Level 1 Princes Court
2 Princes St, Auckland, New Zealand
P.O Box 3696 Shortland Street
Auckland, New Zealand
+64 9 377 5590 **: tel**
+64 9 377 5591 **: fax**
sdonovan@mrcagney.com

McCormickRankin**Cagney**
abn 11 093 336 504

Wheels of misfortune?

The benefits of transportation pricing and policy reforms

Stuart Donovan, sdonovan@mrcagney.com

Transportation Engineer, McCormick Rankin Cagney

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Introduction

This paper examines the benefits of transportation pricing and policy reforms.

New Zealand's current travel and land use patterns are characterised by high demand for private vehicle travel and low density land use development. This paper argues that this demand is not a reflection of our true preferences, or values.

Instead, this paper suggests that transportation market distortions are a major driver of current travel and land use patterns. These distortions have created huge subsidies for vehicle users, particularly at peak times.

In general, vehicle users do not pay for the negative externalities they generate and nor do they pay for the roadway capacity or parking they consume. These subsidies are presented as the main cause creating our current transportation issues.

This paper recommended central and local government agencies consider the following measures to rectify transportation market distortions and reduce subsidies for vehicle use:

- Parking reforms – remove minimum parking requirements and apply demand management measures, particularly pricing, in areas where significant demand exists.
- Value capacity and externalities – complement current fuel excise taxes with electronic pricing that charges for roadway capacity and seeks to internalise negative externalities.
- Smart policies and prices – target funding and development policies to travel demands, such as using a parking levy to fund local road maintenance and improvements.

Pricing and policy reforms that more accurately price different transportation choices are expected to deliver major economic, social, and environmental benefits.

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Benefits will arise through more efficient use of transport infrastructure, better locational choices, more equitable social outcomes, and reduced environmental impacts. By freeing up inner city land for more valuable uses, parking reforms are particularly important for stimulating development and creating employment.

This paper is arranged as follows: firstly it introduces the concept of transport market distortions in terms of vehicles, rights-of-ways, and storage; secondly it outlines the benefits of accurate pricing; and finally it discusses potential solutions, strategies, and perceived barriers to implementation. Information is presented in an Auckland context, but general principles are broadly applicable to other areas. For illustrations readers are referred to the presentation – of the same name –associated with this paper.

Ultimately, it is suggested that transport planners and policy makers need to integrate their pricing and policy mechanisms to ensure they are providing people with quality signals on what outcomes we value. With these signals integrated transport becomes an achievable goal.

Conceptualising urban areas

Market distortions are defined as price signals that encourage people to make choices they would not otherwise make were they faced with the actual costs of their decisions. In a transportation sense, this primarily relates to travel and land use choices. Transportation market distortions are staggering in their magnitude. Initial calculations suggest that rectifying transportation market distortions through accurate pricing may quadruple the price associated with peak hour vehicle travel. Previous experience suggests this increase would reduce per capita vehicle travel in the order of 50-75%, with greater gains in the long run.

Due to their magnitude of the costs they create, transportation market distortions are undermining the economic viability of our urban areas. On a simple level, urban areas are places of exchange, or trade. Exchange brings economic benefits, but the act of exchange depends on movement and thus incurs costs. Urban areas must therefore attempt to maximise the benefits of exchange (whether it be goods, services, or ideas) and simultaneously minimise the costs of movement (transport infrastructure, user costs, and negative externalities). Exchange and movement act as both facilitators and competitors. Exchange is facilitated by movement. However, exchange also competes with movement; the latter takes up limited space and creates externalities that impede on exchange.

Current transportation market distortions tend to subsidise movement above all else. Direct subsidies for public transport are an obvious example. As we shall see current subsidies for vehicles – while less direct – are nonetheless substantial and frequently underestimated. An underlying theme of this paper is that public transport users should be only expected to pay the true costs of their travel in a climate where the same is expected of vehicle users.

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Background to transportation market distortions

Transportation market distortions exist in three key areas: negative externalities, roadway capacity, and parking. Each of these is discussed in turn below.

Firstly, vehicle users do not pay for negative externalities, such as noise and air pollution, the wider cost of which is estimated at approximately $1 billion. These externalities also detract from property values, which means they effectively suppress land use density (Bateman et al., 2001, Levinson and Krizek, 2008). Failing to price negative externalities not only results in higher than optimal levels of vehicle use and lower density, but it also establishes a positive feedback loop that results in additional vehicle travel. Negative externalities have reached levels where they cause people to locate away from town centres and corridors. In doing so, these people are likely to travel more and create additional externalities which subsequently cause more people to move. The process of residential relocation and increased vehicle travel impedes pedestrian amenity, reduces local accessibility, and reduces the size of the surrounding population catchment, thereby detracting from the viability of retail activities.

Secondly, vehicle users also do not pay for roadway capacity. When local factors such as terrain are excluded, the cost of constructing roads becomes primarily a function of coverage and capacity. Coverage provides access in the spatial dimension. Capacity, in contrast, provides access in a temporal dimension – it is concerned with improving access at certain times. Fuel taxes are a blunt distance based measure that does not place a value on capacity. This lack of a temporal dimension means that peak hour vehicle travel is subsidised at the expense of off-peak travel. Urban commuters are thus subsidised at the expense of rural, recreational, and commercial road users, who are more likely to travel in off-peak periods. Incidentally, rural, recreational, and commercial road users are less able to use alternative transport modes than urban commuters, suggesting that those who are bearing a disproportionate financial burden are least able to adjust their travel demands.

Thirdly, vehicle users do not generally pay for the cost of parking their vehicles. This is the direct result of minimum parking requirements, which has created an oversupply of underpriced parking. New developments are required to provide sufficient amounts of free parking to meet near-peak hour demand. As urban areas intensify and land values increase, the costs of providing parking also increase – for example a car-park in Auckland's CBD is now valued at $50,000-$100,000. Similarly, the compliance costs associated with meeting minimum parking requirements increases accordingly, hindering development. Free parking also induces excessively high vehicle travel;, lowers land use density, and reduces the quality of the urban environment (Cervero, 1985, Shoup, 2005, Litman, 2006, Seibert, 2008). As with the failure to price negative externalities, parking requirements create a positive feedback loop that drives vehicle use even higher. This loop progresses as follows: large amounts of free parking are provided and reduce land use density, which detracts from use of alternative modes and results in additional demand for vehicle travel. This additional demand for vehicle travel is then reflected

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in higher minimum parking requirements, which reduce density even further and start the cycle anew.

Land use and transport policies are another area where transportation market distortions are significantly affecting transportation outcomes. Undesirable policies include:

- Funding local roads – using property taxes (local rates) is an indirect way to fund local maintenance of roads. It is suggested that it punishes high-value, centrally located land uses and favours low density development on the urban fringe.
- Development contributions – unsophisticated development contributions policies apply a flat trip generation rate to new developments, regardless of their location. This does not incentivise development in areas with existing transport infrastructure.
- Single use, single centre zoning – zoning practices suppress land use density and diversity. These outcomes reduce the effectiveness of alternative transport modes, particularly passenger transport.

There are therefore a large number of transportation market distortions and policies which are subsidising and perpetuating high levels of vehicle use and low density development in New Zealand's urban areas. Possible approaches to rectify this situation are discussed in the following section.

The benefits of (more) accurate pricing

Accurate pricing simply aims to charge the costs associated with transportation choices directly to users. Accurate pricing encapsulates the concepts of marginal cost pricing and direct user pricing. This essentially attempts to ensure that each additional user pays directly for the marginal additional costs associated with their travel choices. Truly accurate pricing would involve highly complex and dynamic price structures, which would lead to such high transaction costs and uncertainty so as to be impractical and unattractive from the user's perspective. For this reason, this paper is effectively arguing for more accurate pricing in comparison to the status quo, rather than an absolute yet unrealistic economic nirvana.

Accurate pricing has two major benefits, namely: it more efficiently balances demand and supply, and it provides a stimulus for new technology and services designed to reduce costs. These two benefits reflect the broad benefits of market mechanisms, which are discussed at length elsewhere. For an excellent contemporary account of the value – and limitations – of market mechanisms, readers are referred to *The Origin of Wealth* by Eric Beinhocken. More frequently underestimated and misunderstood are the social and environmental benefits of accurate pricing, which are discussed in more detail in the following paragraphs.

Accurate pricing is likely to deliver social benefits because of the regressive tendencies of current pricing and policy mechanisms. Current policies, by and large, have a larger impact on those on low incomes. Low income households tend to work part-time, off-peak, or not all; own fewer and less fuel efficient vehicles; travel shorter distances; travel less for social and recreational

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purposes; make increased use of alternative modes; and live in rural areas. For this reason low income households derive relatively less relative benefit from the current situation, which tend to deliver subsidies to urban commuters. In spite of these seemingly measurable indicators, few studies have quantified the relative burden of our current pricing and policy mechanisms; it is recommended as an area of further research.

Finally, by making vehicle travel in urban areas more expensive – particularly at peak times when the associated environmental impacts of congestion are greatest – accurate pricing may be expected to deliver significant environmental benefits. Preliminary calculations suggest that accurately pricing negative externalities, roadway capacity, and parking would bring about a three to four fold increase in the average cost of home-to-work travel. The demand response to price increases of this magnitude is difficult to predict, although reductions in per capita travel demands of 50-75% would not be unusual given typical elasticities for increases in out-of-pocket transport costs (Litman, 2007).

Accurate pricing thus delivers substantial economic, social, and environmental benefits. For these reasons it is the preferred method for rectifying current transportation market distortions. It is worth noting that there are two main alternatives to accurate pricing. The first alternative is using regulations to balance transportation choices. It is, however, difficult to see how these regulations could be sufficiently comprehensive without being unduly cumbersome to bring about the desired outcomes. The second alternative is to increase investment in alternative modes to the point where they are subsidised to the same degree as vehicle travel. This option, while better than the status quo, tends to be economically and environmentally wasteful. There are, for example, few economic, social, or environmental benefits associated with running empty buses in a blunt attempt to induce demand.

For these reasons accurate pricing emerges as the most effective tool for rectifying curremt transportation market distortions. It is acknowledged that accurate pricing cannot be implemented overnight; reforms must be developed and implemented in sensitive manner. Examples of possible reforms, along with strategies and barriers for their implementation, are discussed in more detail in the following section.

Solutions, strategies, and barriers

The following sections introduce a package of measures designed to rectify some of the transportation market distortions identified in the previous section. These solutions are designed to improve the accuracy of transportation price signals in comparison to the status quo. They are not intended to represent an exhaustive or final list of solutions, but more an indication of where major gains may be made in the short to medium term.

1. Reform parking management practices

Remove minimum parking requirements in town centres and along transport corridors. Price parking in areas where occupancy levels frequently exceeds 80%. Revenues from priced

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parking may be reinvested into enforcement, streetscape improvements, facilities for alternative transport modes, and – where justified by demand – expansions in the parking supply. Over time the area unaffected by minimums parking requirements should be expanded commensurately with increased enforcement capabilities. Excessive time-restrictions on how long vehicles may be parked should be avoided, as they prioritise short, low-value trips over more high value uses and are much more difficult to enforce.

2. Value roadway capacity and negative externalities

Electronic pricing methods, based on gantries or GPS, should be deployed to price the use of urban roads during peak periods. Pricing structures would ideally be tailored so as to incentivise:

- Peak spreading – travel outside of normal peak hours;
- Contra-peak flows – travelling opposite to the primary direction of flow; and
- Technological efficiencies – investment in and maintenance of clean vehicle technology.

As noted above, electronic pricing provides the opportunity to hit two birds with one stone – it can be used to internalise the cost of negative externalities. GPS systems are particularly effective in this regard, in that they can not only be programmed with a pollution rating for individual vehicles but also record when vehicles enter particularly affected areas.

Revenue associated from roadway capacity should be deployed to offset reductions in fuel taxes elsewhere, and as such is presented as revenue neutral. In contrast, revenue raised to offset negative externalities may be deployed more broadly to prevent and/or mitigate impacts. This may be through investment in higher quality low friction road surfaces, alternative transport modes, or streetscape improvements.

3. Smart prices and policies

Ensure that out pricing and policies distinguish between good and bad outcomes. Some suggested examples include:

- Parking levy – an annual parking levy could be used to fund local road improvements. Moreover, such a levy could be used to determine development contributions.
- Flexible zoning – as much as possible zoning practices should not unnecessarily restrict land use density and diversity.
- Urban design –develop more specific urban design outcomes, such as requirements for fine-grained, well-connected street layouts.
- Multiple centres – larger urban areas should plan for and facilitate multiple, mixed use centres in transport efficient locations.

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- Urban containment – the use of vehicles in urban areas is highly subsidised, particularly at peak times. Urban containment is necessary to restrict uneconomic development.

Other options could seek to internalise the costs of larger vehicles through the vehicle registration process. This reflects their increased demand for road space (and hence reduced capacity), as well as their reduced demands on parking resources. While such signals are likely to be relatively blunt, they do provide incentives for consumers to make good decisions.

Implementation strategies and perceived barriers

The successful implementation of reforms is dependent on signalled, staged, and coordinated changes. Signalling changes allows people to make adjustments ahead of time. Staging changes allows people to make incremental changes over an extended period. Coordinating multiple changes maximises people's ability to access alternatives.

The need for nuanced and sensitive implementation should not overshadow the need for urgent reforms. Transportation choices, such as those associated with location and vehicle purchase, are typically long lived and persist well into the future. The longer transportation market distortions persist, the more uneconomic vehicle dependent development patterns and decisions we will have to modify and/or replace. Expected volatility in future energy prices only serves to enhance this sense of urgency.

The perceived existence of "car-culture" is occasionally used to reject or delay proposals for reform in the transport sector. Culture, however, is both dynamic and malleable in the face of changing socio-economic incentives. This reality is reflected in recent discussions on crushing boy racer cars – the risk of losing one's vehicle is seen, rightly or wrongly, as sufficiently off-putting so as to moderate boy racer culture. On a more general level, it appears that "car-culture" is strongest in those countries that provide the most subsidies for vehicle use. For this reason cultural transportation norms must be considered as fluid in the medium to long term, although further behavioural research into this area is warranted.

Summary

Current transportation choices do not reflect our true preferences. Instead, our pricing and policy mechanisms have created a number of substantial transportation market distortions which subsidise the use of vehicles in urban areas, particularly at peak times. In addition to subsidising the use of vehicles, these pricing and policy mechanisms are suppressing land use density and diversity, further undermining the effectiveness of alternative modes.

We need to recognise that many of the transportation problems we currently face are of our own making. Transport planners are struggling with the unintended consequences of our own pricing and policy mechanisms. Accurate pricing, rather than more regulation or new infrastructure, is by far the most effective way to integrate transport and land use and – in the process – realise a host of economic, social, and environmental benefits.

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