

Future Funding

Revenue tools for transport

November 2014



Ministry of **Transport**
TE MANATŪ WAKA

Ensuring our transport system
helps New Zealand thrive



Future Funding: Revenue tools for transport

The Future Funding project is one of three Strategic Projects 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 how much we should invest in the land transport system and how we should raise that money. The key questions considered in this project are set out in the quadrants of the circle in the diagram below with the key reports produced for each question outlined in the adjacent boxes. This report outlines the different revenue tools for the land transport system in response to question four, and serves as an appendix paper for the “Assessment of revenue tools” paper.

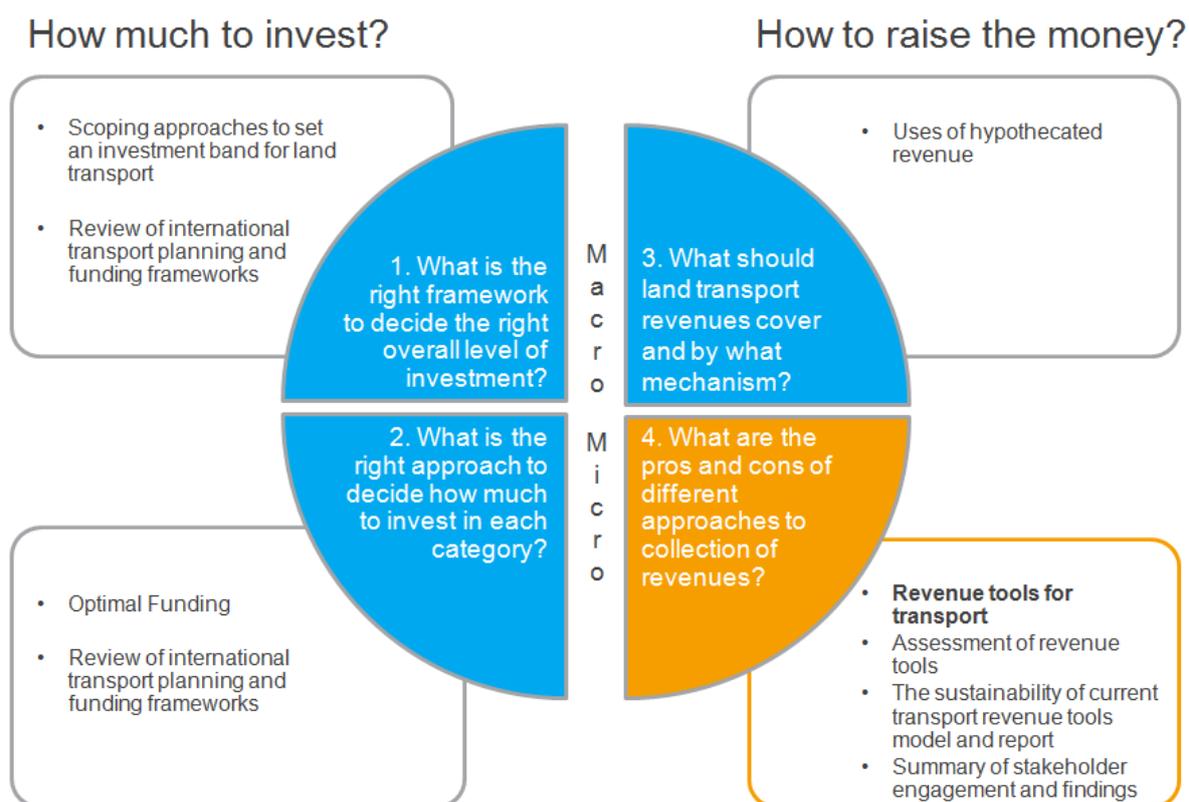


Figure 1: Key questions of Future Funding and its associated reports

This paper is presented not as policy, but with a view to inform and stimulate wider debate.

Revenue tools for transport

Introduction

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, with increasing real prices and increased fuel efficiency curtailing revenues (unless duty rates are increased to compensate) and the potential for widespread adoption of electric vehicles greatly exacerbating issues. Distance based charging also has possible long-term limitations because of the flattening of per capita distance travelled by road seen over the last 10 years in New Zealand and globally for highly motorised countries.

Purpose of question four

The purpose of question four is to qualitatively assess the 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 analysis 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 document is one of several outputs for question one which includes a final report and a set of templates which will act as 'living documents' for the ongoing capture of information on the different revenue tools. The project team does not aim to complete a detailed cost-benefit analysis of the tools.

The purpose of this paper is to articulate and describe some of the high level advantages and disadvantages of revenue tools that can be employed as mechanisms used to fund transport activities, both centrally and locally in New Zealand, as well as those that could be considered for potential use in the future. 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 (overlap does exist):

- ▶ vehicle based access charges
- ▶ consumption
- ▶ spatial
- ▶ value capture
- ▶ road charging
- ▶ other

Table 1 outlines the transport revenue tools present in this paper, and the category to which they have been assigned. The body of the paper follows this outline. Financing is out of the scope of revenue tools for transport. However, for the sake of completeness it has been incorporated into the paper because it has been a useful approach to initiate earlier transport investment and is contingent on future revenue streams.

Table 1: Revenue tools for transport

Vehicle based access charges	Consumption	Spatial	Value capture	Road charging	Other
Motor vehicle registration	Fuel excise duty	General and targeted rates	Development contributions	Universal network charging	General taxation
Vehicle emissions tax	Road user charges	Regional fuel tax	Financial contributions	Urban charging	Car parking charges
Bicycle registration tax	Public transport fares	Regional transport rate	Revenue from assets	Tolling existing roads	Carbon tax
	Tolling of new roads	Regional income, GST, or payroll tax	Advertising/concessions/leases	High occupancy toll lanes	Poll tax
	Diesel tax		Tax increment financing		Visitor and/or airport taxes
	Transport tax on alternative fuels		Joint development /sale of airspace		

Note: Tools in blue text are those currently employed in New Zealand

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 of Transport 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.

Revenue tools

Vehicle based access charges

Motor Vehicle Registration and Licensing

Motor vehicle registration fees are generally one-off fees for adding a vehicle's details to the Motor Vehicle Register and issuing its registration plate, both of which are needed for law enforcement. The annual licence fee is a network access fee, that is, allows road users to use their vehicle on the road. In New Zealand most of the motor vehicle licence fee is an ACC levy (to fund ACC related accident costs). There has been no increase in the level of the transport funding component of the annual licence fee since 1992. 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 or annual registration fees have been used much more aggressively to encourage or discourage use of particular types of vehicle.

Advantages

- ▶ Motor vehicle registration and licensing is a sustainable and stable source of revenue.
- ▶ Registration and licence fees allow for collections from vehicles using alternative fuels without establishing new mechanisms for collection.
- ▶ A registration or annual licence fee based on vehicle value could be structured to reflect ability to pay.
- ▶ Variable fees can be used to incentivise purchase or use of vehicles with particular characteristics.

Disadvantages

- ▶ Registration and licence fees do not vary by kilometres travelled so people who own a car but don't use it often pay as much as a high mileage driver (a high fee could therefore have a disproportionate impact on groups such as the elderly with a fixed income).
- ▶ A high fee would provide strong incentives to evade the tax by not licensing a vehicle.
- ▶ If fees are differentiated by vehicle characteristics unrelated to road costs (for example, emissions or safety features) this introduces added complexity and could give rise to a need to reconcile conflicting objectives (for example, affordability and 'user pays' vs safety).
- ▶ Licencing fees are relatively expensive to administer in relation to potential yield; however, 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 realistically remove a significant portion of administrative costs from the system.

Vehicle emissions tax

A vehicle emissions tax would be paid annually on all registered vehicles. This duty would be graduated according to the carbon dioxide emissions of the vehicle in question. Fees would be based on greenhouse gas emissions, such as an assessment of grams of carbon dioxide per kilometre. The fees could be applied across different vehicle technologies and fuel types. Here consumers can be encouraged to drive less or buy more efficient vehicles and manufacturers/importers would be encouraged to produce/import more efficient models.

An alternative to a vehicle emissions scheme is a rebate scheme. The idea of a rebate scheme is to levy a fee on the purchase of goods with undesirable characteristics (cars with high carbon dioxide emissions) and use the revenues gained to pay a rebate to more desirable ones (cars with low carbon dioxide emissions). This provides an incentive to purchase an efficient car with low carbon dioxide emissions and to discourage cars that pollute more.

Advantages

- ▶ Vehicle emissions tax would indirectly reduce emissions, helping New Zealand achieve legally binding targets set by international agreements.
- ▶ The amount of revenue raised depends on the level of the tax, how broadly it is applied and other factors, and could provide substantial revenue levels.
- ▶ Offers incentives for continuous improvement in carbon dioxide emissions for all new car models anywhere along the spectrum.
- ▶ Incentivises vehicle owners to factor fuel economy more fully into their purchase decisions by increasing the price signal upfront.
- ▶ By providing economic incentives to consumers and manufacturers, vehicle fees act as a decentralised tool allowing the market to choose the cheapest technologies.

Disadvantages

- ▶ Vehicle emission tax has an associated deadweight loss, where only the tax at the point of purchase has a significant influence on vehicle choice. Once purchased, cars will remain in the fleet until they are old enough to be scrapped, irrespective of how much emissions tax is paid on them. Once a car has entered the vehicle fleet, not much can be done to improve its fuel efficiency.
- ▶ Vehicle emissions tax has equity issues. Poorer motorists are steered towards older cars because they are cheaper to buy, but then are forced to pay higher tax each year because older cars often have poor fuel economy. Low-income households spend less on energy in total (relative to high-income households), but spend a relatively larger share of their household budget on energy. Consequently a carbon tax is regressive as it would have a relatively larger impact on low-income households than on high-income households.

Bicycle registration tax

No mechanism is currently in place to raise funds specifically dedicated to improvements to bike or pedestrian facilities in New Zealand. Consistent with the user pays approach to many transport revenue tools, it could be argued bicyclists should pay to support bike paths. One approach to this would be an annual bicycle registration tax, as applied in Switzerland.

Advantages

- ▶ It would be consistent with many other areas of investment in land transport where the user pays.
- ▶ Justifiable as a dedicated source of funding for bike and pedestrian improvements.
- ▶ It would help manage concerns from drivers that their payments for road services are being used to provide services for other people who are not contributing to the costs.

Disadvantages

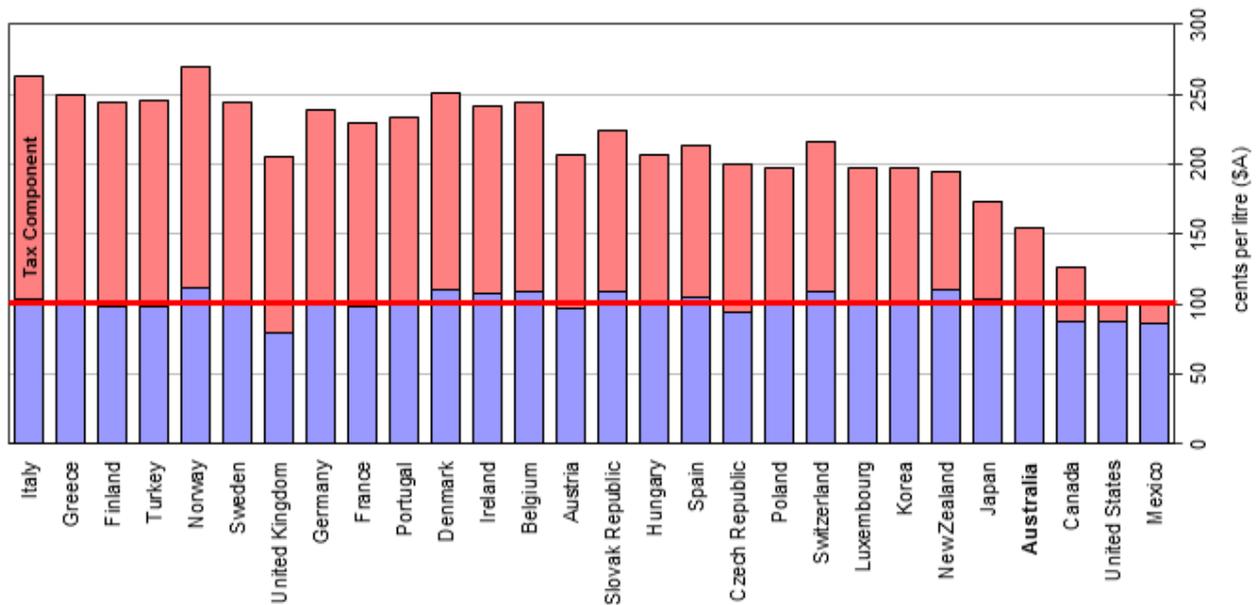
- ▶ It is extremely difficult to administer and enforce (many bicycles are used off-road).
- ▶ It may not receive strong public or political support.
- ▶ It could lack geographic equity if spending is concentrated on urban areas.
- ▶ It would not raise a large amount of revenue, even in the context of current Government bike and pedestrian path spending levels.

Consumption

Fuel Excise Duty

In New Zealand, fuel excise duty (FED) is paid by users at the pump based on the level of fuel use. FED is included in the price of petrol, LPG and CNG fuels (the rate of excise or excise-equivalent duty varies for each fuel). The tax is collected at the border (when imported), or at the refinery (for domestically produced fuel). FED rates are set by Order in Council on the recommendation of the Minister of Transport. One consequence of this is revenues from FED do not increase automatically with inflation.

FED is a proxy for distance travelled, and road costs caused by (predominantly light) petrol vehicles. New Zealand's fuel taxes are relatively low compared with other countries. This is due largely to low petrol taxes. Unlike most OECD countries, full hypothecation means all revenues from fuel taxes in New Zealand are available to be spent on transport activities.



Source: www.aip.com.au/pricing/internationalprices.htm

Figure 2: Petrol Prices and Taxes in OECD Countries March Quarter 2014

Advantages

- ▶ It has significant revenue yield, coupled with very low administrative and compliance costs. A small increase in the fuel tax generates substantial revenue.
- ▶ As payment of fuel taxes is automatic with purchase it requires no action on the part of end users, who may not even be aware of how much they are paying. Small increases can go unnoticed by many users and generate little negative response.
- ▶ Changes to transport taxes can be implemented relatively quickly.
- ▶ Transport fuel taxes have significant scope to be increased. Fuel prices are generally acknowledged to be highly inelastic historically, that is, demand is not very responsive to price. However, this may be changing according to both international and national indicators, especially since the price of petrol in New Zealand increased to above two dollars per litre.
- ▶ The opportunity for evasion of FED is virtually nil, with fraudulent refund claims for non-road use effectively being the only opportunity for evading payment. Eligibility for refunds is very limited which limits the scope for fraud.
- ▶ Fuel taxes could increase significantly without reducing economic competitiveness.
- ▶ Higher fuel prices encourage more efficient transportation and fuel conservation. For oil consuming nations, reduced fuel consumption reduces the economic costs of importing petroleum, while for oil producing countries it increases the oil available for export.

Disadvantages

- ▶ Technological changes in the vehicle fleet may impact on the long-term sustainability of FED revenues. These changes include more fuel efficient petrol vehicles, which produce less revenue for the same use of the network (vehicle kilometres travelled), which is expected to lead to long-term erosion of FED revenues if tax rates are not increased. Technological changes also include the increasing use of new fuel (for example, bio fuels) and hybrid vehicles that use very little fuel.

- ▶ Users are not charged for the time and location of their travel (for example, travel during peak or congested periods). This means once FED is paid, transport is essentially perceived as a free good, with congestion the only real brake on excess demand. This imposes large costs on the economy, particularly in metropolitan areas such as Auckland, where projected congestion levels are estimated to be higher.
- ▶ FED results in charges paid for vehicle use varying substantially depending on fuel consumption, which is not directly related to the costs of providing roads. It therefore provides a very poor price signal to users and providers.
- ▶ FED is likely to become more inequitable as the efficiency of vehicles improves.
- ▶ Revenues go into a general expenditure pool without a specific link to the parts of the network where costs were incurred.

Road User Charges

The New Zealand road user charges (RUC) system is a charge for distance travelled on public roads. It applies to all heavy vehicles with a gross weight of more than 3.5 tonnes, and to light diesel vehicles (diesel not being subject to FED). Distance charging can directly link the distance a vehicle travels on the roading network to differential charges for any determined vehicle characteristics. Revenues from RUC do not increase automatically with inflation. RUC rates vary according to the weight and axle configuration of vehicles to broadly reflect the costs imposed from use of the roading network. For RUC purposes vehicle weight is defined as the maximum legal carrying capacity, as determined by the NZ Transport Agency on the basis of the weight ratings assigned by vehicle manufacturers and mass limits defined in legislation.

Advantages

- ▶ It is a sustainable source of revenue. Revenue is unlikely to be severely threatened in the short to medium term.
- ▶ This system goes a considerable way to assigning charges to vehicles according to their overall use of the network and the general damage they impose on the road system.
- ▶ Revenue is not dependent on fuel consumption.
- ▶ It is a potential way of applying equitable charges to all vehicles irrespective of motive power.

Disadvantages

- ▶ RUC revenue collection is more complex, and compared to FED, it has relatively high administration and compliance costs (which fall predominantly on road users).
- ▶ RUC is more open to evasion than FED or rates.
- ▶ RUC imposes a responsibility on users to ensure they purchase distance licences when required. It is therefore more likely to be perceived as a burden than “invisible” fuel taxes. Under the current system, charges are not differentiated by time or location. All kilometres are the same price, regardless of when or where they are used.
- ▶ RUC differentiates between vehicles solely on characteristics relevant to road construction and maintenance costs and the assumptions about road impacts involve considerable averaging.

- ▶ Variation in levels of RUC for different types of vehicle can be a bone of contention for users who perceive their vehicle is treated unfairly. The NZ Transport Agency receives a steady flow of requests for exemptions or concessions. If agreed to, these add to the complexity of the system, and can complicate enforcement; but if disregarded they can undermine compliance.
- ▶ Revenues go into a general expenditure pool without a specific link to the parts of the network where costs were incurred.
- ▶ It is hard to extend to petrol vehicles unless all petrol vehicles were switched to RUC at once and FED removed as a source of transport revenue. Moving all 2.6 million light petrol vehicles (as at December 2013) from FED to RUC on a nominated day would be challenging and is not currently needed to secure land transport revenues.

Public Transport fares

In New Zealand, fare box revenue partly funds public transport operations, while capital projects are fully funded by other transportation revenues or the Government. Fare box revenue is directly linked to the use of public transportation and to the cost of operation and maintenance. It is generally desirable any users of the transport system pay the full cost of use, including public transport users. However, public transport would get little use if users had to pay the full costs. In New Zealand, the amount of revenue raised by public transport users is usually well below operating costs (the New Zealand Transport Agency has established a fare box recovery rate of 50 percent). Establishing the socially appropriate pricing of public transport is challenging especially given the low population, large transport network, spatial and land use density context of New Zealand.

Advantages

- ▶ An increase in fares will usually increase revenue.
- ▶ Fees give users an awareness of the costs of providing these services.
- ▶ Fares could vary by time of day (for example, peak hours) in order to manage demand and capital expenditure needs, and provide a low fare alternative when there is spare capacity.
- ▶ On some public transport services, users' incomes are higher than average incomes, so fare reductions would be regressive.
- ▶ Without fares some services may not be run due to the increased call upon the National Land Transport Fund (NLTF) and local authorities funding.

Disadvantages

- ▶ Increased fares will reduce ridership.
- ▶ Reduced ridership may reduce total network capacity and exacerbate road congestion problems in some areas.
- ▶ Fare box recovery rates vary widely across regions.
- ▶ Fare box recovery on some services can become very low because of unforeseen externalities.
- ▶ Local authorities may be reluctant to fund their share.

Tolling new roads

Tolling can provide revenue allowing a new road to be constructed that otherwise would not be funded until sometime in the future. In New Zealand it is currently used for roads that have been brought forward in time so the benefits of building the road can be enjoyed earlier. In these cases the toll is used to recover the costs of servicing the debt incurred in bringing the project forward, including the cost of tolling.

Currently under the Land Transport Management Act, toll revenue can only be applied to the particular project on which it is being collected. Road Controlling Authorities under the Land Transport Management Act can seek Ministerial approval of a tolling scheme allowing the authority to charge tolls for new roads, or existing roads where it is physically integral to the tolling scheme, and a feasible, un-tolled, alternative route is available. Road users therefore have a choice to pay the toll and take advantage of the time savings offered by the toll road or use a longer alternative 'free' route.

Although most tolling proposals can raise some additional revenue, diversion of traffic from the new route due to the toll may reduce the economic value of the investment. Very few new roads have the necessary combination of high traffic volumes and long alternative routes needed to support economically efficient tolling. However, this is based on past experience in New Zealand and may change in the future. Successful cases have been implemented in other jurisdictions, for example, Melbourne's CityLink, which combined tolling with a public private partnership structure. If tolling revenue over recovers debt incurred and the cost of tolling, it could be possible to spend the additional revenue on other roads.

Advantages

- ▶ Tolling can send strong pricing signals and has the potential to improve investment decisions by better matching demand to supply. Tolling is used extensively in many countries to raise revenue. Norway, for example, has a long history of tolling and now generates over 50 percent of their transport revenue from tolling.
- ▶ Tolling is a location-specific form of charging and therefore a valid candidate for consideration in a regionalised approach to raising revenue.
- ▶ Tolling and ITS technology are proven and improving internationally.
- ▶ Tolling provides a means of repaying project specific borrowing (be it internal or external borrowing).
- ▶ Tolling can provide reasonable and proven pricing signals if it is used as a demand management tool toward the road pricing end of the spectrum. Variable tolls could be charged depending on the time of day, providing some pricing signals.
- ▶ The viability of toll roads has substantial checks and balances through the Land Transport Management Act, including funding allocation processes for NLTF funding and the requirement for an Order in Council for tolling schemes.

Disadvantages

- ▶ Tolling new roads in New Zealand is generally not cost effective because of the combination of high diversion rates and modest traffic volumes compared to project costs.
- ▶ The scope for tolling new roads is limited; toll roads are generally used where travel time savings are significant and most new projects offer limited time savings over alternative routes.
- ▶ Traffic diversion also reduces the economic return from National Land Transport Funds (NLTF) used to fund tolling projects. To date, no tolling projects have been identified that are fully self-funding or increase the economic value of a project.
- ▶ Traffic diversion due to the toll can also encourage the use of alternative routes that have higher crash risk and in terms of road safety outcomes, reduce the maximisation of social crash cost benefits. The reduction in traffic volumes on the existing untolled route can lead to increased speeds, causing higher severity crashes and therefore higher social crash costs than would have occurred previously.
- ▶ If road usage estimates do not eventuate, the tolls levied on the road may be unable to recover costs associated with borrowing (for example, Route K in Tauranga and the Northern Gateway Toll Road north of Auckland), and may need to be covered by either the Crown or the NLTF (depending on the tolling arrangement in question).
- ▶ Tolling is an expensive means of generating revenue when compared to fuel excise duty and road user charges. Tolling new roads could therefore be expected to make a modest contribution to meeting project costs but is unlikely to account for a large part of the forecast funding gap.
- ▶ Substantial changes would be required to the Land Transport Management Act tolling regime to allow tolling to be used as a demand management or a significant revenue raising tool.
- ▶ Since the users of a given toll road will derive the most benefit from it, it is appropriate they should pay. However, in most cases substantial NLTF funding will supplement toll revenue in paying for the construction of toll roads.
- ▶ Toll roads have a revenue risk in that if road usage estimates do not eventuate, the NLTF is required to cover any unforeseen costs. The increased use of tolling, if tied to borrowing, could lead to increased ongoing costs for the NLTF.
- ▶ Tolling can mean lower priority projects are funded ahead of projects of a higher priority, with the toll revenue effectively buying priority.

Diesel Tax

A tax on diesel could be administered in much the same way as current fuel excise duty on petrol. Taxing diesel is a common form of road charging in other jurisdictions; however, it is almost universally used as a general tax rather than a tied tax. New Zealand is unusual in that it currently dedicates all land transport revenue to a transport fund. For this system to be effective it is likely a road user charges system would need to be retained for heavy vehicles currently paying a far larger proportion of RUC. A diesel tax for these vehicles would not be sufficient to recover the roading costs generated by heavy vehicles over 3.5 tonnes. An alternative could be a fuel tax on diesel and a registration charge based on vehicle weight.

Advantages

- ▶ A diesel tax would help to align the costs and associated charges, and reduce inequities between users of petrol and diesel powered vehicles.
- ▶ The current RUC system involves relatively high administration costs. A diesel tax would reduce the need for administration to a large extent as it is simplistic in its administration and security of collection.
- ▶ Compliance costs for users currently on RUC would be reduced with a switch to a diesel tax.
- ▶ A diesel tax would have the advantage of efficiency and ease of collection for both users and the government.
- ▶ It offers a cash flow benefit to transport operators as it is pay as you go rather than pay in advance.

Disadvantages

- ▶ It is estimated 36 percent of all diesel sold in New Zealand is used off roads, in industries such as construction, farming, fishing and forestry. A tax on diesel would create the need for a refund system for users who do not use the roading network. These non-road users of diesel would pay the costs of applying for refunds.
- ▶ Setting up and operating a system for managing diesel tax refunds would involve significant administrative and compliance costs, including measures to prevent fraudulent refund claims.
- ▶ A tax on diesel could substitute RUC for private cars, but it could not cover the roading costs generated by heavy vehicles over 3.5 tonnes. A RUC system would need to be retained for these heavy vehicles, reducing any administrative savings made by shifting diesel cars from the current RUC system.

Tax on alternative fuels

The extent to which alternative fuels will displace petroleum appears limited in the short term; however, this may change over the coming decade and beyond as motorists turn to new sources of power for their vehicles. Because of the limited use of alternative fuels to date, little experience exists with, or limited information is available on, the use of such fuels. New fuels and vehicle technologies have a high level of uncertainty. Today, transport use of CNG is negligible, and LPG is estimated to account for less than one percent of distance travelled on New Zealand roads. There may be potential future requirements for charging systems relating to other dual or multiple fuel vehicles (for example, plug in hybrids and vehicles capable of running on various other liquid fuels (methanol, hydrogen and biofuels)).

LPG and CNG are subject to fuel excise duty but at considerably lower rates than petrol. As with petrol, excise duty is levied at the point of production or importation, but as these fuels are mostly used for non-transport purposes the greater part of the duty is subsequently refunded.

When looking into the future, New Zealand's almost complete reliance on existing conventional liquid fuels means it is prudent to think about how the market may change in the future. A tax on alternative fuels would extend the approach used for LPG and CNG to include vehicles currently running on liquid fuels not subject to excise duty.

Advantages

- ▶ Once the system was updated, administrative and compliance costs would be low.
- ▶ Changes to taxes can be implemented relatively quickly.

Disadvantages

- ▶ Unless alternative fuels are utilised to a greater extent in the transportation sector, the ability to raise revenue will remain negligible.
- ▶ A refund system will have to remain in place for those not using alternative fuels on the transportation network.
- ▶ If alternative fuels use a combination of fuels currently taxed by different methods, it will be very difficult to determine how they should be paying their tax.
- ▶ This tax is likely to become more inequitable as the efficiency of vehicles improves.
- ▶ Like FED, users would not be charged for the time and location of their travel (for example, travel during peak or congested periods).
- ▶ Revenues would go into a general expenditure pool without a specific link to the parts of the network where costs were incurred.

Spatial

Rates

Rates are local authorities' primary form of revenue. Rates can be made up of general rates, targeted rates and uniform annual general charges. General and targeted rates are related to property value. They are difficult to avoid and any increase is relatively inexpensive to collect.

In New Zealand, generally a large proportion of local authorities' rates revenue is used to pay for transport infrastructure and services, and they therefore provide a significant addition to the transport funding provided from national transport taxes. Recently, the proportion of rates being spent on transport infrastructure has been declining. Local authorities spend about \$1.5 billion a year on land transport and central government about \$3 billion.

Rates can be broken down into:

- ▶ General rates: these rates are not tied to any particular form of expenditure. In many centres of New Zealand they are based on a properties' capital value. General rates can be differentiated whereby different types of property (for example, residential, commercial, farms) are charged at different rates.
- ▶ Targeted rates: these rates are used to fund a specific council activity or programme, usually in a defined geographic area. They are usually only levied on specific types of property (for example, businesses) and/or properties in a specific area (for example, the area served by public transport). Rates targeted at an urban area are typically used to fund public transport services. Targeted rates can also be widely used to fund amenity improvements to streets within business centres subject to the targeted rate.

Advantages

- ▶ General rates can be used to fund activities benefiting the whole region or are available to all.
- ▶ General rates are a relatively efficient, transparent and fair way of raising revenue.
- ▶ It enables local contribution to local benefits.
- ▶ Rates are location specific in nature and therefore a reasonable candidate for consideration in any regionally based funding regime. They also establish a direct link between local decision making and local taxation. This provides local representatives with strong incentives to use rates wisely.
- ▶ Rates are a rough proxy for the value property owners get from the transport system as they are based on property values which tend to reflect the level of accessibility provided by the transport system (for example property values close to key transport nodes tend to be higher). They are arguably as equitable as other transport taxes that are averaged across the entire network.
- ▶ Targeted rates are relatively inexpensive to collect, transparent (as it is clear who is setting and spending the rates) and fair (based on the council's ability to target them to properties benefiting most).

Disadvantages

- ▶ Strong accountability also makes local representatives resistant to rates rises. One of the main limitations on the contribution of rates to transport is the ability of local government to increase rates.
- ▶ The ability of central government to influence the level of rates raised in a given region or territorial authority is limited.
- ▶ Rates are not in proportion to the amount people use the transport system. For example, some owners/occupants do not make full use of the accessibility of their properties. In particular, households with elderly occupants tend to make less direct use of the transport system. This group can also be asset rich but income poor, and be highly sensitive to changes in rates.

Regional fuel taxes

A regional fuel tax would apply to all petrol and diesel sold in a region. It would have to be collected at the retail level as wholesale fuel will not necessarily be used in the region in which it is sold. In New Zealand, a regional fuel tax framework was put in place in major metropolitan regions in the early 1990s and lapsed after price spreading occurred between regions. A regional fuel tax scheme was legislated in 2008 but repealed in 2009 due to concerns about price spreading and refund costs imposed on non-transport users of transport fuels (farming, construction and manufacturing).

Advantages

- ▶ A regional fuel tax would directly link the raising of regional tax to specific regional investments.
- ▶ It would supplement existing revenue sources.

Disadvantages

- ▶ Experience with the regional fuel tax in the 1990s indicates fuel companies would spread the cost of the tax to create a competitive advantage in any large urban area to which the tax applies.
- ▶ Any fuel-based tax is subject to the same demand risks associated with FED.

- ▶ Vehicles may travel between regions to refuel where it was cheaper, thereby evading the tax.
- ▶ Regionalising fuel taxes raises significant problems as the fuel market is not inherently regional in nature, and fuel, particularly diesel, is widely used in non-transport applications, triggering the need for a costly refund system.
- ▶ Regional fuel tax compliance costs would fall on non-transport users of fuels, particularly the farming, forestry, fishing, manufacturing and construction industries. These businesses would need to apply for regional tax refunds.
- ▶ This regime has weak and unclear accountability if responsibility for raising the tax and spending the revenue are split between the national and regional politicians.

Regional transport rate

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. This money could be diverted to the Crown fund to be spent on transport initiatives for the region the money is levied from.

Advantages

- ▶ The rate would be paid by people who live in the area where it is spent.
- ▶ It would be a mechanism for raising increased revenue in fast growing areas that particularly need transport investments, without placing an unfair burden on other parts of the country.
- ▶ The cost of collection would be negligible as it would use the existing rates collection system.
- ▶ Strong accountability would exist where the rate is used to fund locally determined expenditure.
- ▶ See strengths of general rates.

Disadvantages

- ▶ Weak accountability where used to fund nationally determined expenditure.
- ▶ There may be a lack of clarity about whether general rates or the regional rates should be applied to a particular transport investment.
- ▶ See weaknesses of general rates.

Regional income, payroll or GST tax

Examples of general regional taxes are:

- ▶ regional income tax: a tax paid by individuals who live or earn their living in the region
- ▶ regional payroll tax: similar to the above, would be payable by employers in the region who would likely pass on some, or all, of the costs to employees
- ▶ regional GST tax: a higher level of GST.

Advantages

- ▶ If the collection of income taxes can be tied to national taxes, the costs of administering the taxes may be small.
- ▶ Significant revenue can be generated from a small increase in income tax or regional GST, particularly in urban areas.

Disadvantages

- ▶ A tax on economic activity within a region not based on an existing tax would be a new tax with high establishment costs and potentially high operating costs.
- ▶ Would impose costs on non-transport sector.
- ▶ Would be easy to evade and distort investment between regions. If a GST tax rate differential exists in communities, consumers may shift some of their shopping to the region with the lower sales tax rate.
- ▶ Likewise a region with a higher payroll tax might see a reduction in employment. Migration would be directed to lower tax regions.
- ▶ These taxes would be difficult to administer.

Value capture

Development contributions

Development contributions are a charge on developers, paid to the relevant council, to meet the cost of additional services needed as a result of their development. Currently in New Zealand, development contributions can be levied by local authorities through the Local Government Act 2002. Development contributions can only be used for capital expenditure for reserves and infrastructure, and cannot be used for the general maintenance of those assets. A council can only require contributions where the development(s) levied result in a requirement for new assets or assets of increased capacity which in turn results in capital expenditure.

Advantages

- ▶ It is equitable to pass onto developers a significant portion of the costs for consequential transport infrastructure.

Disadvantages

- ▶ Safeguards are needed to ensure developers have some recourse where development contributions are improperly applied, adding complexity and costs to the system.
- ▶ New improvements can benefit existing as well as new network users and setting reasonable charges can be challenging.
- ▶ Development contribution policy varies widely between the 74 local authorities, and should be pre-stated to provide some certainty for developers; however, this adds complexity and cost.
- ▶ Development contributions are impacted significantly by changes in the economic cycle and are not a reliable source of revenue.
- ▶ It does not provide ongoing funding for operational expenditure.

Financial contributions

Financial contributions are charged under the Resource Management Act for specific pieces of infrastructure required as a result of a project, for example, a new road to link with the network or an improved intersection where the link occurs. Agencies other than the relevant local council, such as the NZ Transport Agency, can seek financial contributions where development contributions can only be charged for activities that are the responsibility of the local council (for example, local roads not State highways).

Financial contributions are a form of value capture, as they are a charge on developers who benefit from transport infrastructure by selling a development at an increased price as a result of increased accessibility. Financial contributions normally involve direct contributions of money, but can also involve contributions of land or a mixture of the two. The reason for the financial contributions is for funding infrastructure that has an associated effect on the environment and they are used to relieve these effects at a local level.

Financial contributions are similar to development contributions; however, the main difference is development contributions are set out to recover growth related infrastructure costs while financial contributions are targeted at recovering environmental costs. Financial contributions are used to mitigate, avoid or remedy the negative environmental consequences associated with the infrastructure development.

Financial contributions in New Zealand are currently defined under the Resource Management Act and can only be required as a condition of resource consent given under the Act.

Advantages

- ▶ Financial contributions go some way to mitigate the negative external impacts to third parties associated with a new development.
- ▶ Financial contributions allow for the recovery of costs arising as a consequence of the environmental impact of a development, for example, public transport.

Disadvantages

- ▶ Many councils in New Zealand do not see financial contributions as a useful mechanism because of the perception the Resource Management Act is constraining in how it can be applied.
- ▶ Financial contributions are constrained to effects based on environmental features.
- ▶ It is likely there would be court appeals against the financial contribution in many cases.

Revenue from assets

Revenue can also be raised from the sale of assets to fund transport infrastructure projects (asset recycling), or alternatively to pay down debt on existing infrastructure that may have been financed by borrowing. The opportunity exists for leveraging assets to generate revenues. By maximising asset performance, revenues can contribute to transportation funding by adding new revenue streams. Both forms of funding could be utilised by either central or local government funding.

The Government owns and receives dividends from a number of sizeable investments, particularly in

its State Owned Enterprise portfolio. An example of revenue released from assets can be seen in the Government's recent sale of shares in the State Owned Enterprises involved in the production of electricity. Local and regional councils throughout the country hold large plots of land and property and many are involved with commercial activities including holiday parks, farming and forestry holdings.

Advantages

- ▶ If well managed, ongoing operational cash flow from current asset performance can provide a stable form of revenue generation.
- ▶ Retaining assets with the intention of revenue generation provides dividends over time.
- ▶ Asset sales can provide significant upfront capital to invest in new infrastructure.
- ▶ Government-run assets may not be run with optimal economic efficiency. Business strategies may focus on social and political, not economic objectives; selling these assets in some circumstances may be prudent and economically efficient.

Disadvantages

- ▶ Once assets are sold the future value that could have been received disappears; it is a one-off benefit.

Advertising / concessions / leases / rents / naming rights

Advertising is a non-conventional method that can be used to raise funds for transport related activities. It can be targeted to both the riders of public transport and the public that pass the advertising asset. The value of pricing contracts for advertising in a particular system is dependent on the local market and the total amount of exposure, which is the total number of potential opportunities a viewer would have to see the advertisement.

Naming rights takes advertising a step beyond the typical wall and vehicle advertisements. The concept is public properties can increase revenues by selling naming rights to private companies for brand recognition. This concept is an extension of naming rights in other industries (for example the Wellington Westpac sports stadium), which have a long and growing history of high value naming rights agreements.

Leases are used where a company wants to advertise in a particular position for a long period of time. A typical billboard contract includes the lease of the property, rather than a share of revenue typical of other advertising contracts.

Assuming a viable billboard location, advertising companies should be willing to pay for permits, construction costs and maintenance.

The concession rights to areas attracting a high volume of travellers could be sold or leased. The concessionaire could provide travellers with new services such as food outlets, or other forms of retailing. These concessions would be popular with travellers to the extent they benefited from their presence.

Advantages

- ▶ Advertising is a lucrative business opportunity. It would make use of a market that would otherwise not be utilised.
- ▶ While potential revenues raised from advertising may be small compared to the total operating budget, the potential funds that could be generated are significant.
- ▶ Advertising on the interior and exterior of public transport vehicles can be used to offset the fare cost to public transport users and service provision costs.
- ▶ In the case of leasing, there are no expenses and the public sector receives income for allowing the leasees to build and operate on the property.
- ▶ Some advertising can be artistic or amusing.
- ▶ It can be used to fund amenities that would not have otherwise existed. For example, revenue from advertising on a bus shelter can be used to pay for the construction of the bus shelter.

Disadvantages

- ▶ Advertising can be intrusive on public space, can divert drivers attention away from the driving task and the trade-off between revenue, safety and aesthetics must be considered.
- ▶ Taxpayers and ratepayers may object to particular advertising or the name put on a facility.
- ▶ Current businesses offering advertising space would likely oppose concessions as it could undermine their economic future.

Tax increment financing

Tax increment financing (TIF) is a form of value capture financing recovering some or all of the value that public infrastructure generates for private landowners. Public investments can increase adjacent land values, generating an unearned profit for landowners. TIF is a revenue tool that could be used to promote economic development by earmarking property tax revenue from increases in assessed land values within a designated area. The mechanism uses anticipated future increases in tax revenues to finance current improvements expected to generate those increased revenues.

TIF enables a local authority to trade anticipated future tax income for a present benefit. It involves levying taxes on the future increment in property value within a development project, to finance development-related costs. It would be implemented on the basis the development of infrastructure has a positive effect on property values and so the tax increment is applied to increase revenue.

Advantages

- ▶ It captures unearned profit generated by public developments for private land owners.
- ▶ It is a targeted method to finance infrastructure benefiting specific land. Homeowners may see it as a way of funding redevelopment from taxes collected in the redevelopment area, without raising their taxes.
- ▶ Funding can be channeled toward improvements in underdeveloped or underutilised areas where development might not otherwise occur.
- ▶ Property owners in the area where TIF occurs should see their property values rise after the development occurs.

Disadvantages

- ▶ Tax increment financing will only recover the perceived benefits of transport infrastructure. The efficient level of value associated with an infrastructure development is difficult to calculate.
- ▶ Borrowing against projected revenue may be overly optimistic, and may lead to financial problems if growth does not meet projections.
- ▶ The use of tax increment financing in New Zealand has potential legal impediments under the Local Government Act. In New Zealand, councils set a budget and then allocate costs in the form of rates.
- ▶ It could be hard for households to cope with increases on existing rates.
- ▶ If the value of properties did not increase, for example in the case of an economic recession, then general ratepayers would have to front up through general rates for the loan repayments.
- ▶ It does not provide ongoing funding for operational expenses.

Joint development / sale of airspace

Joint development is the development of a transport facility simultaneously with adjacent private land development, where the private sector partner either provides full funding or makes a financial contribution to offset costs of infrastructure improvement.

Joint development is a form of value capture strategy because private benefits created through infrastructure improvements are partially captured through specific joint development arrangements to support the initial cost of improvements. The private sector contributes some of the benefits back to the public sector based on the recognition of the benefits they will receive through the presence of the infrastructure. For example, a joint development generates patronage for public transport, and this increase in public transport generates business for the development, so can be seen as a win-win.

Joint development to fund transport infrastructure has been used successfully in other jurisdictions and may be applicable to all types of transportation improvement that lead to higher property values or increased development opportunities. However, most overseas examples exist where there are high levels of public transit, or on roads located in high-density development areas, where impacts are easy to identify. Projects can be encouraged that integrate transport facilities, increase the attractiveness of public transport, and encourage growth in the area.

Payments from businesses can take on a number of forms, including one-off lump sums, annual lease payments, or ongoing contributions. All of these mechanisms capture the value of the surrounding property associated with being located near the transport infrastructure.

The sale of airspace is a form of value capture involving the establishment of development rights above a transportation facility that generates an increment in land value. Certain transportation projects are constructed below ground level, for example the Victoria Park tunnel, and the proposed City Rail Link in Auckland, and can generate large increases in land value near access points.

This accessibility effect gives value to the airspace above the facility, which may be an attractive location for new development. As the public sector usually owns and operates the transportation infrastructure, it commonly owns the right of way and has access to potentially valuable airspace immediately above this land. Capturing some of the value created by the transportation improvement

through the sale of this airspace provides a means of financing some or all of the cost of the transportation improvement.

Advantages

- ▶ Successful joint development projects may help alleviate funding shortages and may help improve market efficiency by better linking costs and benefits of transportation improvements.
- ▶ By tapping into private sector resources, the public sector can share project-related risks, access private financing, and take advantage of private sector expertise and innovation.
- ▶ It allows for the construction of projects that may otherwise not take place.
- ▶ Joint development may be more politically acceptable than tax increases.

Disadvantages

- ▶ Joint development can be associated with high transaction costs. The planning and coordination necessary for a successful joint development project require a significant time investment in setting appropriate policies beforehand, and in managing the implementation aspect.
- ▶ Lack of planning or communication between project partners could result in project failure.
- ▶ Concerns could be raised about the extent to which the joint development benefits the private sector at the expense of the taxpayer.
- ▶ It would not provide ongoing funding for operational expenses.

Road charging

Universal Network Charging

Universal network charging would charge users according to length of trip, by location and time of day, as well as vehicle weight and other characteristics.

In its simplest form, the current electronic road user charges system provides a functionally equivalent electronic replacement for the mechanical hubodometer and paper-based record keeping. In this case, the benefits and business case rely on wider benefits than those covered by RUC licences.

A more sophisticated universal charging system would be able to support charging according to:

- ▶ the particular roads used
- ▶ the distance travelled on that road
- ▶ the time of day and state of traffic and
- ▶ the characteristics of the vehicle including the load being carried.

If a universal network charging system were developed to cover such matters as charging for economic and environmental costs and facilitating heavy vehicle productivity concessions, and widened to cover the entire vehicle fleet, the potential benefits from disaggregated charging could be considerable. While technology exists today that would allow such a system to be implemented, it would currently be an expensive way to raise revenue. But the price of the technology is decreasing which will make this a viable and valuable alternative in the future.

Advantages

- ▶ It links road payment and road use more accurately, enabling better decision making by users and providers.
- ▶ It enables charges collected for travel on specific roads to be directed towards the upkeep or improvement of those roads.
- ▶ It can be used as a congestion management tool.
- ▶ It is likely to be less vulnerable to evasion than current RUCs based on paper licences and mechanical hubodometers.
- ▶ Monitoring of safety standards can potentially be improved through the electronic identification of vehicles.

Disadvantages

- ▶ It is expensive to implement and run.
- ▶ It requires robust pricing methodology, including detailed cost information for different roads or classes of road.
- ▶ It raises privacy issues.
- ▶ It raises governance issues.
- ▶ It raises policy issues around the scope of pricing objectives.
- ▶ It may introduce unforeseen risks around use of new technology (for example, hacking for either evasion or accessing information about competitors).
- ▶ It may make it difficult to continue cross-subsidising uneconomic parts of the existing network.

Urban charging

Urban charging, commonly referred to as road pricing, involves setting charges linking actual road use with price within a specified area. While petrol tax and RUC are uniform nationwide charges for road use, road pricing involves varying charges by a range of measures in a particular location and/or time of day. Road pricing has potential to influence travel behaviour (demand management) and how we use existing network capacity and invest in new capacity. Road pricing also has potential to improve network operational efficiency, but raises significant policy challenges.

There can be two goals for urban charging: to raise revenue to invest in that area, or to manage demand. The goal will affect the extent of area covered and also the optimal mechanism to collect the tax.

Advantages

- ▶ Network use is improved by more effectively aligning transport users' willingness to pay with the true costs of their transport choice.
- ▶ Better investment decisions are made by supplying network providers with improved information about user preferences and willingness to pay.
- ▶ Better marginal pricing internalises user costs (through a price) rather than externalising costs (through congestion).

- ▶ Revenue security is enhanced by moving from fuel-use based taxation to vehicle-use based taxation.
- ▶ It can lead to better linking of regional network use and regional investment.

Disadvantages

- ▶ It is associated with high levels of public opposition. It can create social issues if there are no public transport alternatives, thus limiting access to economic and social opportunities for low income households.
- ▶ It may cause an imbalance between revenue optimisation and network optimisation.
- ▶ It may give rise to traffic diversion impacts associated with congestion pricing.
- ▶ Privacy issues will need to be managed, particularly the use of information about network use for investment decision making, revenue enforcement and other transport and non-transport enforcement activities.
- ▶ The affordability and scalability of technology in a rapidly evolving technology environment. Technology does currently exist for corridor and area cordon pricing, but has not yet been applied to network congestion pricing.
- ▶ The collection costs of different options can be large. Number plate recognition (as in London) is expensive, whereas electronic charging (as in Singapore) is cheaper.
- ▶ Pricing may not be welfare enhancing (some overseas examples suggest charges will be higher than the welfare benefits), which is likely to depend on the efficiency and effectiveness of the project chosen for funding.
- ▶ Network pricing raises challenging transitional issues while taxes apply to both fuel consumption and vehicle use.
- ▶ Congestion pricing raises challenging equity issues where people are charged to use infrastructure they have already paid for, if they fund infrastructure in other regions where users don't pay a supplementary charge.

Tolling existing roads

This application of tolling can be applied as a revenue raising mechanism or as a demand management tool. With regard to raising revenue, it can be effective provided traffic volumes are sufficiently large and alternative routes/transport options are significantly less attractive (slower). In metropolitan areas and used as a demand management tool, tolling would need to be applied across a network or on key routes. Imposing a toll on an existing choke point (for example, bridge crossing) can delay the need to provide additional capacity.

Advantages

- ▶ When used to reduce congestion through charges reflecting current utilisation, tolls can send signals to consumers about the full cost of using the road. This includes both maintenance costs and the costs imposed by an additional driver on the travel speed of all other drivers.
- ▶ Without proper price signals, building expensive urban roads can lead to increased congestion. With pricing however, the over-use of a facility is kept in check, and if congestion rises, price can rise with it.

Disadvantages

- ▶ Inequity occurs when, as an outcome of a toll road scheme, road users are burdened with additional cash expense without choice.
- ▶ It is likely to be associated with high initial public opposition because road users have “already paid”.
- ▶ Substantial changes would be required to the Land Transport Management Act tolling regime to allow tolling to be used as a tool for demand management and raising revenue.

High Occupancy Toll Lanes

High occupancy toll (HOT) lanes effectively subsidise buses and car pooling. The lanes exist alongside existing unpriced lanes. On these facilities, low occupancy vehicles pay tolls while high occupancy vehicles have free access. Variable (value) pricing can be implemented on HOT lanes, where prices can vary during the day according to a published schedule which can be updated every couple of months. Alternatively it can be adjusted every few minutes according to traffic conditions.

HOT lanes are often described as simplified forms of congestion pricing. They can be seen as a productive step towards cordon pricing, area pricing or more sophisticated congestion pricing regimes, and as arrangements that might soften the public’s acceptance of actual congestion pricing systems in the future.

Advantages

- ▶ They encourage ridesharing, which could reduce congestion, travel delays and air pollution.
- ▶ They could lead drivers to choose different modes of travel, including carpooling, public transport, bicycling and walking consequently reducing the need to invest in additional infrastructure.
- ▶ They provide an improved service for a fee to those motorists who are willing to pay the fee.
- ▶ Direct user fees are a way to charge users a price better aligned with the full cost of their travel. The prices can be varied to incorporate the cost of providing, maintaining, and operating the toll lanes.
- ▶ Charging users more for peak use and less for off peak use creates incentives for more efficient road use.
- ▶ They generate revenue, which can be used for transportation infrastructure improvements.

Disadvantages

- ▶ Underused HOT lanes may irritate road users who are unable to use them. They bring about equity issues where it can be argued only those that can afford to use them will benefit.
- ▶ Enforcement and evasion tactics are a significant issue. Finding a reliable method to count the occupants of moving vehicles is difficult. Enforcement may require vehicles to be stopped if the number of their occupants was in doubt, unless automated enforcement systems were employed. This is poor for public relations and would be disruptive on busy roads where the tolls were implemented.
- ▶ HOT lanes would have administrative and compliance costs that may be large in relation to the total amount of revenue available to be collected.

Other

General taxation

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. In these instances, transport projects would be assessed against other calls on government funds. Using general fund revenues to pay for transport infrastructure means taxpayers are required to contribute to transportation funding, which can be justified on the basis transportation infrastructure is a public good and everyone benefits from its development, not just users.

Advantages

- ▶ Incremental costs of collection would be negligible and large amounts could be realised through small changes in the tax rate.
- ▶ Funding through broad-based taxes meets at least one standard of equity, that is, it does not impose a larger burden, relative to income, on low-income users.
- ▶ General fund revenues are a large potential source of revenue. It is based on a large tax base and has good growth potential.

Disadvantages

- ▶ This approach gives users no incentive to reduce the mileage or fuel-related costs of their road use.
- ▶ It does not satisfy the user pays standard of equity.

Car parking charges/levy

Overseas, parking pricing systems are growing increasingly attractive to both manage congestion and generate revenues. The concept underlying parking systems are similar to congestion charging, with a larger coverage area potentially resulting in increased revenue generation. However, this would come hand in hand with increased capital costs of car parking equipment as well as incremental costs of administration, payment processing and enforcement.

Parking charges could be paid by users of the parking space; this would be in addition to any car parking charges currently in place. Alternatively, a parking levy could be applied to car parking in a defined area, in addition to any car parking charges already in place. The specifics of a parking scheme would be tailored to the area in which it applied. For example, a scheme could include, exclude, or treat in different ways, long stay commuter car parks, short-stay commuter car parks, short-stay or shopper car parks, and residential car parks.

Reducing the amount of free parking and adjusting pricing policies for both public and private parking spaces can help to achieve goals of increased ridesharing, public transport use, walking and cycling. Any additional revenue gained from car parking pricing can be used to fund other transport related activities.

Advantages

- ▶ Parking charges can help with demand management; by raising the effective price of driving to major activity centres, parking charges or levies lower the relative price of public transport, which can lead to greater patronage.
- ▶ Government subsidies for public transport may be able to be reduced because of more people switching from cars to public transport.
- ▶ These schemes can help to manage parking demand and availability, to improve the parking experience for all, including providing increased convenience and easier location of parking for drivers, and decreased congestion on roads.
- ▶ A parking charge raising the cost of private vehicle travel closer to the marginal social cost would be economically efficient.

Disadvantages

- ▶ Effectiveness will depend on the level of congestion.
- ▶ Experience from overseas suggests a parking levy is not easy to implement, often due to strong opposition from affected parties.
- ▶ Charges would need to increase substantially to raise the amount of revenue in order to have any real impact on overall transport funding.
- ▶ Because of enforcement issues and the relatively low-tech, labour intensive operational requirements, a parking levy is likely to have significant operating costs.
- ▶ Parking measures do not deal with through-traffic and tend to create more of it by freeing up space on radial roads.
- ▶ Supply restriction encouraging cruising for parking wastes time and fuel, although this could be offset by the effect on congestion by discouraging driving to the area.
- ▶ Parking measures would not address the contribution of buses and commercial vehicles delivering and collecting people and goods. Buses and trucks contribute to congestion not only because of their presence, but also because of their size, acceleration characteristics, and loading/unloading activities.
- ▶ It would not be practical to come up with parking charges for all parking spaces in busy locations, that discriminate to reflect timing of entry and extent, traffic conditions at those times, and location of the origin, destination and route of the driver.
- ▶ Regulatory measures to restrict the supply of parking spaces impose a hidden tax on drivers. They provide effective transfers from drivers to owners of pre-existing parking spaces.

Carbon tax

A fuel-based carbon tax could be implemented where emission factors are normalised to fuel consumption and expressed as grams of pollutant emitted per litre of fuel burned. Fleet average emission factors can be calculated from measured on-road emissions of a large, random sample of vehicles. The level of this tax would then be decided by the Government and incorporated into fuel excise duty collected by the New Zealand Customs Service either at the refinery or when imported into the country. As this would be a production tax and not a consumption tax it would ultimately be up to the petrol companies to decide how this additional cost was passed onto consumers.

Advantages

- ▶ A carbon tax would encourage people to drive less and trade off size and performance for better fuel economy when they purchase a vehicle.
- ▶ Carbon taxation helps encourage a shift to less energy-intensive travel modes and consideration of lower-carbon fuels.
- ▶ It provides an incentive for businesses to use and develop more environmentally friendly production processes.
- ▶ Carbon taxation creates a source of government revenue that could be used to support the development of low emissions technologies or reduce other transport taxes.
- ▶ A carbon tax could be implemented relatively quickly with little ongoing administration costs.
- ▶ It can help meet any international agreements New Zealand might become a signatory to.

Disadvantages

- ▶ Carbon taxation does not directly encourage the introduction of more efficiency technology into the vehicle fleet.
- ▶ It would need to be large enough to have an effect on behaviour.
- ▶ A carbon tax does not guarantee any particular emissions outcome will be reached.
- ▶ It would disadvantage vehicles burning a lot of petrol without any regard to whether or not they were burning fuel cleanly.
- ▶ It can be difficult to measure how much carbon is produced and would involve large scale averaging.
- ▶ Increasing transportation costs could have social consequences making it harder for some to access economic and social opportunities.

Poll tax

A poll-tax is a fixed charge applied on a per head basis to a specified population, usually within a geographical area. Historically, in the United Kingdom it was used to fund wars, while in the United States it was widely used as a prerequisite to voting. New Zealand had a poll-tax on Chinese immigrants in the late 19th and early 20th centuries. The most recent example of a poll-tax was in the United Kingdom in 1989 when rates were replaced with a community charge, a fixed charge on adults with discounts for those on lower incomes, as a means to fund community services. It proved very unpopular and was replaced with the Council Tax (a tax on properties' capital value) in the early 1990s.

Advantages

- ▶ It can be applied to a geographical region so is suited to paying for regional services or infrastructure.

Disadvantages

- ▶ It would be difficult to administer and could create geographical distortions or adversely impact the poor.

Visitor and/or airport taxes

A transport departure tax could be levied on people leaving a specified area, typically as a fixed charge paid by everyone arriving or departing from an airport or port. This could be implemented at all airports or ports throughout the country and targeted at domestic travel. Alternatively a tax could be implemented at major international terminals and targeted at those entering or leaving the country. Similar charges have been used in New Zealand by airport companies to recover the costs of airport development.

Advantages

- ▶ There is large revenue potential if applied across all domestic and international terminals, although this would depend on the level of the charge and whether it was applied for domestic and/or international purposes.
- ▶ Once implemented, administration and compliance costs would be low compared to the amount of revenue collected, if the tax was built into the fare.
- ▶ Evasion would be close to impossible.

Disadvantages

- ▶ Potential poor alignment between those who pay the tax and those who benefit.
- ▶ Double counting of taxation: it can be argued these taxes should not be implemented if users of the transport network are paying for their use through other mechanisms already in place.
- ▶ Tourism generates a considerable amount of revenue for New Zealand and this form of tax may be seen as a deterrent.
- ▶ It is likely there would be public opposition, especially from those involved in the aviation/maritime industry because of spillover effects.
- ▶ If this tax were applied to domestic travel, charges would likely raise the cost of domestic travel if it were to have any real impact on revenues collected.

Financing

Transportation infrastructure investment is supported by numerous financing structures. These include, but are not limited to, debt financing and private sector financial participation.

Financing is not a revenue tool for transport, but for the sake of completeness it has been incorporated into this paper because it is an approach that can be taken to initiate transport investment. Financing is different from funding in that investors provide finance for a transport investment to cover the timing gap between costs and revenues.

Debt financing is an approach where future expected cash flows are leveraged or borrowed against, in order to deliver upfront cash. The amount of debt financing available is a function of several variables, including the length of a debt instrument, the amount of revenues supporting it, the expected growth of these revenues and the stability or risk of the revenue stream.

Private sector financial participation can come in the form of debt or equity, or a combination of the two, and is another form of financial contribution that can be used to leverage future revenues. Here the Government can leverage a future stream of cash flows in order to generate upfront proceeds.

Depending on a number of assumptions, a strategy including equity investment can raise greater upfront proceeds than can debt financing alone. The private sector, through comprehensive contractual arrangements can not only deliver projects, but can also operate, finance, and maintain them, thereby providing greater financial certainty and more efficient performance for the public sector.

A Public Private Partnership is a long-term contract between the public and private sectors covering the financing, construction and operation of public infrastructure and services. Full ownership of the public infrastructure remains with the public sector. The recent approval of the Transmission Gully project, north of Wellington is an example of a Public Private Partnership.

Committing future revenues and shifting the burden to future generations through debt financing requires careful balancing. Future generations can benefit from prior investments, but future revenues will be committed to servicing debt.

The applicability of the financing options outlined above will depend on the Government's goals, the project's own characteristics, and the market circumstances at the time.

Advantages

- ▶ Project acceleration: Faster completion not only brings the infrastructure improvements to completion sooner; it also reduces a project's exposure to construction cost inflation.
- ▶ Private sector participation provides an opportunity to shift certain project risks from the public to the private sector (for example, construction, performance and revenue risks).
- ▶ If the designers and builders have a financial stake in the project over its whole life, they will have an incentive to design features and construction standards so they are optimised against the long-term cost of maintenance and operational requirements.
- ▶ Private sector participation provides access to additional capital. The Government does not have to provide capital in the case of public private partnerships. Although not currently an issue in New Zealand, this can be an advantage where the government has a poor credit rating and is not able to raise finance, and where financial markets cannot easily distinguish between central government borrowing and borrowing for a specific revenue-earning infrastructure project.
- ▶ A private sector participant whose compensation is performance based is strongly incentivised to maximise operational efficiencies.

Disadvantages

- ▶ Unjustifiable projects may be undertaken because the full burden of payment is postponed.
- ▶ Uncertain future interest rate hikes may negatively impact on the amount of debt to be repaid.
- ▶ Given the length of the relationships created by Public Private Partnerships, it is difficult to anticipate all contingencies, and some aspects of the contracts may have to be renegotiated at some stage.
- ▶ Given the difficulty in estimating financial outcomes over long periods, there is a risk the private sector may go bankrupt or make very large profits. This can create political problems for the government, causing it to intervene.

Conclusion

This paper has outlined several of the advantages and disadvantages of a variety of revenue options in the context of a changing world. The intention of this work is to promote informed and critical thinking amongst Ministry staff and external stakeholders regarding future land transport funding and revenue gathering and to ensure the system is capable of adapting to economic, environmental, technological, and social changes.

The purpose of question one is to qualitatively assess the different revenue tools and their ongoing suitability. This document is one of several outputs for question four which includes a final report and a set of templates which will act as 'living documents', for the ongoing capture of information on different revenue tools in order to position the Ministry to give consistent, principled advice about the value and utility of the different revenue tools under various circumstances.