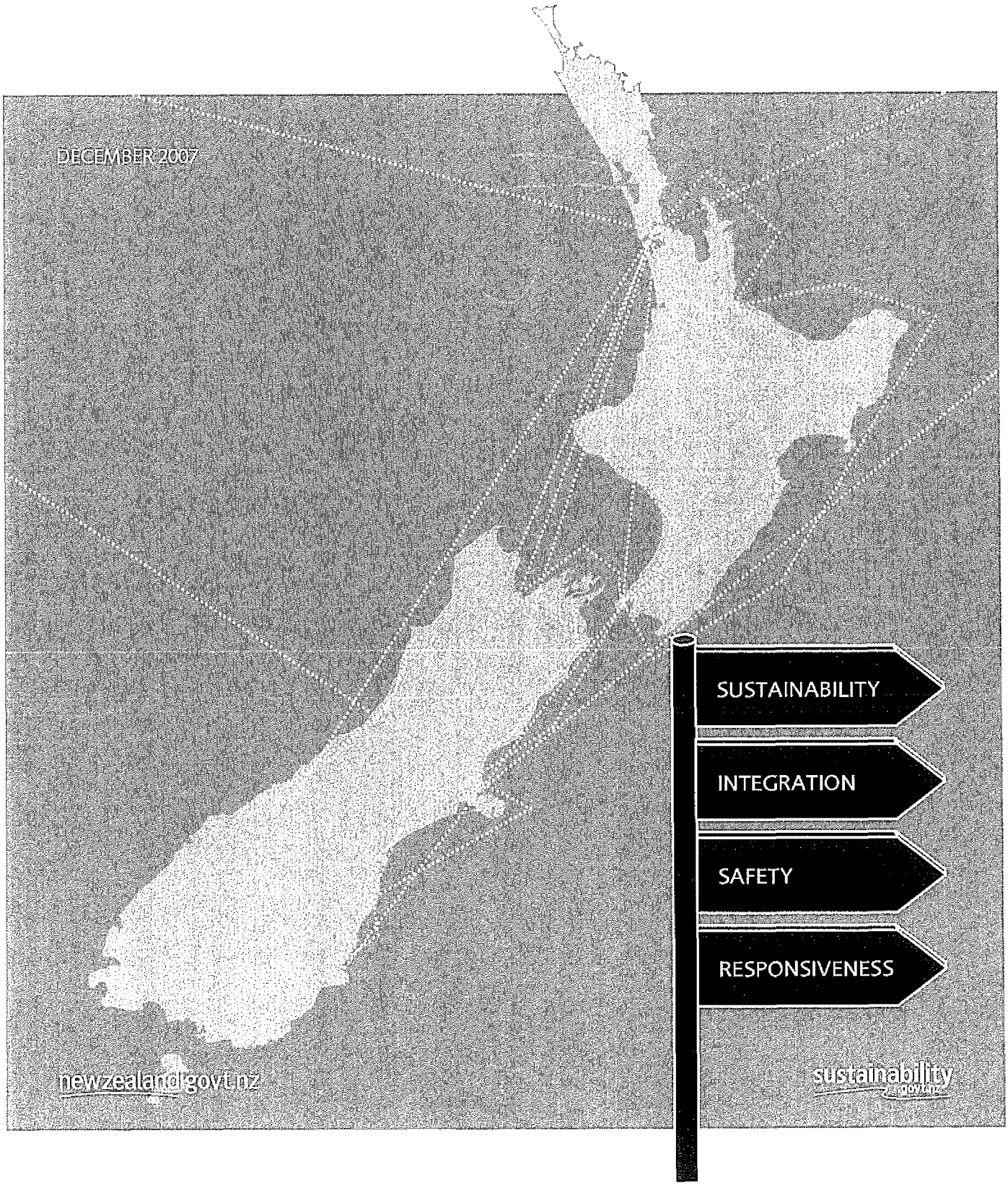
DISCUSSION PAPER

SUSTAINABLE TRANSPORT

UPDATE OF THE NEW ZEALAND TRANSPORT STRATEGY



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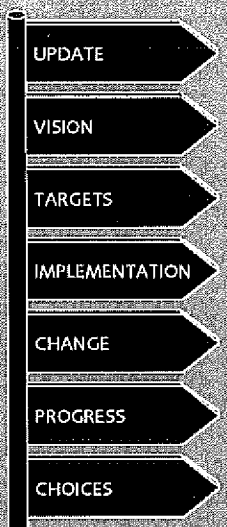


FROM THE MINISTER OF TRANSPORT

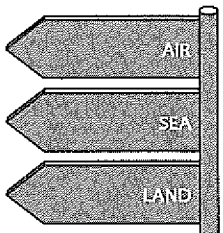
In 2002, this government released the New Zealand Transport Strategy (NZTS). For the first time, New Zealand had a transport strategy which recognised that transport decisions impact every dimension of New Zealand life: the economy, the way society functions and our environment.

As an aspiration, the vision in this Strategy stated that by 2010 New Zealand will have, **"an affordable, integrated, safe, responsive and sustainable transport system".**

It also introduced five key objectives:

1. Assisting economic development
2. Assisting safety and personal security
3. Improving access and mobility
4. Protecting and promoting public health
5. Ensuring environmental sustainability.

Since then much has been done. Working in conjunction with local government and others, we have directed significant efforts to achieving every one of those objectives.



WHERE WE ARE...

We have substantially increased investment in transport. In 1999 the government was investing around $1 billion per annum and this has increased to around $2.75 billion per annum in the latest budget. From 2008, we intend that all revenue collected from transport users from fuel excise duty, road user charges and motor vehicle registrations will be dedicated to transport funding. We are also enabling the introduction of regional fuel taxes as an additional source of transport funding.

We have doubled the investment in road building. Investment has increased from around $593 million per annum to over $1 billion per annum in the last seven years – accelerating New Zealand's largest ever road building programme. The funding for state highway construction has become more certain by extending the one year funding horizon to six years.

We are bringing down the road toll. Last year's road toll of 391 was the lowest in 46 years thanks to our focus on key risks, enforcement, education and better road engineering.

We have launched a major assault on Auckland's traffic congestion. This includes upgrading the Auckland rail network, developing the Northern Busway and its facilities and services, upgrading the strategic highway and regional arterial routes, and implementing travel demand measures.

We are improving public transport. This year, government expenditure on public transport is 8.5 times higher than in 1990.

We are improving our rail networks. When the government bought back the rail network in 2004, $200 million was committed over four years for track upgrades. In Budget 2007 a further $50 million was committed to fund additional improvements to the network in 2008 and 2009. The government has also provided $600 million for track upgrades and renewals on the Auckland passenger network and a further $600 million between 2007 and 2012 for urban rail upgrades in Auckland and Wellington, including the electrification of the Auckland network.

We are promoting walking and cycling. Funding for walking and cycling is expected to double over the next ten years to reach $28 million per annum and we expect to see many walking and cycling networks completed.

We are promoting alternative fuels. The biofuels sales obligation requires fuel companies to supply biofuels and is expected to save over a million tonnes of carbon dioxide (CO_2) emissions between 2008 and 2012.

We are focusing on shipping. We have developed *Sea Change*, a draft domestic sea freight strategy to increase the use of coastal shipping services in New Zealand.

We have improved New Zealand's aviation security. We have strengthened our legislative framework and enabled New Zealand to continue to meet international security obligations set by the International Civil Aviation Organization.

We are looking for greater value. The Next Steps Review of the Land Transport Sector is one of a number of initiatives to ensure value for money from government transport expenditure.

These developments are all moving us closer to our vision.

LOOKING TO THE FUTURE...

Five years on from the launch of the NZTS, it is time to review our position and decide how we should allocate resources in the future. We have a better understanding of the relationships between our transport objectives and more experience of the significant challenges they represent.

We have now set our sights even higher. Because of our deeper understanding of the need to build a sustainable nation, we have established an ambition to be the first carbon neutral country in the world. To achieve this, we must put sustainability at the centre of all our thinking and decision-making. The government's recent in-principle decision to halve per capita domestic transport greenhouse gas emissions by 2040 demonstrates this commitment to creating a sustainable nation.

It is appropriate to think again about how we will achieve the goals set out in the NZTS and we have proposed some targets. While our aspirations and objectives do not change, for example, transport continues to have a vital role to play in supporting sustainable economic growth, we are likely to change our priorities and make different choices. To help the government determine those priorities and choices, I invite your input.

A SUSTAINABLE FUTURE...

Two overarching aspirations for this government are transforming the New Zealand economy and achieving environmental sustainability.

Individually and as a nation, the choices we make about transport either move us towards these goals or make them more difficult to achieve. For example, improvements in transport infrastructure make it easier for people and freight to move, which helps the economy to grow. Increased traffic can lead to more congestion, which adversely affects economic activity and creates more greenhouse gas emissions. Transport accounts for 18 percent of New Zealand's greenhouse gas emissions. We have to change this.

What has changed is how we meet the objectives under the NZTS and the targets and initiatives we need to achieve each objective. Ensuring environmental sustainability, for example, requires choosing different modes of transport, different choices of vehicles, and different choices of fuel. The government's Update of the New Zealand Transport Strategy will be directed to making such choices possible.

Photo courtesy of the Ministry for the Environment

Transport in the future will be more sustainable. There will be more hybrid and full electric vehicles. More freight will be carried, and increasingly by rail and sea. More people will walk, cycle, and use public transport. There will be lower CO_2 emissions owing to modal shifts as well as increased fuel efficiency and new technology, including the widespread use of electric vehicles.

To become more sustainable, we have set some ambitious targets. Our targets for *environmental sustainability* have been released already, as part of the government's initiatives on climate change.

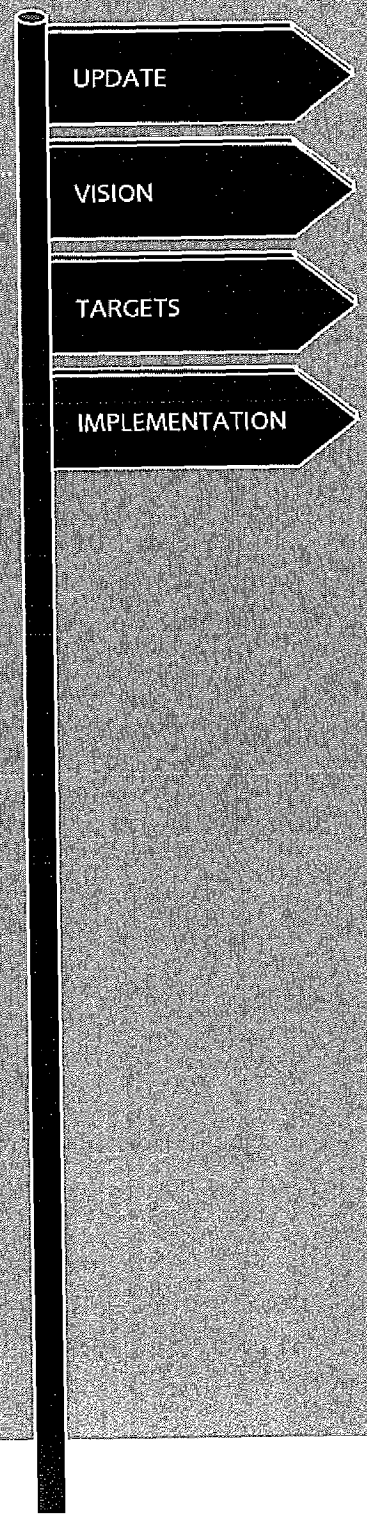
By 2040, we want:

- to halve per capita domestic greenhouse gas transport emissions from 2007 levels
- New Zealand to be one of the first countries in the world to widely deploy electric vehicles.

In this document we propose targets for all the NZTS objectives. Each of them is challenging and none of them will be achieved without acceptance that change is necessary and a willingness to make different transport choices.

Please consider the targets we have proposed and tell us what you think. I thank you for your interest and look forward to hearing your views.

Hon Annette King
Minister of Transport



UPDATE OF THE NEW ZEALAND TRANSPORT STRATEGY

The New Zealand Energy Strategy and the New Zealand Energy Efficiency and Conservation Strategy

The Emissions Trading Scheme

About this discussion paper

SECTION ONE

VISION FOR THE FUTURE

Moving people
Moving freight

TRANSPORT TARGETS

Government agreed and proposed high-level outcome targets for 2040

Government agreed and proposed intermediate or detailed targets for 2040

Government agreed and proposed targets that will help further reduce harmful emissions from cars and trucks

MOVING FROM TARGETS TO IMPLEMENTATION

Proposed guiding concepts for New Zealand Transport

UPDATE OF THE NEW ZEALAND TRANSPORT STRATEGY

Transport provides people with access to facilities and activities, and goods with access to markets. It ensures people can participate in a modern, globally integrated lifestyle and supports our country's economic wellbeing.

The New Zealand Transport Strategy (NZTS) was released in 2002. It described how the transport sector as an integrated whole should contribute to the country's broader social, economic and environmental needs.

Five years on it is time to review our position and perhaps to think differently about how we should allocate resources in the future.

We must do this for three reasons:

1. Experience with the NZTS has led to calls for more specific guidance. When making decisions about a particular project, what is the appropriate way to *assist economic development* on the one hand and *ensure environmental sustainability* on the other? To *improve access* and *mobility* while *assisting safety and personal security*?
2. There is growing evidence that "more of the same" will not deliver the NZTS objectives. For example, despite heavy investment in Auckland roads and public transport, traffic congestion is expected to remain a major problem.
3. Transport's contribution to greenhouse gas emissions is growing unsustainably. As part of its response to climate change, the government has introduced targets that will require far-reaching changes in transport choices.

The Update of the New Zealand Transport Strategy (UNZTS) will operate within and recognise the government's key goals of economic transformation, national identity and families – young and old – under the wider sustainability agenda. It will inform new strategies and the implementation and revision of existing transport strategies, such as those covering railways, state highways, walking and cycling and road safety. It will also influence regional strategic planning documents such as regional land transport strategies and regional growth strategies.

We have proposed specific targets for the five NZTS objectives that will complement transport targets under the government's sustainability agenda, the New Zealand Energy Strategy (NZES), and the New Zealand Energy Efficiency and Conservation Strategy (NZEECS). These strategies all have important transport dimensions and deal substantively with energy security and climate change issues.

Other strategies such as the New Zealand Tourism Strategy, the New Zealand Disability Strategy, and the Positive Ageing Strategy will inform the UNZTS. *Sea Change*, the draft domestic sea freight strategy, was launched on 5 November 2007, and a New Zealand Freight Study will be commencing soon.

To achieve the proposed targets central and local government will need to work together using a partnership approach. Similarly, whole-of-government efforts will also be required for optimum outcomes.

The New Zealand Energy Strategy and the New Zealand Energy Efficiency and Conservation Strategy

The government's response to climate change is set out in the recently released NZES. The transport sector presents a major energy challenge. The government has made an in-principle decision to halve domestic greenhouse gas transport emissions per capita by 2040. The NZES sets out five action areas to complement emissions pricing and improve security.

These action areas are:

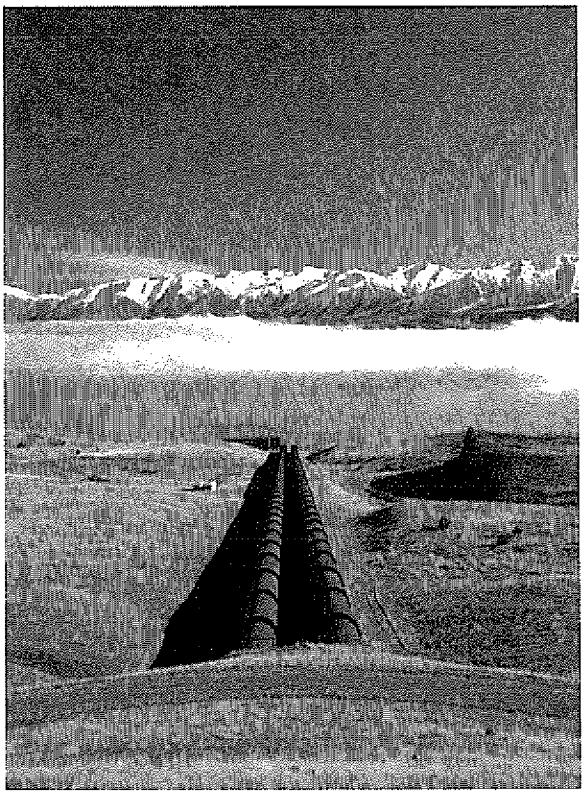
- managing demand for travel
- shifting to more efficient and/or lower impact means of transport
- improving the fuel efficiency of the vehicle fleet
- developing and adopting future fuels
- ensuring the security of short-term oil supplies and a diverse supply of transport fuels.

The NZES and NZEECS set out the detail on how the government's sustainable transport objectives will be achieved. A lot of the work is already underway.

This includes:

- work to develop an average fuel efficiency standard for light vehicles entering the fleet. The standard is expected to be in place by the end of 2007
- introduction of legislation to implement the biofuels sales obligation, including a clause to enable standards to be set, which ensure that only biofuels that come from sustainable sources can count towards the biofuels sales obligation
- the government announcement of New Zealand's goal to be one of the first countries to widely deploy full electric vehicles.

The NZES outlines a work programme to remove potential barriers to plug-in hybrids and full electric vehicles, including how they are classified, safety considerations, how land transport charges are collected, and making sure electric car batteries get charged at smart times.



The Emissions Trading Scheme

An Emissions Trading Scheme (ETS) for greenhouse gas emissions is also part of the government's response to climate change. In the transport sector the ETS will cover liquid fossil fuels used in New Zealand, including petrol, diesel, aviation gasoline, jet kerosene, light fuel oil and heavy fuel oil.

The scheme will apply to liquid fossil fuels as far up the supply chain as possible (when refined oil products leave the refinery or are imported) commencing 1 January 2009. It is expected that the cost of emission units will be passed through to consumers. For example, assuming a price of emissions of $15 per tonne of CO_2 equivalent, fuel prices would likely rise by around four cents per litre.

The objective of the ETS in New Zealand is to support and encourage global efforts to reduce greenhouse gases by:

- reducing New Zealand's net emissions below business-as-usual levels
- complying with our international obligations, including our Kyoto Protocol obligations

while maintaining economic flexibility, equity, and environmental integrity at least cost in the long term.

The ETS will operate alongside other policies and measures to reduce domestic emissions and achieve New Zealand's broader sustainability objectives.

About this discussion paper

In 2008, the government will publish an Update of the New Zealand Transport Strategy.

This Update will:

- provide direction for the transport sector until 2040 in the context of the government's sustainability agenda and other government strategies in the areas of energy and energy efficiency
- translate that direction into high-level targets for the transport sector and intermediate targets for sub-sectors (air, sea, road, vehicle fleet, rail, freight, public transport, walking and cycling) to help achieve the high-level targets
- provide clearer guidelines for decisions about funding allocations
- contain an action plan, including accountabilities for actions, reflecting how we intend to reach the transport targets.

This discussion paper is an important first step towards updating the NZTS. Its purpose is to set out the issues and propose a series of transport specific targets within the context of overarching targets already decided by the government in the areas of sustainability, energy and climate change.

Each section of this document contains proposed targets and key discussion points. Your responses to them will help the government determine the right approach to the objectives and the targets, how resources should be allocated, and what mix of policies will successfully deliver the vision in the NZTS.

For more information or to make a submission, visit:
www.transport.govt.nz

Email your submission form to:
sustainabletransport@transport.govt.nz or post to:
Sustainable Transport
Ministry of Transport
PO Box 3175
Wellington 6140
by Friday 15 February 2008.

VISION FOR THE FUTURE

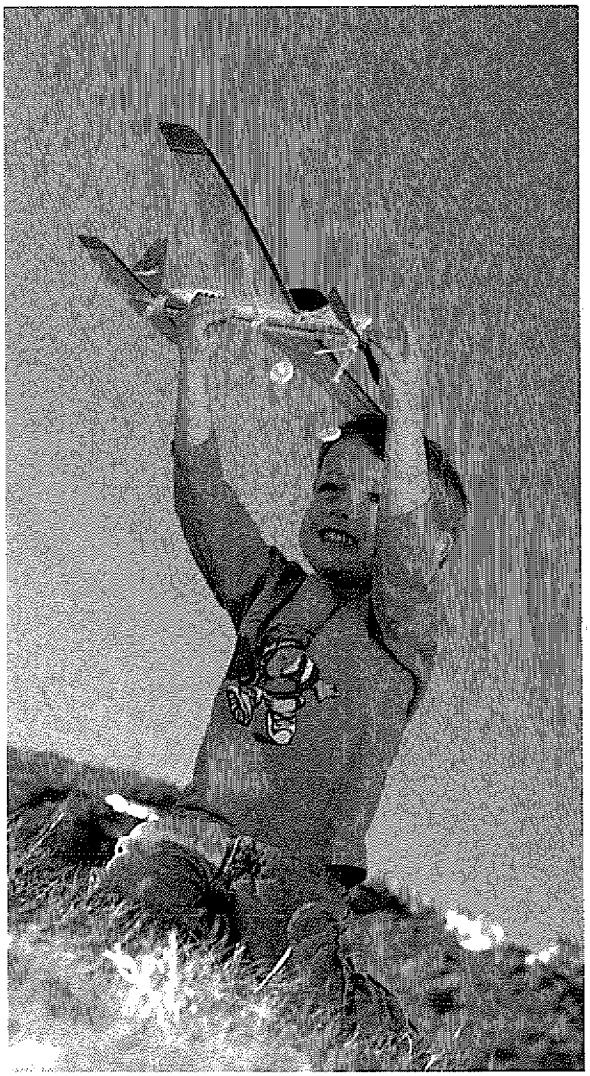
New Zealand's transport system in 2040

What will the New Zealand transport system look like in 2040 if it is to play its part in ensuring New Zealanders have a sustainable way of life?

Any transport system is about "moving people and moving freight".

An important reality is that the cost of fossil fuel will be significantly higher than it is today; this will be a world-wide reality, not just a challenge for New Zealand.

If we make the right choices we can still have a vibrant economy and excellent transport system. Below is a summary of how transport could perform if some of the choices discussed in this document are adopted in the years ahead.



Moving People

INTO AND OUT OF NEW ZEALAND...

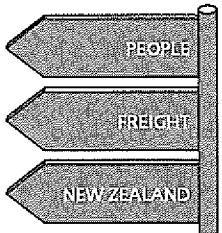
- International air services and airports provide an excellent range of connections, with a high degree of efficiency.
- Safety standards are maintained at world-best levels.
- High security standards as appropriate for New Zealand.
- Users face full costs including the cost of emissions.
- Transport greenhouse gas emissions and energy use per passenger are significantly reduced through use of renewable fuels, more fuel efficient aircraft, and improved operating practices.

AROUND NEW ZEALAND...

- Regional airports and air services provide an excellent range of domestic connections with a high degree of efficiency.
- Road systems provide a reliable network for cars, coaches and commercial vehicles with reliable journey times.
- Inter-town/inter-city bus and coach services are operating at increased frequency, and further selected passenger rail services are operating.
- Safety is significantly improved through improvements to the vehicle fleet, road networks, and vehicle operating practices.
- Users face full costs including the cost of emissions.
- Greenhouse gas emissions and energy use are significantly reduced through use of renewable fuels, more fuel efficient technology, and improved operating practices.

IN OUR CITIES AND TOWNS...

- Improved public transport, including more frequent and higher quality services.
- More walk and cycle-friendly transport environments that 'invite' rather than just 'allow' for the use of these modes.
- Good connectivity between modes provides improved accessibility.
- Road networks operate more reliably through effective use of traffic management, traveller information, and demand management measures and selected capacity improvements.
- Priority provisions (eg dedicated lanes) are provided for buses and other multi-occupancy vehicles on congested sections of networks.
- Improved safety and public health through engineering improvements to vehicle fleet and road networks, vehicle operating practices, and greater use of active modes.
- Electric vehicles are a significant component of road transport.
- Road users pay full costs including carbon charges but subsidies may be provided for public transport and active modes in recognition of the health, environmental and congestion reduction benefits.
- Social subsidies continue to be provided for the elderly and transport disadvantaged.
- Greenhouse gas emissions and energy use are significantly reduced through better town planning, more fuel efficient vehicles and use of renewable fuels, improved operating practices, and increased use of shared and active modes.
- Land use and transport are planned in an integrated way.



Moving Freight

INTO AND OUT OF NEW ZEALAND...

- Shipping lines and ports provide an excellent range of services with a high degree of efficiency.
- Airfreight continues to play a vital role for time-critical freight.
- Safety standards are maintained at world-best levels.
- High security standards as appropriate for New Zealand.
- Users face the full costs, including the cost of emissions.
- Transport greenhouse gas emissions and energy use are significantly reduced per tonne-kilometre of freight through use of renewable fuels and larger, more fuel efficient ships operating to best environmental practice.

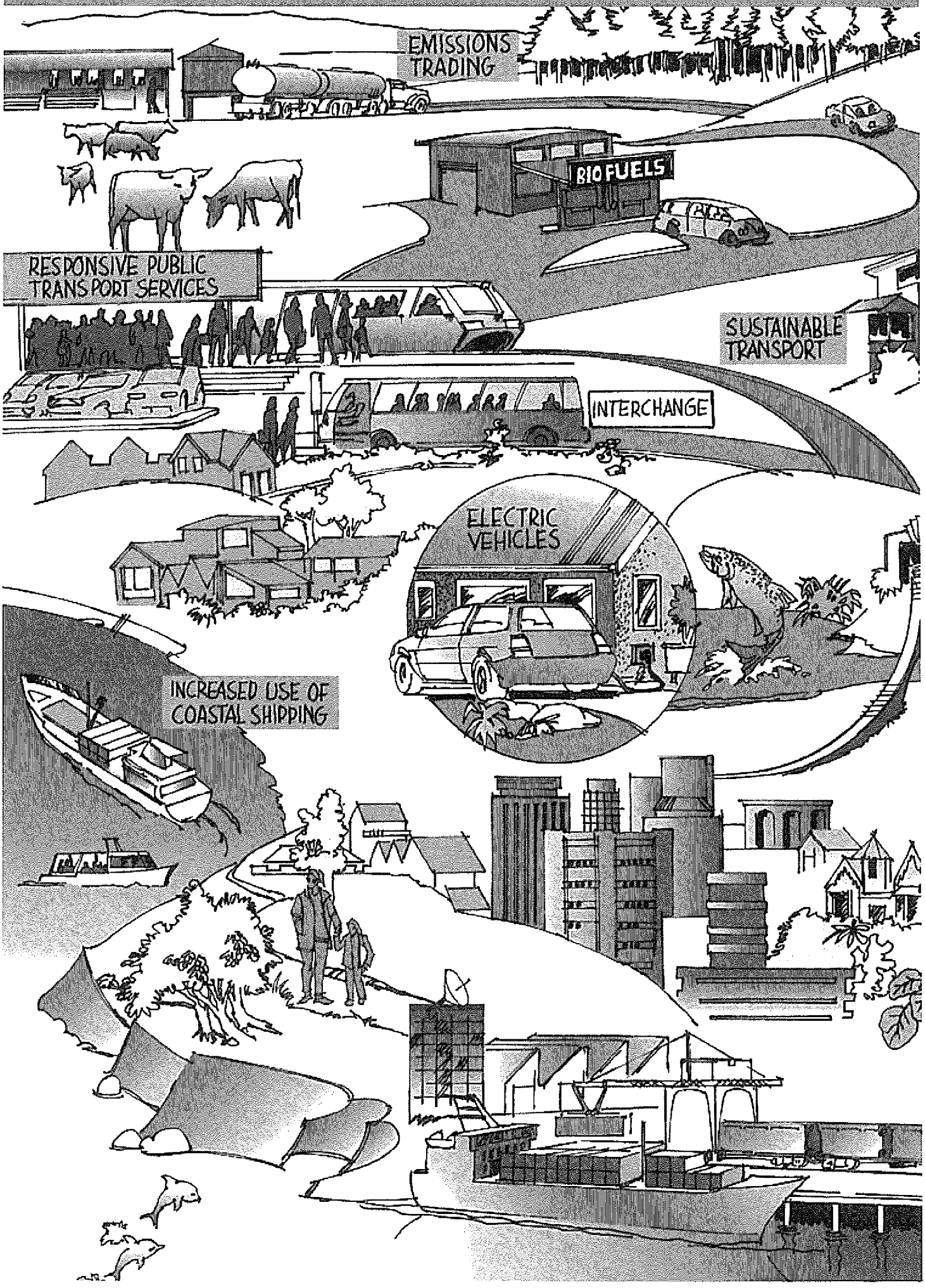
AROUND NEW ZEALAND...

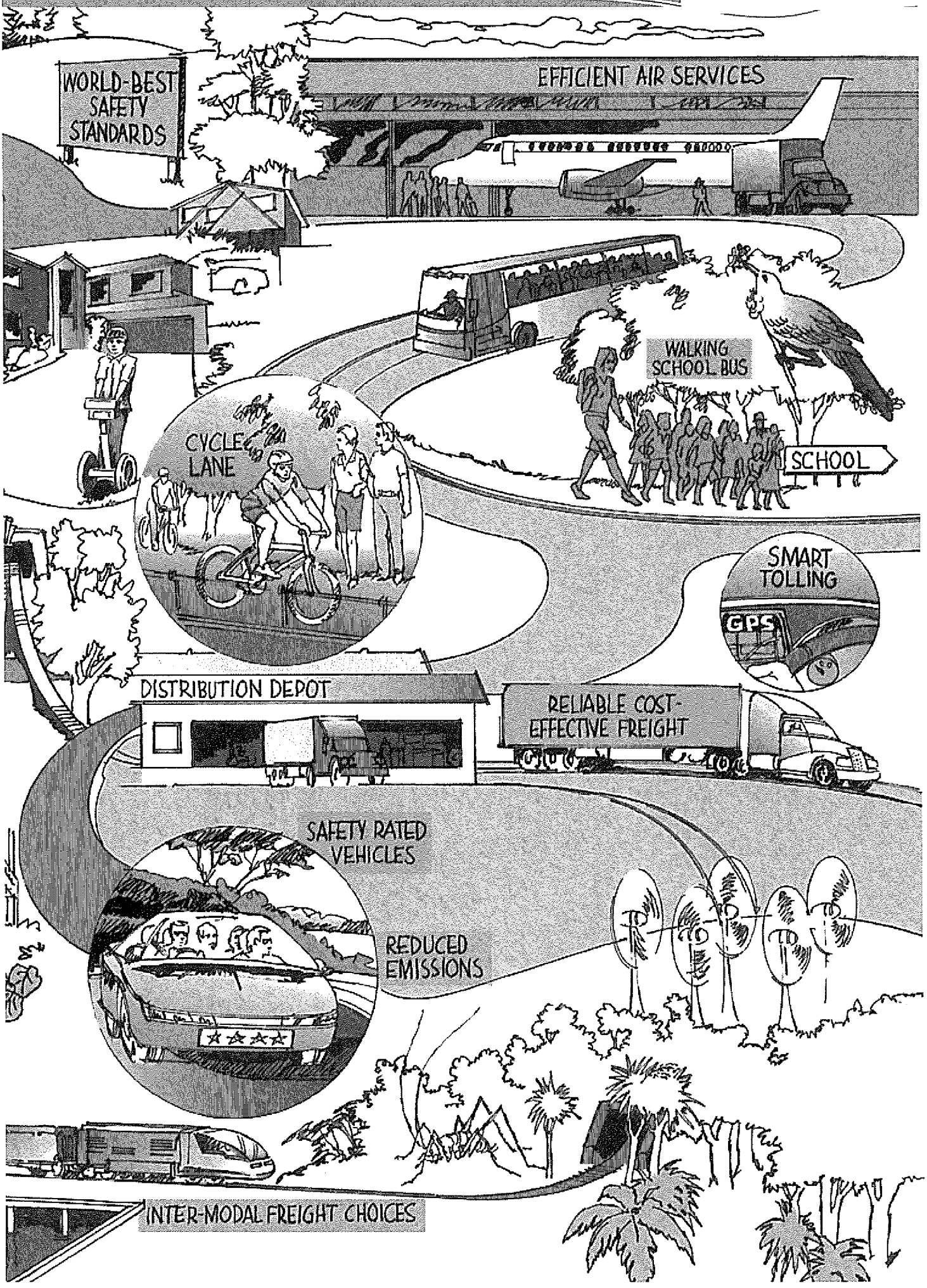
- Transport operators provide an excellent range of reliable and cost effective freight services.
- Effective road, rail and coastal shipping networks provide greater choice for freight users, and there is good connectivity between modes, with minimal delay and damage to freight at intermodal connections and terminals.
- Safety is further improved through improvements to road and rail networks, and vehicle operating practices.
- Users face full costs including the cost of emissions, with start-up support and subsidies targeted at selected modes when justified by externality benefits.
- Greenhouse gas emissions and energy use per tonne-kilometres of freight are significantly reduced through greater use of rail and shipping modes, use of renewable fuels, improved freight logistics and vehicle operating practices, and investment in energy-efficient and greenhouse gas reducing technologies.

IN OUR CITIES AND TOWNS...

- Improved connections for freight traffic between ports, airports, rail and other terminals, and developments that generate significant freight movement, including providing priority lanes for freight vehicles on congested sections of the network.
- Road networks operate more reliably through effective use of traffic management and demand management measures and selected capacity improvements.
- Safety is further improved through improvements to road networks and heavy vehicle operating practices.
- Users pay full costs including the cost of emissions.
- Greenhouse gas emissions and energy use per tonne-kilometres are significantly reduced through better planning, use of renewable fuels, more fuel efficient vehicles, improved operating practices, and greater use of more sustainable modes for freight movement.

This vision for the future represents substantial progress towards "an affordable, integrated, safe, responsive and sustainable transport system" that contributes effectively to the economic, social and environmental well-being of New Zealanders.


EMISSIONS TRADING
BIOFUELS
RESPONSIVE PUBLIC TRANSPORT SERVICES
SUSTAINABLE TRANSPORT
INTERCHANGE
ELECTRIC VEHICLES
INCREASED USE OF COASTAL SHIPPING


WORLD-BEST SAFETY STANDARDS
EFFICIENT AIR SERVICES
WALKING SCHOOL BUS
SCHOOL
CYCLE LANE
SMART TOLLING
GPS
DISTRIBUTION DEPOT
RELIABLE COST-EFFECTIVE FREIGHT
SAFETY RATED VEHICLES
REDUCED EMISSIONS
INTER-MODAL FREIGHT CHOICES

TRANSPORT TARGETS

A series of high-level transport specific targets are proposed for each objective under the NZTS within the context of overarching targets already decided by the government in the areas of sustainability, energy and climate change.

These high-level targets relate to outcomes for 2040 and will be regularly monitored with results published. The targets will also be reviewed in the light of new knowledge and considerations such as cost-effectiveness. This will allow the NZTS to evolve in response to the performance of the New Zealand transport network. Each high-level target is supported by one or more intermediate targets, which either relate to an earlier year or represent how the overall target will be achieved.

An explanation of the rationale for the above targets can be found on pages 24 to 52 with targets listed under each appropriate objective. Some targets will apply to multiple objectives.

In addition, we have proposed some supporting targets (eg around collecting better information on freight movements) that will help to develop our policies and methods to achieve the outcome and intermediate targets.

In order to achieve our high-level outcomes some tough decisions are needed. For example, can we achieve reductions in greenhouse gas emissions without introducing road pricing to encourage mode shifts? Are we prepared to make the hard decisions?

Your response to these targets will help the government determine the right way to address our objectives, how resources should be allocated and what mix of policies will successfully deliver the vision set out in the NZTS.

For more information or to make a submission, visit:
www.transport.govt.nz

Email your submission form to:
sustainabletransport@transport.govt.nz or post to:
Sustainable Transport
Ministry of Transport
PO Box 3175
Wellington 6140
by Friday 15 February 2008.

Summary of Targets

GOVERNMENT AGREED HIGH-LEVEL OUTCOME TARGET FOR 2040

Halve per capita domestic greenhouse gas transport emissions.[1]

PROPOSED HIGH-LEVEL OUTCOME TARGETS FOR 2040

Travel times by all modes will be predictable.

Travel times by principal routes to be improved relative to 2007 for identified critical intra and inter-regional connections, as determined with each region.

All individuals have access to the facilities and activities they need, such as work, education, medical care and shopping centres, to participate in society.

Public health effects of transport to be at accepted international standard.

Local environmental impacts of transport (including air and water quality) to be at accepted international standard.

Operate to world best-practice safety standards for all modes of transport.

GOVERNMENT AGREED INTERMEDIATE OR DETAILED TARGETS FOR 2040

Become one of the first countries in the world to widely deploy electric vehicles[2].

A biofuels sales obligation that will begin at a level of 0.53 percent from 2008, increasing to 3.4 percent of annual petrol and diesel sales by 2012.

Reduce the kilometres travelled by single occupancy vehicles in major urban areas on weekdays by ten per cent per capita by 2015 compared to 2007.

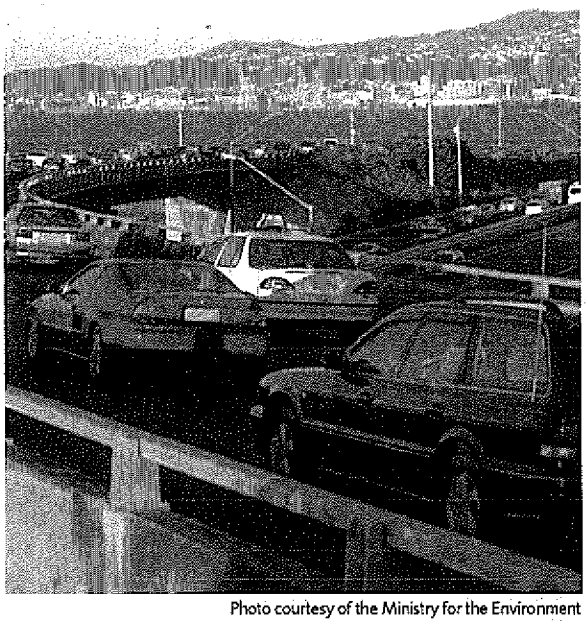


Photo courtesy of the Ministry for the Environment

1. Relative to 2007 emissions per capita.
2. The electricity used to power electric vehicles would need to be generated from renewable sources.

PROPOSED INTERMEDIATE OR DETAILED TARGETS FOR 2040

Identify and remove any barriers to the uptake of plug-in hybrid and full electric vehicles that meet appropriate safety standards.

Effective real-time information systems in place to enable road users to plan their journeys to avoid congestion, minimising delay and fuel wastage, by 2015.

Road deaths no more than 200 per annum[3].

Over 40 percent of the light vehicle fleet to have four star or better[4] occupant protection (currently ten to 15 percent) by 2015 and 90 percent by 2040[5].

Over 25 percent of light vehicles to have electronic stability control (currently less than five percent) by 2015 and 95 percent by 2040.

Lift coastal shipping's share of inter-regional freight to around 30 percent (currently about 15 percent of tonne-kilometres).

Lift rail's share of domestic freight to around 25 percent (currently about 18 percent of tonne-kilometres).

Increase the public transport mode share of peak hour travel (journeys to work) in Auckland, Wellington and Christchurch from an average of nine percent to 20 percent and work with each region to optimise peak hour travel targets.

At least double the overall public transport mode share to seven percent of all passenger trips (currently about two to three percent).

Increase walking and cycling and other "active modes" to 30 percent of total trips in urban areas (currently about 17 percent).

Ensure a substantial reduction in premature deaths and serious illnesses arising from air pollution from motor vehicles.

Manage noise to minimise any public health effects.

No net loss of indigenous vegetation or fauna from infrastructure construction or maintenance.

GOVERNMENT AGREED TARGETS TO REDUCE HARMFUL EMISSIONS FROM CARS AND TRUCKS

Reduce the rated CO_2 emissions per kilometre of combined average new and used vehicles entering the light vehicle fleet to 170 grams CO_2 per kilometre by 2015 (currently around 220 grams CO_2 per kilometre), with a corresponding reduction in average fuel used per kilometre.

Ensure 80 percent of the vehicle fleet is capable of using at least a ten percent blend of bio-ethanol or bio-diesel, or is electric powered, by 2015.

PROPOSED TARGETS TO FURTHER REDUCE HARMFUL EMISSIONS FROM CARS AND TRUCKS

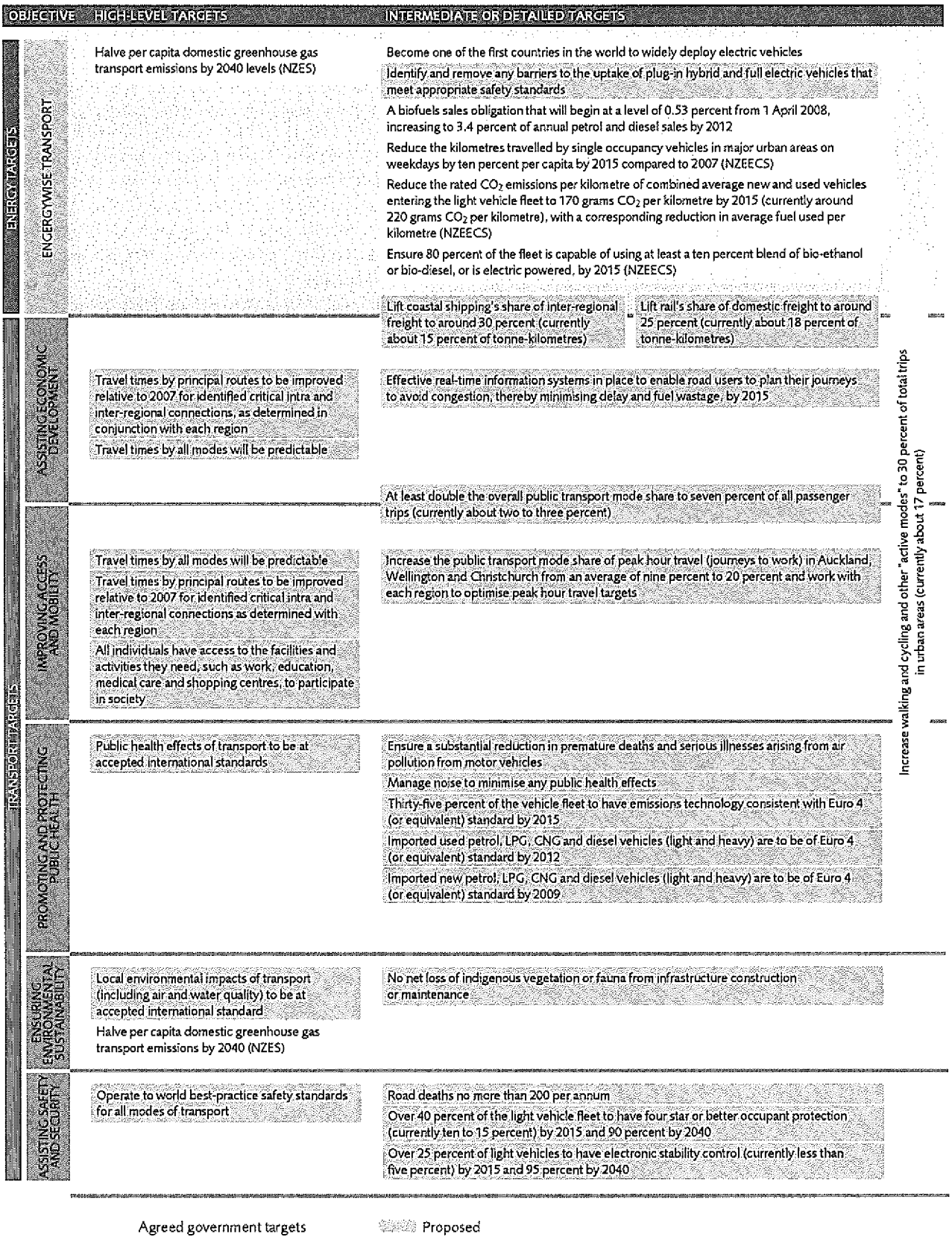
Thirty-five percent of the vehicle fleet to have emissions technology consistent with Euro 4[6] (or equivalent) standard by 2015.

Imported used petrol, LPG, CNG and diesel vehicles (light and heavy) are to be of Euro 4 (or equivalent) standard by 2012.

Imported new petrol, LPG, CNG and diesel vehicles (light and heavy) are to be of Euro 4 (or equivalent) standard by 2009.

3. The category of "road deaths" includes cyclists and pedestrians that die as a result of a crash involving a motor vehicle on a public road.
4. Out of a maximum occupant protection score of five stars based on two tests: an offset frontal test and a side impact test. Research shows a strong correlation between the tests and injuries suffered by vehicle occupants in serious on-road crashes.
5. Achieving this and the following target is going to depend heavily on the speed of turnover in New Zealand's vehicle fleet. A vehicle fleet strategy discussion paper is currently being prepared.
6. Euro 4 is a European emission standard which defines the acceptable limits for exhaust emissions of new vehicles sold in European Union member states. Higher numbers indicate more stringent standards.

THE FOLLOWING DIAGRAM SHOWS HOW THE HIGH-LEVEL AND INTERMEDIATE OR DETAILED TARGETS TO 2040, RELATE TO THE NZTS, THE NZES AND NZEECS OBJECTIVES.



MOVING FROM TARGETS TO IMPLEMENTATION

Much of the discussion in this document has focused on targets for the New Zealand transport system. However, targets by themselves do not provide an overall transport strategy.

A sustainable transport system will be created through a combination of actions by:

- central government
- local government
- business and industry
- the New Zealand people.

An action plan, including accountabilities for actions, reflecting how we intend to reach the transport targets will be included in the final UNZTS.

Detailed policies, sector strategies and location-specific actions will still be required. For example, city and regional growth management strategies will be central in determining the transport systems needed to support regional economic, social and environmental goals in line with national targets. Central and local government and transport agencies will need to work together to ensure national, regional and local strategies are aligned and achievable. An indicative list of policies and strategies is presented in Table 1.

TABLE 1 – DETAILED TRANSPORT AND TRANSPORT RELATED POLICIES AND STRATEGIES

Vehicle fleet policies:

- harmful emissions
- fuel economy
- vehicle safety

Regional land transport strategies (Local Government strategies)

Growth management strategies (Local Government strategies)

Road safety strategy

National State Highway Strategy

National Rail Strategy

Domestic sea freight strategy

Walking and cycling strategy

National guidance on urban design

Some of these policies and strategies will result in legislation, regulation, education, charging regimes, and consenting processes to assess public and private sector transport developments. Other policies and strategies will be used as the basis for particular investment programmes by central government and local government, all with the intention of achieving a long-term sustainable transport system for New Zealand.

In moving towards the targets through other strategies and actions, the four principles from the original NZTS provide useful guidance. They have been updated, and are outlined in Appendix A.

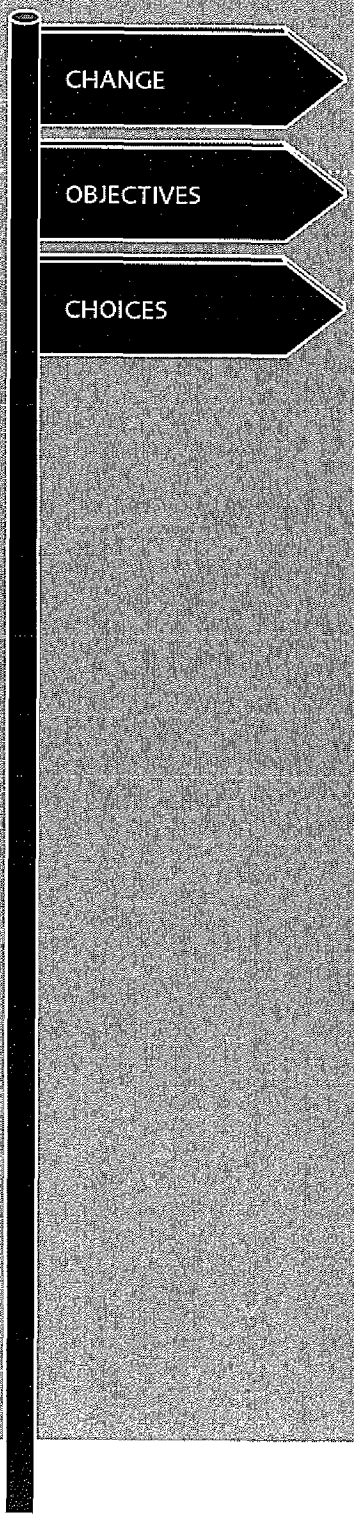
PROPOSED GUIDING CONCEPTS FOR NEW ZEALAND TRANSPORT

Seven useful concepts to help develop transport in New Zealand are:

1. **End-to-end transport solutions** – Ensuring a strong focus on the end-to-end objective of moving people and moving freight safely and securely.
   ...the particular detailed modal solution of a "road", "bus service" or "coastal shipping service" should be a consequence of the objective, NOT an end in itself.
2. **Getting best value from transport assets** – Making the most of pre-existing transport assets, including transport corridors, and key transport nodes (including ports and airports) in the first instance.
   ....establishing new transport corridors or nodes can be extremely time-consuming and contentious.
3. **Integrating land use and transport planning** – Ensuring planning is carried out in an integrated way so that existing and new public investment is used efficiently.
4. **Non-transport solutions** – Looking for "non-transport" solutions such as improved urban planning and IT solutions.
   ....for example, numerous cities and towns around the world have achieved long-term success through compact urban form (which minimises transport demand) rather than urban sprawl (which increases transport demand).
5. **New technologies** – Be willing to utilise new ideas and proven technologies to improve transport outcomes.
   ....technical advances over the last century have reduced construction costs, improved vehicle, ship and aircraft safety, and reduced harmful emissions per vehicle. As further technologies are proven we should utilise these improvements.
6. a) **User pays** – Under most circumstances, the transport tasks should be funded on the basis of user pays, including externalities.
   b) **Subsidies** – Decisions about long-term or start-up subsidies should be the result of conscious decision-making by government or local government.
7. **Effective education and advocacy** – Changing the way we think about travel options for people and freight.
   ...including school, university and work place travel plans, and excellent information to freight originators about transport options.

DISCUSSION POINT

In addition to the NZTS objectives and the targets detailed in this document, do you agree with the concepts outlined above?



WHY CHANGE IS NECESSARY

- Assisting economic development
- Assisting safety and personal security
- Improving access and mobility
- Protecting and promoting public health
- Ensuring environmental sustainability

SECTION TWO

MAKING PROGRESS TOWARDS THE NZTS OBJECTIVES

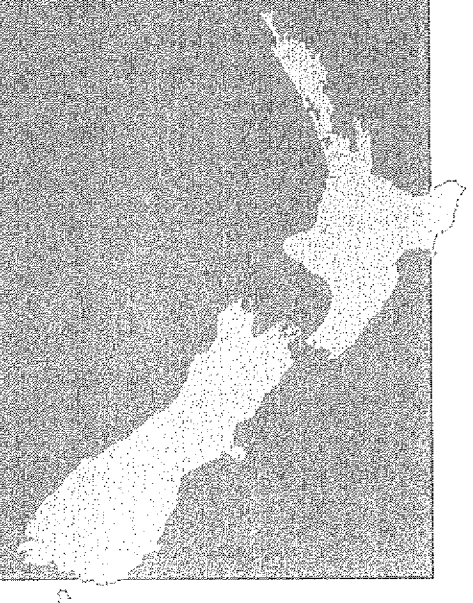
Dependence on fossil fuels and road transport

TRANSPORT CHOICES

Choices about how and how much we move

Choices about how we utilise space

Choices about how we plan



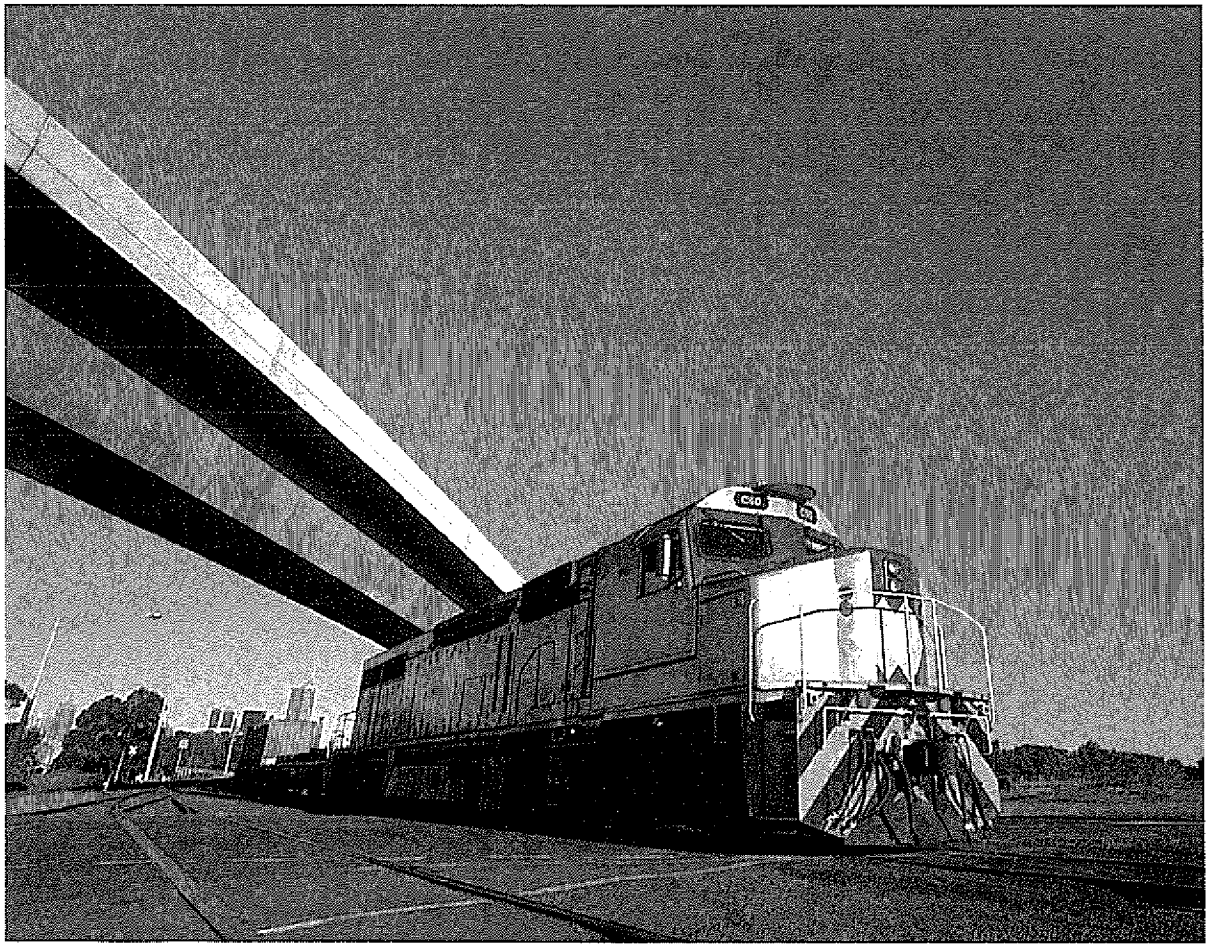
WHY CHANGE IS NECESSARY

Five objectives were set out in the original NZTS. These embraced what was important for New Zealand and New Zealanders.

The objectives covered economic development, safety and personal security, access and mobility, public health and environmental sustainability. Each has been updated but the basic concepts are still valid.

The following section sets out the key challenges to meeting each of the objectives and explains the proposed targets to 2040 to address the underlying issues.

A series of future trends and projections for transport in New Zealand can be found in Appendix B. These are the projections if a new set of sustainable policies are not adopted. Under the government's sustainability programme, these trends are expected to change.



1. Assisting economic development

The outcome for New Zealand is a transport system that supports and assists long-term economic growth and improves the economic and social well-being of New Zealanders through more productive use of resources. Businesses are able to produce and take goods and services to domestic and international markets efficiently, and people can travel easily for work and other productive purposes.

The transport system offers people and businesses choices. It provides transport solutions that help meet the needs of new and existing businesses and those of the people of New Zealand.

DEMAND FOR TRANSPORT IS INCREASING RAPIDLY

INCREASING FREIGHT, TOURISM AND VEHICLE NUMBERS

The more affluent a society becomes, the more goods and people there are on the move. New Zealand's population and economy is growing. Demand for transport is growing even faster.

New Zealand is critically dependent on international sea travel. In 2006/07, 99 percent of New Zealand's export and import tonnage, 85 percent of value for exports and 79 percent of value for imports, went by sea. The boom in trade, especially out of China, is creating a huge strain on port facilities worldwide[7]. Most major ports around the world have seen double or triple digit growth since the 1990s. Over the last year, volumes through the Ports of Auckland have grown by 7.5 percent[8]. Nevertheless, it is estimated that most ports in New Zealand still have the capacity to handle significant increases in freight volumes.

The international cargo not carried on ships is carried by air, with 87 percent of this through Auckland Airport. Between 2000 and 2006 this flow increased by 3.6 percent per annum.

By 2020, domestic freight volumes in New Zealand are expected to almost double[9]. This is consistent with overseas experience, as an economy grows not only do more goods move but goods move further. As is happening in many other countries, domestic freight volumes in New Zealand are increasing faster than GDP[10]. One notable exception is the United Kingdom (UK)[11]. Between 1992 and 2006, New Zealand's GDP increased by 61 percent and truck kilometres[12] increased by 87 percent.

7. W.van Huesden, Moving Forward in Shipping and Freight, National Freight and Shipping Summit 2007.
8. Statistics New Zealand, 2007.
9. Transport Engineering Research New Zealand, Prediction of New Zealand's freight growth by 2020, March 2006.
10. Transport Engineering Research New Zealand, Prediction of New Zealand's freight growth by 2020, March 2006.
11. United Kingdom Department for Transport, Towards a sustainable transport system: supporting economic growth in a low-carbon world, October 2007.
12. Trucks greater than or equal to 3.5 tonnes.

International visitor arrivals are also growing at a faster rate than GDP – at between three and five percent annually. Seventy three percent of overseas arrivals and departures are through Auckland. Every year there are nine million domestic aviation passengers. The importance of air travel for New Zealand is illustrated by the fact that only Iceland, Norway and Singapore show greater per capita trip rates and each of those countries has much higher GDP per capita than New Zealand. Auckland Airport is preparing to accommodate up to 24 million passengers annually (from over 12 million passengers currently) by 2025.

The number of cars and vans on the roads is also increasing faster than the population. There are 19 percent more light vehicles on the roads today than there were in 2000. Better transport networks allow economies of scale and specialisation leading to economic growth and increased transport demand. Despite static or declining populations in rural areas, transport demand is increasing there as well. As land use intensifies, there are more trucks, goods, machinery and people moving along rural roads and along arterial routes. Tourism also relies on provincial roads, adding rental cars, motor homes and tour coaches to the mix with milk tankers, forestry log trucks, stock trucks, school buses and other vehicles. Based on population and GDP growth, and vehicle and fuel prices, VKT (vehicle kilometres travelled) is expected to increase by around 13 percent between 2006 and 2015[13].

INFRASTRUCTURAL SHORTCOMINGS

When the NZTS was released, it stated that "the transport sector cannot endlessly build its way out of all its problems". Given that transport demand increases faster than the population and the economy, and that this growth is primarily in our cities, this would seem to be a reasonable proposition, backed by the increasing costs and challenges of adding transport capacity in our major cities.

Because of New Zealand's terrain, a narrow gauge was chosen for what is now a 4,000 kilometre rail network and nearly 1800 bridges – and 150 tunnels – had to be constructed. The terrain meant early roads took the path of least resistance: winding, narrow and simply-constructed. On the State Highway network today there remain 180 one-lane bridges and 15 timber bridges. New Zealand's longest stretch of straight road is just 13.7km in length. By comparison, the longest stretch of straight road in Australia is 146.6km. There are safety issues around such a network. Our road and rail networks were never designed or built to absorb the weight and volume of traffic they do now, let alone what is projected.

The point is that new infrastructure alone is not the answer. A range of approaches is needed, starting with improving the efficiency of existing infrastructure (through, for instance, effective traffic management) along with parallel initiatives to influence the mobility choices people make (through traffic demand management and provision of alternatives to single occupancy motor vehicle use), then considering further capacity improvements on a selected basis.

13. Ministry of Transport, Travel Projection Model July 2007.

Many regions, for example Northland and Tairawhiti, have large rural areas. Low income households face transport affordability problems and have limited alternative transport options. Public transport services and transport infrastructure improvements are difficult for councils to provide because of a low rating base. Providing walking and cycling infrastructure is not practical because of the distances that need to be travelled to get to work. Regional development funding has been put in place to assist with the development of roads for the forestry industry in Northland and Tairawhiti but innovative solutions are still needed to ensure equitable access and mobility, and to support further economic development.

FUNDING CONSTRAINTS

Land Transport New Zealand have stated there is a $650 million gap[14] between identified funding and expenditure desired over the next four years for road projects alone. One reason for the funding gap is that transport income from fuel excise duty has not kept pace with transport demand. Rising costs of materials and labour also mean projects cost more.

The Next Steps Review of the Land Transport Sector recommended more explicit guidance on the government's funding priorities for land transport over the medium and longer term. A Government Policy Statement (GPS) is expected to provide some of that guidance, with a six-year outlook and a three yearly update process. The review also recommended full hypothecation, meaning that every dollar charged to motorists in fuel excise duties, road user charges and motor vehicle licence fees is reinvested into transport.

CHANGING DEMAND AND SUPPLY PATTERNS

URBANISATION

Cities the world over are struggling to cope with the compounding effects of population growth and associated increases in transport demand. Better integrated transport and land use planning are required to manage this trend.

Today, the Auckland region has 1.3 million people – a third of New Zealand's population. Since 2001 Auckland's population has grown by more than 12 percent, so that in 25 years close to 40 percent of New Zealanders could be living in Auckland, and by 2050 the region could be home to over two million people.

SYSTEM RESILIENCE

New Zealand is vulnerable to a range of natural disasters and extreme weather events and it is predicted that climate change will mean these are more frequent and severe. A common potential consequence is damage to transport infrastructure and disruption of all forms of transport – air, rail, road and sea. There may be risks to the safety of the travelling public and the predictability of journey times may be affected.

CHANGES IN SHIPPING, AVIATION AND RAIL FREIGHT SERVICES

Global shipping is rationalising. International shipping companies are larger and are building bigger ships. The largest ship currently visiting New Zealand carries 4,100 Twenty Foot Equivalent Unit containers (TEUs). Globally, there are at least a hundred ships capable of carrying 8,000 TEUs and the first 12,000 TEU ship is expected by 2010. Bigger ships generally lead to fewer ports of call, and more domestic freight trips to service the emerging hub ports. This creates pressure on ports, port infrastructure, the connecting transport locally and on inter-regional feeder services.

14. Assumes a $750m funding guarantee.

Industries that are able to connect to rail at the point of origin, such as dairy sites and coal mines, find rail cost–effective. Industries whose goods need to be transported by road at the point of origin such as forestry companies frequently prefer road because the extra handling costs mean transferring to rail is not cost–effective.

Rail is also under pressure from super-sizing. Fonterra's refrigerated containers are no longer made in smaller sizes. Once the containers Fonterra has are beyond repair, they may not be able to purchase replacements that will fit through New Zealand's smaller rail tunnels. Tunnel dimensions are similarly a barrier to the newer "high cube" containers travelling by rail south of the Port of Napier.

Technology change has led to a steady reduction in the costs of air transport over recent decades. The new Boeing 787 aircraft will be 20 percent more fuel efficient than the Boeing 767 aircraft it replaces while having significantly greater range. This and other ultra long range aircraft entering service will enable non-stop air services to be established from New Zealand to new destinations around the Pacific Rim. Another change within Australasia is the adoption of the low-cost carrier (LCC) business model. Airports are being expanded to meet the growing demand for air travel. This is particularly so at Auckland Airport where the international and domestic terminals are being extended and construction of a second runway has commenced.

Rising living standards in New Zealand and many parts of the globe, together with the falling cost of air transport in real terms, have seen a steady growth in international tourism. In the five years to June 2007 international arrivals increased by 24 percent to 2.5 million passengers per year, while New Zealand resident departures increased by 50 percent to two million (half of these departures were to Australia). There is, however, concern as to what extent these trends will continue in the face of rising oil prices and the impact of aviation emissions on the environment.

CONGESTION

An efficient freight system is particularly important for New Zealand's small, open economy, distant from world markets. Higher transport costs could reduce the competitiveness of New Zealand exports so we need to ensure those costs don't arise because of inefficiencies (such as excessive travel times owing to congestion).

Even allowing for current planned major investments in the region's transport system – including significant investment in rail – traffic congestion in Auckland is not expected to reduce over the next ten years[15].

This is not what people want. According to the Auckland Regional Council Environmental Awareness Survey 2004/05 traffic congestion is the number one thing respondents dislike about living in Auckland. Ninety-four percent of Aucklanders agree that reducing congestion is important or very important.

Congestion adds to the cost of freight movement. The cost of congestion in Auckland is estimated to be around $750[16] to $900[17] million per annum.

How congestion is dealt with will depend on what is causing it. For example, if all modes are congested for long periods of time capacity may need to be increased. If congestion is more localised for short periods of time or only affects some modes, relative prices and service patterns (eg additional bus services) are more likely to provide a solution.

15. Auckland Transport Strategic Alignment Project, Draft Common View, 2007.
16. Ministry of Transport, Auckland Road Pricing Evaluation Study, 2006.
17. Ernst & Young, 1997.

Photo courtesy of Ports of Auckland Ltd

CLEAN GREEN REPUTATION

In export and tourism markets New Zealand trades on its reputation of being "clean and green".

Clean and green are not absolute measures, and as environmental concerns become mainstream, consumers and tourists may change their attitudes about what they eat and where they travel.

It is in New Zealand's economic interests to actively respond. Establishing a reputation as a global leader in tackling climate change has the potential to offer economic benefits that may far outweigh the associated costs.

TARGETS

PROPOSED HIGH-LEVEL TARGETS TO ASSIST ECONOMIC DEVELOPMENT FOR 2040

Travel times by principal routes within and between major urban areas and key economic nodes (eg main seaports, airports and major industrial areas) to be improved relative to 2007 for identified critical intra and inter-regional connections, as determined with each region.

Travel times by all modes will be predictable.

PROPOSED RELEVANT INTERMEDIATE OR DETAILED TARGETS FOR 2040

Lift coastal shipping's share of inter-regional freight to around 30 percent (currently about 15 percent of tonne-kilometres).

Lift rail's share of domestic freight to around 25 percent (currently about 18 percent of tonne-kilometres).

At least double the overall public transport mode share to seven percent of all passenger trips (currently about two to three percent).

Increase walking and cycling and other "active modes" to 30 percent of total trips in urban areas (currently about 17 percent).

Effective real-time information systems in place to enable road users to plan their journeys to avoid congestion, thereby minimising delay and fuel wastage, by 2015.

GOVERNMENT AGREED SUPPORTING TARGETS

Establish baseline data for the volume of freight moved domestically by different modes by the end of 2009.

Study the costs, including the likelihood of increased damage to roads, and safety factors, and make recommendations on targeted changes to road freight weight and size limits by December 2009.

Conduct a desktop feasibility study into options, including further electrification, for improving the efficiency of the North Island main trunk line and report with recommendations by the end of 2010.

PROPOSED SUPPORTING TARGET

Review Land Transport New Zealand's road programme by mid 2008 to ensure that transport network development is compatible with the UNZTS as part of the GPS development process.

RATIONALE: HIGH-LEVEL TARGETS

- Travel times by principal routes within and between major urban areas and key economic nodes (eg main seaports, airports, major industrial areas) to be improved relative to 2007, for identified critical intra and inter-regional connections as determined with each region.
- Travel times by all modes will be predictable.

An efficient and effective freight transport system is important for the healthy functioning of any economy, as shown by the following extract from the United Kingdom's (UK's) recent discussion document *Towards a Sustainable Transport System: supporting economic growth in a low-carbon world*.

HOW TRANSPORT IMPACTS ON THE ECONOMY – UK PERSPECTIVE[18]

- By increasing business efficiency, through time savings and improved reliability for business travellers, freight and logistics operations.
- By increasing business investment and innovation by supporting economies of scale or new ways of working.
- By supporting clusters and agglomerations of economic activity. Transport improvements can expand labour market catchments, improve job matching, and facilitate business to business interactions. Transport's contribution to such effects is most significant within large, high-productivity urban areas of the UK.
- By improving the efficient functioning of labour markets, increasing labour market flexibility and the accessibility of jobs. Transport can facilitate geographic and employment mobility in response to shifting economic activity, for example in response to the forces of globalisation, new technological opportunities, and rising part-time and female participation in the labour market.
- By increasing competition by opening up access to new markets. Transport improvements can allow businesses to trade over a wider area, increasing competitive pressure and providing consumers with more choice.
- By increasing domestic and international trade by reducing the costs of trading.
- By attracting globally mobile activity to the UK by providing an attractive business environment and good quality of life.

18. From the United Kingdom Department for Transport *Towards a sustainable transport system: supporting economic growth in a low-carbon world*, October 2007.

As a remote exporting country New Zealand depends on cost-effective transport, especially to its ports and airports and from its major producing areas. Higher transportation costs could reduce the competitiveness of New Zealand exports. Trip reliability and travel time are two factors that affect how costly the transport of freight is. They are ways of measuring the performance of, for example, road systems.

A number of factors can affect travel times and trip reliability on transport networks, such as incidents and adverse weather conditions, maintenance of transport infrastructure and congestion.

Trip reliability is used as a proxy for the reliability of the transport networks. It indicates the variability of trip times and captures network wide impacts. By establishing average trip times and variations from average trip times a travel time variability index can be calculated.

Over the last ten years road traffic growth has been between two and four percent per year, though the rate of growth has been declining recently. Ensuring travel times in 2040, in cities and between regions and key economic nodes, are no greater than current levels will be a challenge that will require: integrated land use and transport planning; significant travel demand management measures; considerable increases in public transport usage; walking and cycling; targeted road expansion and some form of road pricing, such as congestion charging.

To further assist in reducing congestion on roads that will still experience an increase in freight usage, "the government will be supporting efforts to give freight users a choice of transport modes and encouraging them to choose the mode – or combination of modes – that are not only in their own commercial best interests but also in the best interests of New Zealand as a sustainable nation".[19]

In Auckland, even allowing for current planned major investments in the region's transport system – including significant investment in rail – traffic congestion is not expected to reduce over the next ten years[20]. To keep travel times in Auckland to today's levels requires the aggregate of all future initiatives to absorb expected growth (population, economic, car ownership[21]). The Auckland Road Pricing study[22] concluded that road pricing would be necessary to curtail congestion growth.

RATIONALE: INTERMEDIATE OR DETAILED TARGETS

LIFT COASTAL SHIPPING'S SHARE OF INTER-REGIONAL FREIGHT TO AROUND 30 PERCENT

The draft domestic sea freight strategy, *Sea Change*, proposes an aspirational target to lift coastal shipping's share of inter-regional freight to around 30 percent by 2040. At twice the estimated contribution of coastal shipping today, this is an ambitious target.

Currently sea freight carries approximately 15 percent[23] of domestic freight (in tonne-kilometres). To achieve this mode share target of 30 percent, domestic sea freight will need to grow proportionately much faster than land transport over the next 35 years. The higher proportion of freight to be carried by coastal shipping reflects an expectation of greater concentration of international shipping at fewer ports. Freight is projected to double by 2020. If the consequential load on road and rail is not to be overwhelming then a higher proportion of the larger load needs to be carried by sea. It is likely that the proportion of inter-regional, longer distance trips will increase over the next 30 years and short trips decrease as spoke and hub shipping is adopted.

The coastal shipping target is focused on inter-regional freight. Intra-regional freight will still be carried primarily on road and this will be significant. For example, in Auckland total inter-regional freight was estimated to be around 1.3 billion tonne-kilometres in 2002, while intra-regional freight was estimated to be around two billion tonne-kilometres.[24]

19. From the draft domestic sea freight strategy *Sea Change: Transforming coastal shipping in New Zealand*, October 2007.
20. Auckland Transport Strategic Alignment Project, Draft Common View, 2007.
21. While increasing car ownership doesn't correlate proportionately with increasing vehicle kilometres travelled, there is a positive relationship between the two and it is believed car ownership saturation has not yet been reached.
22. Ministry of Transport, Tackling Congestion in Auckland: Auckland road pricing evaluation study, March 2006.
23. Booze Allen Hamilton (NZ) Ltd, Development of a New Zealand national freight matrix, Land Transport New Zealand Research Report 283, 2005.
24. Auckland Regional Freight Strategy, Auckland Regional Council, 2006.

EFFECTIVE REAL-TIME INFORMATION SYSTEMS IN PLACE TO ENABLE ROAD USERS TO PLAN THEIR JOURNEYS TO AVOID CONGESTION, MINIMISING DELAY AND FUEL WASTAGE

The efficient and reliable movement of people and freight around New Zealand and to our ports and airports is vital for New Zealand's economic development. While some traffic may be appropriately moved on to other modes, high proportions will still need to be carried by road. New Zealand must have an efficient roading network to support its various industries, including tourism.

Auckland and other major centres' traffic congestion affects quality of life and imposes a burden on businesses and residents alike through delays, unreliable journey times and the opportunity cost of time spent sitting in traffic jams.[25] Considerable expenditure on motorway construction and public transport is underway but this is unlikely to be sufficient to address congestion throughout the metropolitan regions. Effective real-time information systems will help road users to plan their journeys to avoid congestion, minimising delay and fuel wastage.

LIFT RAIL'S SHARE OF DOMESTIC FREIGHT TO AROUND 25 PERCENT

The ambitious increase in coastal shipping's freight share should not be at the expense of rail's freight share. In conjunction with the increase in inter-regional freight our target for rail freight is to increase the share of total domestic freight tonne-kilometres carried by rail to 25 percent by 2040. It also means that rail will need to grow faster than road freight in transporting heavy goods. Currently rail's mode share is estimated to be around 18 percent. It is believed that rail is currently making good use of its capacity, with only three to seven percent of current road freight contestable by rail[26].

The global trend to date has been for the rail share of freight transportation in smaller countries to decrease. In Europe, the share of goods carried by rail fell from 21.1 percent to 8.4 percent (in tonne-kilometres) between 1970 and 1988 but has since grown to around ten percent.

A seven percentage point increase in New Zealand's rail freight share is ambitious. The cost of fossil fuel will increase over the next few decades, however the use of rail and sea services will allow transport of goods at an increasingly lower energy cost. Improved rail infrastructure, improved rolling stock and innovative services will be needed to

25. Auckland Road Pricing Evaluation Study, March 2006.
26. The Contestability of New Zealand's Road Freight Task by Rail, TERNZ, May 2006.

provide 'end to end solutions'. One example is provided by rail freight company CN in Canada ("single provider ease and simplicity, door to door")[27] for freight travelling between North America to Asia. If the interchange mechanisms are effective in our towns and ports, freight forwarders should find it attractive to use quality rail and coastal shipping services.

To better understand how freight moves around New Zealand and be able to measure progress against our targets, the government will establish a baseline date for the volume of freight moved domestically by different modes by 2009.

Even with the increased rail and coastal shipping freight mode shares the absolute road task for freight will still increase in many locations because of freight growth projections. Coastal shipping is focused on inter-regional freight and while rail may increase its share of intra-regional freight, a great deal of freight will still need to be carried on road.

AT LEAST DOUBLE THE OVERALL PUBLIC TRANSPORT MODE SHARE TO SEVEN PERCENT OF ALL PASSENGER TRIPS

INCREASE WALKING AND CYCLING AND OTHER "ACTIVE MODES" TO 30 PERCENT OF TOTAL TRIPS IN URBAN AREAS (CURRENTLY ABOUT 17 PERCENT)

These two intermediate targets recognise that in order to achieve the necessary efficiency of movement, for economic and sustainability reasons, all modes must play their part. Moving more people onto buses and trains or walking and cycling may free up capacity for essential freight and other business trips.

These targets are suggested as the maximum realistic changes that can be achieved in New Zealand given its existing spatial patterns. To achieve such levels will require associated measures, such as stronger land-use planning controls and economic measures as well as major investment.

In many successful cities higher levels of public transport patronage are evident. Particular examples include Ottawa and Vancouver, which have twice the level of patronage as Auckland. Growth in public transport patronage in Auckland could be seen as an indicator of Auckland's success as a competitive global city.

While public transport will continue to have a relatively small share of total passenger movements across the country as a whole, demand for public transport can be expected to grow strongly in urban areas at busy times of the day. Public transport is particularly effective in moving large numbers of passengers at peak times on busy urban corridors, where urban road networks are unable to accommodate the growth in private car travel needed to handle peak movements on these corridors.

The seven percent target represents an increase in public transport boardings in Auckland, Wellington, and Christchurch to levels approaching those already being achieved in the leading North American and comparable Australian cities.

While public transport use and walking and cycling are expected to increase significantly over the next thirty years or so, many people will still require the use of motor vehicles to get to where they need to go.

The public transport and walking and cycling targets are discussed more fully in the access and mobility and public health sections.

DISCUSSION POINTS

- Are our high-level targets appropriate – are there other approaches we could take?
- Are additional targets needed?
- Are our targets achievable given the necessary investment and behaviour change needed to reach them?
- How can we best achieve the substantial increases in mode share suggested for domestic sea freight and rail freight?

27. http://www.cnworldwide.com

2. Assisting safety and personal security

The outcome for New Zealand is an increasingly safe and secure transport system across all modes. There are lower social costs and fewer injuries and lives lost due to transport-related incidents. We are not worried about using the transport system for fear of death and injury, or vulnerability to harassment, attack or loss of possessions.

Transport related incidents are one of the leading causes of accidental loss of life in New Zealand, and are a leading cause of death for children aged one to 14.

On the roads, the numbers have come down. In 1973 our road toll was at its highest at 843 deaths. In 1990 the road toll was 729 deaths and this has steadily reduced over the years so that last year the road toll was 391 – the lowest in 46 years. Since 1990 the number of deaths per 100,000 people has reduced from 21.4 to 9.4.[28] Three broad strategies have contributed to the results to date:

- vehicle and road engineering
- road safety education
- the enforcement of road safety rules.

ENGINEERING

There is potential for safer vehicles in New Zealand. The technology exists to vastly improve both the ability for vehicles to avoid a crash (for example, electronic stability control) and to protect occupants in a crash (such as airbags and crumple zones). Unfortunately most New Zealanders drive older cars without these safety benefits. The average age of the light vehicle fleet is 12 years and this average is rising slowly over time.

The knowledge and technology also exists to make New Zealand's roads safer. For example, by improving road signs and markings, improving skid resistance, removing road hazards, widening road shoulders and installing barriers. The issue is how much funding to invest in improving road safety given all the other demands on funding.

EDUCATION

Overseas experience tells us that to achieve long-term gains in safety, the safety culture needs to change. Safe driving must become a social norm. For example, in New Zealand it is the social norm to put a seat belt on when you drive, but it is not yet the social norm to drive within the speed limit. Some behaviour – such as driving when fatigued – is difficult to prevent through enforcement. More focus on developing a safety culture in New Zealand would lead to safer road users in the future.

ENFORCEMENT

Continued enforcement of regulations such as seat belts, and speed and alcohol limits will be required.

REACHING 2010 SAFETY TARGETS

The NZTS called for New Zealand safety standards to be positively related to international standards. At 1.3 deaths per 10,000 vehicles, New Zealand's road toll is still behind the world's best. Japan and the UK are at one death per 10,000 vehicles and Switzerland's rate is 0.8[29]. The social cost of motor injury crashes is still $3.6 billion per annum.

There is some concern that on current progress the target of 300 deaths annually by 2010 will be challenging to reach. The target of 2200 serious injuries annually by 2010 is also unlikely to be reached.

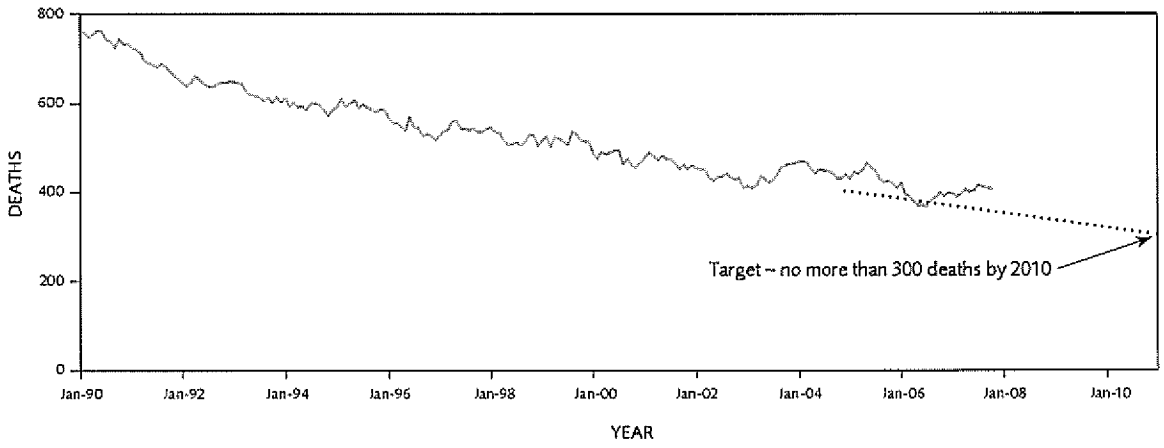
Despite the decline in death and serious injuries from road crashes over recent decades, the rate of that decline may be diminishing.

The following graph shows the trend in road deaths.

28. Ministry of Transport, Crash Analysis System, 2007.
29. Ministry of Transport, *Motor Vehicle Crashes in New Zealand 2006*. Figures quoted are for 2005.

ENGINEERING
EDUCATION
ENFORCEMENT

ROAD DEATHS



Each point shows the number of deaths in the preceding 12 months.

SAFETY FOR OTHER MODES

Although the number of deaths in the maritime and aviation sectors is low compared to road, there is still scope for improvement and work is being undertaken to enhance the safety of these modes. A number of airports, including Wellington International Airport, are developing runway safety areas to provide an extra margin of safety for overrunning (arriving or departing) or undershooting (arriving) aircraft.

A cross-modal approach to safety is also needed to promote a common understanding of safety principles and targets, to encourage multi-modal approaches to common safety problems, ensure effective practices are shared and a cross-modal safety culture is fostered.

Work underway includes the development of a cross-modal approach to the prevention of drug and alcohol use in the maritime, aviation and rail industries.

The current definition of road deaths includes only crashes involving a motor vehicle, ie at least one motor vehicle must be involved. In future, and given our targets for increased walking and cycling, we may also need to consider death and injury targets for crashes involving only cyclists, and cyclists and pedestrians.

TARGETS

PROPOSED HIGH-LEVEL TARGET TO ASSIST SAFETY FOR 2040

Operate to world best-practice safety standards for all modes of transport.

PROPOSED RELEVANT INTERMEDIATE OR DETAILED TARGETS[30] FOR 2040

Road deaths no more than 200 per annum[31].

Over 40 percent of the light vehicle fleet to have four star or better[32] occupant protection (currently ten to 15 percent) by 2015 and 90 percent by 2040[33].

Over 25 percent of light vehicles to have electronic stability control (currently less than five percent) by 2015 and 95 percent by 2040.

30. Note that there may be measurement issues with the latter two targets.
31. The category of "road deaths" includes cyclists and pedestrians that die as a result of a crash involving a motor vehicle on a public road.
32. Out of a maximum occupant protection score of five stars based on two tests: an offset frontal test and a side impact test. Research shows a strong correlation between the tests and injuries suffered by vehicle occupants in serious on-road crashes.
33. Achieving this and the following target is going to depend heavily on the speed of turnover in New Zealand's vehicle fleet. A vehicle fleet strategy discussion paper is currently being prepared.

PROPOSED SUPPORTING TARGETS

Targets around serious injuries and social costs resulting from road crashes and for subsets of road traffic, such as targets for various road user groups and freight safety will be developed by mid 2009.

The Road Safety 2020 Strategy will be in place by 2010.

Targets for rail will focus on safety at level crossings and the level of trespassing on the rail network. This will also be developed by mid 2009.

Social cost targets for aviation safety to 2010 have been agreed and are regularly reported against. Each type of aircraft[34] has its own target level expressed as social cost per seat hour of passenger exposure (see Appendix C). Targets to 2015 are expected to be developed by late 2009.

Targets for maritime safety to 2010 have been developed by Maritime New Zealand and look to reduce the number of fatalities, accidents and injuries per year for a range of vessels and for workplace activity (see Appendix C).

A vehicle fleet strategy discussion paper on the New Zealand vehicle fleet will be developed by the end of 2007 and a New Zealand vehicle fleet strategy by early 2008.

RATIONALE: HIGH-LEVEL TARGET

All forms of transport expose people to safety and security risks. In all modes, we will link safety and security systems as closely as practicable to the growing body of international regulation, standards and guidelines.

RATIONALE: INTERMEDIATE OR DETAILED TARGETS

New Zealand has already made significant strides in road safety. In 1999-2000, when setting New Zealand's road safety targets to 2010, the government used as a reference point those countries which, in the late 1990s, had the best road safety records in the world. Using this approach we proposed a target of no more than 300 road deaths or 5.6 road deaths per 100,000 people. These targets were ambitious, representing a reduction in road deaths of around 35 percent over the ten years between 2000 and 2010.

The proposed target of no more than 200 road deaths per annum by 2040 includes deaths resulting from crashes involving a motor vehicle and cyclists and pedestrians on public roads. This target requires a further significant reduction in road deaths and would necessitate a range of interventions across the three key road safety areas of engineering, education and enforcement. For example ensuring more vehicles have electronic stability control and airbags, improving the safety of roads by widening road shoulders and providing safe crossing points for pedestrians, educating the public and promoting a safety culture, and continuing to enforce regulations such as the wearing of seat belts and alcohol limits.

34. These targets groups cover public air transport aircraft and other commercial operations e.g. large, medium and small aeroplanes, helicopters, sport transport, commercial operations, agricultural operations and private operations.

Further steady improvements can occur in:

- road infrastructure
- education and driver behaviour
- vehicle technologies.

If these improvements are coupled with continuing enforcement programmes then a further reduction in the road toll is achievable. Furthermore, a figure of 200 deaths per year at 2040 will equate to around 4.5 deaths per 100,000 people. A limited number of countries are already achieving similar results, such as the Netherlands (4.6 deaths per 100,000) and Sweden (4.9 deaths per 100,000).

The development of international best-practice safety standards for air, sea and rail should also be maintained.

SECURITY AND PERSONAL SAFETY

Personal security is difficult to develop targets for, and to measure. A number of regions, such as Greater Wellington[35], carry out surveys assessing perceptions of safety. Statistics New Zealand is investigating the inclusion of questions about perceptions of safety in their annual social survey. These will focus on walking alone and public transport. The release of the first report is scheduled for October 2009. This type of information could be used to develop targets in future.

DISCUSSION POINTS

Is our high-level target appropriate – are there other approaches we could take?

Are additional targets needed, for example, around security or perceptions of safety?

Are our targets achievable given the necessary investment and behaviour change needed to reach them?

Should we, for example, develop initiatives to ensure turnover in our vehicle fleet is higher, to allow faster adoption of new safety technology?

35. In Greater Wellington 70% of respondents felt people were safe while walking in the region (2003 survey). Adults felt less safe about their children unsupervised. 40% would not let their children (under 12) walk to school unsupervised. This further emphasises the need for increased uptake of the safe routes to school and walking school bus programmes. Regional Pedestrian Strategy, 2004.

3. Improving access and mobility

The outcome for New Zealand is improved, reliable access to the facilities and activities that enable us to be part of our society and economy. We can access them with ease and confidence by a mode appropriate to our needs. We are able to reach people and places across the country and overseas.

Technology and innovation help us to meet our access needs. They are part of a transport system that provides equitable access for us all, including people with mobility impairment and those on lower incomes.

HIGH DEPENDENCE ON ROAD

New Zealand's transport system is highly dependent on roads. New Zealand has one of the highest rates of vehicle ownership in the OECD and 67 percent of New Zealand's domestic freight (on a tonne-kilometre basis) is moved by road[36]. The predominant users of roads, accounting for 78 percent of road traffic, are people in cars. The most common reason people are driving is to travel to work (20 percent of all household travel) and 90 percent of people travelling to work in cars are single occupants. This preference for using the road transport system is understandable: the road is a highly flexible mode of travel and a large proportion of New Zealanders do not have ready access to good public transport options, or may not perceive the road system as walk or cycle friendly. The transport network grows in response to demand creating greater dependence on road transport.

PUBLIC TRANSPORT PATRONAGE

On a per capita basis, patronage of public transport in the Auckland region has dropped by almost 50 percent, and by more than seven percent on an absolute basis, since the early 1980s. This trend has only started to change recently.

In contrast, comparable cities have increased their patronage per capita levels over the period or experienced only small declines. The following table shows the annual total public transport patronage and the percentage change in total patronage between 1981 and 2005.

36. Booz Allen Hamilton, Development of a New Zealand Freight Matrix: Land Transport New Zealand Research Project 283, 2005.

PUBLIC TRANSPORT PATRONAGE 1981-2005[37]

CITY	TOTAL ANNUAL PATRONAGE (M), 2005	PERCENTAGE (%) CHANGE IN TOTAL ANNUAL PATRONAGE SINCE 1981	ANNUAL PATRONAGE PER CAPITA, 2005	PERCENTAGE (%) CHANGE IN ANNUAL PATRONAGE PER CAPITA SINCE 1981
Auckland	51	– 7.3%	40	– 48.1%
Perth	95	48.4%	65	– 7.1%
Calgary	120	71.4%[38]	125	6.8%
Ottawa	129	27.7% (since 1995)	169	19.0% (since 1995)
Vancouver	276	24.9% (since 1996)	128	10.3% (since 1996)
Portland (from 1987)	96	100.0% (since 1987)	62	40.9% (since 1987)
Greater Brisbane	131	27.2% (since 1999)	51	10.9% (since 1999)

As this table shows, a number of economically successful cities (of comparable scale to Auckland) have high or dramatically increased public transport patronage. A small reduction in per capita public transport patronage has been seen in Perth, reflecting the fact that rapid population growth has outpaced the increase in passenger numbers there. In other cities, increases in patronage were the result partly of population growth but also because of major improvements in their respective rapid transit systems, as well as user-friendly ticketing systems.

ACCESSIBILITY

Accessibility can be provided by a range of transport modes, including public transport and walking and cycling, as well as other measures to support it, such as land use planning. Some sectors of our society, such as disabled people, the elderly, people on low incomes, people in isolated rural communities, and young people, face particular accessibility issues.

A recent report by the Human Rights Commission[39] found that significant numbers of disabled people in New Zealand have acute and on-going difficulties with using public land transport services: buses, trains, taxis and related services. This is despite the considerable progress that has been made in improving the accessibility of the public land transport system.

The report points out that an ageing population means the need for accessible public land transport services will increase. Accessible public transport encompasses all aspects of accessibility for transport services, from information, to service routes, frequency of services, driver behaviour, and getting to service routes as well as on and off vehicles.

Poor accessibility reinforces social exclusion. Opportunities to improve transport systems that improve access need to be explored.

37. Ministry of Transport, Auckland patronage growth targets – comparative analysis, October 2006.
38. It should be noted that in many Canadian cities, while public transport patronage is high, active mode shares are generally low because of cold temperatures. Car mode share may therefore remain relatively high.
39. Human Rights Commission, "The Accessible Journey: Report of the Inquiry into Accessible Public Land Transport, October 2005.

RURAL TRANSPORT

Many regions have large rural areas that are characterised by heavy reliance on private vehicles (with few or no alternative transport options), more expensive and increasing travel and fuel costs, and populations with higher proportions of low income households.

Low income households are finding the cost of transport difficult to afford, yet with limited alternative transport options they have to absorb these costs or restrict access to their activities. Work and Income benefit statistics show that (after taking Auckland out of the picture because of its size) Northland has the highest number of applications for advance payments of benefit for transport-related reasons (predominately health travel), the highest number of applications for car repairs, and the second highest number of applications for stranded travel (the East Coast has more). Northland also has the poorest Social Report indicator road casualty death rates and is in the lowest quartile for road casualty injury rates.

Any increases in transport costs will have a disproportionate negative impact on regions such as Northland, where alternatives to private vehicle travel are not readily available.

TARGETS

PROPOSED HIGH-LEVEL TARGETS TO IMPROVE ACCESS AND MOBILITY FOR 2040

All individuals have access to the facilities and activities they need, such as work, education, medical care and shopping centres, to participate in society.

Travel times by all modes will be predictable.

Travel times by principal routes within and between major urban areas and other key activities (such as tourist attractions, hospitals and airports) to be improved relative to 2007 for identified critical intra and inter-regional connections as determined with each region.

PROPOSED RELEVANT INTERMEDIATE OR DETAILED TARGETS FOR 2040

At least double the overall public transport mode share to seven percent of all passenger trips (currently about two to three percent).

Increase the public transport mode share of peak hour travel (journeys to work) in Auckland, Wellington and Christchurch from an average of nine percent to 20 percent and work with each region to optimise peak hour travel targets.

Increase walking and cycling and other "active modes" to 30 percent of total trips in urban areas (currently about 17 percent).

PROPOSED SUPPORTING TARGETS

Review regional passenger transport mode share targets by 2012 through scheduled reviews of regional land transport strategies, and subsequent regional passenger transport plans.

Implement the initiatives outlined in the walking and cycling strategy's (*Getting there – on foot, by cycle*) implementation plan to a level that begins to achieve a shift to these modes by 2015.

Investigate the need to revise funding procedures for walking and cycling projects to ensure all costs and benefits of such projects are accounted for in their assessment by 2009.

Provide advice on urban design (government will decide on the desirability of providing national guidance on urban design, as outlined in the NZEECS).

The Accessible Journey report contains recommendations on how to improve public transport accessibility and includes National Accessibility Design Performance Standards. These will be implemented progressively by 2025 to support our increased public transport patronage target.

RATIONALE: HIGH-LEVEL TARGET

Transport provides people with access to facilities and activities, linking communities and ensuring people can participate in a modern, globally integrated lifestyle. People and goods move because we need food, clothing, homes to live in, and because we need to earn a living. We have businesses. We have family and community commitments, our children need to get to school and we have more – and more diverse – leisure and recreational pursuits. Our transport system needs to provide equitable access for all, including those with mobility impairment, those on lower incomes and those without access to private motor vehicles.

Our target is that all individuals have access to the facilities and activities they need to participate in society. This is difficult to measure. One option for measuring progress against this target is through a travel survey.

In the UK access to services is measured using indicators based on total journey time (walking, cycling, and public transport) to a set of key destinations (schools, further education colleges, doctors, hospitals, jobs and major shopping centres). They note that journey time is not the only determinant of accessibility; cost is a significant factor as well as crime and fear of crime, physical access, and availability of travel information. To address the complexity of measuring levels of access and mobility, local authorities in the UK are encouraged to develop locally appropriate accessibility indicators based on locally available data.

The UK's key national access and mobility target is improving accessibility, punctuality and reliability of local public transport (bus and light rail) with an increase in use of more than 12 percent from 2000 levels by 2010. While it is an important part of access and mobility, and more easily measured, it doesn't address all aspects of access and mobility.

It should be noted that inadequate funding for infrastructural improvements and public transport services may be a barrier to providing good access and mobility in rural regions such as Northland. Ensuring all individuals have access to the facilities and activities they need may therefore require some innovative thinking, and initiatives across government, with local government, business and the community.

Our second high-level target is that travel time will be predictable. Predictability means that transport is reliable and punctual – departing and arriving when expected. In the UK, passenger train performance is measured against the daily timetable. Long distance trains count as arriving on time if they arrive within ten minutes of their scheduled time; all other trains if they arrive within five minutes. Similar measures could be developed for other modes of transport in New Zealand.

The third proposed high-level target is that travel times by principal routes within and between major urban areas and other key activities, such as tourist attractions, hospitals and airports, need to be improved relative to 2007 for identified critical intra and inter-regional connections as determined with each region. This target differs from the previous one in that a journey may have a predictable departure and arrival time but the journey length may increase over time because of increasing congestion. Maintaining travel times on roads, particularly in Auckland, will require road pricing initiatives such as congestion charging in the face of increasing demand and population growth. Measurements should focus on connections that are or are perceived to be experiencing increasing travel times. Average on road travel times and travel time variability indexes are available for Auckland, Tauranga, Christchurch and Wellington. The measures in these four centres could provide the initial version of the road-based mode indicator for this target.

RATIONALE: INTERMEDIATE OR DETAILED TARGETS

Our more detailed proposed targets focus on public transport, walking and cycling.

Increases in public transport use will help to reduce congestion in our major cities and towns, especially at peak periods for Auckland, Wellington and Christchurch. The percentage increases in public transport use in these three centres will need to be substantial over the next 30 years. This increase will rely on a major investment in improved services in all cities, especially focussing on rapid transit services. An overall increase in public transport services will also improve access for those who don't or can't drive a car and will help to tackle the climate change challenge.

The target of doubling the public transport share is possible over the next 30 years. If we take an even longer-term view, urban consolidation, and development of housing and work opportunities around transport modes will further increase public transport usage. However, this sort of urban change does not occur quickly.

When considering public transport use it is important to be clear about the measure being used. Wellington is noted in New Zealand as having a relatively high level of public transport use. But in reality that is for trips to work in the CBD during the peak weekday periods. Even for Wellington the proportion of all trips that are made by public transport is around four to five percent. For New Zealand as a whole the proportion is only two to three percent. Currently an average of 26 public transport trips per person per year are taken. Around 93 percent of these trips are in the Auckland, Wellington and Canterbury regions, predominantly in the urban centres. A doubling of that proportion of trips will be challenging and expensive.

Patronage in Auckland and Christchurch will need to grow faster between 2016 and 2040, than is planned to 2016. Significant growth will also need to take place outside these three regions.

In 2001 the "journey to work" passenger transport mode shares for Auckland, Wellington and Christchurch were seven percent, 17 percent and four percent respectively. This equates to a mode share of nine percent for all three centres (ie in 2001 nine percent of journeys to work in the three centres were by public transport). Our second intermediate target is to increase this mode share to 20 percent noting this target should be optimised as appropriate for each region. This will be particularly difficult for Auckland and Christchurch and will be a challenge for the Wellington region.

Good progress has already been made by a number of local authorities in improving public transport and targets set in promoting alternative modes of transport.

These targets include:

- Auckland Regional Transport Authority aims to increase public transport patronage to 60 boardings per person per year by 2016.
- Greater Wellington Regional Council has set a target to increase public transport use for journeys to work to 21 percent by 2016.
- Environment Canterbury has set a target for the proportion of all trips (excluding walking) in Christchurch being made by public transport to rise to six percent by 2011.
- Otago Regional Council plans that 4.5 percent of all trips in the region will be made by public transport by 2014.

Neither of the two intermediate public transport targets address rural services. The UK has a target to achieve a one-third increase in the proportion of households in rural areas within about ten minutes walk of an hourly or better bus service by 2010. To establish a similar target in New Zealand would require more investigation into current accessibility to public transport services in rural areas and may be more appropriately set at the regional level.

The target for walking and cycling is discussed under public health.

DISCUSSION POINTS

- Are our high-level targets appropriate – are there other approaches we could take?
- Are additional targets needed, for example, one around urban design?
- Are our targets achievable given the necessary investment and behaviour change needed to reach them?
- Are we satisfied with 2007 travel times as the baseline to aim for in the future?
- How will our aim of reducing travel time on all modes (including road) affect our aim of increasing public transport?
- Are our intermediate public transport targets appropriate and achievable?
- Should we develop a target for public transport in rural areas?

4. Protecting and promoting public health

The outcome for New Zealand is a nation whose transport habits are low contributors to negative impacts and contribute positively to the health of all. Walking, cycling and other active modes are widely used for short trips.

New Zealand has high air and water quality with few contaminants from transport pollutants and by-products. Transport-related noise is not detrimental to the health of individuals and communities, and the effects of harmful emissions from vehicles are at levels that do not damage health.

The transport workforce is protected from occupational diseases.

HARMFUL EMISSIONS AND NOISE

A less visible public health impact of New Zealand's transport system is the premature death and sickness caused by harmful vehicle emissions. Concerns about emissions and noise remain the most commonly raised in public objections to new New Zealand transport infrastructure initiatives.

Technological improvements are also making vehicles quieter. For example, the International Air Transport Association says aircraft noise pollution will be cut by 75 percent over the next 30 years and aircraft entering today's fleets are already 20 decibels quieter than comparable aircraft 40 years ago.

Other ways to reduce emissions and noise include looking at how we plan: better integrating land use and transport planning to reduce the need for travel, managing transport demand and encouraging alternative modes such as rail, public transport and coastal shipping.

WALKING AND CYCLING – THE "ACTIVE MODES"

The amount of time spent walking and cycling by children aged five to 14 has decreased from an average of two hours ten minutes per week in 1989/90[40], to less than one hour 20 minutes in 2003-06[41]. The rest of the population is also affected by low use of these active modes. According to the 2002/03 New Zealand Health Survey one in three adults is overweight and as many as 3000 deaths a year may be the result of low physical activity levels. While walking and cycling for leisure are growing in popularity, the fitness gains are marginal because of the decrease in walking and cycling for day-to-day transport.

TARGETS

PROPOSED HIGH-LEVEL TARGET FOR PROMOTING AND PROTECTING PUBLIC HEALTH FOR 2040

Public health effects of transport to be at accepted international standards.

PROPOSED RELEVANT INTERMEDIATE OR DETAILED TARGETS FOR 2040

Ensure a substantial reduction in premature deaths and serious illnesses arising from air pollution from motor vehicles.

Manage noise to minimise any public health effects.

35 percent of the vehicle fleet to have emissions technology consistent with Euro 4[42] (or equivalent) standard by 2015.

Imported used petrol, LPG, CNG and diesel vehicles (light and heavy) are to be of Euro 4 (or equivalent) standard by 2012.

Imported new petrol, LPG, CNG and diesel vehicles (light and heavy) are to be of Euro 4 (or equivalent) standard by 2009.

Increase walking and cycling and other "active modes" to 30 percent of total trips in urban areas (currently about 17 percent).

40. Ministry of Transport, New Zealand Household Travel Survey, 1989/90.
41. Ministry of Transport, Ongoing New Zealand Household Travel Survey (2003-06 results).
42. Euro 4 is a European emission standard which defines the acceptable limits for exhaust emissions of new vehicles sold in European Union member states. Higher numbers indicate more stringent standards.

PROPOSED SUPPORTING TARGETS

Investigate the need to revise funding procedures for walking and cycling projects to ensure all costs and benefits of such projects are accounted for in their assessment by 2009.

The National Environmental Standard on Air Quality includes ambient air quality standards that must be met by regional councils by 2013. These standards cover carbon monoxide, nitrous oxide, ozone, particulates and sulphur dioxide. To help councils meet these standards further targets are being proposed within the vehicle fleet strategy discussion paper.

RATIONALE: HIGH-LEVEL TARGETS

Cross sector and government efforts will be needed to manage and minimise transport's negative impacts on human health as well as the environment. Premature death and sickness caused by harmful vehicle emissions needs to be addressed as well as the effects of transport noise and the health impacts of stormwater run off.

New Zealand's environmental and health standards relating to the negative impacts of transport need to be comparable to best practice international standards in these areas.

RATIONALE: INTERMEDIATE OR DETAILED TARGETS

WALKING AND CYCLING

Public health can be improved by the increased use of active modes. The share of travel accounted for by walking and cycling has decreased over the last 19 years. These modes accounted for 19 percent of travel time (25 percent of trip legs) in 1989/90, 17 percent of travel time (21 percent of trip legs) in 1997/98 and 14 percent of travel time (17 percent of trip legs) in 2003-06.

An increase in the percentage of walking and cycling trips to 30 percent of total trips per year will be a substantial shift in the trend. The government has already supported initiatives such as walking school buses and increased investment in walking and cycling facilities. Achieving this target will require continued implementation of the walking and cycling strategy – *Getting there – on foot, by cycle*.

TRAFFIC NOISE

Concern about noise remains one of the most common public objections to new New Zealand transport infrastructure initiatives.

A New Zealand standard for "airport noise management and land use planning" already exists. A New Zealand standard to establish upper noise limits for new and substantially altered State highways and local roads is currently under development to be completed by the end of 2008.

A proposed Noise Rule amendment is aimed at ensuring noise levels at the exhaust tail-pipe for stationary vehicles with engine speeds of 4000 rpm are around 90-95 decibels for cars (depending on registration dates), 91 decibels for mopeds, and 96-100 decibels for motorbikes (depending on engine size) and is expected to be implemented by mid 2008.

The development of a framework for the management of land transport noise is also underway. The framework may include targets that could set maximum levels of noise for a range of environments, based on considerations of community health and wellbeing, or set the maximum percentage of the population exposed to a range of high noise levels.

Noise, including port and airport noise, also needs to be taken into account when planning use of nearby land.

HARMFUL EMISSIONS

A recently completed four-year study[43] estimates that air pollution from motor vehicles contributes to the premature death of 500 people per year[44] and that a further 809 people are suffering serious illnesses.

The government has recently proposed more stringent road vehicle emission regulations that update existing minimum standards for new vehicles entering the vehicle fleet, require minimum emission standards for used vehicles imported into New Zealand and a test of the emissions of those used vehicles.

DISCUSSION POINTS

- Are our high-level targets appropriate – are there other approaches we could take?
- Are additional targets needed?
- Are our targets achievable given the necessary investment and behaviour change needed to reach them?
- Is our intermediate walking and cycling target appropriate and achievable?
- How can we best achieve the substantial increase in mode share suggested for walking and cycling?
- Should we develop initiatives to ensure turnover in our vehicle fleet is higher, to allow improved exhaust emission technology, for example, to be adopted more quickly?

43. G Fisher et al, Health and Air Pollution in New Zealand, June 2007.
44. This result should not be interpreted too dramatically, although it certainly indicates a situation to be avoided by reducing air pollution. The concept of premature mortality means that some of these people may be dying a matter of days or weeks earlier than they would have otherwise. But it also means that they may be dying months or years earlier, resulting in high economic and social costs.

5. Ensuring environmental sustainability

The outcome for New Zealand is a transport system that places manageable pressure on the environment, including reduced greenhouse gas emissions and their associated negative impacts.

Non-renewable resources are used at or below the rate of development of renewable substitutes. Renewable resources are consumed at or below their rates of generation. Resources are used more efficiently across the transport lifecycle. Transport-related waste has been minimised and waste recovery from the transport sector has improved.

Land and marine areas used for transport purposes do not fragment or remove vital habitats and areas valued by the community. The transport system allows biodiversity to be maintained.

DEPENDENCE ON FOSSIL FUELS

About 86 percent of New Zealand's oil consumption is used within the transport sector.

The International Energy Agency (IEA) expects global demand for oil to grow by 41 percent by 2030[45] and says world oil markets may come under increased pressure due to potential supply constraints within the next five years. In any event, these consumption patterns mean that within a decade the capacity to increase oil production will be concentrated to just a few countries.

Opinions differ about when oil will become truly scarce and increasingly expensive – some say supply will start to peak within a decade – others put it further out. Factors such as new oil reserves and improvements in extraction technology may alter predictions, but there is no question that oil and gas prices – and stability of supply – are and will become major issues.

Initiatives to increase the proportion of transport fuels from renewable sources, in the form of biofuels and renewable electricity, will help reduce New Zealand's reliance on imported fossil fuels. This will increase the resilience of our transport system and economy to sudden disruptions in oil supply, as well as longer-term concerns about global oil supplies and price uncertainty[46]. The NZES does note that feedback on the draft NZES transport proposals generally supported investment in public transport, but suggested caution around rapidly increasing levels of biofuels.

As outlined in the NZEECS:

> "In acknowledging New Zealand's distance from many key source markets, the sector needs to ensure that New Zealand is serviced by more fuel-efficient aircraft. Air New Zealand is already investing to ensure that it will have one of the world's most fuel-efficient international fleets from 2010. It has also announced plans to test biofuel in one of its aircraft. Steps are also being taken to improve flight plans and routes to reduce fuel consumption. Encouraging the uptake of similar measures by other airlines is an ongoing challenge. Increasing fuel costs and policies to address greenhouse gas emissions will help to drive this [noting that the ETS will only apply to domestic aviation].
>
> New Zealand can also offer real opportunities for tourists to reduce their energy use and emissions once they arrive here. Energy use in the tourism sector is dominated by transport and accommodation activities. Significant scope exists for increasing the uptake of biodiesel for bus travel in line with the ability of fuel providers to supply it, to move to long-distance passenger rail and to accelerate the uptake of more efficient buses."

Mode shift can also provide significant potential for energy savings, not only by moving freight onto coastal shipping or rail, but also by encouraging people to share their cars, use public transport, and take opportunities to walk and cycle instead of driving.

45. IEA World Energy Outlook 2006.
46. New Zealand Energy Strategy, October 2007.

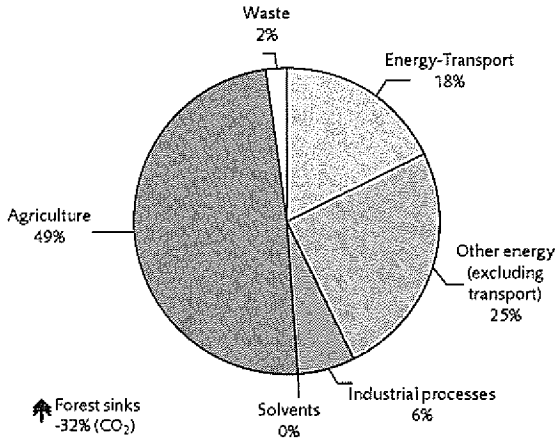
GREENHOUSE GAS EMISSIONS

Burning fossil fuels to power our vehicles is a significant source of greenhouse gas emissions.

The NZES projects that if New Zealand does not change its energy policies, between now and 2030 New Zealand's energy-related greenhouse gas emissions will increase by 40 percent.[47] Transport-related emissions, which currently account for 18 percent of New Zealand's greenhouse gas emissions (agriculture accounts for 50 percent), are projected to rise by 40 percent.

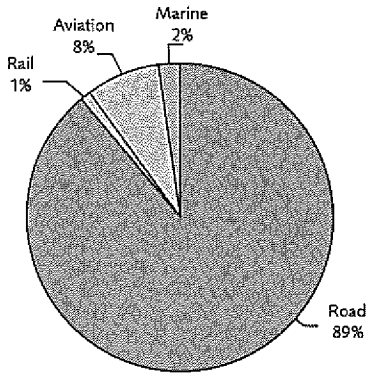
The following graph shows the gross CO_2 emissions by sector in 2005.[48]

NEW ZEALAND DOMESTIC GREENHOUSE GAS EMISSIONS – 2005 BY SECTOR



As the following graph shows, 89 percent of transport's CO_2 emissions are from road transport.[49]

CO_2 EMISSIONS (KT) BY TRANSPORT MODE, 2006



47. Ministry of Economic Development, New Zealand Energy Strategy, 2006.
48. Ministry for the Environment.
49. Ministry of Economic Development, New Zealand Energy Greenhouse Gas Emissions 1990-2006, 2007.

As a party to the Kyoto Protocol, New Zealand has committed to reducing its emissions of greenhouse gases between 2008 and 2012 (the first commitment period) to 1990 levels or to take responsibility for any emissions above this level.[50]

An ETS for greenhouse gas emissions is part of the government's response to climate change. In the transport sector the ETS will cover liquid fossil fuels used in New Zealand commencing 1 January 2009.

The NZES notes that pricing greenhouse gas emissions is unlikely to be sufficient on its own to reduce the growth of greenhouse gas emissions from the transport sector. Resilient, low-carbon transport is identified as one way of helping New Zealand meet this commitment. Key areas of focus are using more efficient and lower-impact transport modes, using alternative renewable fuels, increasing the efficiency of the vehicle fleet and reducing vehicle kilometers traveled through smarter planning.

The NZES also notes that:[51]

- the government has made in-principle decisions to set a target of halving domestic transport emissions per capita by 2040, and for New Zealand to be one of the first countries to widely deploy electric vehicles
- increasing the diversity of transport fuels by introducing biofuels and, in time, electric cars will also make New Zealand more resilient to international oil price uncertainty and risks of supply disruptions
- provision for travel alternatives such as public transport, walking and cycling should be continually upgraded and improved to ease traffic congestion, provide an alternative to private vehicle travel and reduce greenhouse gas emissions
- making these changes will improve the transport choices available to New Zealanders, as well as improving the environmental sustainability of our communities and our economy
- the energy and climate change objectives for transport in the NZES will inform transport policies, including the UNZTS.

There may be opportunities for the rail industry to reduce emissions, for example, by improving train design, greater use of regenerative braking, and the use of biofuel and hybrid trains. The latter are being trialled in the UK. There may also be technological options for reducing CO_2 emissions from shipping.

OTHER ENVIRONMENTAL IMPACTS

Transport has some detrimental effects and the more transport we use, the greater the environmental impact.

Transport creates noise and can affect water quality. For example, metals and hydrocarbons are deposited on roads from vehicle use and wear. These contaminants are toxic. When it rains, they can enter surface and groundwater and harm aquatic life. The sheer volume of stormwater runoff can also have an environmental impact, causing scouring, erosion and increased sediment loads.

50. Ministry of Economic Development, New Zealand Energy Greenhouse Gas Emissions 1990-2006, 2007.

51. Ministry of Economic Development, New Zealand Energy Strategy, 2006.

TARGETS

GOVERNMENT AGREED HIGH-LEVEL TARGETS FOR ENSURING ENVIRONMENTAL SUSTAINABILITY FOR 2040

Halve per capita domestic transport greenhouse gas emissions.

Local environmental impacts of transport (including air and water quality) to be at accepted international standard.

GOVERNMENT AGREED RELEVANT INTERMEDIATE OR DETAILED TARGETS FOR 2040

Become one of the first countries in the world to widely deploy electric vehicles[52].

A biofuels sales obligation that will begin at a level of 0.53 percent from 2008, increasing to 3.4 percent of annual petrol and diesel sales by 2012.

Reduce the kilometres travelled by single occupancy vehicles, in major urban areas on weekdays, by ten per cent per capita by 2015 compared to 2007.

Reduce the rated CO_2 emissions per kilometre of combined average new and used vehicles entering the light vehicle fleet to 170 grams CO_2 per kilometre by 2015[53] (currently around 220 grams CO_2 per kilometre) with a corresponding reduction in average fuel used per kilometre.

Ensure 80 percent of the vehicle fleet is capable of using at least a ten percent blend of bio-ethanol or bio-diesel, or is electric powered, by 2015.

PROPOSED RELEVANT INTERMEDIATE OR DETAILED TARGETS FOR 2040

Identify and remove any barriers to the uptake of plug-in hybrid and full electric vehicles that meet appropriate safety standards.

Effective real-time information systems in place to enable road users to plan their journeys to avoid congestion, minimising delay and fuel wastage, by 2015.

Lift rail's share of domestic freight to around 25 percent (currently about 18 percent of tonne-kilometres).

Lift coastal shipping's share of inter-regional freight to around 30 percent (currently about 15 percent of tonne-kilometres).

At least double the overall public transport mode share to seven percent of all passenger trips (currently about two to three percent).

Increase the public transport mode share of peak hour travel (journeys to work) in Auckland, Wellington and Christchurch from an average of nine percent to 20 percent and work with each region to optimise peak hour travel targets.

Increase walking and cycling and other "active modes" to 30 percent of total trips in urban areas (currently about 17 percent).

No net loss of indigenous vegetation or fauna from infrastructure construction or maintenance.

52. The electricity used to power electric vehicles would need to be generated from renewable sources.

53. Achieving this and the following two targets is going to depend heavily on the speed of turnover in New Zealand's vehicle fleet and the makeup of the fleet (eg electric versus fossil fuel). A vehicle fleet strategy discussion document is currently being prepared.

PROPOSED SUPPORTING TARGETS

Implement the Sustainable Water Programme of Action and develop a National Environmental Standard on Drinking Water Quality.

Develop stormwater guidelines by 2009.

The maritime industry has an outcome target to reduce the amount of oil spilled from vessels into the marine environment by 50 percent by 2010.

Targets for harmful noise and air emissions (such as Nitrous Oxide and particulate matter) are discussed under the public health objective.

NZEECS SUPPORTING TARGETS

Work with local government to promote travel demand management planning and support businesses and schools to put travel plans in place.

Review funding policies to encourage greater provision of public transport, walking and cycling.

Support development of Neighbourhood Accessibility Plans and the Active Living Programme to encourage mode shift.

Review regional passenger transport mode share targets by 2012 through scheduled reviews of regional land transport strategies, and subsequent regional passenger transport plans.

NZES SUPPORTING TARGET

Work with the New Zealand-based aviation industry, and within international forums, to encourage the use of more fuel-efficient practices and aircraft.

RATIONALE: HIGH-LEVEL TARGETS

The NZES envisages a resilient, low-carbon transport future, while the government has agreed in principle to reducing per capita greenhouse gas emissions from transport to half of 2007 levels by 2040.

Transport today is almost totally dependent on fossils fuels which is unsustainable: fossil fuels[54] are a finite resource and burning them creates greenhouse gases.

Unless we take action, our transport emissions will substantially increase. In developing actions to reduce emissions, our relatively high level of car ownership; our low, although increasing, use of public transport; and our limited rail network with dispersed cities and rugged terrain must be taken into account.

Despite these challenges, the transport sector offers opportunities. New Zealand quickly adopts new technologies from overseas and this will soon include more fuel-efficient vehicles. The use of biofuels and plug-in electric/hybrid cars is likely to grow, complementing our strengths in biotechnology and alternative low-carbon fuels.

In the tourism sector growing concerns about the contribution that greenhouse gas emissions from aviation make to climate change make a proactive New Zealand strategy prudent. New Zealand faces potential risk from changes in consumer preference away from long-haul travel, and specifically away from travel to New Zealand[55].

54. Ministry of Economic Development, New Zealand Energy Data File, June 2007.
55. Ministry for the Environment, New Zealand's Climate Change Solutions: An Overview, September 2007.

RATIONALE: INTERMEDIATE OR DETAILED TARGETS

To reduce greenhouse gas emissions from transport, key areas of focus are using more efficient and lower-impact transport modes, using renewable fuels, increasing the efficiency of the vehicle fleet and reducing vehicle kilometres travelled through smarter planning.

Increasing the diversity of transport fuels by introducing biofuels and electric vehicles will also make New Zealand more resilient to international oil price uncertainty and risks of supply disruptions.

Targets and actions in the NZEECS will play a part in achieving the reduction in greenhouse gas emissions. The NZEECS objective for "Energywise transport" is to reduce the overall energy use and greenhouse gas emissions from New Zealand's transport system. Transport targets set in the NZEECS for reducing single occupancy vehicle trips and improving the fuel economy of vehicles entering the light vehicle fleet could, depending on future policy decisions, result in cumulative savings of approximately 20 PJ of energy and approximately 1.3 Mt CO_2 emissions by 2015. Estimated savings to 2025 from the latter target are 175 PJ and 11.8 Mt of CO_2 emissions.

Making these changes will improve the transport choices available to New Zealanders as well as the environmental sustainability of our communities and our economy.

For more discussion, please refer to the NZEECS.[56]

SINGLE OCCUPANCY TARGET

The total number of kilometres travelled during the week in main urban areas by single occupancy vehicles every year is currently estimated to be around 9.2 billion kilometres, around 3100 kilometres per person in a main urban area. A reduction of ten percent on 2007 kilometres travelled per capita by 2015 is an ambitious target that will require major and comprehensive travel demand management strategies for urban areas, including economic levers such as road pricing and congestion charging initiatives.

DISCUSSION POINTS

- Are our intermediate or detailed targets appropriate – are there other approaches we could take?
- Are additional targets needed, for example, one around engine size?
- Are our targets achievable given the necessary investment and behaviour change needed to reach them?
- How can the reduction in single occupancy vehicle travel best be achieved?
- Should we develop initiatives to ensure turnover in our vehicle fleet is higher, to allow faster adoption of electric vehicles, for example?

56. Energy Efficiency and Conservation Authority, New Zealand Energy Efficiency and Conservation Strategy, October 2007.

MAKING PROGRESS TOWARDS ALL NZTS OBJECTIVES

There are challenges associated with achieving all five NZTS objectives together. Because of the relationships between the objectives, a number of dependencies are particularly important.

Dependence on fossil fuels and road transport

Transport's high dependence on fossil fuels is unsustainable. Oil is a non-renewable resource and burning fossil fuels generates greenhouse gas emissions and other pollutants. Allowing New Zealand to remain overly dependent on fossil fuels will constrain economic growth, create congestion, impact on personal safety and health, create noise, and lower the resilience of our transport system.

The following solutions and approaches could help New Zealand address these transport challenges, and foster the contribution of transport to a sustainable economic future.

FACING THE FULL COST

Most transport sector investment is, and always has been, provided by the private sector. But the price New Zealanders pay for their mobility covers the internal costs only (the vehicle cost, fuel, parking, transport infrastructure and maintenance, ACC costs, etc). The costs of traffic congestion and other external costs (such as the social cost of greenhouse gas emissions, emissions-related public health costs, etc) are not explicitly charged for.

One step towards paying more of the cost of transport will be the introduction of the ETS. The scheme will apply to liquid fossil fuels. It is expected that the cost of emission units will be passed through to consumers. For example, assuming a price of emissions of $15 per tonne of CO_2 equivalent, fuel prices would likely rise by around four cents per litre.

If transport users faced the full cost of their mobility, and if there were no hidden subsidies (between modes) in those costs, then users might make different transport choices. Facing the full cost does not necessarily mean paying the full cost but it does mean understanding the costs imposed on society by the choices being made. Instead of fuel excise duty, full road network charging could be used to charge users for the distances they travel (varied by location and time of day) to ensure people think about the choices they make.

AFFORDABILITY

The greater use of economic instruments such as road pricing to influence behaviour will need to take into account affordability considerations. Those considerations need to be at two levels: affordability to households and individuals, and affordability to the nation. The former involves ensuring social equity, which also has an economic dimension, and needing to make sure that perverse results do not occur. The latter needs to be comprehensive, involving exploration of the full costs that may apply, including those that go well beyond direct transport costs – eg transport policy having implications for costs in the health sector. Allied to considerations of affordability are those of cost effectiveness, which also need to be inclusive, ie allowing cost effective solutions to transport problems to come from non-transport interventions.

CHOOSING ALTERNATIVE MODES

The reason for ensuring transport users face the full costs of their mobility is to influence the choices they make. Transport users will then have genuine choice and will be able to weigh up cost and time considerations: high speed, high cost versus lower speed, lower cost.

Climate change is generating some very real challenges. The way we do business will undoubtedly need to change, including how we move long distance freight in New Zealand while enabling overall freight volumes to grow. It is clear there will still be a strong role for truck and van transport in moving freight in urban areas and a growing task for coastal shipping and rail to move freight between urban centres.

We will all need to change our travel behaviour to make real progress, by sharing cars, taking the train or bus, or walking or cycling to work. These choices need to be made readily available, including through better urban design.

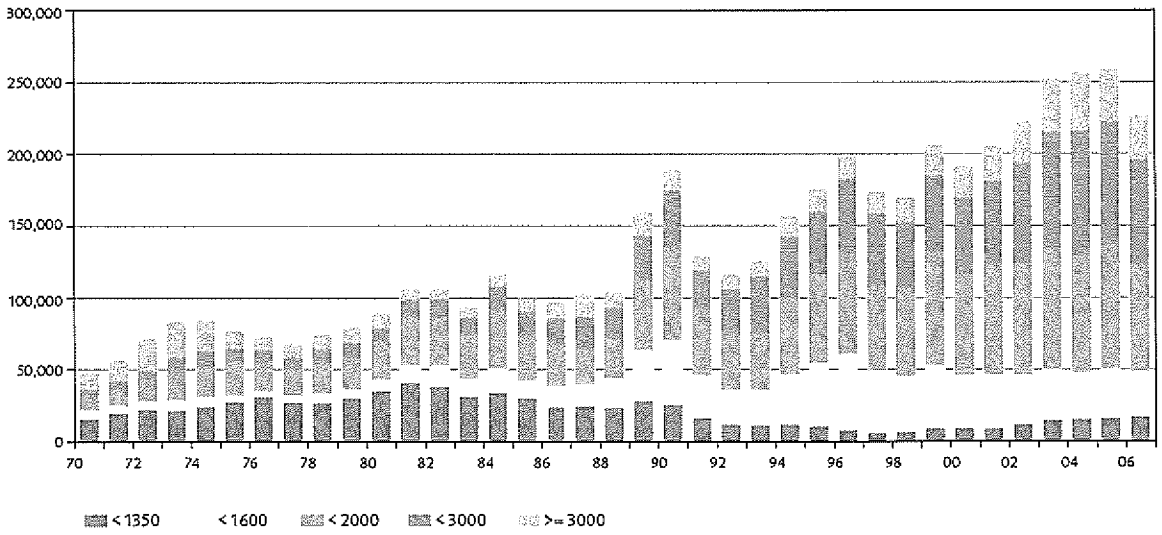
CHOOSING DIFFERENT VEHICLES

Choosing more fuel efficient vehicles reduces fuel use because more efficient engines slow down the rate at which transport vehicles release greenhouse gas emissions. Diesel engines, for example, offer better fuel economy than petrol engines and so produce relatively less CO_2.

The fuel economy of cars and vans (of a given size) in New Zealand is steadily improving but we continue to buy bigger cars. Since the late 1980s, the smallest class of vehicle (under 1350cc) has been steadily disappearing and there has been significant growth in the 1600-1999cc and 2000-2999cc classes.

The following graph shows the annual registrations by engine size (cc) over time.

LIGHT FLEET REGISTRATIONS



CHOOSING DIFFERENT FUEL

A solution to transport CO_2 emissions rests heavily on finding new ways to power vehicles.

Burning fossil fuel releases previously stored carbon into the atmosphere. Burning non-fossil fuel alternatives releases carbon that was only recently absorbed from the atmosphere and is therefore part of the biosphere's existing carbon cycle. Hence the descriptions "carbon neutral" and "alternative low-carbon fuels".

Biofuels are such an alternative, and have the advantage that existing petroleum distribution networks and vehicle technologies can be readily adapted for their use. In February 2007 the government announced a biofuels sales obligation to ensure biofuels were introduced into the New Zealand fuels market.

The obligation will begin at a level of 0.53 percent from 2008, increasing to 3.4 percent of annual petrol and diesel sales by 2012. These are levels that fuel distribution systems and vehicles are capable of supporting.

The potential for markedly increasing the uptake of biofuels, particularly bio-ethanol, is partly dependent on the composition and turnover in our vehicle fleet. New technology arrives in this country an average of seven years after it is available in Japan. Based on these trends, it would take approximately a decade before we begin importing used Japanese vehicles compatible with significantly higher biofuel blends.

As part of a vehicle fleet strategy[57], policies will be developed to promote and encourage the purchase of vehicles that are capable of accepting a ten percent blend of biofuels. In time, the fleet composition is likely to allow the use of higher biofuel blends. The government will also be able to consider how to take advantage of scientific and commercial developments in the biofuels industry.

Hybrid cars offer another partial solution. Even though they still use internal combustion engines, hybrid vehicles deliver significant energy efficiency benefits and offer a low carbon transport option. Hybrid cars are currently more expensive to buy than conventional cars, but in the United States it has been predicted they could be a third of the total market by 2015.

A more promising option is electric powered vehicles. The government has taken an in-principle decision that New Zealand be one of the first countries to widely deploy electric vehicles into the fleet. To date, electricity use for transport has been confined to buses and trains. In the future, the advantages of transferring a proportion of the light vehicle fleet to electricity will depend on the relative economics, potential for uptake and the level of petrol and diesel displaced. Hybrid plug-ins and full electric cars also have other benefits such as reduced or no harmful exhaust emissions.

The additional electricity required to charge electric vehicles is expected to fall within the capacity of the grid if grid improvements go ahead, consistent with the introduction of a target for 90 percent of electricity being generated from renewable sources by 2025. Uptake would have to be supplemented with a charging policy to manage peak demand. New Zealand could begin introducing electric vehicles to the fleet without a large investment in infrastructure. Public charging facilities may be required as uptake levels increase and vehicles gain capacity to travel further. Battery disposal is seen as a consideration rather than an obstacle.

DISCUSSION POINTS

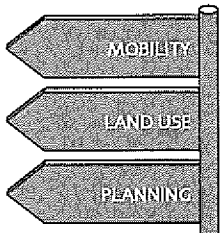
What pathways allow New Zealand's sustainability objective to be reached while also making good progress against all the NZTS objectives?

Do you agree with the measures and targets suggested in this paper?

Are there other measures and targets you believe should be considered?

If so, what are they, and how would they help achieve the objectives of the NZTS?

57. A vehicle fleet strategy discussion paper is currently being prepared.



TRANSPORT CHOICES

There are three sets of choices for New Zealanders to consider if we are to address the transport and environmental challenges we face:

CHOICES ABOUT HOW AND HOW MUCH WE MOVE

Mobility is part of a modern, globally integrated lifestyle. People and goods move because we need food, clothing, homes to live in and because we need to earn a living. We have businesses. We have family and community commitments, and we have more – and more diverse – leisure and recreational pursuits.

Better transport networks allow business to access markets more easily and cheaply, providing benefits of economies of scale and specialisation. These benefits help New Zealand's economy grow but also increase demand for transport. As transport users we need to consider new possibilities. We need to understand the real costs of our mobility such as the cost to the environment and our health, not just its immediate financial cost to us. We need opportunities to make different transport choices.

CHOICES ABOUT HOW WE UTILISE SPACE

As communities we need to consider new possibilities about how we use space. More pedestrian friendly and attractive streets allow more social interaction and exercise. Open spaces provide for recreation and provide routes for pedestrians and cyclists. Better connected communities can be more resilient and adaptable to change and are more socially cohesive. Changing the ways we develop our cities including how we plan for housing, retail, offices, factories and freight facilities will create opportunities for consumers to make different transport choices, and lead to efficient supply chains and logistics.

CHOICES ABOUT HOW WE PLAN

Traditionally everything associated with moving about has been put in a box labelled "transport". Within that box have been smaller boxes labelled "ports", "shipping", "aviation", "rail", "roads", "cyclists", and "pedestrians". But in a wider sense transport is about moving goods and people in seamless ways from one place to another and so transport problems do not necessarily have transport solutions.

As decision-makers we need to consider new possibilities for land use planning and urban design. While urban areas may take time to redesign, it is important to make a start now. We need to ensure land use and transport planning is carried out in an integrated way. We need to integrate the different modes of transport so that it is easy to move cargo from trucks to ships, for example, or for people to park their cars and hop on the train. We need opportunities to achieve solutions by working differently with stakeholders and using different tools for assessing impacts and benefits.

Transport has the potential to help make possible an economically sustainable future for New Zealand. The purpose of this document is to explore the choices to be made, and seek your feedback on the targets we could set to help us get there.

DISCUSSION POINTS

Is this an accurate summary of the transport choices facing New Zealand in the foreseeable future?

Do you agree that transport problems cannot always be solved with transport solutions? If so, what ideas do you have for new ways of working to solve transport issues?

In particular, how do you see transport planning and land use working together?

APPENDIX A

Principles of the New Zealand Transport Strategy

In developing the transport targets we have taken into account the four principles of the NZTS: Sustainability, Integration, Safety and Responsiveness.

SUSTAINABILITY

Sustainable transport for New Zealand:

- enables our economic, social, environmental and cultural goals to be met in a way that is affordable and meets the needs of current and future generations
- enables the access and development needs of individuals, businesses and communities to be met safely and with an appropriate mode of transport
- enables personal well-being, community cohesion and inclusion, and seeks to create like opportunities, reducing transport inequalities
- contributes towards a carbon neutral future and operates within its environmental limits, using wisely our finite reserves of non-renewable resources and where possible substituting them with renewable resources
- safeguards our ecosystems and land for generations to come
- means individuals understand their role and responsibility in contributing to sustainable transport for New Zealand and make transport choices accordingly.

INTEGRATION

Integrated transport for New Zealand:

- recognises the need for "total journey solutions" for people and freight
- has effective links within and between modes with each playing its appropriate part
- complements and does not compromise decisions or interests in other sectors
- considers funding throughout planning processes
- considers decisions about land-use and transport together and helps to shape desired urban form. Transport interests are incorporated into and contribute to broader planning initiatives.

RESPONSIVENESS

Responsive transport for New Zealand:

- recognises that people and freight wish to move at different times and by different mechanisms
- recognises the direct effect transport has on people and their quality of life and takes into consideration the diverse characteristics of communities and regions across our country
- has the flexibility to react to economic, social, environmental and technological changes
- is prepared for, and recovers well from, unforeseen events.

SAFETY

Safe transport for New Zealand:

- meets the implied and expressed expectations for levels of acceptable risk
- protects transport lifelines (in the event of natural or other disasters)
- values the health and safety of all transport users[58], workers and operators equally
- meets affordable best practice design, operating and maintenance standards for the protection of life, property and nature.

58. Across the modes.

APPENDIX B

New Zealand trends

In 2031, nearly five million people will live in New Zealand[59]. On average we will be older. Around one million New Zealanders will be over age 65. As is happening world-wide, more people will live in the cities, especially in Auckland. Today, the Auckland region has 1.3 million people – a third of New Zealand's population. In 25 years, close to 40 percent of New Zealanders could be living in Auckland, and by 2050 the region could be home to over two million people.

The triangle of Auckland, Waikato and the Bay of Plenty will be where more New Zealanders live, work and play. There is expected to be strong growth at the top of the South Island and around Queenstown[60]. In 25 years we could see up to five million international tourists visiting New Zealand a year based on current growth of four percent per annum.

The following pages illustrate some key trends and projections for transport in New Zealand if a new set of sustainable policies are not adopted. Under the government's sustainability programme, these trends are expected to change.

	AT THE BIG PICTURE LEVEL	FOR THE INDIVIDUAL NEW ZEALAND RESIDENT	PROJECTION
FREIGHT			
Imports	Each year New Zealand imports around 18 million tonnes of freight.	Our lifestyle is supported by around 4.4 tonnes of imports each.	If our demand for imported goods follows projected GDP growth then by 2031 we will need to import some 31 million tonnes of freight[61].
Exports	Each year New Zealand exports around 22 million tonnes of freight.	We average around 5.3 tonnes of exports per person to help pay our way in the world.	If the growth in the weight of exports follows projected GDP growth then in 2031 we will be exporting around 37 million tonnes[62].
Urban domestic freight	Each year around 250 million tonnes of freight is moved by road within the Auckland region. About two billion tonne-kilometres of freight movement occurs each year on roads within the Auckland region.	Around one tonne of freight is moved each day for every household in the Auckland region. About 10,000 tonne-kilometres of road freight movement occurs per year for every household within the Auckland region[63].	The total tonnage at tonne-kilometre will increase at a greater rate than the population increases.

59. Statistics New Zealand, Medium projection for 2031 is 4.847 million, 2006.
60. Statistics New Zealand, medium projections, 2007.
61. This will depend on many factors including the relativity of international economies – if we get relatively richer then we may demand more goods – by value if not weight. A move to higher value exports/imports would reduce this estimate.
62. A move to higher value exports/imports would reduce this estimate.
63. 2002 estimates, Auckland Regional Council, Auckland Regional Freight Strategy, 2006.

	AT THE BIG PICTURE LEVEL	FOR THE INDIVIDUAL NEW ZEALAND RESIDENT	PROJECTION
Total national road freight	Last year around 18.5 billion tonne-kilometres of freight was moved over our road network by heavy vehicles – this was about two thirds of all domestic freight tonne-kilometres (the rest is taken by rail and coastal shipping).	Every day over 12 tonne-kilometres of freight is moved over our road network for each person in New Zealand.	If the current relationship between freight and GDP growth continues, we will need to shift over twice (44 billion tonne-kilometres by road) the current freight volumes by 2031.
INTERNATIONAL TRAVEL			
International travel	Each year there are some 1.9 million New Zealanders travelling overseas. Each year some 2.4 million tourists come to New Zealand.	On average 46 percent of New Zealanders travel overseas each year. Tourism supports around 9.9 percent of the total workforce in New Zealand.	Trips abroad by New Zealand residents are expected to be more than two million each year by 2012[64]. The inbound tourism projection for 2012[65] is 3.1 million passengers per year and 5 million by 2032.
DOMESTIC TRAVEL			
Aviation	It is estimated that each year there are over nine million passenger journeys by internal airlines[66].	It is estimated that, on average, we use internal flights more than two times per person per year[67].	Domestic air travel will be closely linked to real costs.
Road travel	Each year our light vehicle fleet travels some 36 billion kilometres. Each year drivers and passengers travel a total of 58 billion kilometres in light vehicles. Last year (2006) we had 391 deaths on our roads.	Each light vehicle licence holder on average drives about 33 kilometres each day[68]. We each average about 39 kilometres each day of travel as drivers or passengers in light vehicles. Road deaths are distributed across our communities.	By 2031 the light vehicle fleet is projected to travel some 48 billion kilometres per year. By 2031 we are projected to travel some 78 billion kilometres per year in light vehicles. Future road safety trends will depend on the overall commitment of the New Zealand community.

64. Ministry of Tourism, 2007-2013 Tourism Forecasts Summary and pivot tables, 2007.
65. Ministry of Tourism, Inbound Forecasts, August 2007.
66. Air New Zealand carried 7.3 million domestic passengers in 2006.
67. Ministry of Transport data based on passenger numbers at each airport that could supply data.
68. Ministry of Transport light vehicle statistics, 2007.

	AT THE BIG PICTURE LEVEL	FOR THE INDIVIDUAL NEW ZEALAND RESIDENT	PROJECTION
Use of urban passenger transport (PT)	Each year Auckland region residents use PT services around 51 million times. Each year Wellington region residents use PT services around 35 million times. Each year Canterbury region residents use PT services around 16 million times[69].	On average each Auckland region resident uses PT 38 times per year. On average each Wellington region resident uses PT 75 times per year. On average each Canterbury region resident uses PT 30 times per year.	By 2030 PT patronage could be around 75 to 85 trips per resident.
RAIL			
Passenger	Each year Auckland region residents use passenger rail services over five million times. Each year Wellington region residents use passenger rail services around 11.3 million times.	On average each Auckland region resident uses rail 3.7 times per year. On average each Wellington region resident uses rail 24 times per year.	Passenger rail in Auckland is forecast to have increased to at least 30 million trips a year by 2030[70]. It is forecast that passenger rail will carry more than 13 million passengers a year by 2016.
Freight	Around 3.9 billion tonne-kilometres of freight is moved over our rail network each year. This is about 18 percent of all freight tonne-kilometres.	Every day more than 2.6 tonne-kilometres of freight is moved over our rail network for each person in New Zealand.	If rail is to maintain the same share of the total domestic freight task then we will need to shift over twice (nine billion tonne-kilometres) the current rail freight volumes by 2031.
EMISSIONS			
Emissions	Road transport vehicles emit an estimated 10.9 million tonnes of CO_2 each year.	Each New Zealander's share of road transport emissions is 2.6 tonnes per year.	If current trends continue, by 2030 it is estimated that road transport vehicles will emit 14.2 million tonnes of CO_2 each year[71]. Reductions in CO_2 emissions will depend on policy initiatives to effectively respond to the NZES.

69. Land Transport New Zealand, 2005/06.
70. This figure assumes an underground loop for Auckland CBD and a rapid rail link to the airport.
71. Ministry of Transport, Vehicle fleet emissions model, 2007.

APPENDIX C

Aviation and maritime targets

New Zealand aviation safety outcome targets to be achieved by 2010

CATEGORY	DESCRIPTION	TARGET TO 2010, SOCIAL COST PER SEAT HOUR
Public Air Transport	Airline Operations – Large Aeroplanes	Less than $0.10
	Airline Operations – Medium Aeroplanes	Less than $0.10
	Airline Operations – Small Aeroplanes	Less than $6.50
	Airline Operations – Helicopters	Less than $6.50
	Sport Transport	Less than $13.00
Other Commercial	Commercial Operations – Aeroplane	Less than $6.50
	Commercial Operations – Helicopter	Less than $6.50
	Agricultural Operations – Aeroplane	Less than $14.00
	Agricultural Operations – Helicopter	Less than $14.00
	Agricultural Operations – Sport	Less than $28.00
Non-Commercial	Private Operations – Aeroplane	Less than $10.00
	Private Operations – Helicopter	Less than $10.00
	Private Operations – Sport	Less than $20.00

Maritime New Zealand outcome targets for 2010

CATEGORY	MEASURE	TARGET
International SOLAS[72] vessels in New Zealand water and New Zealand SOLAS vessels anywhere	Per 100 vessels	No increase[73] from a starting point of: 0.07 fatalities per year 2.37 accidents per year 0.66 injuries per year
Passenger and non-passenger vessels operating under safety management systems (excluding commercial jet boating and rafts)	Per 100,000 operating hours	50 percent reduction from a starting point of: 0.07 fatalities per year 6.26 accidents per year 1.44 injuries per year
Pleasure boats	Per 100,000 pleasure boat owners	25 percent reduction from a starting point of: 0.03 fatalities per year
New Zealand commercial and New Zealand foreign chartered fishing vessels	Per 100,000 operating hours	50 percent reduction from a starting point of: 0.18 fatalities per year 2.34 accidents per year 1.07 injuries per year
Commercial marine craft engaged in adventure tourism – jet boating and white water rafting	Per 100,000 operating hours	50 percent reduction from a starting point of: 0.27 fatalities per year 3.46 accidents per year 2.57 injuries per year
Commercial marine craft engaged in adventure tourism – paddle craft (other than river rafts)	Number	No increase from a starting point of: 0 fatalities per year 0.33 accidents per year 0 injuries per year
Maritime workplace activity	Number	25 percent reduction from a starting point of: 9.33 fatalities per year 76 serious harm injuries per year
Oil spilled from vessels into the marine environment	Volume	50 percent reduction from a starting point of: 44.7 tonnes spilled per year

72. SOLAS vessels are governed by the Safety of Life at Sea (SOLAS) convention.
73. It is considered that the level of safety in this area cannot be further improved while still meeting a positive cost/benefit requirement.

GLOSSARY

Bioethanol – A form of alcohol derived from plant or animal sources. May be blended in low concentrations with petrol and used in conventional petrol vehicles or used in higher concentrations in specially modified petrol vehicles.

Carbon dioxide – Carbon dioxide or CO_2, is a naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as of land-use changes and other industrial processes. It is the most important man-made greenhouse gas.

CNG – Compressed natural gas.

CO_2 equivalent – Measures the combined climate changing potential of emissions of multiple greenhouse gases. Emissions of each gas are converted to the amount of CO_2 that would cause the same climate change impact, and summed.

Emissions Trading Scheme (ETS)
A carbon trading scheme launched by the New Zealand government in 2007 to create a market for the trading of carbon credits.

Getting there – on foot, by cycle
New Zealand's first national walking and cycling strategy, released in February 2005, provides a comprehensive framework to address the factors that influence whether individuals choose to walk or cycle in their everyday lives.

LPG – Liquefied petroleum gas.

New Zealand Energy and Efficiency Conservation Strategy (NZEECS) – the NZEECS proposes ways to promote energy efficiency, energy conservation and the use of renewable sources of energy. It includes measures to reduce electricity demand, address energy use in transport, buildings and industry, and promote greater consideration of sustainable energy in the development of land, settlements and energy production.

New Zealand Energy Strategy (NZES) – The NZES to 2050 clearly sets out the government's vision and an action plan for a reliable and resilient system delivering New Zealand sustainable, low emissions energy services.

New Zealand Transport Strategy (NZTS) – Released in December 2002, the NZTS outlines government's vision for transport in New Zealand ("By 2010 New Zealand will have an affordable, integrated, safe, responsive and sustainable transport system") and describes how the transport system can respond to the social, economic and environmental needs of the nation.

Public Transport (PT) – Passenger transport services provided or subsidised by local and central government.

Regenerative braking – Used to recoup some of the energy lost during stopping. This energy is saved in a storage battery for later use.

Update of the New Zealand Transport Strategy (UNZTS) – The UNZTS is a strategy to implement the key aspects of the 2002 New Zealand Transport Strategy, a framework document that guides the development of government transport policy.

Ministry of Transport
TE MANATŪ WAKA

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ISBN No. 978-0-478-10019-8