

ATTRIBUTES OF A SUCCESSFUL TRANSPORT SYSTEM

In order for the View to provide a sound basis for planning and investment decision making over the medium to long term, it is considered important that it is grounded in a clear, agreed understanding of the transport system New Zealand needs to be successful into the future.

An enduring framework is needed to describe the key attributes of the system and track progress on how the transport system is delivering the outcomes that New Zealand and customers demand. The framework should cover all elements of the system and clearly reflect what customers seek and need from the transport system.

The framework should include the core elements of the transport system. It should also enable consideration of how transport can support New Zealand to respond to broader challenges and opportunities.

The framework will need to integrate with existing measurement and reporting tools, and should identify areas where there are gaps in our understanding and evidence.

To be enduring, the description of the transport system needs to be agreed by all parties involved in developing Version 2.0 of the View. The following key attributes suggest how we can describe a successful transport system that provides for and enables well-being for all New Zealanders. This list (and the following descriptions), provided for further discussion, reflects the Transport Agency's current level of understanding of each attribute based on the available evidential base, our strategic direction and customer expectations.

- Safe
- Connected
- Accessible
- Resilient
- Responsible
- Financially sustainable
- Positive customer experience
- Integrated with land use
- Agile/adaptable

Safe

Transport users should be able to utilise any available type of transport or transport service with confidence that the system is safe and that they will be free of accidents. A safer system takes into account the many different mode and service choices that may be used to undertake a journey, to ensure a safer system for all. At the broadest level safety refers to people feeling safe as they move around their communities including the most vulnerable groups such as children walking, scootering or cycling to school. It includes the personal safety of people that use public transport, including the safety of the bus stops, train stations and footpaths they use to access public transport.

Despite significant progress over the last 30 years, New Zealand still lags behind many other countries in road safety. The risk of death or serious injury is twice that of similar OECD countries.¹ The level of death and injury suffered by young people on the roads is especially high. Many lives are ruined or lost in preventable crashes.

While road crashes have a large economic impact – the annual social cost of crashes is estimated to be \$4.17 billion,² the figures do not show the social and emotional impact of these crashes on families, the wider community and the health system. The government's road safety strategy (2010-2020), Safer Journeys, has a vision of 'a safe road system increasingly free of death and serious injury', with a range of interventions founded on the Safe System approach. This approach focuses on safe roads and roadsides, safe speeds, safe vehicles and safe road use. While there was a positive start to the strategy with the lowest road toll since 1950 in 2013, deaths and serious injuries have subsequently increased.³

Some forms of transport carry higher levels of risk than others. Motorcycling remains the riskiest transport mode, with the risk of being killed or injured in a road crash 21 times higher for a motorcyclist than a car driver (over the same distance travelled).³ Cycling is another vulnerable mode with cyclists making up 3% of all on-road deaths and 9% of serious injuries⁴ yet only making up 2% of total time travelled.⁵



In 2015 there were 16 deaths and 10 serious injuries in rail related incidents.⁶ While rail related deaths and injuries are reducing, safety issues for cars, cyclists and pedestrians at level crossings remain an issue, particularly in Wellington and Auckland with increasing numbers of commuter train movements.

Expected growth in rail traffic, particularly in Auckland, is likely to increase the risk of deaths and serious injuries at rail crossings. KiwiRail is working with the sector to clarify these risks and identify potential interventions to reduce the risk.

Connected

A connected system enables people and goods to be moved where they need to go in a timely and seamless manner. It delivers reliable journeys, connects key destinations, enables efficient switching between modes and influences the need to travel. A connected transport system has networks in the right places and delivers appropriate levels of service. It brings together information, infrastructure and services to provide seamless end to end journeys for people using a variety of modes and it increases access and proximity to opportunities.

Good connectivity for New Zealanders includes:

- networks that provide appropriate connections to key hubs and locations
- a choice of transport modes, particularly in urban growth areas
- certainty about the reliability and availability of services and infrastructure, and
- real time and reliable information about transport services and network availability.

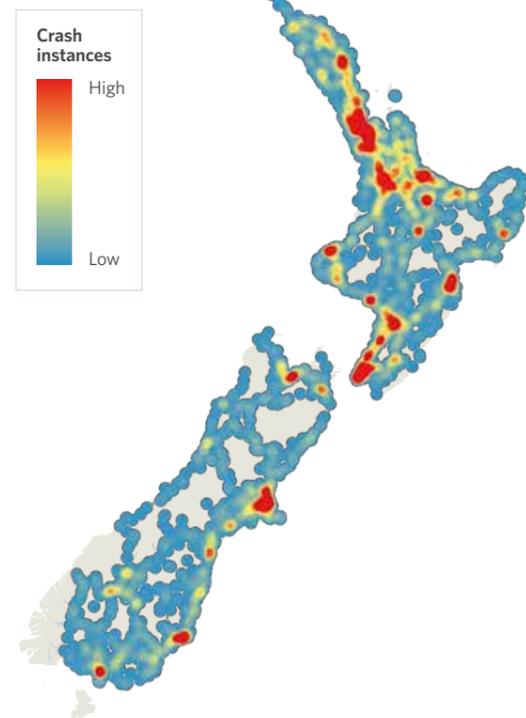
Efficient commuting services will be increasingly important within our major urban centres, and the standard and reliability of transport networks within rural and provincial areas will be critical to supporting their economies.

Our economy relies on good transport links. Primary production centres need efficient connections to international markets and major centres, while the service sector relies on the transport connections with customers. Tourists are seeking safe and reliable routes between arrival points and tourist attractions.

A connected transport system involves integration with information and technology. With the introduction of smart phones, people now expect real time, personalised and connected information that enables them to make the best transport choice for their needs. They also increasingly expect integrated ticketing and payment options. Transport connectivity can now deliver reliable, real-time and customised information to help customers manage their transport needs on-the-go, when they want it, seamlessly.

The information and data available from smart and connected infrastructure and vehicles, combined with real time, can be used to improve system performance.

Fatal and Serious Road Crashes 2012-17



Accessible

Accessible refers to the degree to which individuals and businesses can use the transport system to make the journeys they need to make. While connectivity refers to the extent to which the transport system provides appropriate connections between locations, accessible refers to the degree to which customers are able to make use of those connections. An accessible system is important because it enables people to use the transport system to reach destinations. The degree of accessibility the transport system provides is measured through the ease with which people and businesses can physically reach those destinations e.g. jobs, healthcare, education, services etc. Having access to the transport system provides a means to reach opportunities but it does not guarantee that these opportunities can be reached easily.

Factors that contribute to an accessible transport system include licensing requirements, access to vehicles, affordability of travel options, choice of modes, and the proximity, convenience and timing of transport services.

For many people holding a driver licence is a passport to being able to participate in education and employment, however increasingly in major city centres these connections are being made using public transport, rapid transit and active modes. For many people, including those with disabilities or those who are unable to drive due to age or ill health, a transport system that isn't reliant on access to a private motor vehicle or having a driver licence is essential to enable full participation in education, employment and social interactions.

Levels of accessibility tend to be higher in areas with close proximity to jobs, education, amenities and services (as trips can be made by walking or cycling), and in areas that have access to a range of transport choices.

While valued destinations often involve services and opportunities that require physical presence, other accessibility needs can be met using telecommunications and the internet. The options for access will continue to change as technology and innovation provide new opportunities and choices for both interaction and transport. In the future new digital technologies such as virtual reality may support accessibility outcomes by removing the need to physically move to gain access to opportunities.

Resilient

Resilience refers to the transport system's ability to enable communities to withstand and absorb the impacts of unplanned disruptive events, perform effectively during a disruption, and respond and recover quickly. It involves managing the risk and consequences of events, as well as pro-actively planning for future challenges. The transport system needs to continue to perform during unexpected disruptive events and minimise the impacts on people and communities. This is especially important for strategic networks that carry people and freight, support tourism, and that link regions to core markets and services. Transport system service providers need to work in an integrated manner to enable journeys and services to continue during these events. This will allow New Zealanders to undertake their journeys in a timely and safe manner, and have seamless options and centralised information available to them during unforeseen events.

Our natural and physical environment directly influences the resilience of the transport system. New Zealand is located at the boundary of two tectonic plates and is susceptible to earthquake and volcanic events. With growing impacts of climate change, we expect to see many areas of the country experiencing increased disruptions from weather extremes and sea level rise. Disruptions of physical and digital assets would reduce the transport system's ability to keep New Zealand connected and moving.

New Zealanders and visitors want a transport experience that is safe and reliable and increasingly resilient to hazards and disruption. Meeting these expectations will be challenging as our physical environment continues to experience disruption through climate change or other natural phenomena.

Many transport corridors with resilience gaps provide key routes through regional development areas, or connect them with neighbouring regions and key markets. Recent research has indicated that around 20% of the state highway network has been rated as performing below expected Customer Levels of Service (CLOs) for resilience.⁷ While there are resilience issues on some of our key strategic routes, the main CLOs gaps occur on regional routes or lower classification roads. Improving resilience of the transport system in these regions will contribute to enhanced economic growth and social cohesion.

System resilience can be enhanced, where possible, by designing infrastructure that can be adapted for other uses should conditions change. It also involves considering whether infrastructure should be relocated or re-designed to cope with changes in the external environment such as the emerging impacts of climate change and sea level rise.

An integrated approach to resilience will achieve the optimal, most effective and best value for money solutions for the diversity of contexts across the country. Key elements of this approach are described in the following diagram.

Responsible

A responsible system minimises and reduces harm caused by transport on individuals, communities and the environment. There is a growing expectation that the negative impacts of the transport system will be mitigated and managed. It is important to ensure that transport networks are built, maintained and used in ways that minimise harmful effects on people, other species, habitats and ecosystems.

At an individual level the transport system can result in noise levels and air pollution that can negatively impact on health and well-being. The absence of viable active transport choices can also contribute to poor health outcomes.

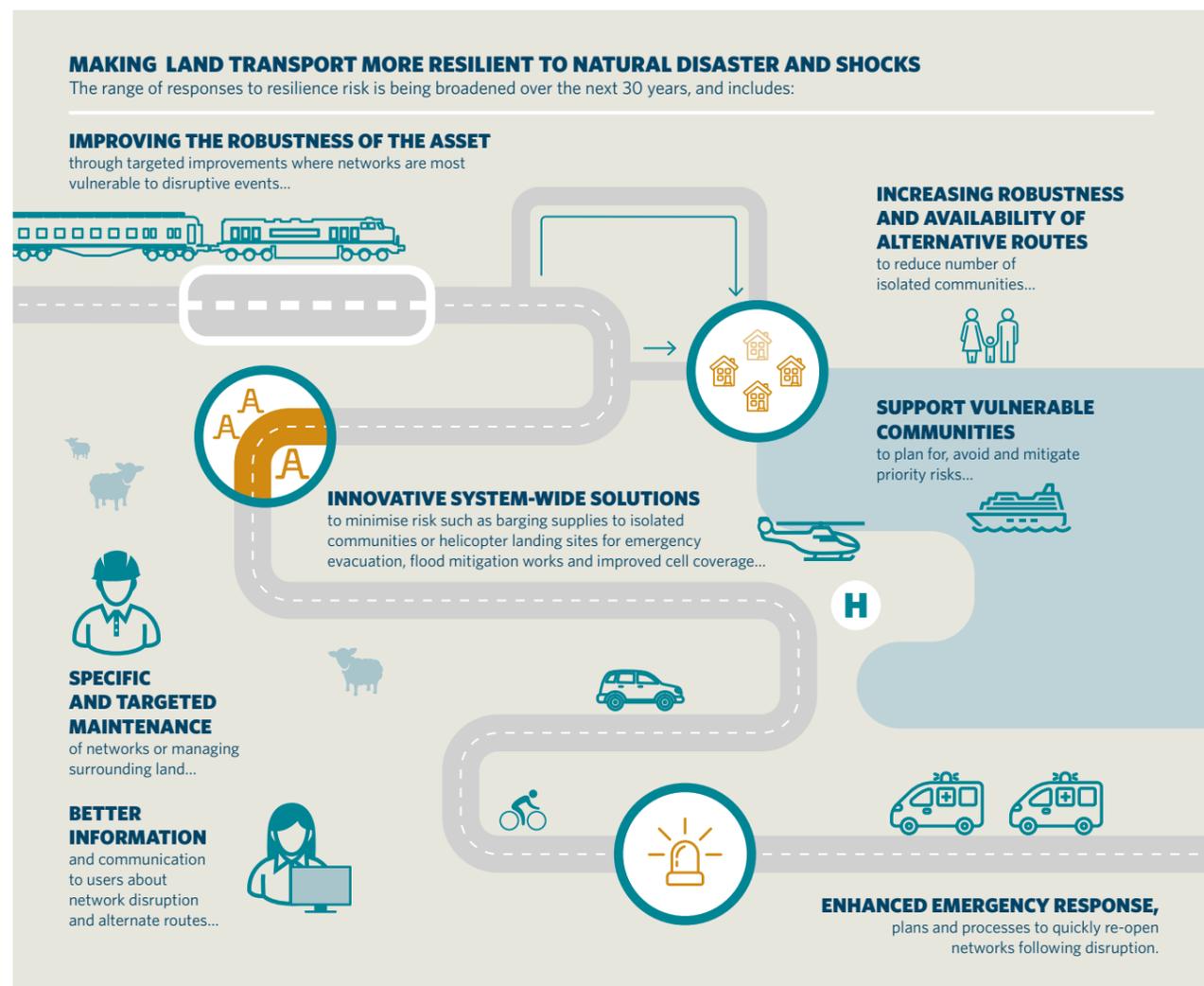
For communities, poor integration of transport infrastructure with land use can result in severance issues (whereby the transport system creates barriers (both physical and psychological) to movement between areas and communities), low quality public spaces and loss of amenities.

Adverse environmental impacts can include carbon emissions contributing to climate change, potential for increased water run-off and reduction in water quality, and impacts on habitats and ecosystems.

Transport is responsible for 18% of New Zealand's total greenhouse gas emissions and land transport represents about 45% of total national level carbon emissions.

There are a range of opportunities for the transport system to play its role in New Zealand reducing greenhouse gas emissions. These include:

- encouraging the use of more fuel-efficient vehicles, including freight vehicles (e.g. 50MAX) and shifting heavy freight to rail.
- enabling the use of new vehicle and network technologies that offer emissions reduction benefits (e.g. autonomous vehicles, electric vehicles).
- advancing demand management approaches that incentivise modal shift to more energy efficient transit options (e.g. public transport, walking and cycling; ride-share).
- shaping more efficient, integrated land transport networks and associated patterns of land use.



- integrated land use planning that reduces the need to travel long distances by private vehicle to access jobs, education and other services.
- optimising materials selection, use and re-use in network construction and maintenance.

The way transport infrastructure is designed, built and managed can also significantly reduce greenhouse gas emissions. It can also improve the amenity of rural and urban landscapes, and bring people closer to each other and the natural environment.

Positive Customer Experience

Customers are telling us they want a system that is easy to use, caters to their individual needs, and positively enhances their transport experience. For someone in a wheelchair this might be about having an even pavement surface, or buses with adjustable entrance levels. For users of mobile phones this might be about having internet available on public transport and an online application with accurate travel time information. For freight operators it might be about having reliable, real time access to information about congestion, and convenient and safe stopping areas en-route.

For tourists a positive experience might be having access to accurate,

up-to-date information on transport choices. On main tourist routes it may be about providing safe laybys and rest areas.

Positive customer experiences will be particularly important to supporting a shift in modes. For example, encouraging people out of single occupancy cars in the main urban centres, will rely on a positive customer perception of alternate options using public transport, walking and cycling. Feeling safe and comfortable, and being able to use your time productively for other activities will provide an attractive alternative to private vehicles.

Financially sustainable

A financially sustainable system considers all benefits and costs, carefully assesses the most cost effective investments, and delivers the right infrastructure and services, in the right place, at the right time, to allow current and future benefits of the investment to be realised.

On-going financial sustainability is supported by ensuring that levels of service are appropriate to the current and future functions of each corridor, and that the resources are used in the most efficient manner. These efforts will be assisted by innovative technologies and processes to provide improved value for money.

Investment needs to be supported by sustainable revenue streams

that equitably and appropriately attribute costs to those who derive value from the system. Ensuring the financial sustainability of the transport system is challenging given the financial constraints on transport partners.

In the medium to long term the increasing cost of mitigating the impacts of climate change will place increasing pressure on the financial sustainability of the system. There are also increasing challenges regarding the increasing costs of maintaining networks combined with anticipated reductions in FED and RUC as a result of more efficient vehicles, electric vehicle use and changing mode choices. To compound the challenge of financial sustainability, in some parts of the country there is an expected reduction in the number of ratepayers to contribute to local share, and/or an increased number of ratepayers on fixed incomes, such as pensions, who have limited capacity to cope with rates increases.

Integrated with land use

Land-use and patterns of land development are the primary drivers of transport demand. Careful integration of land-use and transport, and the design of transport networks, is necessary to ensure that the transport system supports liveability and the delivery of world class cities.

Creation of places and spaces that are attractive and safe, encourages people to sit, gather, walk and cycle. This supports improved safety and accessibility outcomes while also supporting wider outcomes of improving health and social connectedness, and creating more vibrant urban centres.

The location of urban development, how it is designed and laid out, and the mix of uses are critical to determining how people (and goods) are required to move. Urban intensification around activity centres and along key transport corridors can reduce the need to travel long distances to jobs and to access goods and services. It can also enable increased trips by active modes and support the delivery of efficient public transport services.

Similarly the provision of transport infrastructure, in particular the layout of roads and footpaths, shapes the look and feel of places and communities, and determines levels of connectivity and transport choice.

The inappropriate location of land-use activities can adversely impact the performance of the transport system by reducing safety for users or reducing network efficiency.

Careful integration of land-use planning and transport can help support value for money by guiding development to areas that have spare network capacity, thereby delaying the need to invest in new infrastructure. Where new infrastructure is required, integration can enable infrastructure and service delivery to be efficiently timed and sequenced to coincide with land development.

Agile/Adaptable

Customers are telling us they want a transport system that is responsive to changing technologies and innovations, and appropriate to the environment they live in. An agile system is one that can anticipate and respond in a timely manner to changes in customer needs and the environment.

The world is experiencing increasingly rapid changes in technology, with the potential to impact how we travel and live. However there are still many questions as to how emerging technology will be used and the impact this will have on the transport system. Agility is required to help manage increasing levels of uncertainty regarding transport demand, and the changing nature of transport services and how they will be delivered in the future.

An agile transport system, and in particular the related regulatory settings, must support innovation and the emergence of new ideas and services, while ensuring that appropriate safeguards and standards are in place.

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