



Inquiry into Managing Transport Congestion

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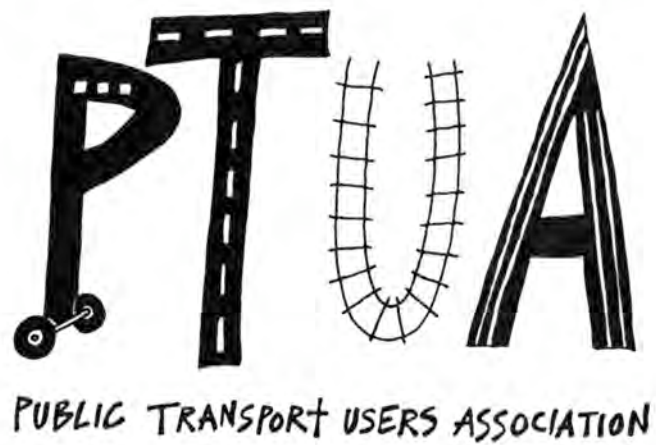
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Choosing the Right Options

Response to VCEC's Draft Report on Managing Transport Congestion

from the



June 2006

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1 Introduction

The Public Transport Users Association (PTUA) congratulates the Commission on compiling an extensive draft report with contributions from a wide range of stakeholders.

The key message of the report is that the past 40 years of road-building has exacerbated rather than solved traffic congestion, contrary to the general expectations at the time. As a result Melbourne not only has more freeways than any other Australian city, but also more traffic congestion.

The business-as-usual response of building even more roads, particularly urban freeways, can no longer be sustained. We cannot build our way out of congestion. Instead transport planning must move beyond 1960s-style 'predict and provide' traffic engineering and include a 'toolbox' of measures including public transport infrastructure and services, encouragement of walking and cycling, demand management and sensible urban design. We put forward Vancouver and Perth as recent examples of our suggested approach.

The politically viable alternative to further road-building is overhauling the alternatives, particularly public transport. Public transport services should be designed to offer go-anywhere-anytime convenience at reasonable cost. With a world-class public transport system in place, people's transport choice is enhanced since they can then choose to avoid road congestion by using a high-quality alternative.

The PTUA has prepared this response to the draft report in the hope of clarifying and developing the issues raised. Where the remarks in this response have implications for the content of the draft report, we have endeavoured to highlight relevant pages of the draft report in italics, e.g. (*p. 47; p. 158*). We would be very happy to provide further information if required and look forward to the release of the final report.

2 Road demand management

2.1 Road use charging

2.1.1 Total level of charging

Traffic congestion is just one negative externality that results from under-pricing of motor vehicle use. A range of other social and environmental costs such as air and noise pollution, greenhouse emissions and uncompensated crash losses are not fully recovered from motorists. Table 1.1 below outlines the ‘road deficit’ - the extent to which negative externalities outweigh the charges levied upon motorists - which amounts to over \$15 billion per annum *excluding* congestion and health system costs related to reduced physical activity associated with car dependence (sub. 65, pp. 15-16).

Table 1.1: The road deficit in Australia

Costs	(\$ million p.a.)	
Road construction & maintenance	8,500	
Land use cost	6,000	
Road trauma	15,000	
Noise	700	
Urban air pollution	4,300	
Climate change	2,200	
Tax concessions	4,200	
State fuel subsidies	600	41,500
Revenue		
Fuel excise	9,800	
Registration fees	3,300	
Insurance premiums	10,000	
Tolls	1,000	
Other revenue	2,150	26,250
Road deficit		15,250

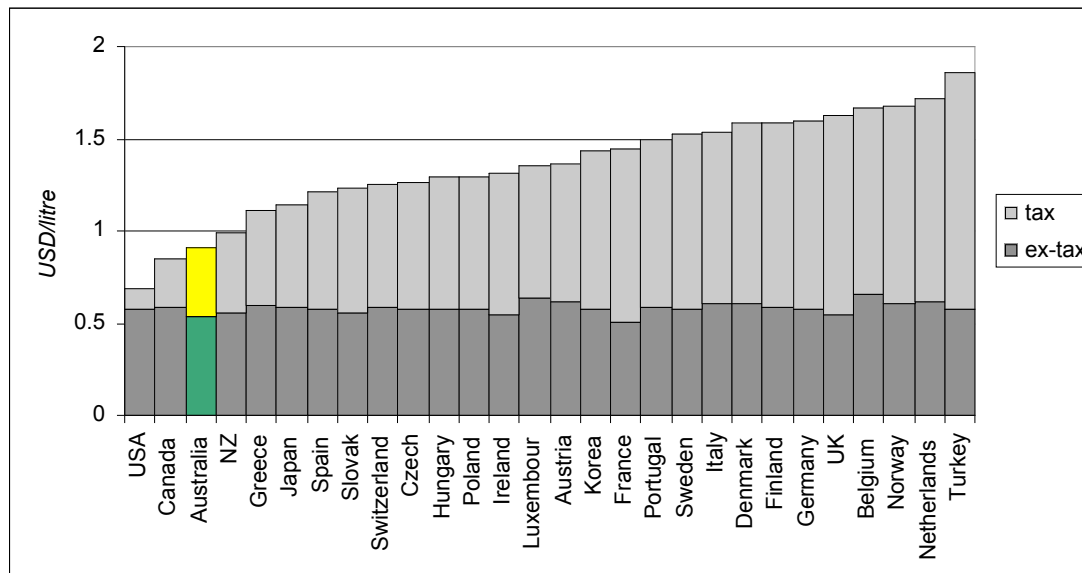
Source: <http://www.ptua.org.au/myths/petroltax.shtml>

A key factor in the size of the road deficit is the comparatively low level of fuel excise. Australia has among the lowest levels of fuel taxation in the developed world (see Figure 2.1 below). This level has been declining in real terms since automatic indexation was abolished in 2001. This, combined with the lack of well-developed transport alternatives, ensures that Australia has among the highest levels of motor vehicle use and petrol consumption in the world (*p. 47; p. 158*). Car travel in Australian cities is matched only by that of North American cities (where fuel tax is also low). Urban driving comprises the vast majority of total driving in Australia, yet it is these areas that public transport is most suited to serve.

The existence of a substantial ‘road deficit’ indicates that fuel excise does not need to be reduced to make way for the introduction of direct road pricing in a revenue neutral manner (*p. xxxii; p.*

158; p. 271; p. 306; p. 417). The total level of charging on motorists, including fuel excise, could be increased substantially before the full economic, social and environmental costs are internalised.

Figure 2.1: Unleaded gasoline prices and taxes



Source: International Energy Agency

Since fuel consumption tends to vary in line with vehicle weight, the amount of travel and emissions, fuel excise can serve as a good second best alternative to address a range of externalities (see Table 1.2 below). It also tends to have lower implementation and administrative costs than more direct instruments. Fuel consumption is also said to increase in congestion (sub. 59, p. 23), hence fuel taxation is far from imperfect as a proxy for congestion charging (p. 158; pp. 271-272) as well as addressing external costs such pollution and safety.

Table 1.2: Preferences for instruments to charge marginal social costs in traffic & transport

Cost item	1 st preference	2 nd preference	3 rd preference
Marginal infrastructure costs	Differentiated charge per kilometre	Excise duty	Ownership tax
Safety	Through insurance premiums	Differentiated charge per kilometre	Excise duty
Greenhouse effect	Excise duty	Differentiated charge per kilometre	
Atmospheric pollution	Differentiated charge per kilometre	Excise duty	Ownership tax
Noise	Differentiated charge per kilometre	Excise duty	Ownership tax
Congestion	Congestion charge	Differentiated charge per kilometre	

Source: EEA 2004, p. 46

Some have recommended restricting the level of fuel excise to ensure full utilisation of existing road networks (p. 166). We consider this a false objective. If full pricing of road use and other

externalities (e.g. air pollution, carbon emissions, etc) leads to traffic levels below road capacity, then it indicates an over-investment in roads. Though such over-investment, when paired with full internalisation of social and environmental costs, may result in a low level of congestion, it would also result in lower returns on road assets and the likelihood that greater public benefit would be obtainable from diverting investment to non-road services. Reducing fuel taxation may also have a counterproductive effect on energy security by encouraging higher consumption of a dwindling finite resource (Liman 2005a).

The solution to under-utilisation of road networks is to stop building capacity, especially in established urban areas. To make better use of existing capacity, space should be reallocated to uses that are more productive, have fewer negative externalities and contribute to shifts in modal share. Examples could include street beautification, bus lanes, tram priority, cycle lanes, and increasing access and permeability for pedestrians.

Failure to fully internalise all costs (even if roads are “under-utilised” as a result of comprehensive pricing) leads to excess travel and demand for road space and continuing over-capitalisation in road network capacity. Full internalisation of social and environmental costs could provide opportunities to redirect resources such as land to more valuable or aesthetic purposes and support Melbourne 2030 objectives including “a more compact city”.

Additional revenue from comprehensive road user charging could fund improved alternatives to private motor car use (e.g. public transport and cycling facilities) and/or be recycled through cuts to tax on more benign activities (e.g. income tax, payroll tax, stamp duty, land tax, etc).

2.1.2 Distance-based charging

In addition to the relative total costs of motor vehicle use and public transport, their respective cost structures also tend to work against congestion minimisation.

While the total cost of motor vehicle use may be higher than public transport (*p. 36*), much of this relates to fixed periodic charges (e.g. registration and insurance) and is not significantly altered by marginal use. Therefore there is little financial incentive for a car-owner to shift some of their trips to public transport. In contrast, driving a little more results in a lower-than-proportional increase in car costs, with per-kilometre costs dropping the more people drive.

Conversely, the cost of public transport is almost completely variable for non-periodic ticket holders. In other words until quite a high level of use is reached, public transport costs do not fall dramatically with use.

Given perverse cost structures like this, people with a motor vehicle will be likely to take advantage of the sunk costs of motor vehicle ownership and avoid the marginal cost of using public transport, resulting in additional traffic on the roads.

Rebalancing the costs of motor vehicle ownership from fixed to variable would encourage selection of the most appropriate mode for the journey and ensure public transport and non-motorised modes are able to compete on a more equal basis with car use (*pp. 164-165*).

The existence of distance-based schemes in other cities demonstrates that such measures need not be impractical to implement and administer (*p. 271*) (VTPI 2006b). For example, the state government could provide market incentives through the stamp duty system to encourage distance-based insurance. Furthermore, such schemes may also have significant safety and air quality benefits where odometer audits are implemented in tandem with the introduction of mandatory vehicle safety and emissions testing (VACC 2005).

2.1.3 Implementation

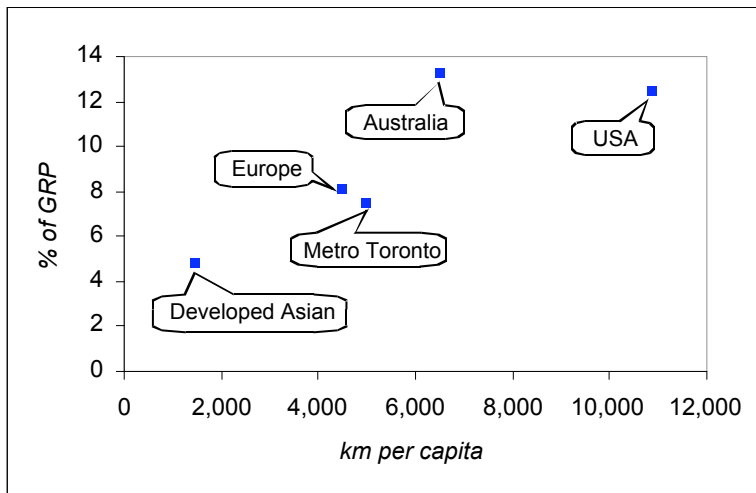
2.1.3.1 Pre-requisites

Successful examples of congestion charging around the world incorporate good quality public transport with revenue directed at improving non-car mobility options such as public transport and cycling (*p. 217; pp. 220-221; p. 224; p. 410; p. 420*). The hypothecation of road pricing revenues to fund road projects (*p. 224*), on the other hand, would be ill-advised due to the additional traffic that would be generated (VTPI 2006c).

A public transport system that offers full-time, frequent and fast services covering the entire metropolitan area is a pre-requisite for road pricing to have maximum impact on congestion with minimal harm to low income groups (PTUA 2006a). Unfortunately Melbourne's transport system compares poorly with successful international examples (Scheurer, Kenworthy & Newman 2005a) and there appears little prospect for fundamental improvements. For instance the Victorian State Government's *Meeting our Transport Challenges* paper includes improvements to local bus routes, but the one hour minimum service frequencies on local routes fall well short of providing a time-competitive alternative to driving (PTUA forthcoming).

The poor standard of public transport in Australia is a key factor in the very high level of car dependence that is feeding congestion, and reflects the disregard for improving public transport infrastructure over the last half century while road building went on apace (*p. 33; p. 36; p. 310*). Notwithstanding low *rates* of taxation on motoring as shown in Section 2.1.1, the high rates of car ownership and usage flowing from car dependence lead to a high level of aggregate transport spending and transfer payments, for example in terms of transport spending as a proportion of Gross Regional Product (GRP) or motor vehicle taxation as a proportion of GDP (see Figure 2.2). The financial burden of car dependence and of any further road pricing on low income groups demands a refocus on providing usable public transport that offers a genuine alternative for modern lifestyles.

Figure 2.2: Motor vehicle use and regional transport spending



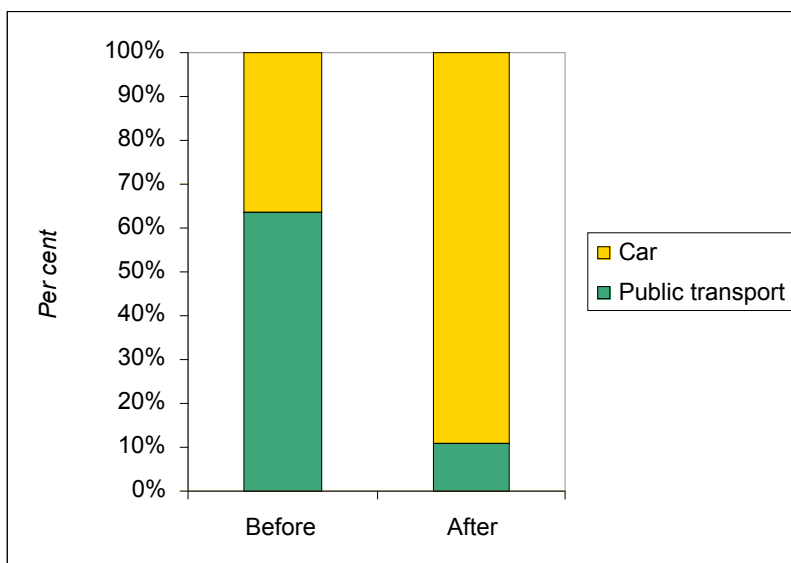
Source: Newman, 2000.

Note: As car dependency rises, as shown by the amount of travel undertaken by car, so too does the proportion of income (or a city's Gross Regional Product) that is consumed by transport. Despite higher fuel taxation, European households need only spend two thirds as much as Australian households on transport thanks to superior public transport.

2.1.3.2 Coverage

A road pricing scheme should be broad-based in order to minimise unintended side-effects. For example, a system based on a CBD cordon might encourage businesses to shift to areas outside the cordon that have inferior public transport. This has precisely the opposite effect of what is desired since trips would be shifted from public transport to driving. This shift can be considerable, as when Coles Myer shifted its headquarters from the Melbourne CBD to suburban Tooronga (see Figure 2.3 below).

Figure 2.3: Priority mode of travel to work – Coles Myer Relocation



Source: Public Transport Corporation

Since a great deal of future congestion growth is projected to occur in middle and outer suburbs (pp. 67-68), a combination of activity leakage away from the CBD and modeshift from public transport to cars would be a seriously negative outcome.

Similarly, application of charging to particular roads in a corridor can lead to ‘rat-running’ with negative impacts on local streets and neighbourhood amenity (p. 266; p. 267). Thus any proposals for expanded road pricing schemes should apply broadly to all roads (not just new roads or existing toll roads) across the entire metropolitan area (not just areas that are currently congested).

It should be noted that fuel excise and distance-based charging (e.g. registration and insurance) compare favourably in terms of the above criteria and in ease of implementation (p. 409).

Draft option (p. 417)	Recommended option
Government to discuss with the Commonwealth in the context of COAG’s review of urban congestion options, the progressive replacement of fuel excise by road pricing in a revenue neutral manner, and modification of fringe benefits tax arrangements relating to company cars.	Government to discuss with the Commonwealth in the context of COAG’s review of urban congestion options, the reintroduction of automatic indexation of fuel excise and the application of revenue from road pricing to reducing car dependence (e.g. enhancement of public transport and facilities for walking and cycling), and modification of fringe benefits tax arrangements relating to company cars, commercial vehicles and parking; remove state petroleum subsidies and redirect funds to reducing oil vulnerability and car dependence in Victoria.

Draft option (p. 420)	Recommended option
Test expanded use of road pricing.	Encourage VicRoads and private sector and statutory insurers to shift to distance-based charging for registration and insurance.

2.2 Parking restraint

A recent paper on parking taxation has demonstrated that such charges can make a useful contribution to congestion minimisation, however the findings also support the warnings in our original submission to the inquiry (and in section 2.1.3 above) that geographically limited taxes could result in leakage of activity to non-taxed areas (sub 65, p. 29; Litman 2006a). The negative consequences of such leakage referred to above, along with non-CBD congestion growth, would be reduced by the application of widespread parking restraint measures across the entire metropolitan area (p. 226; p. 269).

Among the features of best practice parking taxation schemes identified by Litman (*op cit*), the most successful were found to be:

- broad-based (both geographically and in terms of parking types);
- implemented in tandem with other measures to reduce parking supply and enhance other modes;
- structured to avoid reduced competitiveness of the central business district; and
- simple to administer and enforce.

Parking restraint and other demand management techniques need not be an excessive impediment to the use of motor vehicles by employees “in their day to day operations” (p. 166). For example, staff requiring a car can be offered use of a pool car, an overnight car park at/near the workplace (when demand for parking is likely to be low), a guaranteed ride home (VTPI 2005b), etc. Congestion minimisation will require elimination of unfair advantages currently granted to car use, hence the choice between modes should be made on a level playing field without concessions offered only to cars and/or parking.

Since Commonwealth tax policy, especially relating to fringe benefits tax, also impacts parking and travel demand, the state government should push for reform of FBT legislation through COAG and the Australian Transport Council (ATC) (pp. 145-146). Any concessions or exemptions for the provision of parking fringe benefits should be removed, possibly to be replaced with allowances that encourage greater use of sustainable transport modes such as cycling and public transport (p. 232). State tax provisions may also require amendment to eliminate hidden subsidies for motor vehicle use, such as Regulation 6 of the *Pay-roll Tax Regulations 1998*.

While the removal of minimum parking requirements for new developments would be a welcome step forward, the same reasons for limiting parking in new developments apply also to existing parking, so restraint should be progressively expanded more broadly (pp. 163-164; p. 417).

Furthermore, given Melbourne Airport has a strong commercial incentive to encourage travel by car (due to their parking revenues), their role in planning should be closely monitored or curtailed (p. 140).

Draft option (p. 417)	Recommended option
<p>Monitor the impacts of the congestion levy; align the parking components of the Government’s planning approval processes with council parking limitation objectives; replace minimum parking requirements in Victorian Planning Provisions with maximum limits; encourage councils to make more use of parking precinct plans.</p>	<p>Monitor the impacts of the congestion levy; pursue options to equalise parking restraint and taxation measures across the greater metropolitan area; align the parking components of the Government’s planning approval processes with council parking limitation objectives; replace minimum parking requirements in Victorian Planning Provisions with maximum limits; encourage councils to make more use of parking precinct plans; seek opportunities to reduce the supply of parking in activity centres; seek reform of Commonwealth fringe benefits tax legislation relating to parking and relevant state provisions.</p>

3 Mobility management

3.1 TravelSmart

TravelSmart offers most potential where public transport services are already good. However it may be counterproductive and reinforce negative perceptions if services are poor (*pp. 169-170; p. 371; p. 417*).

We consider that government should recognise the existence of the ‘road deficit’ and that it has an educational role in the area. A failure to do so would risk undermining public transport marketing programs such as TravelSmart. In particular, though it might be difficult to resist for electoral purposes, politicians should resist conveying the erroneous impression that motorists already fully pay for road use through fuel excise (see Section 2.1.1) (*p. 289; p. 329; p. 409; p. 416*) or that endless supplies of cheap oil are guaranteed (see Section 4.3.1).

<i>Draft option (p. 417)</i>	<i>Recommended option</i>
Continue to promote and expand TravelSmart information program, particularly for times of day and locations affected by congestion. Could extend further into Geelong, Ballarat and Bendigo.	TravelSmart programs to focus on areas where public transport, cycling and pedestrian access is already well-developed or recently upgraded; Public education on the road deficit and peak oil.

3.2 Carpooling

The PTUA does not agree that increasing rideshare either is or should be an objective of government (p. 263). The PTUA has not found a clear articulation of such a policy by the government.

Ridesharing schemes have the potential to increase vehicle movements (p. 169; p. 234; p. 240; p. 274; p. 417) by shifting journeys from existing public transport services to new private motor vehicle journeys (sub. 65, pp. 29-30).

Carpooling effectively only offers one service per day. It is extremely inflexible if participants need to make travel changes at short notice. With increasingly dispersed working hours, origins and destinations it can only ever be a minor access mode.

Instead, government resources should be directed at enhancing “go anywhere, anytime” public transport rather than promoting limited-appeal “one service per day” carpooling (p. 274).

<i>Draft option (p. 417)</i>	<i>Recommended option</i>
Promoting awareness of benefits from greater flexibility in working and school hours, and car pooling, recognising that these cannot be mandated; encouraging use of public transport and improved bus services to reduce congestion around schools.	Promoting awareness of benefits from greater flexibility in working and school hours but on the condition that peak shoulder and off-peak public transport services are upgraded accordingly; encourage use of public transport and walking and riding school bus services to reduce congestion around schools and promote greater physical activity.

4 Road supply management

4.1 Road capacity enhancement

It should also be noted that capacity expansion is broader than just new or widened roads, but also includes the likes of clearways (*p. 174*) and traffic management (*p. 279; p. 418*). In many ways, road capacity enhancement is simply a cheaper means of generating traffic than road capacity expansion.

The PTUA is concerned about proposed approaches to road hierarchies (*p. xxxiii; p. 284; p. 418*). Vancouver, which has displaced Melbourne as the world's most liveable city, has a clear and simple hierarchy of road users that applies across the road network.

We support a similar over-arching hierarchy in the following decreasing order of importance:

- pedestrians,
- cyclists,
- public transport,
- freight,
- private cars.

This order emphasises access and 'green' transport modes, such as walking, cycling and public transport, that are often neglected by traditional car-based traffic engineering practice which dismisses them as 'minor access modes'. However, we acknowledge that there may be local cases where priorities may not be exactly in accordance with the list. An example might be allocating time between pedestrians and trams. Increased pedestrian improvements combined with tram priority over cars have the potential to create win-win outcomes here.

The above list is the exact opposite of established traffic engineering practice, which has been focussed on maximising car traffic throughput with their freeways, pedestrian-hostile roundabouts, controlled-access highways (with little passive surveillance) and minimal crossing facilities. Pedestrians have generally only been considered in the internal street layouts of suburbs where culs-de-sac and meandering streets have been provided. However, the main effect of this has actually been to reinforce car-dependency due to the loss of a permeable, walkable street network and direct routes for public transport.

Pedestrian improvement projects should be based on a rolling program with minimum access standards based on maximum distance between crossing facilities, waiting times, directness of routes, etc applied to both existing and new suburbs. Greatest priority should be given to areas near transport interchanges, local shops, schools and bus stops, with pedestrian improvements eventually extending to all streets where a need exists.

By undermining pedestrian and resident amenity, road hierarchies and management policies that favour motorised travel can reduce walking and cycling, harm the economic vitality of strip shopping streets and lead to increased car journeys to car dependent shopping centres. This is because there is a tendency for people, once they are in their cars, to keep driving to a larger centre. The abovementioned low marginal cost of car trips further encourages such behaviour.

The introduction of clearways is effectively a form of capacity expansion which in turn generates additional traffic (sub. 65, p. 19). Therefore it cannot be assumed that clearways would provide sustained alleviation of congestion (p. xxxiii; p. 159; p. 163; p. 176; p. 268; p. 270; p. 413; p. 421).

Care should also be taken to ensure that the issue of clearways is not confused with the availability of parking (p. 283). While kerbside parking provides a level of convenience when accessing a shopping strip that off-street parking may not provide, parked cars also provide an important buffer between moving traffic and pedestrians. The introduction of clearways, even if off-street parking was provided, would eliminate this buffer and harm pedestrian safety and amenity. The reduced appeal of the shopping strip would harm the viability of traders along the street (p. 269).

“In general, the most successful shopping sections are those that provide the most comfort and pleasure for pedestrians.”

(American Association of State Highway and Transportation Officials 1990, pp. 98-99)

<i>Draft option (p. 418)</i>	<i>Recommended option</i>
Establish clear hierarchy of road use for Melbourne, and supporting measures, for example, traffic signal priorities and queuing for trams and buses, separation of trams, prioritising for bus/tram boarders.	Establish clear hierarchy of road users for Melbourne, and supporting measures, for example, traffic signal priorities and queuing for trams and buses, separation of trams, priority over cars for passengers transferring between railway stations and bus stops, priority for bus/tram boarders; support a funded program of pedestrian and cycle improvements, including cycleway extensions, shorter traffic light cycles to cut waiting times, pedestrian refuges to aid access and safety near all bus stops, modifying cul-de-sac street layouts to provide permeability, curtailing of pedestrian-and-cyclist-hostile roundabout construction in new areas and their removal in established suburbs.

<i>Draft option (p. 418)</i>	<i>Recommended option</i>
Restrictions on kerbside parking on designated routes; consideration of part funding of alternative commercial parking in adjacent areas.	Improved traffic light sequencing as part of dynamic signal priority on public transport routes to clear paths for trams and buses at intersections; hook turns or restrictions on right-turning traffic where appropriate.

4.2 Traffic calming

Traffic calming, including but not restricted to the reallocation of road space away from cars, could help to minimise congestion in two key ways:

1. by "de-inducing" traffic; and
2. by improving the reliability of traffic flow (*p. 243; p. 280*).

4.2.1 “De-induced” or “disappearing” traffic

By making alternatives to private car use more attractive (e.g. traffic priority for trams and buses, safer cycle paths), car drivers will be inclined to shift some of their journeys to other modes.

This is effectively the opposite of generated traffic that results from increased capacity for motor vehicles. In addition to encouraging a shift to non-motorised modes, safer conditions for cyclists and pedestrians could reduce non-recurring congestion as discussed in Section 4.2.2. As a result overall traffic volumes, along with congestion, may be reduced compared to the levels that would exist without traffic calming.

4.2.2 Traffic flow

Due to its unpredictable nature, non-recurring congestion can be among the most disruptive to road users (*p. 3; p. 60*). One of the most significant contributors to non-recurring congestion is road traffic crashes (*p. 70; pp. 88-89; p. 177*). International experience demonstrates major reductions in the frequency and severity of crashes as a result of traffic calming (Schley 2001) (*p. 183*), as well as reductions in injuries, pollution and fuel consumption (Newman & Kenworthy 1992). As a result of the reduced frequency and severity of crashes, the frequency and severity of non-recurring congestion would also be reduced (*p. 183*).

Perhaps counter-intuitively, traffic calming need not result in a reduction in traffic capacity. The experience in some cities demonstrates that traffic calming can be implemented without lowering traffic volumes (Samuels 1997). This is less surprising when one considers that:

“[t]he faster cars and trucks move, the more road space they require due to increases in following distances required to maintain safe margins.”
(Zuckermann 1991 in Samuels 1997)

Taken together, the reduction in crashes and reduced road space requirements per vehicle ensure that traffic calming can make an important contribution to congestion minimisation.

4.2.2.1 Four wheel drive vehicles

While not specifically related to traffic calming, it should also be noted that four wheel drive vehicles tend to be involved in more crashes and for these crashes to be more severe (Newstead,

Cameron & Le 2000), hence contributing disproportionately to non-recurring congestion (*p. 147*). Due to the congestion, energy efficiency and road safety benefits of discouraging the use of four wheel drive vehicles in urban areas, the state government should seek the elimination of import duty advantages currently enjoyed by such vehicles.

4.2.2.2 The Geelong experience

The biggest cause of delays to public transport services in Geelong is not the narrowing of roads, but the relocation of bus stops to places that require buses to detour from their normal, more direct routes (*p. 183*). This relocation occurred partly to allow the street works to take place, but another significant reason was the City's reluctance to provide stops outside retail premises (see comments from an unnamed city spokesperson, *Geelong News*, 19/4/06, p. 10).

The City's principal reason for narrowing roads in Geelong was to improve the environment for pedestrians (and more particularly, shoppers). The works on Malop Street have indeed improved conditions for pedestrians with wider footpaths, making the environment more pleasant with space for trees and outdoor dining. The narrower roadway is easier to cross, particularly where extra mid-block pedestrian crossings have been installed.

Narrowing roads is a valid way of discouraging traffic from using a particular road, and congestion can be a valid demand management tool to reduce car travel more generally, provided there are alternative transport options. (The City never explicitly offered this as a rationale, though the Vancouver Livable Region Strategy accepts congestion as a way of managing travel demand.)

However, current public transport services in Geelong are not a feasible alternative to car travel. While Geelong's city centre is the most accessible point for public transport in the region, the standard of services is so low that they are used almost entirely by people who cannot drive cars. Services are infrequent, and the hours of operation are very limited. Service frequency must be improved in particular if public transport is to become a viable alternative to car travel for people who currently choose to drive. Only then will public transport in Geelong realise its potential to reduce congestion.

If services are improved to reasonable standards, bus priority measures (such as bus lanes) can be instituted. Reserved road space could insulate buses from the worst effects of congestion.

Road narrowing inevitably creates conflicts with through-traffic that continues to use the road. Traders on Malop Street (east of the Yarra Street intersection) have recently criticised the City's plans to reverse the narrowing of that section of the road by removing centre-of-the-road car parking, which they say has helped their businesses ('Leave Malop Street Alone, Traders Say', *Geelong News*, 12/04/06, p.1).

It appears that the City of Greater Geelong hoped that through-traffic would be diverted to other routes (in particular, truck traffic to the designated highway on McKillop Street). We are not aware of any evidence showing to what extent this may have occurred.

The City's latest strategy for dealing with east-west traffic is still not satisfactory. Every road in the CBD will now be opened up to facilitate the flow of through-traffic, reversing recent

expensive street works as well as much earlier attempts to discourage through-traffic on quieter roads. While this will increase traffic capacity in the short term, it can be expected that the extra capacity will soon be filled, leaving the City with the same level of congestion but more car journeys. The City plans to remove mid-block pedestrian lights on Malop Street to the detriment of pedestrian safety and convenience.

<i>Draft option (p. 418)</i>	<i>Recommended option</i>
Expanded implementation of traffic management measures such as ramp metering, variable speed limits, priority traffic signalling and traffic information.	Expanded implementation of traffic management measures such as ramp metering, permanently lowered and variable speed limits, traffic calming, road safety education and enforcement, priority traffic signalling for public transport and emergency vehicles, and traffic information; seek elimination of import duty advantage for four wheel drives.

4.3 Road capacity expansion

Given the strong evidence demonstrating the impact of generated traffic on the road network, the PTUA was surprised that the draft report does not more strongly warn against strategies based upon road capacity expansion. Not only does copious international research demonstrate that additional road capacity is quickly swallowed up by generated traffic (sub. 65, p. 19), practical evidence encircles Melbourne in the form of various freeways that are groaning under the weight of increased traffic (p. 64). Instead of being the cure to congestion that was touted by the road lobby (Transurban City Link P/L 1999 cited in Mees 2005, p. 8), we find that the disease has simply spread to infect the freeways themselves (p. 1; p. 64), parallel arterials that were supposed to be relieved by the freeways (PTUA 2002, p. 6) (p. 69) and the feeder roads used at either end of the journey (p. 279).

By their very nature, the additional journeys induced by road capacity expansion tend to be of low marginal value (not being regarded as worthwhile under the prevailing traffic conditions prior to expansion), however the generated traffic that results from road capacity expansion ensures that the benefits of

congestion reduction are short-lived. Thus the benefits tend to be low and temporary, whereas external costs – such as higher levels of pollution, greenhouse emissions and road trauma (p. xix; p. 59; p. 263) - are increased and entrenched by the additional traffic (sub. 65, pp. 5-8) (p. 184; p. 264; p. 287; p. 349).

*“And we're digging up the roads,
And widening it just so,
You can suffocate at home...”
(You am I 1996)*

4.3.1 Future demand

The draft report appears to take at face value a range of assertions about future demand growth and the supposed need for road expansion to “support” this growth (p. 285). The draft report, however, does not adequately address the likelihood of such road expansion actually “encouraging” demand growth by generating additional traffic in outer suburbs and in suburbs closer to the centre of Melbourne through which such traffic might travel.

For example, the Department of Infrastructure seeks to defend further road capacity expansion by referring to the symptoms of past road-focussed and car-dependant transport policies (p. 189). This rather circular argument could be paraphrased as “we must continue to encourage more traffic because we have been encouraging traffic for the last half century”. A more appropriate response would be to address access and mobility requirements within a comprehensive integrated planning framework (see Section 8) that integrates transport and land use decisions and supports the government’s goal of 20 per cent mode share for public transport by 2020.

The draft report does however omit to discuss the emerging issue of peak oil and its implications for transport fuel availability and prices. Various submissions to the inquiry raised peak oil – e.g. Alan Parker Design, City of Yarra, Committee for Melbourne, Environment Victoria, Louis Fouvry, Municipal Association of Victoria, Public Transport Users Association, Town and Country Planning Association, Yarra Trams. Nonetheless, to our surprise the draft report failed to acknowledge that a growing body of evidence points to a peak (and subsequent decline) in

global oil production within the next decade and a rapid decline in Australia's level of oil self-sufficiency (PTUA & EV 2006).

Combined with rising demand from countries such as China and India, geological limits on supply will increase the cost of motoring and reduce demand for road-space, thus limiting the need for ongoing road building (*p. 306*). Conversely, tightness in the world oil market will increase the demand for modes that are less dependent on energy-dense portable fuels such as public transport (particularly rail) and cycling (*p. 306; p. 351; p. 353*). Any projections of future trends in transport that omit this significant factor are likely to over-estimate motor vehicle journeys and under-estimate the proportion of journeys undertaken by public transport and active transport. Recent research indicates that Melbourne is more vulnerable to rising oil prices than either Sydney or Brisbane due to inadequate public transport (Dodson & Sipe 2005).

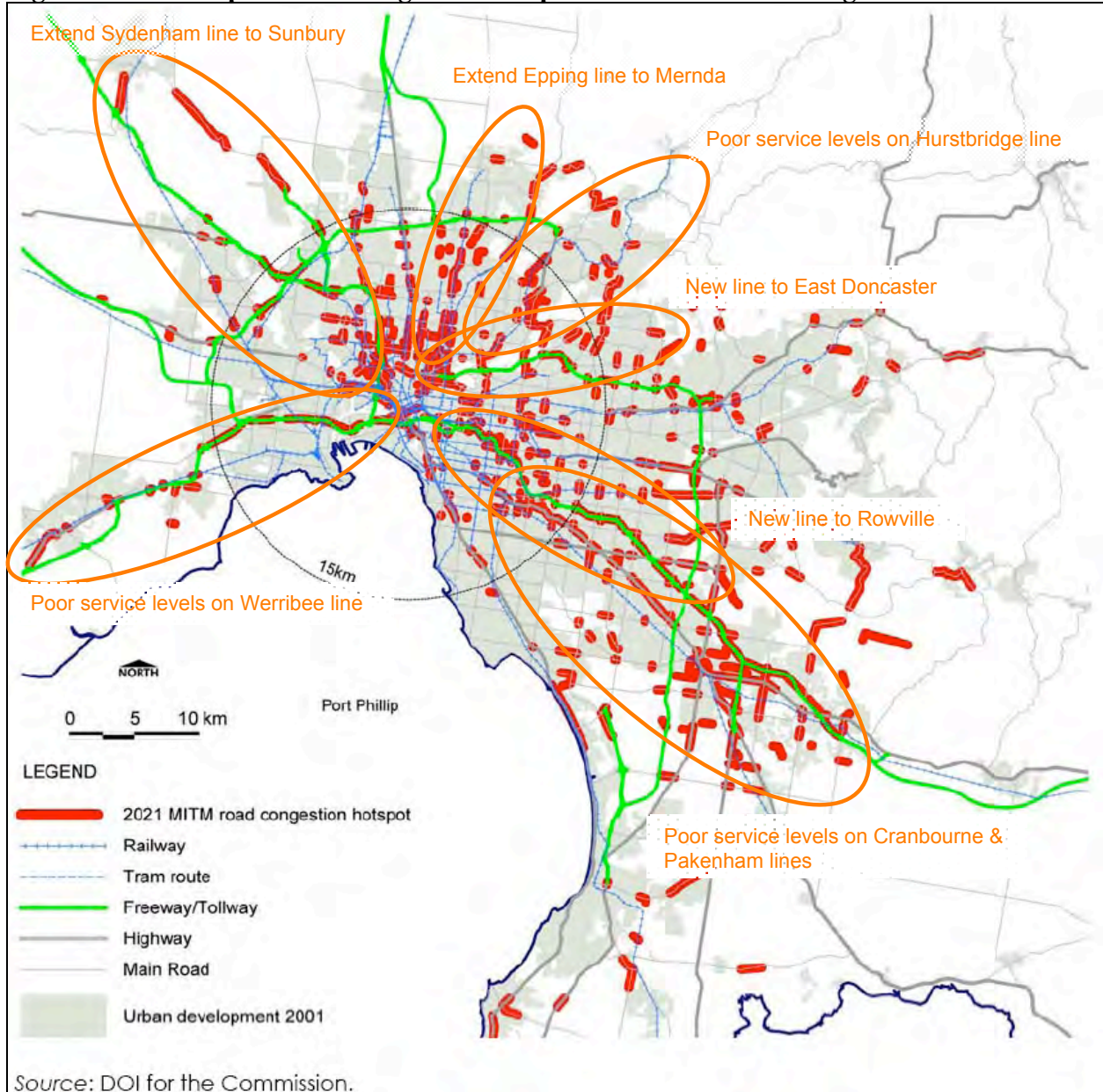
Reflecting transport's major contribution to Australia's carbon emissions, demand for motorised travel may also moderate following introduction of a carbon pricing mechanism as currently being discussed by the states and territories (National Emissions Trading Taskforce n.d.) and now being mooted at a federal level (Taylor 2006). The introduction or expansion of road pricing as proposed in the Commission's draft report would also clearly reduce demand for road infrastructure.

Even if the cost of motoring does not constrain demand, the government's target of 20 per cent mode share for public transport by 2020 implies that little supply expansion will be needed for roads (sub. 57, p. 10; *p. 306; p. 311*).

4.3.2 Missing links and bottlenecks

Claims that congestion is a result of the road network failing to keep pace with population growth (*p. 21*) are simplistic, overlook the fact that Melbourne has one of the highest levels of roadway provision in the world (Scheurer, Kenworthy & Newman 2005a, p. 8) and ignore the generated traffic that would have inevitably followed such capacity expansion (sub. 65, p. 19). Melbourne's road network grew by around half over the period 1961 to 1991 and no part of the city is inaccessible by car (*p. 185-186*). On the other hand, there have been no new rail lines built in Melbourne since 1930, and only a handful of minor rail extensions, leaving two thirds of the city without convenient access to the rail network. This long-standing imbalance is a key factor driving Melbourne's current transport problems. There is now a strong correlation between rising road congestion and the absence of high speed public transport alternatives across Melbourne (see Figure 4.1 below).

Figure 4.1: Overlap between congestion hotspots and corridors lacking rail services



This correlation should not be surprising, and the Commission’s final report should recognise international research demonstrating convergence between general traffic speeds and that of the best public transport alternative (Lewis and Williams 1999; sub. 65, pp. 24-25). Any talk of “missing links”, therefore, should be focussing on the gaps in the heavy rail network (and feeder services) that are leaving people with no alternative than to drive and increase traffic volumes. Also of concern is the relatively low speed of Melbourne’s rail network by international standards (Scheurer, Kenworthy & Newman 2005a, p. 7). This relatively low speed means that general road traffic speeds must decline to a lower threshold before commuters will shift to public transport to escape congestion. Furthermore, low speeds also reduce the service levels (and hence capacity) that can be achieved with a given level of rolling stock and staff.

More specifically, a range of congestion hotspots identified by motorists across Melbourne align very closely with major public transport deficiencies as outlined in Table 4.1 below:

Table 4.1: Congestion hotspots and transport deficiencies

Hotspot	Transport deficiency
Calder Freeway interchange with Tullamarine Freeway, and Calder Freeway section between Green Gully Rd and Keilor Park Drive	Lack of suburban rail services to Sunbury and Melton; poor frequencies on existing V/Line services.
Toorak Road / Monash Freeway, Kooyong	Lack of suburban rail services to Rowville, poor frequencies and speed limits on Glen Waverley line due to level crossings.
Blackburn Road / Central Road, Blackburn	Level crossing.
Mitcham Road / Whitehorse Road, Mitcham	Level crossing.
Springvale Rd / Maroondah Highway, Nunawading	Level crossing.
Wellington Road between Springvale Road, Mulgrave and Napoleon Road, Rowville	Lack of suburban rail services to Rowville.
Bridgewater Road / Craigieburn Road, Craigieburn	Lack of suburban rail services to Craigieburn; poor frequencies on existing V/Line services.
Ferntree Gully Road between Springvale Road, Glen Waverley and Stud Road, Scoresby	Lack of suburban rail services to Rowville, poor frequencies and speed limits on Glen Waverley line due to level crossings.
Fitzsimons Lane / Main Road, Eltham	Poor frequencies on the Hurstbridge line.
Horne Street / Vineyard Road, Sunbury	Lack of suburban rail services to Sunbury; poor frequencies on existing V/Line services.
Kimberley Drive / Maroondah Highway, Mooroolbark	Example of serious disconnect between transport (PPTN) and land use planning (Activity Centre).
Nepean Highway / Oakbank Road, Mornington	Lack of suburban rail services to Mornington.
Plenty Road / George Road / McDonald's Road, South Morang	Lack of suburban rail services to South Morang/Mernda.
Pound Road / South Gippsland Highway, Dandenong South	Poor frequencies on the Cranbourne line and absence of station at Lynbrook.

Source: Hotspots in RACV annual redspot survey (VCEC 2006, p. 75); transport deficiencies as identified by PTUA.

In order to achieve the best outcomes in terms of access and mobility, congestion, environment and energy security, there should not be an assumption of road expansion to address congestion hotspots such as those listed above. As mentioned at the beginning of Section 4.3, capacity expansion will inevitably lead to generated traffic and a re-emergence of congestion around the hotspot and in other parts of the road network (p. 66). The most suitable solutions - those that offer the most benefits while imposing the lowest additional costs upon society and the environment (p. 290; p. 318; p. 418) - are only likely to emerge out of a comprehensive integrated planning process as discussed in Section 8.3.

To a large extent the above congestion problems reflect low occupancy/utilisation rates of vehicles travelling through the corridor. While each car carries on average only 1.2 people through these bottlenecks (VicRoads 2005), substantially higher passenger numbers and freight tonnages could be accommodated in all corridors around Melbourne by boosting the role of public transport and rail freight.

A two track railway, occupying a reservation about 10 metres wide, could carry around 40,000 passengers per hour in each direction, while a 6 lane freeway, cutting a 50 metres swathe through the city, would carry little more than one quarter as many people as the railway line. Similarly,

one 600 metre single-stacked train could carry as many containers as around 50 trucks, or twice this if double-stacked (*pp. 68-69; p. 197*).

4.3.2.1 Eastern Freeway corridor

The Eastern Freeway corridor has been the subject of a range of studies including the Northern Central City Corridor Study (NCCCS), the earlier Eastern Corridor Transport Options Study (Russell 1991) and a key issue for consideration in the City of Melbourne's Transport Strategy. In each case it has been found that the vast majority of journeys along the corridor are destined for the CBD or thereabouts, with only a small fraction travelling further west. In light of this and the need to encourage use of public transport for journeys into the CBD, the clear response is to introduce high capacity, high speed public transport along the corridor to offer a competitive alternative to private car travel.

A heavy rail line following the Eastern Freeway median from Victoria Park would provide a comfortable and fast means to access the central area of Melbourne (where most journeys along the corridor are destined). The original 1969 plan for the freeway incorporated a rail line down the median, and similar projects in Perth have exceeded prior expectations for patronage growth (Newman 2001). This competitive alternative to car travel would reduce the equilibrium level of congestion in the corridor and as a consequence also benefit freight movements (*p. 289*).

Attempting to address congestion by boosting road capacity would generate additional traffic, thus defeating the congestion reduction objectives, and hence result in higher levels of pollution, energy consumption and road trauma. A road-focussed strategy to addressing congestion in the area would also undermine the government's target of shifting 20 per cent of motorised journeys onto public transport by 2020 and 30 per cent of port freight onto rail by 2010 (*p. 186; p. 311*). Even the high profile "East West Integrated Transport Project" linking the Eastern Freeway with the western region of Melbourne, despite incorporating a public transport component, has received a poor reception from transport experts (Currie 2005; Mees 2005; Scheurer, Newman & Kenworthy 2005b) and the author of the report in which it was proposed effectively disowned it:

"My personal view is that we'd probably be better off not building a tunnel : I think the real key to solving congestion is to shift people from car to public transport."
(William McDougall quoted in Millar 2005)

4.3.2.2 West Gate Bridge

The West Gate Bridge is another high profile congestion hotspot. While the draft report correctly states there may be a number of potential measures to address this issue (*p. 288; p. 318*), it omits to mention much needed service upgrades on the Werribee and Williamstown suburban rail lines and the Geelong and Ballarat V/Line routes which could offer more sustainable access and mobility improvements (*p. 290; p. 318; p. 418*).

Increasing congestion on the West Gate is just one manifestation of rising traffic in the western suburbs which is being generated by the strong focus on road capacity expansion in the region. The low scheduled frequencies and poor reliability and/or overcrowding of public transport

services in the west are also exacerbating the trend. Even at peak times, western suburbs trains only run every 20 minutes. The confluence of these factors is leading to a shift away from public transport and growth in motor vehicle journeys (p. 72). As discussed in Section 5.2.1, the western suburbs lines are among the very few services to experience a decline in patronage from 2004 to 2005. The deteriorating traffic conditions in the west demonstrate the urgent need to boost public transport services up to a level that is competitive with car travel.

4.3.2.3 Insights from the Geelong region

The building of the Geelong bypass has been widely promoted in Geelong by bodies including the local council, G21 and business groups, as the way to ‘fix’ congestion on Latrobe Terrace (p. 175; p. 189). However this view is quite mistaken.

Last year VicRoads submitted to a Greater Geelong Planning Scheme Amendment panel hearing that:

“Preliminary traffic modelling work undertaken for the Geelong Bypass indicates that there is likely to be a reduction in traffic volumes of up to 17% in Latrobe Terrace and up to 4% in Aberdeen Street immediately on completion of the Geelong Bypass. However, the natural growth of traffic (approx 2% per year), as well as a redistribution of traffic from other north/south routes, is expected to result in traffic volumes on these two routes returning to their pre-Bypass volumes in a relatively short period of time”.

Proposals to build an extension of the Geelong bypass to the Bellarine Peninsula, to ease the inevitable congestion at its southern end, will not only be expensive, but will also cross the sensitive lower reaches of the Barwon River and its associated wetlands. This extension will also not be very effective, as it will skirt the periphery of the urban area and provide an extremely indirect route to Melbourne (p. 189).

<i>Draft option (p. 418)</i>	<i>Recommended option</i>
Infrastructure investment (roads) focused on major bottlenecks—the Commission has not attempted to include specific infrastructure options for addressing bottlenecks; there will generally be a range of options, as illustrated by the West Gate Bridge.	New road infrastructure proposals should be considered within a comprehensive integrated planning framework that gives equal consideration to alternative solutions to the extent these are consistent with the broader integrated planning framework and the 20 per cent mode share target for public transport.

5 Public transport management

5.1 Appropriate selection of modes

The PTUA is pleased that the government has announced the implementation of orbital SmartBus routes around Melbourne and the expansion of coverage and service spans for local bus services. These local bus enhancements will make a useful contribution to reducing social exclusion, however the service levels proposed are unlikely to attract a significant proportion of discretionary passengers, hence their impact upon congestion is likely to be minimal.

While buses clearly have an extremely important role to play in public transport provision, we note an almost zealous tendency in the draft report to promote buses as the best solution to all public transport needs. While the draft report goes into some detail outlining the advantages of bus systems (*p. 24; pp. 249-250; p. 296; p. 419*), it does not balance this by also outlining the advantages of rail systems. For example, the report should also note:

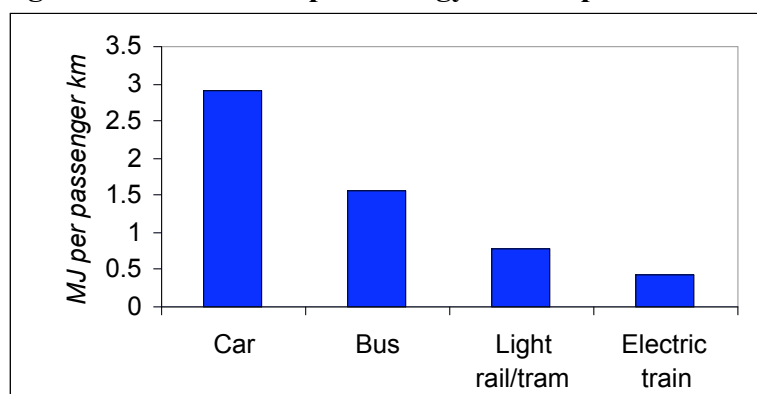
Grid-connected rail systems have higher flexibility in primary energy source.

Suburban trains and trams are able to run on energy from all the primary energy sources currently supplying Victoria's electricity grid as well as from any future development of generating capacity that utilises wind, solar, wave, biomass, etc. Motor vehicles, including buses, are generally restricted to one liquid or gaseous fuel type and any new fuel types would require extensive new infrastructure for production and distribution. This is likely to become a very important factor as the world runs out of cheap oil.

Energy efficiency.

Rail is typically more energy efficient than motor vehicles, which contributes to lower operating costs, reduced pollution and more efficient use of natural resources. Rising global demand for energy is likely to raise the importance of this factor in future.

Figure 5.1: Land transport energy consumption



Source: Newman 2000

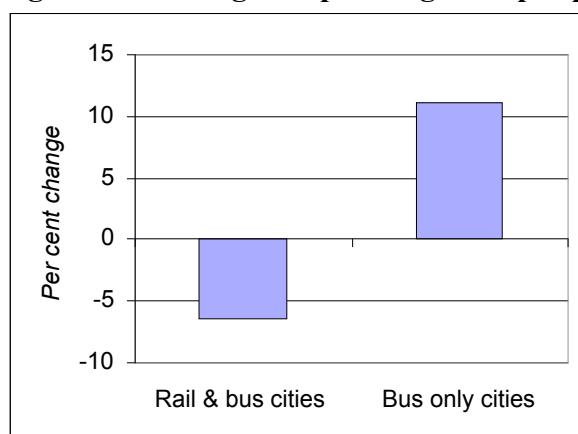
Capacity.

Trains are able to carry significantly higher passenger loads in relative comfort. A two track rail line could comfortably carry 40,000 passengers per hour in both directions, while some of the world's busiest rail lines boast loadings significantly above this level. This capacity would enable the transport network to more comfortably accommodate the tripling in patronage that the government's 20 per cent by 2020 mode share target implies in the context of population growth and also absorb a larger share of journeys that are currently undertaken by car in congested corridors.

Operating costs.

Due to superior energy efficiency and higher capacities allowing more passengers per vehicle/driver, rail systems often have lower marginal costs than alternatives, especially for high volume routes (pp. 298-299). Rail systems also suffer from less wear and tear than road surfaces under heavy loads.

Figure 5.2: Change in operating costs per passenger mile – 1996 to 2003



Source: Henry & Litman 2006, 10

No local emissions.

Trains and trams are effectively free of local exhaust emissions, whereas motor vehicles, including cars, trucks and buses, are the largest single contributor to urban air pollution. This is especially pertinent given growing concern over the level of particulate matter in the air.

Speed

Trains offer the fastest speed of all public transport modes (PTUA 2005a, p. 25). For longer trips they are the only mode that can provide car-competitive travel times and thus have potential to attract modal share. Speed can be further increased though the intelligent use of express services.

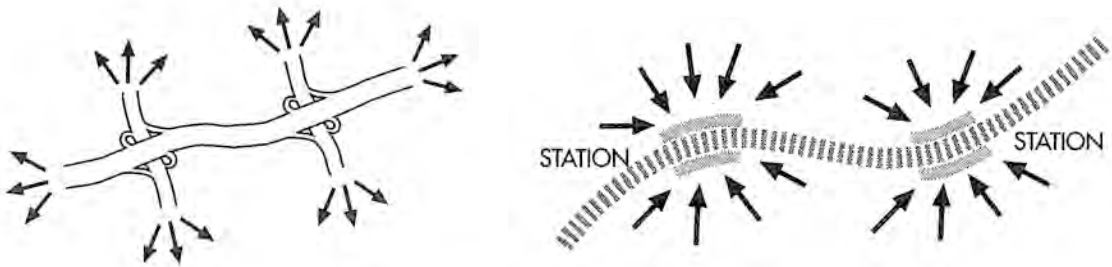
Legibility

Almost all residents (public transport user or not) know the locations and destinations of their local train and tram services. This is not true of bus routes, which can be confusing even to regular passengers.

Landuse impact.

Melbourne’s heavy and light rail networks have successfully attracted higher density mixed use development over the last century in the absence of central edicts such as Melbourne 2030. This can be contrasted with the more dispersed development that accompanies road-based development (see Figure 5.3). The sense of permanence of rail infrastructure increases investment certainty and attracts local development (p. 400). By contrast, roads can have a seriously negative impact on values and the amenity of the local area (Tucker 2003; Mitchell 2006; Houlihan 2006). The “spontaneous” concentration of activities reduces the amount of travel needed to access services and employment, and increases the proportion of travel undertaken by public transport.

Figure 5.3: How freeways and railways affect development



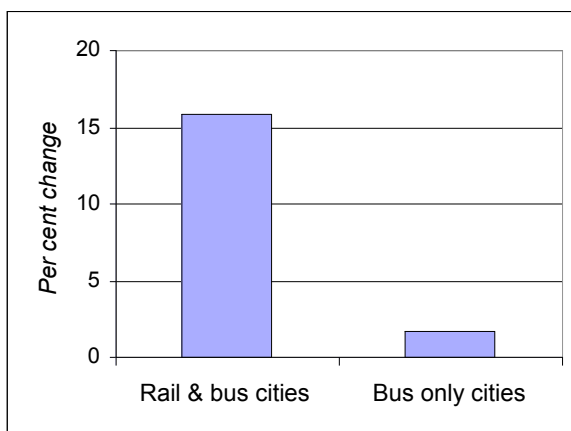
Source: Newman & Kenworthy 1992, p. 22

Modeshift.

For reasons such as speed, legibility, comfort and the smoother ride, rail systems in Australia and internationally have proven substantially more successful in attracting and retaining passengers than bus systems, especially new discretionary passengers that underwrite the financial viability of the system (see Figure 5.4) (p. 297).

“...rail supply has the largest effect on driving of all our sprawl and transit variables.”
 (Bento 2005)

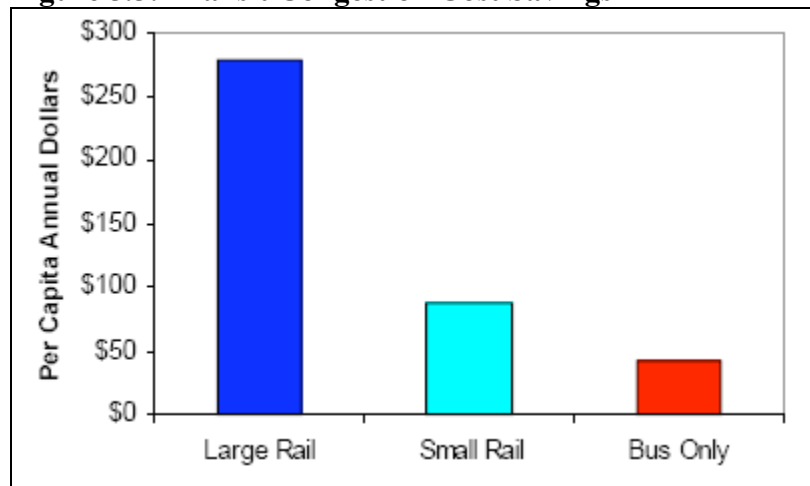
Figure 5.4: Growth in public transport boardings - 1996 to 2003



Source: Henry & Litman 2006, p. 9

This attractiveness, combined with higher capacity, enables rail systems to make a greater contribution to congestion minimisation (p. 65; p. 251). Not only has public transport patronage growth been stronger where rail services are available, congestion cost savings are shown to be higher in cities with large rail networks (see Figure 5.5).

Figure 5.5: Transit Congestion Cost Savings



Source: Litman 2005b

In addition to omitting the advantages of rail systems, the draft report appears to overlook support for rail in other sources it quotes, such as support for federal funding of public transport in the Commonwealth Parliament's *Sustainable Cities* report, "particularly light and heavy rail" (p. 101), and the ongoing investment in rail in London leading up to and following the introduction of congestion charging (p. 293).

The PTUA believes that the most appropriate mode should be chosen for the task under consideration with due regard to context within which it will be operating. The advantages of buses outlined in the draft report and the advantages of rail outlined above would feature prominently in such an assessment. While informative, comparisons with cities such as Curitiba and Bogota (pp. 249-250) should also recognise:

- those cities did not have existing heavy rail networks to build synergies upon, while Melbourne already has a relatively extensive system which new services could integrate with and share rolling stock, support services, etc;
- responsibility for transport was held by municipal governments in economically strained developing countries with limited capacity to borrow for the higher upfront costs of heavy rail, while Melbourne's transport system is the responsibility of a AAA-rated sub-sovereign government;
- Melbourne residents are likely to have higher expectation in terms of speed and comfort.

In characterising rail as a CBD-centric mode, the government often overlooks the important role it could play in serving other journeys if planning policies favoured district centres at intermediate points on the rail network such as Ringwood and Footscray rather than activity centres off the rail network such as Chadstone and Doncaster (p. 22; p. 303; p. 419). A program of modest tram extensions would also greatly enhance the ability of the existing heavy and light rail networks to offer cross-town transport choices competitive with car travel (PTUA 2005b, pp. 5-7).

None of the above discussion should imply that buses do not have an extremely important role to play in providing cross-town and feeder services that can enhance access and mobility while minimising congestion and environmental costs. The inclusion of the above is solely intended to correct a perceived imbalance in the draft report, and the PTUA recommends significant improvements to the coverage, frequencies, service spans and integration of all modes of public transport in Victoria.

5.2 Public transport in the broader passenger market

The PTUA does not believe there are any mysteries surrounding the reasons guiding transport mode choice in Melbourne (*p. 128; p. 353; p. 371*). A small set of themes re-occur through a variety of surveys of transport choices. Regardless of how the factors are described in each piece of research, the critical factors invariably revolve around the availability and coverage of the system, and overall journey speeds, especially the impact of service frequencies and the level of integration of connecting services (ABS 2000; Booz, Allen & Hamilton 2001; Hughes 2006). The PTUA is unaware of any surveys citing low urban densities or philosophical opposition to public transport as key reasons for mode choice.

The draft report seems to downplay the impact that public transport can have on congestion (*pp. 292-293*). While the PTUA agrees that enhanced public transport provision is only one part of a comprehensive approach to providing access (see also Section 8), it is nonetheless an important element with demonstrable beneficial impacts on congestion (sub. 65, pp. 23-25). For example, the draft report appears to have ignored the large increase in peak patronage on Perth's new northern rail line (PTUA 2006c) (*p. 248; p. 292; p. 353*). The report also downplays the significantly enhanced mobility that has been enabled without the corresponding increase in traffic that would have occurred if those journeys were undertaken by private motor vehicle (*p. 283*). While certainly not solving congestion single-handedly, public transport can help to mitigate its severity, while also providing people with an opportunity to escape it (Litman 2006b).

It should also be noted that the relationship between traffic volume and traffic speed is not linear. A relatively small reduction in traffic volume encouraged by time-competitive public transport could result in a disproportionately large increase in average traffic speed (PTUA 2006d, Case Study No.4). It can be small movements in mode share like this that lead to the convergence of general traffic speeds with those of the best public transport alternative, as mentioned in Section 4.3.2.

Public transport participates in the broader passenger transport market along with two of the world's largest industries - the automotive and petroleum sectors - that wield enormous political power and marketing budgets. In many cases public transport starts at a competitive disadvantage since roads are invariably built into residential developments, whereas public transport services may lag by several years, by which time car-dependence is already well entrenched (*p. 372; p. 394*). If public transport is to maximise the contribution it makes to sustainable mobility and congestion minimisation, public transport should be made as competitive as possible as soon as possible.

The traditional marketing mix is a useful framework to assess the competitiveness of public transport in terms of the key factors driving mode choice referred to above, i.e.:

1. Product – service levels including frequencies
2. Price – fares (especially relative to the marginal cost of driving)
3. Place – network coverage
4. Promotion – customer relations

5.2.1 The public transport product – service levels

Assuming there is a system to use (see Section 5.2.3), the ability of public transport to attract users depends upon the system offering competitive journey times. While average vehicle speed is an important contributor to journey times (see also Section 4.3.2), time spent waiting for the vehicle (including any connecting services) will also affect user perceptions of overall journey times. A range of measures can improve actual and perceived waiting times:

1. increased service frequency, and
2. harmonised and simplified timetables.

5.2.1.1 Frequencies

Frequency is key to providing a public transport service people will want to use. World's best practice is providing a service that is so frequent that people can 'turn up and go' without prior planning or consulting a timetable (generally 10 minutes headways or better). On quieter local routes a 'timed transfer' system with departures at even clockface intervals is the next best option (*p. 198; p. 200; p. 203; p. 371*).

The patronage impact of frequency improvements depends upon a range of factors, however an average elasticity of around 0.5 is often reported (VTPI 2005a). The demand curve, however, is far from linear and much stronger responses can be expected where relatively low frequency services are upgraded to 20 minute headways or better. Elasticities in excess of 1.0 have been reported where the frequency of services running through middle and upper income areas (i.e. catchments with a high proportion of discretionary passengers) is boosted above two or three per hour (Evans 2004). This is consistent with the results of higher frequencies introduced with SmartBus services along Springvale and Blackburn roads in eastern Melbourne, including strong growth in full-fare passengers (DOI 2006).

In light of these responses, services operating with headways in excess of twenty minutes are unlikely to make a major contribution to mode shift and congestion minimisation (*p. 198; p. 203; p. 371*). Furthermore, 15 minute headways may fit in better with a hierarchy of harmonised headways by enabling 30 minute frequencies, rather than 'non-clockface' 40 minute frequencies, on lower patronage routes. The likely impact on congestion of the government's transport and liveability statement, *Meeting our transport challenges*, should be assessed in this light given that its main service improvements are longer operating spans but often only hourly service frequencies.

Given that travel patterns are changing and the peak is spreading (*p. xvi*), the span of peak level services should also spread to ensure that public transport remains a competitive alternative to car use and that commuters are encouraged to "time shift" their journey to less crowded services (*p. 205; p. 234*).

Overall service spans should also recognise that many people only travel one direction during the peak, and their return journey might be in the middle of the day or evening when services are less frequent or have stopped altogether. In such circumstances, passengers may abandon public transport for both journeys and thus add to peak motor vehicle traffic (Evans 2004, p. 9-24).

Improved frequencies would also enable public transport to better serve complex trip patterns (*p. 37; p. 86; p. 417*). Rather than having to wait in excess of half an hour between connections, frequent services would enable users to combine journeys (e.g. from home to school drop-off to work) without unacceptable increases in overall journey times compared to driving.

The importance of service levels is demonstrated in Figure 3.8 of the draft report (*p. 80*). While most of Melbourne's train services showed significant growth from 2004 to 2005, the western suburbs services to Williamstown and Werribee (which suffer from low scheduled frequencies and poor reliability) both showed declining patronage, resulting in unnecessary additional pressure on road corridors such as the West Gate (*p. 318*).

During off-peak times, improving service levels is mostly a matter of ensuring that there are sufficient drivers and scheduling more services. During peak times other measures may be necessary. Some capital expenditure is also warranted in three key areas:

5.2.1.1.1 Duplicating single track sections of railway line

Single track sections are often cited as an impediment to higher frequencies, hence duplication should be prioritised ahead of triplication (*p. 91*).

5.2.1.1.2 Eliminating level crossings

While the main beneficiaries of level crossing elimination are road users, level crossings can also slow down trains (especially where they cross tram lines at grade, such as on the Glen Waverley, Alamein and Frankston lines) or reduce their reliability due to motor vehicles encroaching on the track with sometimes tragic consequences (*p. 172*). Crossings where there are major tram and/or bus movements should receive first priority, taking care to ensure that passenger interchange opportunities are enhanced.

5.2.1.1.3 Implementing priority programs for road-based public transport

Traffic light priority for public transport (including provision for head-starts (*p. 173*)) would increase the passenger throughput of intersections by facilitating the movement of high capacity vehicles (*pp. 171-172; p. 180; p. 241; p. 281*). Such measures could also be implemented in tandem with emergency vehicle priority to maximise coverage (*p. 177; p. 181*). Existing fairways should also be enforced to avoid unnecessary delays to public transport vehicles that might reduce their ability to attract people out of their cars (*p. 180; p. 280; p. 296*). Improvements in average operating speeds enabled by priority programs would also enable higher frequencies with a given level of rolling stock and staff.

While the PTUA strongly supports the concept of tram priority, we believe that "efforts to improve tram movement" have been largely misdirected, inconveniencing passengers without improving speeds (*p. 82*). However the Sydney Road experience is encouraging.

It should also be noted that public transport priority measures do not necessarily require expensive mega-stops, large-scale parking reduction or tram stop deletions (*p. 242; pp. 281-282; p. 418*). For example, dedicated bus lanes could be provided on Victoria Parade by allocating the second lane from the kerb to buses and maintaining kerbside parking. At bus stops the kerb could be extended out to the second lane, so buses would not need to turn in to stop (*p. 130*). Such measures could also apply 24 hours a day rather than just during a two hour peak period.

There is a tendency for road building authorities such as VicRoads to inconvenience pedestrians and traders, while refusing to contemplate “sacrifices” by motorists. Consciously preserving this ‘car first’ planning approach – maintaining the status quo - has a negative impact on public transport since it results in gradually reduced speeds, higher labour costs and poor fleet utilisation (*p. 283*).

5.2.1.2 Timetables

Melbourne’s public transport services are poorly integrated, with wildly diverging headways between ostensibly connecting services and long waits between linked journeys the norm rather than the exception. As a result Melbourne has a very low level of linked journeys (i.e. trips involving more than one boarding) by international standards (Scheurer, Kenworthy & Newman 2005, p. 8).

This poor level of integration makes public transport less attractive for discretionary passengers and leads to parking and congestion problems near railway stations due to passengers shunning the often dysfunctional feeder buses.

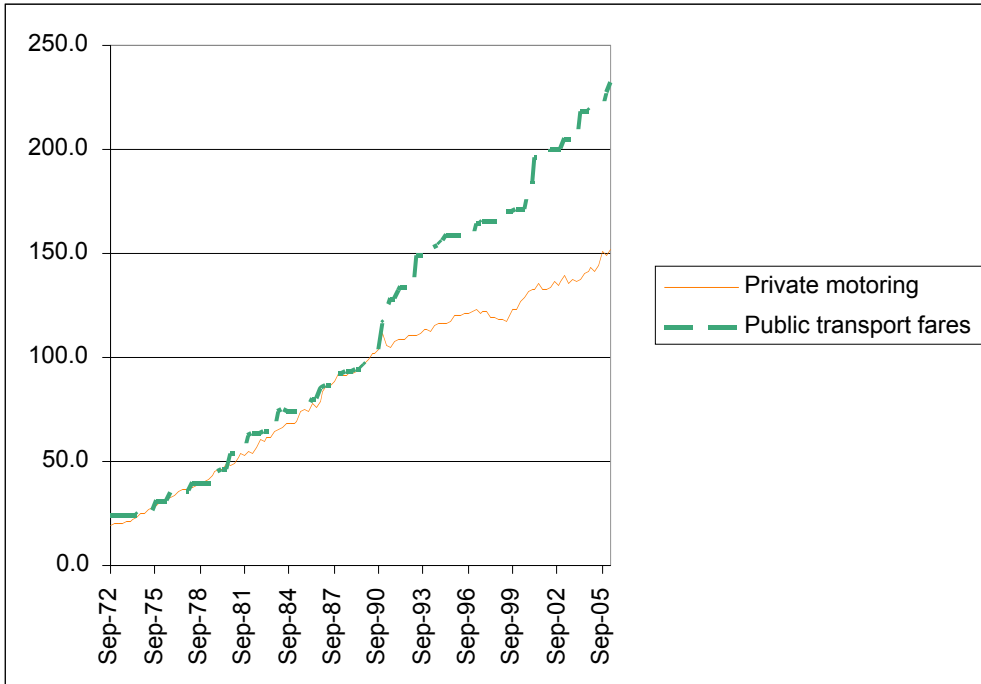
Waiting times could be minimised, especially when connecting to and from lower frequency services, by ensuring timetables are harmonised across the network. Adopting “clockface” timetables would both make this process easier and make the system easier to understand for passengers. There are even indications that clockface timetables by themselves (i.e. in the absence of actual service level increases) can result in noticeable gains in patronage (Evans 2004, pp. 9-16 – 9-17).

5.2.2 The price of public transport – fares

The price elasticity of demand for public transport use tends to be somewhat lower than the elasticities relating to service quality, especially for the commuter market when transport congestion is most acute. Rather than providing free public transport, the priority should be on ensuring good value for money in terms of service levels and availability (*p. 201; pp. 300-301*).

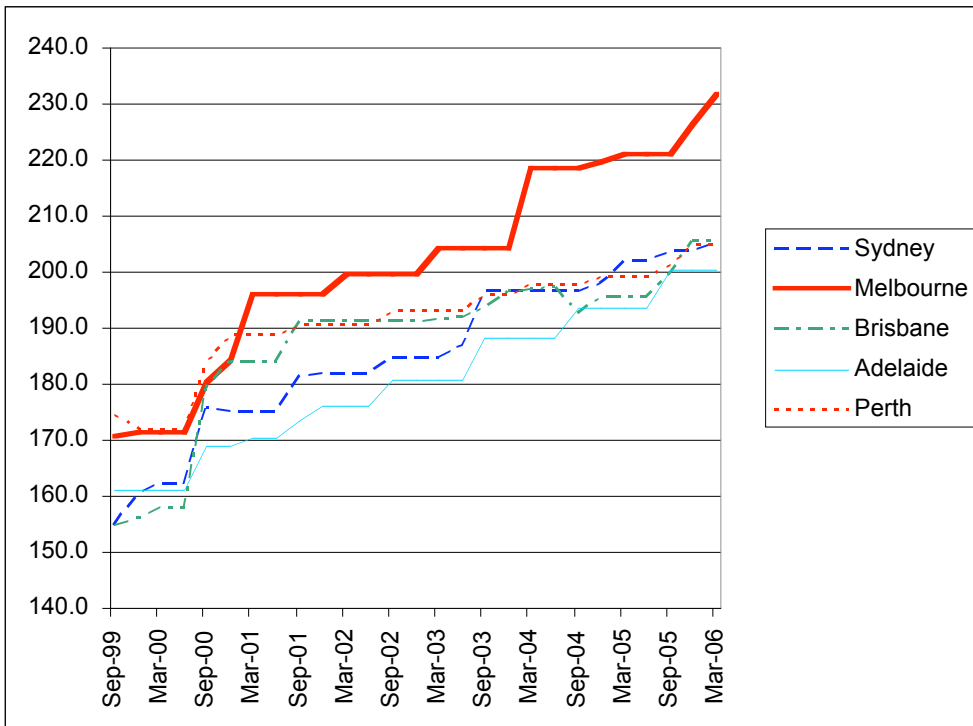
When assessed in this regard, it appears Melbourne’s public transport compares poorly against its Australian peers. Not only have fares in Melbourne increased faster than all other Australian cities since privatisation (see Figure 5.7), public transport fare inflation has consistently outstripped that of motor vehicle use over the last decade and a half (see Figure 5.6). Given Melbourne’s road and freeway network has expanded significantly over that period while the public transport network has remained stagnant, it is clear that Melbourne’s public transport system represents poor and declining value for money for ticket holders.

Figure 5.6: Transport price inflation in Melbourne – 1972 to 2006



Source: Australia Bureau of Statistics

Figure 5.7: Public transport fare inflation in Australia – 1999 to 2006



Source: Australia Bureau of Statistics

Draft option (p. 419)	Recommended option
Use opportunity SmartCard provides for more flexible public transport fares, both between times and in relation to distance.	Bring public transport fares down to the level they would be now if they had increased at the same rate as other Australian cities since 1999; reduce fare increments for additional zones while retaining zone system.

5.2.3 Distribution of public transport – network coverage

As mentioned in Section 4.3.2, coverage is one of the key deficiencies of Melbourne’s public transport system.

While “only” 11 per cent of households did not have a car in 1999 (*p. 30*), approximately one-third of residents cannot drive. These statistics make public transport more significant to more people than its current 9 per cent modal share may indicate at first glance.

Around two thirds of Melbourne lacks easy access to the rail network, leaving most people dependent upon buses for their public transport needs. While 84 per cent of Melbourne’s population lives within 400 metres of bus stop (*p. xxi*), this is of little use if there are poor bus services as is often the case after 7pm on weekdays and all day Sunday.

Given the serious deficiencies in coverage and service spans, the PTUA does not wish to see duplication of resources or unproductive competition between modes (*p. xxx; p. 297; p. 369; p. 372; p. 404; p. 423*). Scarce resources should be integrated for maximum synergies and deployed for maximum coverage and effectiveness.

The PTUA agrees with the Bus Association of Victoria that Park and Ride is not an efficient means of delivering passengers to high capacity transit services (*p. 162; p. 297; p. 298; p. 419*). On top of entrenching car dependency, such strategies contribute to parking and congestion problems around transport interchanges and fail to exploit the potential for increased levels of mixed-use activity in the station vicinity as proposed in Melbourne 2030. Instead of such a costly and unsightly use of valuable land, the PTUA recommends attention be redirected to improving access and storage for cyclists and ensuring ease of transfer and minimum waiting times for passengers connecting to and from feeder buses.

In planning public transport services, the PTUA also believes that the same principles should apply to the distance between stops for all modes, so this should not be seen as an advantage for bus services (*p. 24*) unless bus journeys are inherently longer than journeys made on other modes.

5.2.4 Promotion

5.2.4.1 Customer relations

Due to a range of social, environmental and economic public policy objectives leading to government subsidisation of public transport, the market signals received by operators are not as clear or as strong as they might otherwise be (see also Section 8.7). In this context, the provision of a public transport system that adequately serves the needs of current and potential users depends upon effective consultation and engagement with the community.

Unfortunately the current dysfunctional franchise model operating in Melbourne seems to work against effective community engagement by diffusing responsibilities and clouding accountabilities (p. 81; p. 340; p. 342; p. 418). While a Public Transport Customer Consultative Committee had been in existence briefly, this group has been disbanded without replacement (p. 134; p. 361).

The ability of public transport to serve the needs of the community would be aided by the establishment of a central public agency, accountable to the community, with responsibility to determine mobility requirements and then plan and implement the infrastructure and services required. Such a body could also be empowered to undertake marketing and loyalty programs, properly integrate timetables and ensure consistency in customer service. Such a model would be consistent with international best practice in cities such as Zurich, Vancouver and now Perth (p. 122; p. 132; p. 139; p. 204; p. 251; p. 297; p. 353; pp. 367-369; p. 380; p. 390; p. 404; p. 419).

Box 5.1: Customer service without a central public transport agency (p. 133)

The top of [street name] was blocked after this afternoon due to a loose pane of glass in a building. As I had to be home on time I needed to find out how they were diverting the [bus route] service.

Checked the [bus company] site but no mention of any diversions. I then called MetLink who said that they could supply no information on [bus company] diversions and I should ring [bus company]. The number they gave me was listed on the [bus company] Web site as their Feedback/Complaints line and is open from 9-5. Luckily it was only 4:30 so I gave them a call.

I got an answering machine that said that said "[CEO name] of [bus company] is out of his office, please leave your name and number and he will call you back". Good to see their Chief Executive is manning the Feedback/Complaints line. I guess he decided to go home early.

Source: PTUA member, 20 April 2006

Marketing of public transport is also discussed in Section 3.1, and institutional arrangements are further discussed in Section 8.1.

5.2.4.2 Safety

While concerns over personal security are a relatively minor deterrent for journeys to work and study (ABS 2000), fear of violent crime would be a more significant deterrent to use of public transport off peak, especially for women. As mentioned above, many people may only travel in one direction during the peak and perform the return journey after hours. Fear of violence, whether justified or not, could cause such people to drive in both directions rather than take an after-hours public transport journey.

Actual and perceived levels of safety could be improved by boosting the presence of staff on public transport vehicles and at transport interchanges (p. 294). These staff could also undertake general customer service activities, such as assisting people with disabilities to board (thus reducing dwell times) or providing advice to infrequent travellers. The reputation of public transport as a safe and user-friendly mode of transport would be enhanced and the system would be more able to attract new passengers.

<i>Draft option (p. 418)</i>	<i>Recommended option</i>
Improve the efficiency of the rail system (North Melbourne and Richmond interchanges; signalling in the City Loop; duplication of single tracks). More substantial additions to rail network, subject to cost-benefit analysis. Change operational arrangements for City Loop.	Improve the coverage, integration and efficiency of the rail system (North Melbourne and Richmond interchanges; signalling in the City Loop; duplication of single tracks; tram gap filling program; Rowville and East Doncaster lines; South Morang, Baxter and Sunbury extensions). Change operational arrangements for City Loop.

<i>Draft option (p. 419)</i>	<i>Recommended option</i>
Upgrade local buses; accelerate roll-out of SmartBus; trial bus rapid transit system; expand park and ride.	Upgrade local buses; accelerate roll-out of SmartBus; centralise bus route planning within public agency responsible for all public transport modes; boost frequencies across the network and harmonise timetables.

<i>Draft option (p. 419)</i>	<i>Recommended option</i>
Public transport operators look at scope for developing targeted loyalty schemes as part of broader branding program (as in Paris).	Loyalty schemes to be considered as part of broader branding program by central public transport agency (see Section 8.1); boost customer service staff levels on public transport vehicles and at interchanges.

<i>Draft option (p. 419)</i>	<i>Recommended option</i>
Strengthen incentive structures for public transport operators.	Ensure incentives and penalties for operators encourage high standards of reliability and integration.

6 Land use policies

The PTUA was pleased to see recognition of the importance of supportive land use policies in the draft report. While the importance of urban density is often overstated (PTUA 2006b) (*p. 211; p. 254; p. 303*), Melbourne has numerous examples of land use practices that harm access and mobility. For example:

- the curvilinear street layout and lavish use of culs-de-sac in areas such as Endeavour Hills are hostile to the provision of fast and efficient bus services and direct pedestrian access;
- rail corridors have been closed and/or redeveloped (Cauchi 2006), or not provided for in new developments;
- trip generators have been established and expanded in locations that are difficult to access without a car.

In beginning to redress the last half century of car dependent land use policies, it is important to note:

- provision for public transport in new developments should provide for future rail corridors (given mode shift, capacity and other benefits outlined in Section 5.1 in context of Melbourne 2030) as well as buses, cycling and walking (*p. 137; p. 142; p. 298; p. 303; p. 355; p. 395*).
- roads do not necessarily equal mobility. For example, siting schools near particular roads does not guarantee access given the vast majority of those attending cannot drive (*p. 367*). As with all significant trip generators, planning decisions should ensure accessibility by walking, cycling and public transport.

Land use policies are further discussed in Section 8.6.

7 Freight

7.1 *Competitive neutrality*

While the PTUA does not object to the common premise that freight movements should have higher priority than private motor car journeys, on occasion this principle seems to be characterised as “trucks good, cars bad”. Any assessment of transport options must recognise that trucks cause significant noise and air pollution and wear and tear on road surfaces. A range of studies have demonstrated that trucks generate significantly higher externalities than rail freight (Laird 2006) while motoring organisations have gone as far as to suggest that cars subsidise trucks (AAA 2001). The existence of these hidden subsidies to road freight demonstrates that the enthusiasm to get cars out of the way of trucks should not detract from efforts to increase the proportion of freight transported by rail (*p. 6; p. 311; p. 318; p. 329*).

The growth in road freight that has been experienced (*p. 43; p. 318*), along with the future growth that has been projected (*p. 336*), would each reflect the significant under-pricing of road freight identified by Laird and others, especially when compared to the commercial rates of financial return that are expected from rail freight services and infrastructure provision. Ensuring that freight decisions fully incorporate social and environmental costs would provide a more level playing field and address one of the key elements of “unfinished business” of microeconomic reform.

Increasing the share of metropolitan freight transported by rail (*p. 325*) would mesh well with urban congestion management objectives. Inland ports may be a useful tool to achieve this if such ports are close to the point of origin/destination, however they should not be used simply to transfer freight to and from trucks for intrastate and interstate road haulage (*p. 325*).

Since a good deal of urban and port freight originates in regional Victoria and interstate, it is important to encourage the use of rail freight outside Melbourne as well as within the metropolitan area. The current rail access regime is inhibiting growth in rail freight. Arrangements with the below-rail operator are not delivering value for money to the government or ensuring adequate track maintenance. Control of the rail infrastructure should be brought back into public hands to safeguard equality of access for all above rail operators and to ensure a longer term view is taken on track maintenance.

Future expansion of rail freight infrastructure should also look at synergies with passenger services and re-invigorating the standardisation of the network in cooperation with the Commonwealth (*p. 338; p. 420*).

7.2 *Private use of commercial vehicles*

Whilst likely to be minor compared to the externalities mentioned above, it may also be worth noting that “minor, infrequent and irregular” private use of certain commercial vehicles is granted an exemption from fringe benefits tax under Section 8 of the *Fringe Benefits Tax Assessment Act 1986* (Cwth). This exemption has been known to distort vehicle purchasing

decisions away from standard passenger vehicles towards qualifying commercial vehicles and, due to the minimal substantiation required by the exemption, lead to widespread use of commercial vehicles for private and domestic purposes. In view of this, the reported level of commercial vehicle traffic (*p. 33; p. 309*) may over-state the true scale of freight movements relative to private passenger movements. These provisions should also be reviewed in any reform of fringe benefits tax legislation, along with elimination of incentives towards excessive driving under the Statutory Formula (Section 9 of the FBT Act).

The under-pricing of road access for freight relative to rail, and private use of commercial vehicles, demonstrates that there is significant scope for demand management in road freight before further supply side expansion is required.

7.3 Port of Geelong

The Port of Geelong deals mainly with bulk products, including export woodchips, logs, steel products, bulk fertilisers, grain, aluminium products, oil and petroleum and chemicals. A lot of these bulk products could be moved more efficiently by rail, reducing congestion, causing less damage to roads, using less fuel, causing less noise and air pollution, and less disruption to nearby communities (*p. 314*). Yet the Corio Independent Goods Line, which aims to effectively link the port to the national rail network, remains unbuilt almost a decade after it was announced.

VicRoads has forecast a large increase in logging trucks coming from south-western Victoria and has been looking at ways to get them to Geelong's port. However, despite the existence of rail infrastructure in that region, it does not seem to have considered the use of rail to overcome the predicted congestion despite the government's target of transporting 30 per cent of freight to ports by rail by 2010.

<i>Draft option (p. 420)</i>	<i>Recommended option</i>
In the absence of equitable pricing between road and rail, introduce a levy, initially as a trial, on the road movement of containers at the Port of Melbourne to discourage peak period road traffic.	In the absence of equitable pricing between road and rail, introduce a levy, initially as a trial, on the road movement of containers at the Port of Melbourne to discourage peak period road traffic; bring regional rail track back under public control; push for greater competitive neutrality between road and rail in COAG and ATC; vigorously pursue rail improvements through AusLink.

<i>Draft option (p. 420)</i>	<i>Recommended option</i>
Reserve corridors to ensure adequate road and rail network connectivity to the Port of Hastings.	Reserve corridors to ensure adequate road and rail network connectivity to the Port of Hastings; monitor/pursue opportunities for synergy between freight rail upgrades and passenger services.

8 Institutional reform

8.1 Institutional arrangements

The PTUA wishes to clarify that it strongly supports the establishment of a central public transport agency along the lines of those in successful public transport cities like Zurich and Vancouver (*p. 372; p. 380; p. 386*). A European study of best practice in the delivery of integrated transport found authorities such as these to be:

“...crucial in improving integration (through route planning, common fares and co-ordinated timetables) and marketing services which have led to increased patronage. They have also helped to agree common policies and objectives between those involved in transport provision, and led to the adoption of (higher) common standards of transport infrastructure.”

(WS Atkins Transport Planning 2001, p. 28)

The absence of such an agency guiding public transport development and operations in Melbourne is directly contributing to many of the problems raised in this document, including poor service coverage (see Section 5.2.3), slow and meandering routes, lack of integration of timetables (see Section 5.2.1), wasteful service duplication and declining value for money for both taxpayers (Mees, Moriarty, Stone & Buxton 2006) and ticket holders (see Section 5.2.2).

A transport co-ordinating authority should also be responsible for planning routes and timetables, co-ordinating connections, fare revenue, and marketing. One of its first tasks should be to conduct area-wide route and timetable reviews to ensure that passengers and taxpayers are getting full value per route kilometre delivered.

Although the Public Transport Division operating in the DOI nominally claims ‘accountabilities’ for some of the areas cited, the current spaghetti-like bus route structure and wildly varying service levels are adequate evidence that it is not up to the task and that a professionally-staffed co-ordination agency is required. A new central public transport agency should have access to the best skills available nationally and internationally, and the capacity to recruit and retain appropriately skilled staff (*p. 421*).

In Melbourne this debate has become inextricably entwined with discussion on the merits or otherwise of ‘privatisation’. We consider that the question of whether private operators are involved is less important than whether services are centrally co-ordinated and the community receives value for money and has a degree of control over planning decisions. Melbourne is the only major city to have experimented with ‘privatisation’ in the sense of allowing private operators to become de facto planning bodies, and this model is widely understood to have failed. On the other hand, the transport co-ordination authority model has succeeded equally with both public and private operators, or any combination thereof as shown in the numerous cities that have adopted them.

Contracts with private operators should be consistent with the role of the co-ordinating body recommended above. In particular, franchise agreements, where operators can operate their own (unintegrated) fare systems and set their own timetables, should be avoided since these reduce

service co-ordination. Instead we favour a simple 'contract-out' model. Payment should be on a fee-for-route kilometres basis, with operators delivering services according to planned routes and timetables. Penalties should exist for poor service performance.

8.2 Road bias

While the PTUA welcomes the Commission's recognition that current institutional arrangements carry a strong risk of a bias towards roads, the draft report could also be seen as perpetuating such a bias by discussing both road "enhancement" and "expansion" as options but only putting forward public transport "enhancement" and not also proposing public transport "expansion" (p. 265). In making this observation we do not believe that the omission is deliberate, however it does mirror the dominance of roads in other government transport research (p. 398).

The proposal contained within the draft report (p. 387) to address the risk of road dominance is a welcome step forward, however the risk will remain while ever VicRoads enjoys more direct formal communications with the Minister for Transport, and/or VicRoads retains policy and planning responsibilities. The sub-set of the bureaucracy with responsibility for public transport, whatever form it takes, should have at least the same level of theoretical and actual access to the Minister for Transport and the Secretary of the department as do VicRoads and other DoI divisions with responsibility for roads.

As well as carrying a clear risk of road bias, the PTUA believes that current institutional arrangements have led to actual instances of bias towards roads when public transport alternatives offered better value for money and more sustainable transport solutions (p. 350). For example, early research conducted for the project that has now become known as Eastlink found that the same benefits for traffic could be obtained by shifting just 1.15 per cent of journeys to public transport (PTUA 2002, p. 36).

More broadly, while around half of the road projects identified in a 2001 RACV report have been implemented (p. 188; p. 342), next to none of the public transport projects identified in a PTUA report from around the same time have been implemented (PTUA 2002). Similarly, the progress on road projects identified in the Metropolitan Transport Plan is far greater than progress on implementation of public transport enhancements proposed in the plan (p. xxii; p. 342; p. 384). These imbalances are just the most recent manifestations of a bias that has seen the supply of road infrastructure grow by over half since the 1960s, but no new railway lines constructed since 1930 (p.xxiii).

To some extent the demonstration of bias is complicated by lack of transparency in funding arrangements (p. 115). Roads are also able to access state government funds outside the state budget process (p. 119), funds from local and Commonwealth governments (p. 119; p. 385; p. 397; p. 421), and developer contributions (p. 120; p. 259; p. 345; p. 347; p. 399). Given these imbalances in funding sources, a level playing field would require a strong bias towards public transport in state government appropriations that prioritises public transport initiatives ahead of road projects that may receive funding outside the state budget process (p. 397). Improving the ability to access funding from other tiers of government that would directly benefit public transport would also appear to be constrained by the strong role of VicRoads in managing bids for AusLink funding (p. 118).

Table 8.1: Road and rail expansion in Melbourne over the last decade

Major road expansion projects			Rail expansion projects		
<i>Current</i>	<i>\$million</i>		<i>Current</i>	<i>\$million</i>	
Eastlink	2,600		Craigieburn electrification	100	
Deer Park bypass	331				
Pakenham bypass	242				
Greensborough bypass	17				
Tullamarine/Calder	150				
Total Current	\$3,340		Total current	\$100	
Past 10 years			Past 10 years		
Western Ring	1997	631	Sydenham	2002	44
Northern Ring	1999	770	Docklands tram loop	2003	2
Citylink	2000	2,000	Box Hill tram	2003	28
Hallam bypass	2003	165	Docklands Dr tram	2005	8
Craigieburn bypass	2005	306	Vermont South tram	2005	43
Total past 10 years	\$3,872		Total past 10 years	\$125	
Total past & current	\$7,212		Total past & current	\$225	

It should also be noted that roads are not currently subject to the Capital Assets Charge (CAC) levied by state treasury, whereas CAC is levied upon public transport assets, further distorting comparisons between road and public transport funding (p. 103).

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Include overarching and consistent objectives within the Transport Act and related legislation.	Include overarching and consistent objectives within the Transport Act and related legislation that enshrine social and environmental sustainability principles within the legislative framework.

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Clarify the roles and responsibilities of the transport portfolio so that DOI has responsibility for policy development and coordination, and the public transport management group is strengthened, with an advisory board and enhanced project management capabilities.	Clarify the roles and responsibilities of the transport portfolio so that DOI has responsibility for transport policy development and coordination, VicRoads is abolished or stripped of any policy and planning functions, an accountable central public transport agency is established, with direct formal lines of communication to the Minister and Secretary, an advisory board and enhanced project management capabilities.

8.3 Criteria

Current project appraisal methodologies utilised in Victoria are clearly deficient if they do not adequately account for the impact of generated traffic on traffic volumes, aggregate vehicle emissions and other negative effects (p. 349). All infrastructure proposals, regardless of mode, should be assessed under a consistent project appraisal framework with comprehensive triple bottom line criteria (p. xxxvi; p. 351; p. 398; p. 411; p. 421) that fully recognises the impact of induced traffic (p. 62; p. 279; p. 349; p. 401).

Given the long service life of transport infrastructure and the inertia that can develop around transport and land use practices once established, it is not necessarily appropriate to prioritise the avoidance of capital expenditure. Instead a more strategic approach should be taken, seeking to optimise benefits and costs (including externalities) across the whole of life of alternative transport solutions. Consistent with Strategic Asset Management frameworks, this may involve higher upfront expenditure for better long-term outcomes in terms of mobility, operating costs, land use impacts, pollution and road trauma (p. 262).

International best practice is clearly shifting towards integrated planning frameworks such as the United Kingdom's Transport Analysis Guidance and the German Federal Transport Infrastructure Plan (Campbell & White 2005; Department for Transport 2006; BMVBW 2003) (p. 284; p. 351; p. 372). As a matter of priority Victoria must adopt such a framework which would differ from the current framework in a number of key respects, including:

- integrating transport and land use decisions;
- recognising transport as a derived demand that requires solutions addressing the underlying need for access rather than just the traditional "predict and provide" supply-side responses;
- incorporating proper consideration of all benefits and costs, including induced demand and environmental costs, rather than just the direct financial cost to government; and
- full and transparent community engagement.

The legislative and regulatory framework, such as the *Transport Act 1988*, should also support an integrated planning framework and ensure that the pursuit of vehicle through-put is not sought at the cost of social and environmental objectives, including local amenity, air pollution, greenhouse emissions and mobility for non-drivers (pp. 375-376; p. 379; p. 392; p. 421).

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
A single state budget for transport projects.	A single state budget for transport projects that offsets any privileged access to funding that roads enjoy from other sources; seek federal funding for public transport infrastructure.

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Adopt a consistent framework to assess the costs and benefits of all transport projects.	Adopt a consistent Integrated Planning framework to assess the costs and benefits of all transport options.

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Improve DOI's information base, through enhancement of its modelling capabilities and better understanding of factors influencing transport choices.	As proposed.

8.4 Coordination between state and local governments

As the smallest and most localised unit of representative democracy, local government has an important role in representing the interests of local residents and traders. In performing this role, it is important that councils are able to effectively protect the safety and amenity of pedestrians and residents from excessive traffic (p. 111). While VicRoads is focussed on moving cars, councils have broader responsibilities for the local environment, amenity and businesses (p. 354; p. 361; p. 401; p. 421).

Local governments should retain discretion in transport related activities at least until such time as the overarching transport and local government legislation incorporate broader social and environmental principles that promote active transport and public transport, and a comprehensive integrated planning framework has been implemented. Once those measures are in place, the involvement of local government in the integrated planning process should ensure a higher degree of coordination than has often been the case in the past.

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Legislative change to the Transport Act, the Road Management Act and the Local Government Act to clarify that all local government decisions about transport related activities are to be consistent with transport legislation.	Legislative change to the Transport Act, the Road Management Act and the Local Government Act to clarify that all local government decisions about transport related activities should pay due regard to transport legislation, once the Transport and Road Management Acts have been amended to incorporate broader social and environmental goals as discussed in Section 8.3.

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Supported by guidance notes issued by DOI for decisions on public transport priority on roads, allocating bus lanes, restricting parking on arterial roads and improving pedestrian facilities.	Supported by guidance notes issued by DOI for decisions on public transport priority on roads, allocating bus lanes and improving pedestrian and cyclist facilities.

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
Seek volunteer local councils to develop a MOU on integrated transport planning in local areas.	As proposed.

<i>Draft option (p. 421)</i>	<i>Recommended option</i>
Review the Growth Areas Authority process after three years to assess the scope to improve and extend their application to other regions.	Review the Growth Areas Authority process after three years to assess the scope to improve and extend their application to other regions while ensuring full local participation.

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
Make forward commitments to funding for key transport projects that have been identified and assessed as critical to the outcomes of growth area plans and integrated transport strategies.	Make forward commitments to funding for key transport projects that have been identified and assessed as critical to the outcomes of growth area plans and integrated transport strategies to the extent these are consistent with the broader integrated planning framework and the 20 per cent mode share target for public transport.

8.5 Coordination between transport and other state departments

Transport policy has an impact on virtually every other area of public policy including environment, health, social justice, energy and economy (Coalition for People’s Transport 2006). The current approach to transport provision fails to adequately account for these impacts. Co-ordination between transport and other state departments would be greatly enhanced by the adoption of an integrated planning framework which adequately accounts for all benefits and costs, including externalities, as discussed in Section 8.3.

We also draw your attention to an error in Table 4.2 provided by VicRoads (*p. xxvi; p. 102*). While the PTUA sees significant value from the involvement of Environment Victoria in the environment-related aspects of transport policy, vehicle noise and emissions are actually the responsibility of the Environment Protection Authority.

As well as properly integrating transport policy with other areas of government, the “government as exemplar” approach currently being applied to occupational health and safety should be extended to transport by actively discouraging car travel in the public sector and encouraging the use of walking, cycling and public transport (*p. xxxi; p. 233; p. 273; p. 414; p. 417; p. 422*).

Part of this leadership role would include ensuring a high level of access to public schools and hospitals by active transport and public transport since many people attending these establishments are unable to drive (*p. 145; p. 367; p. 414; p. 422*). Walking and cycling are especially well-suited to addressing congestion relating to school trips as well as adding another weapon to the fight against childhood obesity (*p. 246; p. 276; p. 417*). Government can play a role here by supporting walking and riding school bus programs to address the safety concerns of parents (VicHealth n.d.).

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
Make exemption from the Planning Provisions conditional on demonstrated compliance with an effective consultation process.	Make exemption from the Planning Provisions conditional on demonstrated compliance with an effective consultation process and subject to offsetting arrangements to improve public transport and non-motorised travel; adopt a “government as exemplar” approach to reducing motor vehicle journeys, including restrictions on the salary packaging of cars and free parking; expand walking and riding school bus programs to all schools.

8.6 Coordination between land-use and transport planning

Land use planning is arguably the single most significant area of public policy in terms of impact on transport. Unfortunately this interdependence has not been reflected in the level of integration between the portfolios. The PTUA is pleased to see recognition of this deficiency in the draft report. The response to this deficiency is much as outlined above; the immediate adoption of a comprehensive integrated planning framework as discussed in Section 8.3.

Land use planning to encourage public transport use and for ecologically sustainable development is not just about planning for the provision of transport infrastructure or services between development areas. It also means giving priority to intensive development in areas that are most accessible by public transport, and restricting development in areas with poorer access. In particular, retail and office development that causes intense activity should be located close to high-quality public transport services, such as district centres on the heavy rail network as in Vancouver (*p. 257; p. 303*).

We also stress that the onus should not only be on the planning portfolio to fall in behind the transport portfolio. It is equally important that transport does not undermine planning objectives, for example by implementing major road projects that encourage urban sprawl (*p. 391; p. 399; p. 413; p. 422*).

The privileged access to developer contributions enjoyed by roads should also be eliminated by making these funds available to facilities for cycling and public transport (*p. 122; p. 399; p. 419*).

The failure of existing institutional arrangements is evidenced through the disjointed departmental ownership and implementation of the transit cities program (*p. 145*). The Department of Sustainability and Environment (DSE) is responsible for the Transit Cities program and activity centre planning, while DOI retains responsibility for transport, and this has led to haphazard decisions on public transport planning and service provision.

While government expenditure has been earmarked for the transit cities program, the actual provision of public transport services seems to be designated as a minor importance. Progress has been made in regard to increased urban densities around designated transit cities, but there has been a systematic failure to provide genuine transport choice for both existing and future land uses.

Ultimately the frequency, service span, directness of routes and reliability of public transport are the crucial factors that must be addressed to encourage increased patronage of the system. Whilst there remains poor level of public transport services into and out of transit city areas the corresponding usage of such public transport will be curtailed. For example, while all transit cities are located along designated rail lines no effort has been made to provide improved services to encourage usage of public transport.

This is evidenced at Ringwood whereby services along the Belgrave and Lilydale lines operate at 30 minute headways during weekday off-peak periods, with bus services being even more infrequent. This is despite the fact that research within the DOI clearly stipulates that a minimum 15 minute service frequency is required to create modal shift from car to public transport. This modal shift is required to ensure that traffic congestion is mitigated within areas

earmarked for higher urban densities.

In similar regard the current zone boundaries of Melbourne's public transport system exacerbate traffic congestion. For example both Ringwood and Box Hill reside within a new zone boundary causing nearby residents with car access to drive through these transit city areas to minimise the cost of public transport usage. Such unnecessary trips must be avoided to minimise traffic congestion through such areas. This can be done through the adequate provision of frequent, direct and readily available bus services as well as a reduction in the price differentials between public transport zones.

With the designated transit cities being located on rail corridors and well provisioned in regard to road access it is both reasonable and necessary to expect more frequent and more readily available public transport services to reinforce the benefits and the merits of the transit cities program. Given that current arrangements are clearly inadequate there is a pressing case for institutional reform to incorporate land use planning and transport provision at a holistic level.

<i>Draft option (p. 419)</i>	<i>Recommended option</i>
Implement existing policies for restricting highest densities to Principal and Major Activity Centres; fast-track the Transit City program; assess ways to reduce congestion impacts of business zones outside major activity centres; improve coordination between relevant agencies.	Implement policies to restrict significant trip generators to the rail network; fast-track the Transit City program; assess ways to reduce congestion impacts of business zones outside major activity centres; improve coordination between relevant agencies.

<i>Draft option (p. 419)</i>	<i>Recommended option</i>
Ensure public transport and roads have equal access to developer contributions.	Ensure active transport and public transport have better or equal access to developer contributions relative to roads.

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
Government announce that it requires all departments to explicitly consider transport access and congestion for all major projects.	Government announce that it requires all departments to explicitly consider transport access and congestion for all major projects, with presumption that all significant trip generators to be located on rail network; Projects that increase car travel should incorporate off-setting measures to encourage use of active transport and public transport.

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
Negotiate a public MOU between DSE and DOI to ensure land-use planning and transport policies are fully integrated.	As proposed.

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
Finalise negotiation on DOI's role and a referral authority under section 55 of the Planning and Environment Act.	As proposed.

8.7 Improving market solutions

8.7.1 Exclusivity

The PTUA does not believe there is necessarily a correct one-size-fits-all contract term for all transport operators that should apply regardless of circumstances (*p. 403; p. 422*). Factors that would suggest a longer term include:

- operators have significant responsibility for business/patronage development;
- operators have responsibility for asset and fleet acquisition and management;
- operators are subject to strict and transparent benchmarking against national and international best practice;
- contracts facilitate flexibility in service levels and planning, consistent with the principles of zero based planning; or
- contracts include strict and enforceable performance measures with provisions for strong penalties and contract termination for under-performance.

Shorter contract terms may be appropriate where:

- operators have little or no responsibility for business/patronage development;
- operators have little or no responsibility for asset and fleet acquisition and management;
- operator cost structures are not subject to strict and transparent benchmarking against national and international best practice;
- contracts seek to protect historic grandfather “rights”;
- contracts provide the government with limited flexibility with regard to service levels and planning; or
- performance standards under the contract are lax and penalties for under-performance are light.

The selection of appropriate contract terms should take proper account of factors such as those given above, and not be unnecessarily wedded to arbitrary contract terms such as 5 or 10 years.

<i>Draft option (p. 422)</i>	<i>Recommended option</i>
New bus contracts should be negotiated for five rather than 10 years.	New bus contracts should facilitate greater flexibility in service levels and planning.

The PTUA is concerned about proposals to increase the level of patronage incentives offered to operators (*p. 423*). A successful public transport system is founded upon a well-integrated network (Scheurer, Newman & Kenworthy 2005b, p. 28), not a collection of independent, unrelated and competing routes. Incentives that are based upon system-wide patronage growth may not adequately recognise the contribution of individual operators in boosting patronage. On the other hand, incentives that are based upon individual route patronage growth would introduce incentives to cannibalise ridership from other services, thus jeopardising the integration and efficiency of the network (see below) unless strong centralised service planning and enforcement was in place. For example, an operator may choose to run their service just ahead of a competing service, thus bunching the two services close together and leaving a long wait until the next service (Gómez-Lobo 2006).

The current situation where public transport routes are meandering, poorly integrated services that provide inadequate spatial and temporal coverage is in no small part due to the lack of central planning and integration during earlier network growth (see Section 8.1). The PTUA believes that resources should be deployed to ensure maximum geographic coverage and service spans with high frequencies and level of integration. This would not be aided by the duplication of resources in competition (as opposed to cooperation) with existing services in the area or along the corridor as suggested in the draft report (p. xxx; p. 297; p. 369; p. 372; p. 404; p. 423).

The PTUA believes that as far as possible a zero based planning approach should be taken to ensure resources are deployed for maximum coverage, speed and integration. It may be appropriate to allow new services to compete with existing dysfunctional services when such improvements are developed under zero based planning, however the PTUA would be unlikely to support such duplication of resources in the absence of effective centralised service planning given the major deficiencies in coverage, service spans and frequencies across the rest of the system.

Similarly, overcrowding on existing services is a demonstration that service levels are inadequate and should be increased. Relying on other services to absorb the overflow may not assist the legibility of the network and should not be regarded as more than a temporary measure (p. 404).

<i>Draft option (p. 423)</i>	<i>Recommended option</i>
New operators be allowed to compete with existing bus services if the services they offer have features that differ significantly from those normally identified with traditional bus services. This includes the proposed bus rapid transit trial.	New operators be allowed to compete with existing bus services if the services they offer are developed under a centrally planned zero-base planning regime that enhances coverage, speed and integration of the public transport network.

<i>Draft option (p. 423)</i>	<i>Recommended option</i>
Allow buses to pick up and set down on tram routes once tram overcrowding reaches a set level.	Ensure funding arrangements and contracts provide adequate flexibility to boost service levels in response to overcrowding in a cost-effective manner; remove pick-up and set-down restrictions following route and timetable reviews (see Section 8.1).

<i>Draft option (p. 423)</i>	<i>Recommended option</i>
Coordination between public transport services should be monitored and reported.	Responsibility for public transport planning and coordination should be assumed by a public agency modelled on the likes of Zurich's Verkehrsverbund and Vancouver's TransLink.

<i>Draft option (p. 423)</i>	<i>Recommended option</i>
Create a stronger linkage between patronage and remuneration for all public transport contracts and separate general subsidies and subsidies for concession passengers paid to bus operators.	Ensure incentives and penalties for operators encourage high standards of reliability and integration.

8.7.2 Toll roads

The PTUA believes toll-roads have three key drawbacks that limit their suitability:

1. generated traffic;
2. conflict of interest with sustainable transport policy; and
3. equity impacts.

8.7.2.1 Generated traffic

New roads, whether tolled or not, fall for the same trap that has bedevilled transport planning for the last half century. Roadway expansion inevitably encourages new traffic, both on the new road itself and on existing roads that feed it, thus failing to adequately provide optimal mobility with minimal congestion. On top of bringing congestion back up to previous levels, the additional traffic adds to the existing level of pollution, greenhouse emissions and road trauma.

8.7.2.2 Conflict of interest

Toll road operators, understandably, seek to maximise the return on their investment. This profit maximising behaviour results in contract terms that act against sustainable transport and congestion minimisation. For example, the CityLink concession deed gives the toll road operator the right to seek compensation if the government introduces various enhancements to the public transport network or demand management and environmental taxation measures, or if an airport rail link is used to transport freight (*p. 29*).

While the government has sought to highlight the absence of such rights from the EastLink concession deed, clause 39 of the concession deed does provide incentives for the government to maximise traffic on the toll-road and, by implication, minimise alternatives such as attractive public transport in the corridor. Similar incentives to maximise traffic volumes were included in the recent agreement to widen sections of the Monash Freeway.

The above examples illustrate how toll road operators either act to ensure their interests are protected under the contract and/or the government's interests are brought into alignment with their own (e.g. through sharing of upside) at the expense of the broader community and environment. Given this inherent conflict of interest, it is unlikely that project specifications for new toll roads would include proposals that offer the most appropriate solution to public transport requirements. Moreover, such proposals may even crowd out more appropriate "stand

alone” public transport enhancements that better serve numerous goals such as enhanced mobility, reduced pollution and road trauma (p. 403; p. 405; p. 423).

8.7.2.3 Equity impacts

Similar to other forms of road pricing, toll roads increase the financial burden on low income households who may already be straining under the cost of car dependence and rising oil prices. The access and mobility requirements of such people, and the one third of Melburnians who are unable to drive, would be better served by improved land use planning and expanded public transport services. Toll roads, by encouraging urban sprawl and car dependence, are counterproductive in both these regards.

<i>Draft option (p. 423)</i>	<i>Recommended option</i>
Project specifications for new toll roads to include proposals on how new infrastructure would enhance the efficiency of all parts of the transport network, including public transport.	Moratorium on major road projects pending implementation of comprehensive integrated planning framework incorporating broader social and environmental objectives; toll road proposals to be considered alongside a broad range of alternative solutions as part of a comprehensive integrated planning framework; contract terms for new toll roads to explicitly prevent the operator from seeking compensation for economic or financial detriment resulting from the introduction of enhanced public transport, transport/energy demand management measures or other public policies, taxes or charges that reduce traffic; contract terms for toll roads to exclude incentives for government to maximise traffic volumes.

9 References

AAA 2001, *Towards a fairer fuel tax policy*, Australian Automobile Association, Canberra, viewed 8 June 2006,

<http://fueltaxinquiry.treasury.gov.au/content/Submissions/Industry/downloads/AAA_228.pdf>

ABS 2000, *Australian Social Trends 1998: Transport choices and the environment*, Australia Bureau of Statistics, Canberra

American Association of State Highway and Transportation Officials 1990, *AASHTO Policy on Geometric Design of Highways and Streets*. AASHTO, Washington, D.C.

Bento, A 2005, *Comprehensive Urban Approach Can Affect Travel Choices -- Even in Auto-Dependent U.S.*, media release, University of Maryland, 14 November, viewed 12 June 2006, <http://www.smartgrowth.umd.edu/articles/UrbanFormandTravelDemandPR_111505.pdf>

BMVBW (Federal Ministry of Transport, Building and Housing) 2003, *Federal Transport Infrastructure Plan 2003*, Federal Ministry of Transport, Building and Housing, Berlin, Germany, viewed 2 June 2006, <http://www.bmvbs.de/Anlage/original_17121/Federal-Transport-Infrastructure-Plan-2003.pdf>

Booz, Allen & Hamilton 2001, *Bus Improvement Strategy: Final Report*, Report prepared for the Victorian Department of Infrastructure, Melbourne

Campbell, S & White, S. 2006, 'Integrated Resource Planning for Transport: asking better questions', paper presented at Urban Transport 2005 Conference, Algarve, Portugal, 12-14 April 2005, viewed 9 June 2006, <http://www.isf.uts.edu.au/publications/SC_SW_2005.pdf>

Cauchi, S. 2006, 'The incredible shrinking railway lines', *The Age*, 11 June, viewed 12 June 2006, <<http://www.theage.com.au/articles/2006/06/10/1149815357543.html>>

Coalition for People's Transport 2006, *Transport and Liveability: The Path to a Sustainable Victoria*, Coalition for People's Transport, Melbourne, viewed 2 June 2006, <http://www.melbourneontrack.org.au/publications/liveability_statement.pdf>

Currie, G 2005, *Melbourne Future Transport Options: Final Report*, Institute of Transport Studies, Monash University, Melbourne

Department for Transport 2006, *Transport Analysis Guidance*, Department for Transport, UK, viewed 9 June 2006, <<http://www.webtag.org.uk/>>

Dodson, J. & Sipe, N. 2005, *Oil Vulnerability in the Australian City*, Griffith University, Brisbane, viewed 29 May 2006, <http://www.gu.edu.au/centre/urp/urp_publications/research_papers/URP_RP6_OilVulnerability_Final.pdf>

DOI 2006, *SmartBus on Springvale Road (Route 888/889)*, Department of Infrastructure, Melbourne, viewed 15 June 2006, <<http://www.doi.vic.gov.au/DOI/Internet/planningprojects.nsf/AllDocs/5976C8298702066BCA256F31001E334D?OpenDocument>>

EEA 2004, *Transport Price Signals*, Technical report No. 3/2004, European Environment Agency, Copenhagen, viewed 2 June 2006, <http://reports.eea.europa.eu/technical_report_2004_3/en/Technical_report_3-2004_web.pdf>

Evans, J 2004, 'Transit Scheduling and Frequency', *Traveler Response to Transportation System Changes*, Transportation Research Board, Washington D.C., viewed 9 June 2006, <http://gulliver.trb.org/publications/tcrp/tcrp_rpt_95c9.pdf>

Gómez-Lobo, A. 2006, *Why competition does not work in urban bus markets: some new wheels for some old ideas*, University of Chile, viewed 20 June 2006, <<http://www.bcentral.cl/esp/estpub/seminarios/pdf/gomezlobo.pdf>>

Henry, L & Litman, T. 2006, *Evaluating New Start Transit Program Performance: Comparing Rail And Bus*, Victoria Transport Policy Institute, Victoria B.C., viewed 29 May 2006, <http://www.vtpi.org/bus_rail.pdf>

Houlihan, L. 2006, 'Residents dirty on tollway ramp', *Herald Sun*, 30 January, viewed 30 January 2006, <http://www.heraldsun.news.com.au/common/story_page/0,5478,17974762%255E2862,00.html>

Hughes, G 2006, *Melburnians less likely than Sydneysiders to take the morning train*, media release, AAMI, Melbourne, 6 February

Laird, P. 2006, *Submission to the Productivity Commission Inquiry into road and rail freight infrastructure pricing*, University of Wollongong, viewed 8 June 2006, <<http://www.pc.gov.au/inquiry/freight/subs/sub023.pdf>>

Lewis, D. & Williams, F.L. 1999, *Policy and Planning as Public Choice: Mass Transit in the United States*, Aldershot, Ashgate, <http://www.fta.dot.gov/transit_data_info/reports_publications/reports/2264_ENG_HTML.htm>

Litman, T. 2005a, *Appropriate Response to Rising Fuel Prices*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/fuelprice.pdf>>

Litman, T., 2005b, *Rail Transit in America: A Comprehensive Evaluation of Benefits*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/railben.pdf>>

Litman, T. 2006a, *Parking Taxes: Evaluating Options and Impacts*, Victoria Transport Policy Institute, Victoria B.C., viewed 1 June 2006, <http://www.vtpi.org/parking_tax.pdf>

Litman, T. 2006b, *Rail Transit's Impact on Traffic Congestion: A Summary of Key Research*, viewed 20 June 2006, <http://www.lightrailnow.org/features/f_lrt_2006-06a.htm>

Mees, P. 2005, *Melbourne's Future Transport Options: A report to the Melbourne City Council*, University of Melbourne, Melbourne

Mees, P., Moriarty, P., Stone, J. & Buxton, M. 2006, *Putting the public interest back into public transport*, viewed 8 June 2006, <<http://www.abp.unimelb.edu.au/features/PublicInterest.pdf>>

Millar, R 2005, '\$10bn tunnel plan a bad idea, says its creator', *The Age*, 1 September, viewed 1 September 2005, <<http://www.theage.com.au/news/national/10bn-tunnel-plan-a-bad-idea-says-its-creator/2005/08/31/1125302632676.html>>

Mitchell, G. 2006, 'Busy road hurts property investment', *Herald Sun*, 13 May, viewed 13 May 2006, <http://www.heraldsun.news.com.au/common/story_page/0,5478,19113372%25E2862,00.html>

National Emissions Trading Taskforce n.d., *National Emissions Trading Taskforce*, viewed 8 June 2006, <<http://www.emissionstrading.nsw.gov.au/>>

Newman, P. 2000, *Sustainable Transportation and Global Cities*, Murdoch University, Perth, viewed 9 June 2006, <http://www.wistp.murdoch.edu.au/publications/e_public/Case%20Studies_Asia/sustrans/sustrans.htm>

Newman, P. 2001, *Ways busways fail*, Brisbane Institute, Brisbane, viewed 2 June 2006, <http://www.brisinst.org.au/resources/newman_peter_busway.html>

Newman, P. & Kenworthy, J. 1992, *Winning Back The Cities*, Pluto Press, Leichhardt, NSW

Newstead, S.V., Cameron, M.H., Le, C.M, 2000, *Vehicle Crashworthiness and Aggressivity Ratings and Crashworthiness by Year of Vehicle Manufacture: Victoria and NSW Crashes During 1987-98, Queensland Crashes During 1991-98*, Monash University Accident Research Centre, Melbourne

PTUA 2002, *It's time to move*, Public Transport Users Association, Melbourne, viewed 8 June 2006, <<http://www.ptua.org.au/files/2002/PTUA-Its-time-to-move.pdf>>

PTUA 2005a (sub. 65), *Submission to Inquiry into Managing Transport Congestion*, Public Transport Users Association, Melbourne

PTUA 2005b, *Five Years Closer to 2020: A plan to get transport back on track*, Public Transport Users Association, Melbourne, viewed 8 June 2006, <http://www.ptua.org.au/news/2005/PTUA_Five_year_plan_20051115.pdf>

PTUA 2006a, *Road user and congestion charging*, Public Transport Users Association, Melbourne, viewed 8 June 2006, <http://www.ptua.org.au/files/2006/PTUA_paper_road_pricing.pdf>

PTUA 2006b, *Myth: Viable public transport requires high population densities*, Public Transport Users Association, Melbourne, viewed 8 June 2006, <<http://www.ptua.org.au/myths/density.shtml>>

PTUA 2006c, *Myth: No-one uses public transport, so it's pointless trying to improve it*, Public Transport Users Association, Melbourne, viewed 18 June 2006, <<http://www.ptua.org.au/myths/nouse.shtml>>

PTUA 2006d, *Myth: Freeways relieve traffic congestion*, Public Transport Users Association, Melbourne, viewed 18 June 2006, <<http://www.ptua.org.au/myths/congestion.shtml>>

PTUA & EV 2006, *Submission to the Inquiry into Australia's future oil supply and alternative transport fuels*, Public Transport Users Association & Environment Victoria, Melbourne, viewed 8 June 2006, <http://www.aph.gov.au/Senate/committee/rrat_ctte/oil_supply/submissions/sub100.pdf>

Russell, EW 1991, *On the Right Track... Freeways or Better Public Transport for Melbourne's East?*, Report to the Victorian Minister of Transport, Hon Peter Spyker MP, of the Eastern Corridor Transport Options Study, Melbourne

Samuels, T. 1997, *Implications of Reduced Traffic Speeds on the Urban Environment*, viewed 26 April 2006, <<http://www.walkablestreets.com/speed.htm>>

Scheurer, J., Kenworthy, J. & Newman, P., 2005a, *Most Liveable and Best Connected*, Metropolitan Transport Forum, Melbourne, viewed 29 May 2006, <http://www.mtf.org.au/n/resources/presentations_from_mtf_report_launch_8th_november_.html>

Scheurer, J., Kenworthy, J. & Newman, P., 2005b, *Melbourne's Future Transport Options*, A review for the City of Melbourne, Melbourne

Schley, F 2001, *Urban Transport Strategic Review: Experiences from Germany and Zurich*, Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn, viewed 8 June 2006, <[http://wbln0018.worldbank.org/transport/utsr.nsf/5d346125687632dc8525684d006437be/460f9ad574b73beb85256a3800406eb5/\\$FILE/gtz_report.pdf](http://wbln0018.worldbank.org/transport/utsr.nsf/5d346125687632dc8525684d006437be/460f9ad574b73beb85256a3800406eb5/$FILE/gtz_report.pdf)>

Taylor, L, 2006, 'Howard's hot air ignites carbon debate', *The Australian Financial Review*, 9-12 June 2006, p. 44

Tucker, R. 2003, 'Road uncertainty triggers tempers', *Geelong Advertiser*, 16 September, viewed 16 September 2003, <<http://www.geelonginfo.com/readarticle.asp?articleid=8676>>

You am I, 1996, 'Soldiers', *Hourly Daily*, MMA Music

VACC, 2005, *VACC Five Point Safety Inspections Report*, Victorian Automobile Chamber of Commerce, Melbourne, viewed 2 June 2006, <<http://www.motor.net.au/VACC/Media/SurveysAndResearch/3ef90a45%2D1f7f%2D4d9e%2D9e9c%2D73c616f94dc4/FPSI%20Report%20January%202005.pdf>>

VCEC 2006, *Making the right choices: options for managing transport congestion*, draft report, April

VicHealth n.d., *Walking School Bus*, VicHealth, viewed 19 June 2006, <<http://www.vichealth.vic.gov.au/Content.aspx?topicID=23>>

VicRoads 2005, *Traffic System Performance Monitoring 2004/05*, viewed 2 June 2006, <<http://www.vicroads.vic.gov.au/vrpdf/trum/vrpin01551.pdf>>

VTPI 2005a, *Transportation Elasticities*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/tdm/tdm11.htm>>

VTPI 2005b, *Guaranteed Ride Home*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/tdm/tdm18.htm>>

VTPI 2006a, *Least-Cost Transportation Planning*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/tdm/tdm21.htm>>

VTPI 2006b, *Distance-Based Pricing*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/tdm/tdm10.htm>>

VTPI 2006c, *Road Pricing*, Victoria Transport Policy Institute, Victoria B.C., viewed 2 June 2006, <<http://www.vtpi.org/tdm/tdm35.htm>>

WS Atkins Transport Planning 2001, *Study of European Best Practice in the Delivery of Integrated Transport: Summary Report*, WS Atkins Transport Planning, Epsom, viewed 8 June 2006, <<http://www.cfit.gov.uk/docs/2001/ebp/ebp/exec/pdf/exec.pdf>>