Probability

Significant magnitude earthquake (7+), major volcanic eruption or a tsunami

13.3 THE NEED FOR INVESTMENT

The key resilience problem for Wellington's regional transport network can be described as:

Regional infrastructure that is vulnerable to disruption by unplanned events is potentially resulting in an unacceptable cost of severance and restricted ability to recover over time.

Wellington's topography and resultant relatively narrow corridors of development, infrastructure and transport across the region makes it relatively susceptible to disruption from natural hazards events and traffic crashes.

Only four roads connect the Wellington metropolitan area with the remainder of the North Island. These are:

- SH1
- SH2
- Paekakariki Hill Road
- Akatarawa Road

Each of these four roads, including the state highways, has sections that are both seismically vulnerable and at risk from more common events such as slips or flooding. The SH1 and rail corridor between Pukerua Bay and Paekakariki is very narrow and wedged between the hills and the sea. The SH2 and railway corridor between Petone and Ngauranga have similar characteristics. SH2 Rimutaka Hill road traverses steep terrain between the Wellington metropolitan area and Wairarapa. Sections of SH58 and Grays Road, which provide a strategic east-west link within the region, are also low lying and vulnerable to slips.

In addition to being vulnerable to being cut off as a result of landslips following earthquakes or weather related events, a road traffic crash or incident on these parts of the road network may result in the closure of traffic lanes in one or both directions. In addition, the lack of alternative north-south routes and limited east-west connectivity means that even a relatively minor incident often results in severe delays and disruption to the wider network.

In the longer term, the low lying parts of these corridors will also be increasingly vulnerable to the impacts of sea level rise.

Low impact, high probability events

Examples:

- landslips
- major storms, flooding
- traffic incident
- long term sea level rise

Likely outcome:

- Numerous transport links are vulnerable to low impact high probability events resulting in disruption and potential community severance

Local areas/suburbs that are served by single (or effectively single) roads are particularly at risk.

Major strategic transport corridors in the region are also very susceptible. The presence of both road and rail infrastructure in close proximity also represents a risk.

- An example is the storm event of June 2013 in Wellington that washed out rail lines between Petone and Ngauranga resulting in a significant increase in congestion and delays on the adjacent state highway network. The Ministry of Transport estimated that the economic impact of the event was between $12 and $43 million, including a $5.3 million cost to government agencies.
- A significant flood event in the vicinity of Melling Bridge would affect road and rail networks, and sever access to Hutt City at that point, creating additional pressure on the surrounding network.

The 2011 landslip on SH3 Manawatu Gorge (the largest road slip in New Zealand history) is another example from just outside the region of the potentially significant impact a localised event can have when there are limited alternatives.

The cost of long delays as a result of closing one or more traffic lanes on the state highways or mechanical breakdowns on the rail network can also be significant due to loss of workforce productivity and missed flights or meetings.

High impact, low probability event

Examples:

- Major earthquake
- Major tsunami

Likely outcome:

- Fragmentation of the regional transport network, disrupting distribution of essential supplies and delaying recovery
- Routes in and out of the Wellington metropolitan area severed, resulting in up to four months isolation of the population

In 2013, Wellington Lifelines Group (WeLG) and the Wellington Region Emergency Management Office (WREMO) developed a lifelines report titled "Restoring Wellington's transport links after a major earthquake". The report identifies a number of key lifeline locations that are critical to enable recovery after a major event. These are described in Figure 40 below and shown on the map in Figure 41.

CentrePort is located at a critical point in Wellington's lifeline network and will play a vital role in any post-event recovery effort. However, the poor quality of the Hutt Road over-bridge and Aotea Quay off-ramp present a significant resilience risk that is likely to affect access to the port after an event. This amplifies the likely issues such as transport network vulnerability to slips and liquefaction between Ngauranga and Thorndon – which the lifelines report identified as the 'Thorndon Critical Area'.

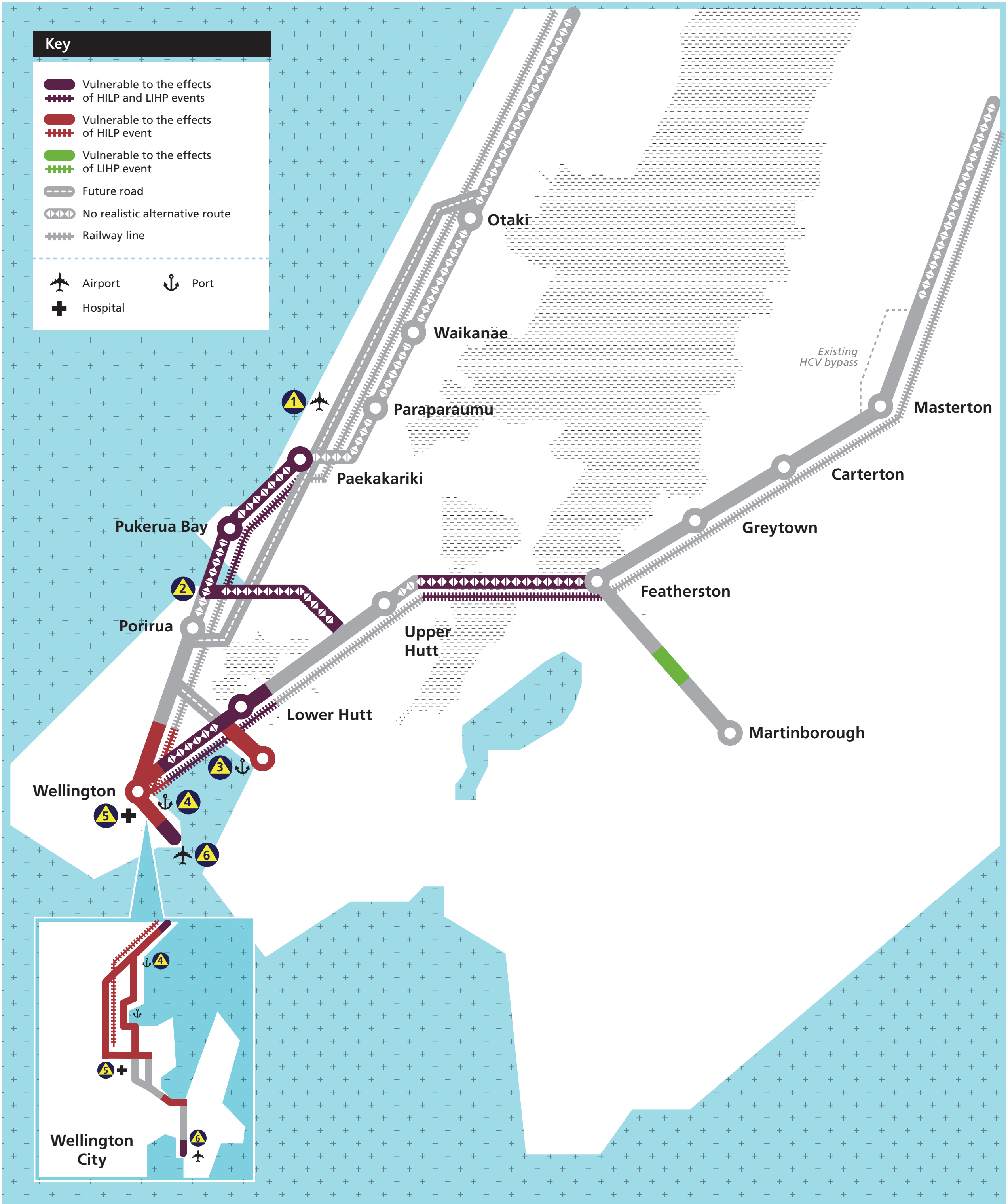
Recovery time after an event is driven by the ability to access these critical locations and use them to drive recovery. The region will need to continually address current risks with the long term goal of re-opening critical transport links to key lifeline recovery sites within two days, and establishing core access to and within the region within seven days.

Risk types and locations are identified in Figure 41. This illustrates by location types of high impact low probability or low impact high probability hazards and the key lifeline priority locations.

Figure 40. Key Lifelines Locations

Location	Purpose	Details
Paraparaumu Airport and Paekakariki earthmoving operation	National assembly area and vehicle and plant storage site for the earthmoving operation	Emergency response logistics site in the event of a major event. Earthmoving operation in order to restore transport access from the north.
Titahi Bay beach	Temporary supply logistics location	Temporary beach landing site and barge access point should access to and within central Wellington be extremely limited by road/rail.
Seaview Marina and Petone foreshore	Primary and secondary landing logistics locations	Fuel landing point and barge and landing sites to move supplies to/from CentrePort.
Wellington CentrePort	Primary supply logistics location	Barge traffic to/from the Hutt Valley and road based distribution of supplies to the suburbs / regions from the port.
Wellington Hospital	Central medical HQ	Main medical triage and casualty treatment site. Medical coordination HQ.
Wellington Airport	Primary supply logistics location	Helicopter distribution and aircraft supply site to the rest of the region.

Figure 41. Wellington Region Transport Network Vulnerabilities Map



Key lifeline locations

1. *Paraparaumu Airport and Paekakariki earthmoving site*
2. *Titahi Bay landing site*
3. *Petone and Seaview landing sites*
4. *Centeport (Wellington port)*
5. *Wellington Hospital*
6. *Wellington Airport*

13.4 BENEFITS OF INVESTMENT

If a major event were to occur in the region today or in the foreseeable future then the region's communities and infrastructure would be significantly affected. The region would be heavily reliant on the existing restoration and emergency plan(s) in order to recover. Increasing the resilience of transport infrastructure and networks over time will mean less reliance on restoration and emergency plans.

Increasing route security and providing route alternatives will mean emergency services, supplies and residents will have better access to the transport network and key locations after a major event and the network will be increasingly less susceptible to disruption as a result of the smaller, more frequent events. This will also reduce the social and economic impact upon the region from the unplanned event.

By ensuring that planning and investment in the transport network takes account of potential future scenarios (such as climate change, fuel price, technology and lifestyle trends) that affect travel patterns and the transport network, the region will be better future proofed itself and insulated against the impacts of those changes.

13.5 STRATEGIC RESPONSE

The following action areas are proposed to address the transport resilience problem described in the above sections of the plan.

Improving the security of existing strategic corridors and routes

Future investment in the transport network will need to ensure existing strategic routes are less vulnerable to disruption and delay as a result of unplanned events. The long term aspiration is to prioritise and address known resilience risks and vulnerabilities to create a robust resilient transport network and community. This will include both new infrastructure to protect existing routes and ongoing preventative maintenance.

An example of proposed new infrastructure is potential land reclamation alongside the existing SH2 and rail corridor between Ngauranga and Petone. This could offer route protection for this strategic road and rail corridor, and a significantly improved level of service for cyclists and pedestrians (providing improved travel options), both for low impact high probability and high impact low probability events.

Ongoing preventative maintenance and seismic strengthening of the transport network and its infrastructure is crucial to improved resilience. Such work enables the transport network to evolve in order to cope with ongoing low impact high probability events and enhances the ability of the network to function and support recovery in the event of a high impact low probability occurrence. This will be particularly important in the shorter term prior to new alternative routes being completed.

Photo: Kiwi Rail

Provision of good route options and alternatives

Development of the future transport network will need to include projects that provide alternative strategic routes to contribute to overall network resilience and allow quicker recovery and access to and through the region in both low impact high probability and high impact low probability events.

Key future projects include construction of the Kapiti Expressway, Transmission Gully, and a new east-west link between SH2 and SH1 (Petone to Grenada Link Road) to improve network reliability and provide alternative routes. The completion of these regional roading projects is expected to result in a significant reduction in the time to recover access to and through the region following a major event from 120 days to around 40 days. [1]

Increasing travel choices within the transport network

Providing good modal choice will enhance the transport network's resilience. If people have different choices for making a trip, they will have greater flexibility when disruption occurs to one mode of travel and may still be able to complete their journey.

Walking and cycling provide a good level of personal mobility when major unplanned events occur and offer realistic alternatives for localised low impact high probability events. Equally the rail network functions independently of the road infrastructure meaning that should the road network be affected by an unplanned event, then rail can offer a travel alternative. Ensuring more of the population is located so that they live and work in areas with good travel options is an important aspect of resilience.

Continually improve network safety performance and standards

Improving road safety performance in the region is an important component of resilience because disruption and delays as a result of crashes can have a significant effect on numerous users of the transport system. The region's key road safety challenges and strategic response is set out in the Road Safety chapter of this plan.

Future proofing the transport network

Planning and investing in the transport network will need to consider a range of future scenarios to ensure that we are resilient to different futures and can adapt our network to respond to changes in climate, land use, trip demands, technologies, lifestyle, fuel types and energy availability.

Often the slower incremental threats to the network are overlooked. It is critical that these be factored into our planning. Facilitating and accommodating population growth should be done without putting communities at risk and it is important that land use planning and transport planning are well integrated.

Energy resilience is a long term and incremental area of resilience that is recognised in policies such as the New Zealand Energy Strategy 2011-21 and the New Zealand Energy Efficiency and Conservation Strategy 2011-16. These strategies promote the need for New Zealand to develop its own petroleum and mineral fuel resources whilst also embracing new technologies, against a background of increasing costs related to greenhouse gas emissions, increasing oil price rises, oil supply volatility and the need for renewable energy sources. Regional energy resilience will be guided by the national approach in this area.

13.6 PRIORITY ACTION AREAS

The development of business cases in relation to the region's resilience issues will help to determine the best resilience solutions and packages and will help to guide the priority order in which projects should be undertaken.

Consideration of the key recommendations from the lifelines report will also provide valuable guidance on priorities for addressing transport network resilience.

The key priorities for the Wellington region are as follows:

- **Improving the security of existing strategic corridors and routes**
  - Establish an agreed risk register, develop and apply an agreed prioritisation methodology with which to influence project programming in order to deliver future transport network resilience.
  - Improve the resilience of the key transport and lifelines corridor between Ngauranga and Petone
  - Carry out seismic strengthening of road/rail bridges and embankments/cuttings on key strategic routes throughout the region
- **Provision of good route options and alternatives**
  - Develop alternative north-south and east-west strategic routes through the region
  - Improve levels of access to/from lifelines key locations (port, airport, hospital, etc.)
- **Planning for recovery of transport network access following a major event**
  - Develop and adopt a comprehensive regional restoration and emergency plan

1 Wellington Lifelines Group (WeLG) and the Wellington Region Emergency Management Office (WREMO) 'Restoring Wellington's transport links after a major earthquake, 2013.

- **Increasing travel choices within the transport network**
  - Ensure that the planning of the region's land use and transport network are well integrated and support good travel options
  - Develop strategies for restoring access to suburbs given some communities may face particular access restoration issues
- **Continually improving network safety performance and standard**
  - Continuously improve road safety infrastructure standards along strategic routes to reduce the level of disruption from road crash incidents
- **Future proofing the transport network**
  - Ensure that future scenarios are considered as part of our regional transport planning so that the network is adaptable to future changes.

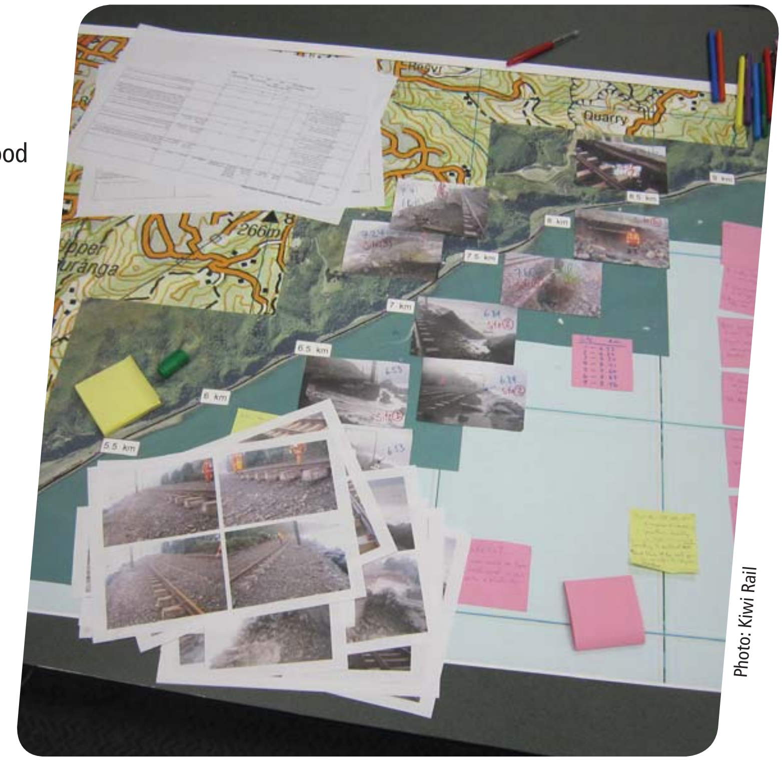


Photo: Kiwi Rail

Photo: Kiwi Rail

14. TRAVEL DEMAND MANAGEMENT

14.1 INTRODUCTION

The purpose of the Land Transport Management Act is to contribute to an effective, efficient, and safe land transport system. Travel demand measures are critical to this goal as they collectively help to create a more economical and resource efficient transport system.

The effective movement of people and freight is critical to economic development. Congestion and unreliable journey times on the road network adversely affect the efficiency of the transport network. Optimising the use of the existing network can help to address these issues, recognising that building additional road capacity may not always be affordable, desirable or sustainable.

Investing in a range of travel demand management areas alongside investment in other aspects, contributes towards achieving an overall efficient transport system. This chapter describes the strategic approach for managing travel demand on the region's transport network.

14.2 WHAT IS TRAVEL DEMAND MANAGEMENT?

Travel demand management is a collection of measures used to:

- maximise the use of the existing network
- reduce the demand for travel, particularly by single occupancy vehicles
- influence use of efficient and sustainable travel options

Achieving an optimised and efficient transport system will involve a combination of both 'supply-side' measures and 'demand-side' measures as shown in the diagram below.

This chapter focuses on the demand-side measures including network management tools, promoting behaviour change, economic pricing measures and appropriate land use policies. Other parts of this plan discuss the strategy for providing good travel options, including high quality, safe, attractive public transport, walking and cycling.

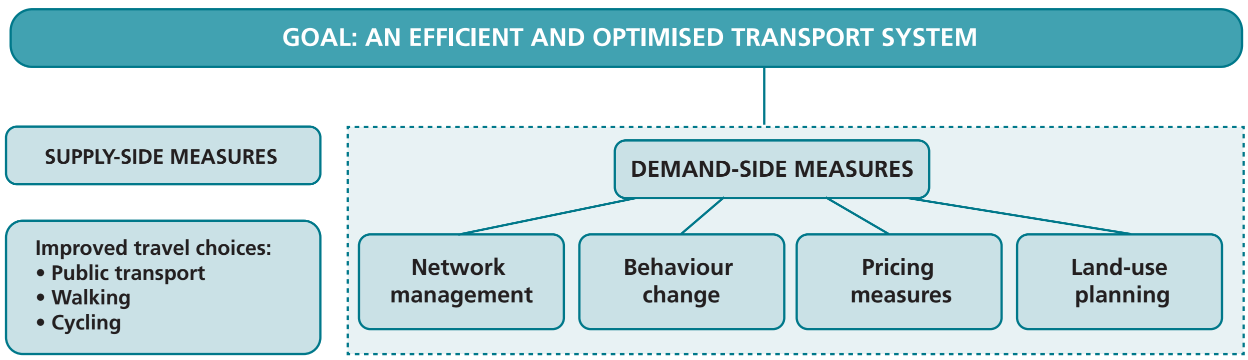
14.3 THE NEED FOR INVESTMENT

The challenges facing the Wellington transport system are described at the beginning of this plan and include issues such as traffic congestion, unreliable travel times, road safety issues, and impacts of transport on communities and the environment.

The transport network experiences very high demand at peak times, particularly to/from the Wellington City CBD.

- 24% of all region-wide trips (car and public transport combined) are made during the morning and evening peak.
- 14% of all region-wide trips (car and public transport combined) are trips to the Wellington City CBD.
- 30% of rail passengers arrive at Wellington Railway Station during a 15 minute window in the morning peak period.

Figure 42. Supply-side and demand-side measures



It is not practical or affordable for the region to continue to provide unlimited additional capacity to meet these peak demands. Travel demand management measures will be needed to look for ways to reduce the demand on the transport network at peak times.

Trips made by a single occupant in a car during peak periods, where active modes or public transport are feasible options (e.g. short trip distances or where there is good access to public transport services) contribute unnecessarily to congestion and unreliable travel times on the road network for freight and other trip types for which there are no practical alternatives.

A lack of awareness in the community about travel choices and the benefits of different travel options can contribute to inefficient trip choices. Concerns about safety and other barriers (perceived or actual) can also constrain the uptake of the most efficient travel choice for a particular trip.

14.4 BENEFITS OF INVESTMENT

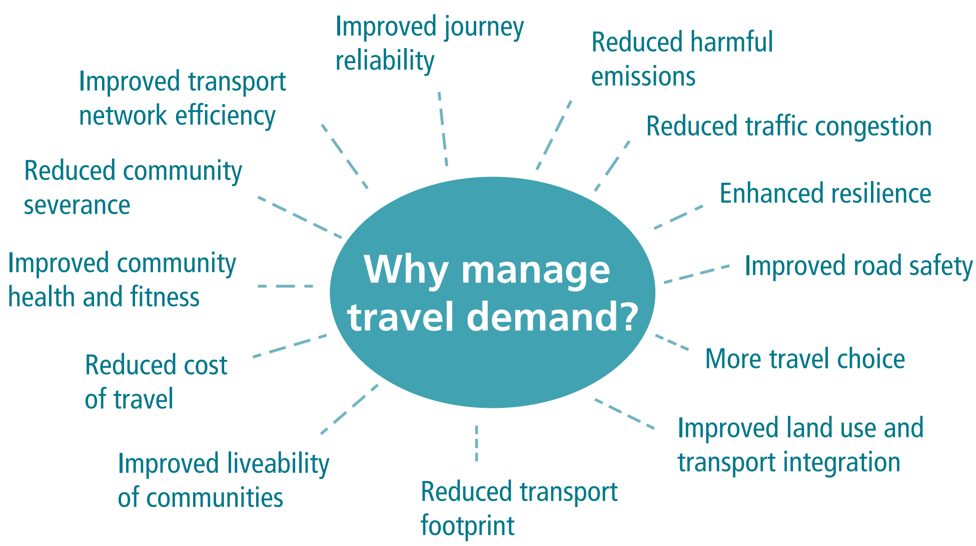
Travel demand management measures contribute to the improved operation of the transport network including through reduced traffic congestion, more reliable journeys, and enhanced resilience as a result of more transport choices.

Safety benefits are often associated with travel demand management programmes – for example road safety skills and education as part of school travel programmes, and improved 'live' information for road users warning of poor driving conditions, hidden queues or an accident ahead.

More efficient travel patterns and travel behaviours can also have affordability, environmental, health and community benefits by reducing the cost of travel, reducing climate change and air pollution impacts, and supporting more active lifestyles.

Optimising the region's transport system will also provide opportunities to minimise the transport 'footprint' on our urban environment, making our towns and cities more attractive environments in which to live, work and play.

Figure 43. Benefits of travel demand management



The effect of some travel demand management initiatives, particularly network management and pricing tools, can be measured by improvements in journey times or vehicle occupancy levels. However, in general, it can be difficult to isolate the effect of a particular travel demand management measure from some of the wider external factors.

The potential for different demand management interventions to influence mode choice is illustrated in the next section.

14.5 STRATEGIC RESPONSE

There are a number of key strategic interventions that can be used to influence more efficient and sustainable travel choices.

Influencing travel behaviour

Travel behaviour change programmes seek to provide an environment where the most efficient and sustainable travel choices are made as attractive as possible and people are made aware of those choices. These programmes are generally focused around four key areas:

- Motivation – encouraging change through goals, challenges, incentives and support
- Social norms – making sustainable transport an everyday activity
- Targeted information – providing knowledge to act
- Ability to act – removing the barriers to change

An example is programmes to encourage more children to walk, cycle, or travel by scooter to school as part of a school travel programme. These programmes include both promoting the benefits of active transport and addressing barriers that may affect travel choices.

Another example is tools that encourage more efficient and sustainable travel for workplaces – both in terms of the employee commute and wider business travel practices. This may involve a comprehensive travel programme within a workplace, looking at how efficient travel behaviour can be incentivised and supported, or may involve individual initiatives within a workplace such as providing good cycle storage facilities or promoting a carpool programme.

Behaviour change programmes such as school travel plans and workplace travel programmes have had good uptake and have resulted in positive behaviour change. A 2011 report on the implementation of workplace travel plans in a number of large organisations in the Wellington region suggested the following percentage change in mode share for journeys to work among participating organisations and businesses (before and after travel plans were implemented): a 18% change in public transport mode share, a 20% change in cycling mode share and a 11% change in single occupant car mode share.[1]

Community-wide travel awareness communications are used for ongoing promotion of behaviour change initiatives, including regular events, and promoting new technology and innovations with the potential to reduce travel demand.

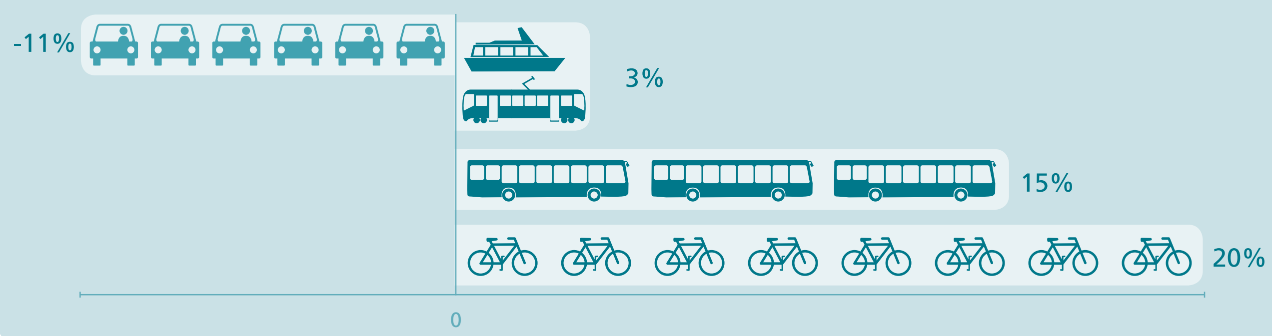
A regional programme to coordinate and deliver travel behaviour change programmes and promote efficient and sustainable transport, has been in place since late 2006. GWRC leads this area of work to minimise duplication of effort and resources among individual local councils and ensure consistency of campaigns and messaging across the region. This approach ensures better value for money for investment in travel behaviour programmes. Local councils have a lead role in relation to school travel programmes and a partnership role in wider travel behaviour change initiatives. Other organisations such as schools, workplaces, police and health agencies are also important partners in delivering these activities.

Network management

Traffic management and technology-based tools can be used to maximise existing network capacity, improve traveller information, improve journey reliability, smooth traffic flows, support safer journeys, and enable more efficient freight supply chains.

1 Greater Wellington Regional Council, 2011, Sustainable Transport Annual Achievement Report 2010-2011

Percentage change in mode share after travel plans were implemented



Tidal flow traffic lanes to add capacity in peak directions or high occupancy vehicle lanes (for buses, multiple occupancy vehicles, freight vehicles, or a combination of these) are good examples of tools that can be used to encourage more efficient use of the road network. Simple improvements to the design and phasing of an individual intersection or set of intersections, including priority phasing for particular modes, can also be effective.

Intelligent transport systems can improve the transport network's operation by applying information and communication technologies that support and optimise all modes of transport. These technologies allow transport systems to be responsive to changing traffic conditions through interventions such as adjustments to traffic signal phasing, variable speed and message signs, and ramp metering.

Ramp metering is used to control the flow of traffic entering the motorway or designated road from its on-ramps to ensure more efficient merging. Technology that provides real time information is used to warn drivers in advance about things like traffic queues, traffic incidents or poor road conditions. Live information can also be provided to public transport users about the running of services and any delays.

Intelligent transport systems also assist with collection of better quality data to drive better operations, planning and investment. They help to promote smarter transport choices by improving traveller information, and provide mechanisms that enable new options for payment of tolls and future road pricing schemes.

Economic pricing measures

Pricing measures are economic tools that can be used to influence travel choices. These can involve network wide charges (such as fuel levies or distance based charges) or can target certain trips, for example by placing a toll on a new road or a charge on using the existing road network at peak times and at certain locations (congestion or cordon charges). Targeted pricing is most likely to be successful where good alternatives are available, and where the revenue generated by pricing schemes is fed back into the alternative options to make them more attractive.

Evidence suggests that road pricing tools could be extremely effective in influencing travel behaviour. Traffic volumes and congestion levels can be significantly reduced as a result of mode shift to public transport, walking and cycling, trip re-timing, ride-sharing, and some trips not being made at all.

Analysis undertaken as part of the work to develop this plan suggests that by applying a cordon charge to the regional network, a significant increase in public transport trips to the CBD (around 3 million extra annual PT trips in the AM peak – a 25% increase compared with an expected future scenario without a cordon charge) and a decrease in vehicle trips to the CBD (around 4 million fewer annual car trips in the AM peak – a 6% reduction compared with an expected future scenario without a cordon charge) could be achieved.[1]

1 GWRC 2014, Wellington's Regional Land Transport Plan, Working Paper

Of course, any road pricing scheme must be carefully designed to take account of the potential economic, social and equity implications.

Current legislation in New Zealand does not currently allow for road pricing schemes to be implemented on existing roads. However, applying a toll to new roads is legal, and analysis suggests applying a toll (for example, on the new Transmission Gully motorway and the proposed Petone to Grenada Link Road) would have some positive impact on managing the demand for car use.

Parking policies

Parking supply, management and cost can have a significant influence on the demand for car use. Analysis suggests that the application of increased parking charges could have a significant positive influence on reducing demand for car use.[2]

While most long-stay commuter parking, particularly in Wellington City CBD, is privately owned there are measures to manage demand and encourage mode shift - for example by applying a parking levy or differential rating.[3] In addition to demand management benefits, this would allow revenue generated to be fed into public transport improvements. However, it would be important that any such tool was targeted at long-stay commuter parking rather than short-stay parking.

An efficiently managed supply of short-stay parking (for shoppers or visitors) is important to a competitive economy within our region's centres. The allocation of on-street parking also needs to be balanced with other needs such as road space for bus priority lanes, cycle lanes or wider footpaths which are all important aspects of network management.

Removing minimum parking standards in district plans, particularly in relation to developments located within close proximity to local centres or public transport, is also an important intervention to influence car ownership and car use.

Land use policies

Land use patterns and the degree to which they are integrated with transport networks have a significant influence on travel demand, and appropriate land use policies are crucial to support an efficient and sustainable transport network.

Urban sprawl is not easily served by public transport and longer travel distances limit opportunities to make trips by walking or cycling. A compact urban form and higher

3 – WTSM Modelling Approach. Note: The test carried out used an in-bound Wellington City CBD cordon charge of $4 AM peak, $2 inter-peak, $4 PM peak, however a number of variations on a congestion or cordon charge could be applied, with varying impacts on demand and mode choice.

2 GWRC 2014, Wellington's Regional Land Transport Plan, Working Paper 3 – WTSM Modelling Approach

3 Hill Young Cooper, 2013, Wellington Public Transport Spine Project, Alternative Funding Options Study

densities in or around centres and along transport corridors support public transport services and encourage walking and cycling. Comprehensive, mixed use developments provide opportunities for local employment and access to local shops and amenities, reducing travel distances and making active modes more feasible.

Structure plans and other local area planning tools can be used to encourage comprehensive and integrated new developments, rather than ad hoc urban sprawl.

The provision of quality pedestrian and cycle facilities within new developments that are well connected to adjacent networks and local centres will also support the use of walking and cycling for shorter trips.

Supporting new technologies and innovation

Evolving technologies and lifestyle trends are expected to influence travel demand and the way we access services in future. New technologies often improve travel efficiency and reduce the need for travel. For example - access to services and information through internet and smartphone technology; 'face to face' meetings carried out using Skype, Face Time, or video-conferencing; and access to goods through home deliveries or 3-D printing. Supporting the uptake of new technologies is another important component of travel demand management.

Car share schemes are a good example of an innovative concept that supports an optimised transport network. An increase in inner city living in the Wellington region, particularly Wellington City, provides a significant opportunity to use cars more efficiently. There are rising numbers of people who only require occasional access to a motor vehicle and do not wish to purchase a car. Car sharing schemes allow a single vehicle to be shared among a group of people, maximising its use and minimising space required for parking. At full capacity, one car share vehicle can replace up to 13 conventional cars[1]. These schemes have a number of benefits to individuals and the community.

1 http://www.vtpi.org/tdm/tdm7.htm

14.6 PRIORITY ACTION AREAS

Behaviour change tools need ongoing support and promotion. This is the case in the short term to ensure that a critical mass is reached so that the tools are effective and in the longer term to ensure that behavioural change is sustained over time. Land use and parking policies adopted in the short term will have a significant impact on land use and travel patterns in the longer term. Technology changes will occur over time and longer term are expected to influence both travel patterns and the efficient operation of the transport network.

The following action areas will be progressed over the short to medium term and will support longer term outcomes:

- **Promote and facilitate active and safe school travel through school travel programmes and activities**
  This will involve GWRC and local councils working together to identify opportunities and to provide resources, training, advice, and monitoring/data collection. Local councils will also carry out physical infrastructure improvements to address barriers.
- **Promote the uptake of efficient and sustainable commuting and business travel within workplaces, organisations and the wider community**
  This may include for example tools, programmes and activities such as carpool programmes, car sharing, flexible work hours, video conferencing, cycle parking and shower facilities, cycle skills training, encouraging commuting trips by active modes and public transport, and vehicle fleet policies.

  It will also include encouraging the development of new tools and programmes to facilitate more efficient travel and to support better travel choices – such as a fully integrated and centralised online journey planner site for all modes, including carpooling.

- **Carry out travel awareness activities, events and campaigns**
  This will include ongoing support for and promotion of: available tools (e.g. carpool programmes, journey planning tools); travel choices (e.g. walking, cycling, travel by scooter, public transport); new technology and innovation (e.g. video conferencing, car-share schemes, smartphone apps); and supporting infrastructure (e.g. priority car parking spaces for carpools).

  It will also involve identifying opportunities to promote efficient and sustainable travel choices through annual or more frequent events and campaigns (e.g. Walk to Work Day, Active a2b, Spring to the Street).

- **Optimise the use of the existing transport network through the use of network efficiency tools, intelligent transport systems and other tools**
  Managers of the state highway, local roads, and public transport networks will work together to identify opportunities for implementing measures that will allow best use to be made of the existing network and to enable people to make smart travel decisions.

  This may include, for example, intersection upgrades, ramp metering, tidal lanes or peak only lanes, variable message signs, real-time information, integrated ticketing, and traffic light phasing and priority.

  Other transport network optimisation tools and concepts will be supported, including car share schemes, priority parking for carpoolers and new technologies that reduce the need for travel.

- **Promote and encourage integrated land use and transport planning**
  Appropriate provisions will be included in the relevant land use policy documents – such as the Regional Policy Statement and district plans – to ensure future land development follows the principles of compact urban form that is well integrated with transport infrastructure.

- **Investigate and advocate for the use of road pricing tools to influence travel demand**
  Advocating for the ability to consider and implement pricing schemes for the existing road network, such as a congestion charge for trips along key routes during peak times.

  The use of tolling will be considered to manage the demand in relation to new roads. Consideration will be given to availability of alternative routes and modes, and wider social equity implications of each case.

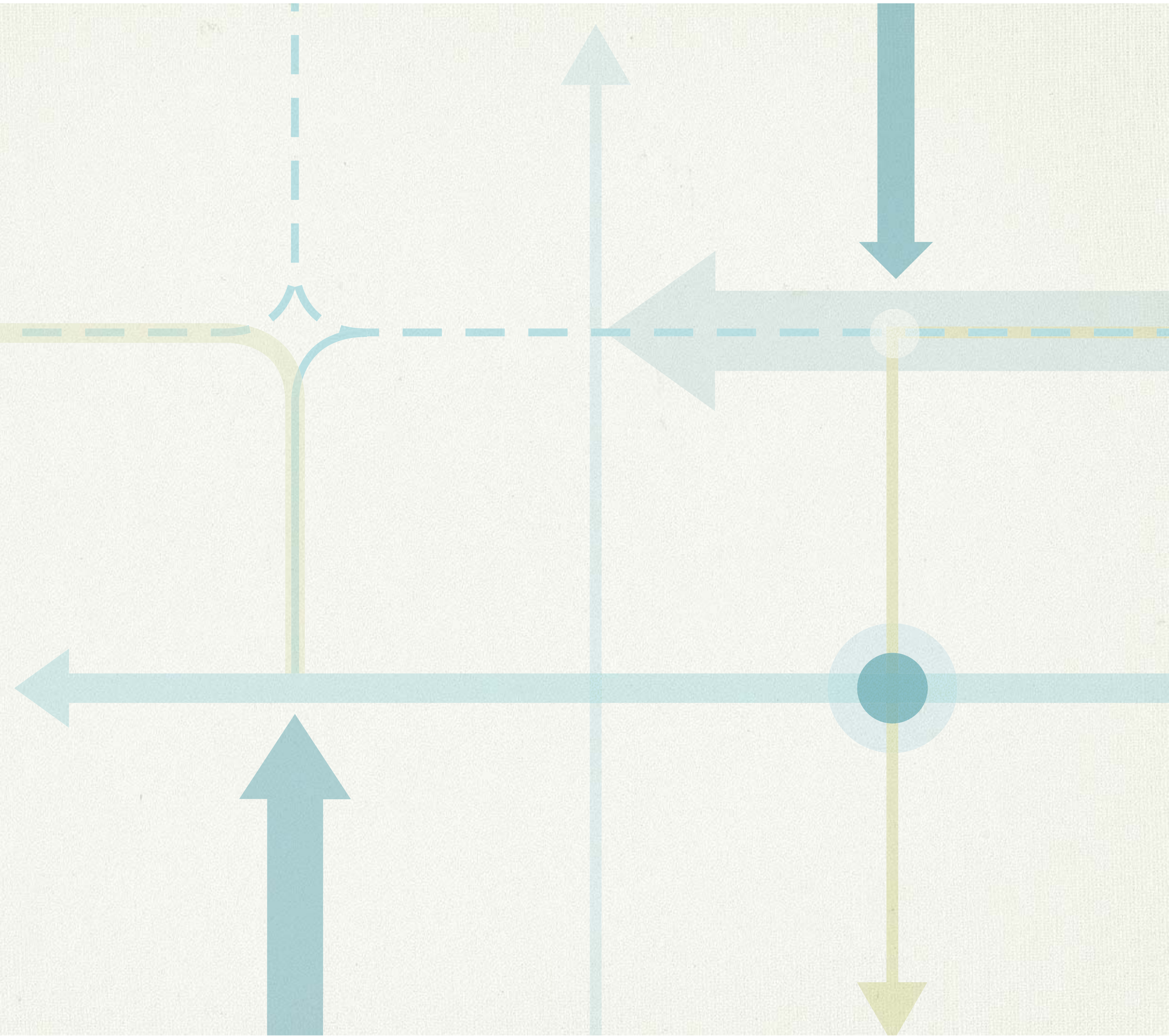
  The availability and cost of parking (long-stay commuter parking in particular) will be regularly reviewed by local councils with particular consideration given to the demand management benefits.

  Parking requirements within new developments will be regularly reviewed as part of district plan reviews, with particular consideration given to maximum rather than minimum parking standards in appropriate locations.

- **Continued monitoring, data collection and information sharing**
  Understanding how people travel and why they make particular travel choices and decisions is critical to managing demand and finding ways to use our transport network more efficiently.

  Ongoing data collection through travel surveys and monitoring programmes will therefore be an important action in this area. Forums for sharing information, ideas and success stories will also be an ongoing initiative.

REGIONAL PROGRAMME



APPENDICES

The Greater Wellington Regional Council promotes **Quality for Life** by ensuring our environment is protected while meeting the economic, social and cultural needs of the community

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