# Public Infrastructure: Solutions for Moving People

# Submission by the Bus Industry Confederation the Productivity Commission Public Infrastructure Inquiry

# December 2013

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## About the Bus Industry Confederation of Australia

The Bus Industry Confederation (BIC) is the peak national body representing the interests of Australian bus and coach operators and suppliers to the industry. As the primary voice of the bus and coach industry the BIC works with all levels of Government, regulatory authorities, strategic partners, our industry and the community to:

- Encourage investment in public transport infrastructure and services.
- Coordinate and make more effective existing Federal, State and Local Government policies and programs that relate to passenger transport.
- Improve public understanding of the contribution made by the bus and coach industry to Australia's economy, society and environment.
- Ensure that the accessibility and mobility needs of Australians are met, regardless of where they live or their circumstances.
- Ensure that buses and coaches operate safely and effectively.

## About this Submission

This submission addresses a number of the key questions and themes presented in the issues paper for the Inquiry.

The basis of responses in this submission is two reports produced by the Bus Industry Confederation with Professor John Stanley from the University of Sydney Institute of Transport and Logistics Studies. The reports referred to in this submission are *Moving People Solutions for a Growing Australia* and *Moving People Solutions for a Liveable Australia*. These reports and other BIC policy and research can be found at the Ozebus website www.ozebus.com.au

# The Importance of Public Infrastructure: Infrastructure Types

## *Does the proposed definition of public infrastructure capture all forms of infrastructure that should be considered by this inquiry?*

The BIC believes the definition of "national significance" in needs to take into account the importance of our cities and regions to the national economy and the national cost of social and environmental externalities such as congestion even when it is experienced at a local level.

We believe there is scope for Infrastructure Australia and the Commonwealth Government to address a number of gaps not only in nationally significant infrastructure development, but also small to medium scale local infrastructure projects under the value of $100 million.

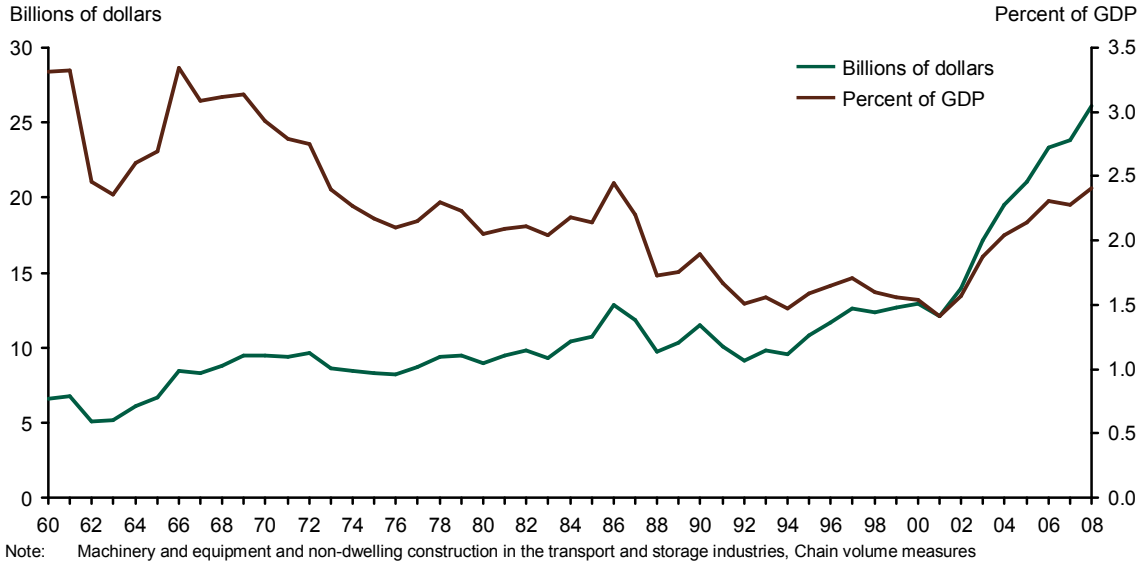
As Infrastructure Australia stated in its 2012 report to COAG, these smaller scale projects, built within a framework of strong strategic planning principles have the potential to improve the liveability and viability of our major cities, towns and regions.[1]

There is potential for a wider recognition within the definition of infrastructure, and consequently the development of infrastructure, for urban public transport infrastructure to be recognised as delivering national benefits at a local level. This comes through the myriad of environmental, social and economic benefits produced by public transport system improvements that alongside delivering travel time, financial and health benefits to individual users also deliver congestion and emissions reduction, social inclusion and productivity benefits to the whole nation.

## *What are the circumstances that might lead to Governments over or under investing in infrastructure?*

Our focus in responding to this question is the transport sector. Figure 1, from our 2010 report *Moving People: Solutions for a Growing Australia*, shows that the transport infrastructure share of GDP declined from around 2-5 to 3.0 per cent in the period from 1960 to the mid 80s, to about 1.5 per cent at the turn of the century, but has recovered since that time.

**Figure 1: Transport infrastructure fixed capital formation (FY1960-2008)**




[1] Infrastructure Australia, 2012, Progress and Action, June 2012 Report to the Council of Australian Governments, Australian Government Canberra.

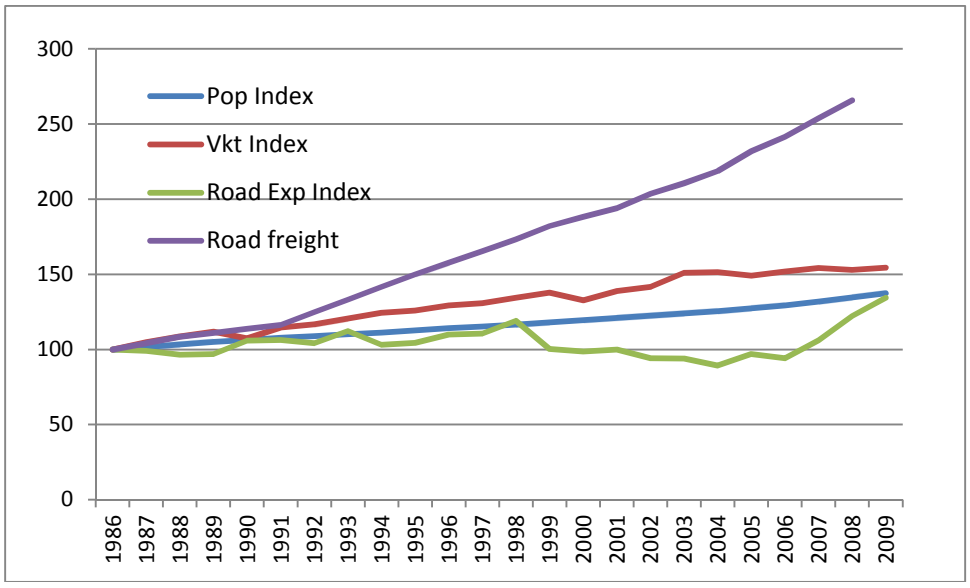
**Source: Australian Bureau of Statistics (2008), *Australian System of National Accounts,* Cat. no. 5204.0, ABS, Canberra.**

In our 2012 publication, Moving People: Solutions for a Liveable Australia, we noted that the road traffic task continued to grow strongly over the 1986 to 2006 period, even though road expenditure was flat in real terms (see Figure 2, from that report).

The dramatic decline in the transport infrastructure investment share of GDP, and flat road expenditure levels in real terms over an extended period, while the transport task has continued to grow, is consistent with increasing congestion levels on roads and public transport services and is a major reason why many commentators now argue that Australia has a substantial transport infrastructure backlog. For example, if road expenditure had grown at the same rate as population over the period shown in Figure 2, total road expenditure would have been $35 billion higher, in constant prices, in aggregate over that period. However, pressure on roads is more accurately reflected in growth in the road task. Had road expenditure in real terms grown at the same rate as vehicle kilometres of travel (VKT), which is still well below the growth rate in road freight, total road expenditure would have been about $75 billion higher in aggregate. That is equivalent to about five years total spending on roads, suggesting a substantial backlog[2]. The impact of heavy road vehicles on road condition, and the growth rate in freight traffic, suggests that the actual backlog could be much larger again. Comparable estimates are not able to be produced for rail/public transport, because of data differences between modes.

The transport investment 'hole' resulting from the decline in share of infrastructure investment spending has been recently assessed by NIEIR3 at $111b, which is consistent with the numbers set out above. This is of a similar order to the transport projects in the Infrastructure Australia 2013 priority list, which totalled $82-91b as at June 2013 across all Infrastructure sectors but were dominated by land transport proposals. It is no surprise, therefore, that transport projects figure prominently in the Infrastructure Australia priority project funding lists.

## Figure 2: Growth in road traffic task and road expenditure, relative to population growth (1985-86 = 100)




**Source: BITRE (2012).**

[2] Detailed cost benefit analyses of individual projects are required, of course, to identify relevant backlogs. Expenditure levels are only a rough first indicator of prospective changes in condition.

[3] NIEIR (2013). *State of the regions 2012-13*, Report prepared for Australian Local Government Association, Canberra.

What kinds of circumstances, then, might lead to governments under (or over) investing in transport infrastructure, along the lines that seem to have characterised the period from 1986 to 2002?

Competing demands for scarce government funds and changing political priorities as between the key issues of the day (e.g. transport versus health and education; infrastructure versus services) are obvious contributory factors, which are always present. After periods of sustained investment, governments are frequently attracted by the argument that some lag in provision for a few years will be possible without deterioration in service quality, particularly for long life assets such as roads, bridges and rail track. This is a frequent response to budget pressures and may lead to underinvestment. These competing priorities arguments are well rehearsed and need little further attention here.

Of more relevance to the current investigation are the following considerations:

1. the pervasive influence of unpriced external costs (such as congestion, air pollution, accidents, greenhouse gas emissions) and benefits (e.g. agglomeration economies) in land transport and the corresponding lack of proper price signals to guide both individual travel behaviour and land transport infrastructure investment decisions towards efficient solutions. With external costs dominating in urban areas (being estimated at a net cost of $27b in *Moving People: Solutions for a Liveable Australia, as set out later in this submission*), the neglect of pricing of these externalities systematically leads to excess infrastructure needs being apparent on the road side and under assessment on the public transport side;
2. the absence of a set of accepted transport infrastructure/service quality indicators (KPIs), to demonstrate whether network/service performance is improving, receding or staying the same means there are no overarching indicators of relative 'needs', which trigger project/program identification. The lack of such needs indicators introduces an increased element of chance into the needs identification and performance assessment process that is used by jurisdictions and will increase the prospects of under or over investment;
3. allied to the previous point, poor land use/transport planning and needs identification practices (a matter to which we return below), which mean that there is little assurance that the best set of infrastructure opportunities have been identified or are being implemented, compound the problem of lack of accepted performance indicators. This is accentuated by the increasing tendency of some state governments to withhold the results of project evaluations.

More open needs identification, performance assessment and project evaluation processes should help to tackle these problems.

## *What is the appropriate distinction between the funding and financing of public infrastructure?*

BIC agrees with the general distinction that is drawn by the Business Council of Australia[4] and others (such as the Committee for Melbourne), that funding refers to who ultimately pays for the construction, maintenance and operation of infrastructure, through user charges or government revenue sources (e.g. taxation, borrowing or asset sales) and financing refers to paying for the up-front costs of putting the infrastructure in place (which might be via private equity and debt, perhaps sourced from superannuation funds, or might be public borrowing to finance the project). Value capture techniques are a form of beneficiary pays funding, which is a broader concept than user pays, recognising that some beneficiaries of infrastructure investment may not be users.

[4] Business Council of Australia (2013). Securing investment in Australia: Infrastructure Financing and Funding, BCA.

# The Provision of Public Infrastructure

## *What models can be used to provide public infrastructure? How do alternative models vary in their ability to address real or perceived limitations compared with more standard forms of public sector procurement? How adaptable are the different models between types of infrastructure? How do different models influence the efficiency of provision, funding and financing of public infrastructure?*

*Various models of public infrastructure provision exist, including:

- direct government provision and operation
- the creation of Government Trading Enterprises (GTEs) or corporations as legally separate entities from government, and which may be subject to Australian Corporations Law
- the creation of competitive market frameworks for some infrastructure services, such as electricity, gas and communications (although a range of matters such as the pricing, income streams and service standards are still subject to government regulation by various regulators)
- the privatisation of some government-owned infrastructure assets
- the granting of concessions or franchises to private companies to provide public infrastructure subject to government regulation
- the involvement of the private sector in the operation and financing of new public infrastructure under different types of long-term contractual arrangements, including different types of 'public private partnership' (PPP) models.

## *Are current systems for raising revenue for public infrastructure services providing appropriate signals for efficient use and for new investments? If not, what scope is there to improve these systems?*

As BIC argued above, pricing shortcomings in land transport are a major barrier to efficient use of existing infrastructure and send poor signals as to where infrastructure development is needed. Section 4.3 of our *Moving People: Solutions for a Liveable Australia* report examined the question of pricing in some detail, including estimates of relevant external costs. We reproduce that material below, because it presents a clear statement of our position on this matter and is one of the very few Australian studies that presents actual data. Section 4.4 of the report is also reproduced, because it suggests ways to improve the relevant pricing arrangements. Reference citations are available in the original report.

### Road cost recovery including external costs

Economic theory recognises that, in a competitive market economy, the existence of external costs and benefits creates a situation where the market decisions of individual consumers and producers no longer add up to an efficient outcome for society. Market prices do not reflect these externalities and there will be too much (negative externality) or too little (positive externality) production of the good or service that causes the externality.

In a submission to the Australian Tax Forum 2011, Stanley and Hensher (2011) pointed out that, in land transport, most discussion of external costs has focused on the external costs of road use. The typical external costs that are usually considered in this context are:

- congestion
- greenhouse gas emissions
- local air pollution
- noise pollution

- the external cost of accidents
- road damage.

It is arguable that high community dependence on motor vehicles increases risks of social exclusion for many people, which suggests that there is also a social exclusion external cost of road use (Stanley et al., 2011). Energy insecurity is also increasingly being considered as a negative externality of fossil fuel dependence associated with motor vehicle use (Parry and Small 2005).

The most comprehensive early Australian examination of external costs of road use was probably the Bus Industry Confederation's submission to the 2001 Commonwealth Fuel Tax Inquiry, a submission whose preparation was assisted by ExternE project consultant, Paul Watkiss (BIC 2001), who was also a co-author of the important UK report on the external costs of road use (Sansom et al. (2001). That submission estimated the total external costs of road transport in Australia at $30 billion (Table 1).

Revenues collected by governments from road users were estimated at $11.5 billion, well below the total external costs. Stanley (2010) updated these costs and revenues and estimated the total external costs of road use at over $40 billion, with revenues at $16 billion, suggesting a wider total deficit than a decade ago, as shown in Table 1.

### Table 1: Total External Costs of Road Transport and Road-Related Revenues

| Cost/Revenue Item | 2001 BIC est. ($b) | 2010 Stanley est. ($b) |
|---|---|---|
| **COSTS** | | |
| Road expenditure | 4.6 | 14 |
| Congestion | 12.8 | 10 |
| Air pollution | 4.3 | 4 (inc. noise) |
| Climate change | 2.4 | 5 |
| Noise | 1.2 | (in air pollution) |
| Accidents | 5 | 10 |
| **Total Costs** | **30.3** | **~43** |
| | | |
| **REVENUES** | | |
| Commonwealth excise | 12 | |
| Less diesel fuel rebate | -2 | |
| Less DAFGS | -0.7 | |
| Registration fees | 2.2 | |
| Total Revenues | **11.5** | **16** |
| | | |
| **ROAD "DEFICIT"** | **~20** | **~27** |

**Source: BIC (2001); Stanley (2010)**

However, if one is seeking to implement an **efficient road pricing regime**, the total external costs of road use are not relevant. Market pricing on the basis of **marginal social costs** is a requisite for efficient resource allocation, marginal social costs being the change in total social costs for a unit change in the amount of travel.

The 2001 BIC research considered marginal social costs and presented estimates of fuel-based charges that might be used to cover various external costs, with congestion costs excluded – on the argument that this should be charged on a city-specific basis, rather than being recovered through fuel charges. BIC's analysis showed that, in addition to road users as a whole not meeting the full external costs of their road use, based on its assessment of marginal social costs (BIC 2001, p. 76):

- the fuel excise (~38 c/L) was probably about right in 2001 as a charge for internalising the costs of urban road use by cars, ignoring congestion costs, but was too high in relation to rural road use by cars. It is important to note that fuel excise has not increased since 2001 but the external costs of road use have grown
- the external costs of urban road use by heavy vehicles were probably higher than the (then) current excise rate (ignoring congestion costs) but rural external costs for these vehicles were probably similar to excise rates.

An implication of the 2001 analysis was that heavy vehicles should not receive any rebates of the fuel excise, unless they could demonstrate they created external benefits. This can be shown for buses, for example, which reduce the external costs of road use. To that end, current heavy vehicle road use charging arrangements unduly penalise bus because they neglect the external benefits that the mode delivers. This should be corrected until such time as a full road user charging system is in place. Thus, for example, bus should be exempt from a carbon charge until cars are subject to the charge and buses should be exempt from road use charges until a marginal social cost pricing scheme is in place, as a second best way of recognising the social benefits the mode provides.

For road vehicles more generally, the deterioration in aggregate social cost recovery performance since 2001, as illustrated in Table 1, suggests marginal costs have probably increased and that higher charges should now be levied on all road users. We return to this point below, where marginal social costs (as distinct from aggregate social costs) are considered further.

The main conclusions to be drawn from this brief overview of research on road user revenues and expenditures and on the wider external costs of motor vehicle use are that:

- there is now a long history of quantifying the external costs of transport
- the focus of this quantification has been on the external costs of road use
- Australian road users do not meet the full social costs of their travel choices and it is increasingly arguable that they may not even meet the direct road infrastructure/servicing costs associated with their road use this suggests that the current set of road user charges do not recover sufficient revenue from road users
- bus is an exception to this generalisation, because of the social benefits it produces, which are not recognised in road charging regimes and which would justify lowering of road use charges, until a reformed road pricing system is in place
- road infrastructure/servicing costs tend to be dwarfed by other external costs of road use, which suggests that road use charging regimes should have a much broader focus than simply seeking to recover only road damage costs and, in Australia's case, explicitly only heavy vehicle road damage costs
- the gap between the total and marginal social (or external) costs of road use in Australia, and current road user charges, is increasing, suggesting that there is increasing urgency for reform of road pricing (in both charge levels and the charging base)
- the growing international literature on the externalities of road use, and increasing implementation of congestion pricing schemes, suggests that there is likely to be a growing incidence of such initiatives in the coming decade.

The favoured treatment of public transport suggested above (bus in this particular case, because the discussion is about road user charging) is supported by staff of the World Bank and Asian Development Bank, who argue (WB & ADB 2012), p. 37:

*In an ideal world, user fees, tolls, fuel taxes and other charges to beneficiaries would cover urban transport investments and maintenance costs, taking into account the positive externalities of public transport...*

The proposed lowering of road use charges on public transport (bus) is a second best solution until such time as a reformed road pricing system can be implemented.

## Re-thinking fuel excise

### *Is the current excise sufficient?*

Figure 3[5] underlined the sharp reversal of the road revenue/expenditure balance against road use. Pressures to improve fuel economy standards, to lower greenhouse gas emissions, and the apparent saturation in per capita motor vehicle travel will serve to continue the decline in excise receipts on petrol in coming years, in the absence of any increase in the excise rate. Excise receipts on diesel can be expected to increase but this has not been sufficient to deliver an increase in total excise receipts. As in the US, where the Highway Trust Fund revenue stream has been in decline for some years, and in the UK where excise revenues will create a major funding hole in coming years, the excise rate applied to petroleum fuels needs to be increased. The last such adjustment for excise in Australia was in 2001, apart from the periodic changes in the charges levied on heavy vehicle fuel use.

Excise is an imperfect way of charging for road use, because most of the external costs of road use are not well correlated with fuel use. Carbon emissions are the major exception. However, given the political will, fuel taxation is able to be adjusted much more quickly than the time taken to implement a new and broader charging system. There are strong grounds for Australia moving to a new basis for charging for land transport, particularly road use, as argued in *Moving People*. In the short term, however, increasing excise rates would be a move in the right direction and would improve the efficiency of transport resource allocation, while generating funds that could be hypothecated to land transport improvements. What might this require in terms of an increase?

In work for the Henry Tax Review, Clarke and Prentice (2009) adapted a model developed by Parry and Small (2005), to estimate optimal fuel charges for Australia. The Parry and Small model derives an optimal fuel tax (or excise), based on maximising social welfare while raising revenue. It includes three components (Johnson et al. 2012):

1. a range of external costs of road use (local pollution, greenhouse gas emissions, energy security, accidents, congestion), to enable calculation of what is sometimes called a Pigovian (externality-reducing) tax that prices the marginal costs of the relevant externalities
2. an adjustment to allow for the efficiency trade-off between commodity taxation and income taxation, called the Ramsey component (such that the excess burden of different taxes can be included within a welfare optimising framework, along with external costs). The Ramsey component recognises that welfare maximising revenue raising from commodity taxation should impose higher taxes on commodities with lower price elasticities of demand (such as petrol and diesel used for motoring)
3. a congestion feedback component, which relates to positive impact on labour supply, and social welfare, of reduced congestion. This element is very small within the total.

The relevant external costs are estimated as marginal external costs but a lack of detailed knowledge of the shape of the relevant damage functions for a number of externalities inevitably means that marginal and average social costs per kilometre are assumed to be the same. Congestion is the most glaring exception to this, where marginal costs far exceed average costs in congested road conditions.

Johnson et al. (2012) set out three sets of estimates of marginal social costs of road transport for the UK, as shown in Table 2. Putting their numbers in approximate Australian currency (purchasing power parity) suggests marginal external costs ranging between 11c/km and about 23c/km (ignoring price levels as between different years). If congestion costs are excluded, where the notion of a single cost/km is very dubious in light of the variation in marginal congestion costs between low volume rural roads and highly congested urban arterials, the Bayliss and DfT figures are both about 4 cents/km if expressed in 2009 prices at PPP. At an assumed fuel economy rate of 10L/100kms, this set of external costs would approximately be equal to the Australian excise rate of ~38c/L). We explore this further below.

[5] Not included in this submission but available in the BIC report.

The Clarke and Prentice adaptation of the Parry and Small research, however, led them to conclude that the Australian excise on fuel should be considerably higher than the current rate. Their estimates of the optimal fuel tax ranged between $0.83/L and $3.28/L well above the current excise rate of 38.143 c/L. The major source of variability in their estimates is in the Ramsey component, which changes substantially as underlying modelling assumptions are varied. However, as Clarke and Prentice (2009) note, **all their estimates suggest that simply recovering the external costs of road use through the fuel excise would require an increase of about 10 c/L on the current excise rate, the externality component of their optimal fuel tax being relatively stable at just under 50 c/L**. This conclusion essentially confirms that above, where it was argued that the current excise rate is too low if excise is to be used to charge for road use (albeit that it is an imperfect way of charging).

## Table 2: Estimates of the marginal costs of road transport (pence/km)

| **Type of cost** | **Sansom et al., 2001 (1998 prices)** | | **DfT 2010 (2002 prices)** | **Bayliss 2011 (2009 prices)** |
|---|---|---|---|---|
| | Low | High | | |
| Congestion | 9.71 | 11.16 | 13.1 | 4.60 |
| Infrastructure | 0.42 | 0.54 | 0.1 | 0.57 |
| Accident | 0.82 | 1.40 | 1.5 | 0.88 |
| Local air quality | 0.34 | 1.70 | 0.4 | 0.57 |
| Noise | 0.02 | 0.78 | 0.1 | 0.50 |
| Greenhouse gases | 0.15 | 0.62 | 0.3 | 0.64 |
| Total | 11.46 | 16.20 | 15.5 | 7.76 |

**Source: Johnson et al. (2012)**

## Stanley and Hensher (2011) Estimates

Dr Ian Parry kindly made his optimal fuel tax models available to Stanley and Hensher. To apply the model, Stanley and Hensher (2011) adopted the assumptions set out in Table 3, in most cases aligning with the assumptions adopted by Clarke and Prentice (2009). Road damage costs are not included, on the basis that marginal road damage costs relate primarily to heavy vehicle use and should be recovered from heavy vehicles.

As an aside, it should be noted that the carbon price assumed by Stanley and Hensher is $25/t, in line with early application pricing under Australia's carbon pricing scheme. The UK (non-traded) price, estimated with respect to the UK meeting its emissions reductions targets, is far higher at £56/tonne, or about $80/t at purchasing power parity. It is thus arguable that the greenhouse gas externalities embedded in the Stanley and Hensher estimates are too low from a long term cost perspective.

### Table 3: Parameter Assumptions Used for Base Application of Parry Model to Australia

| Parameter | Base Value Used | Comments |
|---|---|---|
| Initial car fuel efficiency (miles/gallon) | 21.5 | Authors' estimate |
| Pollution damage - distance-related (c/ml) | 2.4 | Clarke and Prentice (2009) |
| Pollution damage - fuel-related (c/gal) | 32 | Assumes carbon at $25/t; energy security 10c/gal |
| External congestion costs (c/ml) | 10.9 | Clarke and Prentice (2009) on a mile basis |
| External accident costs (c/ml) | 3.5 | Parry (2009) |
| Fuel price elasticity | -0.21 | Parry and Small (2005) |
| VMT portion of fuel price elasticity | 0.4 | Clarke and Prentice (2009) |
| VMT expenditure elasticity | 0.6 | Parry and Small (2005) |
| Uncompensated labour supply elasticity | 0.2 | Parry and Small (2005) |
| Compensated labour supply elasticity | 0.35 | Parry and Small (2005) |
| Government spending/GDP | 0.35 | Clarke and Prentice (2009) low estimate |
| Fuel production share | 0.0156 | Clarke and Prentice (2009) |
| Producer price of fuel (c/gal) | 227 | Clarke and Prentice (2009) on gallon basis |
| Initial tax rate on fuel (c/gal) | 144.4 | Clarke and Prentice (2009) on gallon basis |

Source: Stanley and Hensher (2011), Table 6

The base optimal fuel (petrol) tax estimated by Stanley and Hensher (2011) is $0.94/L (Table 4). The externality cost component of this is 44 c/L, similar to the estimates produced by Clarke and Prentice and again suggesting that the Australian fuel excise is not sufficient to cover the external costs of road use. The Ramsey tax component in the Stanley and Hensher base estimate is $0.50/L, similar to the Clarke and Prentice "low share of government" estimate, mainly because the Stanley and Hensher base model run uses the 35 percent government spending share that Clarke and Prentice use as a sensitivity test for their low government spending share scenario. In the Stanley and Hensher base case, revenues to government from the optimal fuel tax are more than double existing revenues but they increase relatively less than the increase in the fuel excise (or tax) rate, because higher fuel prices drive fuel economies.

**Table 4: Stanley and Hensher Fuel Charge Estimates for Australia (c/L)**

| Basis of calculation | Externality Component | Ramsey Component | Optimal Tax | Revenue/Current |
|---|---|---|---|---|
| Base estimate | $0.44 | $0.50 | $0.94 | 2.27 |
| Accident costs increased (higher value of life) | $0.57 | $0.55 | $1.13 | 2.64 |
| No congestion costs | $0.39 | $0.48 | $0.87 | 2.11 |

**Source: Stanley and Hensher (2011) table 7**

***Some Sensitivity Tests***

Estimating the external part of accident costs is a difficult and under-researched area and the Henry Tax Review did not include accident externalities in its discussion of road pricing reform. There are two major issues in the Australian context: first, estimating accident costs; and second, estimating the external part of these costs.

BITRE (2009) estimated Australian road crash costs at $17.85 billion in 2006. That report used a hybrid human capital approach to valuing life. It is arguable that a willingness-to-pay value for life is more consistent with other values used in transport cost-benefit studies. If the Hensher et al. (2009) value of $6.2 million for life is used, which is now included in the NSW RTA economic evaluation manual, BITRE (2009) estimates that total accident costs would increase to $27.12 billion.

BIC (2001) cites work that suggests that 20-35 percent of accident costs might be external, in the sense that they are not covered by private insurances. Stanley and Hensher use the low end of this range (20 percent) and apply it to the BITRE base accident cost estimate of $17.85 billion to get an estimate of $3.6 billion for the external costs of accidents. If the total cost of accidents increases by $9.27 billion when a willingness-to-pay value for life is used, the full amount of this increase in total accident costs can be added to the base estimate of accident externalities to re-estimate accident externalities. This gives a value of $12.9 billion. Spread over 224b vkms (BITRE 2009) this suggests accident externalities of about 5.8 c/km (in 2006). Using this as a sensitivity test in Table 4 increases the optimal fuel tax by 19 c/L, with the externality component of the tax increasing by 13 c/L to 57 c/L. Revenues are an estimated 2.64 times current fuel tax revenues under this scenario.

Given the strong argument that a willingness-to-pay approach is the most suitable way to assess the welfare impacts of most public policy, this accident cost sensitivity test case is the modelling run on which BIC would place most weight in terms of optimal fuel charging.

It was argued above that seeking to internalise congestion costs into a fuel charge requires the assumption of a fixed congestion charge rate per unit distance. This is clearly unrealistic. For example, UK research suggests that marginal congestion externalities range from 0.03p/km on uncongested motorways to £2.40/km on heavily congested 'A' roads in conurbations (Johnson et al. 2012). ATC Australian evaluation guidelines for urban areas suggest congestion costs ranging between 17-90c/vkt in 2004 prices (ATC 2006). The 10.9c/ml used by both Clarke and Prentice, and Stanley and Hensher, is at the bottom end of this range. However, it can properly be argued that congestion costs should only be levied in those locations where congestion is a serious problem, rather than recovered through broader charges.

If congestion costs are removed from the Stanley and Hensher (2011) base case, Table 4 shows that the optimal fuel tax falls from $0.94/L to $0.87/L for cars, with the externality component (39 c/L) being almost exactly equal to the current excise rate. This accords closely with the rough extension of the UK research to Australia in section above, although the composition of the various external costs within this total differs somewhat. For example, UK work uses a higher carbon price than the $25/t used by Stanley and Hensher.

The sensitivity test provides a rough basis for identifying which particular external costs of Australian road use might be reasonably considered as being internalised, on average, through the current excise system. In making this point, it needs to be recalled that there are no road damage costs in the analysis reported in Table 4, since marginal road damage costs of light vehicles are negligible and, in a reformed marginal social cost-based road pricing regime, would be primarily recovered from heavy vehicles.

The most relevant results for policy result from combining the above two sensitivity tests, i.e. incorporating a higher price for accident costs (because it more accurately reflects a willingness to pay approach) but excluding congestion costs (on the presumption that these should be priced on a location-specific basis). The resulting external cost combination implies an externality charge of about 52c/L (ignoring the Ramsey component), or about 14c/L above the current excise rate. This charge would be higher still if a higher carbon price was used, as in the UK.

**In short, the current fuel excise rate seems likely to underprice the marginal social costs of car use, probably by about 14c/L, ignoring congestion costs and road damage costs.** Clarke and Prentice argued for a 10c/L increase in fuel excise. The current research suggests that the increase could arguably be higher, ignoring congestion costs and also road damage costs, the latter being primarily applicable to heavy vehicles. Truck charges should, therefore, far exceed the current excise rate, since relevant road damage costs would need to be added and costs such as air pollution and noise would be higher per vehicle kilometre. As argued previously, however, external benefits attributable to buses indicate a lowering of charges (higher rebate of fuel excise) levied on that mode, until such time as a comprehensively reformed road pricing system is in place. Revenue from a 14c/L higher fuel charge, by way of example, would total over $5 billion annually if levied on both petrol and diesel fuel use and should be hypothecated to improve land transport systems, including public transport.

Australian fuel excise was indexed until March 2001 but not since that time. It is noteworthy that, if indexation had continued from then until June Quarter 2012, the increase would have been 13.7c/L by the latter date, which is very much in line with the proposed increase. It suggests that, had indexation been continued, the rate by June 2012 would have been about 52c/L and that would have been a fair payment for most external costs of road use.

## Pathways

Australian road users need to pay more for their use of roads and, to improve the efficiency of resource use, the basis for setting charges should be broadened to include external costs of travel. While excise is not closely linked to congestion costs, which are the major reason why road user charges need to be reformed, increasing fuel excise is seen as a first step in the direction of a reformed pricing system. This will encourage some behaviour change in the direction that is required to lower external costs and will generate additional revenue for the Federal Government. These additional revenues, raised by increasing fuel excise, should be fully hypothecated for land transport purposes, strengthening expenditure/pricing/funding links. The ultimate aim should be abolition of fuel excise and vehicle registration charges and their replacement by variable road use charges, as proposed in Moving People.

Increasing fuel excise across the board will mean that most rural and regional car users are overcharged for their road use, until such time as a variable usage charging system replaces fuel excise and registration. To deal with this problem, the additional revenue raised from rural/regional car users should be solely dedicated to improving rural and regional transport infrastructure and services, primarily roads. The additional revenue raised from urban road use should be dedicated to urban transport applications more broadly, including roads, public transport, walking and cycling. This will both help in overcoming the transport infrastructure backlog (urban and rural) and send improved pricing signals to travellers, moderating the future growth in road infrastructure needs. The hypothecation nexus is critical to any chance of acceptance. In less technical terms, for this option to have even a slight chance of being politically palatable, the funds must be intrinsically linked to infrastructure investment and improvement, and be readily seen to be so linked.

The process of pricing reform would be further facilitated by changing the way existing toll roads are priced, to incorporate a congestion premium and to deliver more consistent network charging on tolled routes. More heroically, it could include imposition of tolls on heavily congested sections of untolled freeways, to ease congestion and generate revenue for improvement initiatives. For example, a toll on Melbourne's West Gate Bridge could be levied, to help fund the proposed East-West Link, the de-congestion benefits that bridge users would receive from the opening of the EW Link being a solid beneficiary pays argument for them making a contribution to funding of the Link.

In summary, then, a first set of steps towards implementation of road pricing reform in Australia should include:

1. immediate indexation of current fuel excise rates, such that they at least keep pace with future inflation
2. in the near future, implementing a step change in those fuel excise rates (14c/L is proposed), as an improved proxy for recovering marginal costs of road use[6]
3. changing the way existing toll roads are priced, to incorporate a congestion premium and to deliver more consistent network charging on tolled routes (giving clearer price signals to users, as supported recently by Infrastructure Australia, 2012)
4. imposition of tolls of heavily congested sections of untolled freeways, to ease congestion and generate revenue for improvement initiatives.
5. reducing road use charges levied on bus, in recognition of the external benefits from use until such times as a comprehensively reformed road pricing regime is implemented.

The focus of this report is moving people. In the interests if an integrated approach, however, BIC also strongly supports the implementation of mass, distance, location (MDL) charging for all heavy vehicles, giving due recognition to the external costs generated by particular classes of heavy vehicles. Such a pricing model would improve charging for heavy vehicle road use and assist the pathway to reforming charging of light vehicles. The Henry Tax Review (Commonwealth of Australia 2010) proposed MDL charging for road wear by heavy vehicles. BIC proposes that this be extended to all external costs.

Imposition of congestion charges on tollways will obviously require consideration of existing contractual provisions and decisions about how any additional revenue that might result from such a scheme should be used. Alternatively, it may be that a solution seeks to lower off-peak prices while peak prices are raised, with a neutral impact on overall toll-road operator cash flow.

Long term, BIC sees mass, distance, location charging as the ideal solution for all modes, replacing excise and registration charges, because of the flexibility that it provides to vary charges for road use to more accurately reflect the marginal social costs of road use (for example):

- road damage that relates to vehicle mass and dimensions and to the roads where the travel takes place
- congestion that is location specific
- air pollution and noise costs that are also location specific
- the distance users travel, which will affect the quantum of their social costs.

Charges would be set to internalise the external costs of travel as closely as possible. This is a pay-as-you-go charging system, as proposed for the UK by Johnson et al. (2012) and supported by the RAC Foundation and as proposed for the US by the National Surface Transportation Infrastructure Financing Commission (NSTIFC). Arguably a price on carbon should remain reflected in a fuel tax, because of the direct link of carbon emissions with fuel use. Otherwise, fuel tax would go.

The difficulty of implementing pay-as-you-go charging was recognised in the BIC's *Moving People Solutions for a Liveable Australia* report which proposed a wide ranging community consultation about the need for reform and the best way to implement such reform, under COAG leadership. The COAG Road Pricing Reform study has made progress in regard to improving charging of road use by heavy vehicles but a much broader set of reforms is needed, to include light vehicles and the major external costs of road use. A suitable community consultation would need a two to three year period to cover such issues as:

- why road pricing needs to change

[6] Increasing fuel excise is only a short to medium term measure. It has recognised weaknesses, particularly the loose connection between fuel use and external costs. For example, electric vehicles are not charged, which is appropriate in terms of their performance with respect to some externalities (e.g. environmental benefits) but not for others (e.g. congestion, accident costs).

- the options for change
- how these options will impact on various stakeholders (where scenarios would be useful in describing expected outcomes)
- what will happen to revenue raised from the charges
- what measures might be implemented to mitigate particular adverse impacts
- how privacy will be protected if comprehensive mass, location, distance charging is adopted.

It should be managed by eminent independent people, who are committed to the need for open dialogue. BIC strongly supports the need for such a conversation.

As a counter to the inherent political anxiety usually involved in tackling road pricing reform, it is noteworthy that survey work recently undertaken by Professor David Hensher and colleagues from the Institute of Transport and Logistics Studies, University of Sydney, has found that more than 80 per cent of Sydney motorists surveyed said they would accept some form of road pricing scheme. Just over 62 per cent said they favoured a cordon-based payment of $8 to enter the Sydney CBD in peak hour and $3 outside the peak. They would be prepared to pay this on top of existing registration and fuel costs, so long as 100 per cent of the revenue so raised was used to improve public transport.[7]

Public transport service levels and fare setting should both be an integral part of the community conversation about road pricing reform. The current failure to price the external costs of road use is a significant argument in favour of governmental funding support for public transport. If road prices more closely reflect the relevant marginal social costs of the travel in question, the case for funding support to public transport, through a low cost recovery rate, reduces. However, there will still remain strong social safety net arguments for some governmental funding support of public transport, even in a regime of marginal social costing of road use.

Background research undertaken for the US National Surface Transportation Policy and Revenue Study Commission (which reported in 2008) found that future US Highway investment needs could be very substantially reduced (by about a third over the long term) by implementation of a congestion pricing regime (NSTPRSC 2008). While investment levels in public transport needed to increase, above what they would otherwise have been, to cater for patronage numbers that are increased by user pays pricing of roads, the expected fall in required future road system funding was found to be in excess of this increased public transport funding requirement. The overall result was an expected reduction in US land transport infrastructure funding requirements[8], which helps to ease funding requirements. We are not aware of any such research having been undertaken for Australia but expect that the findings would be similar.

## *Are there any coordination issues between the different levels of government and the private sector in the provision of public infrastructure? If so, what implications does this have for funding and financing decisions?*

Our reply to this question sits somewhere between the subject matter specified for this question and that for the subsequent question on Decision Making and Institutional Arrangements. However, because co-ordination is the key issue of concern, we have chosen to present our response here, noting the link with the later question.

A major co-ordination issue that impacts the selection of public infrastructure is the process used, or not used, to 'integrate land use and transport' decision-taking. Major transport improvements can play important city-shaping roles. It is better that this is planned, to achieve intended societal outcomes, rather than arising as an unintended consequence of seeking to solve transport problems in siloed isolation. This requires an integrated approach.

[7] ITLS media release on 27th June, 2012.

[8] Compared to the infrastructure need estimated without such pericing. The absolute infrastructure expenditure requirement would still increase but by less than if no congestion pricing was in place.

BIC's *Moving People: Solutions for a Liveable Australia* pointed out that COAG asked the COAG Reform Council to undertake three tasks in relation to capital cities, the first of which was to review State and Territory capital city strategic planning systems against nine agreed criteria. An Expert Advisory Panel was appointed to assist the Council in these tasks. The CRC report was important because it pointed out that no city had planning systems that were fully consistent with the various criteria that had been agreed by COAG; most jurisdictions were 'partially' or 'largely consistent' with most criteria.

Subsequently, a comprehensive assessment of the state of play in terms of development of strategic plans and converting them to infrastructure priorities was provided by the work of Infrastructure Australia[9]. Infrastructure Australia pointed out that[10]:

To build on progress to date, the nation needs to concentrate on further improving performance in:

***A. strategic planning*** *– establishing credible long term infrastructure plans, which focus on better use of existing infrastructure as well as new capital investment;*

Improved strategic planning processes, where the focus starts with land use/transport integration but then ranges more widely, to encompass all the important infrastructure and service inputs that might be required to serve growing/changing communities, must be the starting point for improved infrastructure decision making in our cities. Public transport is one component of a suite of measures in this mix, to help improve productivity, social inclusion and environmental sustainability and more generally improve the way of life of Australians and visitors.

*Moving People Solutions for a Liveable Australia* argued that a particular focus of improving land use transport integration should be on taking **an integrated approach to place**. In a paper to the Thredbo 13 Conference[11] in Oxford in September 2013, Professor John Stanley showed that this will often throw up different priorities to those that emerge from the 'big project culture', which seems dominant in Australian urban planning and infrastructure pipeline development at present (partly because of the Infrastructure Australia infrastructure review and recommendation processes). **It is vital that, in our city infrastructure thinking, the focus shifts from big projects to networks and systems that are designed to help meet the COAG high level objectives for our cities**. This will encompass big projects but much more, such as protecting and enhancing critical and extensive networks of arterial roads, which currently risk being swamped by the emphasis on a few big projects, and paying much more attention to making the middle suburbs of our cities function more efficiently, as the knowledge economy increases the importance of these areas.

We need better city strategic planning, which should be accompanied by cross-sectoral intergovernmental funding agreements to help implement the resulting strategic plans (discussed later in our submission), including their infrastructure and service components, recognising the roles of public and private sectors. The private sector should be closely involved throughout the full course of this work, rather than simply being invited to bid for a few big projects at the end of a planning process undertaken by others or, as is unfortunately all too common, bid for projects that have little foundation in any comprehensive integrated strategic planning process. If such involvement is open, then questions of information asymmetry should not be of concern.

Institutional design for land use/transport integration frequently concentrates on integration within one particular level of government. However, if service impacts (benefits and/or costs), service delivery responsibilities and/or funding obligations cross jurisdictional boundaries between levels of government, then institutional arrangements also need to facilitate and manage this cross governmental involvement for effective integration, even if service delivery responsibilities lie largely (or entirely) at one particular level of government (as is common). COAG and Infrastructure Australia processes recognise this complexity, particularly as between the Commonwealth and State Governments. However, current Federal arrangements for our cities are fragmented and under resourced, relative to the national significance of cities.

Quite simply, the weaknesses in current processes for land use/transport integration mean that there can be little confidence that the best set of infrastructure and service initiatives are coming forward.

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[9] Infrastructure Australia (2012). Australian Infrastructure: Progress and Actions 06/12: A report to the Council of Australian Governments, Canberra, Infrastructure Australia, July.

[10] Ibid p.8.

[11] Go to http://www.thredbo-conference-series.org/ for more information.

### *To what extent do coordination issues present barriers to efficient investment in public infrastructure?*

Our answer to the previous question should indicate clearly that we have serious doubts about whether current land use/transport planning and decision making processes are producing the right kinds of projects. In particular, our 'big project' mentality is, we believe, distorting a systemic approach to infrastructure planning and prioritisation (among other things). Section 3.4 of Moving People: Solutions for a Liveable Australia, reproduced below, suggested that the following kinds of initiatives should be expected from a well integrated land use/transport strategic planning process.

## Urban transport policy directions to support land use

BIC strongly supports the Council of Australian Governments' (COAG) national objective to ensure Australian cities are globally competitive, productive, sustainable, liveable, socially inclusive and well placed to meet future challenges and growth (COAG 2009)[12]. Taking account of the various research findings and urban planning principles outlined above, BIC believes that place-based urban transport system development to support pursuit of this national objective, with a focus on people movement, should include:

- ensuring that adequate trunk public transport capacity is available to facilitate growth in the central city and movement around the central city. This is about sustaining locational agglomeration economies and, for the largest cities, will mainly mean ensuring that there is sufficient trunk rail capacity to cater for mass movements at a satisfactory service level. In some cases and in the smaller cities, Bus Rapid Transit may often be the preferred solution, as demonstrated in Brisbane. This transport policy direction also means ensuring that walking and cycling opportunities are provided to support use by central/inner urban residents and by others travelling to this area. This will support greater dwelling density in the centre. Peak people movement to/from central cities is not effectively undertaken by car, so transport policy should ensure that public transport, walking and cycling have priority over improved car access. Increasing parking charges and limitation of car parking spaces can support these policy directions and, longer term, road pricing reform should be implemented.... If major new central area bypass roads are built, direct access/egress to/from the central city should not be available in close proximity, because of the adverse impact this would have on PT use. The central area is not the major location for jobs, residences or most activities. Its importance should not be overemphasised within the context of the total transport budget
- road use priority being given to light rail, tram and trunk bus services, plus walking and cycling, in inner suburbs, as part of transport network management plans and to support higher densities along transport corridors ensuring high quality road capacity exists to support circumferential operation of road-based PT systems in middle and outer suburban areas, crossing radial rail lines and joining up activity centres. High frequency trunk PT services should be provided along these circumferential corridors and high quality opportunities for walking/cycling should be provided within and to/from activity centres. This should help to increase the PT/walk/cycle mode share for work and non-work journeys, most of which are not to the CBD but are within home LGA or to a neighbouring LGA. Improving accessibility should assist in promoting job growth in activity centres, as part of an integrated set of measures to promote activity centre development (e.g. selective increases in density, mixed use development, focus on growing higher order service employment, etc). Target PT service frequencies on the trunk circumferential middle-outer corridors in the larger cities should be 15 minutes or better for most service hours (which should be from about 5.00am to midnight in most cases, with a lesser frequency being acceptable late in this operating span)
- providing local PT services to transport nodes/activity centres, at a frequency that will help to facilitate social inclusion ... relevant local PT service frequencies should certainly not be any less than hourly from 6.00am to at least 9.00pm, with 30 minute frequencies being preferred. Alignment of frequencies between

[12] Council of Australian Governments (2009). *Communique*. 7th December, 2009.

local and trunk PT services is important to maximise patronage potential, such that if rail is operating on 15 minute headways, connecting buses should operate on a multiple of 15 minutes

- a high priority being attached to walkability/cyclability within and to/from local centres, to support greater use of more sustainable travel modes and also assist development of more compact settlement forms, particularly in the middle and outer suburbs (inner suburbs are already typically characterised in this way)
- providing high quality trunk PT services between outer growth suburbs and the most proximate employment hubs, ensuring that road capacity is sufficient to meet these PT service needs (if rail is not available). In many cases this will mean improving trunk PT service between outer suburbs and middle suburbs, where jobs are more readily available, while also seeking to increase the availability of local (non-transport) services and of jobs in growing outer suburbs, to reduce the need to travel.

In addition to these spatially focused policy directions, improved land use/transport integration also requires a suite of generic policies, such as pricing systems that reflect social costs and road safety treatments to reduce risks to travellers (including pedestrians and cyclists

These are the kinds of directions that should be expected from integrated capital city strategic planning processes, nuanced by local circumstances, with efficient infrastructure programs being a key output, rather than simply a number of big projects. Integrated strategies, such as those recently produced by South Australia for Adelaide, Victoria for Melbourne and NSW for Sydney are starting to approach the expectations for integration outlined above but still tend to be weak on their understanding of the importance of the middle suburbs in the knowledge economy and weak on linking neighbourhood level functioning to the broader strategic directions.

## *Does the scope for each level of government to impose user charges or taxes and other charges affect the provision of public infrastructure, and/or the funding and financing mechanisms used?*

At the risk of gross over-simplification, the states currently have most (about 80%) of the responsibility for infrastructure provision but only a minor proportion (about 20%) of the available revenue. Taxation arrangements mean that the federal government is a major beneficiary of projects that improve productivity, as is the case with most transport infrastructure investment. This vertical fiscal imbalance may be good for macro-economic management but builds transactions costs into infrastructure development and delivery processes and probably gives the federal government a greater influence over infrastructure priorities than might result if decisions were more closely aligned with the incidence of investment benefits and costs, instead of being so dependent on revenue raising capacity. Greater reliance on user pays/beneficiary pays approaches, as we proposed above, could improve the alignment of revenue raising potential with benefit/cost incidence, because revenues should flow more closely to the level of government with the functional responsibility (which should be based on primary benefit/cost incidence).

If the level of government responsible for infrastructure and service delivery had revenue sources available to it that were more closely aligned with the costs involved, more efficient planning processes should be expected. Reforming transport (and more particularly road) pricing arrangements, to better reflect marginal social costs, and then using the behavioural responses that flow there from to help guide investment decision taking requires realignment of revenue flows, which could involve the establishment of state-based 'transport funds'. If prices better reflected the relevant marginal social costs, then revenues from user charges and value capture (for example) could be paid into such transport funds, at a state level, and disbursements made there from, in accord with decisions of a suitably qualified board. The major focus would be at state level, since that best captures relevant benefits and costs, but federal priorities could be built in through an intergovernmental funding agreement that specifies, among other things, the revenue flows that the Federal Government is willing to commit to particular state-based transport funds and federal expectations in consequence of these revenue flows. A similar specification would be needed to cover state government involvement, setting out revenue commitments that the state is prepared to provide and delivery expectations associated with these funding flows. We elaborate further on these matters in relation to our responses to the question on Decision Making Arrangements.

# Decision Making and Institutional Arrangements

## *What are the strengths and weaknesses of the current institutional environment within which decisions about the provision of public infrastructure are made? How does this differ for different types of public infrastructure? How does this influence the extent to which efficient investments are prioritised?*

Again our focus in on the land transport sector, with some commentary on other sectors

***Land Transport Strengths***

1. There are competent planning and evaluation guidelines published by the Australian Transport Council, which encourages consistent approaches.
2. We have a tradition of the 'tyranny of distance', which means that land transport is never far from the political consciousness, which encourages research and policy thinking.
3. Infrastructure Australia has encouraged a more disciplined approach to project development and evaluation (but has relied too heavily on a 'big project' approach). This affects all sectors but the preponderance of transport projects in the Infrastructure Australia priority lists suggests transport has a relatively big pipeline.
4. The Commonwealth and States have a long tradition of co-operating and consulting, through mechanisms like Ministerial Councils and their supporting structures (but this is too much of a club that excludes others on too many occasions)

***Land Transport Weaknesses***

1. Dysfunctional pricing signals, as discussed above (sectors such as water and energy are somewhat better, because they are more market-based commodities at present, although external costs in those sectors are still largely absent from pricing signals, with this being a particular distortion in the energy sector, as between greenhouse gas light and GHG heavy sources of supply).
2. Poor alignment of land use and transport planning (the water and energy sectors are also weak in this area, also being largely silo based).
3. Too dependent on searching for the best 'big project' (water has been through a major capital expansion phase and is now thinking harder about doing better with what it has got).
4. Too few bidders for major projects and excessive bid costs have developed (approaches such as unbundling can help).
5. Weak public policy discussion, including on infrastructure needs, in the general and professional communities (too many consultants and academics are dependent on government largesse and are loath to be critical, which hinders constructive and open debate). This probably affects all sectors equally.
6. Too little engagement of the private sector in the strategic planning process (a further manifestation iof poor integration or co-ordination).

To improve institutional arrangements we propose some changes to institutional arrangements. The need to reform land transport pricing in Australia should be complemented by reforms to the way transport funding is arranged. With respect to cities, we propose the establishment of state-based land transport funds, which would receive revenue from users, value capture and government (federal and State, and possibly local in some situations) and implement priorities that have emerged from integrated land use/transport plans, that include ten year transport infrastructure plans. Tying strategic planning processes closely to pricing and funding arrangements should help drive improvements in strategic planning processes and help deliver better outcomes.

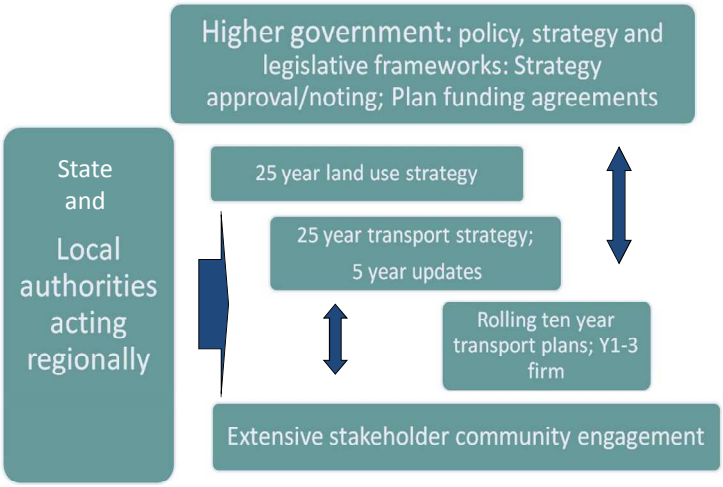
The way we see the land use/transport plans operating is summarised in Figure 3, which is taken from Professor Stanley's 2013 lecture material at ITLS, University of Sydney. Figure 4 then suggests how this might be linked to funding.

The emerging UK experience with Single Local Growth Funds (SLGFs) is in the general direction BIC is proposing but goes even further and is well worth consideration, in terms of better integrating strategic planning processes and funding flows. The SLGF provides Local Enterprise Partnerships (or LEPs, which include local business leaders, local authority leaders and other partners) with a potential national revenue stream to pursue priorities that are agreed through a strategic economic planning process. It provides for a wider span of national level infrastructure funding flows than simply transport, through 'Growth Deals' with local areas, to support activity in those areas. For example, 'City Deals' have been negotiated with core cities such as Greater Manchester, Leeds, Liverpool and others). The funding pool is provided over a ten year period, for competitive bidding by local areas, with the LEPs having responsibility for spending on the basis of the strategic economic plans. As noted in HM Treasury (2013), Investing in Britain's Future (p. 68) the SLGF model provides

*... LEPs with the flexibility to tackle the barriers to growth in their areas and provide influence over the key levers of transport, skills and housing. As area's allocation from the SLGF will be available to be spent on the priorities LEPs and their partners have determined in their strategic economic plans.*

The emerging UK model takes ideas such as those embedded in Figures 3 and 4 further along the integration pathway. To that extent, they are very worthy of close consideration. They are one logical outcome to institutional design from taking a broad view of the requirements for integrated thinking and delivery.

**Figure 3: Integrated land use/transport planning process** (Source: Stanley and Smith 2012)



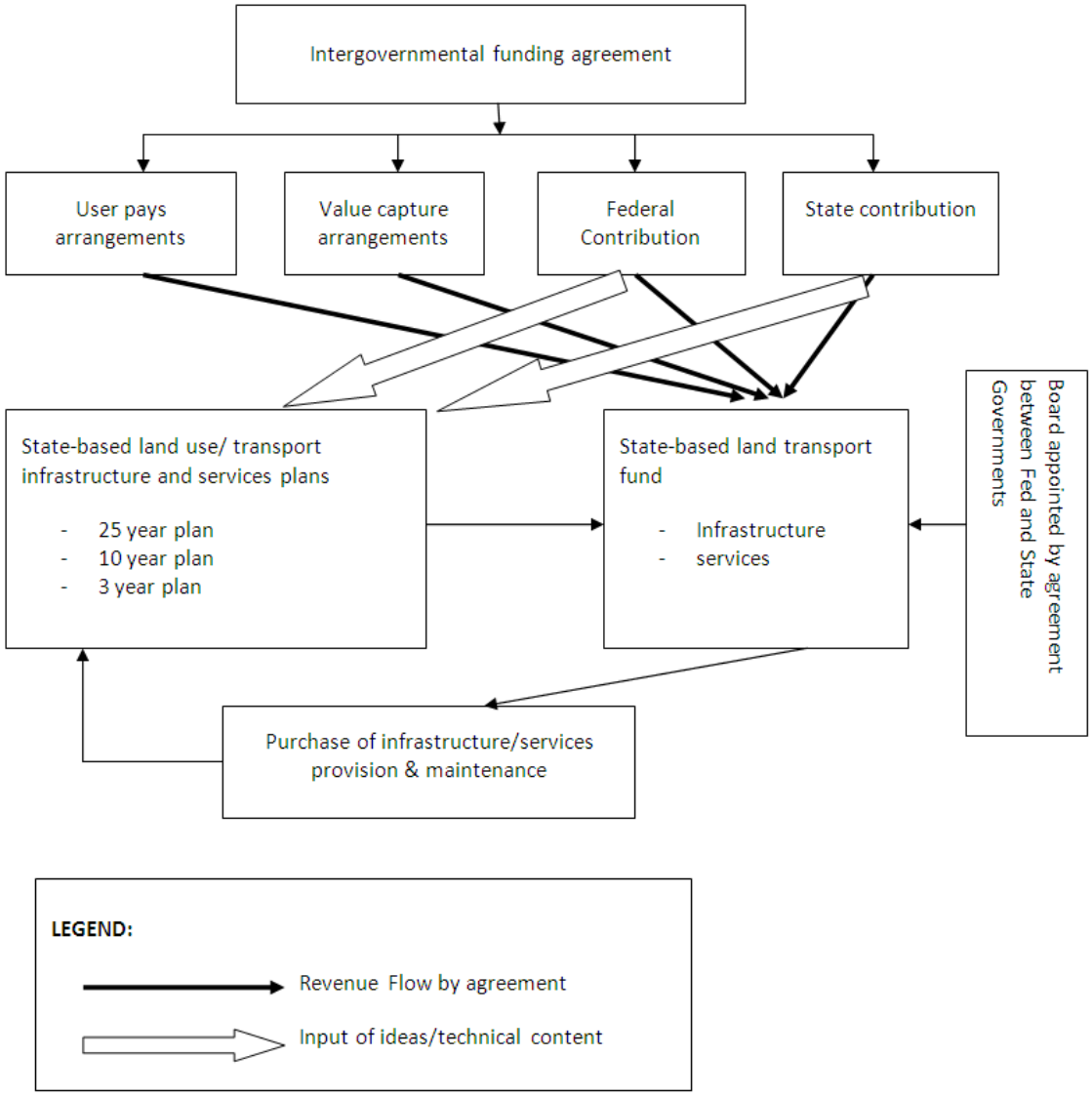

As noted, Figure 4 suggests how the integrated land use/transport planning process would link to a dedicated land transport fund. The major advantages of the proposed approach are that it would closely link strategic planning with infrastructure and services prioritisation and also with pricing and funding/financing. The latter effect would be helped by the land transport fund being managed by a skills-based board, accountable for delivering outcomes in line with the brief set out in the proposed intergovernmental agreement and arising from the integrated land use/transport planning processes. This could be the result of strategic economic plans if one goes down the UK pathway. The prioritisation process would be less subject to political pressure and more linked to desired longer term outcomes set out in the founding intergovernmental agreement (where an emphasis on local economic partnerships could be embedded, if one was to go down the UK pathway).

The fundamental principles underlying this proposed approach are:

- aligning pricing with marginal social costs
- aligning infrastructure priorities with the results of integrated land use/transport strategic planning processes, where partnerships are a key element in developing and implementing the plan

- aligning funding with revenue streams that (partly) flow from marginal social costs and value capture mechanisms (beneficiary pays), supplemented by government funding contributions for functions seen as community service obligations, such as support for base public transport service levels to help assure social inclusion and for functions seen as delivering significant external benefits
- increased professionalism in decision-taking, guided by more open strategic planning processes
- increased transparency and accountability in planning and decision-making.

## Figure 4: Indicative Land Transport Fund




**Source: Stanley 2012**

# Funding Mechanisms

## *What alternative funding mechanisms for public infrastructure should be considered in this inquiry? What are the strengths and weaknesses of each, trade-offs to consider, and what principles should guide their use?*

There are two key alternative funding mechanisms that BIC proposes should be used to fund land transport infrastructure: (1) user charges based on marginal social costs and (2) land value capture. We have discussed user pays pricing elsewhere in this submission. This part of our submission concentrates on value capture, again drawing on our report *Moving People: Solutions for a Liveable Australia*. Section 4.5 of that report, which discusses value capture, is reproduced below. Again we note that reference citations set out in this section are available in the original report.

### Other land transport funding opportunities

… it has long been understood that accessibility influences land prices and is itself influenced by the quality of the land transport system. Those places that have higher accessibility typically have higher land prices. Transport improvements frequently improve accessibility and increase land prices, benefitting landowners and developers. Reflecting the *beneficiary pays* principle, value capture mechanisms can be used to convert part of this created benefit into revenue, which can be used to help fund the relevant transport initiative that generated the value gain, or other public purposes. The recent Infrastructure Finance Working Group (2012) report, *Infrastructure Finance and Funding Reform*, recommends use of techniques such as value capture. (There are) … a number of possible approaches to value capture, some of which are briefly elaborated below... CTS (2009) and Committee for Melbourne (2012) are very useful overviews of opportunities in this regard.

### Tax Increment Financing

Tax increment financing (TIF) is widely used in the US and can now be used by local government in the UK to help drive local investment and economic growth[13]. In essence, TIF allows a (usually) local government to borrow against predicted growth in locally sourced revenues in a defined area, to help fund activities that will drive that growth. TIF has been used for fifty years in the US to fund a range of infrastructure and development projects, with almost every US state having passed relevant enabling legislation. Bonds are usually issued to provide the necessary upfront funds for infrastructure/urban renewal initiatives, additional annual local tax (rate) revenues being used to meet interest and principal repayments. TIF is particularly suited to an urban renewal context.

TIF might also be relevant at state jurisdictional level, where the incremental revenues could be state property related taxes (primarily land tax and stamp duty). This revenue would be used mainly to fund infrastructure otherwise funded by state governments. However, there seems no reason why local government could not also use a TIF model to bring forward infrastructure/urban renewal programs, this being the more usual jurisdictional level of application.

A key issue in relation to TIF as a possible funding source is the extent to which the infrastructure programs being financed lead to a **net increase** in development-related revenues to the sponsoring government, as distinct from simply diverting revenue from one area to another (even within the same municipality). US evidence on this account is mixed, Dye and Merriman (2008), for example, finding little evidence that TIF actually led to net new development in a Chicago area case study. In a governmental context where infrastructure is in short supply and available capital funds are scarce, net increases in governmental revenue streams seem more likely to be realisable to meet payments on borrowings for infrastructure. That would seem to be the case in Australia at present, particularly in cities where population growth pressures are severe. Major urban renewal projects, which usually include substantial transport infrastructure components, should be suitable candidates. Joint ventures between government land agencies and local government, or between local government and the private sector, could see local government drawing on TIF finance to help accelerate infrastructure provision and its subsequent rate income flows.

[13] Property Council Australia (2012) calls this funding method Growth Area Bonds.

## Special assessments

These impose special charges on property close to a new facility, with the charges only being raised for those properties that receive a special (identifiable) benefit from the public improvement, such as a new transport facility. Committee for Melbourne (2012) uses the generic description of Benefitted Area Levy for this type of funding source. For example, Melbourne's Regional Rail Link and Sydney's North West Rail project will benefit properties located adjacent to proposed stations. Some value capture in relation to such properties also may be pursued through means such as air rights development or joint development projects, as discussed below, but all properties that will clearly gain could be subject to a special assessment, to value capture part of the relevant uplift. This approach is widely used across the United States, typically for local infrastructure improvement projects. It has much in common with TIF.

Property Council Australia (2012) notes that a number of Australian jurisdictions apply a value capture levy, citing (for example) a recently introduced value capture charge introduced in Queensland by the Urban Land Development Authority.

## Metropolitan improvement levy

This is a broad-based charge related to all properties in a large area, set at a low rate and used to fund specific government services. It might be levied on a flat rate per property basis or on a proportion of property value basis. The advantage of the latter is that it implies an element of value capture and is not as regressive as a flat levy. Discussing this approach in a transport context, Committee for Melbourne (2012) calls this a Broad-Based Transport Improvement Levy. Melbourne has a Parks Levy, for example, which fits this model.

One way to increase the availability of funding for transport infrastructure/service initiatives that deliver community value would be to implement such a levy, hypothecated for transport purposes, particularly where the relevant services are widespread throughout the charging area, such as public transport services. Thus, for example, a metropolitan improvement levy could be used to help fund PT service costs in growing suburbs, on the argument that there are both direct user benefits (including social inclusion benefits …), 'option benefits' (essentially insurance benefits, to those who might possibly need to, or wish to, use the service at some future time = a form of beneficiary pays) and reduced external costs of road use from the availability of such services. The redistribution of revenue raised from inner/middle to outer areas implied in this arrangement may have equity benefits, since most public transport services/benefits currently accrue to inner/middle urban residents.

## Development impact fees (aka developer contributions)

Development impact fees, also known as developer contributions, are one-time charges levied on new development. They are commonly used in Australia (e.g. for greenfields development and major projects such as Docklands) and are mainly levied on new development, to help recover costs of public infrastructure/services, growth-related public service costs, such as new rail level crossings (if a development creates a need for such a facility), parks/open space and perhaps local public transport. These charges have some similarities to negotiated exactions but differ insofar as development impact fees are usually determined by formula, related to expected public service costs attributable to a level of new development, rather than through the less-formal negotiation processes typically used with negotiated exactions. Levying such charges on a consistent basis across all new urban development is appropriate, particularly with urban infill being expected to play a bigger role in most cities.

## Negotiated exactions

Negotiated exactions might cover similar types of costs to a development impact fee but are subject to negotiation, rather than being the outcome of a formal, formulaic process. They may be in-kind contributions (e.g. of open space), instead of money. CTS (2009) explain that negotiated exactions are not typically applied to off-site infrastructure provision.

## Joint development

In a transport context, joint development refers to the development of a transport facility and adjacent private real estate, often based around a railway station where higher density development might accompany station re-development (e.g. transit oriented development). In an Australian setting, this might involve a partnership between

a public land development agency or transport authority, and a private sector developer. There are a number of possible joint development models, with varying equity, risk allocation and revenue/cost treatments. Joint development may include air rights development (see Air rights), such as above a railway station. Such proposals are unlikely to generate sufficient funding to facilitate developments beyond those covered by the particular joint development arrangements but they can be significant for a small number of particular major development opportunities.

## Air rights

Major new transport projects, or urban development projects, may add value to the space above (or below) a transport facility. For example, air rights above Wurundjeri Way in Docklands (Melbourne) have been part of a development proposal before the market for bidding in early 2012. Air rights agreements establish the right to develop above (or below) a facility, in exchange for a financial contribution or future additional property and/or income taxes (depending on jurisdictional income raising opportunities). Revenue from such an initiative may be used for a range of public purposes, such as place making, but is most likely to be retained within the development site.

In Australian cities, development above railway stations usually has a high cost for podium development, relative to surrounding land prices. This typically means high density development will be needed to establish a financially feasible opportunity. (Ends section of report) Table 5, taken from *Moving People: Solutions for a Liveable Australia*, summarises these funding mechanisms and adds governmental revenues as a possible funding source. The **key strengths** of the three methods shown are that they align funding source with the expected infrastructure beneficiaries, from users to wider value recipients to the general public, as shown in the table. When user charges (or fees) are based on relevant marginal social costs, the price signals will be such as to encourage more efficient resource allocation.

The main weaknesses of the proposed user charging and value capture revenue raising approaches are the political difficulties of implementation, which are discussed in our two *Moving People* reports in relation to road pricing reform. *Moving People: Solutions for a Growing Australia*, proposed a wide ranging community consultation to deal with such concerns, the consultation focusing on the need for reform and the best way to implement such reform, under COAG leadership. The COAG Road Pricing Reform study has made progress in regard to improving charging of road use by heavy vehicles but a much broader set of reforms is needed, to include light vehicles and the major external costs of road use. A suitable community consultation would need a two to three year period to cover such issues as:

- why road pricing needs to change
- the options for change
- how these options will impact on various stakeholders (where scenarios would be useful in describing expected outcomes)
- what will happen to revenue raised from the charges
- what measures might be implemented to mitigate particular adverse impacts
- how privacy will be protected if comprehensive mass, location, distance charging is adopted.

It should be managed by eminent independent people, who are committed to the need for open dialogue. BIC strongly supports the need for such a conversation.

As a counter to the inherent political anxiety usually involved in tackling road pricing reform, it is noteworthy that survey work recently undertaken by Professor David Hensher and colleagues from the Institute of Transport and Logistics Studies, University of Sydney, has found that more than 80 per cent of Sydney motorists surveyed said they would accept some form of road pricing scheme. Just over 62 per cent said they favoured a cordon-based payment of $8 to enter the Sydney CBD in peak hour and $3 outside the peak. They would be prepared to pay this on top of existing registration and fuel costs, so long as 100 per cent of the revenue so raised was used to improve public transport.[14]

[14] ITLS media release on 27th June, 2012.

Public transport service levels and fare setting should both be an integral part of the community conversation about road pricing reform. The current failure to price the external costs of road use is a significant argument in favour of governmental funding support for public transport. If road prices more closely reflect the relevant marginal social costs of the travel in question, the case for funding support to public transport, through a low cost recovery rate, reduces. However, there will still remain strong social safety net arguments for some governmental funding support of public transport, even in a regime of marginal social costing of road use.

### Table 5: Value capture in a framework of transportation finance

| **Funding Mechanism** | **Beneficiaries** | | **Measurement of Benefit** | **Finance Instrument** |
|---|---|---|---|---|
| General revenue | General public | | General tax base | General fund allocation; property tax; transportation sales tax (US) |
| Value capture | Restricted non-user beneficiaries | Landowners | Land value growth | Land value taxes |
| | | | Property tax growth | Tax increment financing |
| | | | Assessed special benefits | Special assessments |
| | | | Transportation utility | Transportation utility fees |
| | | Developers | Off-site development opportunities | Development impact fees |
| | | | Off-site access benefits | Negotiated exactions |
| | | | Development privileges | Joint development |
| | | | On-site development opportunities | Air rights |
| User fees | Users of transportation facilities | Vehicle operators | Gas consumption | Gas taxes |
| | | | Mileage | Mileage-based charges |
| | | | Vehicle units/types | Vehicle sales tax; license tab fee; wheelage fees |
| | | | General access rights | Tolling |
| | | | Demand-controlled access rights | Congestion pricing |
| | | | Rights to incur environmental impacts | Transportation environmental taxes/fees |
| | | Passengers | Ridership | Fares or permits |

**Source: Centre for Transportation Studies (2009), Table 1.**

### *What are the different types of revenue streams that can be created to attract private sector finance for public infrastructure projects, such as user charges, availability payments and any other mechanisms? How widely are these currently used for different types of public infrastructure?*

The two major revenue streams that could be created to attract private sector finance in to land transport are user fees, including externality charges, and value capture revenues. Their use is currently very small in the sector, since the major revenue source (fuel tax) is not actually designated as a user charge (other than the part charged to heavy vehicles for their road damage). Availability payments are also a possibility to attract private finance but they do not generate additional government revenue availability and are therefore essentially achieved at the cost of some alternative use of the money in question. They have the distinct disadvantage that they do not confront users with the real costs of their travel decisions. BIC regards availability payments as a soft option that should be avoided until user charging reform and value capture options have been implemented.

### *What costs and benefits should be taken into account when considering the suitability of user charging for public infrastructure? What impediments exist to the wider application of user-pays funding arrangements for public infrastructure, and how does this differ for different infrastructure types? How could such impediments be addressed?*

We have dealt with these issues at some length in our responses to other questions. We simply add a few comments here.

Economically efficient road use pricing, as we propose, is based on the idea of users paying the marginal social costs attributable to their road travel choices, to maximize the efficiency of resource allocation in land transport, subject to meeting distributional concerns. Our submission has already identified the key external costs involved in calculating marginal social costs. Any jurisdiction seeking to pursue such pricing has some fundamental considerations to resolve, such as (for example):

- how to ensure that cost recovery targets are met, if a jurisdiction believes this is important (where the usual answer is to price at short run marginal social costs and raise any additional revenue required to meet cost recovery targets by charging higher prices to users who are least deterred by higher prices);
- how to calculate relevant marginal social costs, when there are frequently many joint and common costs involved in provision of transport services and the analytics of costing is still emerging. The European Commission has supported substantial valuable research to improve relevant marginal social cost estimates and reasonable estimates are now feasible; and,
- how to design a pricing scheme that will be acceptable to voters (also the subject of a wide literature, with many commentators proposing dedicating (or hypothecating) the revenues that are raised to specific transport and/or closely related applications and upgrading alternative travel options prior to implementing charges, to give people a choice, as well as undertaking a comprehensive community engagement program to discuss the need for change (as we have proposed elsewhere in this submission).

If significant external benefits are expected to flow from transport infrastructure benefits, then it is arguable that cost recovery targets should be adjusted downwards to allow for this circumstance. This is most likely to be relevant to the realisation of agglomeration benefits that are associated with trunk public transport service capacity to high density urban nodes.

The US National Surface Transportation Infrastructure Financing Commission[15] (NSTIFC 2009) proposed that the US shift from its current road charging/funding system, based largely on indirect user fees in the form of federal motor taxes, which are in decline[16], toward more direct user charges, in the form of a vehicle mile travelled (VMT) charging

[15] National Surface Transportation Infrastructure Financing Commission (2009) *Paying our way: Report of the National Surface Transportation Infrastructure Financing Commission*, Washington DC.

[16] In part this is due to the long period over which US fuel taxes have not been indexed.

system (NSTIFC, 2009). The Commission adopted six guiding principles as criteria for selecting road pricing mechanisms:

1. Enhance mobility of all system users
2. Generate sufficient funding on a sustainable basis
3. Cause users to pay full cost of system use to greatest extent possible
4. Encourage efficient investment
5. Incorporate equity considerations
6. Support broader public policy goals (i.e., energy and environment).

It argued that a VMT best met these criteria (from among the large range of funding options evaluated). Increased fuel taxes were supported in the short term, to restore funding from the Highway Trust Fund, but a VMT was seen as the preferred long term solution, incorporating externalities. This is the general approach supported above by BIC but BIC's proposed approach goes a bit further: adjusting fuel taxes in the short term to better reflect marginal social costs and then moving to mass, distance and location-based charging for road use. The benefits that should flow from this change are a greater realization of the six factors listed by NSTIFC.