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New Zealand Road Transport Reform and the Environment

Presented in partial fulfilment of the requirements for the Degree of Master of Science in Resource Management

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Chapter 1: Introduction

The government seeks to manage the provision of transport services in a manner that minimises adverse effects on the natural and physical environment and human health (Environment 2010 Strategy, MfE, 1995).

Background

Managing New Zealand’s roads has been, and always will be, a complicated undertaking. Roads provide a number of benefits to society, such as mobility and the transportation of goods and services. But access and mobility comes at a price, that being high social, economic and environmental costs. Traffic accidents result in severe social and economic costs, and pollution released by vehicles can endanger the health of present and future generations of humans and non-humans. The difficulty for road managers is attempting to enhance the benefits of roads while minimising their costs. The growing levels of pollution (such as increases in carbon dioxide concentrations (a greenhouse gas) (MfE, date unknown)) suggest that road managers have not been successful when it comes to avoiding, remedying, or mitigating adverse environmental effects that result from roads (as the Resource Management Act requires).

The New Zealand Government has recognised that the current road management system is not delivering satisfactory outcomes in terms of its efficiency, safety, and its effect on the environment. Consequently, the immediate past administration initiated a review of the road management system, which resulted in the release of Better Transport Better Roads (BTBR) in 1999. This document outlined a new possible model for road management intended to improve the efficiency, safety, and environmental outcomes of road management in New Zealand.

The main changes that BTBR proposed were to the management, funding, and payment options for roads. Between four and eight public road companies would be responsible for local roads, and Transit New Zealand Ltd would be responsible for the state highway system. Funding would be provided by Transfund New Zealand Ltd. The principal objective of the companies would be to “operate as successful businesses; be as profitable and efficient as
adverse environmental effects.

A set of criteria was developed to evaluate the BTBR and LGNZ models, and to identify areas in which these models were inadequate. The criteria were developed by reviewing the literature and identifying policies that are, or could be, effective at avoiding, remedying, or mitigating adverse environmental effects. Criteria were also established that would address problems arising from the current management system.

Applying this framework to the two models revealed that the LGNZ model was more likely to avoid, remedy or mitigate adverse environmental effects than the BTBR model. However, the LGNZ model was unable to satisfy all of the criteria, and therefore a new model was developed which did so.

The new model incorporates two major changes. First, it proposes institutional reform, with Regional Transport Authorities (RTAs) taking on the transport roles and responsibilities of regional councils, local territorial authorities, and Transit New Zealand. RTAs would be responsible for all transport matters (excluding aviation) in their areas, that is, those of the regional councils.

The other major change proposed is the introduction of electronic road pricing. Differential road pricing would be used to reflect different fuel-efficiencies of vehicles, engine size, and the distance travelled. However, before road pricing is introduced, the public transport system and other alternatives to the private vehicle would need to be developed to a level where they provided real alternatives to the private car. This would help reduce the expected public opposition to road pricing.

The following goals and recommendations have been made to give effect to the conclusions reached by this report.

**Goal Statements**

*Long-term Goals*

1. To achieve a sustainable transportation system.
2. To avoid, remedy or mitigate the adverse effects of road transport on the
environment.

**Short-term Goals**

1. To increase the patronage of public transport.
2. To increase the number of trips made by foot, cycle, or other non-motorised vehicles.
3. To improve public awareness of the environmental effects of driving.
4. To increase the number of vehicles fuelled by alternative fuels.

**Recommendations**

1. That sustainable transportation is adopted as the primary objective for road management.
2. That further investigation and consultation is required to determine the most appropriate legislation for avoiding, remedying, or mitigating the adverse environmental effects of road transport.
3. That the Regional Transport Authority model is implemented.
4. That electronic road pricing is introduced and incorporates externality costs, fuel-efficiency, and the type of fuel used.
5. That revenue from congestion pricing is re-invested into alternatives for private vehicles or into building or upgrading roads that meet environmental, social, and economic criteria.
7. That the Ministry of Transport develop national strategies for alternative fuels and alternatives to private vehicles.
8. That EECA and regional councils begin educational campaigns on improving fuel-efficiency, the environmental effects of transport, and alternatives to private vehicles.
9. That Section 3D of the Transit New Zealand Act is amended to minimise transaction costs.
10. That a staggered pilot study is conducted in the Wellington region before electronic road pricing is introduced nationally.
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The government seeks to manage the provision of transport services in a manner that minimises adverse effects on the natural and physical environment and human health (Environment 2010 Strategy, MfE, 1995).

Background
Managing New Zealand’s roads has been, and always will be, a complicated undertaking. Roads provide a number of benefits to society, such as mobility and the transportation of goods and services. But access and mobility comes at a price, that being high social, economic and environmental costs. Traffic accidents result in severe social and economic costs, and pollution released by vehicles can endanger the health of present and future generations of humans and non-humans. The difficulty for road managers is attempting to enhance the benefits of roads while minimising their costs. The growing levels of pollution (such as increases in carbon dioxide concentrations (a greenhouse gas) (MfE, date unknown)) suggest that road managers have not been successful when it comes to avoiding, remedying, or mitigating adverse environmental effects that result from roads (as the Resource Management Act requires).

The New Zealand Government has recognised that the current road management system is not delivering satisfactory outcomes in terms of its efficiency, safety, and its effect on the environment. Consequently, the immediate past administration initiated a review of the road management system, which resulted in the release of Better Transport Better Roads (BTBR) in 1999. This document outlined a new possible model for road management intended to improve the efficiency, safety, and environmental outcomes of road management in New Zealand.

The main changes that BTBR proposed were to the management, funding, and payment options for roads. Between four and eight public road companies would be responsible for local roads, and Transit New Zealand Ltd would be responsible for the state highway system. Funding would be provided by Transfund New Zealand Ltd. The principal objective of the companies would be to “operate as successful businesses; be as profitable and efficient as
comparable non-public businesses; be good employers; and ‘exhibit a sense of social responsibility’” (MOT, 1999: 7-8).

Changes in funding would also occur. The contribution from rates would be replaced by new levies and increases in road user charges. Another major change would be the introduction of payment options. Individuals and groups of road users could leave the levy system and choose an alternative way to pay for their road use, either by entering into contracts with the public road companies, or through intermediaries (Ibid.: 8).

However, BTBR had its critics, among which was Local Government New Zealand (LGNZ). As part of its submission on BTBR, it proposed an alternative model, Streets Ahead (1999a).

LGNZ advocates creating ‘roading entities’ to manage the roading network. These entities would be controlled or owned by local government, and would be responsible for local and state highway roads.

Like BTBR, LGNZ also proposes changes to the funding system. There would be a three-tiered system, with a nationally administered charge for maintaining the network to specified standards, local administered pricing for capital works and maintenance, and local pricing for congestion and environmental externalities. The fuel excise tax would be abolished (LGNZ, 1999a: iii-iv).

**The Issue**

The resource management issue at hand is that the current road management system is unable to avoid, remedy, or mitigate adverse environmental effects. This report contends that the BTBR and LGNZ models also fail to adequately deal with those effects. This project is primarily about critically appraising the BTBR and LGNZ models, identifying their shortcomings, and proposing a new model that may be more successful in meeting these objectives.

**Report Objectives**

The aim of this project is to critique the BTBR and LGNZ roading reform models from an
environmental perspective; and, if necessary, to put forward a new model which overcomes any shortcomings of the current options. To achieve this, several objectives have been formulated:

1. To identify aspects of the current road management system that result in adverse environmental effects.
2. To identify changes to the road management system that could avoid, remedy or mitigate adverse environmental effects.
3. To describe how aspects of the BTBR and LGNZ models could reduce the environmental effects of roads, and to evaluate their effectiveness.
4. To identify which model, if any, best avoids, remedies or mitigates adverse environmental effects, and to recommend modifications which may further reduce those effects.

**Methodology**

Information for this project was gathered primarily by using secondary research techniques. It included examining submissions on the BTBR proposal, published literature, and information from the Internet. In addition, some primary research was used to further identify problems with the current system. This involved informal contact with the transport department of the Wellington Regional Council.

A criteria framework was developed to evaluate the BTBR and LGNZ models. The criteria were based on policies that avoid, remedy or mitigate adverse environmental effects, or those that would correct current institutional deficiencies. Based on this framework, the more ‘environmentally-friendly’ model was identified, and recommendations for its improvement were made.

Feedback was obtained by seeking comments on a draft report. Comments were obtained from Professors Ian Spellerberg and Chris Kissling of Lincoln University, and Tony Brennand and Nick Sargent from the Wellington Regional Council, and Colin Ryder.

**Interdisciplinary Nature of Research**

This report uses an interdisciplinary approach, which means that an issue is examined from an ecological, economic, policy and socio-cultural perspective. This section discusses how
road transport relates to each of these disciplines, and as such, relate to the report as a whole.

**Ecological Perspective**

Examining road transport from an ecological perspective looks at the relationship between road transport and the natural environment. Roads occupy space in the natural environment, and, coupled with the presence of moving vehicles, can affect the natural environment. Road transport causes a whole range of environmental problems, which, as they are discussed in Chapter 2, will not be covered here.

**Economic Perspective**

From an economic perspective, roads are seen as a public good that impose externalities. A public good is one which is, in normal conditions, neither excludable\(^1\) nor rival\(^2\). Roads are generally seen as a public good because their access is not limited, and one person's consumption of it does not affect others. But there are exceptions. Private roads can restrict access, and at congestion levels, roads can become rival as a road at full capacity limits the ability of other vehicles to be driven on that road.

Roads and vehicles also impose externalities\(^3\) such as pollution, noise, congestion, and injury or death through traffic accidents. Individual drivers do not pay these externality costs; rather society as a whole does so instead.

However, roads still play a crucial role in the macro-economy. Transport contributes to the local economy and to GDP because it allows the movement of the labour force as well as goods and services. The dependency that the economy has on road transport has been shown recently by increases in fuel prices affecting the price of supermarket goods, taxi fares, and, consequently the level of inflation.

**Policy Perspective**

Road transport can also be considered from a policy perspective, and this is another area that

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\(^1\) An excludable good is one where someone can be prevented from using it at little or no cost.

\(^2\) A rival good is one when its consumption by one person prevents its consumption by others.

\(^3\) Externalities are unintended consequences of someone's consumption or production of a good or service, which are imposed onto a third party.
this report addresses in depth. As Chapter 2 discusses, the institutional framework that governs roads plays an important role in determining the degree to which they affect the environment.

**Socio-Cultural Perspective**

Roads also have socio-cultural impacts. Roads benefit societies by providing mobility. However, they also have negative effects. Roads can impact on the health of people through the health effects of pollution, lower fitness levels, and noise and stress.

Road transport is a particularly complex problem when it comes to determining and meeting community aspirations. Communities desire the positive attributes of roads, such as their contribution to personal mobility and to the economy, but they also have other conflicting aspirations, such as low pollution and safe roads. There are also equity aspects to consider, as people who do not drive require access to alternative forms of transportation.

Road transport, however, does not have a cultural aspect to it. The benefits and costs of road transport tend to be spread across all cultures. Therefore, the cultural dimension is not relevant for this project.

**Limitations and Assumptions**

This report has several limitations and assumptions. They are:

- Not all of the possible solutions to reducing environmental damage have been identified, as it is impossible to be completely comprehensive in this manner.
- This report does not evaluate whether the proposed policies in this report will work. Many of the options are relatively new or have not been used for a sufficient time to allow their evaluation. It is assumed that they would be effective.
- Not all of the impacts of roads and vehicles on the environment have been considered. For example, there are environmental costs of obtaining materials for road and vehicle construction, and disposing of vehicle bodies.
- The methodology has focussed mainly on using secondary sources of information, and there has been little contact with practitioners aside from the Wellington Regional Council (WRC). This may mean that the findings of this report do not cover the full range of problems inherent within the roading system. Furthermore, contact with
WRC may not be sufficient to provide an understanding of problems that affect other regions.

**Report Audience**

The intended audience of this report is central and local government bodies, and other institutions interested in road management reform and its implications for the environment.

**Report Structure**

Each chapter of this report (excluding this one) addresses one of the objectives listed above (page 3). Chapter 2 describes how roads impact on the environment, and outlines how the current system is contributing to a degraded environment (Objective 1).

Chapter 3 identifies the policies that should be included in a road management strategy that could potentially avoid, remedy, or mitigate adverse environmental effects. This chapter also develops a set of criteria which will be used to critique the BTBR and LGNZ models (Objective 2).

Chapter 4 outlines the aspects of the BTBR and LGNZ proposals that have the potential to affect the environment, and evaluates both models against the criteria framework developed in Chapter 3. From this, the potential effectiveness of each model is determined, as well as identifying areas which require improvement (Objective 3).

Chapter 5 identifies the model that is potentially more useful at addressing environmental effects. It develops a new model that meets all of the criteria, and makes recommendations (Objective 4).

Finally, Chapter 6 provides some concluding remarks.
Chapter 2: Roads, Environment, and Institutions

Introduction

This chapter is divided into two parts. The first part identifies some of the environmental effects caused by road transport. It also presents some information on vehicle use and fuel consumption, which indicate that the environmental effects of roads are intensifying. The second part discusses the current road management system, focusing on areas in which it contributes to adverse environmental effects.

Part 1: Roads, Transport, and the Environment

Roads cause environmental effects in two ways. First, their physical presence can directly affect the environment. Land occupied by roads is considered degraded because it has lost its biological productivity – plants cannot grow on a sealed and maintained road. Roads can also affect the aesthetic values of landscapes. For example, the aesthetic impact of an existing road near Stonehenge is considered to be so significant that a tunnel will be built to replace it (Sargent, 2000). Roads can bisect human communities and habitats. Fragmenting habitats can introduce invasive species, as well as increasing the risk to wildlife from moving vehicles. In New Zealand, the number of possums killed by traffic is testimony to the effects that transport has on wildlife. The presence of roads can also reduce the size of habitats to below sustainable levels. Furthermore, the impermeable nature of roads can result in localised flooding and other water problems. Some roads, particularly unsealed ones and those being constructed, also create dust.

The other way that roads affect the environment is indirectly by vehicles. Adverse effects of vehicles include noise and vibrations, and pollution of the air, atmosphere, and water bodies. These will be discussed below.

Noise and Vibrations

Noise and vibrations are a nuisance to people and to wildlife, and can interfere with sleep, work or schooling (MOT, 1996: 25). They also contribute to stress, which can aggravate

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*A definition of ‘environment’ is provided in Appendix 1.*
some pre-existing conditions such as hypertension and psychiatric disorders (*Ibid.*: 29).

Air Pollution

The internal consumption engine generates a number of unwanted byproducts (see Figure 1). Many of these byproducts are pollutants which can be detrimental to human health, non-humans, buildings and visibility. Areas around roads receive most of the pollution, but it is thought that vehicle occupants are the most at risk as they receive concentrated amounts of polluted air. This is due to the proximity of the vehicle’s air intake system to exhausts of preceding vehicles, and the enclosed space inside the vehicle (DETR, 1998).

**Figure 1:** Emission products from petroleum fuelled engines.

These pollutants include: (*MOT, 1996: 41*)

- Particulate matter. Particles less than 10 microns in diameter are light enough to remain suspended in the air. They reduce visibility and are small enough to lodge in the respiratory tract;
- Sulphur dioxide, which can form acid rain;
• Volatile organic compounds, semi-volatile compounds and hydrocarbons, which are carcinogenic;
• Oxides of nitrogen, which can form acid rain;
• Asbestos; and
• Carbon monoxide.

**Atmospheric Pollution**

The transport sector is the leading contributor to greenhouse gas emission in New Zealand, making up around 40 percent of the total contributions. Carbon dioxide, nitrous oxide, and methane are combustion byproducts which are among the main greenhouse gases. It is widely accepted that the increased concentration of greenhouse gases in the atmosphere is linked to global climate change (*Ibid.*: 71).

**Water Pollution**

Runoff water from roads is known to pollute water bodies. Effects on water quality include:

• Increased amounts of suspended sediment, causing loss of water clarity. This affects the water body’s ecosystem by favouring species that prefer cloudy rather than clear conditions;
• Disrupting fish migration through the use of culverts;
• Toxic chemical contamination of the water by chemicals such as lead, zinc, cadmium³, copper, chromium, nickel, herbicides used in vegetation control, and petroleum hydrocarbons (*Ibid.*: 75-76).

**Externality Costs of Transport Pollution**

The presence of pollution means that there are externality costs involved, due to the effects on health, productivity, and so on. It is extremely difficult to determine the full externality cost of using roads. This would require perfect information on the nature of the problem and how much society was willing to pay for the problem to be resolved. However, an attempt was made as part of the Land Transport Pricing Study in 1996. This study estimated the social costs of adverse transport effects on the environment (shown in Table 1 below).

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³It is estimated that 1.85 kg of material has been lost from a new tyre when it has worn enough that it fails the Warrant of Fitness standard. A typical tyre contains zinc oxide, cadmium, lead, and sulphur compounds.
### Table 1: Annual social costs of each pollutant category ($1996 million)

<table>
<thead>
<tr>
<th>Pollutant Category</th>
<th>Range</th>
<th>Best Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>230 to 2,650</td>
<td>290</td>
</tr>
<tr>
<td>Local air quality</td>
<td>Not assessed, but very wide range</td>
<td>700</td>
</tr>
<tr>
<td>Greenhouse gases</td>
<td>25 to 580</td>
<td>290</td>
</tr>
<tr>
<td>Water quality</td>
<td>35 to 170</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: MOT, 1996: xvi.*

### Social and Economic Effects

Vehicle use also has social effects. For example, it can break down social cohesion within communities and lower fitness levels (DETR, 1998). Increased stress levels are also attributed to vehicle use, particularly when congestion occurs – in extreme cases leading to ‘road rage’ (*personal observation*).

Congestion also comes at a cost. In the Auckland region alone congestion is estimated to cost the local economy between $100 and $150 million per year (RAG, 1997: 26). This figure is already considered to be too low for that city, and is perceived as being more appropriate for Wellington (Brennand, 2000).

### Trends in Environmental Impacts

While the environmental effects of roads are being increasingly acknowledged, New Zealand’s dependency on vehicles is continuing to increase. For example:

- Since 1972, while the population has increased by 18 percent, the number of licensed vehicles has increased by 46 percent (TEC, 1998: 50).
- Between 1971 and 1991, the percentage of full-time workers who drove to work increased from 44 percent to 65 percent. Those that used public transport dropped from 14 percent to 5 percent over the same period (*Ibid.*).
- Between 1975 and 1996, energy consumed by cars increased by 55 percent, an average annual rate of 2.1 percent per annum. (It should be noted that the annual growth rate over the last five years of this period was 3.7 percent). Petrol consumption increased by 23 percent and diesel use increased by 190 percent over this period (*Ibid.*).

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6 All examples are for New Zealand.
This means that as pollution is generally linked to traffic volumes (such as fuel consumption and tyre wear), any increases in vehicle dependency will increase adverse effects. It should be noted that the growth in traffic more than matches the increased efficiency of fuel consumption (Brennand, 2000).

Part 2: The Road Management System

The environmental effects of roads and the worsening trends in vehicle dependency suggest that the current road management system is unable to adequately avoid, remedy or mitigate these environmental effects. The deficiencies (from an environmental perspective) of the current management system are classified under three broad headings: institutional framework, legislative framework, and road pricing. These will be discussed below.

Institutional Framework

*No integrated approach to transport policy*

According to Bührs and Bartlett, environmental policies often fail because they are not comprehensive enough and are instead ad hoc and piecemeal (1993: 9). But these terms can be used to describe the approach adopted by many countries (including New Zealand) towards transport policies intended to reduce adverse effects (Short, 1993: 134).

New Zealand transport policies have been criticised as not having a co-ordinated approach for addressing adverse effects (Mitchell Partnership, 2000: 2). For example, national policies appear to be made without considering their impacts on the environment\(^7\), and national roading authorities (Transit and Transfund) do not appear to give environmental issues due attention\(^8\) (*Ibid.*: 2).

*Inappropriate objectives*

Despite the E2010 Strategy objective (page 1), transport policy has focussed almost exclusively on access and safety issues. Other issues tend to be ignored, such as the environment and community linkages (*Ibid.*: 18, LGNZ, 1999a: 2). This is evident in the main objective for road transport being economic development. But, as Figure 2 shows,

\(^7\)Such as the importation of secondhand cars and tyres.

\(^8\)For example, air emissions do not play a significant role in the selection process for new developments.
economic development means more vehicles are used, so there are higher levels of pollution (May, 1993: 235). The interactions between economic development and adverse environmental effects suggest that any attempt to reduce those effects would necessarily have to affect economic development.

**Figure 2:** Interactions contributing to unsustainability in urban travel.

![Interaction diagram](image)

*Source: May, 1993:235*

An objective of economic development could also be construed as being contrary to the purpose of the RMA, which is concerned with the sustainable management of natural and physical resources (s 5(1)). The roading network is a 'physical resource', so sustainable management of the network is needed to meet the purpose of the RMA (Mitchell, 2000: 4).

*Lack of integration within the roading system*

Road transport policies tend to focus on the relationship between private vehicles and roads,
ignoring public transport and non-motorised forms of transport. For example, public transport was almost entirely removed from discussion in *Options for the Future* (TEC, 1998: 28). Non-motorised forms have suffered a worse fate. According to Boulter, they "have been breathtakingly neglected in so-called 'integrated' transport strategy development. It is common to hear calls for a shift from 'private to public transport' as if the car was the only 'private' transport and public transport the only alternative" (2000: 10). Even TEC, which criticised other documents for ignoring public transport, is guilty of neglecting these modes.

Yet formulating a strategy that deals with these different modes offers an opportunity to explore how they can complement each other. Providing bicycle lockers at train stations, park-and-ride schemes, or carrying bicycles on public transport are ways that could reduce people's dependence on vehicles. These measures are being used in the UK with some success (DETR, 1998), and some of these schemes are beginning to appear within regions of New Zealand. To date, there is no overall national strategy provided by central government, although the MOT stated in July 2000 that the Government was committed to a New Zealand Transport Strategy which would set out to integrate "environmental, economic and social goals" and "to give high priority to transport and its relationship with the environment" (Toleman, 2000).

**Legislative Framework**

There are three main statutes that affect the relationship between roads and the environment. They are the RMA 1991, the Land Transport Act 1998 (LTA), and the Transit New Zealand Act 1989 (TNZA).

**The Resource Management Act**

The RMA is the principal environmental legislation in New Zealand. Its purpose "is to promote the sustainable management of natural and physical resources" (s 5(1)). Sustainable management means, *inter alia*, "avoiding, remedying, or mitigating any adverse effects of activities on the environment" (s 5(2(c)).

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9This includes (but is not limited to) cycling, walking, skateboarding, roller-blading, horse-riding, kayaking etc.

10For example, park-and-ride at Waterloo Station, Upper Hutt, and modifying buses to carry bicycles in Christchurch.
The RMA also provides the framework for local authorities to manage the environmental effects of activities. Their duties include preparing regional policy statements, implementing regional and district plans, considering applications for permits to discharge contaminants into the air and water, undertaking enforcement action, and monitoring the state of the environment (Mitchell Partnership, 2000: 4). Section 43 provides for the establishment of regulations prescribing national environmental standards (Ibid.: 5).

While the RMA has potential to address environmental effects of roads, there are a number of areas where it is deficient.

**Technical issues**

Despite the intentions of the RMA, environmental effects may not be adequately dealt with because the RMA is best suited for large, point-source, and stationary polluters. This means that it does not adequately deal with a large number of small, diffuse, and mobile polluters, so while individual contributions are low, the accumulated effect can be high. This makes it difficult to hold individuals accountable (TEC, 1998: 17). The inability to deal with small, diffuse, and mobile polluters questions the ability of the RMA to deal with environmental effects from transport at all (Brennand, 2000).

**Legislative issues**

Omissions in the RMA further limit its ability to deal with environmental problems. Section 15 (discharges) does not apply to mobile sources, and section 326, which defines ‘excessive noise’, excludes vehicles that are driven on the road (s 326 (1a)). There are no provisions to internalise externality costs. Section 108 allows financial contributions to be made, but this is considered by local government to be too restrictive (Mitchell Partnership, 2000: 4).

**Conflict of interest**

Local government has specific roles and responsibilities under the RMA. They are responsible for managing local roads, but they are also responsible for regulating and controlling environmental effects. This has the potential to cause tension between and within local authorities. While this has not caused any major problems to date, it is not an ideal situation (MfE, 1999: 5).
Cross-boundary issues
Under the current system, there are 75 authorities responsible for the day-to-day management of New Zealand’s public roads\(^\text{11}\). There are also a significant number of private roads (Brennand, 2000). But the effects of transport are often caused by actions taken in other areas, which makes regional effects difficult to address\(^\text{12}\) (Mitchell Partnership, 2000: 6). Solutions should be regionally based, but achieving this is complicated by the number of authorities required to co-operate, and who may have different problem definitions and its solutions.

Land Transport Act 1993
The LTA is intended to promote safe road-user behaviour and vehicle safety, to provide for a system of rules governing road-user behaviour, and covers various technical aspects of land transport. The LTA authorises the making of rules in relation to land transport, including road safety and licensing, and the setting of standards, specifications, restrictions and registrations.

The LTA also allows for the creation of a National Land Transport Strategy (NLTS) and Regional Land Transport Strategies (RLTS) (Ibid: 12). RLTS must have regard for the environment (s 175(2)(b)), and both NLTS and RLTS allow environmental effects to be addressed.

Transit New Zealand Act 1989
The Transit New Zealand Act (TNZA) created two agencies: Transit New Zealand and Transfund New Zealand.

Transit New Zealand
Transit is responsible for the ongoing maintenance and improvement of the state highway system, with the objective of operating a safe and efficient highway system. It is implicit, although not stated directly, that it will operate in accordance with the requirements of the

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\(^\text{11}\)Transit NZ and 74 territorial authorities.

\(^\text{12}\)For example, Auckland traffic has an effect outside of the Auckland area, and traffic originating from the Kapiti Coast or the Hutt Valley creates a problem for Wellington City Council (Brennand, 2000).
Transfund

The Transit New Zealand Amendment Act 1995 established Transfund, which is charged with funding roads and transportation. It distributes funds to Transit and local authorities.

Section 3D of the Transit New Zealand Amendment Act 1995 authorises the funding of efficient roading alternatives (Mitchell Partnership, 2000: 14). However, 3D requires that the alternative project is evaluated against an equivalent roading proposal in terms of benefits to motorists. It will only fund the proportion of that project that represents benefits to motorists. For example, a park-and-ride project at Waterloo Railway Station (Hutt Valley) had a capital cost of $90,000. Benefits to road-users were estimated to be 18 percent of the total benefits. Transfund only funds 18 percent of the capital cost—about $1,800 per annum over the life of the project (Sargent, 2000).

Determining these benefits means that applications have a high transaction cost. The cost of submitting the above application to Transfund was about $4,000. Because of this high transactions cost, it acts as a disincentive for local government to apply for funding. As a result, Transfund is not spending its full Section 3D budget (Ibid.).

Another problem is that Transfund does not explicitly incorporate the environmental effects of its projects into the decision-making process, such as impacts on local air quality or contributions to the greenhouse effect. However, the National Roading Programme must not be inconsistent with RLTS, which must not be inconsistent with regional policy statements (Mitchell Partnership, 2000: 14).

Road Pricing

Road users do not pay the full cost\(^\text{13}\) of their road use

People are generally ignorant of the full cost of their vehicle use. Externality costs (such as the cost of air pollution) are not factored in, and when motorists make decisions over their vehicle use, often the only cost they consider is parking costs. Fixed costs, and even

\(^{13}\)Full costs are considered to include depreciation, insurance, maintenance, fuel, registration and warrant of fitness, parking costs, and externality costs.
variables such as fuel are ignored as they are (normally) not paid on a daily basis (Riertveld & Verhoef, 1997: 294).

Environmental externality costs are estimated to be at least $1.5 billion per year, including pollution and congestion in Auckland (refer page 10). This cost is not borne by motorists, so the full costs of operating a vehicle are substantially higher than what motorists actually pay. According to neo-classical economic theory, reducing vehicle pollution requires the transparent internalisation of externality costs\textsuperscript{14}, and the price should reflect the benefit of using the road\textsuperscript{15} (MfE, 1999: 6; TEC, 1998: 27). The current system does not do this.

Road funding is generated from petrol taxes, road user charges (RUC) for diesels, and local government rates. Of the three, the RUC is the most transparent as it reflects the vehicle's weight and the distance it travels. The petrol tax is semi-transparent as it increases the price of petrol and consequently reflects fuel consumption. However, neither of these measures reflects the full cost of using vehicles. While the distance travelled is roughly proportional to fuel consumption, which is roughly proportional to emissions, vehicle technology and traffic conditions also affect the emission of contaminants, which neither the RUC nor the petrol tax signal to motorists (Matthews et al, 2000: 2).

The least transparent mechanism is rates. Rates are based on property value and vary between local authorities, so they do not reflect the cost of using roads. Through rates, light road users subsidise heavier users. However, an advantage of using rates is that it captures non-motorists such as cyclists and pedestrians (LGNZ, 1999a: 48). Furthermore, communities that benefit from certain projects, such as reduced noise and pollution from a bypassed route, can also be captured by rates (Sargent, 2000). The proportion of funding that rates contribute should be reduced, but not removed entirely for this reason.

\textit{Current pricing regime is inflexible}

The present pricing regime does not reflect the time of travel, the types of roads used, the

\textsuperscript{14}This means that there should be a direct and not hidden charge.

\textsuperscript{15}At the moment, travelling along a congested road costs the same as when it is not congested, aside from time wasted and stress.
location of those roads, or the type of vehicle used \(^{16}\) (RAG, 1997: 24). This means that a
vehicle travelling at peak time on a motorway pays the same per kilometre as someone on a
rural road. If there was some pricing variability, excessive demand for some roads could be
managed. This could be used to reduce congestion and pollution, as motorists would have
an incentive to consider alternative routes, times, or modes of travelling. This is used in the
Central Business District (CBD) of Singapore, where differential pricing has decreased
traffic volumes at particular times (see page 28)(Chin, 2000).

Another problem is that the present pricing system does not easily accommodate different
methods of powering vehicles, such as batteries, solar panels, hydrogen, alcohol, or
compressed air. The RUC and petrol tax would not apply, so a new mechanism would need
to be developed that charged those vehicles for access to the network, maintenance, and
externalities. As mechanisms have not been developed, the monetary benefits of using these
vehicles are not signalled to the market, which acts to stifle innovation (RAG, 1997: 26).
While it is not a major problem now, it is likely to become an issue as alternatives to oil-
fuelled vehicles become widespread.

**Pricing system marginalises public transport**

Public transport users are subject to a direct charge for their patronage, which is paid each
trip (unless concessions are used). In contrast, private vehicle drivers do not normally
consider the costs of operating their vehicle (discussed on page 17). This creates a
perception that private vehicles are cheaper to operate than using public transport which
marginalises public transport. If the full costs of vehicle use were made transparent,
motorists might be more willing to forego the convenience of a private vehicle for public
transport if this option appears to be cheaper.

**Pricing system marginalises alternative forms of freight transportation**

Cross-subsidies within the road transport system exist so road freight is subsidised whereas
rail and shipping are not. The roading infrastructure and its maintenance are provided by

\(^{16}\)With the exception of RUC. However, it is based on the vehicle’s total weight, not engine
size, engine efficiency, technology, age, or any other parameter that would more accurately represent
the vehicle’s contribution to adverse environmental effects. The vehicle’s total weight is only a very
crude measure insomuch as a larger engine size is required, which would increase its contribution to
environmental problems.
ratepayers, taxpayers, and other road-users, whereas shipping and rail infrastructures are provided and maintained by private companies. This cross-subsidisation is ameliorated, but not removed, by the imposition of RUC for heavy vehicles because rates still subsidise road use.

Conclusions

This chapter has outlined the main problems with the current management regime for roads. The main problems identified are:

- Deficiencies within the institutional environment;
- Legislative framework being unable to adequately deal with adverse environmental effects;
- Pricing system being unable to internalise externality costs;
- Subsidisation of road use; and
- Marginalisation of public transport.

These issues must be addressed if an improved outcome is to be achieved, and this is the intention of Chapter 3.
Chapter 3: A New Road Transport Policy

Introduction

The preceding chapter has shown that road transport can cause adverse environmental effects. Furthermore, within the current road management system, there are a number of areas that were identified as unsatisfactory from an environmental perspective. This chapter identifies some policies that, if implemented, would help avoid, remedy or mitigate those adverse effects. While an attempt has been made to be as comprehensive as possible, it is acknowledged that this chapter does not present a full and complete range of possible policies. The policies that have been identified will be used to develop a set of criteria that will evaluate how well the BTBR and LGNZ models avoid, remedy, or mitigate adverse environmental effects.

There are a number of policies available that can be used to reduce adverse environmental effects. According to Goodwin, there is an almost universally accepted approach to transport policy and the environment, based on the ‘carrot’ and ‘stick’ approach. The carrot promotes alternatives to private vehicle use, while the stick discourages vehicle use (1998: 114). Carrots tend to be more politically acceptable, whereas sticks are more effective at actually changing behaviour (Anderson et al., 1998: 284).

The New Zealand Transport and Environment Committee (TEC, 1998: 22) developed a hierarchy that ranks policy in terms of effectiveness in reducing adverse effects. This hierarchy (from best to worse) is:

1. Reduce the need to travel;
2. Encourage the use of low impact means of travel;
3. Encourage the use of a low impact propulsion system; and
4. Improve the efficiency of propulsion.

It should come as no surprise that the most effective policies go to the root of the problem, vehicle dependency, while the least effective (3 and 4) are technical and short-term fixes. However, environmental and transport problems are so complex and interconnected that only a mixture of policies will be effective and acceptable to the public. A balanced strategy
should set standards, move by incentives towards a full costing approach, inform consumers, provide alternatives for them, and integrate transport policy (Ecouncil, 2000: 11).

**Elements of an ‘Environmentally Friendly’ Roads Policy**

**Institutional Structures**

*An appropriate primary objective*

The previous chapter showed why the promotion of economic development only is an inappropriate objective for the roading system (page 12). The literature\(^{17}\) suggests that sustainable transport is a more appropriate objective.

Sustainability means that transport must meet three basic conditions:

1. Its rates of use of renewable resources do not exceed their rates of regeneration;
2. Its rates of use of non-renewable resources do not exceed the rate at which sustainable renewable substitutes are developed; and
3. Its rates of pollutant emission do not exceed the assimilative capacity of the environment (Tolley & Turton, 1995: 352).

Sustainability could be achieved through focussing policies on TEC’s hierarchy (page 20). Reducing the need to travel, for example, could potentially result in all three of the conditions for sustainability being met. But ultimately, achieving sustainability requires changes in lifestyles, vehicle design, land-use and locational decisions\(^{18}\), driver behaviour, choice of travel mode and the length of car journeys (ECMT, 1995: 154). All of these change incrementally over a long period (particularly land-use and locational decisions), so sustainability requires a long-term approach. Furthermore, for transport to be sustainable, policies need to be compatible and contribute to sustainable development, and be politically acceptable (Taylor and Brook, 1998: 72).

Having an objective of sustainability means that authorities are discouraged from delaying responses, relying solely on technical solutions, or implementing inappropriate policies that fail to fully address the problem. Sustainability also promotes a long-term view of transport,

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\(^{17}\)For example, ECMC, 1995; Tolley & Turton, 1995; Walter *et al.*, 1997; World Bank, 1996.

\(^{18}\)An example of a locational decision is choosing a house based on its locations – so it is close to work, school, and other amenities.
as well as ensuring that environmental considerations are taken into account. Consequently, this leads to the development of criterion 1, which is contained in the box below.

1. Road transport's primary objective is sustainability

Reduce demand rather than increase supply

Excessive demand for roads means they quickly become full of vehicles and congested. Attempts to solve this problem have mainly focussed on the supply side of the equation, so new roads are constructed or capacities of existing ones are increased. However, increasing supply simply results in more traffic using the roads, with little effect on reducing congestion (ECMT, 1995: 17). This is shown by the following diagram (Figure 3). Growth in traffic volumes is not consistent with sustainable transport as it increases the consumption of resources and the production of pollution.

Figure 3: The Black Hole Theory of Highway Investment.

It is imperative that any road transport policy should not contain any perverse incentives for increasing roading capacity. Proposed new roads should undergo a rigorous examination of their full benefits and costs, not only for motorists, but also on social, economic, and environmental grounds. Alternatives to new roads, such as enhancing public transport, or improving existing roads to enhance access for non-motorists, should be part of that evaluation.

2. **No perverse incentives for increasing roading supply**

**Integrated transport policy**

Another identified problem with the current management system is that policy-makers tend to focus on the relationship between private vehicles and roads, excluding public transport and especially non-motorised modes (page 12). Instead, authorities should consider the land-use-transport system as a whole, examining alternative modes, how they integrate with each other, and how they relate to land-use development. For example, public transport has a number of strengths which are not shared by non-motorised alternatives (Boulter, 2000: 11). An integrated transport policy would examine how they can be made to complement each other, which if successful, could reduce the degree of private vehicle dependence (for examples, refer page 13).

3. **Integrated approach to land-use-transport policy**

**Reduce fragmentation of roading system**

Seventy-five authorities in New Zealand are responsible for the day-to-day management of our roads. If the number of authorities was reduced, it should lead to more consistent decision-making, and allow regional problems to be addressed within a single agency (see page 15).

Furthermore, there is no reason why state highways should be treated differently from local roads, provided that the state highway is maintained to a national standard. Incorporating both local and state highway roads would allow a more consistent management approach to

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19 For example, the construction of new roads can be justified if they can bring about improvements in sensitive areas or can significantly reduce travelling time. As an example, Oslo built a tunnel under the city that removed 70,000 vehicles a day from the city streets, reducing congestion and improving air quality in that area. Bypasses are also effective at reducing noise and vibrations for neighbouring communities.
problems in the region, and removes the need for extensive co-operation by different authorities.

4. The number of roading authorities is reduced
5. Division between the state highway system and local roads is removed

**Business-like approach for roading authorities**

If full road pricing is to be implemented, and is economically rational, road management needs to be conducted in a business-like manner. This means that the authority is less subject to political pressures, it can manage assets optimally, and ensures that new projects will benefit future generations as well as the current one (TEC, 1998: 27).

A commercial model for roading authorities is inappropriate for road management from an environmental perspective. Companies have a profit-making objective, which means that they have a strong incentive to focus on sources of revenue and ways to increase their profits (*Ibid.*: 32). If revenue is provided by vehicles, then increasing profitability means encouraging more vehicles to make more trips on more roads. Suffice to say, this will not reduce adverse environmental effects.

Furthermore, non-paying users of the road system would tend to be marginalised, and environmental objectives and community aspirations would be undermined unless they affected profits. Environmental externalities are also likely to be ignored as they might reduce the company's profits, unless the company had a mandate to incorporate externality costs. This would suggest that road authorities that operate under commercial conditions would increase adverse effects rather than reduce them.

6. Roading authority should be subject to a business-like approach, but not a commercial model

**Policies to Reduce Demand**

*‘Carrots’*

**Questioning the need to travel**

Questioning the need to travel is considered to be one of the most effective policies for reducing environment impacts (*Ibid.*: 22). Incentives should be provided that encourage people not to use their vehicles.
There are a number of ways that people can be encouraged not to travel. For example, incentives that encourage people to work at home eliminates the need to commute each day. Internet shopping can also reduce the need to go out. These, and other measures, should be promoted using education or incentives such as tax breaks or lower ACC premiums, or subsidies for home office equipment.

7. Contains incentives that encourage people not to travel

Land-use design is another important tool in reducing vehicle trip numbers. Studies have found that low-density cities exhibit higher patterns of fuel consumption than high-density ones (Newman and Kenworthy, 1991).

One land-use design approach would be to encourage centralisation over dispersal. For example, locations of buildings such as hospitals, shopping centres, large employers – all of which are major travel generators – could be controlled (Bendixson & Whitelegg, 1993: 177). In Wellington, a deciding factor for the location of the Westpac-Trust Stadium (the ‘cake tin’) was the stadium’s proximity to the central railway station and bus terminal. This strategy should be promoted for other major buildings that could generate large amounts of traffic.

But the usefulness of a centralisation strategy is debatable. Bendixson and Whitelegg believe that centralisation, although it increases public transport patronage, also results in congestion and higher vehicle emissions. They cite the example of the decentralised city of Milton Keynes in the UK, which despite its dispersal and higher than average vehicle usage, has lower than average fuel consumption and vehicle emissions (averages are for the UK). This is due to higher average speeds than other areas (1993: 177).

But regardless of the approach taken, land-use design requires long-term strategies for areas, with its effects being evident in the future rather than immediately.

Controlling parking is a land-use tool that has a more immediate effect. Parking can control vehicle use in cities through manipulating parking prices, availability, and the length of stay (Tolley & Turton, 1995: 188).
Public transport

Public transport provides an alternative to using private vehicles. It provides mobility to those that choose not to drive, or are unable to do so. In New Zealand, around 10 percent of the population do not have access to cars (Bus and Coach Association, 1999: 3).

Developing a comfortable, convenient, and efficient public transport system is necessary if demand measures (sticks) are introduced, as it allows people to substitute public transport for vehicle use. Improving public transport has been a common policy response to congestion in many cities, but reductions in vehicle use tend to be small and short-lived (ECMT, 1995: 103). Despite this, community investment in the public transport system is seen as necessary to restrain vehicle use, as public transport offers an alternative form of transportation, and helps make more effective, but less popular policies more palatable to the public.

Therefore, public transport investment should occur before any sticks are introduced. This will provide an alternative mode of transport for those willing to give up their cars, and will help allay any opposition to new and controversial policies.

To achieve this, the way that public transport is funded needs to change. Section 3D of the Transit New Zealand Amendment Act has already been identified as having high transaction costs, with the result that the full budget is not being used (page 16). Therefore, Section 3D should be amended and funding should be allocated directly to regional councils to avoid this transaction cost. Congestion pricing (discussed on page 29) also provides a source of revenue that can be invested into public transport.

Community investment should focus on improving the efficiency, standard, and speed of public transport. Land-use measures such as high-occupancy-vehicle lanes and other dedicated routes increases the attractiveness of public transport as the space for other vehicles is reduced (and consequently their speed), while public transport has an 'express-lane'. Improving the frequency of services, introducing new routes, and making it more comfortable can also attract new users.

8. Alternatives to road use are promoted
9. Development of the public transport system should receive adequate funding prior to road pricing measures being introduced
Information and education

An environmentally-focused road management system requires public acceptance and cooperation for it to be successful (Anderson et al., 1998: 267). But even if people were aware of the environmental effects caused by transport, most would not have specific information on how they are personally affected or how they could individually increase or decrease the effects (Ibid.).

Introducing road charges can help educate people on the financial consequences of their travel (see below). But there are other educational tools that can be used. Singapore uses road-side displays to inform people about the estimated time to particular destinations. This educates drivers on the level of congestion as well as enabling them to select alternative routes (personal observation). Other useful information includes tips on buying a fuel-efficient vehicle and driving efficiently. EECA currently uses their website to display this information20, but using it in other media would reach a much larger audience.

Education can be designed to change behaviour, so road authorities should be encouraged to undertake such campaigns. This is not only important in setting up some of the more controversial elements (such as road pricing), but can also be used as an instrument in its own right.

'Sticks' – Economic Incentives

Road pricing

If demand for roads is to be reduced, there should be a system that discourages people from using roads. Making drivers pay the full costs of their road use through road pricing is a way of achieving this.

Road pricing seeks to correct a form of market failure (externalities) by manipulating the price of a good – using taxes, charges, and subsidies. It is based on the principle of 'user-

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20 www.eeca.govt.nz
pays’, where the beneficiaries of a resource should pay for it (Tietenberg, 1994). This payment should not only include economic costs (like maintenance), but it should also include an extra charge to compensate society for externality costs. In other words, the total cost to the user should not only include the private marginal cost (the costs of running a car) but also the social marginal cost (the costs to society of the pollution created). Imposing a charge would increase the price and, according to the theory of supply and demand, will decrease the quantity of roads demanded. Consequently, pollution levels should decrease.

Because road pricing is a ‘direct, in-your-face’ cost (TEC, 1998: 29), it allows drivers to make informed decisions on the type of transport used, the route taken, the time of day, and whether they would be better off not making some trips at all (MfE, 1999: 8).

As people become aware of the costs of travelling by private motor vehicle, alternative forms of transportation begin to look more attractive. Some drivers would be prepared to forego the convenience of vehicles so that their costs are reduced. This worked successfully in Singapore, where traffic entering the CBD was reduced by between 21 and 27 percent after electronic road pricing was introduced (see Figure 4 below)(Chin, 2000: 8).

**Figure 4:** Change in traffic entering the CBD after the introduction of Electronic Road Pricing.

![Bar chart showing change in traffic](image)

*Source: Chin, 2000: 8.*
However, road pricing is not a perfect solution. It attracts high levels of public opposition, and is a regressive tax. Despite these problems, road pricing has enormous potential in substantially reducing adverse environmental effects.

Road pricing can be used to differentiate between the type of roads and the time of travel by using congestion pricing. This is used to manage excessive demand for some roads by charging motorists for using a particular road at a particular time. It encourages motorists to select an alternative route or time to travel, use public transport or other alternatives, or not make the trip at all. As there would be fewer vehicles using the road, there would be fewer emissions and less time wasted in congestion. For example, Singapore uses differential charges for access to the CBD depending on the time of day. As Figure 5 shows, travelling during peak times attracts a higher charge than at other times (Chin, 2000: 7).

**Figure 5:** Road Pricing Charges for the CBD under Electronic Road Pricing (ERP) [Ignore ALS].

![Road Pricing Charges for the CBD under Electronic Road Pricing (ERP) [Ignore ALS]](image)

*Source: Chin, 2000: 7.*

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21 In Hong Kong, despite road pricing being successful, local politics prevented it from becoming permanent policy (Tietenberg, 1994).

22 As poorer people would pay a higher proportion of their income in road charges than richer ones – although the argument could be made that the poor cannot afford cars anyway.
Road pricing can also be used to differentiate between the types of vehicles and the fuels they use. Less fuel-efficient vehicles should be subject to higher costs than more efficient ones, which would encourage the purchase of fuel-efficient vehicles. Even though this already occurs somewhat through higher fuel costs, adding a ‘pollution-levy’ to vehicles such as four-wheel-drives and older models will highlight the disproportionate contribution that these vehicles make towards pollution.

Using alternative fuels should be rewarded through road prices that reflect the different effects these fuels have on the environment.

‘Sticks’ – Regulatory Control
Regulations should be introduced that place standards on vehicle emissions and sets objectives for pollution levels. Many areas have employed emission controls to reduce air pollution, such as Ontario (Canada), which improved its air quality partially because of emission controls. Actions they took include:

- Vehicle emission testing. Vehicles that fail must be repaired and retested. The programme is estimated to reduce pollutants by 22 percent;
- The ‘Smog Patrol’ targets heavy polluters and issues tickets; and
- The ‘Smog Rover’ – a van that identifies polluting vehicles and educates the public on air quality (Ministry of the Environment, 1999: 2).

Other standards and regulations that could be used are:

- Vehicle efficiency standards (such as streamlined design, lighter vehicles);
- Requiring diesel vehicles to have ‘idling control’. This switches off the engine when the vehicle is stationary or coasting, and restarts it at a touch of the accelerator. It is estimated to reduce fuel consumption by up to a third in city driving conditions, but costs around £1000 to install (RCEP, 1995: 132); and
- Catalytic converters.

This is by no means the full list of regulatory policies. Instead, they illustrate the range of
options that may be appropriate to implement. What is important is that authorities have the ability and the will to implement these controls as they see fit.

16. Regulations and standards are used

Community Influence
Communities\(^\text{23}\) consider roads to be assets. Roads provide the community with mobility, but the community also has different and often conflicting aspirations that should be incorporated into decision-making. These include safety, environmental, economic and social concerns, and often affect the local, rather than the national level.

17. Authority recognises and incorporates community aspirations into road management

Conclusions
This chapter has outlined policies that, if introduced, have the potential to avoid, remedy, or mitigate adverse environmental effects of roads. It is important to realise that not all of the options for reducing environmental effects have been identified. Rather, authorities should be permitted and encouraged to use a wide range of instruments instead.

A list of criteria was developed that will be used to evaluate the BTBR and LGNZ models in Chapters 4 and 5. This list is contained in Table 2 below.

Table 2: Full list of criteria

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Road transport's primary objective is sustainability</td>
</tr>
<tr>
<td>2</td>
<td>No perverse incentives for increasing roading supply</td>
</tr>
<tr>
<td>3</td>
<td>Integrated approach to land-use-transport policy</td>
</tr>
<tr>
<td>4</td>
<td>The number of roading authorities is reduced</td>
</tr>
<tr>
<td>5</td>
<td>Division between the state highway system and local roads is removed</td>
</tr>
<tr>
<td>6</td>
<td>Roading authority should be subject to a business-like approach, but not a commercial model</td>
</tr>
<tr>
<td>7</td>
<td>Contains incentives that encourage people not to travel</td>
</tr>
<tr>
<td>8</td>
<td>Alternatives to road use are promoted</td>
</tr>
<tr>
<td>9</td>
<td>Development of the public transport system should receive adequate funding prior to road pricing measures being introduced</td>
</tr>
</tbody>
</table>

\(^{24}\)A definition of community is provided in Appendix 1.
10. Section 3D funding is allocated to regional councils to administer

11. Congestion charges should be used to fund public transport

12. Information and educational campaigns are used

13. Direct road pricing used

14. Congestion pricing available as a demand management tool

15. Road pricing structures reflect type of vehicle and fuel used

16. Regulations and standards are used

17. Authority recognises and incorporates community aspirations into road management
Chapter 4: Critique of the BTBR & LGNZ Models

Introduction
This chapter addresses Objective 3 by describing how each model reduces the effects of roads on the environment, and evaluates their potential effectiveness. It uses the criteria framework developed in Chapter 3 to identify how each model would avoid, remedy, or mitigate adverse environmental effects and to determine its effectiveness. It begins with a summary table (Table 3) which shows how each model performs against the criteria, with a more in-depth discussion following.

Criteria Framework
This section examines the two models against the criteria framework developed in Chapter 3. It outlines each criterion, and then evaluates the two models against the criterion in two columns, with BTBR on the left and LGNZ on the right. Faces represent whether the criterion is met or not. A green smiling face (ienia) indicates that the criterion has been met, whereas a red frowning face (ienia) indicates that it has not. If it meets the criterion to a certain extent, a blue indifferent face is used (ienia). These symbols are also used in the summary table below (Table 3).

Table 3: Performance of models against criteria framework.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>BTBR</th>
<th>LGNZ</th>
<th>Refer page:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Road transport’s primary objective is sustainability</td>
<td>✅</td>
<td>✅</td>
<td>21, 34</td>
</tr>
<tr>
<td>2 No perverse incentives for increasing roading supply</td>
<td>✖️</td>
<td>✅</td>
<td>22, 35</td>
</tr>
<tr>
<td>3 Integrated approach to land-use-transport policy</td>
<td>✖️</td>
<td>✅</td>
<td>23, 35</td>
</tr>
<tr>
<td>4 The number of roading authorities is reduced</td>
<td>✅</td>
<td>✖️</td>
<td>23, 36</td>
</tr>
<tr>
<td>5 Division between the state highway system and local roads is removed</td>
<td>✖️</td>
<td>✅</td>
<td>23, 36</td>
</tr>
<tr>
<td>6 Roading authority subject to a business-like, but not a commercial model</td>
<td>✖️</td>
<td>✅</td>
<td>24, 37</td>
</tr>
<tr>
<td>7 Contains incentives that encourage people not to travel</td>
<td>✖️</td>
<td>✖️</td>
<td>24, 37</td>
</tr>
<tr>
<td>8 Alternatives to road use are promoted</td>
<td>✖️</td>
<td>✅</td>
<td>26, 37</td>
</tr>
</tbody>
</table>
Development of the public transport system should receive adequate funding prior to road pricing measures being introduced

Section 3D funding is allocated to regional councils to administer

Congestion charges should be used to fund public transport

Information and educational campaigns are used

Direct road pricing used

Congestion pricing available as a demand management tool

Road pricing structures reflect type of vehicle and fuel used

Regulations and standards are used

Authority recognises and incorporates community aspirations into road management

<table>
<thead>
<tr>
<th>Criterion 1: Road transport’s primary objective is sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BTBR</strong></td>
</tr>
<tr>
<td>The Draft Roads Bill indicated that the Act, when introduced, was to “ensure that the road system contributes the maximum benefit at minimum cost to the New Zealand economy as a whole, in a way that is consistent with sustainable development”. But because economic efficiency is given greater emphasis than sustainable development, efficiency is seen as the primary objective, with sustainable development as the secondary one. This is not consistent with the criterion.</td>
</tr>
<tr>
<td>It is unlikely that road companies would be interested in sustainability as it might affect profitability (Andrews et al, 1999: 28). This further erodes the importance</td>
</tr>
</tbody>
</table>

| **LGNZ**                                                     |
| There is no primary objective on which the LGNZ model is based. Instead, it uses seven principles, which include the recognition of polluter-pays (principle 3), the integration of the transport system (4), and environmental externalities (5) (LGNZ, 1999b: 1). These principles are consistent with the concept of sustainability, but it is not explicitly mentioned. This omission means that LGNZ also does not fully meet this criterion. |
| **Meets criterion 1?**                                   |
| ☺️                                                             |

34
of this objective in the management regime.

Meets criterion 1? 😞

**Criterion 2: No perverse incentives for increasing roading supply**

**BTBR**
Under the commercial model, the only way that roading companies can increase their revenue is through building new roads (Andrews et al., 1999: 37). As they are driven by a profit-making motive, there is an incentive to increase the capacity of the roading network.

Meets criterion 2? 🎨

**LGNZ**
The LGNZ model does not contain any perverse incentives to increase roading supply. There is no link between revenue raising and increasing the roading supply, and there are no profit-making objectives.

Meets criterion 2? 😊

**Criterion 3: Integrated approach to land-use-transport policy**

**BTBR**
BTBR intends to achieve an integrated approach to transport policy through a National Transport Statement, which would achieve, *inter alia*, the integration of transport with other agencies. This would set out the “Government’s broad policy objectives, and the outcomes that the Government seeks to achieve through these objectives, covering the transport sector overall” (MOT, 1999: 54).

However, the commercial focus of the model reduces the potential for policy integration to occur. The emphasis on commercial returns from road-users means that there is an incentive to margin-

**LGNZ**
LGNZ uses the National Land Transport Strategy (NLTS) to co-ordinate transport and the wider policy initiatives of Government. Regional Land Transport Strategies (RLTS) would be used to integrate different modal forms and land use/transport integration issues (LGNZ, 1999a: 42-43).

Meets criterion 3? 😊
alise other forms of transportation. This undermines its ability to achieve an integrated approach to transport (Brennand, 2000). Therefore, it fails this criterion.

Meets criterion 3? ☒

Criterion 4: The number of roading authorities is reduced

**BTBR**

Road management will be transferred from 75 authorities to between five and nine roading companies, including Transit New Zealand.

Meets criteria 4? ☕

**LGNZ**

LGNZ does not indicate the number of roading entities that will be created. However, they expect the number to be a ‘significant reduction in the current number’ (LGNZ, 1999a: 39). The integration of the state highway system with local roads will permit a greater number of roading entities than what BTBR proposes (*Ibid.*: 40).

Meets criteria 4? ☕

Criterion 5: Division between the state highway system and local roads is removed

**BTBR**

Under the BTBR proposal, Transit New Zealand retains control of state highways (MOT, 1999: 7). No justification for this division is given.

Local roading companies are required to negotiate with Transit if they wish to introduce road or congestion charges.

Meets criterion 5? ☒

**LGNZ**

Transit would be disestablished. However, these roads would be maintained to a consistent standard through the Minister of Transport having oversight for the maintenance of Crown-owned roads, and performance agreements between local authorities and the Crown (LGNZ, 1999a: 41). The day-to-day management of the state highway system will be undertaken by the local roading entity. National objectives for strategic roading links would
 Criterion 6: Roading authority subject to a business-like approach, not a commercial model

**BTBR**
Road companies are set up using the commercial model. Their main objective is “to operate as successful businesses in the provision of roads and road-related services” (MOT, 1999: 22). As they are driven by a profit-making motive, BTBR fails to meet this criterion.

**Meets criterion 6? 🚫**

**LGNZ**
Roading entities are not subject to a commercial approach, but are run under business-like conditions. They are accountable to a board of directors or a joint committee, with local authorities as the shareholders.

**Meets criterion 6? 📢**

Criterion 7: Contains incentives that encourage people not to travel

**BTBR**
The BTBR proposal does not contain any incentives that discourage travel. On the contrary, as revenue can be raised from increasing road use, there is an incentive to encourage travel (Andrews et al, 1999: 28).

**Meets criterion 7? 🚫**

**LGNZ**
Likewise, the LGNZ model contains no mention of measures that encourage people to remain at home. However, there are no perverse incentives for the entity to encourage increased road use.

**Meets criterion 7? 📢**

Criterion 8: Alternatives to road use are promoted

**BTBR**
Roading companies have no or only a weak incentive to promote alternatives to road use. As it could be seen as competing for road use, companies may discourage the use of alternative transport modes (ARC, 1999: 22). Furthermore, as non-

**LGNZ**
The LGNZ model does not discuss where the responsibility for promoting alternative modes of transportation lies. However, there are indications that alternatives will be promoted because congestion pricing revenue would be used to fund investment
motorists do not pay for their road use, companies may fail to meet their needs (Ibid: 10).

This means that alternatives to road use are marginalised under the BTBR proposal. Moreover, companies have control over amenities on the on-carriageway, including bus and high-occupancy-vehicle lanes, bus stops and cycle lanes, so it is possible that these services could be under-provided, as they might undermine profitability if they are successful.

Meets criterion 8? ☑

Criterion 9: Development of the public transport system should receive adequate funding prior to road pricing measures being introduced

**BTBR**

There is no discussion whether extra development of the public transport system will occur prior to road pricing, unless there are increases under Section 3D. It assumes that public transport is able to cope with demand increases (ACC, 1999: 26).

Meets criterion 9? ☑

**Criterion 10: Section 3D funding is allocated to regional councils to administer**

**BTBR**

Under BTBR, Transfund no longer distributes alternative transport funding. Instead, regional councils would collect an

in alternatives to private vehicles.

RLTS can be used to reflect the community’s aspirations for public transport, which the roading entity must not act inconsistent with (LGNZ, 1999a: 43).

Meets criterion 8? ☑

**LGNZ**

Likewise, there is no indication that suggests that the public transport system would receive extra funding.

Meets criterion 9? ☑

Under the LGNZ model, a “proper and realistic system for funding alternatives is developed”, which does not just focus on
annual regional public transport levy from road companies and other road service providers. The amount that regional councils can raise is capped at the Section 3D level ($43.1 million per annum) until a methodology that determines benefits to motorists is established (MOT, 1999: 37). Rates are still available for regional councils to use.

However, this still limits the ability of regional councils to raise funding for public transport (outside of rates). The levy is still based on the benefits to motorists (Draft Roads Bill, 1998, s 56(1)). However, public transport and other alternatives to road use have a number of social, economic, and environmental benefits accruing to the whole community, not just to motorists, which are not taken into account.

While it does not discuss Section 3D, the methodology appears similar to the current Section’s requirements. This may still impose large transaction costs on councils.

Meets criterion 10? ❓

Criterion 11: Congestion charges should be used to fund public transport

BTBR

Revenue from congestion pricing is not available to fund public transport. Any revenue raised must be offset by decreas-

LGNZ

Under the LGNZ model, the levy imposed on roading entities can be complemented by revenue raised from congestion pricing.
ed costs elsewhere.

Meets criterion 11? ☺

Criterion 12: Information and educational campaigns are used

**BTBR**

There is no discussion on whether information and educational campaigns will be used as a road management tool. Road companies do not have an educational role.

Meets criterion 12? ☺

**LGNZ**

Likewise, there is no discussion of the role of education and information in road management.

Meets criterion 12? ☺

Criterion 13: Direct road pricing used

**BTBR**

BTBR uses a ‘user-pays’ system which is very similar to the current regime. Rates no longer contribute, and revenue is instead raised from:

- RUC increases for heavy vehicles and light diesel vehicles;
- Increased fuel excise duty on petrol, CNG and LPG (called ‘road user levy’); and
- Possibly introducing an ‘area road use levy’ on petrol, CNG and LPG, or a vehicle levy collected with the motor vehicle licensing fee (or both).

While this is a step towards user-pays, it is not direct road pricing as environmental externalities are not taken into account. Furthermore, this represents only a slight

**LGNZ**

LGNZ proposes changes that would move the current system to a more user-pays basis. They include:

- Introduction of electronic pricing for heavy vehicles;
- Tolls and congestion pricing;
- Use of vehicle registration fees to penalise heavy consumers of fuel;
- Introduction of differential fuel levies in areas where externalities are at ‘problem’ levels; and
- Abolishment of the fuel excise tax.

This is much closer to the direct pricing ideal, but as rates still make up a proportion of funding, there is still an indirect pricing element to it (LGNZ, 1999a: 48).

This may not necessary be bad, as rates ensure that non-motorist users contribute
modification of the current pricing regime, which has already been identified as defective (page 17).

BTBR uses an ‘opt-out’ clause to introduce competition, so motorists are able to choose how they pay for their road use. Instead of paying RUC and levies, they can pay for their road use by either directly contracting with the company or through an intermediary (MOT, 1999: 38).

Meets criterion 13? 😊

Criterion 14: Congestion pricing available as a demand management tool

**BTBR**
Under BTBR, congestion pricing is available to road companies as a demand management tool. However, they need to negotiate with Transfund, intermediaries offering alternative payment options, and road-users that had separate arrangements with the company. Negotiating with these parties will impose a transaction cost. Although the size is unknown, if it is significant it will pose a barrier for introducing congestion pricing.

Meets criterion 14? 😊

**LGNZ**
LGNZ uses congestion pricing as a demand management tool. Amendments would be made to the Local Government Act and the LTA to ensure that demand-control mechanisms are available to local roading entities (LGNZ, 1999a: 47).

Meets criterion 14? 😊

Criterion 15: Road pricing structures reflect type of vehicle and fuel used

**BTBR**
There is little difference in the way that BTBR’s pricing structures reflect the type

**LGNZ**
The LGNZ model uses vehicle registration fees to penalise vehicles known to be hea-
of vehicle and fuel used, and the current situation. RUCs are still applicable to diesel vehicles based on weight, and petrol, CNG, and LPG vehicles are subject to fuel excise duties and other levies. These levies would be collected at the same time as the registration fee. However, page 17 has already indicated that these mechanisms lack transparency and are not direct enough. Furthermore, there is no indication that pricing structures would be based on fuel-efficiency, or how the pricing structure would reflect the use of alternative fuels.

Meets criterion 15? ✗

Criterion 16: Regulations and standards are used

**BTBR**

Under BTBR, the RMA is amended so that discharges from single vehicles are covered. This means that regional councils would have the ability to hold companies responsible for the combined discharges to air from vehicles using their roads (MOT, 1999: 46). If this is coupled with a discharge standard, air quality problems may be resolved (LGNZ, 1999a: 32).

Noise is also provided for in the model.

**LGNZ**

LGNZ also uses amendments to the RMA to address environmental issues, specially for discharges and noise (LGNZ, 1999a: 50). It does not discuss whether the RMA is a suitable instrument for addressing environmental issues, and does not acknowledge that the RMA is not particularly effective in dealing with mobile sources.

The LGNZ model also makes no mention

vy consumers of fuel (LGNZ, 1999a: 47). However, because it is an annual or biannual event, it does not represent a direct 'in-your-face' charge. Furthermore, it also does not penalise vehicles that are moderate, rather than heavy consumers of fuel. One might expect the proportion of these vehicles to be higher than heavy consumers, and so the accumulated effect of those vehicles would be higher.

There is no indication that there will be differential pricing based on the type of fuel. The model does not suggest that vehicles that run on non-petroleum products would be rewarded though lower prices, although this possibility cannot be excluded.

Meets criterion 15? ☑
The RMA would also be amended to include noise, and a national noise standard would be created.

However, BTBR does not discuss the ability of authorities to impose technical standards on vehicles, nor whether the RMA is able to achieve the desired outcome.

Meets criterion 16?

Criterion 17: Authority recognises and incorporates community aspirations into road management

**BTBR**

Corridor Management Agreements (CMAs) are used to facilitate community involvement with roading companies. These are between the company and local authorities, and link the management of the corridor to the plans and operations of the local authority (MOT, 1999: 52). Other mechanisms that communities can use are through the RMA (such as district plans), and by commenting on the company’s Statement of Intent (Ibid.).

However, these mechanisms only weakly link the company with the community, and incentives exist that suggest that the community’s aspirations will be marginalised by the company if it impacts on profits (ARC, 1999: 10; Andrews et al., 1999: 20). Furthermore, as the management of technical standards being imposed on vehicles, nor is there any discussion on authorities’ ability to impose those standards.

Meets criterion 16? 🚫

**LGNZ**

Roading entities will be owned or governed by groups of local authorities, and would be required to act under the terms and conditions set out in a CMA. In setting up roading entities, one of the principles to be adhered to is the “consistency with communities of interest and the wishes of local inhabitants” (LGNZ, 1999a: 39).

CMAs are used by the roading entities to manage competing interests of road users and to explain how the entity will meet those needs (Ibid.: 44). Consequently, they are the key mechanism for ensuring community input into the management of their roads.

NLTS and RLTS would be used to bind
the road system is subject to a test of reasonableness (s 151(2) Draft Roads Bill 1998), it becomes difficult to require road companies to provide for community interests, as a weight of evidence is required. In addition, there is a great inequality of resources between the road company and community groups (Ibid: 21), so relying on the court system to resolve issues between companies and the community would tend to be biased towards the road company.

**Meets criterion 17?**

**Conclusions**

This chapter highlighted the differences between the BTBR and LGNZ models, and evaluated how well they performed against the criteria framework developed in Chapter 3. Table 3 (page 33) provides a summary of their performance, and based on this, the ‘better’ model will be identified and its limitations addressed in the following chapter.

local authorities, roading entities, and the Crown. The NLTS will address:

- The role of transport in contributing to economic growth and social cohesion;
- Maintenance of the network and the definition of a set of national standards for roads; and
- The co-ordination of transport and the wider policy initiatives of central government (Ibid: 42).

The RLTS would provide entities with a statement on how communities want their transport system to evolve. This provides the entity with information on community values and transport aspirations, particularly with respect to demand management, environmental externalities, modal integration, and land use and transport integration issues. The entity cannot act inconsistent with the RLTS (Ibid: 43).

**Meets criterion 17?**
Chapter 5: A New Road Transport Model

Introduction

This chapter addresses the final objective of this report by identifying which model, if either, best avoids, remedies, or mitigates adverse environmental effects. It also recommends modifications to the preferred model which may further reduce adverse environmental effects.

The ‘Better’ Model

From the preceding chapter (particularly Table 3 (page 33)), it is apparent that neither of the two models are fully able to avoid, remedy, or mitigate adverse environmental effects as each fails some of the set criteria. For example, BTBR contains an incentive that encourages new roads to be build, and the LGNZ model fails to penalise moderately fuel-inefficient vehicles.

Although the LGNZ model has its weaknesses, it still outperformed the BTBR model as measured against the evaluative criteria. It met eight of these criteria, partially met five, and failed four. BTBR met only one, partially met three, and failed thirteen. So, as measured against the criteria framework, the LGNZ model of Streets Ahead fully lives up to its name, and is superior to BTBR in how it avoids, remedies or mitigates adverse environmental effects.

However, as the LGNZ model failed four of the criteria, and only partially met five, it is not an ideal model from an environmental perspective, and it can be improved upon. This is what the reminder of the chapter focusses on – developing a new model that meets all of the criteria. This model proposes changes to institutional structures by creating new transport authorities and changing the roles and responsibilities of existing agencies. Road pricing forms a central part of this model, and is complemented by the use of other instruments, particularly by encouraging the use of alternatives to private vehicles, and by education, and regulations. It also evaluates whether these changes are politically feasible. Recommendations are made at the end of the chapter.
The RTA Model

Creation of Regional Transport Authorities

Regional transport authorities (RTAs) represent the major change being proposed under the new model. RTAs would be responsible for transport within a specific region, and would amalgamate the functions that are currently being performed by regional councils, local territorial authorities and Transit New Zealand. They would have the following features:

- RTAs would be responsible for all transport matters (excluding aviation but including marine and rail) within their jurisdiction. They would also be responsible for other transport infrastructure such as bus and train terminals, and car parks at stations. This will promote an integrated approach to transport management (meets Criterion 3). RTAs would be responsible for both local and state highway roads (meets Criterion 5).
- RTAs would have the same jurisdiction as regional councils. This would provide an area large enough for the RTA to take advantage of economies of scale, and would allow regional problems to be addressed. This would reduce the problem of institutional fragmentation (meets Criterion 4).
- The main objective of an RTA would be to achieve sustainable transport. Other objectives may be pursued if they meet the community’s aspirations and are not inconsistent with sustainable transport (meets Criterion 1).
- The RTA would be run according to business principles, but it will not have a profit-making objective. This is necessary for the rational implementation of road pricing (meets Criterion 7).
- The authority would be mandated to promote alternatives to vehicle use, and would be required to undergo a rigorous examination of all benefits and costs when considering to increase the roading capacity (meets Criteria 2 & 8).
- The RTA will be run by an elected board of directors who would be required to respond to community needs (meets Criterion 17).
- The authority would have to develop Regional Land Transport Strategies in consultation with the community. This document would provide the authority with guidance as to how the community wants its roads to be managed, and the future direction of the roading network (meets Criterion 17).
- The RTA is responsible for setting road pricing and for collecting revenue. Road pricing can only be implemented after consultation with the community (meets...
Criterion 13).

- The RTA has the ability to implement demand-management measures. Congestion pricing can only be used on roads for which a viable alternative is available. Revenue raised from congestion pricing must be reinvested into the public transport scheme, into improving roads that facilitate pedestrian and cyclist access, or by building roads that meet environmental, social, and economic criteria (such as a community bypass) (meets Criteria 11 & 14).

**Road Pricing**

Regional transport authorities would be responsible for road pricing. Electronic road pricing would be used, but until all vehicles are fitted, a modified RUC will be used. Road prices would reflect the distance travelled, the size of the engine and its efficiency, the weight of the vehicle and the type of fuel used. The introduction of road pricing will result in the removal of the fuel excise tax and the reduction in the amount that rates contribute to road funding (meets Criteria 13 & 15).

Before road pricing can be implemented, the public transport system should be further developed and other alternatives to the private vehicle should be promoted. Funding for this would come partially through changes in the way that Section 3D of the Transit New Zealand Act funds alternatives to motorised vehicles. Instead of regional councils applying for funding, funds will be allocated directly to RTAs (meets Criteria 9 & 10). Until RTAs are established, funding would be allocated directly to regional councils instead.

**Ministry of Transport**

While RTAs would be responsible for the day-to-day management of the transport network, there is a role for a national institution. The most appropriate agency is the MOT, which would have the following functions:

- Setting national standards for vehicles (in conjunction with MfE);
- Vehicle emission and tuning standards (meets Criterion 16);
- Developing the National Land Transport Strategy;
- Developing a national strategy for alternative fuels;
- Developing a national strategy for alternatives to motorised vehicles;
- Ensuring that the former state highway system is maintained to a consistent standard;
• Investigating national standards for road pricing, and ensuring that the implementation of electronic road pricing is technically compatible between different RTAs;
• Identifying, as far as practical, the full cost of vehicle operation (which road pricing would reflect); and
• Auditing RTAs.

EECA
EECA will continue to have their educational and promotional role. They would be responsible for:
• Promoting efficient driving techniques and other means to reduce fuel consumption;
• Promoting tele-working; and
• Promoting (or subsidising) the use of alternative fuels (such as CNG, LPG, alcohol, water etc) (These meet Criteria 6 & 12).

Pilot Studies to be Used
It is difficult to state categorically what impact road pricing will have on congestion, pollution levels, volumes of traffic on alternative routes, and public opinion, so it would be useful to initiate a pilot study before road pricing is adopted nationally. The Wellington region would be an ideal place to conduct a study as commuter travel is concentrated along two main roads and there is an extensive public transport system.

The pilot study should be undertaken in stages. The first step involves fitting electronic pricing devices to government and local government vehicles in the region. This would provide information on technical issues with setting up electronic pricing. The second step involves fitting the devices to commercial vehicles. The third and final stage involves fitting all private vehicles. This should be undertaken at the same time as the annual warrant of fitness.

Environmental Regulation
The RMA is New Zealand’s principal piece of environmental legislation, but it has been identified as not being able to avoid, remedy or mitigate problems caused by mobile, diffuse, and small sources of pollution (such as vehicles) (page 14). Consequently, there needs to be
an investigation into determining whether this is the best instrument for transport-related
effects, or whether another Act (such as the LTA or a new one) is more appropriate. The
Act would needs to incorporate noise and emissions from vehicles.

**Political Feasibility**

Ultimately, the success of any new road management system relies upon public and political
approval. However, road pricing, which forms a central part of the RTA model, is an
unpopular measure. Studies overseas have shown that the prospect of road pricing is
unpopular (Güller, 1999). It was abolished in Hong Kong because of public opinion
(Tietenberg, 1994), and a recent survey in Auckland revealed that road pricing would be
equally as unpopular (Matthews et al., 2000: 16).

The present Government also opposes road pricing in the absence of alternatives to private
road transport. According to the current Prime Minister, “roading pricing could only be fair
to motorists and be fully effective if a reasonable alternative is available” (Clark, 1999). So,
given this position, it is not reasonable to expect some support for road pricing if alternatives
were developed beforehand. However, if the public was firmly opposed to road pricing, it
would be extremely unlikely for the Government to adopt it, particularly if its timing was
close to a general election.

Other features of the RTA model are more likely to find favour with the current
Government. Labour has said it intends increasing the amount of funding for public
transport by $20 million per year (*Ibid.*), and proposes ‘regional clustering’ of local
government’s roading responsibilities (Labour, date unknown). This is similar to the RTA
model, however, the extent to which this will encompass the functions of RTAs is unknown.

Overall, some political resistance can be expected to particular elements of the RTA model
— especially the key one of road pricing. This opposition could be ameliorated with public
transport and other alternatives being developed before its introduction, and more debate on
the matter could serve to inform people of its advantages, such as being a zero-sum game for
the economy in the long-term.
Recommendations

This section is divided into two parts. The first part identifies some long and short-term goals that the second part will address by making recommendations.

Goal Statements

*Long-term Goals*
1. To achieve a sustainable transportation system.
2. To avoid, remedy or mitigate the adverse effects of road transport on the environment.

*Short-term Goals*
1. To increase the patronage of public transport.
2. To increase the number of trips made by foot, cycle, or other non-motorised vehicles.
3. To improve public awareness of the environmental effects of driving.
4. To increase the number of vehicles fuelled by alternative fuels.

Recommendations

1. That sustainable transportation is adopted as the primary objective for road management.
2. That further investigation and consultation is required to determine the most appropriate legislation for avoiding, remedying, or mitigating the adverse environmental effects of road transport.
3. That the Regional Transport Authority model is implemented.
4. That electronic road pricing is introduced and incorporates externality costs, fuel-efficiency, and the type of fuel used.
5. That revenue from congestion pricing is re-invested into alternatives for private vehicles or into building or upgrading roads that meet environmental, social, and economic criteria.
7. That the Ministry of Transport develop national strategies for alternative fuels and alternatives to private vehicles.
8. That EECA and regional councils begin educational campaigns on improving fuel-efficiency, the environmental effects of transport, and alternatives to private vehicles.

9. That Section 3D of the Transit New Zealand Act is amended to minimise transaction costs.

10. That a staggered pilot study is conducted in the Wellington region before electronic road pricing is introduced nationally.
Chapter 6: Conclusions

Road transport plays such an important role in our lives, it is easy to overlook that it causes adverse environmental effects, particularly when those effects are not obvious or have long-term consequences (such as air pollution and the release of greenhouse gases into the atmosphere). These effects are significant; transport’s externality costs are estimated to cost New Zealanders at least $1.5 billion per year (page 10).

Yet, to date, road transport policies have concentrated on the benefits of roads and ignored their total costs. This means we have a road management system that makes little attempt to avoid, remedy or mitigate environmental effects. Until reform of the road transport system is undertaken with the intention of reducing those effects, levels of pollution will continue to increase as society becomes more and more dependent on private vehicle use.

This report has identified a number of problems (from an environmental perspective) within the current road transport management system. These problems include fragmentation of transport modes, policies and institutions, and an inappropriate current objective (from an environmental point-of-view). Furthermore, our funding mechanisms are considered to be flawed as they do not reflect the full cost of using roads – they ignore externalities. As a result, alternatives to road use are marginalised, and there are no incentives to discourage private vehicle use.

But there is hope. A number of policies have been identified that would avoid, remedy or mitigate adverse environmental effects. For example, a total overhaul of our pricing system is needed, as well as promoting alternatives to road use. Institutional changes also need to occur.

These changes will have a far-reaching impact on our daily lives. We would have to reduce our dependence on the vehicle, and start walking, cycling, and using public transport again. If we choose to continue using our vehicles as we do now, then it will cost society more than it currently does.
These policies are likely to generate intense debate, so much so that there may be the temptation to avoid making any difficult decisions. But we are at the stage where some hard decisions must be made if we want a ‘clean’ and ‘healthy’ environment. Society must remind itself that vehicles and roads are just a tool, and reducing our dependence on private motorised vehicles will ultimately benefit present generations and future ones to come.
References


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Appendix 1: Definitions

This section provides some definitions for key terms in the report. Unless otherwise specified, all definitions are from the Concise Oxford Dictionary (1990).

A **community** is:

- all the people living in a specific locality
- a specific locality, including its inhabitants
- a group of animals or plants living or growing together in the same area

An **environment** includes:

(a) Ecosystems and their constituents parts, including people and communities;
(b) All natural and physical resources;
(c) Amenity values; and
(d) The social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters.


A **habitat** is:

the natural home of an organism

A **road** is:

a path or way with a specially prepared surface, used by vehicles, pedestrians, etc.
the part of this used by vehicles (don’t step in the road)

A **vehicle** is:

any conveyance for transporting people, goods, etc., especially on land