Future Funding
Assessment of revenue tools
November 2014
Future Funding: Assessment of revenue tools

The Future Funding project is one of three Strategic Projects that the Ministry of Transport undertook in 2014. The other two projects are Future Demand and Economic Development and Transport. These projects consider the changing world and how our transport systems, including funding, can be ‘future proofed’ while adapting to known and uncertain economic, environmental and social changes.

Future Funding addresses land transport funding. The project aims to promote informed and critical thinking among Ministry staff and external stakeholders regarding future land transport revenue gathering and funding. It also develops future options for deciding on the right level of land transport investment, including managing future demand where this is required.

The key questions considered in this project and the reports produced are covered in the diagram below. This report outlines the pros and cons of the different revenue tools in response to question 4.

This paper is presented not as policy, but with a view to inform and stimulate wider debate.
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Question four: What are the pros and cons of different approaches to collection of revenue?

Problem definition for question four

The Ministry does not currently have a systematic basis for identifying the most appropriate revenue tools to raise money for the land transport system. Revenue options need to be considered in the context of a changing world to ensure the system is capable of adapting to economic, environmental, technological, and social changes. For example, reliance on traditional excise duty as the key revenue tool to fund infrastructure is internationally recognised as potentially having limited longevity. Increasing real prices and increased fuel efficiency curtail revenues (unless duty rates are increased to compensate) and the potential for widespread adoption of electric vehicles greatly exacerbates the issues already present in regard to diesel vehicles. Distance based charging also has possible long term limitations due to the flattening of distance travelled by road seen in New Zealand over the last 10 years and globally for highly motorised countries.

Purpose of report

The purpose of the report is to qualitatively assess different revenue tools and their ongoing suitability. The project team aims to consolidate and document what we know about the revenue tools and develop a multi-criteria assessment methodology for assessing them in order to position the Ministry to give consistent, principled advice about the value and utility of the different revenue tools under various circumstances.

This work seeks to develop a framework to support consistent policy; this report is not in itself Government policy. Every effort has been made to ensure the information in this report is accurate. The Ministry does not accept any responsibility or liability whatsoever for any error of fact, omission, interpretation or opinion that may be present, however it may have occurred.
Methodology

Team structure
The Future Funding project has been sponsored by Andrew Jackson, Deputy Chief Executive of the Ministry of Transport, and led by Doug Wilson, Strategy Director and Transportation Engineering Group Leader at the University of Auckland. The Core project team is drawn from within the Ministry. The project established internal and external reference groups to test potential findings and get feedback on the overall work. The internal reference group consisted of Ministry staff with specific knowledge in regards to the different revenue tools. The external reference group consisted of representatives from different agencies including the Treasury, the NZ Transport Agency, Automobile Association, Local Government NZ, Auckland Alternative Transport Funding Project, Road Transport Forum NZ, Cycle Aware Wellington, Bus and Coach Association, NZ Council of Infrastructure Development, Auckland Council, and Auckland Transport. An external peer-review group was also formed to review and provide insight into the team’s work.

Overall approach
The approach the project team adopted was to consider a long list of revenue tools, and to evaluate them using a multi-criteria assessment (MCA) methodology. This approach was chosen as it allowed the team to evaluate the tools against criteria that are very hard to quantify (for example, accountability and equity) as opposed to a more traditional cost-benefit analysis (CBA). It also recognised for the purposes of this project, defining monetary values for all the major costs and benefits associated with each revenue tool is impractical. The implementation of a variety of the revenue tools will have interactions between different impacts on social equity, accountability and environmental effects which are not easily fully taken into account in standard CBA.

The purpose of this project is not to make policy recommendations about the optimal mix of tools, but rather develop a process to identify a potential short-list of tools, which could then be the basis of further research and work, including CBA. With this in mind, an MCA approach is appropriate as it enables the project team to capture the strengths and weaknesses of the different funding tools in a qualitative sense and identify a short-list to focus the work.

This work should therefore complement any further detailed analysis that uses monetary valuation, financial analysis and CBA and provide an improved way of presenting both monetised and non-monetised impacts of transport funding tools to decision makers.

For any significant change in the way revenue is collected to fund the New Zealand transport system, the relevant government department or agency will need to carry out detailed CBA and financial analysis of the impacts on budget and expenditure. This would include a detailed Regulatory Impact Analysis, which is required whenever proposals for legislation or regulations are published, and is intended to help reach decisions about whether or not proposed measures are appropriate.
Developing a framework to assess the tools

The project team developed an overall framework to assess the revenue tools and identify a short-list for more detailed focus and research. The steps in this process included identifying a long-list of tools, developing criteria to assess the tools and developing a spreadsheet model to record the assessment and identify a short-list.

To identify the long-list of tools, the project team initially had a brainstorming session where a long-list was compiled. The tools were then separated into six different categories to better organise them for work purposes. A literature review of funding tools was then completed to ensure all relevant funding tools were captured under the long list.

The next step was to develop a list of criteria on which to evaluate the funding tools. The aim was to ensure the criteria are consistent with the Ministry’s outcomes framework of effective, efficient, safe, and resilient. The team subsequently came up with draft criteria based on qualities that a good funding tool should have.

Both the long-list of tools and the draft criteria were presented to internal reference group members based in Auckland for comment. Following this session, both the list of tools and the criteria were refined and a methodology for three workshops developed. The team also completed an assessment of the full long-list of tools against the criteria to identify a short-list for use in the project and as part of the workshops.

Three workshops were then held with the internal reference group and two external reference groups. These workshops sought feedback on the criteria, the list of funding tools and rating the ten shortlisted tools against the criteria. Interestingly, not all of the existing revenue tools currently in use made it onto the short list of 10 revenue tools. Results from each of the groups were then collated with the initial results from the team members for analysis. Following the final workshop, the long-list of revenue tools was revised, but no changes were made to the criteria.
Long-list of transport revenue tools

The tools have been grouped into the following categories for the purposes of readability. The categories are based on general characteristics and can be used to understand the nature of the tool (although overlap does exist):

► Vehicle based access charges
► Consumption
► Spatial
► Value capture
► Road charging
► Other

The long list of funding tools is provided below. The shortlisted tools that were assessed in more detail are in bold:

Vehicle based access charges
► Motor vehicle registration
► Motor vehicle registration based on fuel consumption
► Motor vehicle registration based on engine size
► Motor vehicle registration based on vehicle value
► Bicycle registration tax

Consumption
► Fuel excise duty
► Road user charges (distance and mass charging)
► Public transport fares (in combination with subsidies)
► Tolling of new roads (in combination with grant funding)
► Diesel tax
► Transport tax on alternative fuels

Spatial
► General rates
► Targeted (or special) rates
► Regional fuel tax
► Regional transport rate (for example, set centrally, collected locally)
► Regional income, GST, or payroll tax
► Regional lotteries
Value capture
► Development contributions
► Financial contributions
► Revenue from assets (for example, asset sales or dividends)
► Advertising /concessions /leases /rents /naming rights
► Tax increment financing
► Sale of airspace / joint development

Road charging
► **Universal network charging (ultimately all vehicles, full network)**
► **Urban charging (group of urban roads)**
► Tolling existing roads (relates to a single corridor)
► High occupancy toll lanes on existing roads (relates to a single lane)

Other
► **General taxation**
► **Charges on public car parks**
► Carbon tax (fuel based)
► Charges on private car parks
► Poll tax
► Visitor and/or airport taxes

A summary of each of the funding tools can be found in the ‘Revenue tools for transport’ paper. The paper also highlights the advantages and disadvantages of each of the revenue tools.
Revenue tool assessment framework

To enable the broad assessment of the long-list of tools and identify a short-list, six criteria were developed. The six criteria create a framework which can be used to assess revenue tools. Under each criterion, a number of indicators were developed to provide a basis for the analysis. The criteria are: revenue sustainability, collection costs, economic efficiency, distributional equity, accountability and environmental sustainability. The following sections outline each criterion in more detail and indicate how it relates to the Ministry’s strategic outcomes framework and four long-term outcomes of a system that is resilient, efficient, effective, safe and responsible.

Revenue sustainability

The focus of the revenue sustainability criterion is ensuring a sustainable and reliable source of revenue to fund the land transport system. Therefore, the definition given to the criterion is that a tool would generate sufficient resources to contribute materially to national investment levels. The indicators developed include enough revenue to make a material contribution, that a tool is hard to avoid and easy to enforce, and copes with changing patterns of system use.

The implication of these types of measures is that tools providing a significant amount of revenue will score higher than those providing only a marginal input to the overall level of income. While smaller revenue raising tools may remain a part of the system, the purpose of this type of criterion is to focus research and policy consideration on the significant tools that could provide a substantial amount of revenue for the land transport system. Tools that are also resilient to change and could continue providing substantial revenue in different scenarios are also likely to score highly.

Overall, these measures mean the tool needs to be effective for its purpose, therefore, it is mapped to ‘Effective’ on the Ministry’s Outcomes Framework.

Criterion A: Revenue sustainability (Effective)

Generates sufficient resources to meet national investment needs on a sustainable basis, including

- Enough revenue to make a material contribution to running the system
- Is hard to avoid and easy to enforce
- Copes with changing patterns of system use

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1 The Ministry of Transport, with the transport Crown Entities, has developed a strategic framework that supports the government’s direction for transport and is flexible to respond to changes in priorities over time. The objective is a transport system that maximises economic and social benefits for New Zealand, and minimises harm.
Collection costs

The collection costs criterion considers the cost of the tool both to the user and to the collector or the Crown. It is defined as having minimal set-up and collection costs, implicitly measured as a proportion of total revenue. Tools that have both low set-up and ongoing transaction costs will score highly. Tools that have high set-up costs but lower transaction costs are difficult to score against the criteria, but generally are not significantly disadvantaged.

Overall, the purpose of the criterion is to measure the efficiency of a tool in raising revenue, therefore, the criterion has been mapped to ‘Efficient’ on the Ministry’s Outcomes Framework.

Criterion B: Collection costs (Efficient)

Has minimal set up and collection costs, including

- Low transaction cost to the public (for example, low compliance and operating costs)
- Low transaction cost to the Crown (for example, low collection cost)

Economic efficiency

The economic efficiency criterion is focused on encouraging decisions by users and providers of land transport systems that take into account the resulting cost (for example, road wear and tear) and the benefits to users of investment by providers. The measures are therefore that the revenue mechanism should have a positive influence on both user and provider behaviour, namely provision of incentives that reflect the costs and benefits to others of their decisions. The revenue tool should therefore enable the internalisation of costs of travel such as congestion, but also externalities such as air pollution and noise.

A risk of double counting exists, particularly between this criterion and criterion F: environmental sustainability. Economists would naturally include issues of environmental sustainability and possibly social equity as part of economic efficiency, although usually economic analysis does not include income distribution effects but rather analysis is supplemented with information on social equity. Therefore, when assessing a revenue tool against this criterion it is necessary to focus solely on the economic impacts of the tool on the system. Under this approach we acknowledge sometimes we will need to make trade-offs between economic goals and environmental goals. The value in this approach is trade-offs are explicit rather than hidden.

Overall, the tool represents the need for revenue raising to be efficient from an economic perspective. As such, it was also mapped to ‘Efficient’ on the Ministry’s Outcomes Framework.
Distributional equity

Equity effects are important features of any revenue tool, particularly who the costs fall on in terms of income groups, sectors, or geographically. Tools ensuring impacts of revenue raising are evenly spread, rather than falling disproportionately on one group or region will score higher under this criterion. It is also important revenue tools for transport purposes minimise the cost on non-transport sectors. For example, approximately 36 percent of diesel is used off-road. Taxing diesel at the pump in the same way as petrol would require this group to either pay the tax or bear the compliance costs involved in any refund process that might be established. The criterion also picks up the concept of privacy as it is considered an important equity issue that people should be able to travel relatively anonymously (that is, the concern that road pricing would unduly monitor travel patterns due to collection methods).

Overall, this criterion is picking up social concerns and has therefore been mapped to ‘Safe (from harm) and Responsible’ in the Ministry’s Outcomes Framework.

Accountability

The accountability criterion is focused on linking the group responsible for setting the charges to those who are responsible for spending the money and those who pay. Ensuring a strong link between those who pay and those who provide should encourage well informed decisions about infrastructure investment. It should also ensure those who raise revenue are aware of the impacts of the revenue tool on all people and are held accountable for the revenue they are raising, meaning a responsible level of revenue is gathered.
Overall, the issue of accountability is ensuring a revenue tool is efficient, but also that it is resilient to change whether within communities or governments. Therefore, this criterion has been linked to both ‘Efficient’ and ‘Resilient’ in the Ministry’s Outcomes Framework.

**Criterion E: Accountability (Efficient/Resilient)**

Has strong links between those who set the tax, those who spend the tax and those who pay, including:

- Strong feedback loops between users and providers (for example, to encourage well informed decisions by both)
- Encourages sound investment decisions by providers (for example, good project selection and execution)
- Links charges and representation (for example, an issue where beneficiaries do not pay)
- Transparent cross subsidisation where necessary to advance equity or network goals

**Environmental sustainability**

The sixth criterion, environmental sustainability, can be used to reflect environmental goals that might be relevant for a revenue tool. For example, a tool that can incorporate the external costs of travel, such as pollution and positively influence user and provider behaviour (for example, demand management) to ensure environmental welfare benefits will score highly under this criterion.

Overall, the criterion has been mapped to ‘Safe (from harm)’ on the Ministry’s Outcomes Framework.

**Criterion F: Environmental Sustainability (Safe/Responsible)**

Encourages recognition of the external cost of travel such as emissions and noise

- Positive impacts on user behaviour (for example, time and frequency of travel)
- Positive impacts on provider behaviour (for example, form, location and timing of investment)
Objectives and weightings methodology

This section sets out how this framework can be used to identify a set of revenue tools by matching a stated set of objectives. The case study used is for revenue tools, but the methodology could equally be applied to the hypothecation evaluation or the assessment of options to set optimal funding.

Please note, the objectives and weightings used in this example do not reflect any current policy goals or outcomes, but are a case study that demonstrates the potential to use the methodology to analyse the impact of different policy settings on different options assessments.

Methodological steps

The key steps of this process are:

► Identify the policy objective or objectives for the revenue tools
► Investigate the policy objective and identify likely weightings for the criteria in the framework. The weightings should be backed up with evidence
► Agree the weightings and apply them to the framework (which has been put into a spreadsheet to facilitate analysis)
► Compare the weighted score results to the raw score (neutral weighting or base case assessment) in order to identify the revenue tools that have the greatest relevance to the policy objective and which warrant further careful investigation.

Case study example

Two objectives were arbitrarily chosen for the case study: optimising revenue potential and managing demand for environmental reasons. Weightings for each were chosen based on qualitative assessment of the objectives, without additional research or evidence, as outlined below. The chosen weightings are then shown in Table 1 below.

Objective 1: Optimising revenue potential

This objective is focused on raising the right amount of revenue needed for the system using the most effective and efficient method. It is not about raising more revenue than needed (that is, raising revenue for the purpose of just raising revenue). Based on these assumptions, the criteria of revenue sustainability and collection costs are the most important and the criteria of economic efficiency, distributional equity and environmental sustainability are low. Accountability is still important as it will reflect the right amount of revenue is being maximised.
**Objective 2: Managing demand for environmental reasons**

Under the second objective, the focus is on managing demand on the network for environmental goals (not for optimising network use). The amount of revenue raised and the cost of raising revenue are secondary concerns to tools that enable user and provider behaviour to be influenced. **Distributional equity** is important as it will ensure a tool does not unnecessarily disadvantage some groups over others. **Accountability** is less important, but still needs to be valued as part of any identification of revenue tools.

**Table 1: Weightings for objectives**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Neutral</th>
<th>Optimising revenue potential</th>
<th>Managing demand for environmental reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue sustainability</td>
<td>17%</td>
<td>40%</td>
<td>5%</td>
</tr>
<tr>
<td>Collection costs</td>
<td>17%</td>
<td>40%</td>
<td>5%</td>
</tr>
<tr>
<td>Economic efficiency</td>
<td>17%</td>
<td>5%</td>
<td>30%</td>
</tr>
<tr>
<td>Distributional equity</td>
<td>17%</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Accountability</td>
<td>17%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Environmental sustainability</td>
<td>17%</td>
<td>0%</td>
<td>30%</td>
</tr>
</tbody>
</table>

**Applying the weightings**

The weightings outlined above were entered into an evaluation spreadsheet to identify the top 10 tools for each objective from the long-list of tools on page 6. The results showed the ranking of tools does change with different weightings or emphasis on criteria.
Table 2 compares the top 10 revenue tools based on the raw score rankings and the two objectives case studies. Tools highlighted in orange are found in all three groups, tools highlighted in blue occur in two groups and un-highlighted tools only occur once across the scenarios.

Table 2: Top 10 funding tools under different scenarios

<table>
<thead>
<tr>
<th>Rank</th>
<th>Neutral (raw score)</th>
<th>optimising revenue potential</th>
<th>managing demand for environmental reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RUC</td>
<td>FED</td>
<td>Universal network pricing</td>
</tr>
<tr>
<td>2</td>
<td>Universal network pricing</td>
<td>Targeted / special rates</td>
<td>RUC</td>
</tr>
<tr>
<td>3</td>
<td>3= FED</td>
<td>3= General rates</td>
<td>Targeted / special rates</td>
</tr>
<tr>
<td>4</td>
<td>3= Targeted / special rates</td>
<td>3= general taxation</td>
<td>4= FED</td>
</tr>
<tr>
<td>5</td>
<td>General rates</td>
<td>Poll tax</td>
<td>4= Urban pricing</td>
</tr>
<tr>
<td>6</td>
<td>General taxation</td>
<td>RUC</td>
<td>General rates</td>
</tr>
<tr>
<td>7</td>
<td>7= Regional transport rate</td>
<td>Regional fuel tax</td>
<td>Tolling new roads</td>
</tr>
<tr>
<td>8</td>
<td>7 = Urban pricing</td>
<td>Regional transport rate</td>
<td>Public transport fares</td>
</tr>
<tr>
<td>9</td>
<td>9= Car parking charges</td>
<td>Car parking charges</td>
<td>Regional transport rate</td>
</tr>
<tr>
<td>10</td>
<td>9= MVR</td>
<td>Universal network pricing</td>
<td>General taxation</td>
</tr>
</tbody>
</table>
Short-list of revenue tools

In order to develop the assessment framework and test it as a concept, we decided to trial it at three workshops with external stakeholders. It was not practical to do this for the full list of revenue tools so we decided to identify a short list of tools for the basis of that exercise.

Each tool in the long list was rated against the assessment criteria by individual team members. The expected consequences of each tool were assigned a numerical value on a strength of preference scale for each option with less preferred options scoring lower (1 = significantly negative impact) and more preferred options scoring higher (5 = significantly positive impact).

The individual scores of each revenue tool were totalled, ranked and compared between team members. Many of the tools ranked highly across all individual scores and were incorporated into the short-list. The remaining revenue tools that had high, yet conflicting total scores were scrutinised in more detail before a complete short list of 10 tools was agreed to be investigated being:

- Motor vehicle registrations
  - Motor vehicle registrations including fuel based consumption
- Fuel excise duty
- Road user charges
- Universal network charging
- Car parking charges
- Urban charging
- General rates
- Targeted (or special) rates
- Regional transport rate
- General taxation

The short-list of tools was provided to the internal reference group to ensure the appropriate short list of tools was being pursued. Discussion took place on why public transport fares did not make the short list given the interests of members of the external reference group, however, consensus was reached that, for the purposes of the project, the short list was appropriate.

This section provides the assessment of potential land transport revenue tools. For each revenue tool, this section includes a brief description of the revenue mechanism and an evaluation of the tool against each criterion.
Motor vehicles registrations summary

Vehicle licensing in New Zealand is the process where vehicle owners or people who have a vehicle registered under their name pay an annual fee to use a vehicle on public roads. The fee is paid into the National Land Transport Fund (NLTF) and helps to pay for a range of transport projects and services, such as roads, public transport, and vehicle safety programmes. Motor vehicle registration and licensing currently collects around $170 million per annum (around 6 percent of total NLTF revenue).

Registration is generally a once-off process that identifies the person legally responsible for a vehicle, whereas licensing is the regular annual process through which a fee is paid to use a vehicle on public roads. In New Zealand the term here referred to as annual vehicle licensing is colloquially called “registration” by the public.

The Accident Compensation Corporation (ACC) Motor Vehicle Account levy is also collected through the annual vehicle licensing process. The account covers claims for injuries involving motor vehicles on public roads in New Zealand. This levy is currently the largest portion of the amount paid when a vehicle is relicensed each year.

Currently the New Zealand Transport Agency is responsible for administering the collection of revenue from motor vehicle registration and licensing fees. It also collects the ACC motor vehicle account levy on behalf of the ACC, as part of motor vehicle licensing transactions.

Evaluation against criteria

Revenue Sustainability – Motor vehicle registration and licensing does provide a sustainable source of long-term revenue. However, only the ACC levy component of the licensing fee has been increased in the last two decades and the portion of the fee going to the NLTF has been unchanged since 1992. Total revenue generated for the Fund from motor vehicle registration has increased since this time, largely a result of an increasing number of vehicles in the national fleet. However, in real terms this revenue has been reducing since 1992. Considerable scope exists not only to adjust charges to maintain the real spending power of this revenue stream but also to increase its contribution of revenue to the Fund.

Collection Costs – The administration cost of motor vehicle licensing and registration is recovered through administration fees incorporated into the overall cost of licensing. Administration fees are set to closely align the actual costs of providing the service to which they relate.

Registration fees allow for collections from vehicles using alternative fuels without establishing new mechanisms for collection. The greater utilisation of technology may provide opportunities to reduce transaction costs for licensing in the future. For example, the use of automatic number plate recognition technology to identify licensed vehicles, rather than relying on paper licences in the windscreens of vehicles, could remove a significant portion of administrative costs from the system.
**Economic Efficiency** – Registration and licensing fees can affect the number and type of vehicles purchased. The current fees payable at first registration are graduated by engine size, but the fees are low and the difference is not sufficient to have a noticeable effect on total price. In other jurisdictions, initial registration or annual licensing fees have been used much more aggressively to encourage or discourage particular types of vehicle.

Vehicle registration and licensing fees are not related to the amount of driving and any fee increase is not expected to significantly influence driving behaviour.

**Distributional Equity** – Registration and licence fees do not vary by kilometres travelled so people who own a car but do not use them much pay as much as a higher mileage driver. This means the fee could have a disproportionate impact on groups such as the elderly, with a fixed or low income. They are vehicle based access charges and do not take into account ability to pay. In other jurisdictions registration or annual licence fee based on a vehicle’s value has been used to reflect ability to pay.

**Accountability** – Most motor vehicles in New Zealand must be licensed continuously. If a vehicle is licensed after the current license has expired, the new licence must be back dated to the expiry date of the previous licence, rather than commencing from the date of payment. This means a person cannot avoid paying fees by paying late, and the overall revenue collection rate from registered vehicles is very high.

A major limitation of registration and licensing is there is no relationship between fees and road use. Additionally, revenue raised will not necessarily be used to provide a service to the motorist that has paid the fee.

**Environmental Sustainability** – While current motor vehicle registration and licensing does not directly contribute to environmental sustainability, the next section focuses on an option that would require the owners of cars with a high rate of fuel consumption to pay increased vehicle registration and annual licensing fees. Throughout this report, all discussions of fuel efficiency cover both the externalities relating to dependence on hydrocarbons motivated by future supply concerns and those relating to carbon emissions motivated by climate change concerns.

**Motor vehicle registrations including fuel based consumption summary**

The level of the registration and licensing fees could vary to reflect the fuel efficiency of the vehicle. Regulating fuel economy plays an important role in deterring air pollution in many countries. Carbon dioxide taxation is a fuel based consumption tax now well established across many OECD countries who apply some form of tax to the registration and / or ownership of passenger cars.
In the case of this tool, a portion of the registration and licensing fee would be allocated to reflect the vehicle’s fuel efficiency level. It would result in a pricing system that encourages consumers to purchase the most efficient vehicles.

The level of the fee could be calculated using travel based models which would combine gram per kilometre emission factors with activity data, expressed as vehicle kilometres travelled for an array of vehicle subgroups. Activity and emission could be resolved by vehicle class (for example, light petrol vehicle, light diesel vehicle, heavy vehicle), engine size or efficiency, emissions technology and age.

The component of motor vehicle registration and licensing assigned to a vehicles fuel efficiency could be set at the desired level.

Work would have to be done on the appropriate charges assigned to each vehicles class. A change in primary legislation would be required to enable a fuel efficiency component of motor vehicle registration and to differentiate based on vehicle characteristics. Public consultation would be required before amending any legislation.

It is likely the adoption of new technology in New Zealand will take place slowly over the coming decades. Currently, the average age of the vehicle fleet is 13 years, and evidence suggests that this may be growing.

**Evaluation against criteria**

**Revenue Sustainability** - For energy security and the environment, motorists are encouraged to consume less fuel. However, less fuel consumption reduces revenues from motor vehicle registration and fuel excise duty, potentially causing shortfalls in transportation funds that support New Zealand's national land transport programme. The extent of the shortfall would be a function of changes in demand (reducing need for resource for transport infrastructure), increases in vehicle efficiency (reducing revenue for each kilometre driven) and willingness to increase the charge per kilometre.

If a vehicle efficiency component was introduced to vehicle registration, the effect on revenue sustainability would depend on how the scheme was implemented. The goal of this tool is to encourage environmentally friendly choices by consumers rather than to raise significant amounts of revenue. Over time, the revenue raising ability of the tool would erode as consumers move to vehicles with greater fuel efficiency.

This could be dealt with by changing the relative rates or setting the component of the registration fee based on fuel efficiency in addition to the existing components of the registration fee. Alternatively, as consumers move to more fuel efficient vehicles an increase in other forms of revenue collection mechanisms may be necessary to keep overall revenue flowing into the NLTF stable.

The effect of increased fuel efficiency on fuel excise duty, and particularly the issue that electric vehicles will pay low, if any fuel excise duty, would need to be addressed independent of any variation in the registration and licensing fees based on fuel efficiency.
A registration and licensing system based on fuel efficiency could be implemented relatively easily and would remain a viable tool for the foreseeable future. The internal combustion engine will continue to play an important role in transport for many years, with improvements in fuel efficiency and increased hybridisation providing incremental improvements in carbon dioxide emissions. As technology improves and emissions targets tighten, the charges implemented through motor vehicle registration would need to be changed if this tool is to remain an efficient and equitable revenue tool.

Efficient low carbon cars often cost more than conventional cars. Although some of this extra cost will be offset by lower fuel costs, some form of additional government incentive may be required to encourage the early take up of new technologies.

**Collection Costs** – A system is in place for the administration of vehicle licensing and registration. No infrastructure requirements would be necessary, and the main costs would be in research, policy, legal and consultation requirements. Any further administration and collection costs of motor vehicle licensing and registration can be recovered through administration fees incorporated into the overall cost of licensing. Administration fees are set to closely align the actual costs of providing the service they relate.

**Economic Efficiency** – It is not clear whether the market would provide an efficient level of fuel economy in the absence of government regulation. A range of technical possibilities exist for improving vehicle fuel efficiency including improved engine and transmission efficiency, reduced weight and aerodynamic drag. The marginal value of fuel saving benefits could exceed the marginal costs of vehicle redesign improvements in efficiency, depending on market conditions. Whether New Zealanders decide to import these vehicles will remain a question left to the market. A question exists around whether these examples of technologies that are not being offered to vehicle buyers constitute a market failure. More analysis should be undertaken on whether more stringent government fuel economy standards could produce net economic benefits.

While vehicle efficiency improvements require increased up-front capital investments, it can be argued by reducing fuel use, these improvements strengthen national security and result in significant net savings to consumers. This depends on whether operating savings outweigh increased capital costs.

The imposition of a fuel efficiency levy would constrain consumer choices and this would therefore need to be weighed up against the environmental harms it is intended to mitigate.

This tool would incentivise manufacturers, importers and consumers to build and buy smaller and more fuel efficient cars, creating a positive environmental effect. The transitional arrangements would determine short-term impacts on vehicle manufacturers and importers.
**Distributional Equity** - It can be argued that currently, motorists do not pay for the higher health and environmental costs they incur. By introducing a component to vehicle registration indirectly linked to emissions, motorists could pay for the associated negative externalities they create by consuming fuel.

The implementation of a fuel efficiency component of vehicle registration could increase costs of travel, undermining social goals around equitable access to economic and social opportunities.

**Accountability** - Other countries have had problems in the past where emission inventories (which the taxes are based on) have been inconsistent with actual emissions measured from on-road vehicles.

The fuel efficiency component of the motor vehicle registration would be based to a large extent on averaging of data. As vehicle emissions and fuel efficiency are better when driving at a constant speed over large distances, motorists who spend the majority of their travel time on State highways would be paying more than their fair share when compared to motorists in urban centres where a greater proportion of stop-start driving takes place.

Adding to the uncertainties related to new technologies are the emissions related to the sources of electricity for electrified transportation, where coal and gas generation result in emissions while hydro, wind, and solar do not. This is not as big an issue in New Zealand when compared to other countries. In New Zealand, coal and gas electricity generation currently make up 4.7 percent and 18.4 percent respectively of the total national electricity generation. Renewable electricity generation makes up the remainder and this share is expected to increase further to about 90 percent.

**Environmental Sustainability** - Efficient transport is important to New Zealand’s wellbeing and road transport remains the dominant transport mode in New Zealand. However, traffic and increasing road capacity bring about concerns over air quality and noise. Increasing the use of fuel efficient vehicles will therefore have an important role to play in reducing emissions while maintaining or improving mobility.

The New Zealand Emissions Trading Scheme (ETS) is a way of meeting our international obligations around climate change. The ETS puts a price on greenhouse gases to provide an incentive to reduce emissions and to encourage tree planting. In order to meet these obligations, and owing to the relatively slow turnover of vehicle stock, this will require continuous progress in reducing carbon dioxide emissions from our existing stock of cars. It can be argued with the ETS in place, vehicle use already faces the appropriate incentive, being the same as the incentive that applies in other sectors of the economy.

The primary environmental justification for government intervention to encourage fuel efficiency is concern about emissions on global climate change. Reducing travel demand, increasing fuel
efficiency and use of public transport and active modes are key elements to reducing overall demand on fuels. This revenue tool attempts to improve the last three of these measures.

Opponents of fuel economy standards often assert they force people into lighter vehicles and more use of lighter vehicles will adversely affect road safety. This concern is legitimate as both size and weight are important factors of vehicles’ fuel efficiency and in determining injury. However, there are some light vehicles on the market that have good safety ratings.

**Fuel Excise Duty summary**

Fuel excise duty (FED) is paid indirectly by drivers of vehicles powered by petrol, liquid petroleum gas and compressed natural gas. Revenue collected from FED goes into the NLTF to be spent on the maintenance and development of the land transport network.

FED is collected by the New Zealand Customs Service under the provisions of the Customs and Excise Act 1996. An excise is specified for many fuels, but these can be simplified into three fuel types, comprising: motor sprits (petrol), natural gas and liquid petroleum gas. Fuel excise duty is collected either at the border (when imported), or at the refinery (for domestically produced fuel). Through the fuel excise duty system, fuels can be excised cheaply and efficiently when they are imported, or when they leave the refinery. The excise is then passed on to the main user, effectively charging them for their use of roads.

All revenue from FED goes into the NLTF to be spent on the maintenance and development of the land transport network and contributes around $1.5 billion annually towards the NLTF (55 percent of NLTF revenue).

To change FED rates usually requires an amendment to the Customs and Excise Act 1996, unless section 79A applies\(^2\), in which case an increase can be made by Order in Council. An amendment is usually led through the House by the Minister of Transport. This has been done under urgency in the past. The rates of FED are not automatically indexed to inflation, and are only changed if specified in the Customs and Excise Act 1996.

**Evaluation against criteria**

**Revenue Sustainability** - FED represents a sustainable source of revenue for the NLTF and can be set to a desired level. Excluding a sudden, severe shock in the economy, or to the supply of oil, revenue from FED is unlikely to be severely threatened in the short to medium term.

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\(^2\) Section 79A(1) of the Customs and Excise Act 1996 states that at any time during the second financial year, or the third financial year, that follows the financial year in which any current rates of excise duty and excise-equivalent duty on motor spirits came into force, the Governor-General may by Order in Council, reduce or increase any or all of those rates of excise duty and excise-equivalent duty by amending the Excise and Excise-equivalent Duties Table.
However, internationally the sustainability of fuel based taxation is being questioned. Technological changes in the vehicle fleet may impact on the long-term sustainability of FED revenues. These changes include:

► More efficient vehicles. Revenue can potentially be lost through improvements in average fuel economy. Fuel efficient vehicles produce less revenue for the same use of the network, which is expected to lead to long-term erosion of FED revenues (we estimate current fuel economy across the fleet is improving by 0.4 percent per year).

► Increasing use of new vehicles powered by diesel, new fuels (for example, bio fuels), or electricity (including hybrids) on which FED is not levied.

The rates of fuel excise duty are not indexed to inflation and maintaining the same rate over long periods of time could see a deterioration of the purchasing power of the NLTF. The extent of deterioration would depend on overall vehicle kilometres travelled. The effects of increases in petrol engine’s fuel efficiency and of inflation on the amount collected per vehicle kilometre travelled could be offset by a steady series of regular increases to FED. If the share of petrol engine vehicles in the national fleet remained constant, such increases would allow the contribution to the NLTF to remain at a constant (real) level over time.

Although subject to fluctuations, the proportion of FED that makes up the total price of fuel has generally been below average when compared internationally amongst OECD countries, and therefore, there is reasonable potential to raise this level as well as indexing it to inflation. Table 3 shows a comparison of premium unleaded petrol prices and taxes in OECD countries as at June 2014.

Table 3: Quarterly comparison of premium unleaded petrol prices and taxes in OECD countries

![Graph showing quarterly comparison of premium unleaded petrol prices and taxes in OECD countries]

A reduction in the proportion of petrol engine vehicles in the national fleet due to a continuing switch to diesel reduces the share of revenue collected by FED. At current RUC rates it also has a negative impact on the revenue system, as RUC for a light diesel vehicle is 12 percent less than the fuel excise duty generated by the average petrol vehicle travelling the same distance. A switch to hybrids or electric vehicles would erode the contribution per kilometre travelled unless there is a commensurate increase in the rates.

**Collection Costs** - Collection of FED at present involves extremely low transaction costs as the tax is collected by the New Zealand Customs Service from only a handful of fuel manufacturers and importers. However, refunds are relatively expensive to process, but few in numbers relative to total revenue collected. As most LPG and CNG are used off-road, a large amount of the excise on these fuels is eligible for refund. Up to 90 percent is refunded each year with net revenue for the NLTF of $5 million.

A significant advantage of all fuel tax options is the low cost of collection compared with other revenue tools. There are no capital costs and negligible collection costs except for potential technology upgrades at point of sale and operating a scheme for rebates.

Through the FED system, fuels can be excised cheaply and efficiently when they are imported, or when they leave the refinery. The excise is then passed on to the main user, effectively charging them for their use of roads.

**Economic Efficiency** - To some extent, user fees encourage economic efficiency as roads are paid for using a capacity charge that encourages people to make more efficient use of that capacity. However, FED is not perfect as a user fee because we do not pay different tax rates for the use of different roads or different prices for the use of congested versus uncongested roads. Here benefits are paid roughly in proportion to the use of the system.

The costs of a tax fall into two categories - the administrative and compliance costs borne by Government and taxpayers, and the deadweight costs on the economy.

In terms of administrative and compliance costs, a narrow consumption tax such as the petrol excise is likely to be cheaper to collect than GST. The reason for this is the excise is paid by a handful of major oil companies, with minimal book-keeping required. GST is paid by thousands of businesses and must be accounted for on all their sales and purchases. The counterweight to this is if excise covered as many goods and services as does GST, the compliance costs would rise significantly. Enforcement would also be far more difficult without the audit trail generated by GST.
In terms of economic efficiency, FED is in principle inferior to a full GPS based universal network charging system but it does not require the high capital costs involved in that alternative. Provided the level of FED reflects the cost attributable to the road use that corresponds to the fuel use, FED provides rough approximates to an efficient user charge for vehicles that use fuel types subject to FED.

Viewed as a price for road usage, FED obviously does not precisely reflect different road types. While FED does therefore involve a substantial degree of averaging across road types, such averaging is often found in pricing of networks, examples being electricity transmission and telecommunications networks.

When viewed as a tax as opposed to a price, and setting aside the issue of switching to alternative fuels, FED is relatively efficient in terms of deadweight impact on economic output because demand for petrol is relatively insensitive to the level of FED.

**Distributional Equity** – The revenue raised will not necessarily be used to provide a service to the motorist that has paid the tax, as transfers occur between regions and between modes within the national funding system. However, there is a general consistency between where road use occurs and where land transport revenue is spent.

Because FED is only a proxy for the use of roads it can result in road users paying substantially different amounts for the same level of service. While users are charged for the costs they impose on the network they are highly averaged and blunt. For example, the driver of a large sports utility vehicle will typically pay twice as much in fuel excise duty per kilometre travelled as the operator of a small petrol car, even though the additional costs created by the larger vehicle are marginal.

As noted, however, averaging is often found in pricing of networks, examples being electricity transmission and telecommunications networks.

**Accountability** – While FED is a cheap and efficient means of raising revenue, its main limitation is the relationship between fuel excise duty paid and road use is approximate.

**Environmental Sustainability** - All taxes on road use add to incentives to avoid unnecessary travel. FED also adds to incentives to minimise fuel consumption. However, the land transport revenue system is designed primarily to recover the direct costs generated by road use. Current government policy is that specific incentives for reductions in the use of fossil fuels are best provided through the New Zealand Emissions Trading Scheme, which targets the use of these fuels across all sectors, not just transport.
FED has been used to provide incentives for alternatives to fossil fuels like ethanol, biodiesel, and electric vehicles. These policies have been justified as interim measures to encourage uptake of sustainable energy technologies.

From an environmental perspective, the optimal fuel taxation would need to reflect the marginal damage of each fuel in the range of fuels available so as not to distort the price of one fuel relative to another. When taxation fails to reflect marginal damage of individual fuels there is a risk of encouraging the use of less desirable fuels.

**Road User Charges summary**

In New Zealand, road user charges (RUC) are paid by drivers of vehicles powered by a fuel not taxed at the source (mainly diesel) and all vehicles with a gross laden weight of 3.5 tonnes or more. Under the Road User Charges Act 2012, a vehicle is exempt from paying road user charges if it is a light electric vehicle whose motive power is derived wholly or partly from an external source of electricity.

In contrast to full-electric vehicles, petrol hybrid vehicles still use some fuel, which is why fuel excise duty is still payable. However, the electric vehicle road user charges exemption still means these vehicles are not subject to any charges for energy generated from an external source of electricity. This policy will continue to apply to all electric vehicles, including petrol hybrids, until 2020.

All revenue collected from RUC goes into the NLTF to be spent on the maintenance and development of the land transport network and contributes around $1.3 billion annually towards the NLTF (40 percent of NLTF revenue). Approximately 33 percent of RUC comes from light vehicles (up to 3.5 tonnes) and 67 percent comes from heavy vehicles.

Different RUC rates apply to different vehicle configurations, depending on the numbers of axles and tyres. This is intended to reflect the different degrees of wear and tear on roads caused by different weights and axle configurations. Distance licences are purchased in units of 1,000km or multiples thereof and vehicles must be licensed for continuous distance. When the finish distance is reached a new licence is required. Licences are available from NZ Transport Agency agents. Licences can be purchased online, over the counter, or by telephone. Road user charges are collected by the NZ Transport Agency and enforced by the New Zealand Police.

RUC has the potential to be applied to all motor vehicles in New Zealand. RUC rates can be adjusted to reflect the level of revenue required to fund the road network and reflect the costs imposed by different vehicles subject to RUC.

The Ministry of Transport operates a cost allocation model (CAM) which is a mechanism designed to calculate the RUC rates and FED necessary to fund the National Land Transport Programme (NLTP) in any given year. The primary purpose of the CAM is to allocate the costs included in the NLTP on an equitable and efficient basis. Externalities are not taken into consideration by the CAM. They are often very difficult to quantify and in some cases are captured through other mechanisms like ACC or the
emissions trading scheme. The CAM seeks to ensure users pay according to the cost they impose, although with significant averaging in the distribution of costs among similar vehicles.

RUC requires IT and business systems to administer RUC licences. Much of this cost is recovered through RUC administration fees. The fees cover the cost of providing purchasing channels and maintaining RUC systems. Administration fee levels are set to cover the cost of providing the particular purchase channel used.

**Evaluation against criteria**

**Revenue Sustainability** - RUC is a sustainable revenue source for the land transport network that can be applied to new technologies being introduced in vehicles.

The emerging picture is that over the next decade there is likely to be a much wider array of vehicle engine technologies achieving greater fuel efficiency levels than currently. Some of these are already emerging, including continued emergence of diesel vehicles, hybrid vehicles and electric vehicles. Other longer term technologies include hydrogen. RUC is able to accommodate the emerging vehicle technologies with relative ease.

The magnitude of RUC revenue will be driven by several considerations, including the extent of pricing, types of applications and the rates that are set.

**Collection Costs** - RUC is relatively easy to understand and simple to administer. The administrative costs of RUC can be incorporated into administration fees paid for at the same time as RUC.

**Economic Efficiency** - Key drivers for the introduction of the RUC system in New Zealand were:

► to establish more appropriate price relativities between road and rail transport
► to more accurately reflect road costs to provide economic incentives to heavy vehicle users to economise on the use of roads.
► to give the ability to adjust revenue from road taxation to match road expenditure attributable to heavy vehicles.
► to ensure each type of vehicle is taxed according to the costs it imposes on the road system, thus making the user-pays principle more evident in the financing of road construction and road maintenance.

RUC represent a small percentage of the total cost of running a light diesel vehicle. Variations in charges therefore have little effect on their road use. RUC is about 10 percent of the total cost of road freight. It is economically efficient that freight should bear its share of the cost of roading. It may be noted demand for heavy vehicle use is driven mainly by general economic trends and is also relatively insensitive to variations in RUC.
RUC does not take account of location, time of travel, or road type and in that sense there is potentially room to improve the economic efficiency of RUC in terms of the cost borne by different types of freight.

**Distributional Equity** - In the current RUC system the main factor determining difference between charges for different sizes and types of vehicles is the allocation of road wear costs in accordance with variation in axle loadings of a vehicle. Costs used to calculate charges are at present largely limited to road and bridge construction, maintenance and operation. They are averaged across the entire road network and do not include externalities such as noxious emissions, noise and congestion. At the same time, some costs included (for example, public transport subsidies) are not costs directly generated by motor vehicle use, although the subsidies are paid in recognition of the congestion and other (for example, safety, environmental) benefits to road users provided by public transport services.

The revenue raised through RUC will not necessarily be used to provide a service to the user that has paid the tax; rather, transfers occur between regions and between modes within a national funding system. However, for the system to be workable it has to be sufficiently simple to be understandable to users and those charged with its enforcement and administration. This inevitably leads to averaging of charges across user groups and the associated inequities and cross subsidies this causes. As noted, averaging in pricing is observed in a range of networks.

Having a differential charging system based on motive power (FED for light petrol vehicles, and RUC for light diesel vehicles), inevitably creates inequities between petrol and light diesel vehicles, with some petrol vehicles costing more in fuel excise duty than the equivalent RUC and some less.

**Accountability** - RUC takes into account the weight and load of a vehicle and essentially imposes a premium on heavier vehicles to recover the added wear and tear they cause to the system.

A benefit of RUC is it does not impose administrative costs in respect of refunds of excise duty for off-road use of diesel-based vehicles, or non vehicle use such as marine, power generation and farm equipment.

**Environmental Sustainability** - A charge averaged across all vehicle kilometres covered in New Zealand cannot accurately capture the costs of negative externalities, which tend to vary substantially with time and location. An averaged charge for air pollution effects on health, for example, would likely be modest relative to benefits of road use and would probably have a correspondingly minor effect on the incentives faced by road users.

RUC only takes account of the actual costs associated with road use. As RUC does not include a charge for environmental externalities, in particular, carbon emissions, there is no basis for providing a discount for environmentally friendly vehicles. Many externalities are covered by other policy
measures, such as the emissions trading scheme. Since this is an issue which has different impacts in different locations, it is not effective to address it through RUC at present.

The full potential of RUC as an instrument for influencing vehicle use is only likely to be realised when time and location can be used as charging variables. At that point RUC can be used to set prices which are accurately differentiated for the use of particular parts of the road network at particular times.

**Universal network charging summary**

Universal network charging refers to electronic road user charging by location, distance, weight, emissions and/or time which could be designed and phased to:

► build on the existing RUC system
► be introduced progressively to targeted classes of vehicle
► immediately secure benefits across the entire network
► enable new vehicle charging technologies to be proven on a small proportion of the fleet
► enable public acceptance of the technologies to be built-up over time.

Universal network charging would provide an equivalent electronic replacement for existing road user charges that would be able to support charging according to the particular roads used, time of day and state of traffic and characteristics of the vehicle and the load being carried, should such policies be introduced and complementary investments made.

As vehicles would be charged according to the particular roads used, time of day, state of traffic and characteristics of the vehicle being used and loads being carried it would be appropriate for charges to be paid at the time, or in arrears. Universal network charging could be applied to anyone driving on the network or targeted at specific vehicles in the national fleet (that is current vehicles subject to RUC). It could initially be used on vehicles that currently pay RUC with a long-term objective of charging all vehicles, whether powered by petrol or diesel or some other means, using the same underlying system.

Universal network charging could be collected in the same manner as current RUC system but allowing for changes in technology. A range of providers currently use tracking information to monitor vehicle movements of their clients’ fleets for various commercial purchases such as claiming off-road rebates, driver management, speed monitoring, logistics and assessing travel time and distance data. Similar methods could be implemented by a universal network charging system, where commercial tracking service providers could facilitate payment to the Government on behalf of those who pay the charges.

Rapid technological developments are taking place in the wider road charging area. New Zealand is well positioned to take advantage of these developments by building on the RUC system to move away from the narrow focus of cost recovery towards the promotion of economic efficiency and
environmental sustainability. The timing and scale of such a change could be adjusted to recognise emerging overseas experience, technological improvements, and rapid changes in the fleet or fuel supply position.

A universal network charging system would involve the use of various wireless technologies to obtain information both from and about a vehicle and transmit this to a central host system for processing into an accurate charge. Heavy fleet vehicles already use a range of on-board electronic and computer systems that collect data on the vehicle including current weight, to fuel consumption, and speed. Combined with the use of a Global Positioning System (GPS) to accurately identify the present location of the vehicle, all of the information required for accurate and efficient charging is already available.

In order to establish a universal network charging system, the Road User Charges Act 2012 would have to be amended in order to enable central government to require different classes of vehicle to come onto the newly established system.

Extending universal network charging to eventually replacing local authority transport rates could be done but would have to be carefully considered. Rates provide strong local accountability for transport project selection and execution. Similarly strong accountability for any locally raised and expended revenue would need to be established.

Universal network charging would potentially simplify the payment of RUC. Payment could be on an account which would allow for payment instantaneously or in arrears based on actual on-road usage. This would avoid the need for refunds.

**Evaluation against criteria**

**Revenue Sustainability** – Universal network charging would deliver a stable revenue stream. Charges could be revised to make sure desired levels of revenue were being met.

The implementation costs associated with universal network charging are likely to be significant. Implementing a system may require relatively high initial capital to establish appropriate enforcement measures, together with more extensive enforcement on an ongoing basis to avoid excessive revenue leakage. Universal network charging requires signals to be transmitted to satellites, or other positioning infrastructure. Currently, GPS systems suffer from loss of signals in cities, in tunnels and in other covered areas, so upgrades may be required. In transitioning to universal network charging there would be an issue of enforcing the uptake and installation of the required technologies given the size of the fleet to be covered. There could be costs associated with the uptake and installation of the required technologies to allow vehicles to pay their associated charges. Whether this cost was met by the Government or users would have to be carefully considered.

Evasion is a significant problem with RUC and would also be a problem in universal network charging. Significantly improved enforcement would need to be introduced, such as making compliance a
prerequisite for a warrant of fitness. Evasion could be reduced through a sound architecture system, appropriate laws and the ease of enforcement.

**Collection Costs** – The current cost for a system of this type would be high, but the costs are likely to reduce as technology develops. Universal network charging could simplify the method of charging through the use of a billing type system, but would rely on new back office functions within government. It may also create the need for internal analysis or outsourcing of data analysis.

Commercial providers could administer or facilitate the payment of charges and costs could be passed on to users. The ongoing cost to the Government may be reduced but this may essentially be shifted to the vehicles, with operators required to install tracking devices and pay monthly fees to private back office operators charged with collecting the charges and passing the revenues to Government.

**Economic Efficiency** – Universal network charging would provide a financial incentive for more efficient travel choices. It would allow land transport revenue to be progressively de-linked from fuel usage and replaced by network wide variable pricing. Variable pricing has the potential to lead to better use of the existing network, reducing the need to add capacity over time. Where new capacity is still required, universal network charging would help decision makers align that capacity with demand. Technology could eventually be compatible with other fleet, logistics, traffic demand management and traffic management systems.

The efficiency benefit of universal network charging is it provides significantly stronger price signals than those that can be achieved under the current transport system. These price signals would be achieved through the removal of much of the averaging required by current road user charging systems. Therefore each road user would, theoretically, be charged for a much closer approximation of the cost they impose on the road network.

It is expected changes in these consumption decisions, as a result of universal network charging, would drive greater resource allocation decisions across the economy. Specific improvements in resource allocation decisions could be expected through:

- Encouraging more efficient use of the road network. This would essentially involve creating the disincentive for heavier vehicles to use roads of a lower strength. On such roads, heavier vehicles would cause significantly higher damage, and be charged a significantly higher fee for its use. Therefore heavier vehicles would try to maximise the use of major roads with higher strengths. This would be expected to result in a reduction in the overall cost of maintaining the network, as there would be less damage to ‘local’ roads caused by heavy vehicles
Influencing the decisions around the time of day that travel is undertaken. By incorporating congestion charging in a road pricing regime, it is expected that there would be a significant cost associated with travelling during peak times. This would encourage users to travel outside of peak times, increasing the overall utilisation of the road network, and potentially reducing the demand of expansions of network capacity.

Influencing decisions around mode choice and destinations. Universal network charging could see users change behaviour around their destinations for certain activities. For instance, users may decide to travel to nearby local shops instead of large shopping complexes further away, reducing the overall level of resource consumption in the economy. Users may even decide to walk, use a bike or catch public transport for certain journeys, rather than use a private vehicle.

The benefits described above are potentially available. However, it is appropriate to note there would be significant uncertainty regarding some of the relationships between usage, cost and efficient pricing. A significant portion of roading costs are common costs and the efficient recovery of common costs is not uniquely defined.

**Distributional Equity** – Implementing universal network charging across all vehicles would create the ability to charge more equitably for road use and road damage regardless of fuel type. It could also facilitate the direct funding of regional and local infrastructure. However, it does not necessarily mean the funds would be applied on the roads where the tax has been raised.

Universal network charging does bring up privacy issues about the levels of traveller related information captured and stored by government agencies. To overcome these concerns, any system would have to put in place comprehensive privacy policies and could be designed to the degree of privacy required by New Zealand law, in order to limit post implementation friction. Privacy issues have been successfully managed overseas.

**Accountability** – Adoption of universal network charging would remove much of the averaging currently required by existing road user charging systems. There would be no need to group vehicles into weight categories; there would be no averaging of distances travelled, fuel consumed and backloads. By removing averaging, there would be fewer inequities, as every road user would be charged as closely as possible for their road use.

A universal network charging system would reflect the full costs to society of different freight modes which may increase freight transport by rail and sea and would allow electric vehicles to contribute to the funding of transport.

The simplification of the charging structures is also likely to improve transparency. This is because of the fewer weight based charges and removal of the supplementary licensing structure, which is likely to mean that allocation of costs across the fleet would be more easily understood.
Charging each user for the cost they impose on the road network would improve road user decisions around their use of the network. Users would be expected to consider the relative costs and benefits of travelling by road and whether:

► the route taken minimises overall costs on the road network in terms of damage caused as well as other factors such as congestion
► the trip is actually needed
► they consider it best to travel by private vehicle or some other mode
► whether there is a substitute activity or location closer by that can be used.

**Environmental Sustainability** – A universal network charging system could be designed to provide incentives for reduced travel and low emission vehicles and fuels. It could reduce congestion at peak times, improving the reliability of journey times, so reducing average journey times. It could also reduce traffic at locations where noise impacts are significant.

**Car parking charges summary**

Parking charges could be implemented in addition to any parking charges currently in place. These charges would be paid by the users of the car parking space and revenues gained from the charges can be used to fund other transport related activities. The implementation of differentially priced car parking schemes around congested city centres can also be a strong lever in a travel demand management (TDM) strategy that can complement other congestion reducing TDM measures.

Currently councils set the level of the charge for publicly owned parking spaces, including roadsides within their jurisdictions. Any additional charge would have to take into account the level of the existing charge, along with prices set by market providers for privately owned parking spaces. Local authorities currently manage both on-street and off-street parking spaces throughout the country and parking charges are set by the relevant authority through bylaws. These bylaws are enforced through parking enforcement officers appointed by the relevant authority.

The required infrastructure, processes, and administration mechanisms currently exist through pre-established council parking services and so the implementation cost of additional parking charges would not be significant.

Information on car parking revenue levels can be sourced from local authority annual reports and varies from region to region. Any additional charges would need to increase substantially to have a significant impact on overall revenue collected. However, competition from private parking providers is likely to limit this revenue raising potential.

In order to implement car parking charges as a revenue raising tool, the Land Transport Act 1998 would need to be amended to enable the collection and setting of national car parking charges in addition to local car parking charges.
Evaluation against criteria

**Revenue Sustainability** - Charges would need to increase substantially to raise the amount of revenue to have any real impact on overall transport funding. Level of enforcement activity and fines would need to keep up with parking charges in order to achieve the revenue. The total revenue increase would depend on elasticity of demand.

**Collection Costs** – Additional system costs would depend on whether revenue is retained by the current operators or passed on, in which case a system to allocate and pass on the revenue would be needed.

**Economic Efficiency** - A parking charge that raises the cost of private vehicle travel closer to marginal social cost should be efficient. Reduced demand for car parking spaces in the CBD should allow land/floor space to be used for more productive purposes (for example, office space).

A parking charge that captures off-peak trips will be strongly resisted by business owners in that particular area (especially in the case of retail), many of whom already see parking fees as too high. Making parking charges more expensive may direct people to shop locally or head even further out to areas with free parking.

**Distributional Equity** – Although commuters do have the choice to use public transport to access the areas where car parking charges apply, the higher a charge, the more inequitable access becomes for lower income earners.

**Accountability** – This tool can be seen to have low accountability. Once the car parking charge is paid, users have no knowledge of where the money is going.

**Environmental Sustainability** – Not only can a car parking charge be used as a revenue raising tool, it can also be used as an indirect way of charging motorists for the use of congested roads and could form part of a package of TDM tools. Fewer vehicles in central areas could improve the quality of the environment in those areas.
Urban charging summary

An urban charge is a charge for travel either into, across or within a defined area or to a defined destination. These schemes include Cordon, Area, and Parking Levy Schemes. In these cases, charging can be in the form of a flat rate per day (for example, London’s Congestion Zone) or they can price variably by location, space, time and congestion to more effectively incentivise travel behaviour change outcomes (for example, Singapore and Stockholm). Significant TDM benefits can be achieved with a well designed urban charge scheme (20 percent to 30 percent reduction in car based trips are common).

The technology typically involved in urban charging networks can provide decision makers with more information about actual road use. This information could enable investment to be directed to the locations most valued by network users.

Urban charging could have significant implications for the current funding system and the organisations that operate it, as it needs to be aligned with local rates and existing pricing mechanisms (FED and RUC).

When considering the introduction of such schemes, there are a number of possible transition paths. For example, building on the current RUC system or applying pricing to limited portions of the network such as those that are severely congested.

Mixing urban charging and the current tax based system may be a good way of balancing differing objectives. For example, the tax-based system may be a good way of funding a minimum level of service across the network. However, the political, technical, implementation, and public acceptability risks are significant, and should be weighed against the relative success of the current funding system and the low risk, low cost nature of the current FED and RUC system.

If urban charging were to be implemented in New Zealand a purpose built legislative regime would be required. Implementing urban charging would have to address how the system would operate in the simplest and most accessible way for the public. Recent technological improvements, alongside improving driver awareness of payment options including smart cards could offer a link between urban charging and public transport charges.

One of the major obstacles associated with urban charging of main routes or congested areas is motorists who are unwilling to pay the charge may congest local suburban streets where no charge is payable. These ‘boundary’ roads / areas need careful modelling, evaluation and usually significant additional capital investment to ensure unintended consequences are appropriately evaluated, managed and the effects minimised. The effects of urban charging schemes on lower income households including access to employment also need to be carefully understood.
Evaluation against criteria

Revenue Sustainability – Where it is used to manage demand, attention should be given to setting the level of charges for any road pricing system at the optimal level. If the charges are too low the potential of this tool to influence private vehicle use will be limited. However, if the charge is too high, it will discourage motorists from using their private vehicles, and overall revenue will go down and tolled roads will become underutilised and potentially redirecting traffic to non-charged roads / areas less able to cope with the traffic flow. Any revenue level would depend entirely on the scheme that was implemented and the area in which it was introduced. For any given proposal, financial modelling would need to be undertaken.

Collection Costs - Collection costs are currently high but actual costs are dependent on the type of technology used in the collection process. As the cost of the technology to implement urban charging falls, it will become an increasingly attractive solution, given the benefits it offers to help manage demand.

Economic Efficiency - Urban charging has three benefits: use is more likely to be allocated according to greatest economic benefit, it provides useful signals for future investment, and in some instances it may ensure optimal investment levels as the purchase of new infrastructure can be deferred.

Distributional Equity – Urban charging would create challenges with privacy around information collection and use.

There would be a close correlation between the costs imposed on the road network and the use made of it by particular users and the charges they face as a result. Rates, for example, are a very blunt mechanism for allocating the cost of road to users because prices are set on the estimated value of a ratepayer’s property, not the use made of the road network.

International experience shows an important factor in ensuring the success of any road pricing scheme, is to make significant upfront investments in public transport. This also provides an alternative to those motorists who are unable or unwilling to pay the charge.

One risk is if alternative forms of transport are not provided, urban charging could have negative social consequences for those no longer able to afford to access key economic or social opportunities.
Accountability - New Zealanders tend to view roads as a free public good. As a result, considerable public opposition exists for adding additional charges for road use. The submissions process for the Auckland Road Pricing Study (2006) showed 75 percent of submitters were opposed to a cordon charging scheme in Auckland. The submitters opposing road pricing pointed to the inadequate state of the public transport network, the lack of a ‘ring road’ to allow travel from south to north without entering the heavily congested areas, an aversion to the concept of pricing on roads that have already been fully funded through existing taxes, and the perceived unfair application of a flat pricing structure across all groups in society.

International studies have indicated public acceptability and opposition peaks when schemes are first consulted with the public and reduces with time, although will increase again just prior to any implementation. However, generally after implementation the public acceptability can increase as congestion benefits are realised. Recent surveys in the Auckland region indicate that public acceptability for road pricing in Auckland is now increasing with declining opposition.

Urban charging reinforces rigorous project analysis and prioritisation. A more direct link between cost of particular investment and the charges made should encourage more scrutiny of investment decisions by road users. There should be more transparency around what users are paying for and what their money is being used for and the benefits they are or are not receiving.

Environmental Sustainability – Urban charging has the potential to provide very clear pricing signals to users. This can reduce demand for car travel creating an environmental benefit. However, this will depend on the type of urban charging system chosen and the extent to which it can disaggregate prices.

Changes in demand are strongly related to the amount of the charge and number of trips covered. The amount of demand will depend on elasticity of demand. This is affected by factors such as availability of alternative destinations and travel modes, the size of the charge, how quickly charges are raised, how easy it is to pay and how well charging is enforced. If alternative destinations and modes are not available and only main routes are charged, it is likely traffic will change to secondary local roads, simply shifting the problem.

General rates summary

Rates are local authorities’ primary form of revenue and are used to pay for transport infrastructure and services. General rates are a form of tax paid by land owners and the amount ratepayers pay varies according to their property value. Each council decides if the rates will be assessed on the land value, capital value, or the annual value of the property.

The Local Government (Rating) Act 2002 outlines the types of rates that can be collected and the processes local authorities must follow in setting rates. Each year, rates must be set by resolution of the local authority in accordance with their long-term plan and funding impact statement. In general,
New Zealand rates properties according to their capital value, which is usually provided by an external organisation.

A general rate could be applied to fund expenditure when benefits are widely distributed and where it is not practicable to identify individual beneficiaries. It is more suitable for funding operating expenditure and capital projects where the benefits are widely dispersed. For example, it could be used to fund public transport services, and general road improvements.

The financial data on the total amount of rates collected by local councils throughout New Zealand can be sourced from local councils’ financial statistics by Statistics New Zealand.

Rates revenue can be set at a desired level; however, the approach to increases in rates should take into account who is paying other charges such as road pricing charges if they exist and who benefits from the transport infrastructure. The affordability of rates for those paying them should be of great consideration before implementation.

**Evaluation against criteria**

**Revenue Sustainability** – Rates can technically be set as high as needed but councils are usually politically limited at the level it can be set. Generally, rates increase at the rate of inflation.

**Collection Costs** – If an additional rate was to be set to recover revenue specifically targeted at transport infrastructure, additional collection costs would be small because existing mechanisms are in place to collect the rates. Currently, rates have relatively low costs and complexity and can be implemented in existing legislation. Assuming a rates increase through property value or fixed amount, the rating database and collection methods are well established, the implementation and ongoing operating costs of a rate increase are low.

**Economic Efficiency** – Rates have an element of both a property tax and charge for services. The Local Government Act 2002 requires councils to consider, among other things “the distribution of benefits between the community as a whole, any identifiable part of the community as a whole, any identifiable part of the community, and individuals” and “the extent to which the actions or inaction of particular individuals or a group contribute to the need to undertake the activity”. Underlying this is the principle that more efficient outcomes are achieved if benefits and costs are recognised in the allocation of charges.

**Distributional Equity** – Rates are generally fair across the population; however, this may not be true in the case of people that are asset rich, yet have relatively low incomes. Currently, a council can set a rate taking into account the affordability of rates and charges to certain groups. This is based on “the overall impact of any allocation of liability for revenue needs on the community”, which the council must also consider.
**Accountability** – Because the rating of land is a tax, it is important policies and processes associated with all aspects of rating are transparent and accountable, and council processes enable ratepayers to understand their liability for rates. Currently throughout New Zealand, the process of increasing rates is generally very transparent and information on what the collected rates are spent on is made available to the public.

**Environmental Sustainability** – General rates are unlikely to impact on transport outcomes as there is no direct linkage between the rate set and choices that are taken to fund transport infrastructure. Property values reflect in a very broad sense the levels of accessibility enjoyed by the owner.

**Targeted rates summary**

A targeted rate is used to fund those activities where a council considers the costs should be met by a particular group of ratepayers, or some other benefit in funding exists outside the general rate. They are applied to either land owners or land users (that is, residents or businesses as either lessees or leasers) since they are beneficiaries of the infrastructure or service.

Targeted rates are mainly used where a clearly identifiable group benefits from a specific council activity and will apply to properties that receive certain services, or which are located in specific areas. They are generally paid together with general rates, and are typically applied as an ongoing charge; however, nothing prohibits a local authority from using targeted rates as a mechanism for applying a one-off charge.

A targeted rate could be applied when it is possible to separately identify the groups which benefit from, or cause the need for, the projects or services delivered. The tool is more suitable for funding transport services and projects that benefit a particular group of ratepayers. For example, it could be targeted to a specific geographic area to fund developments in that area (for example, that reflected the greater benefit that some areas may receive from certain transport initiatives), or targeted to specific ratepayers who benefit from a specific project (for example, businesses in a CBD may benefit specifically from a project).

Smaller councils (e.g. Marlborough) have used targeted rates to seal roads. These communities have been willing to pay in order to gain the benefits associated with sealed roads.

The use of targeted rates varies across the councils. For example, some councils use targeted rates extensively, with targeted rates being used to fund projects either above the level of investment the council is willing to fund from other sources, or where an individual wants projects to occur faster than the council is willing to fund.
Section 103(2) of the Local Government Act 2002 sets out the range of funding mechanisms local authorities can use to fund their activities. The Local Government (Rating) Act 2002 details the type of rates that can be collected (including general and targeted rates) and the processes local authorities must follow in setting rates.

**Evaluation against criteria**

**Revenue Sustainability** - Targeted rates are usually set at a level dependent on the specific project and the level of benefits generated.

**Collection Costs** – The additional administration cost associated with targeted rates does add complexity. This is because the administration costs are relatively high in terms of setting up such a rate by calculating the amount to be attributed to each beneficiary. This may involve using some form of cost allocation model to determine financials. The relative cost of administering and raising targeted rates will depend on the size of the project and number of contributors.

**Economic Efficiency** - Targeted rates have the potential to improve the efficiency of funding infrastructure, and better reflect the costs and benefits individuals impose on and receive from infrastructure. They may also be a more practical mechanism of charging ongoing operating costs.

Targeted rates can be ‘targeted’ towards a particular activity or service provided by councils. This provides price signals to these individuals in relation to the activity or service, and so will produce efficient use of investment in infrastructure. This allows the costs and benefits of goods and services provided by councils to be better reflected in the charges residents pay. This provides incentives to residents to use the goods and services to their optimal level.

**Distributional Equity** - Targeted rates are generally more equitable than general rates as it is usually paid by those who benefit from a specific project or from being in a specific area. Rates are targeted against those properties that benefit the most from targeted investment, and so can be considered equitable, although issues with the ‘asset rich income poor’ group still exist.

Targeted rates are typically seen as being publicly unacceptable since residents do not like paying for specific projects where other residents may not have to pay. However, public acceptance of user- or beneficiary-pays approaches has increased in recent years due to increased public education on these issues.

Targeted (and general) rates can also be subject to ‘differential’ rates, with differences relating to specified criteria such as land use, where the land is situated, and annual capital / land value. For example, a targeted rate can be applied to a particular suburb, and businesses can be deemed to benefit more from a particular investment and so pay 120 percent of the targeted rate, while residents
pay say 100 percent of the rate. If the rate was 1 cent per dollar of rateable land, then businesses would pay 1.2 cents per dollar, whereas residents would still pay 1 cent per dollar.

**Accountability** - Targeted rates are often used by councils because they allow the recovery of costs from those who specifically benefit from a particular infrastructure and are consistent with a user pays approach. Because the rating of land is a tax it is important that policies and processes associated with all aspects of rating are transparent and accountable, and that council processes and information enable ratepayers to identify and understand their liability for rates.

Before implementing targeted rates, the concept of ‘free riders’ should be considered in detail and can create a negative public perception of them. Free riders are those benefiting from the development who have not contributed. The risk is those who have paid consider it unfair and so there can be accountability issues. To overcome this, typically those homeowners / businesses / industry associations that may be affected are involved in the development of the targeted rate. This increases the transparency of the revenue tool.

**Environmental Sustainability** - Targeted rates can create incentives for individuals within an area. However, targeted rates are typically set at such a low level by local authorities that these incentives are not strong. Importantly, the level of targeted rates can only be set at a point where they will recover the cost of the service.

**Regional transport rate summary**
A regional transport rate is a potential revenue tool whereby a rate would be set by central government but collected on behalf of the central government at the territorial level. The rate would form part of the overall annual rate paid by land owners. The revenue from this rate could be collected locally using existing mechanisms and be diverted into the NLTF to be spent on transport initiatives.

To enable this form of revenue collection would require new provisions to be made in legislation to provide for the setting and collection of regional transport rates.

**Evaluation against criteria**

**Revenue Sustainability** – The rate can be set at a level to meet the transport demands of an area and resulting costs. However, there would be political limitations on the level of the rate that can be set. This would be seen at both a central and local government level as local government would be collecting it and therefore it is likely complaints may be directed at them.

**Collection Costs** – Collection costs should be relatively minor, as a transport rate would be collected as part of general rates collection for which existing mechanisms are in place.
Economic Efficiency – As with general rates, there would be limited linkages between the rates set and user behaviour.

Distributional Equity – Inequity could occur between regions, for example, if the rate was heavily collected in one region but spent on transport initiatives in another region. This could be avoided by basing the transport rate on an underlying assumption the revenue is spent within the area it is collected.

Accountability – An accountability issue exists in that central government would be setting the rate, but local government would be receiving the brunt of complaints as the collectors of the tax.

Environmental Sustainability – As there are few links between the rate and the users, there is likely to be low impact on environmental sustainability.

General taxation summary findings

General taxation can be used as a revenue tool for the funding of transport initiatives. This option involves raising transport revenues from tax sources that do not have a direct link to the transport network. These taxes would seek to raise revenue by spreading costs to all members of a population through broad-based taxes such as income taxes, GST and company tax.

Using general government tax revenues to pay for transport infrastructure means taxpayers are required to ‘contribute’ to transportation funding. This can be justified to the extent transportation infrastructure is a public good and that there are wider benefits not captured by users. In the case of this tool, transport projects would be assessed against other calls on government funds. This topic is investigated in more detail in the report on hypothecation.

The Crown already funds some land transport activities directly. This money is allocated to the New Zealand Transport Agency through the Ministry of Transport. This is funding separate to the NLTF and is allocated to activities such as:

► the fast tracking of high priority state highway activities, for example, a number of activities aimed at improving the network across the country gained additional Crown funds through the February 2009 stimulus package
► investing in regional development activities in specific regions to improve transport linkages for the forestry industry
► providing for public fare concessions for retired New Zealanders through the SuperGold card scheme
► loans to the New Zealand Transport Agency to advance certain projects.
Any legislative or regulatory change would form part of the annual budget process. The Government may find scope for leveraging the revenue raising potential of tax systems by raising some taxes more than others, depending on how taxpayers respond.

**Evaluation against criteria**

**Revenue Sustainability** – This type of taxation would remain sustainable over the long-run. General fund revenues are a large potential source of revenue. They are based on a large tax base and have good growth potential.

**Collection costs** – General taxation collection mechanisms are already in place. Revenue is collected at the national level by the Inland Revenue Department on behalf of the New Zealand Government. There would be no additional collection costs.

**Economic Efficiency** – Higher income taxes would create a tax wedge which is the difference between what employees take home in earnings and what it costs to employ them, or the dollar value of the income tax rate. This results in consumers paying more and producers receiving less and the result of this is market inefficiency. In addition, tax is not related to use whereas a user charge gives a price signal.

The level of revenue loss or evasion will depend on the type of tax, for example, GST is harder to evade compared to income tax. Higher taxes will tend to encourage evasion.

**Distributional Equity** – This will depend on whether it is a progressive or regressive tax. A progressive tax is a tax where the tax rate increases as the taxable base amount increases. This type of tax takes a larger percentage from the income of high-income earners than it does from low-income earners. A regressive tax is generally a tax applied uniformly, which means it hits lower-income individuals harder. A progressive tax, like an income tax, will be more equitable compared to a regressive tax like GST.

Funding through progressive taxes meets at least one standard of equity, that is they do not impose a larger burden, relative to income, on low-income earners. However, use of general taxation to pay for specific services that benefit some taxpayers more than others does not satisfy the user pays standard of equity under the Treasury’s Living Standard Framework.

**Accountability** – This is low as road users do not directly face the costs they impose on the system. Furthermore, taxes collected nationally could be spent in particular regions where taxpayers elsewhere do not receive the benefit.

**Environmental Sustainability** – No effect noted.
Existing tools not included in short-list

A number of the tools in the long-list did not score sufficiently high against the criteria to be included in the short-list, but are legislatively enabled and part of the current transport revenue system. These are:

► Public transport fares
► Tolls on new roads
► Development contributions
► Financial contributions
► Revenue from assets
► Advertising and other marketing revenue
► Carbon tax

These tools are not unsatisfactory, but were excluded from the short list because of the modest revenue they generate and the relative advantages offered by the tools that were incorporated in the short list. Each of these tools provides a small amount of revenue for a specific purpose. However, they can provide an important contribution allowing increases in service otherwise not possible. For example, public transport fares funded 48 percent of the operating costs of public transport services in 2012/13. Development and financial contributions fund specific infrastructure to provide for growth. Therefore, in developing any package of tools in the future, these existing tools should be considered as part of the package and what role they might play for different agencies.
Conclusion

The purpose of this report has been to qualitatively assess different revenue tools and their ongoing suitability. After examining a wide range of potential funding approaches, an additional level of review was conducted for a subset of what were deemed as the most promising future funding options. The revenue tools paper accompanying this report has delivered a broader description of transport revenue tools, with an assessment of the advantages and disadvantages of each option.

A multi-criteria assessment methodology has been developed in this project for assessing revenue tools in order to give the Ministry consistent, principled advice about the value and utility of the different revenue tools against different objectives.

One overarching objective is revenue tools employed to fund the New Zealand land transportation system should generate sufficient resources to meet national investment needs on a sustainable basis. Whatever group of tools is selected it must enable central government together with supporting local and regional government to together raise sufficient funds to make appropriate transport investments at the local, regional and national levels.

While analysing each revenue tool individually against assessment criteria is useful, funding the transportation network will likely always incorporate a package of revenue tools. The project objective was to have a methodology to evaluate the revenue tools against the six assessment criteria qualitatively, and apply a quantitative score that would enable identification of a possible package. However, a final package of tools will not just reflect the scoring against the assessment criteria for a number of reasons.

Firstly, consideration needs to be given to the potential for overlap between the criteria and double-counting in the scoring, which can be addressed through detailed quantitative assessment. Secondly, some of the criteria have unavoidable conflicts, where the factors that result in a tool achieving a high score on one criterion for a certain revenue tool impinges on its ability to score highly on other criteria. Thirdly, there can be different weightings or priorities across the criteria, reflecting legitimate differences of opinion as to the relative importance of each. In particular, different weightings could be used to provide a focus on a particular government policy objective such as managing demand for environmental reasons or maximising revenue potential and then identify different packages of tools that would be appropriate for each scenario.

The evaluation and assessment of existing and potential new revenue tools reinforces the fact there is no simple guaranteed solution to the optimal mix of revenue tools. Each tool has its own advantages, disadvantages, and time and place for appropriate utilisation. In addition, not all approaches could work equally well throughout the geographically, economically and asset diverse country. Nonetheless, this evaluation does provide insight into the relative attractiveness of different tools and the situations and circumstances in which they are an effective option to be employed.
In recognition of the supporting role financing mechanisms can play in leveraging and initiating transport investments, an explanation of the contribution of financing has been incorporated into the funding tools paper accompanying this report. Although distinct from revenue raising tools, properly structured financing techniques, including those focussed on facilitating partnerships with the private sector, can play an important supplementary role. However, this success will depend on the ability to leverage revenue streams from appropriate revenue tools to repay upfront capital investments.

Looking to the future of New Zealand, and under current forecast assumptions, fuel excise duty and road user charges are forecast to be sustainable for approximately the next fifteen years, if taxes are indexed to inflation. Over this time they will provide adequate revenue to meet expenditure targets, and road users, on average, will meet their fair share of costs.

This assessment is based on current forecasts of modest improvements in fuel efficiency based on trends since 2008. There is no allowance for a significant uptake of new vehicle types, such as hybrid or electric vehicles. A significant uptake of these vehicles would require intervention to ensure revenue sustainability. In the long-run, and as technology improves, both urban charging and universal network charging are likely to become increasingly attractive revenue tools, as fuel excise duty revenues decline.

Our current indirect user charging system based largely on fuel excise duty and road user charges provides users with only very approximate price signals regarding use of the various components of the transportation system in the most efficient ways. This results from users typically being unaware of how much they pay in fuel taxes, because of daily fluctuations in the price of fuel that hide the tax component and dull its effect on demand. In addition, fuel taxes and road user charges do not have a direct link to specific parts of the system being used or to the times of day and therefore cannot be used to affect these kinds of traveller behaviour choices.

A national transport funding system based on more direct forms of “user pay” charges, in the form of universal network charging, is emerging as a viable choice for the future because it conveys much more precise price signals as it regards the cost of using specific parts of the road network and delivers optimal use of the transport infrastructure. Although the price of implementing such a system is currently expensive, the costs are decreasing. We do not need to rush into such a system as the current approach is sustainable for the foreseeable future.

If such a system is implemented, it is important it be designed in a way that protects users’ civil liberties and privacy, and incorporates any necessary subsidies (for example, public transport) for other parts of the transport network that will benefit the national network or help to meet social equity objectives.

In addition, urban charging (including congestion management), which has been limited by public acceptability, may become more acceptable if this approach is adopted more widely overseas.
Greater use of pricing mechanisms, may stimulate more efficient use of the transport network, by shifting demand to other modes or less congested times of the day, and may in turn enable more efficient investment and reduce the additional capacity that needs to be built.

In New Zealand, both national and all regional governments, including urban and rural locations, face substantial funding burdens to accommodate New Zealand’s national interest. Every trip, whether carrying people or freight, uses a network of both national and local roads from origin to destination. Government policies need to continue to support and promote transportation investments across the nation at levels adequate to maintain system quality of the national transportation network. Central government revenue raising tools and policies therefore need to be coordinated with related local policies and must be aware and informed of the impacts its actions have on the others’ ability and willingness to use certain approaches to raising transport revenue.

As New Zealand faces a number of very specific transport funding pressures it is important both the culture and opportunities are created to undertake an effective dialogue on both the extent of funding required and the best way to raise that revenue.

As current systems are sustainable for the medium term needs, we have time for this debate and to find the best way forward for New Zealand.