Ministry of Transport Briefing to the Incoming Minister

Ministry of Transport
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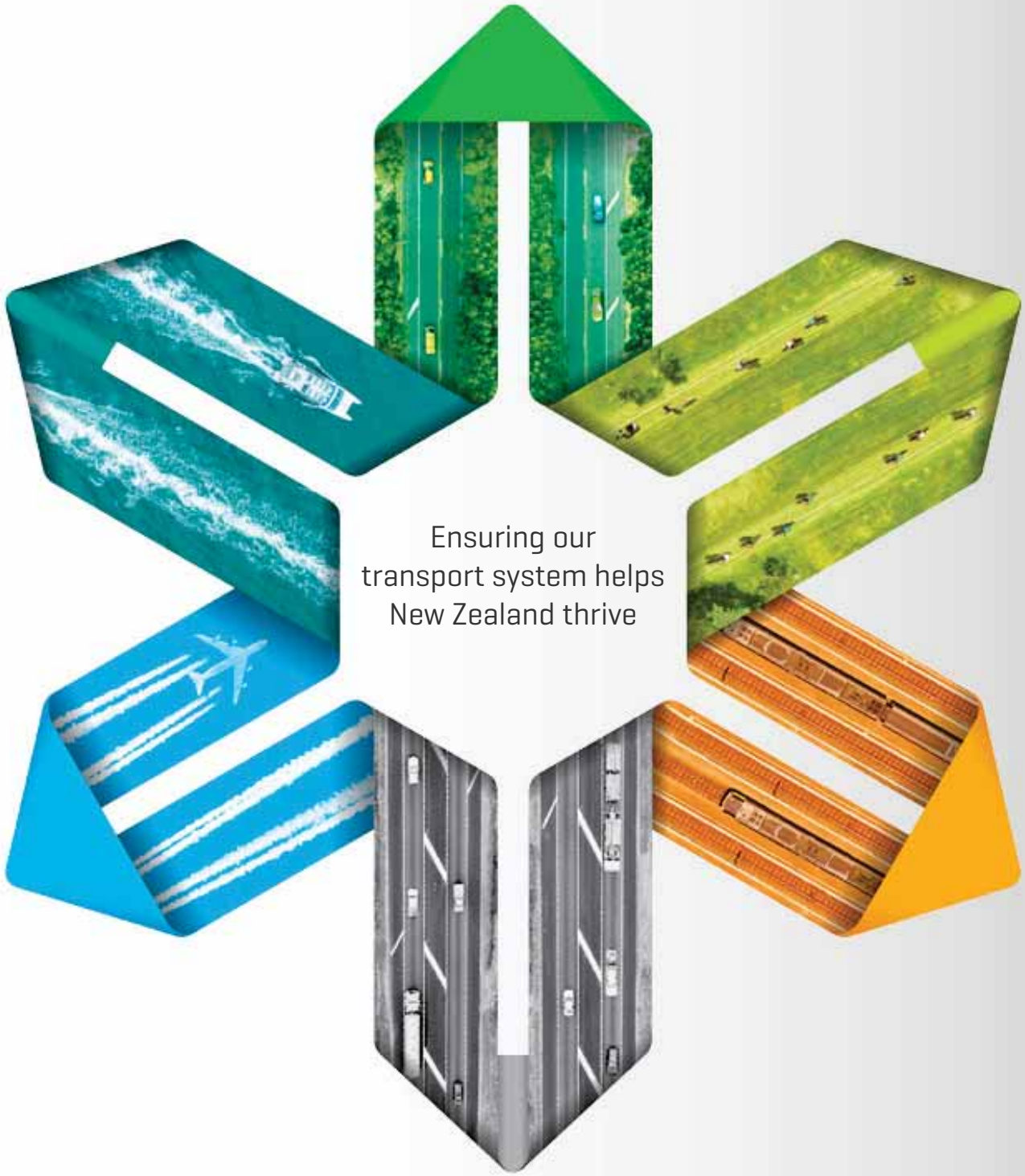

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Introduction to the Ministry of Transport and our Briefing to the Incoming Minister

Martin Matthews
Chief Executive

Welcome to your new role as Minister of Transport.

We are enthusiastic about transport and the role it plays in supporting economic growth and connecting us as a society. As your principal advisors on transport issues, we are ready and keen to engage with you on your priorities. The Ministry has vast experience and knowledge on transport and is equipped to provide you with robust, informed and evidence-based advice to support you in your role. I and the rest of the Ministry's leadership team (see biographies provided on the following pages) would welcome an early opportunity to share our perspectives on both the immediate and long-term issues for the transport system.

As Minister of Transport, you will be responsible for making decisions that have both immediate and long-term implications. The purpose of this briefing is to 'set the scene' and introduce you to both the strategic context for our work as well as some of the more immediate issues that we have been progressing. The briefing consists of two parts:

- **Part one** discusses five key long-term and strategic challenges for the transport system. We hope this will give you a sense of how the decisions you make could impact on the development of the transport system over the longer term. An important part of our role is advising you on the 'big picture' issues for the transport system. As well as engaging with you to deliver your programme, we would welcome the opportunity to establish a series of ongoing discussions with you (perhaps every two months) on some of the long-term challenges and opportunities for transport.
- **Part two** provides an overview of our current work programme, and the decisions that you will be asked to make in your first three months. We look forward to working with you to understand your priorities and vision for the transport portfolio, to help us build a programme of work that will deliver on those priorities.

This briefing does not attempt to provide specific policy recommendations. Over the next three months and beyond we will be engaging with you on specific issues. In particular, we will be looking to engage with you as a matter of priority to confirm the 2015 Government Policy Statement on Land Transport – the key document for the government to set its objectives and expectations for the investment of over $3 billion per annum over the next three fiscal years. We are able to provide more specific advice on any of the issues raised in this briefing should you wish to discuss them further.

The Ministry's role

The Ministry is the government's principal advisor on transport policy, regulation and investment. We will provide you with specialist transport advice and support on these matters. We will also provide you with support to promote good governance, performance and accountability of the Crown entities in the transport sector for which you are responsible. We lead and co-ordinate the transport sector agencies to ensure they deliver on the government's expectations and priorities, and achieve the results sought from them for New Zealand.

We articulate our purpose as 'ensuring our transport system helps New Zealand thrive'. To this end, we have set for ourselves what we call our greatest imaginable challenge; 'to create the environment to double the value from transport initiatives'. We achieve these things by working with you to deliver a programme of work that aligns with your priorities, but also by ensuring you get the best possible advice on issues and opportunities to ensure the government's policy, regulatory and investment settings are appropriate to meet the future needs of the nation.

Although we play a critical role in the transport sector, we are a relatively small organisation with a budget of $30 million per annum and 155 full-time equivalents. This size is about 25 percent less than it was in 2008. However, we think the Ministry is a more capable and effective organisation than it was back then. Recent Performance Improvement Framework reviews have confirmed that the Ministry is a well performing organisation, and that we have come a long way in the last few years.

We have achieved this in part because of our unique operating model. We work in much the same way as a consulting firm. Our staff are allocated both to teams where they maintain specialist transport knowledge, build expertise, and develop their understanding of longer term strategic issues, as well as being assigned to project teams to respond to the priorities that you establish. This allows us to be expert and well informed while being flexible and responsive to changing demands.

The Ministry's Leadership Team

Martin Matthews

Secretary for Transport, Chief Executive Officer

Martin has been Chief Executive for the Ministry of Transport since September 2008. He has extensive experience in government, public policy and working with Crown entities, having spent ten years as Chief Executive at the Ministry for Culture and Heritage immediately before joining the Ministry of Transport.

During his six years as Secretary for Transport, Martin has led a significant programme of change and performance improvement at the Ministry. He has also led the Ministry's work with successive Ministers on a wide range of policy, regulatory and investment matters. Martin chairs the National Road Safety Committee, the New Zealand Search and Rescue Council, the Maritime Security Oversight Committee, and the Transport Sector Leadership Group of Chief Executives. He is also a member of the Leadership Development Centre Board.

Martin's career started in the Audit Office in 1979 and he was appointed Assistant Auditor-General in 1990. During this time he helped develop the Public Finance Act, the Public Audit Act and contributed to the design of the Crown Entity Act framework. From the Office of the Auditor General, Martin was appointed Acting Chief Executive of the Ministry for Culture and Heritage in July 1998 before becoming Chief Executive in 2000.

Martin has a Bachelor of Arts (Honours) in Economics and is a Chartered Accountant.

Andrew Jackson

Deputy Chief Executive

Andrew has been Deputy Chief Executive of the Ministry of Transport since August 2011. He chairs the high level policy group which decides the Ministry's overall portfolio of work, considers aspects of transport policy and builds policy capability within the Ministry.

Andrew was previously Deputy Secretary in the Ministry of Economic Development, where he was responsible for policy relating to regulation of financial markets, company law, intellectual property and competition law, and trade tariff policy.

Prior to that, he worked for the United Kingdom's Chief Scientific Adviser Sir David King on UK science policy, and helped lead the UK's Foresight programme, which used science to help tackle challenging issues such as obesity, drug use and cybercrime.

Andrew holds a Bachelor of Science in Biology and Biochemistry (Honours), and a Post-graduate Diploma in Economics and Law.

Gareth Chaplin

General Manager, Sector Performance

Gareth joined the Ministry of Transport in May 2011, and is the General Manager Sector Performance. He has responsibility for the Finance, Funding and Infrastructure and Governance teams.

The work of the Sector Performance group includes managing the revenue model that supports land transport funding, advising on priorities for investment in transport infrastructure, Crown entity governance and accountability, and the strategic financial management of Ministry and Crown budgets.

Gareth has a background in Government policy, fiscal management and organisational development. He has previously worked at NZ Trade and Enterprise as their Chief Economist, and the New Zealand Treasury, where his roles included managing the International Economics and Security and Land and Natural Resource teams.

Gareth has represented New Zealand interests at the APEC Finance Ministers' Meeting, the Pacific Forum Finance Ministers' Process, the World Bank and the IMF and the Asia Development Bank.

He holds a Bachelor of Arts (Honours), and is a member of the Institute of Directors.

Nick Brown

General Manager, Aviation and Maritime

Nick has been General Manager Aviation and Maritime since early 2014, focusing on aviation and maritime regulatory issues, and the delivery of the National Freight Demand Study.

Nick's portfolio as General Manager Aviation and Maritime covers freight and technology in transport, as well as aviation and maritime policy.

Nick has worked in transport policy and operational roles since 1998, and with the Ministry of Transport since 2007. In 2010 and 2011 he was seconded as private secretary to the then-Minister of Transport, dealing with the road and rail infrastructure portfolio. He has also led work on the government's Intelligent Transport Systems Action Plan, as manager of the Technology and Transport Systems team.

Nick's early career in the UK was in forestry, land use planning and environmental management. He is also a former Director of ITSO Ltd, the UK smart card standards organisation.

He has a Bachelor of Science (Honours) in forestry, and a Master of Science (with Distinction) in Environmental Assessment and Management.

Mike James

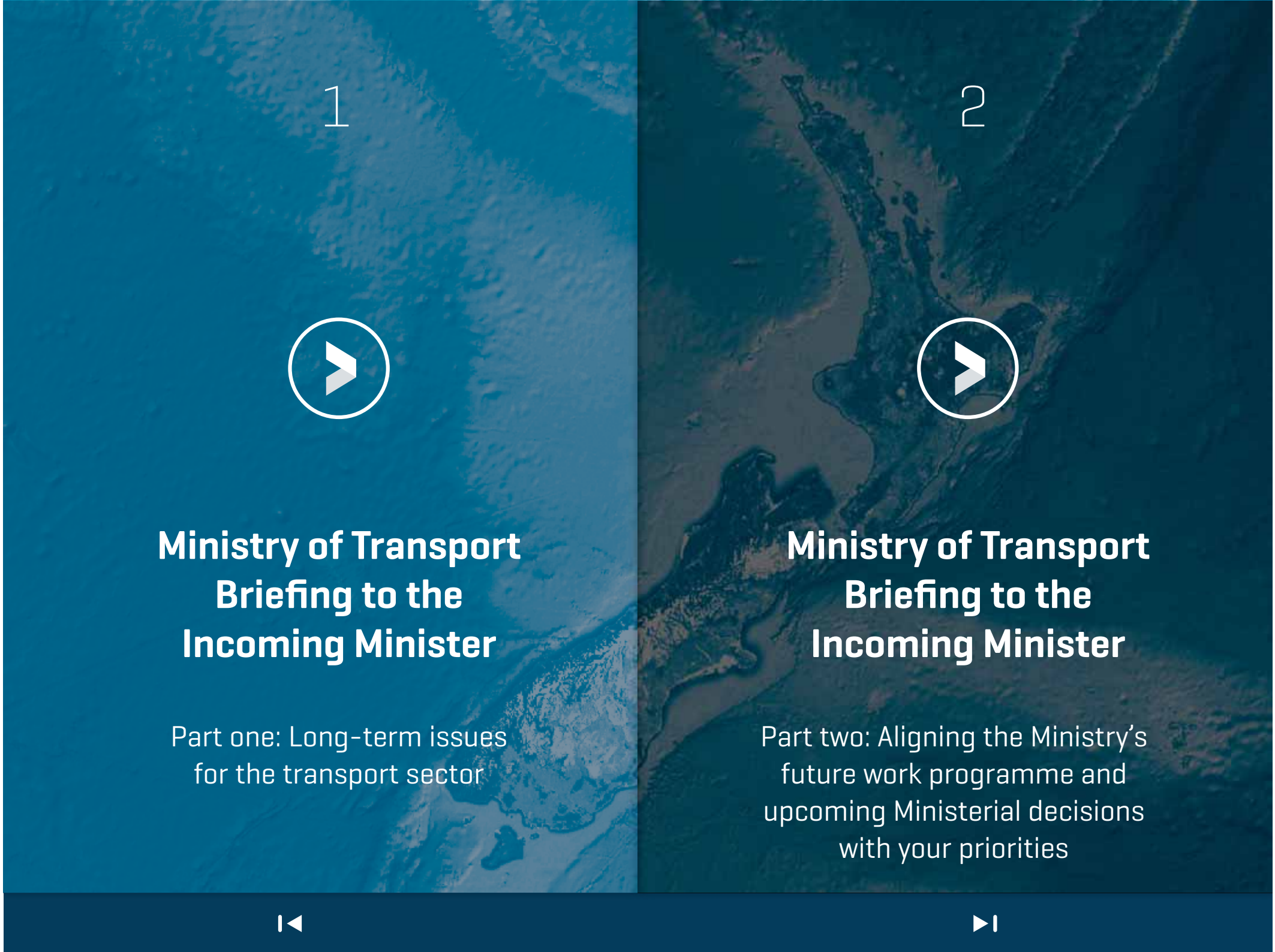
General Manager, Road and Rail

Mike is General Manager Road and Rail, and joined the Ministry in February 2012. The Road and Rail group focuses on Auckland issues, road safety, public transport and environmental matters.

Mike chairs the cross-agency National Road Safety Management group, and is a member of the Department of Conservation's Risk and Assurance Committee.

He has previously worked in the Treasury, where he held a number of roles, including Deputy Secretary from 2001-2010.

He is a chartered accountant, with a Bachelor of Business Studies from Massey University and a Bachelor of Commerce and Administration (Honours) from Victoria University.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Overview

Transport has a critical role in our economy and society. It provides the essential links to enable our businesses to access markets both domestically and internationally, and provides individuals with access to employment, education, healthcare and leisure activities. It is embedded into our lives, with the majority of us interacting with the transport system on a daily basis. As a small and remote country, we depend on our transport system to keep us connected to the rest of the world.

An efficient transport system can enable economic growth and enhance social wellbeing. Faster journeys allow for more efficient use of resources, and reduce the time needed to travel, freeing up our time for other activities. Good transport links can also increase the size of a market that a business can serve, or allow more firms to compete in a market, increasing competition and driving innovation. Likewise, an inefficient or ineffective transport system can constrain economic development and reduce personal mobility.

The significance of transport to the economy and society is reflected by the size of the government's investment in the transport system. Each year, central government alone invests over $3 billion in the transport network – around 1.3 percent of our GDP. This is in addition to the very significant asset base that already exists. The State highway roading network alone is valued at over $28 billion.

The importance of the transport system to all aspects of daily life, and the changing nature of the transport environment, mean it is critical that the Ministry has a focus on the longer term issues for the transport system.

The world is changing – and so are the demands we place on the transport system

You will oversee around $10 billion worth of investment in the transport system over the next three years. Many of these investments will be in permanent structures, expected to last for generations. Investment decisions will be made based on assumptions about future levels of demand, but the way people travel may be very different in the future.

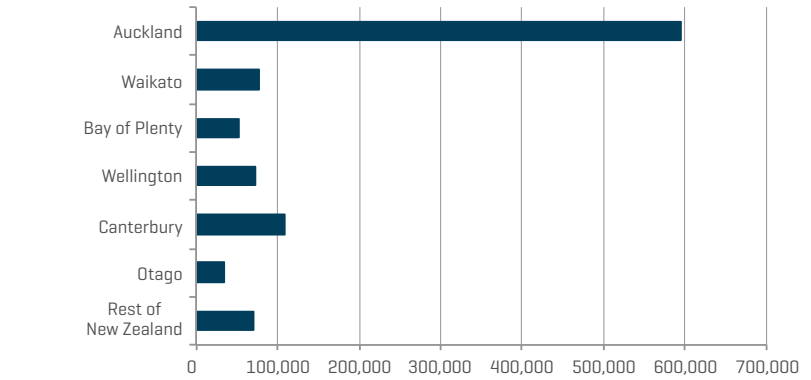
Three key trends are likely to have a particularly significant impact on the demands placed on the future transport system. These are discussed below.

A growing and ageing population

The latest census data indicates that New Zealand's population has grown at an average of 1.2 percent per year for the last decade. The population is expected to continue to grow, albeit at a slower pace, reaching 5.4 million by 2036.

This population growth will not be distributed evenly around the country. As shown in figure 1, Auckland's population is expected to increase by more than half a million, roughly equivalent to the population of Wellington, over the next 20 years. This will result in increased pressure on Auckland's transport network. An Auckland transport network that is working well is crucial to improving the contribution the city can make to national economic growth. Auckland is likely to require additional transport investment to keep the city and its economy moving, prompting ongoing calls for regional equity from other parts of the country.

Figure 1: projected population growth in New Zealand by 2031



Source: Statistics New Zealand

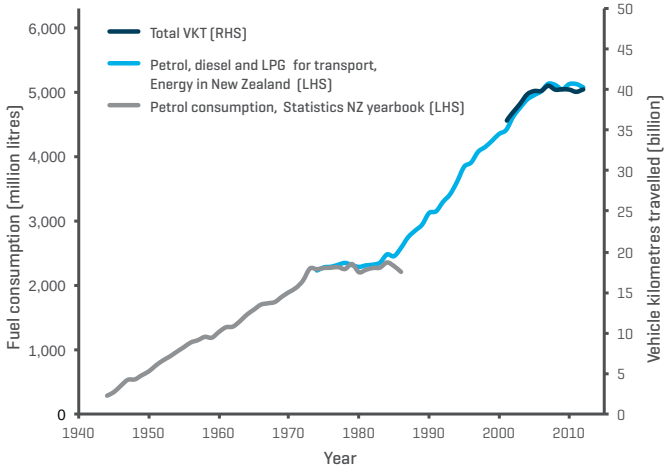
By 2036, the number of people in New Zealand aged 65 and over is forecast to double to 1.2 million. The ageing population is more pronounced outside of the major urban areas and international data suggests that individuals halve their vehicle kilometres travelled when they retire. This is likely to radically change transport demands in the regions and reduce the revenue base available to maintain the transport network and meet social expectations for levels of service.

Uncertain demand for personal travel

Around 96 percent of personal travel in New Zealand occurs in private vehicles. Historically, the total distance travelled by private vehicles has increased consistently over time. This consistent growth has been driven by an increase in population and the number of vehicles in the fleet, and an increase in the distance travelled on a per capita basis. However, as shown in figure 2 below, this growth has stalled in recent years.

Figure 2: Travel demand as indicated by Vehicle Kilometres Travelled (VKT) and fuel consumption, 1944 to 2012

The average distance travelled per-person in light passenger vehicles has fallen by around 8 percent, from a peak of about 7,600km in 2004, to around 7,000km in 2013. The total distance travelled over the same period has increased marginally (from 39.3 billion kilometres in 2004 to 40.4 billion kilometres in 2013) as a result of population growth. This trend is not unique to New Zealand – it has been observed in a number of developed countries.



Source: Ministry of Transport's total VKT data (TV001)
Ministry of Business, Innovation and Employment's Energy in New Zealand data

There is some debate as to whether this trend is the result of economic factors or a more structural shift in attitudes towards personal transportation. The fact that this trend emerged before the onset of the global financial crisis gives cause to believe that social, behavioural and lifestyle factors (such as the proliferation of smart phones, social media, online shopping and video conferencing) may also be having an influence. A related trend is a reduction in the number of driver licences being issued. In particular, fewer young people are choosing to drive. This suggests that in some groups, the perceived merit of car ownership and use may be declining.

Strong population growth means that overall demand for transport across all modes will continue to increase. Motor vehicles are and will continue to be the predominant mode of transportation in New Zealand for the foreseeable future. However, the rate of growth in motor vehicle travel seen in the twentieth century is unlikely to continue. An ageing population, rising fuel prices, increasing urbanisation, improved mobility and accessibility options, growing health and environmental concerns, and changing consumer preferences all appear to be contributing to reduced per-capita travel in motor vehicles and an increase in demand for alternative transport options.

New technologies driving improvements in safety, efficiency, and environmental outcomes

Technology is everywhere, and it is changing the way we live our lives. It is changing how and when we communicate with each other, whether we travel to purchase goods or have the goods come to us, and where we work. It is changing the demands that we, as a society, place on the transport system and our need for it.

Modern transport systems are becoming increasingly reliant on technology, with increasing levels of automation delivering improvements in safety and efficiency. In the long-term, the use of fully autonomous or driverless vehicles has the potential to revolutionise the transport system. In the more immediate term, the increased availability and reducing cost of information technology will offer improvements in efficiency, safety, and social experience. Technology will play an increasingly important role in helping to improve service levels while managing costs.

long term issues for transport

This briefing focuses on five long-term strategic policy challenges, which have significant implications for the future transport network. Each of these long-term issues is discussed on the following pages. The purpose of this part of our BIM is not to predict the future, but to consider the likely impact of the current trends that we are aware of in order to better inform government decision making.

A sustainable land transport revenue and investment system

Our current model for collecting revenue and distributing it across the transport system (described **here**) works well for now, but in the future it will come under increasing pressure. There is an opportunity to consider whether the model could be enhanced to deliver better outcomes.

Keeping Auckland moving

Auckland accounts for more than one third of New Zealand's GDP. Over the next 30 years, Auckland's transport system will come under increasing pressure as its population rises to more than 2 million. Central and local government will need to work together to respond to this challenge.

Supporting an export economy

New Zealand depends on its international aviation and maritime links to connect us to the global marketplace. The government has a target of growing exports from 30 percent to 40 percent of GDP. In order to achieve this, we need to do everything we can to remove

unnecessary regulatory barriers and promote New Zealand as an attractive destination for airlines and shipping lines. An efficient and cost-effective domestic freight network can also go some way towards compensating for the competitive disadvantage we face as a result of our distance from markets.

Transport and the environment

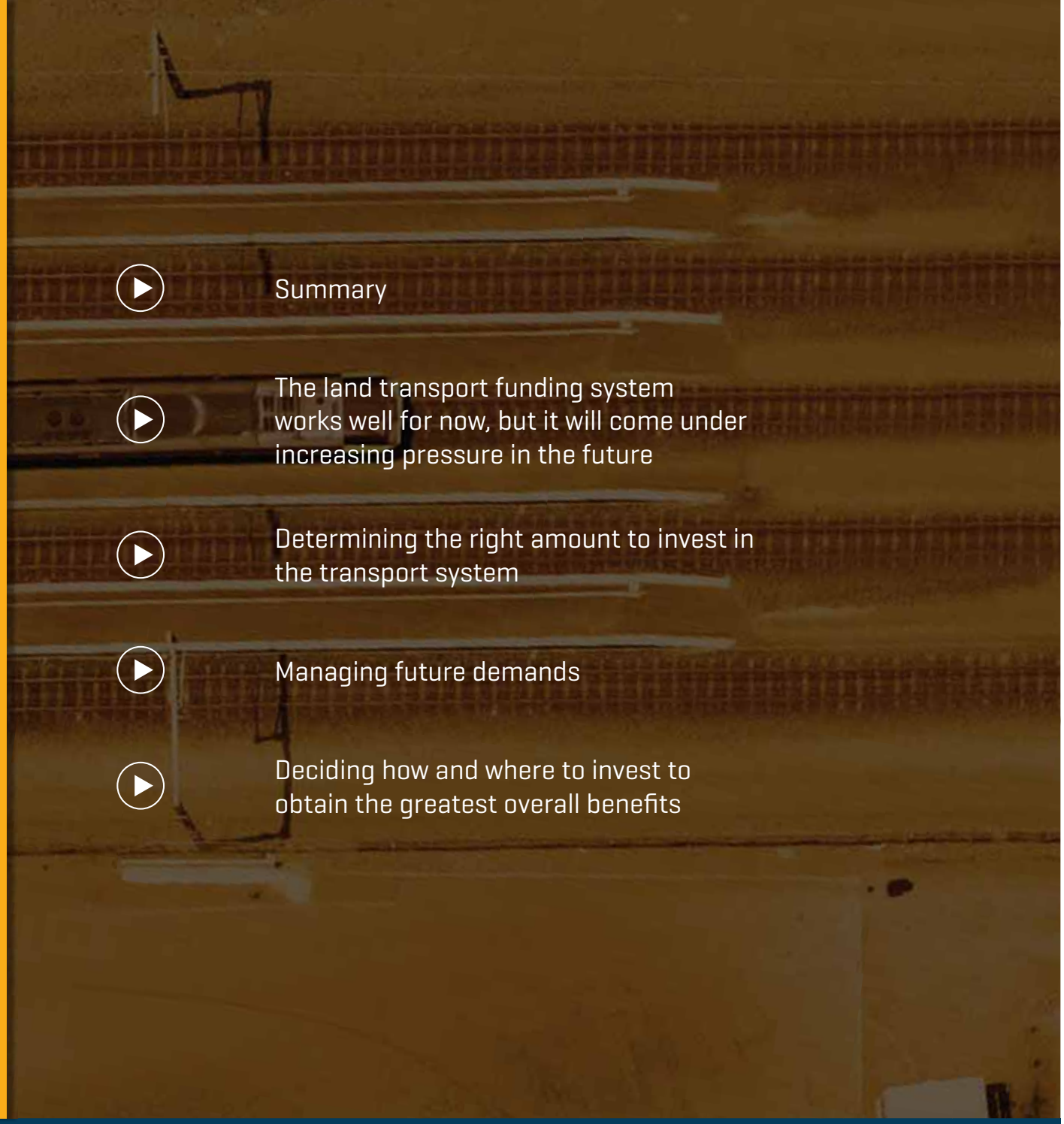
Transport accounts for around 18 percent of New Zealand's Greenhouse Gas Emissions and projections indicate that transport emissions will continue to rise for the foreseeable future. Measures to reduce transport emissions have had a limited impact, and more will need to be done if we are to make a meaningful contribution towards the government's wider targets and international obligations on climate change. Regardless of our actions, we will need to prepare for the cost and disruptions caused by an increase in extreme weather events.

A more intelligent transport system

Intelligent transport systems technologies are revolutionising the transport system globally. These technologies offer some of the best prospects for improvements in safety, efficiency, and environmental outcomes. Most technological developments are being led by the private sector, but the government will have an important role in helping to realise the full benefit of these technologies – both as an investor and as a facilitator.

A sustainable land transport revenue and investment system

Within the next ten years, the model used to collect and distribute revenue from land transport users will come under increasing pressure. There is scope to refine the model to improve its efficiency, effectiveness, and sustainability over the longer term. We need to start thinking now about what changes to the model are required and how we might go about implementing them.



What the future might look like

In the next ten years:

- The historic link between the rate of economic growth and the level of demand for transport will continue to weaken. We will achieve economic growth without an equivalent increase in transport demand.
- As our population becomes more concentrated in urban areas, local councils with stagnating or declining populations and low growth prospects will find it increasingly difficult to meet the cost of maintaining their existing networks.

In 20-30 years:

- Gradual improvements in the fuel efficiency of cars will slowly erode the effectiveness and fairness of Fuel Excise Duty as a means of collecting revenue from transport users.
- Solutions to congestion in cities are likely to become increasingly expensive. This could increase the tension between cities' and regions under a national funding system.
- Greater demand for public transport and active modes could put pressure on the National Land Transport Fund, which is collected from motorists.

Key facts

- Central government will raise and invest $40 billion in the transport system over the next 10 years
- Government spending on transport is equivalent to around 1.3 percent of GDP
- Over the next 10 years, transport expenditure is expected to increase by 3.3 percent per year, well above the rate of inflation. Maintenance costs are rising at over 4 percent per year
- Transport taxes have increased by 33 percent over the last five years
- New Zealanders make around 165 million trips per year using public transport – this accounts for less than 3 percent of total transport trips

Web links

- Read the draft 2015/16 **Government Policy Statement on Land Transport** – the governments tool to set the priorities, objectives and funding levels for land transport.

What it would mean for the government

- We will need to answer difficult questions around the amount that should be collected from transport users, what it can (or can't) be used for, and how it should be distributed around the country.
- As expenditure rises and the amount collected from motorists at the pump decreases, regular increases in fuel taxes will be required. This could prompt changes to the way we collect revenue from transport users.
- Measures to contain costs and transition towards a more sustainable expenditure path will be challenging, particularly for transport providers that are accustomed to continuous improvements to network standards.
- The government should expect increasing pressure for more funding from both larger cities (especially Auckland), which are struggling to pay for the investments required as a result of population growth; and smaller regional centres, which are facing rising costs with fewer rate-payers to fund them.

The land transport funding system works well for now but it will come under increasing pressure in the future

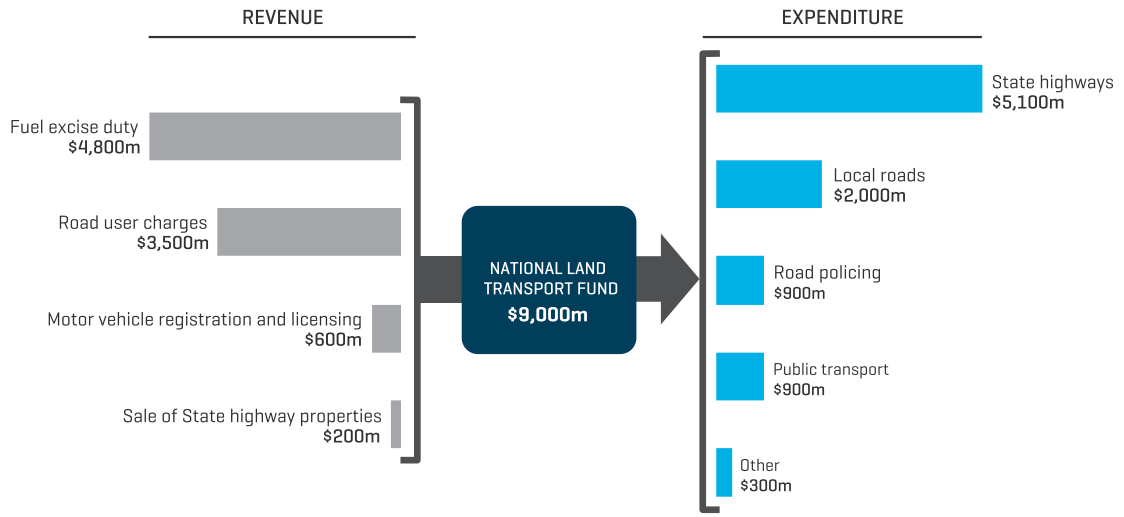
The way we collect and distribute revenue impacts virtually every aspect of the transport system. Through the funding system, we can influence the amount that is invested in the system and the relative price for users to access each transport mode.

The current land transport funding system is very simple in principle. Revenue is collected from road users and dedicated to transport investments. It is collected and allocated on a national basis, which allows us to direct it to areas that need it the most. Any increase or decrease in the total amount of funding for transport investments is achieved by adjusting the rate of taxation on road users. Local authorities also contribute around half of the costs of local roading and public transport investments using revenues from rates.

Currently, central and local government invest around $4.4 billion annually in the land transport system. About $3.4 billion of this comes from the National Land Transport Fund (NLTF) – a dedicated fund of revenue collected from road users. This includes:

- Fuel Excise Duty (FED), which is a component of the per litre price of petrol, LPG, or CNG
- Road User Charges (RUC), which are paid by users of diesel vehicles, on a weight per-kilometre basis
- A portion of the fees paid for motor vehicle licensing and registration.

Figure 3: the land transport funding system



The government is responsible for determining the overall level of funding available to the NLTF and its allocation to broad categories of investment. It also sets the high level goals and objectives for investments in the land transport system. The New Zealand Transport Agency is responsible for selecting which projects are funded by the NLTF.

The government cannot direct the Agency at a project level, and there are limits around what the NLTF can be used for. As a result, previous governments have used Crown funding, in addition to the NLTF, to advance specific transport investments. This has included funding for capital investment in Wellington and Auckland commuter rail; repairs to earthquake damaged roads in Christchurch; the SuperGold Card free off-peak public transport scheme; selected regional State highway projects; and urban cycleways. Other projects, such as the Auckland transport Package of State highway improvements, are being funded by the NLTF but will be brought forward by Crown loans.

The simplicity of the funding model means that it is likely to come under increasing pressure in the longer term as a result of emerging complications and changing external factors. In particular:

- Gradual improvements in the fuel efficiency of cars will slowly erode the effectiveness and fairness of FED as a means of collecting revenue from transport users.

- While investment levels and tax rates are set to meet current investment objectives, there is no clear framework to determine the optimal level of investment in the transport system. Expenditure on transport is rising rapidly, and maintaining this expenditure path is likely to be unsustainable in the longer term.
- Strong population growth (particularly in Auckland) means that solutions to congestion in cities will become increasingly expensive.
- Some regions struggle to demonstrate investment projects that qualify for funding at a national level, but consider the projects necessary for regional economic growth.
- A lack of clarity about the appropriate and sustainable use of road user revenue for rail infrastructure, public transport and active transport modes (walking and cycling) means that it is difficult to apply integrated, multi-modal solutions to transport and land use problems.

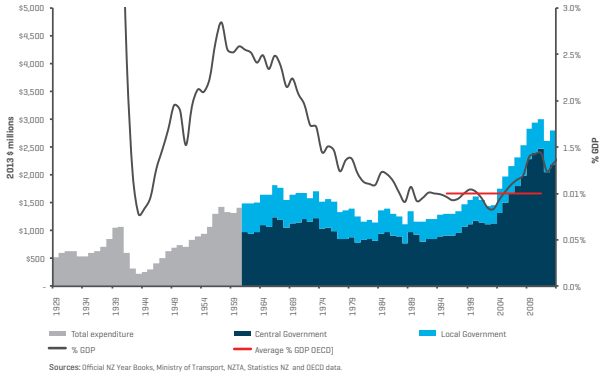
It may be that no alternative model could adequately address all of these issues. But with such a significant annual investment at stake, there is good reason to maintain a close watching brief on these issues and the ways in which we might refine or change the current revenue and investment models to address this long-term challenge.

Some of the factors that would need to be considered when assessing alternatives to the current model are discussed below.

Determining the right amount to invest in the transport system

New Zealand's current level of investment in roading is the highest it has been since the 1960s. New Zealand is now spending a higher percentage (1.3 percent) of its GDP on roading compared to other developed countries. Over the next 10 years, expenditure on transport is expected to increase at 3.3 percent per year, well above the forecasted 2 percent annual increase in inflation for the economy as a whole over the same period.

Figure 4: New Zealand investment in roads, real investment and as a percentage of GDP, 1929-2013



The level of investment in transport infrastructure needs to keep pace with growth and increasing demand, but excessive investment in transport will be counterproductive. Over-investment can result in poor economic returns, diverting resources which could be applied to greater effect elsewhere, and creating additional operating and maintenance costs for future taxpayers and ratepayers.

Determining the right amount to invest in the transport system is a significant challenge. The Ministry needs to maintain a programme of research and thinking that helps governments ensure the level of investment in the transport system is appropriate.

Managing future demands

Different regions have different transport demands. This can create tensions under a national funding system. For example:

- Auckland has at times suffered from relatively low per-capita investment in transport infrastructure and will face increasing congestion in the future as a result of strong population growth. The 'golden triangle' region of Auckland, Hamilton and Tauranga is expected to experience significant growth over the next 30 years, and there is a strong argument that good transport links in this part of the country will deliver the best returns for New Zealand overall.
- Many small regional centres have stagnating or declining economies, with some experiencing population decline. Some of these regions are already struggling to maintain their transport services and infrastructure with increasing maintenance costs and fewer rate-payers to fund them. However, it is often argued that transport can stimulate regional economic growth, and that stronger regions will help to alleviate pressure on our major cities.

The high cost of addressing congestion in cities, increasing demand for public transport alternatives, and a perception that big cities are taking more than their fair share will result in escalating pressure on the national funding allocation system. In addition, we have a large investment in transport infrastructure (the roading network) that can be underutilised for much of the day. Building the network to meet 'peak' demand is neither sensible or feasible.

New charging tools based on distance, time and place, using technologies like Global Positioning Systems, can provide different charges for travelling on different parts of the network or at different times of the day. These technologies are becoming more advanced and cheaper, and could provide solutions to manage demand and optimise the use of existing networks while providing alternative revenue sources to the current fuel based ones.

It would take some time before such a system would be viable in New Zealand, although some countries such as Singapore are introducing these now. It is important that we closely monitor developments in this area to determine if and when this approach is likely to be feasible in New Zealand.

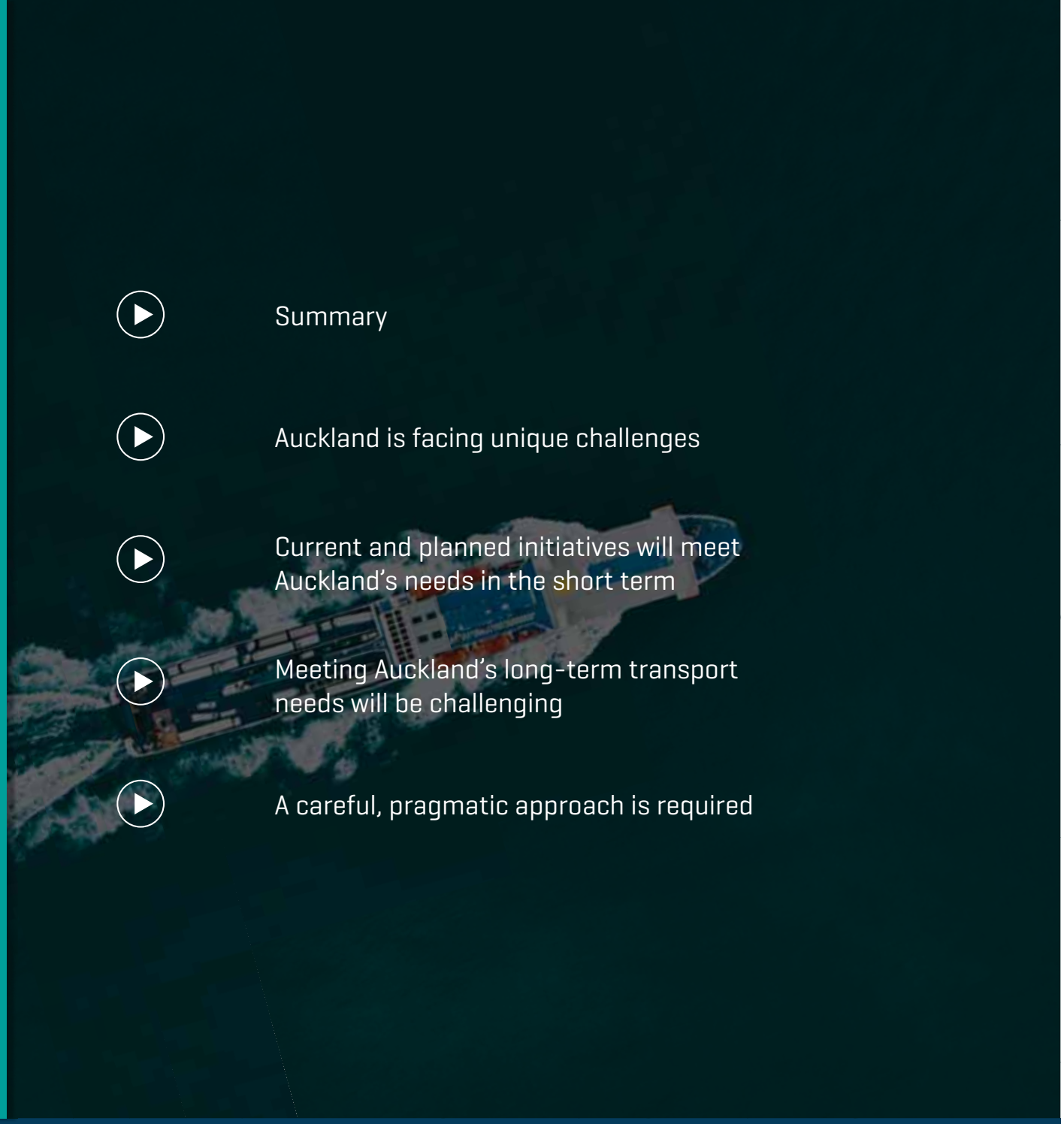
Deciding how and where to invest to obtain the greatest overall benefits

The current revenue and investment framework is designed primarily around the costs and benefits to road users. There is an implicit assumption that transport projects should be assessed primarily in terms of their benefits to road users, as they provide the revenue for the NLTF.

Investments in public transport can be partly justified by the fact that they generally reduce congestion on roads, but they also have other benefits – for example improving transport access for people who do not have a private vehicle, and by reducing transport emissions. Walking and cycling initiatives will often have a limited impact on congestion, so there is always likely to be some resistance to paying for them using funds derived from road users. The same is true for rail investments. These distinctions may become more problematic in the future if we are to invest in the system to deliver the greatest overall transport benefits.

Keeping Auckland moving

Finding the best way to plan, fund and develop Auckland's transport system to cope with strong population growth will be one of the biggest transport challenges for central and local government. Auckland accounts for 34 percent of New Zealand's population and generates 35 percent of our GDP, so the performance of its transport network has implications for the whole economy.



What the future might look like

In the next ten years:

- Despite continuing rapid population growth, congestion will remain relatively stable following completion of comprehensive improvements to the motorway, rail and bus networks.
- Public transport patronage and walking and cycling will continue to grow but more than 80 percent of all trips will continue to be made by private vehicles.

In 20-30 years:

- Auckland's population is expected to grow to over 2 million people. Around half of this growth is expected to be accommodated in existing, built-up areas and half in greenfields land.
- Public transport, walking and cycling trips are projected to grow significantly, increasing their share to around a quarter of total travel. The public transport network, boosted by the City Rail Link and other improvements, should have the capacity to accommodate the expected growth. Private vehicle trips are also expected to grow significantly, and the roading network is likely to become increasingly congested, with congestion spreading throughout the working day.

Key facts

- The government currently invests around $1 billion in Auckland's transport system each year. Of this, around 59 percent is for roading, 38 percent for public transport, and 3 percent for other activities (including walking and cycling)
- Employment is dispersed across Auckland, with 77 percent of commuters working outside of the CBD and its surrounds. This makes it challenging to provide cost-effective public transport options to multiple locations
- In the year to July 2014, Auckland's public transport patronage grew by six percent, totalling 72 million trips. (56 million by bus, 11 million by rail, and 5 million by ferry)

Web links

- Read a report analysing **Auckland commuter trip patterns from the 2013 Census**

What it would mean for the government

- Continued investment in new transport capacity will be required. Decisions on the next phase of network development, beyond the current major projects, will be challenging as the most obvious, high value network improvements will already be in place.
- The government will be called upon to respond to ongoing requests for additional funding and new ways to help pay to meet the city's transport challenges and aspirations. This will have broader implications for the national transport funding system.
- Future major transport investment decisions will require a careful, pragmatic, and evidence-based approach that draws on the strengths of each mode and based on likely travel patterns and a sharp focus on delivering maximum value from every dollar spent.

Auckland is facing unique challenges

More than one-third of New Zealanders live in Auckland. As our largest city, Auckland has an important role in our economy. Very few other countries in the OECD have such a high proportion of their population and economic activity concentrated within a single city.

In the next 20 years, Auckland's population is expected to grow by just under half a million people – equivalent to the current population of Wellington. Auckland is expected to continue to increase its share of both New Zealand's population and economic activity. Our modelling, based on Statistics New Zealand data, suggests it could account for 41 percent of economic activity by 2042. This growth will put significant pressure on Auckland's transport system.

The challenge for the transport system of providing for this growth is made even more difficult by the city's geography and urban form (see Figure 5).

- Auckland is located on a narrow land mass and its urban area is constrained by the Manukau and Waitemata Harbours. As a result, there is much less land available within a 10-kilometre radius of the CBD compared with most other cities. This affects the way the transport network functions and options for its development.
- Housing and employment are spread throughout Auckland's urban area, with approximately 77 percent of employment located outside the CBD and its surrounds. Auckland's travel patterns are therefore widely dispersed. This makes it challenging to provide cost effective public transport options for the majority of trips taken on the network. Consequently, private vehicles are the dominant mode, accounting for around 78 percent of trips during the peak period.

Figure 5: Auckland's Urban Area

Current and planned initiatives will meet Auckland's needs in the short term

Current and planned transport investment in Auckland is focussed on improving and upgrading three major networks:

- The motorway network: The government is investing $2 billion in the Western Ring Route. Once the $1.4 billion Waterview Connection is completed in 2017, Auckland will have a new motorway running through the city as an alternative to State Highway 1, and a complete motorway connection between the Airport and the city centre. A further $800 million has been allocated through to 2019/20 on projects within the Northern and Southern Corridors and State Highway 20A to Auckland Airport.
- The metro rail network: The government is investing $1.7 billion to upgrade and electrify the metro rail network and provide financial assistance to Auckland Council for the purchase of new electric trains. This investment will enable 10-minute frequencies during peak periods. These works will be completed by the end of 2015 once the last of the 57 new electric trains come into service.
- The bus network: By 2017, Auckland will have a streamlined bus network focussed on more frequent services operating on key routes, with services feeding into the city's rapid transit network (the rail network and the Northern Busway). Significant investment at public transport interchanges is also underway or planned for the next few years.

These investments are already yielding significant results. Over the last decade, average morning peak congestion in Auckland has remained stable, despite Auckland gaining an additional 200,000 people and around 70,000 employees. Rail patronage has also increased substantially from three million to 11 million trips per year.

As a result of these and other projects, congestion in Auckland is expected to remain steady until the early 2020s.

Meeting Auckland's long-term transport needs will be challenging

Future development of Auckland's transport network will be challenging, as the most obvious improvements are already being delivered.

In 2012, Auckland Council released its 30-year plan for Auckland, the Auckland Plan, which includes a strategy for the development of the city's transport system. The Plan includes a strong focus on residential intensification by locating a much greater proportion of housing closer to, or alongside, key transport corridors and facilities. The transport strategy supports this by emphasising a transformational mode shift to public transport as the primary means of providing for Auckland's forecast growth in demand for travel.

The strategy includes a range of public transport and roading projects, such as the City Rail Link, a rail connection to the Auckland Airport, busways, and the additional Waitemata Harbour Crossing. Auckland Council estimated that it would need up to $15 billion more funding than the $52-$60 billion forecast to be available through the NLTF and ratepayer contributions over the Plan's 30-year period.

Auckland Transport, a statutory council-controlled-organisation responsible for the city's transport, developed a 30-year implementation programme to give effect to the Auckland Plan.

Auckland Transport's modelling of the implementation programme indicated that while there would be some increases in public transport and walking and cycling mode share, private vehicles would continue to remain very much the dominant mode of travel and account for the bulk of all kilometres travelled on the network in 2041 (see figures 6 and 7). Congestion was forecast to increase significantly and increasingly spread throughout the working day, affecting the majority of trips taken on the network. For these reasons, and taking into account the significant additional funding proposed, we concluded the strategy would not effectively address anticipated growth in demand for travel or deliver value for money.

Figure 6: Current and forecast mode shares in Auckland during the morning peak period

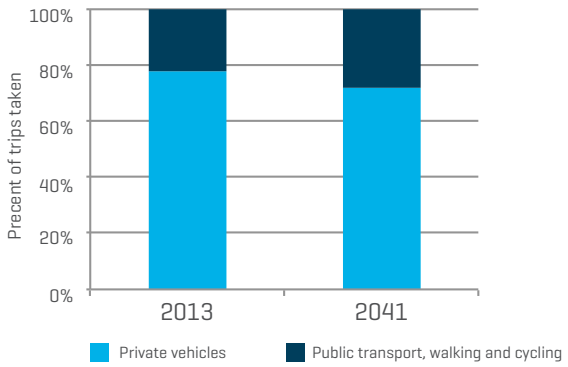
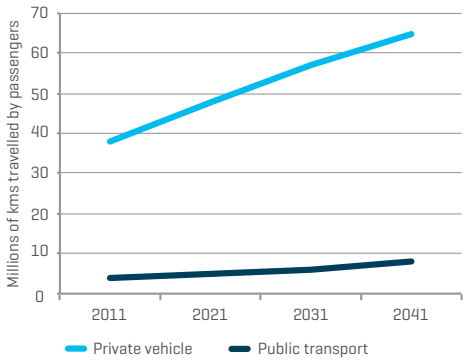


Figure 7: Distance travelled by private vehicle occupants and public transport passengers per day



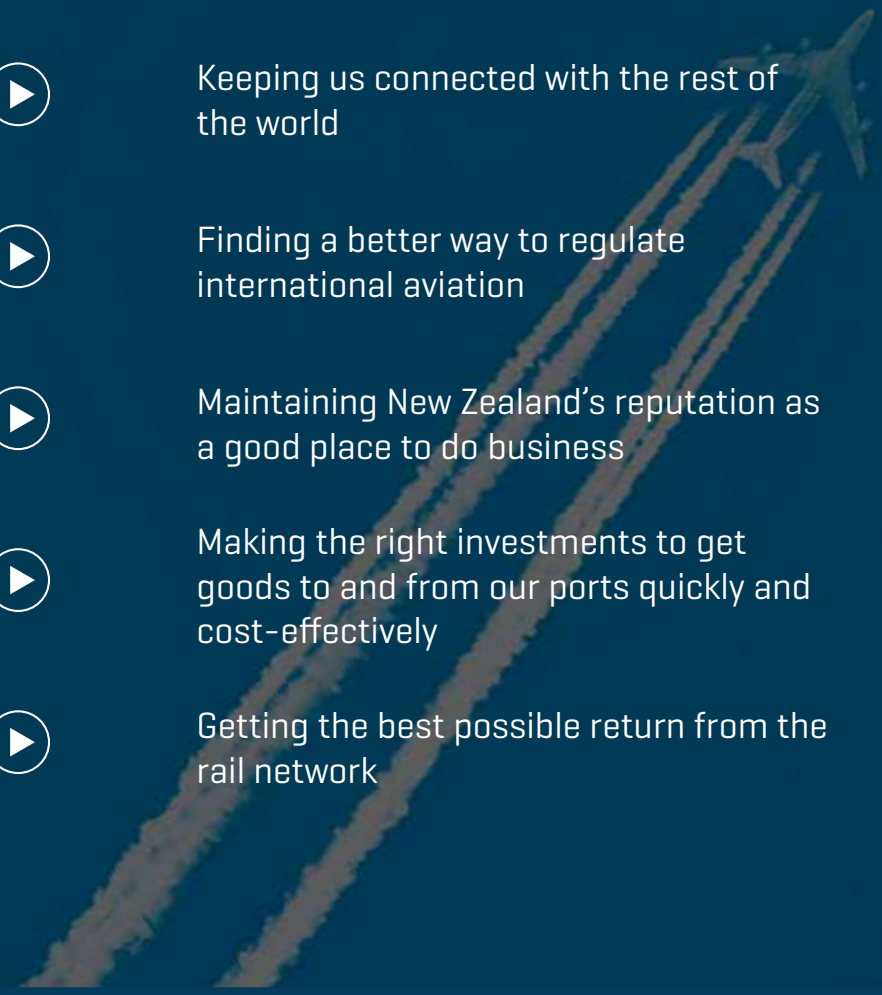
Auckland Transport is currently reviewing the strategy as part of a wider review of all planned Council expenditure to inform decisions on the Council's Long-Term (funding) Plan 2015 - 2025. We understand this has already resulted in improvements to the strategy; in particular, the funding shortfall has been reduced to $10 billion. However, as we do not anticipate substantial changes to the projects included in the strategy, it remains to be seen whether the additional funding proposed in the strategy will effectively address Auckland's transport issues and deliver value for money.

A careful, pragmatic approach is required

The performance of Auckland's transport network is important for the government in its funding role and because of the broader implications for the national economy. The issues that Auckland will face over the next 30 years are long-term challenges for which there is no quick fix. We will need to work closely with Auckland Council and Auckland Transport to find solutions that meet Auckland's transport needs at an acceptable cost. Any transport solution for Auckland will need to be something that both Auckland and the government support.

Supporting New Zealand's export economy

The transport system has a critical role in supporting our exporters by connecting them with the global marketplace. Our geographical isolation is a major competitive disadvantage – but we can help to overcome this by ensuring that we have an efficient domestic freight network, and policy and regulatory settings which support growth in the aviation and maritime sectors



What the future might look like

In the next ten years:

- A small number of ports will have invested in the necessary infrastructure to support larger ships, and the gap between our biggest ports and our smallest ports will widen. Road links to our larger ports will become more congested.
- Road freight will be more productive, due to more sophisticated data and information systems and increasing use of larger trucks.
- An increase in online shopping and demand for goods to be delivered quickly will lead to more goods being shipped directly from suppliers to consumers.

In 20-30 years:

- Most of our international freight could be moved through a few large ports. Big ships are likely to dominate the movement of New Zealand's exports and imports with international shipping lines controlling when export goods leave New Zealand (exporters will need to meet their timeframes).
- The world is likely to have moved on from negotiating air services agreements bilaterally, with airlines increasingly able to operate freely across borders.
- Rail freight may still face fundamental challenges, but it will be making an important contribution along high-volume freight corridors and for transporting goods which are not time sensitive. Technology could provide opportunities to use our rail corridors more effectively.

Key facts

- 99 percent of our exports by volume (85 percent of exports by value) are shipped by sea
- Average sea freight costs in New Zealand are 21 percent higher than in Australia; air freight costs are 15 percent higher
- 99 percent of international visitors arrive by air
- Around 22 percent of international ships operating globally are too big to dock in New Zealand's ports

Web links

- **The National Freight Demand Study** provides a snapshot of New Zealand's current and projected freight task

- **The International Air Transport Policy** sets out the Ministry's approach to negotiating air services agreements
- The **Productivity Commission's inquiry into international freight transport services**

What it would mean for the government

- We will need to closely monitor developments in our port sector and the international shipping industry to identify and respond to pressures on land transport links, especially those connecting to our major export ports.
- Once the remaining restrictions in our bilateral air services agreements have been removed, the government's role will focus on maintaining competitive aviation markets and an attractive operating environment.
- We will need to continue to refine the business model for rail and develop a better understanding of the contribution it makes to the economy.

Our distance from markets is a significant challenge for our exporters

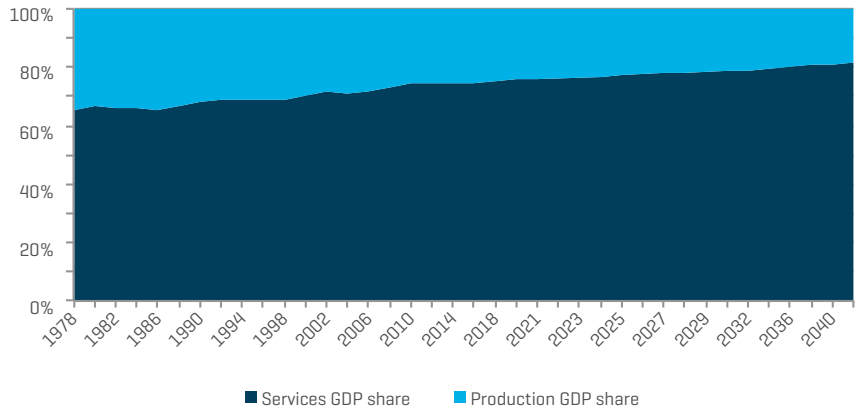
New Zealand is a small country, geographically isolated from its major trading partners. No other developed country in the world faces the same geographical challenges. Our size and distance has been linked to relatively low levels of competition in New Zealand compared to other developed countries, which reduces our productivity. A 2012 Productivity Commission inquiry on international freight transport services found that the cost of sea freight in New Zealand is 21 percent higher than Australia on average; and the cost of air freight is 15 percent higher.

The future will bring new opportunities for New Zealand to capitalise on the shift in global economic power which is currently taking place. The rapid pace of economic growth in markets across Asia has given rise to the phrase 'the Asian century'. By the middle of this century, Asia could account for around half of global output, trade and investment. This shift in the centre of global economic activity will bring our export markets closer to us. The trend is already apparent, with Asian countries (particularly China) accounting for a larger share of our international trade than ever before. However, while our markets are getting 'closer' to us, it is likely that we will always remain on the periphery of global economic activity.

In the longer term, New Zealand may become less reliant on international transport links as the economy continues to transition from one based on the export of physical goods to a more 'weightless' service economy (see figure 8). In the services sector, New Zealand can compete on a more level playing field and is less constrained by our geographic position. But for the foreseeable future our international transport links will continue to play a major role

in our economic success. Lifting trade intensity is vital for New Zealand to achieve its growth targets. As a small economy, exporting enables our most productive firms to increase scale, incentivising investment and higher productivity.

Figure 8: Historical and projected composition of New Zealand's economy, 1978-2041



An efficient transport system can help us to reduce the impact of our distance from markets. The role of the transport system in supporting international trade and tourism is most obvious in the aviation and maritime sectors, which provide our exporters with vital links to the rest of the world.

The domestic freight network also plays an important role in supporting trade, as domestic freight costs can represent a significant portion of the total cost of getting goods to their final destination. Around a third of our domestic freight movements are related to the movement of goods to or from our international ports and airports.

Keeping us connected with the rest of the world

The aviation and maritime sectors are largely funded by the private sector. The government does not have the same ownership and investment levers that it does in land transport. The scope for the government to regulate these industries is also somewhat limited, as both are governed by international conventions which set minimum operating standards. These sectors are also capital intensive. Aircraft and ships are expensive to own and operate, and the attention of airlines and shipping lines is naturally focussed on larger and potentially more lucrative markets.

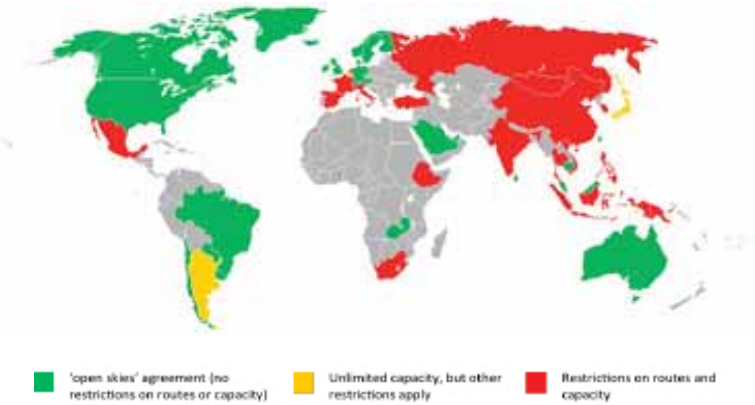
Despite these limitations, the government will have opportunities to influence the way that these sectors develop over the next 30 years to improve our transport links with the rest of the world. These are discussed below.

Finding a better way to regulate international aviation

Despite being part of one of the most 'global' industries in the world, airlines are not able to operate freely across borders. The international air transport industry is regulated by a complex web of bilateral air services agreements, which specify (among other things) which airlines can operate between two countries, which routes they can fly, and how much capacity they can provide. The Ministry is responsible for negotiating these agreements on behalf of the government.

Since the 1980s New Zealand has taken a very liberal approach toward regulating international air services. As shown in figure 9, we have around 60 air services agreements, including with all of our major trading partners. More than half of these are 'open skies' agreements which remove most restrictions on airlines. This liberal approach has been successful, and has helped us achieve steady and consistent growth in visitor arrivals to New Zealand. Nevertheless, a number of significant restrictions remain in place, including with some of our largest trading partners.

Figure 9: New Zealand's air services agreements



The bilateral framework that has governed aviation since the 1940s is an inefficient and impractical way of regulating international aviation. New Zealand cannot act alone to change this global framework – but we do have an opportunity to take a leadership role and help to build a consensus for a transition towards a single, multilateral agreement to improve the competitiveness of aviation markets globally.

Without reform of the global regulatory system, there is a risk that New Zealand will be left behind. Many regional blocs such as the European Union and the Association of South East Asian Nations (ASEAN) are creating their own regional agreements. These agreements will give their airlines access to new markets resulting in increased competition, lower fares and more choice for consumers. New Zealand is not associated with any of these regional aviation blocs.

Maintaining New Zealand's reputation as a good place to do business

Our international transport links are enablers of economic growth. Each new air link or shipping service has significant flow-on effects throughout the economy. Strong international transport links facilitate tourism, and help our firms to be better connected and better positioned to seize the opportunities that arise from the flow of people, ideas, capital and trade across borders.

For many shipping lines and airlines, New Zealand is already a marginal proposition. To entice airlines and shipping companies to operate in the New Zealand market, we need to ensure that our policy and regulatory settings continue to promote growth and innovation. The focus should be on promoting an open, effective and competitive market. We can do this by providing information, avoiding unnecessary compliance costs, and where possible, looking for new opportunities to reduce costs and improve regulatory efficiency while maintaining safety and environmental standards.

Making the right investments to get goods to and from our ports quickly and cost-effectively

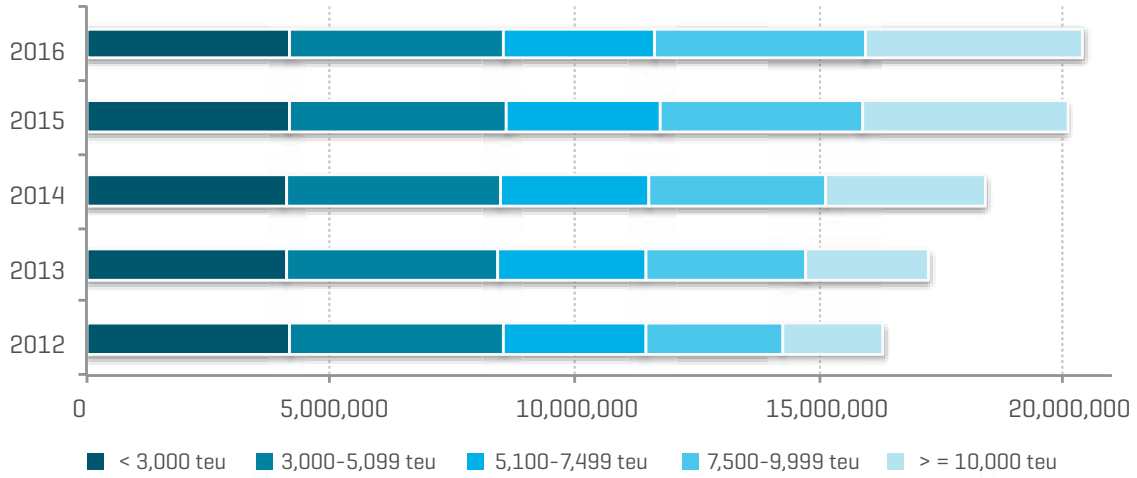
Each year, our domestic freight system is responsible for moving over 236 million tonnes of freight within New Zealand by land – about 50 tonnes for each member of the population. Freight shippers rely on our roads, rail lines, ports, and airports to move goods around the country as quickly and cost effectively as possible.

The National Freight Demand Study provides projections on the size of the future freight task. It forecasts that New Zealand's total domestic freight task will increase by around 58 percent over the next 30 years in terms of tonnage and 48 percent in terms of tonne kilometres (the weight of goods multiplied by the distance travelled). The volume of freight going through our ports is also expected to increase. This will put pressure on our transport links to and from our ports.

The growth will not be distributed evenly across our ports – some are likely to experience significantly higher growth than others as a result of trends in the international shipping industry. In particular, the global trend towards larger ships is likely to increase the gap between our largest ports and our smaller ports. New Zealand ports are currently equipped to

handle ships with a capacity of up to 5,000 twenty-foot equivalent units (TEU), but some 22 percent of global ships (and 53 percent of global shipping capacity) are larger than 5,000 TEU and too large to dock in New Zealand's ports. The forward order-book for new vessels shows that 81 percent of the new capacity will be in vessels over 7,500 TEU. Not all of our ports will be able to justify the expense of investing to accommodate these larger ships.

Figure 10: Projected global container ship capacity by vessel size



With larger vessels accounting for a larger proportion of our shipping capacity and fewer ports with the necessary facilities and freight volumes to accommodate them, some shipping lines are likely to stop calling at smaller ports throughout New Zealand. This would create a gap which may not necessarily be filled by smaller operators. At the same time, demand for moving goods around the country to our largest international ports is likely to grow. This could have an impact on the relative priorities of land transport investments, so close monitoring of trade patterns and trends is vital.

Getting the best possible return from the rail network

For decades, rail has struggled to be a commercially viable mode for freight transport. Over the last four years, KiwiRail has received $1.04 billion in taxpayer funding as an investment in its 10-year turnaround plan. The objective of the turnaround plan is to transition KiwiRail's freight business into a sustainable business that is able to fund its ongoing operating and capital expenditure solely from customer revenue.

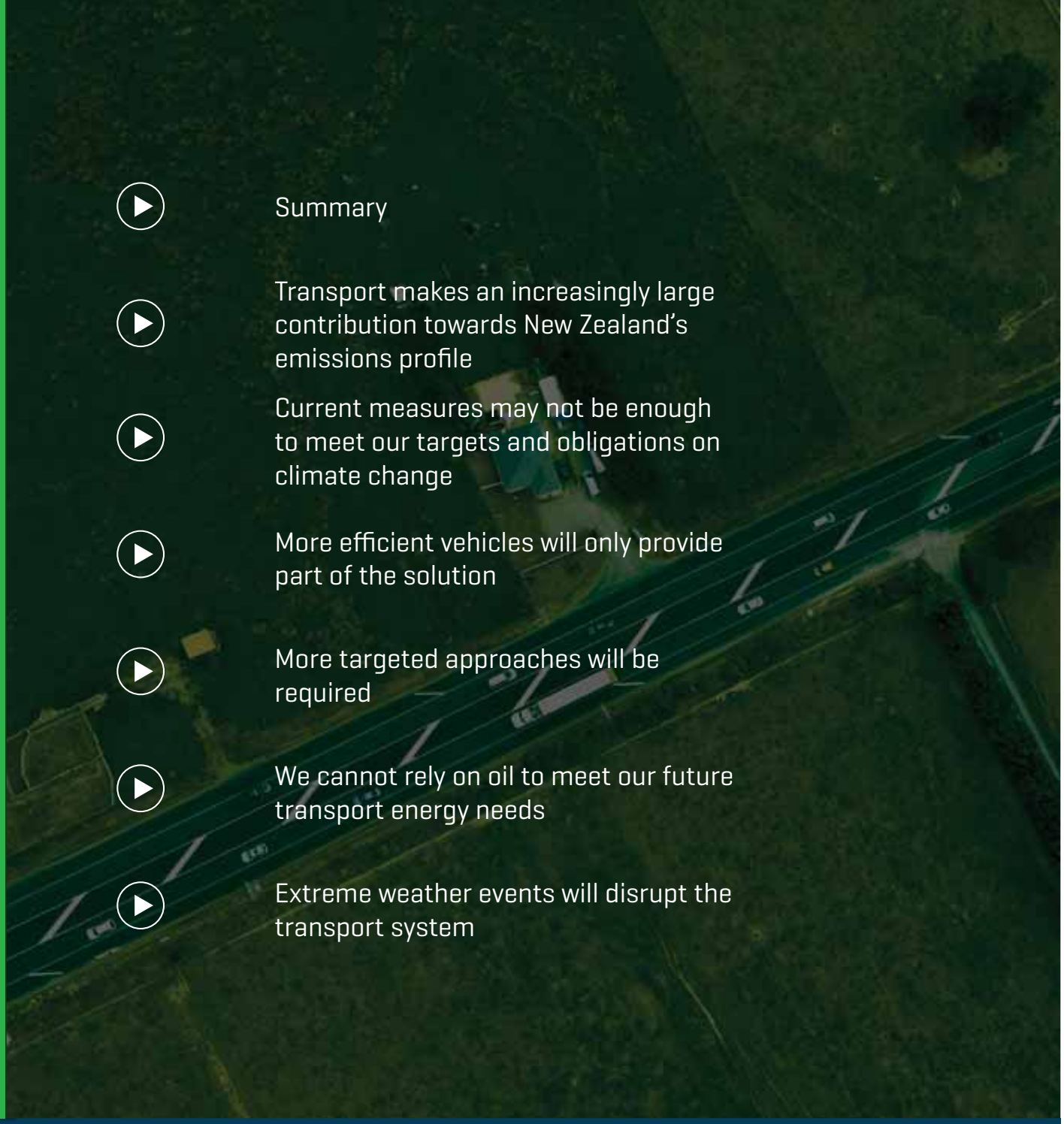
Rail faces a number of significant challenges. KiwiRail is responsible for managing a large network of track which is expensive to maintain, and New Zealand's low freight and passenger volumes make it difficult to generate enough revenue to be commercially sustainable. However,

rail is also an important strategic asset. It provides substantial freight capacity on a number of routes, which frees up otherwise congested routes and reduces the wear and tear on our roads. It is particularly effective in transporting bulk goods and lower value freight, such as coal, dairy, and forestry products. Freight volumes for some of these products are expected to grow significantly over the next 30 years.

Achieving a sustainable and self-funding rail network will be an ongoing challenge for KiwiRail and the government. The focus will need to be on increasing volumes and reducing costs on the parts of the network that are most likely to deliver a commercial return. In the longer term, new technologies that cannot currently be contemplated may provide some of the solutions to these challenges.

Transport and the environment

Transport makes a large contribution to New Zealand's greenhouse gas emissions. There are a range of options available to ensure that the transport sector makes a valuable contribution to New Zealand's targets and obligations on climate change. The changing climate is already testing the resilience of the transport system, so decisions will be needed around how we maintain and repair the network in the future.



What the future might look like

In the next ten years:

- Transport greenhouse gas emissions are projected to increase, but at a slower rate than previously due to uncertain demand and a more efficient vehicle fleet.
- More electric or hybrid vehicles will be sold, but these vehicles will still represent a very small percentage of the overall fleet. New Zealand's transport system will still be dependent on fossil fuels.
- The cost and frequency of extreme weather related events will continue to rise on average, putting pressure on NZ Transport Agency and local council budgets for maintenance and repair work.

In 20-30 years:

- New technologies mean that transport emissions are likely to gradually reduce, but without measures to promote more efficient, low emission transport options, the rate of decline is unlikely to be enough to make a significant contribution towards wider government emissions targets.
- Regardless of New Zealand's mitigation actions, the transport system is likely to be affected by a changing global environment. Climate change is predicted to result in an increase in the cost and frequency of extreme weather related events.
- The price of oil is likely to become increasingly volatile.

Key facts

- 18 percent of New Zealand's greenhouse gas emissions come from the transport system. Transport is the highest emitting sector after agriculture
- New Zealand has set a target to reduce net greenhouse gas emissions by 50 percent by 2050 (from 1990 levels)
- 89 percent of transport emissions come from road transport
- Annual land transport maintenance costs are rising by more than 4 percent per year, in part due to the cost of repairs after extreme weather events

Web links

- Read **New Zealand's 6th National Communication under the United Nations Framework Convention on Climate Change**
- Read a report on the impacts of climate change by the intergovernmental panel on climate change

What it would mean for the government

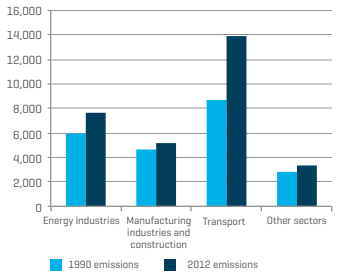
- International pressure to reduce greenhouse gas emissions will increase. Some of the more promising opportunities to reduce emissions lie in the transport sector, but any improvements are likely to be gradual.
- We will have an opportunity to implement measures that not only reduce emissions, but also reduce our dependence on oil.
- In the longer term, we will need a framework for deciding which transport routes are the most critical so that we can invest in protecting them from the effects of changes in the climate.

Transport makes an increasingly large contribution to New Zealand's emissions profile

Transport is vital to society as it supports all aspects of our social and economic activities. However, the public are increasingly becoming aware of the adverse effects of the transport system, including the impact on greenhouse gas emissions, the natural environment, health outcomes, and noise.

In 2012, domestic transport accounted for 82 percent of New Zealand's oil consumption, with land transport making up 92 percent of that amount. As a result, in 2012, 18 percent of New Zealand's total domestic greenhouse gas emissions came from transport. This is an increase of 58.5 percent from 1990 levels. As shown in figure 11, transport has accounted for the majority of growth in emissions from fuel combustion.

Figure 11: Change in New Zealand's emissions from fuel combustion, by category, 1990–2011



Over the past 10 years, transport emissions have stabilised. However, this is more closely linked to the flat demand for private vehicle usage that has been observed recently, rather than any fundamental improvement in fuel efficiency. We expect per-capita road transport emissions will remain steady or drop slightly, but total transport emissions are expected to increase slightly due to population growth.

Current measures may not be enough to meet our targets and obligations on climate change

New Zealand has set a number of targets to reduce its greenhouse gas emissions, including:

- An unconditional target tabled under the United Nations Framework Convention on Climate Change to reduce emissions by 5 percent below 1990 levels by 2020.
- A conditional target of reducing emissions by 10-20 percent below 1990 levels by 2020 if certain conditions are met.
- A long-term target to reduce net greenhouse gas emissions by 50 percent from 1990 levels by 2050.

The New Zealand Emissions Trading Scheme (ETS) is the government's principal tool supporting New Zealand's efforts to meet its international climate change obligations and reduce its net emissions below business as usual levels. The ETS helps New Zealand to meet its international targets by incentivising domestic emission reductions and allowing access to international carbon markets.

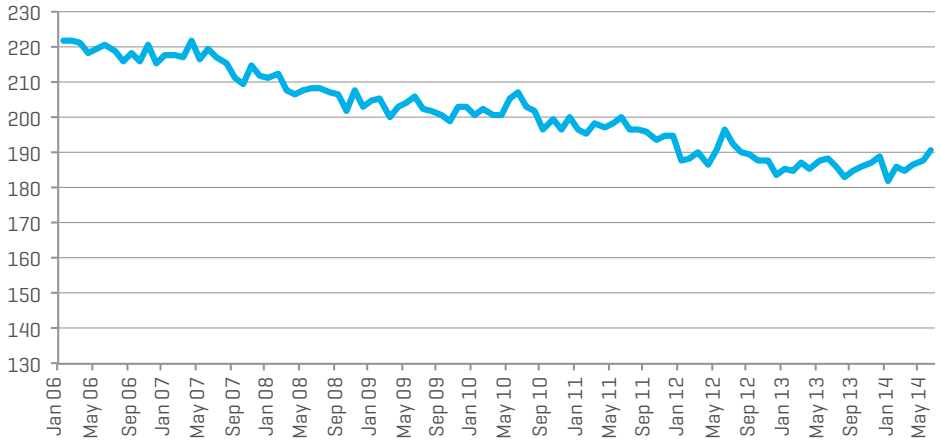
In the transport sector, the cost of the ETS flows through to the price of petrol at the pump. Its effectiveness is based on an assumption that the increased prices will moderate demand for petrol consumption. However, fuel use is highly inelastic. Even with carbon prices of $25 per tonne, the ETS would have a relatively minor impact on transport emissions. But with current carbon prices at around $4 per tonne, the impact of the ETS on transport emissions is negligible (equating to about 1 cent per litre of fuel).

A number of other measures have been implemented in recent years which may have a small impact on transport emissions, such as exempting electric vehicles from road user charges until 2020, and introducing a fuel economy labelling scheme. However, these initiatives alone will not be enough to achieve any significant reduction in transport emissions.

More efficient vehicles will only provide part of the solution

As shown in figure 12, the average CO_2 emissions of light vehicles entering the fleet has reduced by around 10 percent over the last six years. However, the overall improvement in the average vehicle emissions across the entire vehicle fleet has been much smaller. This is partly due to the fact that vehicles entering the fleet each year account for a relatively small proportion of the total fleet. However, it is also becoming increasingly clear that the actual on-road efficiency of many new vehicles can vary considerably from advertised efficiency rates. Improvements in vehicle efficiency are also being held back by strong consumer demand for large, high-emissions vehicles

Figure 12: Average CO_2 Emissions of new light vehicles (gms/km)



Alternative fuel vehicles (such as electric cars) and other low emission vehicles are beginning to gain prominence internationally and could have a big impact on emissions, particularly as more than three-quarters of our energy supply is derived from renewable sources. However, the uptake of alternative fuel vehicles in New Zealand has been low (less than 100 electric vehicles are currently registered in New Zealand) and it may be many years before they are widely adopted, given the relatively slow turnover of our vehicle fleet. Barriers to uptake include the high initial investment cost, the lack of available second-hand imports, and anxiety over their limited range and lack of recharging infrastructure.

More targeted approaches will be required

There are a range of options with potential to reduce transport emissions, including the manufacture of bio-fuels from woody biomass, providing incentives to encourage the uptake of more fuel efficient vehicles; setting higher emission standards for imported vehicles; or introducing tail-pipe emissions testing. All of these measures involve some form of trade-off, with potential social or economic consequences.

Options are limited in the international aviation and maritime sectors, where alternative fuel sources are not yet an economically viable option. Introducing unilateral taxes, levies, or other targeted initiatives in these sectors could reduce our competitiveness as a destination for the international shipping lines and airlines on which we so heavily rely. However, airlines and shipping lines already have strong financial incentives to improve their fuel efficiency, as fuel is a significant operating cost.

We cannot rely on oil to meet our long-term future transport energy needs

Transport is heavily reliant on fossil fuels. Oil prices have been relatively stable over the past few years, and proven oil reserves are expected to be sufficient to meet global demand at least for the next few decades. But over the longer term it is likely to become increasingly difficult and expensive to locate and extract oil, which could result in greater volatility in the price of transport fuels.

Any significant increase in the price of oil would be felt widely throughout the transport system and the economy in general. Higher energy prices would have a significant impact on the tourism industry, and potentially on the exports of high-volume, low-value commodities such as exported logs. A sustained increase in oil prices could also change the way we travel, by encouraging urbanisation, leading to greater demand for public transport and active modes.

Even if oil prices do not increase significantly over the long-term, they are likely to remain highly volatile and susceptible to political turmoil in oil producing economies and other factors well beyond New Zealand's control. As well as reducing greenhouse gas emissions, policies that promote vehicle efficiency and the uptake of alternative fuels (as technology allows) will have the added benefit of insulating the economy from future oil price shocks.

Extreme weather events will disrupt the transport system

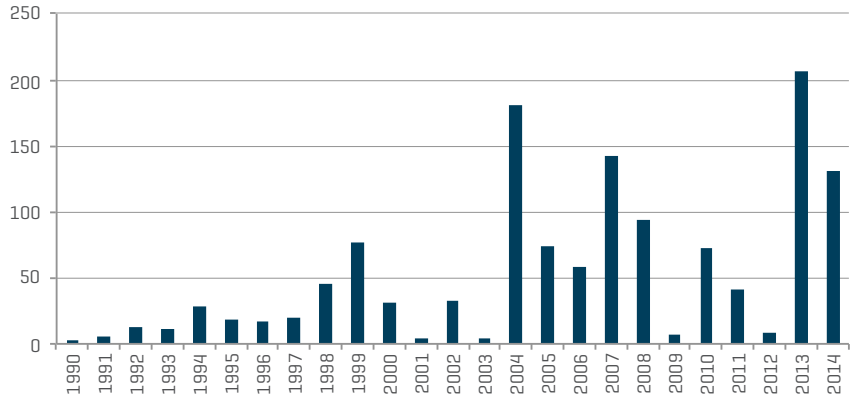
Regardless of New Zealand's mitigation actions, our transport system will be affected by a changing climate. There is strong evidence to suggest that more frequent extreme weather events are already causing significant cost and disruptions to the transport network.

Transport is one of the critical infrastructure services identified by the Ministry of Civil Defence and Emergency Management as essential for supporting the life of a community,

enabling business, and underpinning the function of a society and the economy. Closures and repairs needed on transport corridors can have enormous flow-on effects for the affected communities through loss of mobility and access to services that enable productivity.

In the last 10-20 years there has been a noticeable increase in the cost and frequency of extreme weather related events as a result of climate change. In particular, extreme rainfall events will become more frequent in many parts of the country, increasing the risk of flooding and erosion. Heat waves could damage our roads and rail track, and heavier winds will keep aircraft grounded on a more regular basis, while tidal surges caused by rising sea levels will impact on coastal infrastructure.

Figure 13: Cost of weather related natural disaster insurance claims (inflation adjusted) [Source: NZ Insurance Council]



Further climate change and related impacts are expected as greenhouse gas emissions continue to rise globally. This will increase expenditure for maintenance and repairs. Over time this will reduce the amount of funding available for new infrastructure, or create pressure for additional funding to be made available, either by increasing taxes on road users or by other means.

The government will need to carefully consider the appropriate amount of resilience to build into the transport system. For strategically significant and vulnerable routes, it may be appropriate to invest resources in preventative measures to minimise the impact of extreme weather related events before they occur, but on other routes it may be more cost effective to repair the infrastructure when required.

A more intelligent transport system

Intelligent transport system technologies are revolutionising transport globally. The government has an opportunity to adopt a leadership and coordination role, and take a long-term focus so that New Zealand can gain the full benefit of these technologies.

What the future might look like

In the next ten years:

- Smart phones and other devices will be integrated into vehicle control systems, providing real-time information to users. Cheap sensors will be used to collect information to monitor and report on conditions across the transport network.
- Technology will be an essential part of the roading network. It will help to alleviate congestion by better managing traffic flows, delaying the need for investment in new roading infrastructure.
- Technology improvements will make freight delivery much more efficient, particularly in urban areas, through a combination of better logistics, better vehicle technologies, and better route planning.

In 20-30 years:

- The road toll could be significantly lower as a result of safety features in new cars, which may be so advanced that they are nearly impossible to crash.
- A large proportion of aircraft used for specialised activities in New Zealand are likely to be operated remotely.
- Road users could be charged electronically based on how far they travel, where they travel, and when they travel.

Key facts

- The technology for driverless cars already exists. Google has conducted over 1 million kilometres of testing
- Small aircraft (weighing less than 25kg) are already operated in New Zealand for some specialist activities without pilots on board
- New technologies will have a big impact on our road toll – more than 250 lives are lost on our roads each year

Web links

- The government's work programme on intelligent transport systems is set out in the **ITS Action Plan**
- **New Southern Sky** is the government's plan for modernising the airspace and air navigation system

- Watch a demonstration of a **Google driverless car**
- Watch a demonstration of a **driverless road train**

What it would mean for the government

- We will need to adapt the transport system to be more flexible and responsive to new technologies. Privacy and information sharing will be active considerations.
- A particular technology may be so beneficial that incentives to accelerate its uptake are justified.
- Decisions on investment in transport infrastructure will need to take account of the fact that why and how we travel might be completely different.
- To take advantage of new opportunities, the government will need to address significant policy challenges, for example around liability and licensing requirements for autonomous vehicles.

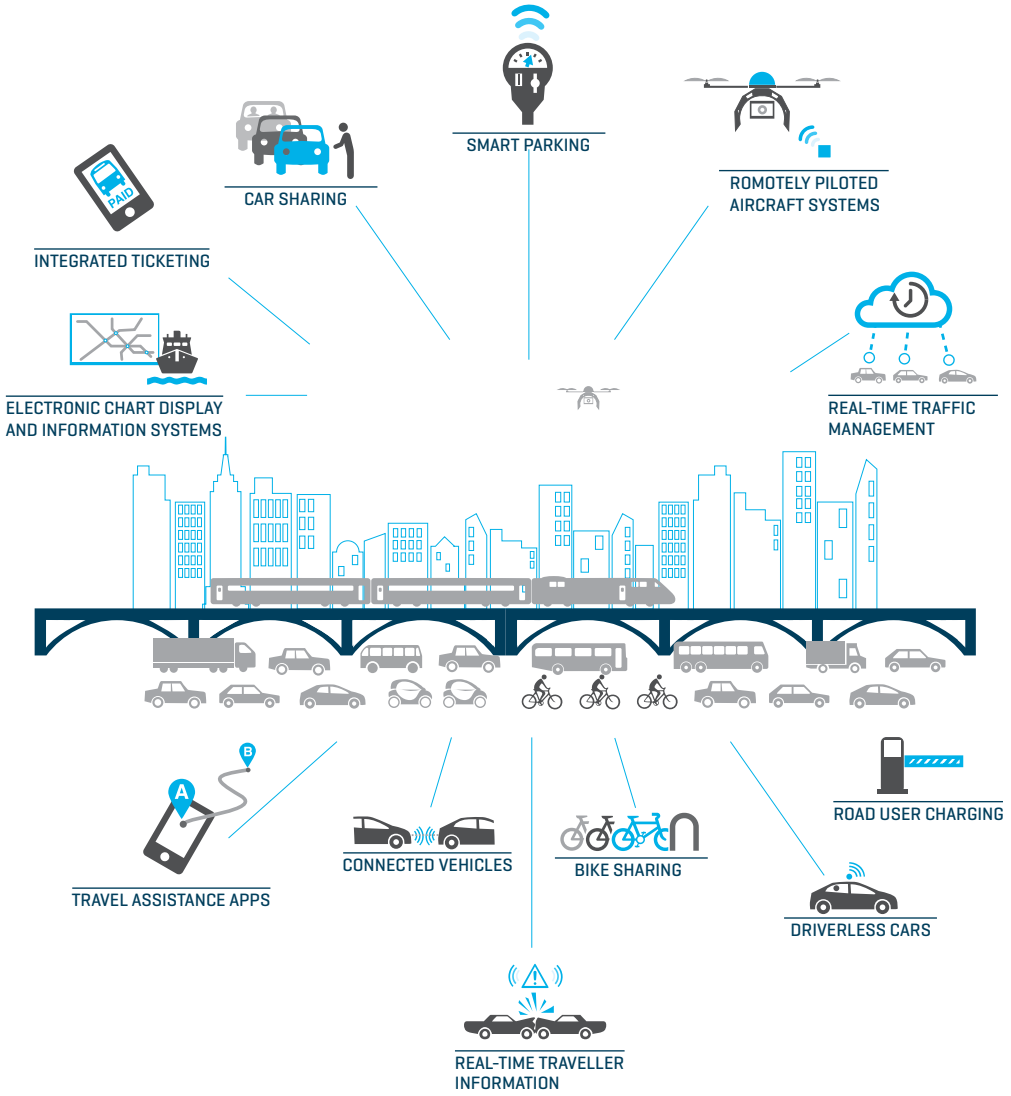
Intelligent transport system technologies will transform the transport system

Technology is playing an increasingly prominent role in our transport system. Of all emerging transport technologies, fully autonomous or 'driverless' vehicles have received the most attention. Companies like Google and Nissan have invested significant resources in this technology. It is now only a matter of time before vehicles will be capable of being operated safely on our roads without a driver in control.

This transition won't happen overnight. It is likely to be at least 30 years before fully autonomous vehicles are a common sight on our roads. But we are already seeing a trend towards a more autonomous transport system, with vehicles increasingly taking over tasks from the driver. Technological developments are also leading to the emergence of new business models (such as car sharing schemes) or applications that will result in paradigm shifts in how people's mobility needs may be met in the future, and how infrastructure use is optimised or paid for.

Similar developments are taking place in other transport modes. Overseas, a number of rail systems already operate autonomously. In aviation, commercial flights are routinely operated with minimal input from the pilot, and remotely-piloted aircraft (or 'drones') are already flying in our airspace. In maritime, electronic chart display and information systems are allowing mariners to digitally layer their charts with other information from radar, depth sounders and GPS positioning to aid safe, accurate, fuel efficient navigation, reducing the scope for human error.

Figure 14: Examples of Intelligent Transport System Technologies



Most technological developments will be driven by the private sector, where there are strong commercial incentives for businesses to develop the "next big thing" and gain an edge over their competitors. Beneficial technologies will be adopted by New Zealand consumers without any need for government to get involved. However, the government has an important role to play, both as a regulator and an investor. There is also an opportunity for the government to take a leadership and advocacy role to establish New Zealand as a test-bed for some of these new technologies.

Technology will allow us to get more out of what we already have

We are only beginning to see the potential role that new technologies could play in reducing congestion and improving efficiency across the transport network. In the near future, commuters will be making use of apps providing real time information, allowing them to compare the cost and convenience of different transport modes and to plot the most direct and least congested routes to their destination. In the medium term, technology could allow motorists to be charged different rates to access the network at different times of the day, which could help to spread demand and relieve congestion during peak periods. In the longer term, autonomous vehicles will be able to travel safely at higher speeds with less separation between them, significantly increasing the capacity of the roading network.

In the future, there could be an opportunity to consider whether there are better ways to make use of our rail corridors through the use of new technologies. For example, it is possible that some of our existing low-volume rail corridors may be more economically viable if they were converted into dedicated lanes for a fleet of 'platooning' automated trucks.

It will save lives and reduce transports environmental impact

In 2010, the government launched Safer Journeys, New Zealand's road safety strategy to 2020. Since this strategy began, we have seen a 25 percent decrease in road deaths. This is a significant achievement, but with over 250 lives lost on our roads each year, there is still much more to be done.

New safety features are already making a big contribution towards reducing our road toll. Examples include electronic stability control, side curtain airbags, autonomous emergency braking, lane departure warning, and motorcycle anti-lock braking systems. There are also opportunities to use new technologies to improve enforcement, such as red-light cameras and point-to-point cameras. Bigger benefits will occur as technology develops to allow vehicles to communicate with each other, sharing information about their speed and direction, and warning them when there is a need to take evasive action. It is unlikely that road crashes will ever disappear completely, but the scope for human error – which is a factor in most crashes – will reduce significantly.

Technology is also driving improvements in aviation safety, with modern satellite-based navigation and surveillance systems providing pilots and air traffic controllers with greater certainty about their position and the position of other aircraft. Improvements in technology mean that commercial aviation accidents are now relatively rare – but incidents such as the recent disappearance of Malaysia Airlines flight MH370 demonstrate that further improvements are still needed.

Intelligent transport systems will also play a role in reducing our greenhouse gas emissions and meeting our climate change obligations. Technological solutions could make car-share schemes a far more attractive option, and many people may discover that there is no longer any need to own a car. For most people, it is currently far cheaper to own a car which is parked for most of the day than it is to hire a car and driver. But in a driverless society, that concept could be reversed. The whole population could conceivably be served with a vehicle fleet a fraction of the size it is today. Whether or not this occurs will depend on how society chooses to make use of the new technology.

It will allow us to use pricing signals to achieve better outcomes

Intelligent transport system technologies can provide more efficient, convenient, and cost-effective methods of charging and paying for both public and private transport systems. New Zealand has been relatively progressive in using electronic charging in transport, but charging systems that are being developed and implemented internationally are becoming even more sophisticated, reliable, and cost-effective.

In the future, it will be cost-effective to use satellite-based positioning systems to introduce charging systems based not only on distance, but on specific routes and the time of day. This would achieve better alignment between what each user pays and the benefits they receive from the roading network. It would also provide the ability to use pricing signals to encourage a particular type of behaviour. The roading network is a finite resource, and over time, our objective should be to optimise its use by pricing access to it according to demand. This could encourage broader social changes by incentivising employers to offer flexible working hours, teleconferencing, or working from home.

Challenges for the government

Our regulatory system will need to be more flexible

In most cases, the development of new technologies will be led by the private sector. Their success or otherwise will be determined by whether or not consumers value them, and there may not be any need for the government to be involved. However, there may be instances where transport rules and regulations or other barriers are preventing a new technology or business model from being adopted, or deterring developers from investing in research and development.

Regulators, not just in New Zealand but globally, will be challenged to keep up with the pace of technological change. For example, we have seen a rapid increase in the use of remotely piloted aircraft (or 'drones') which are being used for an increasingly diverse range of civilian

applications, including aerial photography, search and rescue, and agricultural crop spraying. The Civil Aviation Rules were never intended to apply to aircraft operating without a pilot on board. A suite of new rules will be required to ensure that these aircraft can operate safely in the same airspace as other aircraft – and the government is likely to come under increasing pressure to develop an appropriate regulatory framework quickly so that the potential benefits are not lost.

We will need to tackle difficult policy issues

As technology develops, the government will need to tackle some significant policy issues. For example, if a driverless car is involved in an accident, who is liable? And if a car is being operated without a driver, is there any need for a driver licence? In some cases, government may also need to consider whether it is appropriate to speed up the adoption of a particularly beneficial technology, for example by requiring a feature to be fitted on new vehicles entering the fleet, or by providing incentives to encourage consumers to purchase vehicles fitted with a particular feature.

We will need to be ready for new technologies before they arrive

For intelligent transport systems to work effectively, government will need to adopt standards to ensure that certain technologies developed overseas work properly in New Zealand. Radio spectrum will need to be allocated to ensure communication and sensor technologies used by advanced driver assistance systems (and eventually by autonomous vehicles) do not cause or suffer from interference.

Unlike most developed countries, only half of the vehicles imported to New Zealand are new. These new vehicles are primarily built to European and Australian standards. The other half are imported as used vehicles and are built primarily to Japanese domestic standards.

Until now, the fact that vehicles were built to different standards has not been a significant issue. Consumers have not been concerned that features such as SatNav and FM radios built for the Japanese market do not work in New Zealand, as these features can be replaced relatively easily.

Some of the technology underpinning intelligent transport systems may not be so easily replaced. A particular concern is that the 700MHz range used in Japan for intelligent transport systems has already been allocated to the telecommunication industry in New Zealand. This could impact our ability to import used vehicles from Japan. Over time it is likely that similar 'compatibility' issues will emerge in other areas. Identifying them in advance, acting quickly, and where possible, advocating a more collaborative approach will be crucial to ensure that potential benefits are not delayed.

Our investment framework will need to evolve

As the owner of the State highway network, the government will have a major role in deciding whether to adopt new technologies. Decisions will need to be made around how much funding is provided for intelligent transport systems, and which specific technologies to adopt. A better understanding of the relative benefits of intelligent transport systems compared to traditional improvements to the roading network may be required. Investment decisions are complicated by the fact that roads are expected to last for generations, but new technologies can quickly become obsolete. For the private sector, having a clear understanding of the government's priorities for future investment is essential to allow it to plan accordingly.

Conclusion

The five long-term issues canvassed in this part are by no means the only long-term issues for the transport system. Nor are they mutually exclusive. However, they illustrate the importance of the transport system to New Zealand and the complexity of the competing issues, challenges and opportunities we face if the system is to ensure it helps New Zealand thrive.

There is no short term 'answer' to these issues. But it is important that the steps we take today are taken with regard to this longer term context. This is why it is important that the Ministry maintains ongoing research and study into the long-term issues and trends for the transport system.

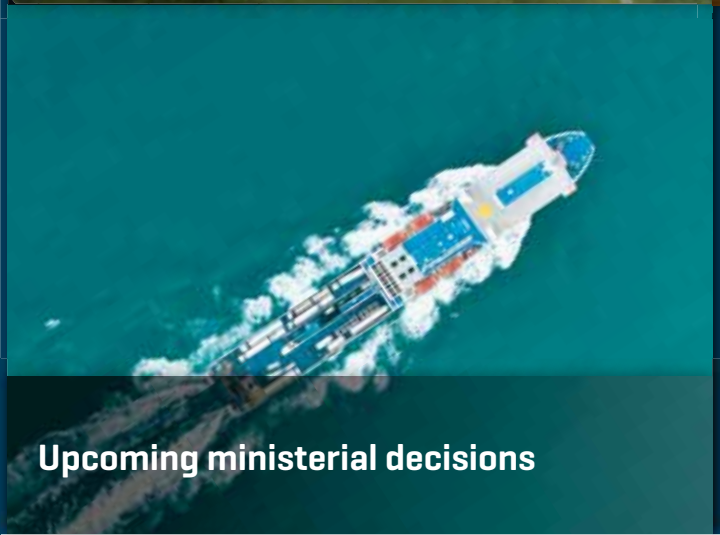
Ministry of Transport Briefing to the Incoming Minister

Part two:
Aligning the Ministry's future work programme and upcoming Ministerial decisions with your priorities

Introduction

Introduction to the Ministry's work programme

Summary of the Ministry's current work programme



Upcoming ministerial decisions

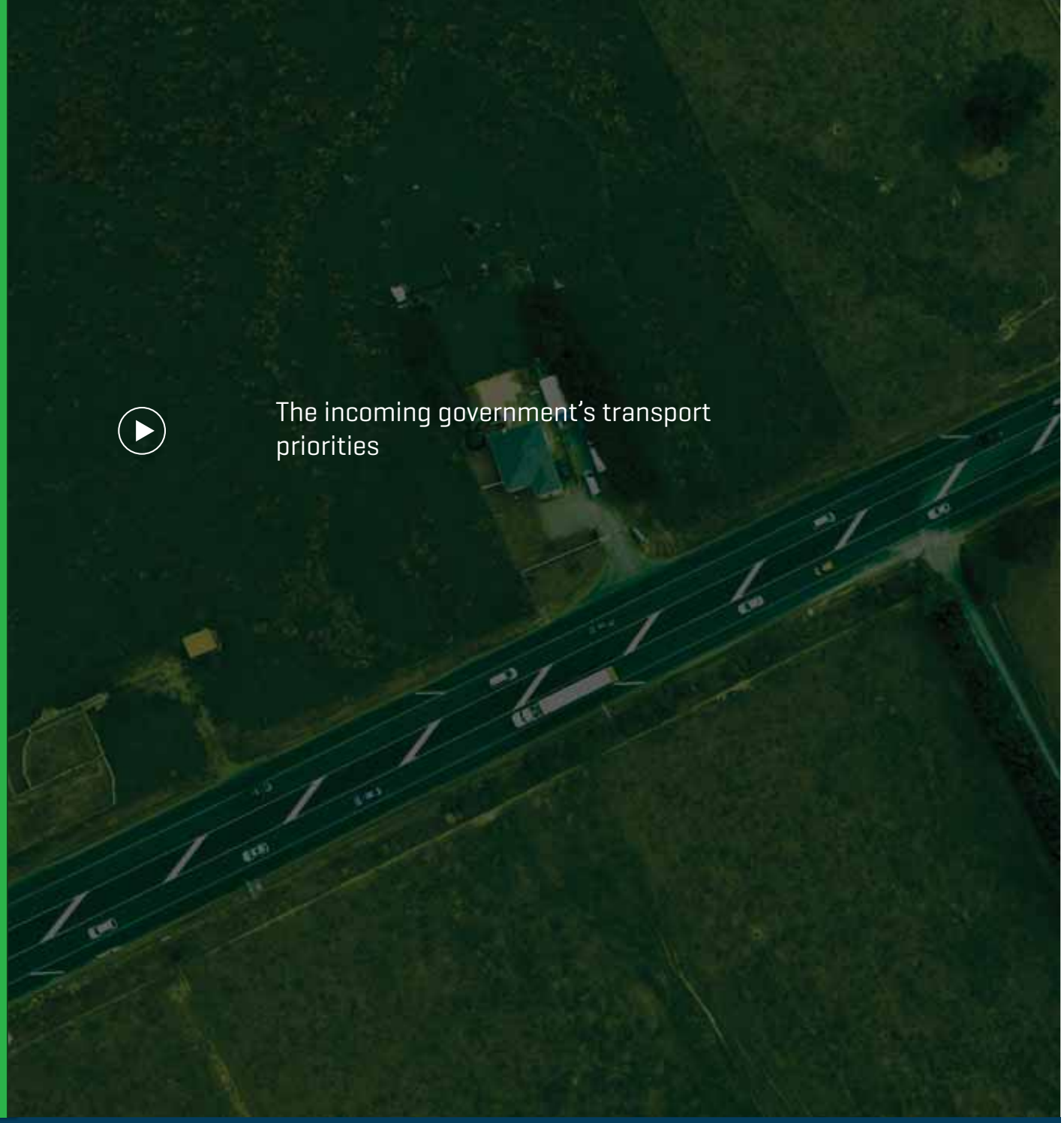
Begin

Introduction

Part two provides information to support discussions with you on both your priorities for the transport portfolio and the development of the Ministry's work programme for the next three years.

This part also sets out the key Ministerial decisions for the next three months, as they relate to our existing work programme. We would like to discuss the ongoing need and timing for these decisions, given your priorities.

We welcome the opportunity to discuss these matters with you and can provide additional or more detailed information to assist you.



The incoming government's transport priorities

The incoming government's transport priorities

Over the last three years, the Minister of Transport has had the following priorities:

- Investment in infrastructure
- Better quality regulation
- A safer transport system
- Opening markets

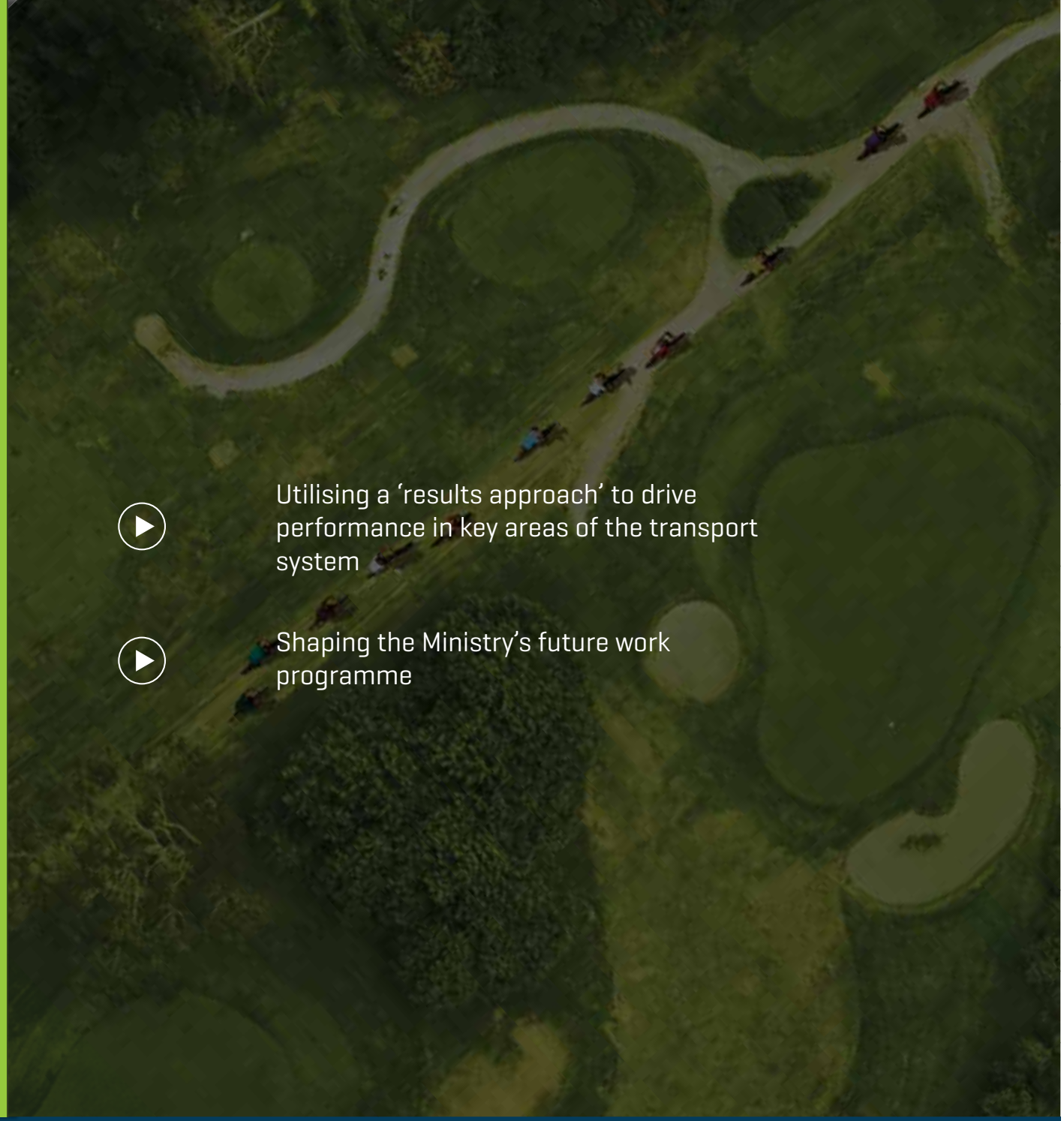
These priorities were set having regard to the overall priorities of the previous government. They have been critical in determining our work programme. We are also mindful of what we regard as enduring, longer term outcomes that all government's presumably seek from the transport system. That is, a transport system which is:

- Effective: moves people and freight where they need to go in a timely manner
- Efficient: delivers the right infrastructure and services to the right level at the best cost
- Safe and responsible: reduces the harms from transport
- Resilient: meets future needs and endures shocks

We appreciate that you will have specific areas of priority or emphasis for the next three years in your pursuit of these longer term outcomes. You may wish to revisit the priorities set by your predecessor, having particular regard to the initiatives set out in the National Party manifesto, namely:

- Continuing to deliver the Roads of National Significance Programme
- Delivering an accelerated regional roading package of 14 projects around the country worth $212 million, using money from the Future Investment Fund
- Delivering a new fund of up to $90 million a year dedicated to priority transport projects in the regions
- Kick-starting a new urban cycleways fund of $100 million and appointing a specialist Urban Cycleway Investment Panel, drawing on expertise from central and local government, and other organisations to identify which cycleway projects to build

Introduction to the Ministry's work programme



- Utilising a 'results approach' to drive performance in key areas of the transport system
- Shaping the Ministry's future work programme

Utilising a 'results approach' to drive performance in key areas of the transport system

Taking a 'results based approach'

The government has introduced a 'results based approach' through its Better Public Services programme to focus agencies efforts on the most critical matters and make real progress towards achieving desired results. Public sector chief executives believe that this approach has provided an effective model for the delivery of a wider range of public services to address a number of cross-cutting and seemingly intractable issues.

Applying the results based approach to transport

We consider that there is scope to apply the results approach to transport policy. This would help to ensure that, collectively, government transport agencies make the greatest possible impact with the resources available to them. To be effective, the results approach needs to be limited to a small number of the most important issues. Alongside that, setting the right targets are also critical as it:

- sets the level of ambition for improvement within the system
- diverts resources from other lower priority areas

A transport example of an ambitious results approach could be to reduce the number of deaths within the transport system to no more than 200 by 2020.

Shaping the Ministry's future work programme

To effectively serve you and future transport Ministers, we need to have a strong understanding of the external factors that influence the operation of the transport system. This helps us to provide a professional, expert, view on how the operation of the transport system could best meet New Zealand's needs over time.

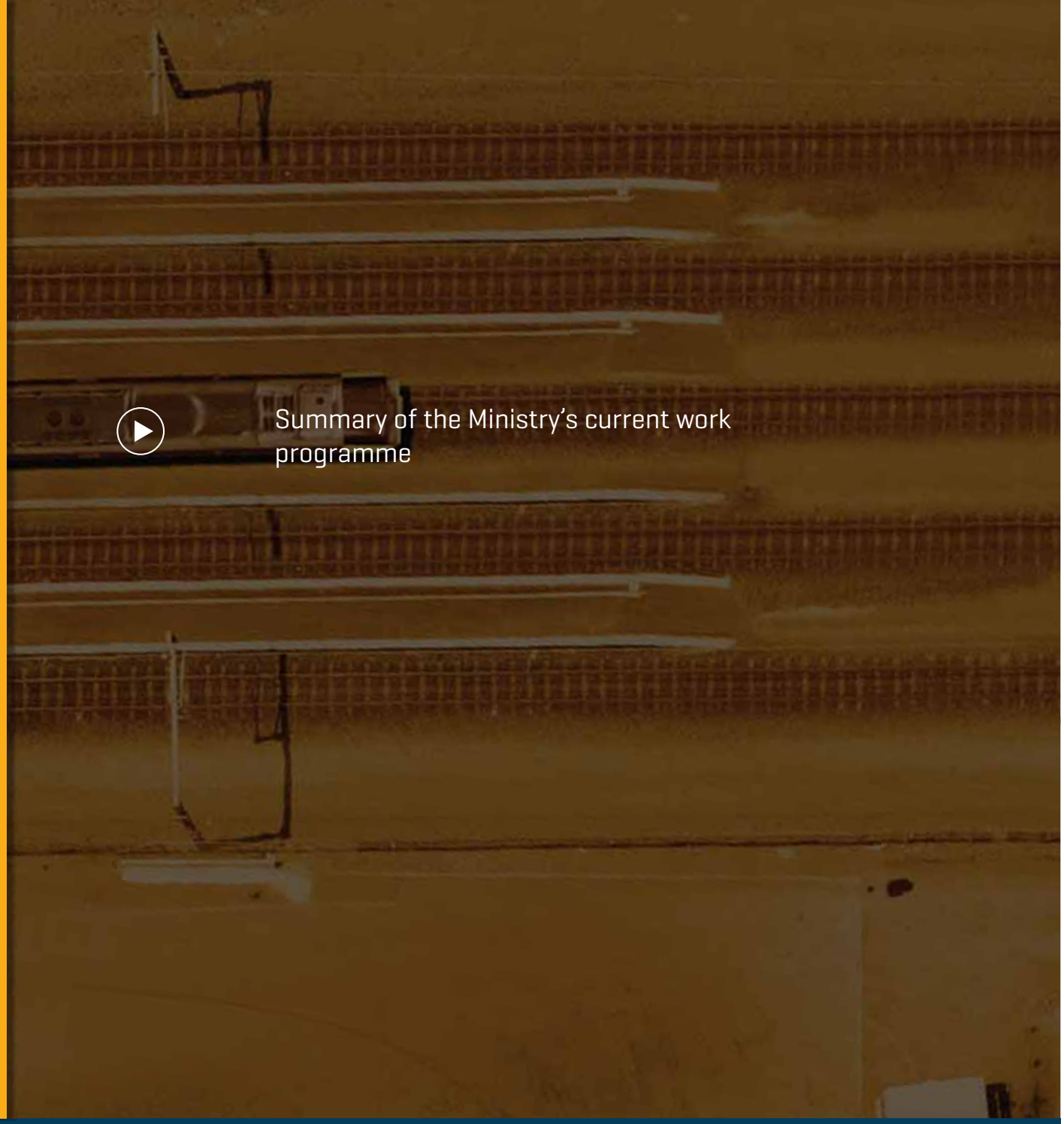
Our full work programme been shaped to meet the following needs:

- supporting the Minister's priorities
- other work to support transport responsibilities
- contributing to wider government objectives
- lifting the performance of transport Crown Entities and State Owned Enterprises

A summary of our work programme is provided on the next page. Some of our work is 'fixed' - that is it is necessary in order to meet statutory or fiscal obligations. Other projects are able to be deferred of stopped if you consider that they do not fit with your priorities.

We look forward to working with you to determine which elements of the current work programme you wish to continue and how our work programme can be shaped to respond to your specific priorities.

Summary of the Ministry's current work programme



Supporting the Minister's Priorities

Priority 1: Investment in Infrastructure

2015 Government Statement on Land Transport Funding (GPS):

Every three years, we prepare a GPS for your approval. The GPS is a key strategic document for the transport sector. It sets the government's priorities from $10 billion of expenditure on land transport, and how funding is allocated between various activity classes.

Auckland transport package:

we will provide you with advice on whether the Crown should support and contribute to funding for the Auckland transport package, including East-West connections and the Panmure to Pakuranga phase of the Auckland Manukau Eastern Transport Initiative.

Contribution to the KiwiRail Strategic Review:

We are contributing to a cross-government review of KiwiRail's business, and where value is generated to provide clarity on long-term investment requirements.

Providing advice on investment in cycleways:

We are developing an investment strategy to set criteria for the government's $100 million investment in cycleways.

Priority 2: Better Quality Regulation

Transport rules:

Transport rules contain detailed technical standards, requirements and procedures for the construction, maintenance, licensing and operation of transport modes. We are working with transport agencies to progress a programme of 18 issues where a new rule or rule amendment could be justified.

Review of the Civil Aviation Act and the Airport Authorities Act:

We are reviewing these Acts to ensure they are fit for purpose, and promote a responsive regulatory system and a dynamic aviation sector.

Improving the regulatory regime for offshore oil and gas installations:

The financial security regime for offshore oil and gas installations is inflexible and does not adequately reflect the potential impacts of a significant pollution spill. We are working with other agencies to review the financial security regime. We have also consulted on an interim proposal to increase the minimum financial assurance for offshore oil installations from $26 million to $300 million.

Supporting the Minister's Priorities

Priority 3:

A safer transport system

Safer Journeys:

We convene the National Road Safety Committee, which is tasked with implementing the Safer Journeys Action Plan. The Action Plan aims for a safe road system that is increasingly free of death and serious injury. The current areas of focus include continuing work on implementing a speed management regime, and implementation of the lower blood alcohol limits which will come into effect on 1 December 2014. Reviews are underway to consider the provisions for drug driving and for the penalties for drink-driving.

Reviewing the drug and alcohol regime in the aviation, maritime and rail sectors:

We will provide you with advice to inform the government's response to alcohol and drug impairement in the aviation, maritime and rail sectors, following the Transport Accident Investigation Commission report into the 2012 hot air balloon crash near Carterton.

Priority 4:

Opening markets

Freight Policy:

We provide advice on a range of freight issues and undertake regular monitoring and reporting on key trends and metrics in the freight sector.

Implementing the Intelligent Transport Systems (ITS) Action Plan:

The ITS Action Plan outlines the role that government departments and transport agencies will play in ensuring New Zealand gets the best value from ITS and achieves value for money when investing in infrastructure.

International air services agreements:

We are responsible for negotiating and providing advice on air services agreements, which set the conditions under which airlines can offer services between New Zealand and other countries.

Competition regulation in international aviation markets:

We provide you with advice on whether to approve alliance and code-share arrangements between international airlines.

Supporting transport responsibilities

Four year plan:

We are preparing a four year plan to set out what we and the wider government transport sector are seeking to achieve and how we plan to achieve it. The Plan will also set out how the sector intends to address challenges facing the delivery of its strategy, including how it will manage within existing funding levels.

Revenue forecasting for the National Land Transport Fund:

We are required to provide transport revenue forecasts for Treasury's fiscal updates at least twice a year. We also monitor the revenue coming into the NLTF to ensure that current funding arrangements are sustainable, efficient and equitable.

Airport operation and divestment:

We are responsible for managing the Crown's interests in six regional airports operated as joint ventures with local councils, and for the day to day operation of Milford Sound/Piopiotahi Aerodrome in Fiordland National Park, which is fully owned by the Crown. We are exploring opportunities to divest the Crown's interests in New Plymouth airport and Milford Sound Aerodrome.

Presidency of the International Transport Forum (ITF):

The ITF is a transport 'think tank'. Its goal is to help shape the transport policy agenda on a global level. New Zealand is the current president of the ITF. This provides us with an opportunity to advance issues of interest to us and to shape the agenda for the annual ITF summit.

Contributing to wider government objectives

Contributing to the whole of government climate change response:

We have established a work programme to manage our contributions to cross-government work on climate change. This work will consider what abatement measures, if any, might be used in the transport sector to reduce emissions and contribute to nationally determined targets.

The SuperGold card travel concession scheme:

The SuperGold Card is a discount and concessions card issued to eligible senior citizens and veterans. Among other things, it provides card holders with free off-peak public transport. We are currently reviewing the operating mechanisms of the travel scheme. A decision on the sustainability of the scheme needs to be considered by Cabinet by mid-2015 to provide certainty to users and service providers.

Funding and performance of transport Crown Entities and State Owned Enterprises

Transport Accident Investigation Commission Review:

We have recently reviewed the Transport Accident Investigation Commission's budget and operating model to ensure they remain fit-for-purpose to deliver on its mandate as a Commission of Inquiry and an Independent Crown Entity; and meet the government's targets and international expectations for credible, independent investigations.

Transport fees and charges reviews:

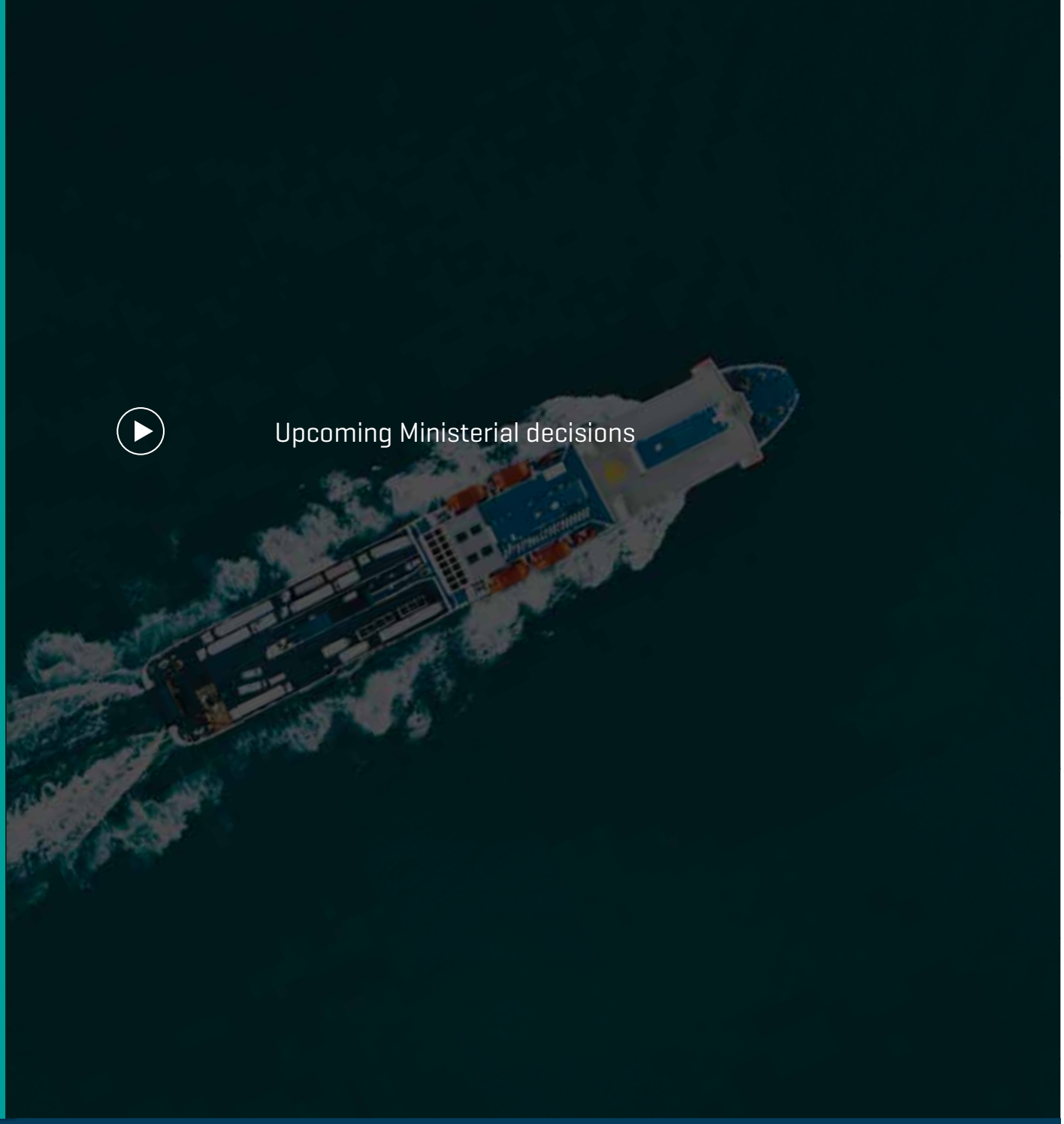
We work with transport Crown Entities to review their fees, charges and levies on a regular basis. We are currently working with the Civil Aviation Authority on a review to make its funding system more fair and reasonable.

Metservice review:

We have reviewed the Ministry's contract with Metservice to provide public good weather forecasts. The existing contract expires on 30 October 2014. A Cabinet decision will be required around funding arrangements for the next four years.

Upcoming ministerial decisions

This table provides a summary of the key policy decisions that will likely to be required over the next three months.
This is not an exhaustive list – there are a number of other issues where we intend to provide you with advice and may seek a decision before the end of the year, subject to your availability. The decisions listed below are those that cannot easily be deferred without significant statutory or financial implications.



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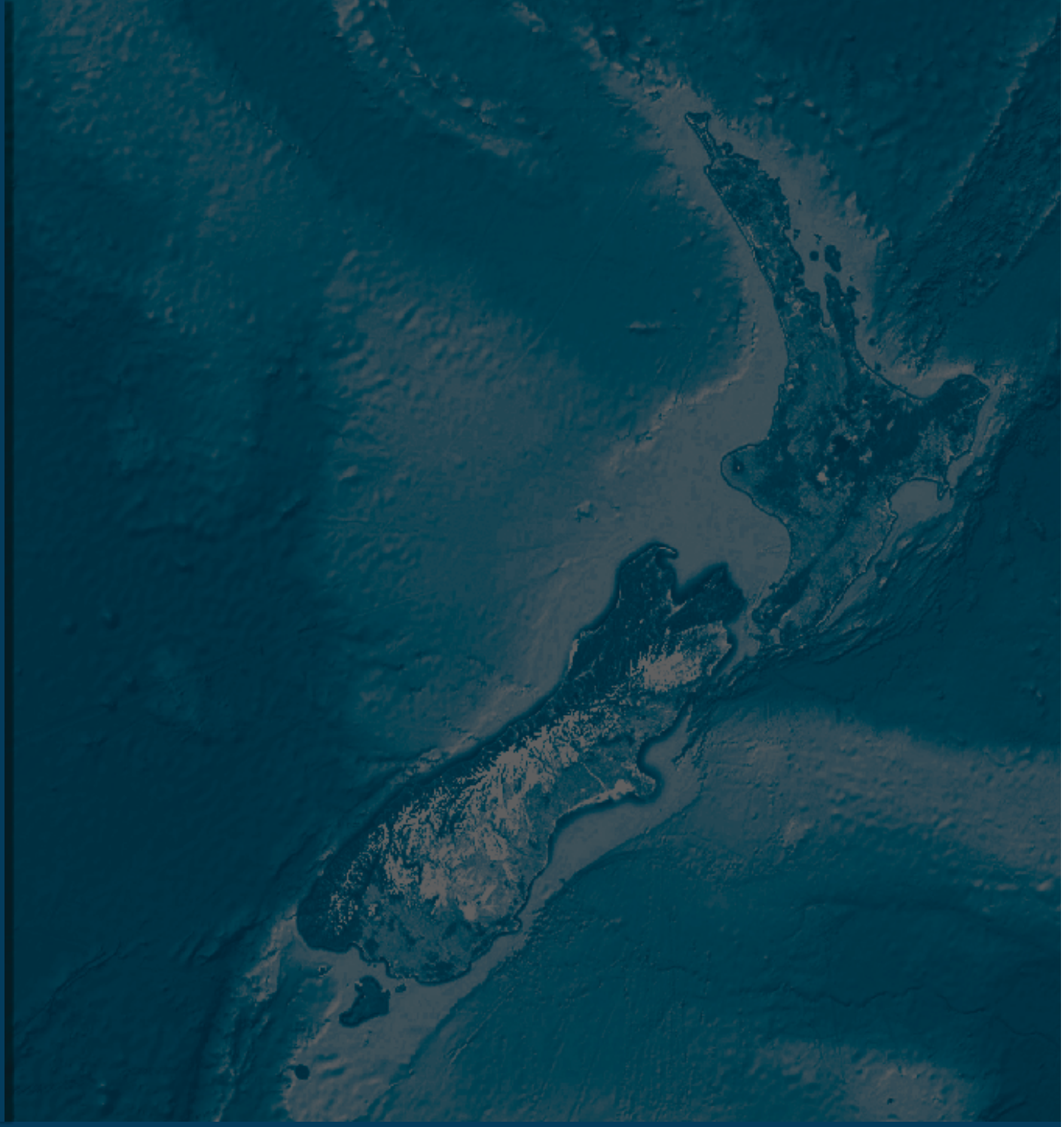
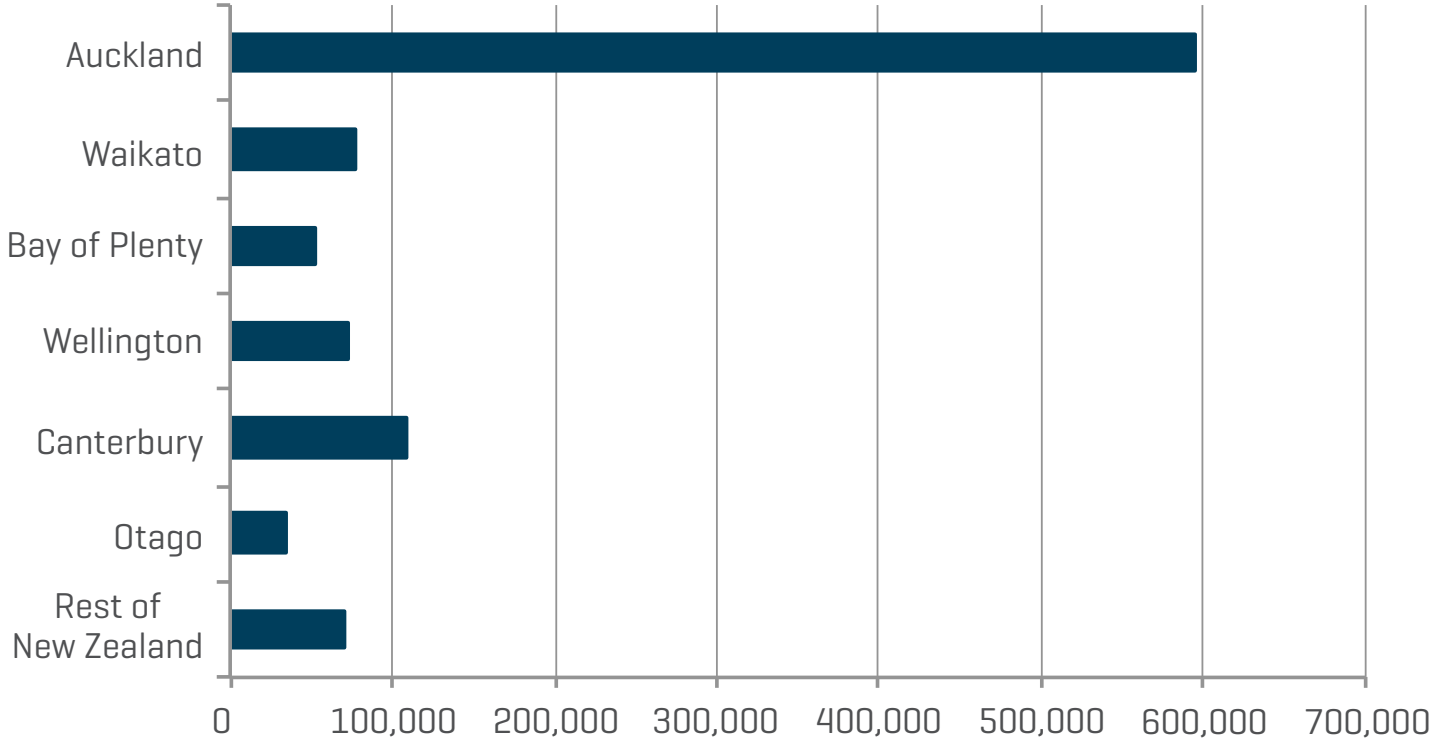
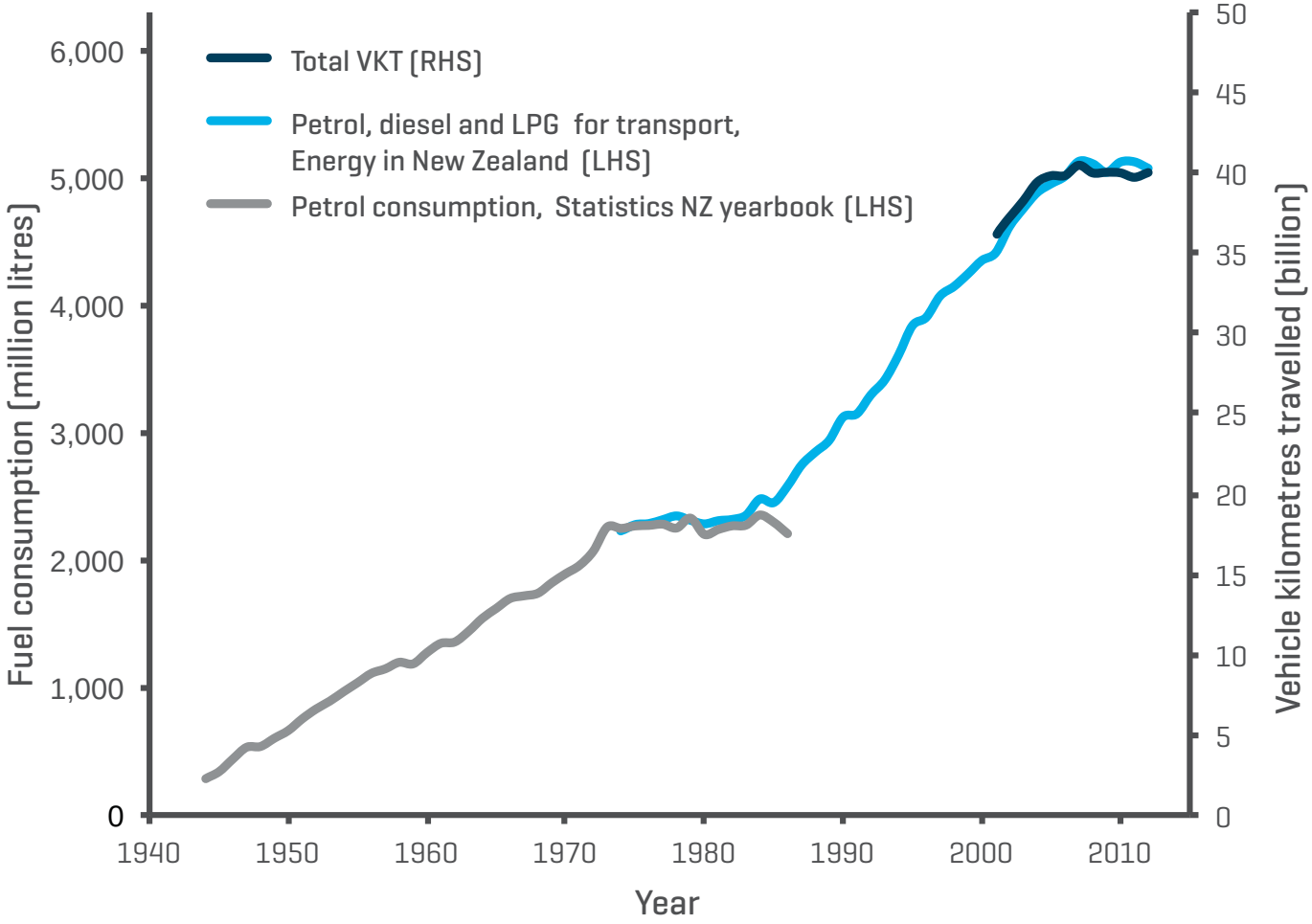
Images

This section holds the enlarged versions of the figures throughout the document.

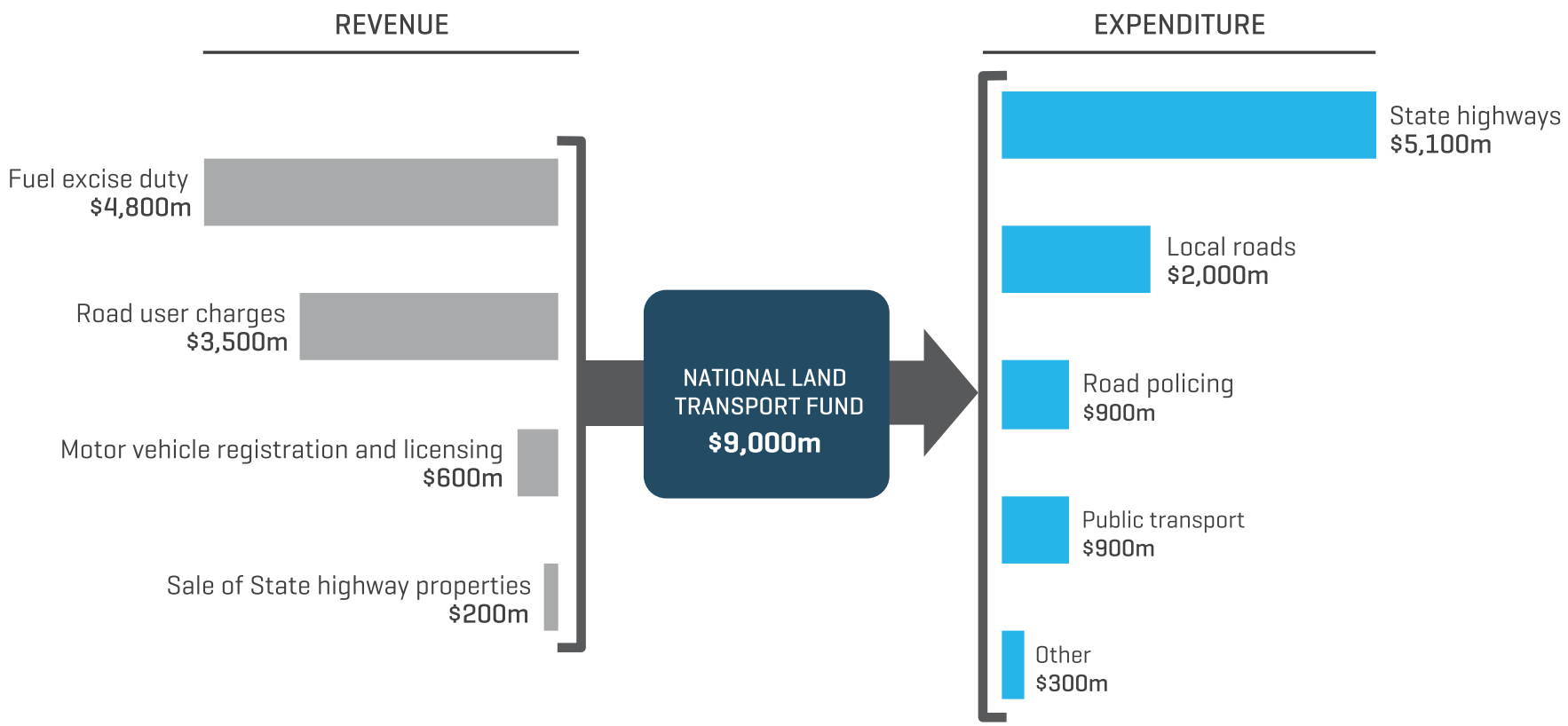


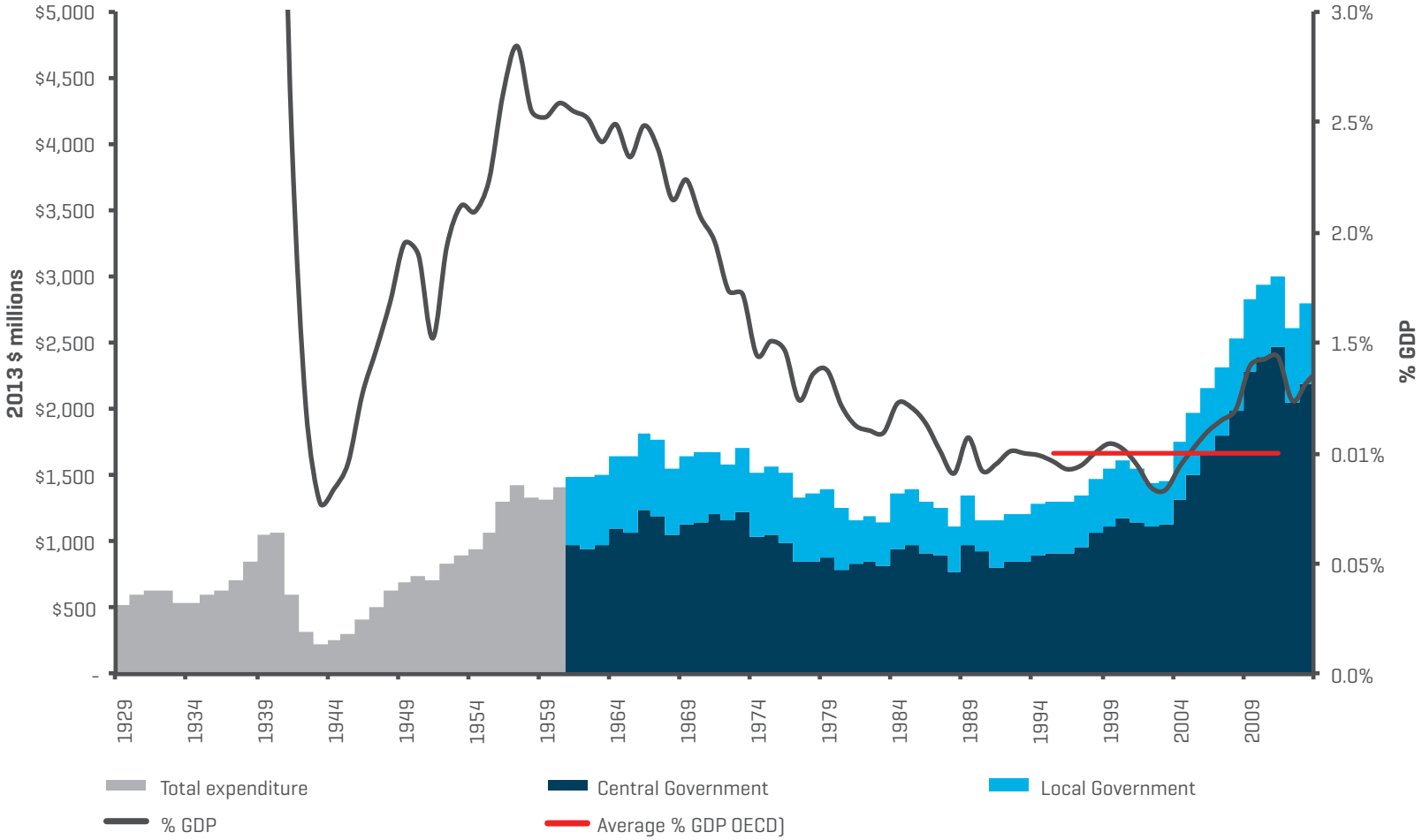


Source: Statistics New Zealand



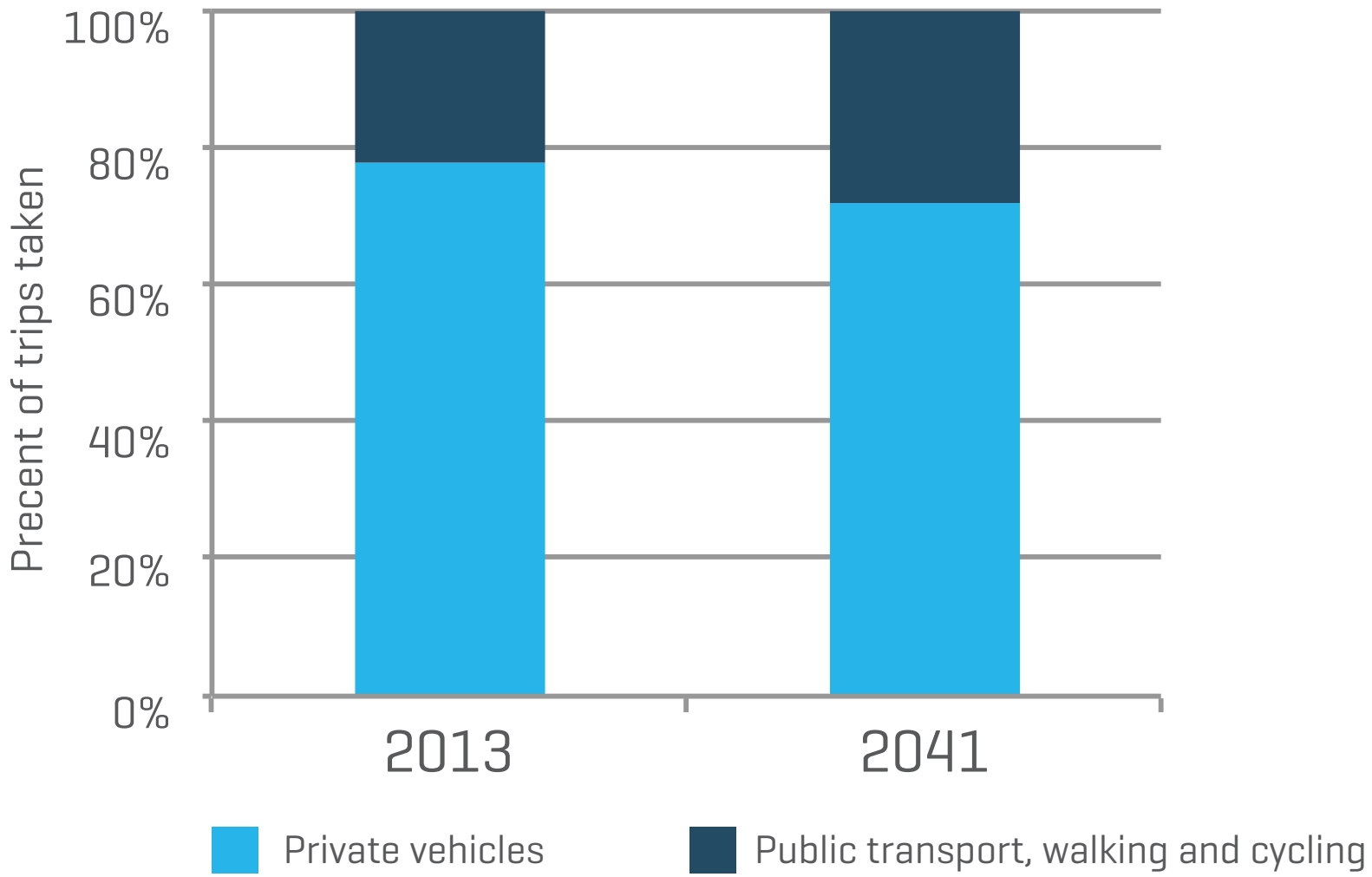
Source: Ministry of Transport's total VKT data (TV001)
Ministry of Business, Innovation and Employment's Energy in New Zealand data


REVENUE
Fuel excise duty
$4,800m
Road user charges
$3,500m
Motor vehicle registration and licensing
$600m
Sale of State highway properties
$200m
NATIONAL LAND TRANSPORT FUND
$9,000m
EXPENDITURE
State highways
$5,100m
Local roads
$2,000m
Road policing
$900m
Public transport
$900m
Other
$300m



Sources: Official NZ Year Books, Ministry of Transport, NZTA, Statistics NZ and OECD data.


Albany
Takapuna
Westgate
10km
CBD
Henderson
Howick
New Lynn
Onehunga
Manukau
Airport
Papakura
Key
Urban area
State highways
State highway under construction (the Waterview Connection)
Rail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80%
60%
40%
20%
0%
Precent of trips taken
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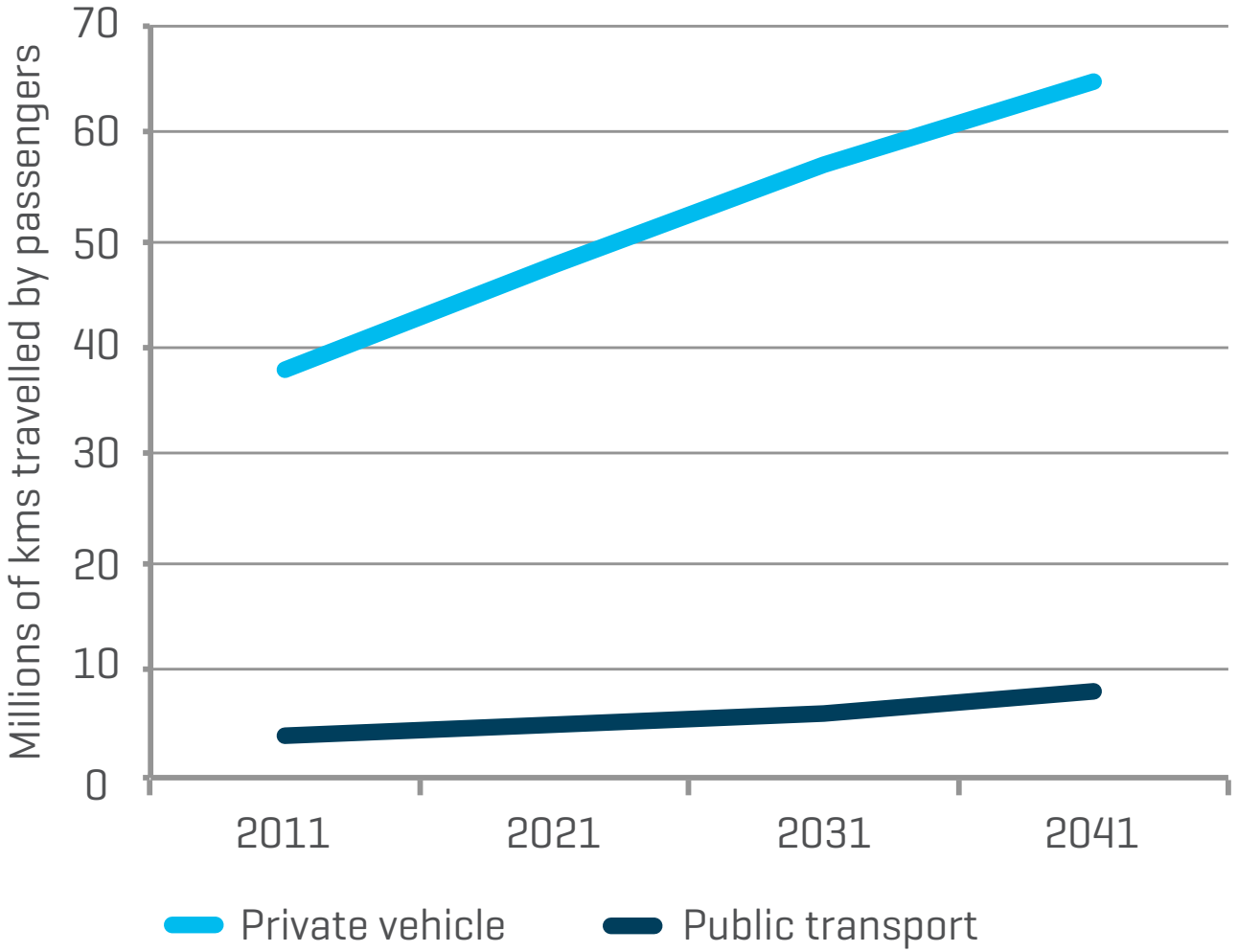
2041
Private vehicles
Public transport, walking and cycling


Millions of kms travelled by passengers
70
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50
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10
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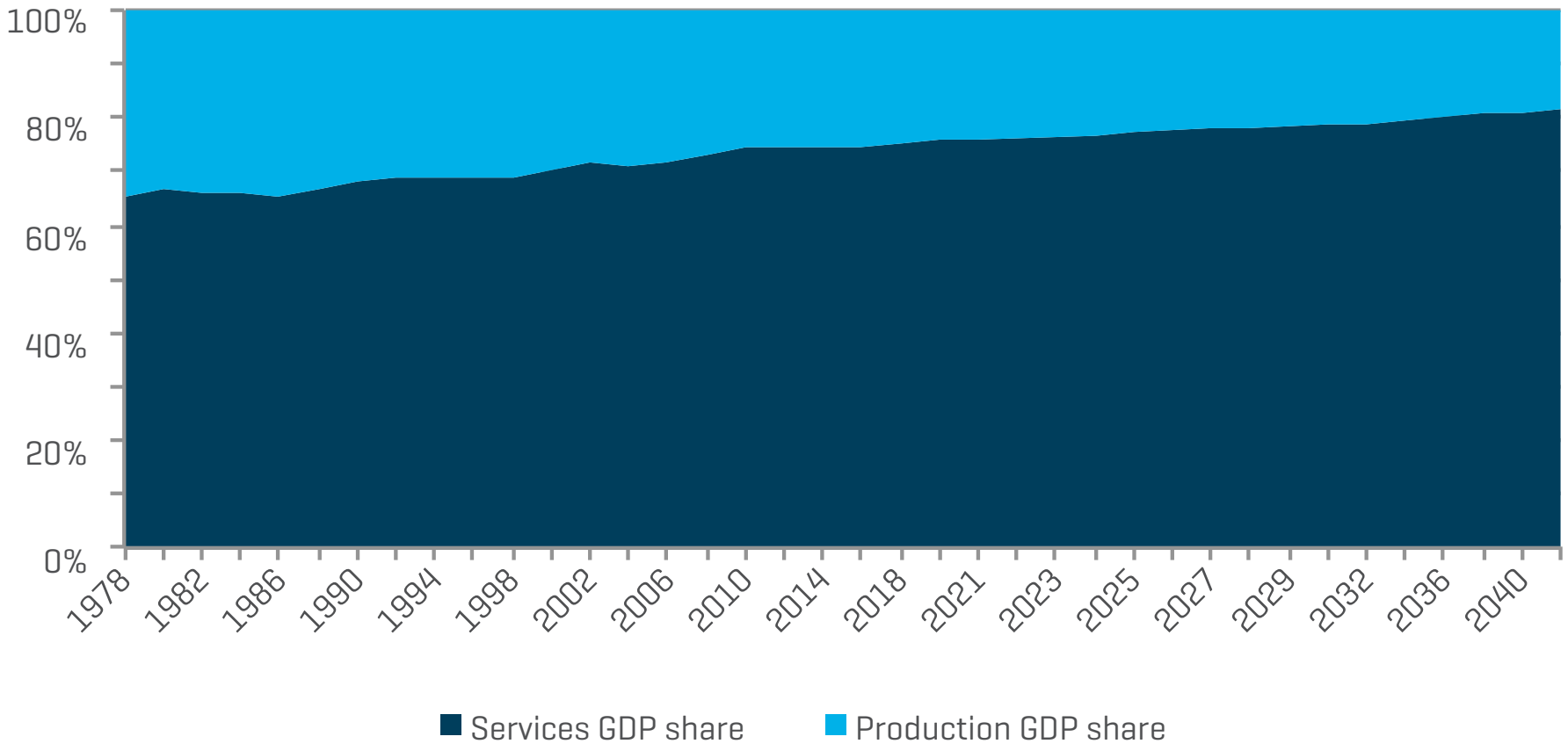
2011
2021
2031
2041
Private vehicle
Public transport


100%
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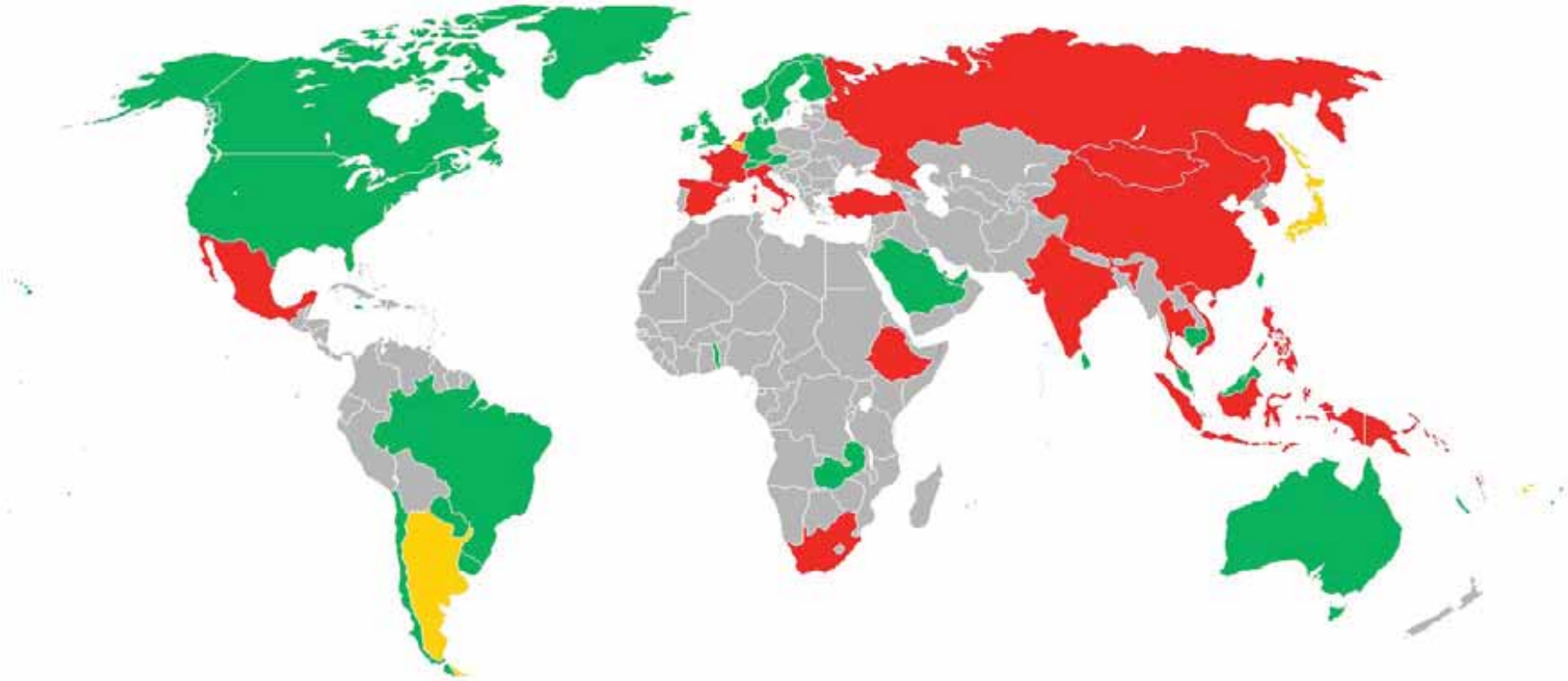
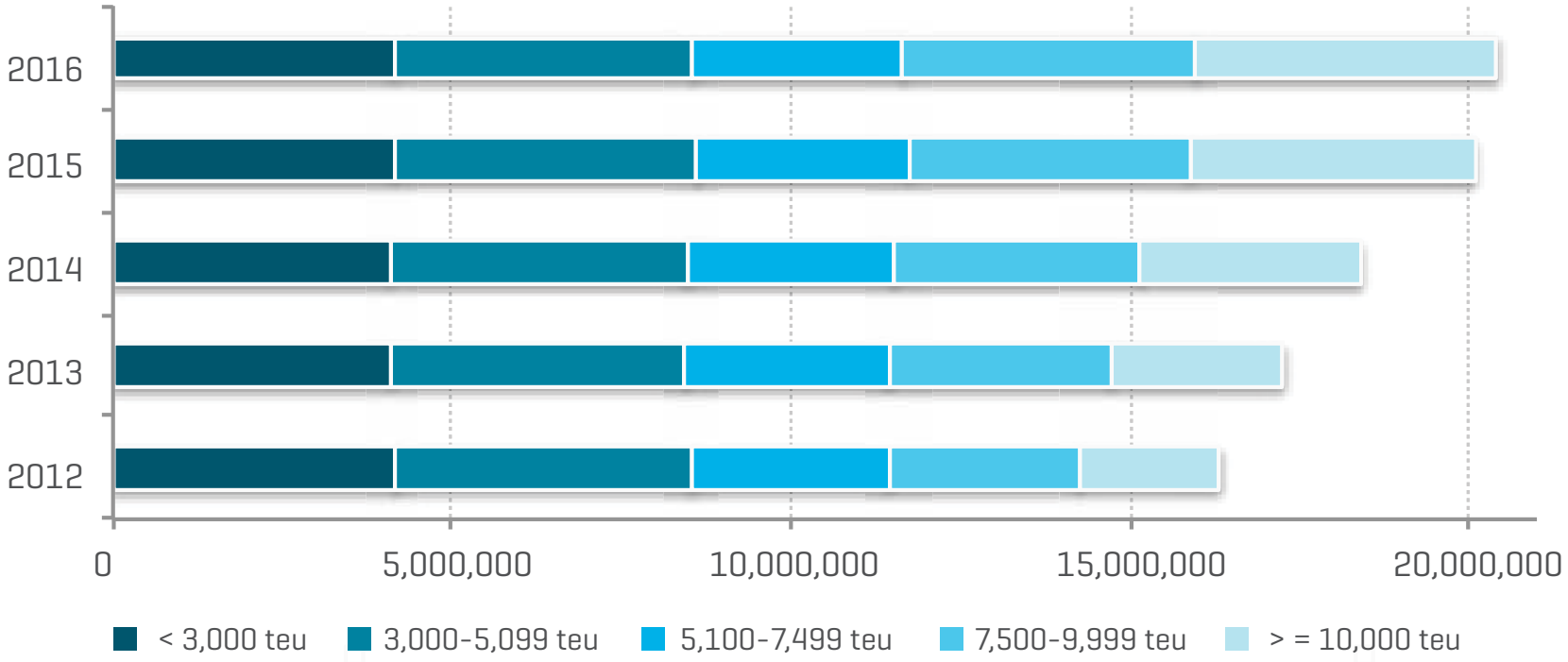
Services GDP share
Production GDP share



'open skies' agreement (no restrictions on routes or capacity)

Unlimited capacity, but other restrictions apply

Restrictions on routes and capacity


2016
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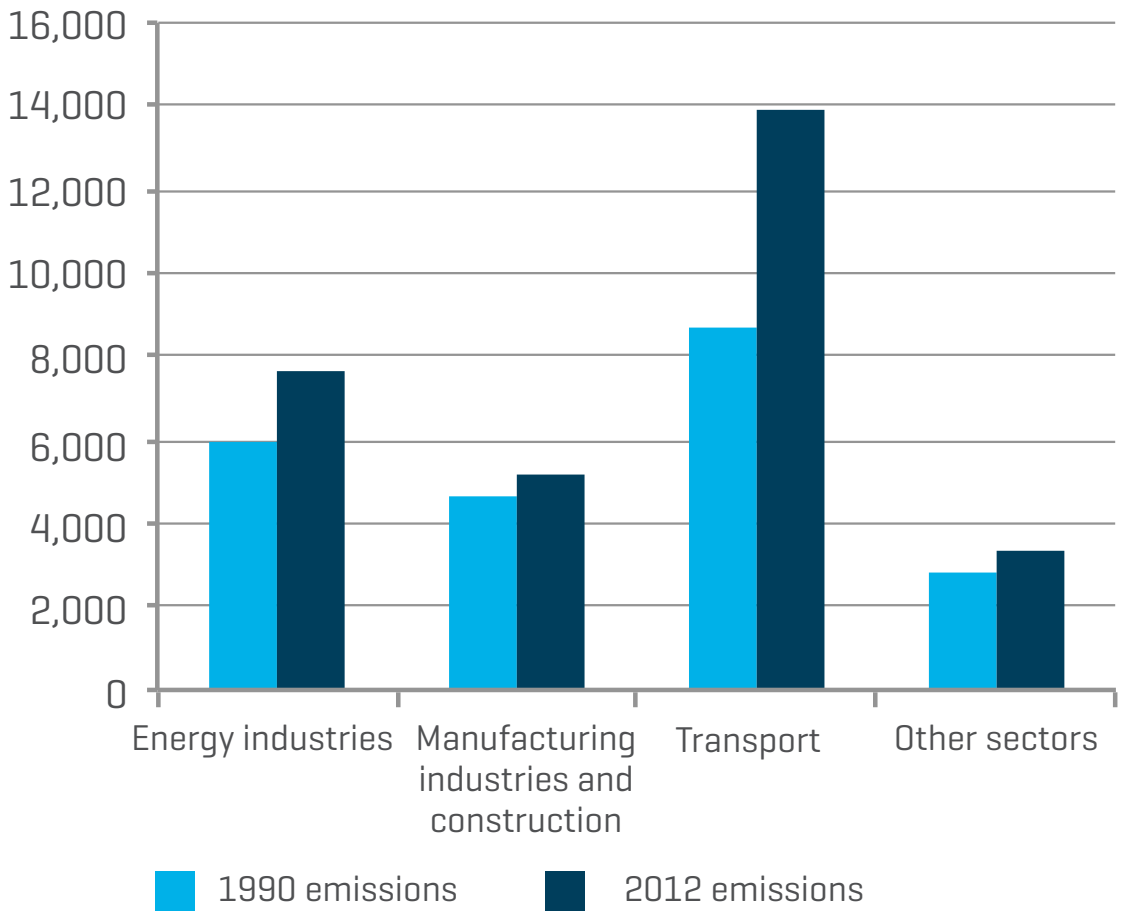
5,100-7,499 teu
7,500-9,999 teu
> = 10,000 teu


16,000
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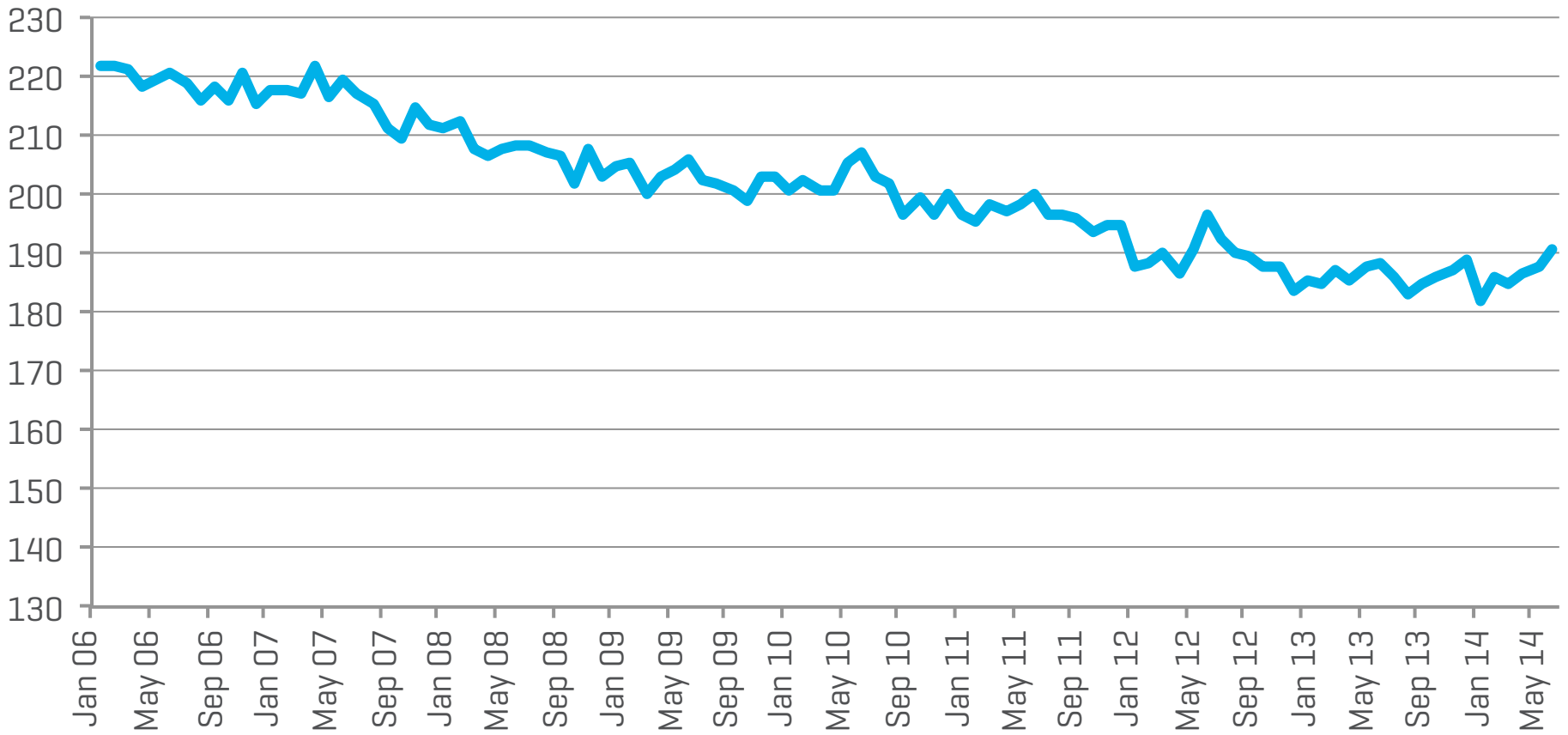
Energy industries
Manufacturing industries and construction
Transport
Other sectors
1990 emissions
2012 emissions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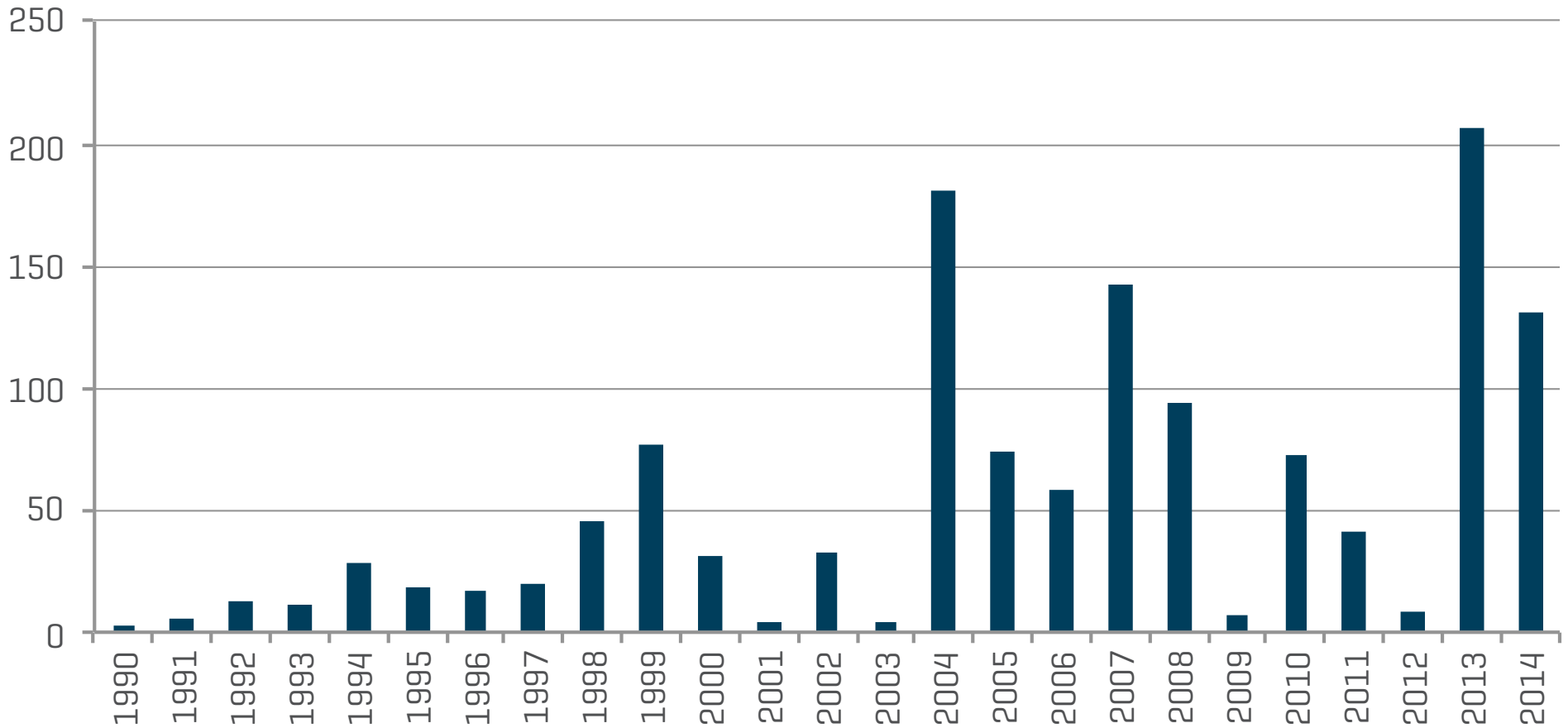
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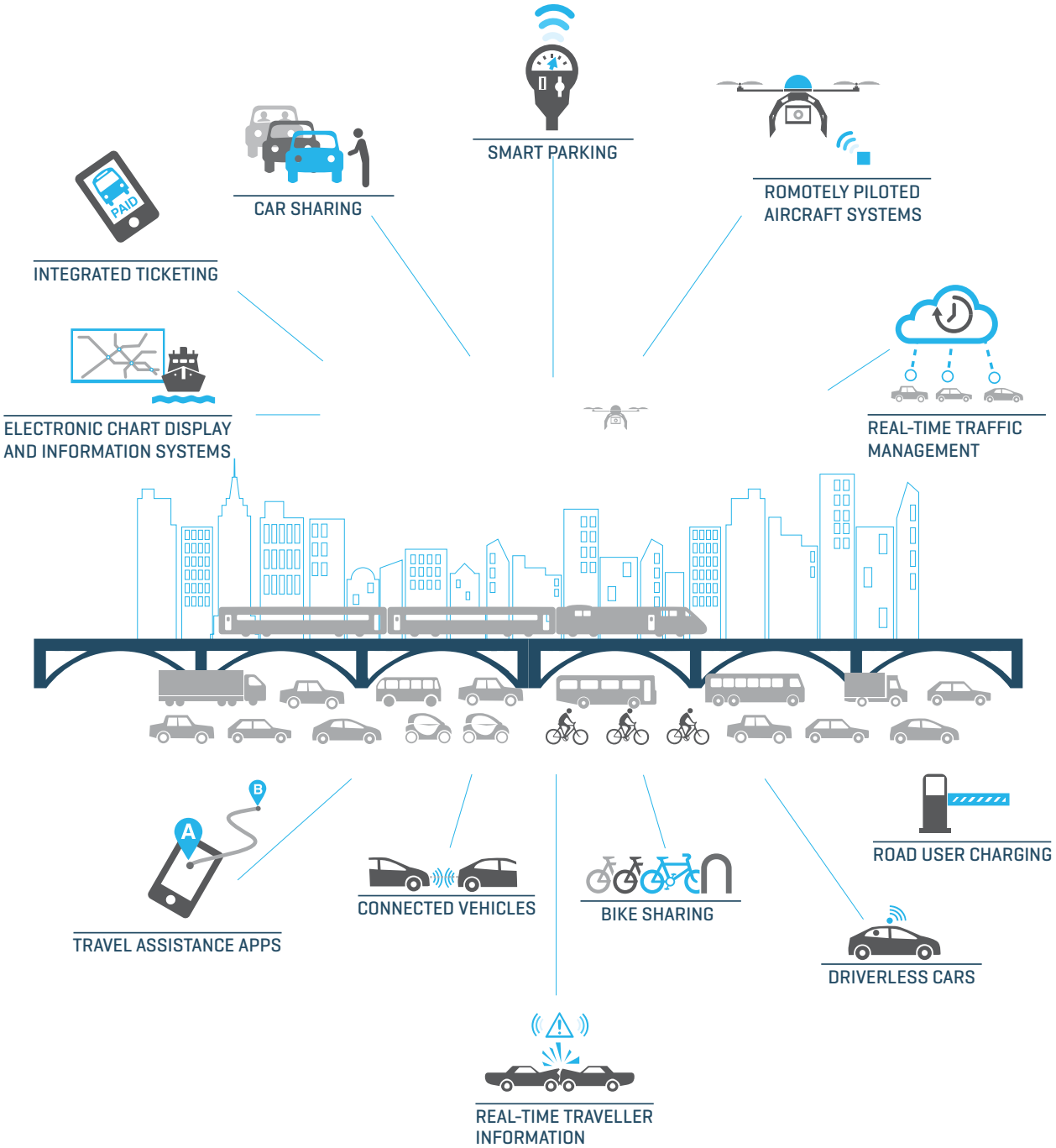
SMART PARKING
CAR SHARING
ROMOTELY PILOTED AIRCRAFT SYSTEMS
INTEGRATED TICKETING
PAID
ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS
REAL-TIME TRAFFIC MANAGEMENT
TRAVEL ASSISTANCE APPS
A
B
CONNECTED VEHICLES
BIKE SHARING
ROAD USER CHARGING
DRIVERLESS CARS
REAL-TIME TRAVELLER INFORMATION