Public Cover Sheet

Inquiry into Managing Transport Congestion

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Attachment 1: Five Years Closer to 2020

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Inquiry into Managing Transport Congestion in Victoria

Submission from

PTUA

PUBLIC TRANSPORT USERS ASSOCIATION

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1. The nature and incidence of transport congestion

1.1 The concept and cost of congestion

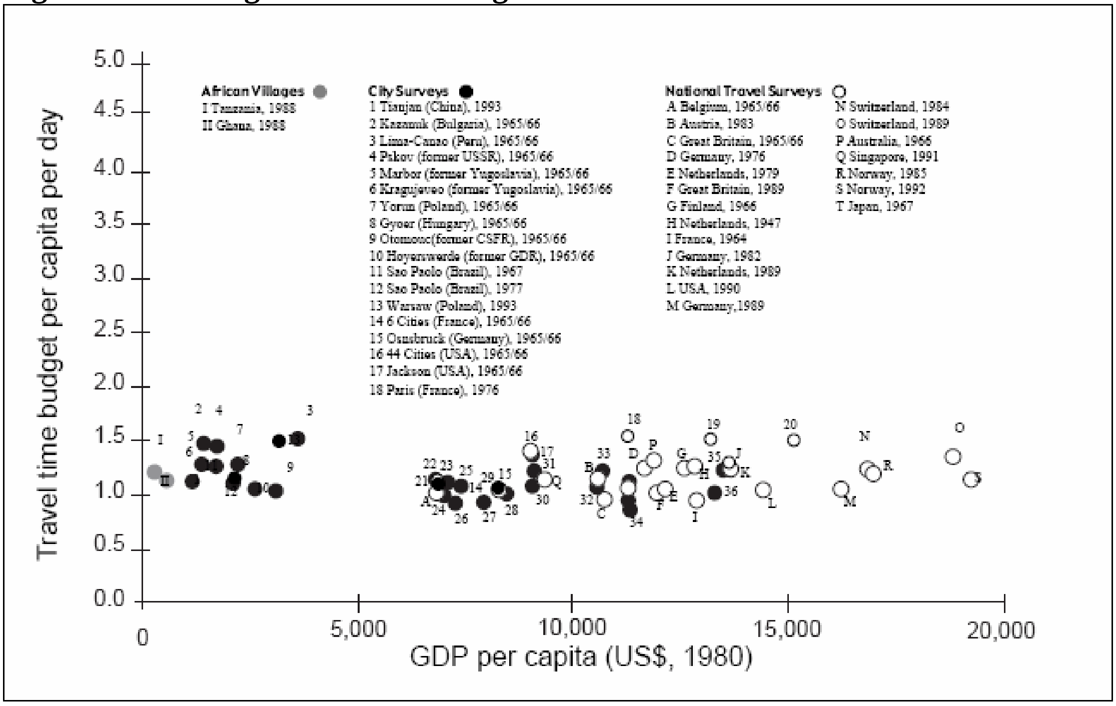
No one would deny that travelling in heavy traffic can be frustrating. Compared to unimpeded progress along an otherwise empty road, driving along a heavily congested road can be slow and result in greater wear and tear on machine and human nerves alike. The valuation of such congestion, however, and the appropriate response are more problematic. Organisations such as the BTRE have suggested that congestion currently costs the Australian economy in excess of $12 billion per annum, and that this figure is likely to reach $30 billion by 2015. On the other hand, the very concept of congestion costs has been questioned by leading international transport specialists:

> “The costs of congestion are measured from the difference in journey time under 'ideal' conditions and in reality.... The definition [of 'ideal'] chosen is that condition where the driver is unimpeded by any other driver, in effect where [s]he is travelling in the dead of night (say 3am)....These are patently absurd conditions....The cost of congestion is therefore an invalid concept in an urban area.”
> M.J. Mogridge, Transport Studies Group, University College London, 1990

> “I have to say I cannot endorse statements of the form congestion costs the economy £15 billion a year, updated from time to time by inflation, implying an annual dividend of £1000 waiting to be distributed to each family. This is a convenient, consensual fiction. It is calculated by comparing the time spent in traffic now, with the reduced time that would apply if the same volume of traffic was all travelling at free flow speed, and then giving all these notional time savings the same cash value that we currently apply to the odd minutes saved by transport improvements. This is a pure, internally inconsistent, notion that can never exist in the real world. (If all traffic travelled at free flow speed, we can be quite certain that there would be more of it, at least part of the time saved would be spent on further travel, and further changes would be triggered whose value is an unexplored quantity). It is a precise answer to a phantom question.”
> P.B. Goodwin, Professor of Transport Policy, University College London, 1997

The final point made by Goodwin is important to note. As shown in Figure 1.1, research into travel behaviour shows that individuals right around the world tend to structure their living, work and transport arrangements such that travel times average about 75 minutes per day, including about an hour travelling to and from work (Levinson & Kumar 1995; Schafer 1997; Lawton 2001; Zeibots 2003).

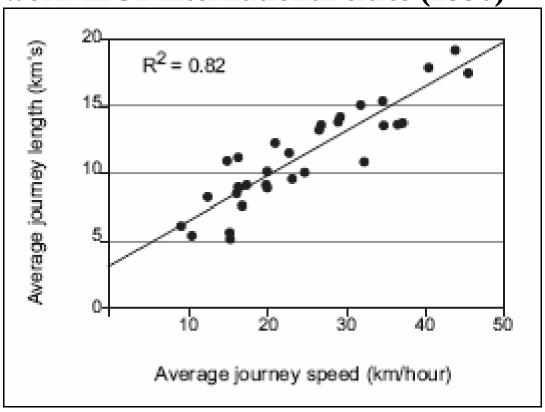
Figure 1.1: Average travel time budgets in a selection of international locations



Source: Schafer 1998 cited in Zeibots 2003

This phenomenon is known as *travel time budget constancy*. As travel speeds increase, the amount and distance of travel also increases to maintain this time allocation, as shown in Figure 1.2 below. Consequently, attempts to make journeys faster have invariably resulted in a rebound effect of more travel by more people, with little or no net reduction in time lost to congestion or time spent travelling. Hence any attempts to put a value on time saved through increasing average vehicle speeds must recognise that this time saving is likely to be transitory.

Figure 1.2: Average journey length vs. average journey speed for the journey-to-work in 31 international cities (1990)



Source: Kenworthy et al 1999 cited in Zeibots 2003

1.2 Types of congestion

Transport congestion can be distilled into two sub-components - vehicle congestion and passenger congestion. Vehicle congestion occurs where too many vehicles attempt to travel within a corridor relative to the corridor's capacity. Passenger congestion occurs where passenger numbers reach or surpass the capacity of the vehicle/s or interchange points such as railway stations. For example, if a single train ran between points A and C encountering no other vehicles, there would appear to be no congestion. If, however, the train was overloaded upon leaving point A and was unable to take on more passengers at point B along the way, there would clearly be passenger congestion.

Whilst much of Melbourne's transport system appears to suffer from severe congestion at peak times, this is predominantly congestion of vehicles with very low occupancy rates – largely single occupant cars (e.g. Whelan, Diamantopoulou, Senserrick & Cameron 2003). From this perspective passenger congestion is negligible and there is very inefficient utilisation of the space along the corridor. To carry 50,000 people per hour in each direction by car, a road would need to be 20 times wider than a railway with the same capacity (UITP 2001). A pedestrian requires 0.8m^2 of footpath, a cyclist 2m^2 of pavement and a car travelling at walking speed requires 20m^2 of road. At 40km/h a car's space requirement triples to 60m^2 (Tolley 2003; Bargwanna & Mason 2001).

Overall congestion could be significantly reduced by carrying the same number of passengers in a smaller number of vehicles with higher occupancy rates. Essentially this is the objective of public transport – less vehicles than would exist if passengers travelled by private car, but with more passengers in each vehicle.

In other words, Melbourne does not have a congestion problem on its roads; it has a problem with low vehicle occupancy levels that needs to be addressed by making high capacity vehicles - trains, trams and buses - more attractive to the occupants of private cars.

1.3 Free flowing traffic is not a panacea

A number of statements in the Treasurer's media release announcing the inquiry reflect common misconceptions about congestion. For instance:

- "congestion increasing the risk of accidents resulting in higher insurance premiums for business and households";
- "stop start driving increases carbon dioxide emissions which contributes to increasing pollution levels in cities".

1.3.1 Congestion and traffic crashes

Whilst it is possible for a reduction in congestion to reduce the frequency of crashes in terms of incidents per kilometre, congestion reduction induces additional travel, thus increasing the overall risk of incidents. As shown in Figures 1.3 and 1.4 below, the risk of death and injury is much higher for occupants of cars than for public transport users, hence any actions that generate additional car journeys (whether new journeys or a mode shift from public transport) will increase the risk to road users.

Figure 1.3

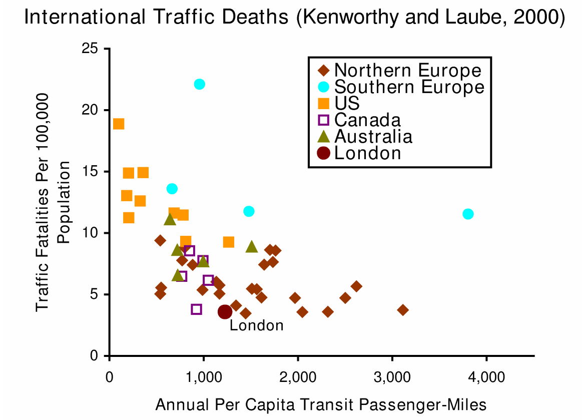
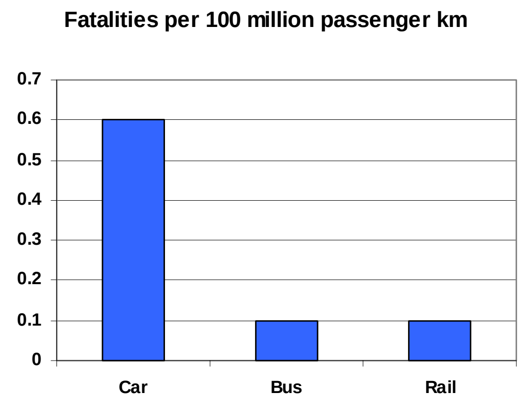


Figure 1.4



Note: As the role of public transport increases, shown by increasing transit passenger miles along the bottom of Figure 1.3, traffic fatalities decrease. This should not be surprising given the much lower rate of fatalities shown for public transport in Figure 1.4.

Furthermore, congestion reduction strategies generally increase average vehicle speeds (Noland, 2001), which tends to increase both the frequency and severity of crashes (Leaf and Preusser, 1998; Stuster and Zail Coffman, 1998; Elvik, 2001; Gårder, 2004; Ginsberg, et al, 2003).

Reductions of between 1.4 per cent and 1.8 per cent in incident claim costs can be expected from each 1 per cent reduction in vehicle kilometres travelled (Litman & Fitzroy 2005). Thus the objectives of reducing traffic crashes, property damage and associated trauma are better served by reducing and calming motor vehicle travel rather than facilitating motor vehicle travel or undertaking measures that induce additional vehicle kilometres. As shown in Table 1.1 below, the impact of congestion pricing on crash incidence is ambiguous, whilst measures that achieve a reduction in overall vehicle use or a switch to public transport can provide large safety benefits.

Table 1.1: Safety impacts of transport management measures

Measures	Travel changes	Safety Impacts
Pricing reforms (road pricing, parking pricing, increased fuel taxes, etc.).	Reduces vehicle mileage.	Moderate to large safety benefits. Vehicle mileage reductions generally cause proportional or greater reductions in total crash damages.
PAYD Insurance.	Reduces mileage in proportion to motorist risk class.	Large potential safety benefits. Reduces total traffic and gives high-risk motorists an extra incentive to reduce mileage.
Transit Improvements, HOV Priority, Park & Ride	Shifts automobile travel to transit	Moderate to large safety benefits. Shifts from automobile to transit reduce crash rates, and additional benefits are possible if major transit improvements provide a catalyst for less automobile-dependent land use patterns.
Ridesharing, HOV Priority	Shifts to single occupant travel to ridesharing	Moderate safety benefits. Increases safety due to reduced vehicle traffic, but crashes that occur may involve more victims.
Walking and Cycling Improvements, Traffic Calming	Shifts motorized travel to nonmotorized modes	Mixed safety impacts. Can increase per-mile risk to people who shift, but reduces risk to other road users, reduces total person-miles, increases driver caution, and can provide significant health benefits.

Telework, Delivery Services	Reduces total vehicle travel	Modest safety benefits. Reduced vehicle mileage reduces crashes some benefits may be offset by rebound effects.
Flextime, Congestion Pricing	Shifts travel from peak to off-peak	Mixed. Reducing congestion tends to reduce crashes, but increased speed increases crash severity.
Traffic Calming, Speed Enforcement	Reduces traffic speeds	Large safety benefits where applied. Increases safety by reducing crash frequency and severity, and reducing total vehicle mileage.
Land use management (Smart Growth, New Urbanism, etc.)	Reduces per capita vehicle travel and traffic speeds.	Large safety benefits. Increases safety by reducing per capita vehicle travel. Increases congestion, which increases crash frequency but reduces crash severity.
Time and location driving restrictions.	Vehicle Use Restrictions	Mixed. May shift vehicle travel to other times and routes, providing no safety benefit.

Source: Litman & Fitzroy 2005, p.28

1.3.2 Congestion, pollution and fuel consumption

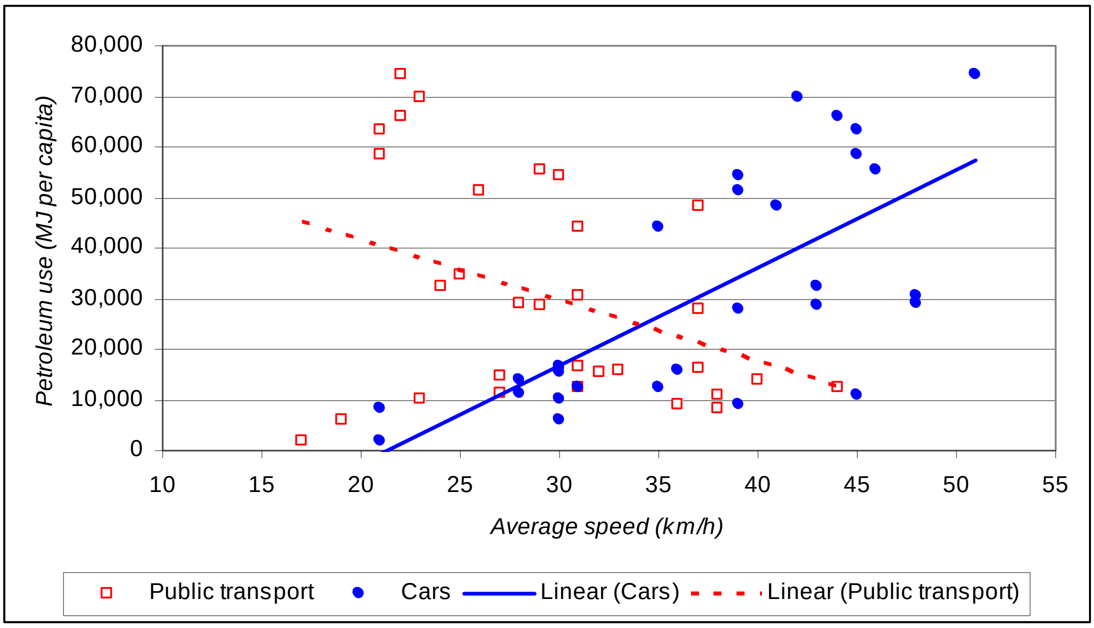
Many cars consume less fuel and produce less pollution per kilometre when driven in free flowing conditions compared to when they are driven in stop-start traffic conditions. This relationship is frequently used as a rationale for increasing road capacity in the hope of freeing cars from slow, congested traffic. This leap of logic overlooks the rebound effect mentioned above that ensures congestion returns and reverses any short-term gains in individual vehicle efficiency. As discussed above, congestion reduction tends to increase average vehicle speeds (Noland *op cit*) and higher average speeds lead to additional travel (Kenworthy *et al* 1999).

Secondly, the proponents of road-based supply-side measures rarely point out that cities with higher roadway provision and higher average vehicle speeds consume much more energy and create much more overall pollution due to the subsequent greater motor vehicle use and longer distances travelled. Studies of major cities in North America, Europe and Asia demonstrate a significant relationship between road provision and vehicle speed on the one hand and fuel consumption and aggregate air pollution on the other.

> "In other words higher average traffic speed appears to spread the city, creating lower density land use, a greater need for cars, longer travel distances and reduced use of less polluting or pollution-free modes. The benefits gained in terms of less polluting traffic streams appear to be overwhelmed by the sheer amount of extra travel and the resulting bulk of emissions."
> Newman and Kenworthy 1989, p. 157

Newman & Kenworthy (1989) compiled an extensive sourcebook of transport data from major cities around the world. As illustrated in figure 1.5 below, this data clearly show that higher average car speeds leads to increased fuel use – induced traffic in action. Conversely higher average public transport speeds leads to lower per capita petroleum use, reflecting greater ability to attract passengers onto these more energy efficient modes.

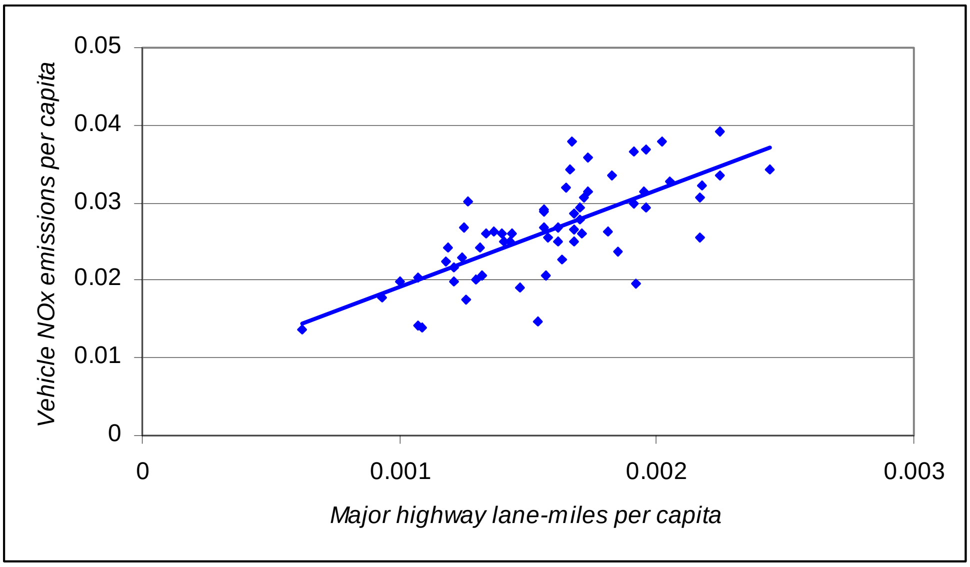
Figure 1.5: Average transport speeds and fuel use



Source: Newman & Kenworthy 1989

Similar findings emerge in a study of highway provision and pollution in the United States. For example, emissions of oxides of nitrogen, which include powerful contributors to greenhouse emissions and respiratory illnesses, are strongly related to increasing roadway capacity, as shown in Figure 1.6.

Figure 1.6: NOx emissions and highway provision



Source: Environment California, 2004

1.4 Congestion in Melbourne

1.4.1 Congestion pinch-points

Vehicle congestion on Melbourne's road network is frequently most severe where mass transit alternatives are least developed and overall vehicle occupancy rates in the corridor are typically low as a consequence. For example:

- The Eastern Freeway and inner north suffer from excess vehicle movements due to the absence of a heavy rail link to East Doncaster;
- Congestion along the Monash corridor is exacerbated by the absence of a heavy rail service to Rowville, poor frequencies on the Glen Waverley line and passenger congestion on the Dandenong line (see below regarding line capacity);
- The Westgate corridor is under great pressure at peak times due to very poor frequencies on train services to the western suburbs and Geelong and connecting services; and
- The Calder and Tullamarine corridors are suffering due to poor service frequencies on existing lines and the absence of suburban rail services to Sunbury.

Conversely, many public transport vehicles suffer from passenger congestion. This is particularly acute in the following circumstances:

- three carriage trains are used instead of six carriage trains;
- poor frequencies cram passengers into a limited number of services; and
- poor reliability forces additional passengers onto the services that do run.

1.4.2 Rail capacity

Higher train frequencies would ease passenger congestion on the public transport system and make it more attractive to motorists, thus easing vehicle congestion on the road network. In response to calls for higher service frequencies, the Department of Infrastructure (DoI) claims that our urban rail system is 'at capacity' and cannot support additional peak services unless we spend hundreds of millions of dollars building additional tracks. We acknowledge that higher frequencies and reliability would be aided by duplication of the remaining single-track sections on the Werribee, Epping, Hurstbridge, Lilydale, Belgrave and Cranbourne lines, most of which are quite short and could be duplicated for relatively little cost. On the other hand, we are concerned that DoI appears to be solely focussed on a third track to Dandenong, involving high costs but relatively little benefit (and none whatsoever outside peak hour).

We do not believe that the bulk of claims about capacity constraints stand up to closer scrutiny. The map at Attachment A was prepared for the 1929 Melbourne Town Plan, at a time when train patronage was higher than it is now, despite the population being smaller. Shown next to each line are the peak and off-peak train frequencies (for metro services only; some lines also carry country services but these are not counted in the frequencies shown).

A number of important facts can be read off this map. Note first that even in 1929 trains ran as frequently as every three minutes to Clifton Hill, Brighton Beach and Box Hill - all on double-track lines (the third track to Box Hill came much later). It is also evident from the difference between peak and off-peak frequencies that journeys were just as concentrated in peak periods as they are now (largely because most non-work journeys were made on foot or by bicycle). This refutes the argument that our supposed capacity problems stem from a need to carry more people in peak periods than in earlier times.

The frequencies shown on the map were those achievable with 1920s-vintage signalling and manual crossing gates. Since then, all lines have been upgraded with improved signalling (the last one was the Upfield line in 1997). This should allow trains to run better than every three minutes on all but the few remaining single-track sections, even if we cannot quite achieve the 60-second headways of the London Underground or the 30-second headways of the Paris Metro.

Not only did trains run much more frequently in the past: they also carried many more passengers. Back in 1929, the Sandringham line carried 30 million passengers, a fact proudly noted in that year by *Bradshaw's Guide to Victoria*. This compares with just 6 million passengers in 1991, and around 8 million today. According to government figures, the number of trips on the entire Melbourne train network in 2003-04 was 135 million - less than five times the patronage on just one line in 1929.

Based on the system-wide figures above, Melburnians made on average about 37 train trips each in 2003-04. In 1950 the equivalent figure was 157 train trips per person. Of course, the population in Melbourne was only 1.3 million in 1950 compared with some 3.6 million now, but that still means that in 1950 the rail system carried 204 million passengers - more than 50 per cent more than it does now. And it did so without any of the infrastructure improvements that have been built since 1950, including the City Loop, the expansion from 6 to 10 platforms at Richmond, and quite a few third tracks (such as that between Caulfield and Moorabbin on the Frankston line, built in the 1970s).

The City Loop itself was originally planned on the basis that CBD trips by train would increase to 176,000 per day and require 181 incoming suburban trains between 8am and 9am, compared with 108 peak hour trains in 1964. Yet 2005 Connex timetables show only 87 incoming trains between 8am and 9am, less even than in 1964. On the Dandenong line alone, peak hour throughput has dropped from 13 trains (11 suburban, 2 country) in 1970 to 11 trains (10 suburban, 1 country) in 2005 (Mees 2005).

So we are currently running at only 48 per cent of the capacity the 1960s rail engineers had in mind when they designed the City Loop. (The main reason is that operators now insist on running nearly every train through the loop, rather than running half the trains directly to Flinders Street as was originally planned.)

There remains one semi-legitimate objection, and that has to do with express running. Expresses have been used on Melbourne's train network since the 19th century, and *Bradshaw's* assures us that peak-hour expresses were certainly used on the Sandringham line in 1929. But as soon as one mixes express trains and stopping trains on the same track, extra space has to be allowed in front of the express train, otherwise it catches up with the stopping train and gets slowed down.

The map at Attachment A shows that even with expresses, the Sandringham line managed 3-minute frequencies in 1929. But the Dandenong line is longer than the Sandringham line, hence the ongoing claims that this line cannot sustain a mixture of express and stopping trains at nearly the same capacity without a separate track for the express trains.

However, the reduction in capacity depends on how long the express runs are. An express run from Caulfield to Oakleigh shortens travel time by three minutes, so requires an additional three-minute gap between it and the previous stopping train. An express run from Caulfield to Dandenong, on the other hand, requires an eleven-minute gap. If such 'super expresses' were commonplace, it would be impossible, without a third track, to maintain a high frequency while also serving intermediate destinations.

There are, however, many ways of arranging train stopping patterns so that passengers benefit from express running but capacity is not jeopardised. In Perth, for example, trains on the Northern Suburbs line alternate between two different express patterns, which together ensure that all stations are covered. There are 16 trains per hour on the Northern Suburbs line (compared with the Dandenong line's 'congested' 10 trains per hour), and planners there are confident that even more capacity is available. Building entire new tracks is just one of many possible ways to fit in more trains, incurring the highest cost but requiring the least planning effort.

Transport planner Vukan Vuchic (2005) notes that three-track lines are rare internationally because they offer little flexibility relative to their cost. The scheduling methods described in this same textbook can be applied to the Dandenong line to achieve capacities of 20 trains per hour, close to the theoretical maximum of 24 per hour allowed by Melbourne's signalling system.

Other international examples provide evidence of higher service levels using comparable infrastructure:

- In Japan, planners face the exact same problem of operating double-track 'main lines' with a mixture of stopping trains, expresses, long-distance services and freight. The minimum performance benchmark there is 15 trains per hour each way (or one train every four minutes). This applies regardless of the service mix; but if one particular kind of service predominates, then planners expect to be able to run even more trains;
- The busiest subway line in Rome (an ordinary two-track railway much like ours, only underground), carries 500,000 passengers a day. This is equal to the number the entire Melbourne rail system carries in a day. On the day of the Pope's funeral, this one Italian train line carried one million passengers;
- Vancouver recently built a light rail line (that is, a tram, not a train) to a part of the city that was thought not to have enough patronage to justify another Skytrain service. Sure enough they are somewhat disappointed with patronage on the line, because it's carrying 'only' 100,000 passengers a day - nearly twice as many as the Dandenong line.

In conclusion, if there really is money available to spend on new tracks, the priority should be:

- the remaining single-track sections in the network, which make the provision of reliable high-frequency services difficult to impossible whether inside or outside peak hour; and
- network extensions to areas that currently have no train services at all, no matter how fast or frequent.

Once the real bottlenecks have been fixed it may then be appropriate to consider additional tracks for 'super expresses', which are in any case only useful in peak hour and then only for central-city commuters.

The effective capacity of the public transport system, as well as its attractiveness to current motorists and ability to withstand service disruptions, would be increased by working towards an enhanced network effect. For example, many tram routes currently stop short of train stations by only a few hundred metres. Undertaking a program of modest tram extensions would enable better integration across modes and allow passengers to permeate across a broader range of routes rather than concentrate in a small number of crowded services. See Attachment B for examples of how the current system is hampering a true network effect, and therefore is channelling passengers onto crowded services.

1.5 Congestion in Geelong

Only ten years ago, in the name of easing traffic congestion, LaTrobe Terrace, on the fringes of the CBD, became part of the Princes Highway, through the construction of a rail overbridge at the northern end and a bridge over the Barwon River at the southern end.

LaTrobe Terrace rapidly became a traffic sewer, and within a few years moves began to solve the "traffic woes" by constructing a Geelong Bypass. Yet VicRoads surveys have found that 80 per cent of LaTrobe Terrace traffic is headed for destinations within Geelong.

VicRoads has further confirmed the ineffectiveness of the Geelong Bypass in that preliminary traffic modelling work undertaken for the Bypass indicates that "the natural growth of traffic (approx 2 per cent per annum) … is expected to result in traffic volumes [in LaTrobe Terrace] … returning to their pre-Bypass volumes in a relatively short period of time".

In fact, traffic in Latrobe Terrace flows smoothly most of the time, apart from relatively short morning and evening peaks, and peak holiday travel times when cars head for coastal resorts.

Greater patronage of Geelong's bus system, which could reduce traffic volumes, is held back by low service frequency, limited operating hours, and poor connections with other routes and transport modes.

1.6. Congestion at key modal and inter-modal freight transport facility interfaces

In addition to the gaps in the rail network identified above, the absence of a train service to Melbourne International Airport marks the city out as a relatively unsophisticated player on the global stage. Any serious attempt to address congestion along the Tullamarine corridor and feeder routes must incorporate a rail link to the airport that is properly integrated into the broader suburban network.

In this context, it is worth noting that provisions in agreements for the construction or funding of road infrastructure are an impediment to proper management of congestion if they have the effect of inhibiting competing rail services or demand management measures. Such provisions should not be allowed in any contracts entered into by the government. It should also be emphasised that passenger rail services to Melbourne Airport are not prevented under the agreement entered into with CityLink.

2. Impact on businesses and supply chain efficiency

Across all times of the day where congestion is a problem, the vast majority of vehicles on the road are low-occupancy private cars. If all private motor vehicle journeys were somehow removed from the system, the released road capacity could accommodate existing freight and business transport movements many times over. For example, a review of the Eastern Freeway by transport academic Professor Bill Russell found relatively little interference to road freight outside peak hours and that freight formed a minority of traffic on the freeway.

The dominance of private motor cars on Melbourne's roads was also recognised in the Environmental Effects Statement for the Scoresby Freeway (now Eastlink). The most commonly proposed transport improvement suggested by businesses in the corridor was better public transport, as shown in Table 2.1 below.

Table 2.1: Passenger transport solutions suggested by local business

Proposal	**Responses**
Scoresby Freeway	3
Better public transport	27
Local road improvements	11
Other	3
No suggestions	28
Total surveyed	**72**

Source: Scoresby Freeway EES, Supplement G, p.39

There are two key elements required to ensure efficient supply chains within Victoria:
- removing any physical or institutional barriers to increased use of rail freight; and
- providing alternative means of mobility that are able to attract at least a modest proportion of motorists away from low occupancy private motor vehicles.

As well as ensuring efficiency in a strict logistical sense, these approaches would also achieve greater energy efficiency in a time when high oil prices are simultaneously adding to production and distribution costs and eating into household disposable income.

3. Regulatory and institutional barriers

3.1 Getting the prices right impossible if comparing apples with oranges

A number of inconsistencies distort the reality of transport policy, including negative externalities and government accounting practices.

3.1.1. Capital Asset Charge

Roads are the only form of economic infrastructure exempted from the State Government's Capital Asset Charge (CAC). The rationale that applies CAC to rail and other infrastructure should see it applied also to roads, e.g.:

- full recognition of the cost of providing transport services; and
- encouragement of efficient use of government resources.

This discrepancy runs counter to the concept of competitive neutrality and ensures that comparisons between public transport expenditure and spending on roads are frequently misleading. Since the principles underlying CAC apply equally to capital allocated to roads, this distortion should be eliminated by either imposing CAC on roads and/or exempting public transport assets.

3.2 Eliminating the road deficit

A frequent complaint from the road lobby is that road spending is less than the various forms of revenue that the three tiers of government receive from motorists. We believe it would be no more appropriate to hypothecate these revenues towards road spending than to direct the proceeds of tobacco excise towards supplying cigarettes to school students. Nevertheless, any comparison of revenues and expenditure attributable to roads and road users must consider the full range of direct and indirect costs and externalities.

To the extent that the total value of costs and externalities exceed revenue from motorists, this gap represents a subsidy to road users that is commonly referred to as the *road deficit*. The existence of the road deficit results in a massive misallocation of resources and therefore is a major institutional barrier to reducing congestion, pollution, greenhouse emissions and road crashes.

Precise valuation of the road deficit is difficult, however estimates range up into the tens of billions of dollars per annum. Key components of the road deficit are discussed below.

Table 3.1: Costs included in the road deficit

Item	**($ million)**
Road construction and maintenance	8,500
Land use cost	6,000
Road crashes	15,000
Noise	700
Urban air pollution	4,300
Greenhouse emissions	2,200
Tax concessions	4,200
Queensland fuel subsidy	500
Total	**41,400**

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

3.2.1 Land use

The value of land under roads in Australia was estimated at around $100-120 billion in 1996 (NIEIR 1996). Adjusting these figures for inflation (but not adding roads built since 1996) suggests a current value in the range $124-149 billion. Indexation in line with house prices would suggest a land value around $222-267 billion. Based on these values and a required rate of return of 5 per cent, Australian road users should now be paying between $6 billion and $13 billion per annum for the use of this land.

3.2.2 Road trauma

Traffic crashes kill nearly 2,000 Australians each year and hospitalise over 20,000 (ABS 2001). The human cost of these crashes (i.e. not counting property damage, traffic delays, etc) is in excess of $8 billion per annum (BTRE 2000). When other costs such as property damage and emergency services are also included, the costs rise to around $15 billion per annum in 1996 dollars (approximately $18.6 billion in 2005 dollars).

3.2.3 Indirect health costs

Car-dependency is recognised as a factor in a wide range of lifestyle illnesses such as obesity, diabetes and various diseases of the cardio-pulmonary and skeletal systems.

> "Cars make us sick, sad and dead - how cars are managed is critical to public health - and much more important than we previously realised - we need to repopulate the streets. Car centred suburbs are 'obesogenic' (fattening) and foster depression and isolation by discouraging social interaction, walking and cycling."
> Dr Rob Moodie, Chief Executive Officer, VicHealth. Presentation to Planning Institute of Australia, 2003.

Table 3.2 summarises the costs of a number of illnesses associated with car dependency.

Table 3.2: Cost of selected ailments influenced by transport and activity patterns

Ailment	**Annual cost ($)**
Obesity	1.5 billion
Diabetes	3 billion
Heart disease	3.9 billion
Respiratory disease	18 billion
Cancer	0.5 billion
Arthritis	9 billion
Osteoporosis	2 billion
Dementia	6.6 billion
Depression	15.5 billion
Total	**$60 billion**

Source: PTUA 2004

While car-dependent transport patterns are not totally responsible for these problems, greater focus on public and active transport could save hundreds of millions of dollars per annum (e.g. Owen 1999 cited in Stone 1999; Stephenson, Bauman, Armstrong, Smith & Bellew 2000).

3.2.4 Air, noise and water pollution

Motor vehicles are the dominant producers of urban air and noise pollution, including carbon monoxide, oxides of nitrogen, and airborne particulates. These pollutants are key factors in many respiratory ailments such as asthma as well as "a range of [other] human health effects, from headaches and eye irritation to cancer" (Chertok, Voukelatos, Sheppeard & Rissel 2004).

More broadly, deaths attributable to air pollution in Australia number more than traffic crashes, however they receive comparatively little publicity. The health impacts have been estimated at around $18 billion per annum, with over $4 billion of this directly attributable to road transport.

Motor vehicle ownership and usage generates significant levels of pollutants including oil and petrol leakages, detergents and brake-pad residues. Catering for car usage increases the amount of land covered by impervious surfaces and concentrates run-off, thus increasing flooding in built-up areas and pollution in water courses such as the Yarra River.

3.2.5 Greenhouse emissions

The transport sector is one of the largest and fastest growing emitters of greenhouse gases in Victoria, and over 90 per cent of Australia's transport-related emissions come from cars, trucks and aircraft. Based on a conservative cost of $40 per tonne of CO_2 equivalent, the short-term marginal costs of greenhouse emissions from the Australian transport sector total around $2.2 billion per annum.

3.2.6 Barrier effect

High capacity roads tend to carry higher volumes of traffic and create a more significant barrier between each side of the road. These barriers cause delays for people and other vehicles, especially pedestrians and cyclists, and detract from the amenity of the local area.

3.2.7 Perverse incentives in the tax system

The Australian tax system provides a range of generous tax deductions and concessions for motor vehicle use that are not available to public transport or active transport. As a result, transport decisions are biased towards motor vehicle use at the expense of more space and energy efficient modes. For example, company cars make up about 40 per cent of peak hour traffic, despite only comprising 16.5 per cent of vehicle sales (Australasian Railway Association 2000). A more rational and economically efficient balance would be achieved by reforming the *Fringe Benefits Tax Assessment Act 1986* (Cwth) to eliminate the incentive to drive further under the Statutory Formula (s.9), and remove concessions for the provision of car parking (Div. 10A).

Land tax exemptions for roads such as CityLink distort investment decisions in favour of large scale roads that use a significant amount of land themselves and also encourage car-dependant land-use patterns. This has the effect of inducing additional traffic and congestion, as well as reducing the pool of revenue available for public transport expenditure. Distortionary subsidies to motor vehicle use should be eliminated to ensure a level playing field between transport modes.

3.3 The machinery of government is a single occupant car

Institutional arrangements within the Victorian government currently prevent integration of transport and land-use policies that would minimise congestion. The planning and transport portfolios are within separate departments under different ministers with contradictory programs. While the planning portfolio has articulated a vision of vastly improved public transport and a doubling of public transport patronage, the transport portfolio continues to prioritise additions to the capacity of the road network and refuses to commit to extending the rail network to growth areas identified within *Melbourne 2030*.

Moreover, most of the practical decisions on transport are devolved to a semi-autonomous agency called VicRoads whose *raison d'etre* is the construction and maintenance of roads and who has a track record of building to projected traffic levels rather than attempting to manage demand.

This disconnect between transport and land-use planning must be resolved by merging the planning and transport portfolios into a single department and absorbing all policy and planning functions from VicRoads. This restructure is consistent with the institutional arrangements in Western Australia and reflects the recommendations of the Infrastructure Planning Council:

> "Transport planning is a subset of the overall broader plan and a coordinated and integrated approach to transport planning is required.... The current institutional arrangements especially the separate budget for road funding and the separation of VicRoads from the other transport functions within the Department of Infrastructure, have not encouraged such a holistic view." (Infrastructure Planning Council, Final Report, September 2002)

In addition to these structural changes, careful attention must be paid to the culture of the merged entity to ensure it does not represent a "reverse take-over" by VicRoads. All policies and programs must reflect the government's goal of shifting a significant proportion of journeys onto public transport and reducing pollution and greenhouse emissions. Expenditure decisions must be based upon comprehensive cost-benefit analysis including recognition of the full impact of induced travel, the transitory nature of time savings due to travel time budget constancy and negative externalities arising from motor vehicle use.

3.4 Some commuters are more equal than others

Standard Cost-Benefit Analysis performed for infrastructure proposals tends to value projected time savings for car occupants at around the same level or higher than projected time savings for public transport passengers. This is inappropriate for two key reasons:
1. time savings for road users induce additional traffic (see section 4.1) which reverses short-term savings;
2. by using public transport, passengers are reducing road traffic and hence also saving the time of other road users (effectively a positive externality).

For example, a suburban train passenger completely removes themself from the road network, hence their time should be valued at twice that of a single occupant car whose presence on the road slows progress for other road users.

In addition to valuing travel time for public transport users more highly to reflect their contribution to reducing traffic congestion and other externalities, it is also important to recognise that waiting time has higher disutility (especially when unplanned) than travel time. Therefore waiting time savings and reliability improvements for public transport users should have an additional premium attached to them in Cost-Benefit Analysis.

4. Approaches used in other cities

No major city in the world has successfully eliminated traffic congestion. In fact, traffic congestion is more than a fact of life in large cities; it can be a sign of vibrancy that accompanies high levels of economic and social activity. It is no coincidence that some of Melbourne's most iconic streets – such as Chapel Street, Bridge Road, Brunswick Street – also experience high levels of congestion.

Congestion is also of itself a demand management technique. High levels of congestion encourage road users to change mode, journey length, time of travel and land use practices in response, thus putting a ceiling on the level of demand placed on infrastructure.

In view of this, a blinkered obsession with totally eliminating traffic congestion is probably misplaced. Nevertheless, a suite of measures can be undertaken to manage congestion whilst also minimising the rebound effect and associated increases in pollution, energy consumption and road trauma.

4.1 Road capacity expansion not the answer

The frustration felt by motorists caught in congestion leads, understandably, to frequent calls for increased road works in the hope of finally achieving an elusive "end to road congestion". Numerous studies have shown that additional road capacity[1] is quickly filled with new traffic and congestion increases to levels that existed prior to expansion with little or no net benefit for existing users (SACTRA 1994; Institution of Engineers 1990; Pfleiderer & Dieterich 1995; OECD 1995; Luk & Chung 1997; Sinclair Knight Merz 1997; Litman 2001; Zeibots 2003; Kenworthy 2003; Myer 2004; Noland 2001; Smith 2005; DoI 2005). In the face of such evidence, it is a testament to the strength of the road lobby that serious proposals to expand Melbourne's freeway system remain.

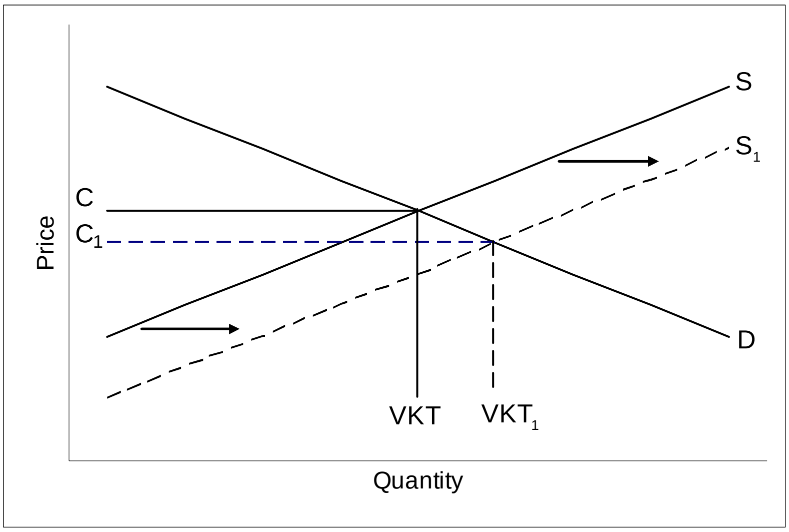
The concept of induced traffic has a very logical basis in economic theory. For many motorists, the marginal cost of driving is negligible compared to the overall cost of vehicle ownership and operation, especially where the vehicle is part of a remuneration package that benefits from the perverse subsidy embodied in the Statutory Formula under the Fringe Benefits Tax regime. Given the low marginal cost in direct financial terms, the more significant cost for motorists is frequently the disutility and loss of time resulting from driving in congestion. In other words, congestion is a price that consumers of road infrastructure pay and factor into their consumption decisions. Where this price falls, i.e. congestion is reduced, motorists will increase consumption of the service embodied in the road infrastructure and generate additional traffic which in turn restores congestion to its previous level.

Increasing the capacity of roads is analogous to shifting the supply curve which has the short-term effect of reducing congestion and hence lowering the price "paid" by road users. This change is shown by the shift of the supply curve from S to S_1 in

[1] Although the measures most commonly associated with increased capacity are new or widened roads, they can also include various Intelligent Transport Systems (ITS), traffic light synchronisation, clearways and grade separation, to name a few. Although differing in scale and cost, all such measures aimed at increasing capacity are conceptually similar when it comes to induced traffic.

Figure 4.1 below. In the short-term, the amount of travel increases from VKT to VKT_1 and the congestion "price" paid falls from C to C_1.

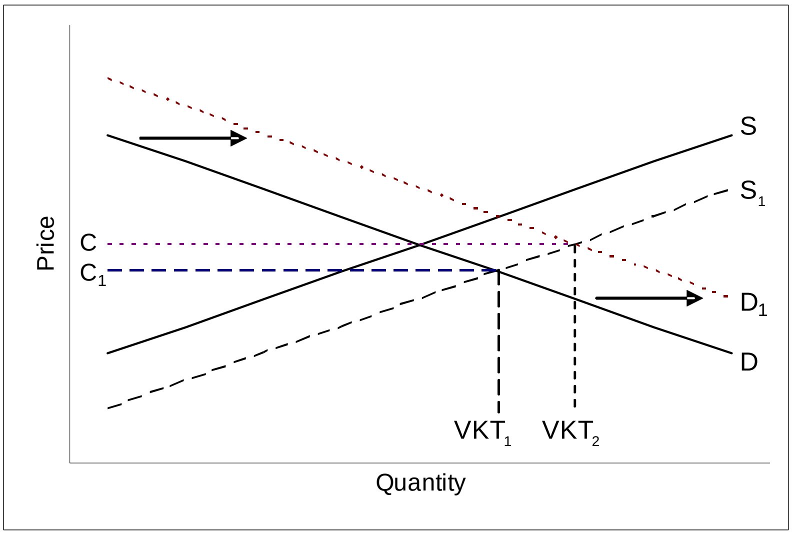
Figure 4.1: Induced travel in the short-term



Note: if road capacity is increased from S to S_1, vehicle kilometres travelled increase from VKT to VKT_1.

Some proponents of congestion reductions strategies that are based on increasing road capacity do not acknowledge the increased travel represented by the shift from VKT to VKT_1, however even this is not the end of the story. A road-based supply-side approach does nothing to change motorists' willingness to pay the "cost" of congestion. In response to the lower congestion "price" and unchanged willingness to pay, longer-term changes will also occur that have the effect of shifting the demand curve from D to D_1 as shown in Figure 4.2 below. For instance, households and businesses are likely to adopt land-use and transportation practices that generate additional vehicle kilometres (e.g. urban fringe development, adoption of car-dependent past-times, etc.). Congestion increases once again to its old equilibrium level around C as shown in Figure 4.2 below.

Figure 4.2: Induced travel in the longer-term



Note: if travel demand shifts from D to D_1, travel increases to VKT_2 and congestion rises back to C.

In addition to the above theory, a wide body of real-world research shows that the bulk of new road capacity will be absorbed by induced traffic within a few years. Numerous studies indicate that additional traffic over the longer-term will totally erase any short-term congestion reductions. Furthermore, by definition many of the additional journeys will be of marginal value and fail to compensate for the additional externalities created in the form of pollution, additional road trauma and greenhouse emissions (Litman 2005b).

As well as performing poorly at long-term congestion reduction, increasing road capacity is far from low risk. Continued growth in motor vehicle traffic is not inevitable. Growth so far has been based on a premise of free road use, generally free parking (and often mandated provision thereof[2]), cheap[3] and plentiful[4] fuel and underinvestment in public transport as an attractive alternative. Each of these four factors need not hold in the future, hence catering for car use on an increasingly larger scale is far from future-proof. There is a strong risk that investment in road capacity could be left stranded in future by demand management policies and/or rising fuel prices.

[2] Planning regulations have frequently specified minimum parking requirements which have contributed to the estimated one third of our cities' area being taken up by provision for cars.
[3] Australia's fuel excise is the 4th lowest out of the 28 countries in the OECD. http://www.dpmc.gov.au/publications/energy_future/chapter5/2_introduction.htm
[4] There is growing evidence that global oil production will peak within the next few years and then begin terminal decline. Australia's level of self-sufficiency in oil consumption is expected to decline to 20 per cent within a decade. See Box 4.1.

Box 4.1 – The end of cheap oil

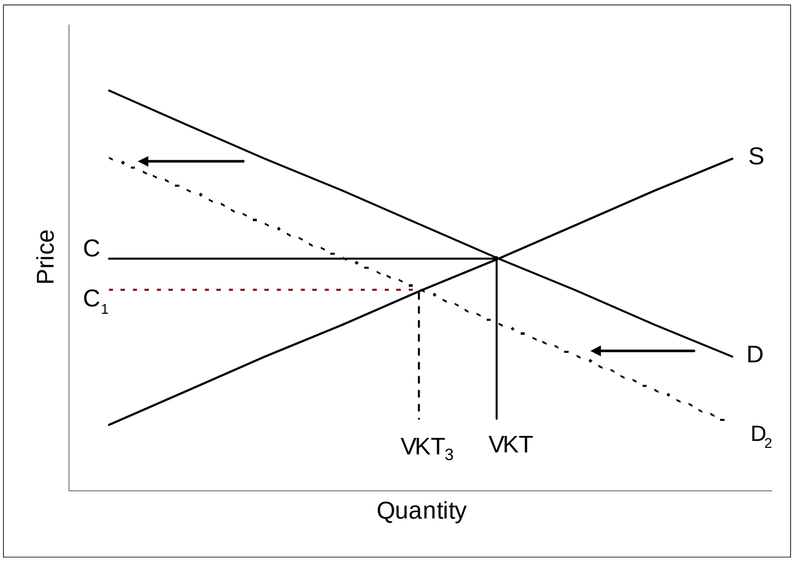
As evidenced by the high price volatility of oil, the market lacks sufficient information (i.e. reliable data on reserves) to operate efficiently in setting prices (Simmons 2005). Furthermore, the vast majority of reserves are in the politically volatile Middle East region, further increasing the risks inherent in road/car-based transport strategies. Notwithstanding market failure in supply data, even the more optimistic of credible estimates indicate that global oil production will peak relatively soon when considered against the national vehicle fleet life span (e.g. around 20 years to eliminate leaded fuel vehicles), the lifespan of transport infrastructure and the long-term impacts of land-use decisions that are currently being implemented. Government policy should encourage less car-dependent land-use patterns, energy efficiency and development of alternative sources of energy. An appropriate market signal can be supplied by maintaining a "high" price of fuel through taxation and thus help to achieve these and other goals such as fuel economy, emission reductions and congestion reduction (Litman 2005c).

***Photo:** European freeway during 1973 oil crisis. Whilst Australia was largely insulated from the 1970's oil crises by high self-sufficiency in oil production and export bans, over the coming decade domestic oil production is forecast to decline to only 20 per cent of local consumption (CSIRO) and fuel prices will more closely reflect movements in global oil prices.*

4.2 Public transport – an attractive alternative?

As long as car travel remains more attractive than public transport use, the potential of public transport to minimise congestion will not be realised. Whilst road capacity expansion was shown above to shift the supply curve in such a way as to increase vehicle kilometres travelled (VKT), improving the attractiveness of substitutes to motor vehicle travel will shift the demand curve in such a way as to reduce VKT, as shown in Figure 4.3 below.

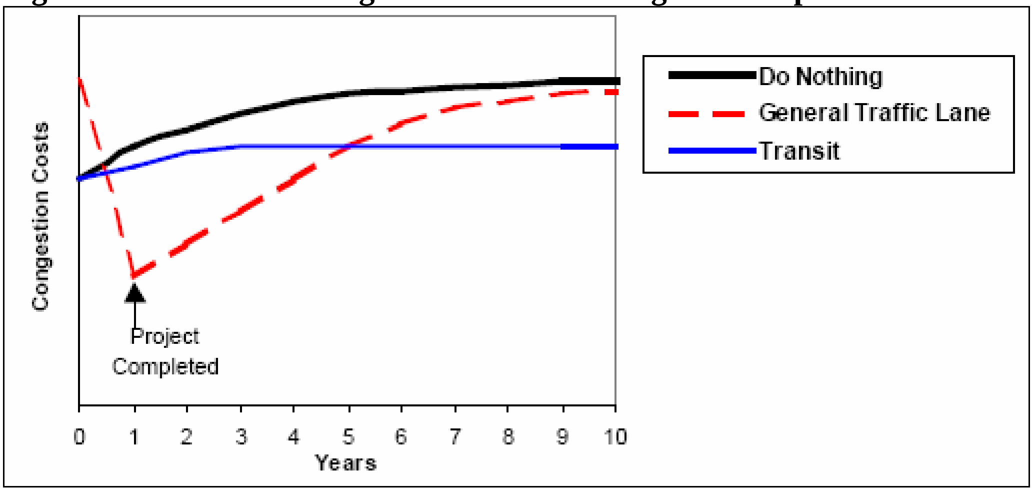
Figure 4.3: Effect on travel demand of improving substitutes to car use



Note: Improving the attractiveness of substitutes will move the demand curve from D to D_2, thus reducing the equilibrium level of congestion from C to C_1.

The shift in the demand curve reflects motorists' reduced willingness to pay the congestion "cost" and results from increasing the attractiveness of substitutes to car travel. This shift has the effect of lowering the equilibrium level of congestion relative to the base case C. This can also be contrasted with the effect on congestion levels of increasing road supply, as shown in Figure 4.4 below.

Figure 4.4: Road Widening Versus Transit Congestion Impacts



Source: Litman 2004

4.2.1 Making public transport more attractive

The most common reasons given for not using public transport in Melbourne are the lack of services in the area and the length of travel times. This is consistent with the findings of a report prepared for the Victorian Department of Infrastructure that shows commuters are willing to make the switch from cars to public transport where the services are:

- extensive in coverage,

- frequent,
- reliable,
- well publicised, and
- well integrated.

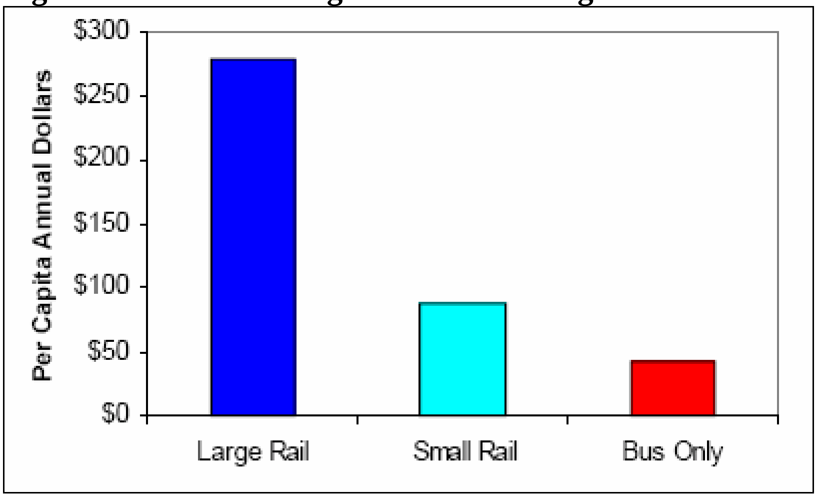
(Booz, Allen & Hamilton, 2001)

The fact that Melbourne's public transport system meets few, if any, of these criteria is demonstrated by its low patronage among choice passengers. It is also no coincidence that the PTUA has focussed on these issues in our five year plan for Melbourne's public transport system (PTUA 2005).

4.2.2 The case for trains

Although there seems to be a general link between city size and traffic congestion, this link appears to be weaker in cities where rail-based public transport is a major part of the transport system. An annual study of US cities (TTI 2003 cited in Litman 2005) shows that cities with large rail transit systems suffer from lower congestion costs than similar-sized cities with smaller rail networks or bus-based systems. Other studies have shown lower congestion costs for motorists and road freight in cities with high rail usage (Winston & Langer 2004 cited in Litman 2005) and reduced growth in congestion following the introduction of rail services (Garret 2004 cited in Litman 2005). As shown in Figure 4.5, large rail systems offer larger congestion savings than alternative approaches.

Figure 4.5: Transit Congestion Cost Savings



Source: Litman 2005

Lewis and Williams (1999) found that travel times for motorists tend to converge with those of the most competitive public transport alternative (i.e. grade separated transit) since travellers will be inclined to switch between modes depending upon which offers the superior journey times. Thus a fast public transport network will also encourage a fast road network since motorists will switch to rail if congestion slows average car speeds significantly below that of trains. The corollary of this, however, is that uncompetitive journey times on public transport will encourage people to drive, thus adding to congestion levels on the road.

This is broadly consistent with the data collected for the *Millennium Cities Database for Sustainable Transport* (Kenworthy & Laube 2001). As shown in Table 4.1 below, average road network speeds across a number of regions are comparable to the average speeds of suburban rail and metro systems, whilst buses fail to compete on speed with all other modes.

Table 4.1: Comparison of average speeds of transport modes (km/h)

Mode	USA	Aust/NZ	Canada	Western Europe	High income Asian
Road network	49.3	44.2	44.5	32.9	28.9
Buses	21.7	23.3	22.0	20.2	16.2
Metro	37.0		34.4	30.6	36.6
Suburban rail	54.9	45.4	49.5	49.5	47.1

Source: Kenworthy & Laube 2001

The reasons behind rail's relative success in minimising congestion compared to bus-based systems could be summarised as:

- greater ability to attract choice passengers due to comfort and speed (i.e. lower equilibrium level of congestion by making substitutes to car use more attractive);
- higher capacity, thus being able to absorb larger numbers of would-be road users using less space; and
- ability to catalyse higher density, mixed-use development that reduces travel.
  (Litman 2005)

Although Melbourne has a reasonably extensive rail network, around two thirds of Melbourne does not have easy access to the rail network and poor service standards are deterring many other would-be passengers. The serious gaps in coverage should be addressed by implementation of the following enhancements to the heavy rail network[5]:

- train line to East Doncaster;
- train line to Rowville;
- train extension to Mernda;
- electrification to Mornington;
- electrification to Melton; and
- electrification to Sunbury.

To reduce "pinch points" on the rail network and improve service reliability, sections that are single track need to be duplicated. Those most important include:

- Clifton Hill to Westgarth;
- Heidelberg to Rosanna;
- Greensborough to Hurstbridge;
- Keon Park to Epping;
- Altona Junction to Laverton; and

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[5] We propose a phased approach to these enhancements, starting with the projects identified in our five year plan *Five Years Closer to 2020* (PTUA 2005).

- Dandenong to Cranbourne.

To ensure that the service is attractive for a wide variety of trips, we propose a standard service frequency of 10 minutes peak, 15 minutes off-peak, until at least 10pm, seven days a week on all lines (see Box 4.2).

Box 4.2 – Public transport is a waiting game

- Waiting is often the longest component of a public transport journey. This is especially so for local trips and those requiring a transfer. When people are kept waiting as long as it would take to complete the entire trip by car, then those with a choice will drive;
- The increased attractiveness of more frequent services to 'choice' passengers increases patronage, and thus the modal share for public transport as it become more attractive relative to car trips;
- Having more passengers paying full fare increases revenue collected. The percentage increase is higher than the patronage increase due to the higher average fare passengers pay;
- Higher service frequencies mean better connections between services and thus increased usability. Where services are sufficiently frequent, passengers need not even consult a timetable and have 'turn up and go' convenience which motorists already take for granted and are reluctant to give up;
- Higher frequency also means shorter wait and total journey times. Studies show that an unknown wait is perceived as being longer than a known wait, and a wait for a connection is perceived as much longer than the same time spent in-vehicle;
- Higher service frequency during off-peak periods increases vehicle utilisation. Even if off-peak patronage is lower than during peak times, running the service may still be economic as existing capital is being used more intensively. Also relevant where services are not at capacity is that the marginal cost of carrying extra passengers reduces as patronage grows. This creates a virtuous circle of better service – higher patronage – more revenue – better service – higher patronage;
- When combined with longer operating hours that reflect modern working and lifestyle patterns, more frequent services can spread the peak, and thus reduce capacity constraints at that time. Constraints on the train network and stations are also eased if passengers can take a short bus between two suburban destinations instead of travelling into and out of the city;
- Frequent services mean that when services do have to be cancelled, it is not long to wait until the next one. Harmonised timetables where every train is met by a bus reduces the effect of service cancellations on travel times;
- Inadequate frequencies on busy routes increase passenger congestion and raise vehicle dwell times, further slowing average vehicle speeds;
- Most people with a choice are fairly sensible when it comes to choosing their transport mode, and the current modal share represents market information that public transport is less attractive than the car for most trips. Differences in transport time (public transport often takes 2 to 4 times longer than a car trip) often have more to do with service frequency and waiting times than with in-vehicle travel speeds or the presence (or absence) of express running.

4.2.3 Trams need priority

Trams mainly service the inner areas of Melbourne that tend to suffer most from congestion and that would therefore benefit most from a mode shift to public transport. Rising vehicle congestion has seen average tram speeds fall by 8 per cent in the past 5 years and a vicious downwards spiral of mode shift to private cars has ensued. As a consequence, trams are becoming less and less able to attract passengers away from the rising numbers of cars that are clogging up the roads, and the subsequent vehicle congestion further slows trams and encourages greater mode shift to private cars.

A significant modal shift from cars to trams, with consequent congestion minimisation benefits, could be achieved by ensuring trams are not delayed at traffic lights or behind turning motor vehicles. Measures such as dynamic signal priority for trams, introduction and enforcement of turning bans on tram routes and lane separation would enable trams to serve as an efficient means of transporting significant numbers of people in otherwise congested areas. A trial of such measures on Sydney Road has demonstrated the potential to save significant amounts of time for tram passengers.

A tram system that is unencumbered by traffic congestion would be able to run faster, more frequent services with the same level of rolling stock and enable more passenger journeys with a given amount of road capacity. This improved service would be more attractive to people who might otherwise generate additional car journeys in the corridor.

To ensure that the service is attractive for a wide variety of trips, we propose a minimum service frequency of 15 minutes or less on all routes seven days a week (see Box 4.2).

4.2.4 Don’t forget buses

The above discussion on the crucial importance of rail should not be interpreted as dismissing a role for buses in minimising congestion and in serving other transport policy goals. Bus services play a vital role in providing connections to rail services, thus reducing pressure on roads and parking near train stations, and in offering non-radial services where rail may not be feasible.

Unfortunately Melbourne’s bus services have failed miserably to live up to their potential in minimising congestion. The average Melbourne bus route runs every 40 minutes and finishes before 7pm. Saturday services are even less and only a minority of routes operate on Sundays. Existing service frequencies are too low to attract choice passengers and service spans are often too short to provide a genuine alternative to car use outside restricted hours of operation.

One symptom of this is the very low proportion of linked public transport trips in Melbourne compared to other cities (Scheurer, Kenworthy and Newman 2005). Most journeys involving public transport in Melbourne include only one boarding with no use of connecting services. By contrast, trips in a number of cities worldwide involved twice as many boardings, reflecting much higher use of connecting services. This is exemplified by the majority of Melbourne's train passengers who access the station by walking or cycling compared to only 9 per cent who reach the station by bus. In Toronto, over three quarters of train passengers reach the station by feeder bus. Bus service levels in Perth are typically lower than in Toronto, but careful service co-ordination still means that 40 per cent of rail passengers reach the station by feeder bus.

A practical example could be a person working in inner Melbourne that finishes work around 6pm, then catches a train to a station in an outer eastern suburb, and then finds that the next bus is nearly an hour away, or alternatively that services have ceased for the day. People in circumstances such as this may either drive to their closest station, thus adding to pressure on local roads and parking, or drive all the way to work, thus adding to congestion along the whole corridor.

The contribution of buses to congestion minimisation must be increased by boosting frequencies, lengthening operating hours, providing buses with traffic light priority and by ensuring they are coordinated with other services, including trains and trams.

Waiting times for passengers would be reduced by providing frequent bus services, or on quieter routes, harmonised service headways that mesh with train and tram services. Accordingly we recommend a frequency of 15 minutes or better on busy routes and 30 minutes (i.e. connecting with every second train/tram) for quieter local routes (see Box 4.2). Operating hours should likewise be compatible with trains and trams.

4.2.5 Ease of transfer

In addition to timetable co-ordination discussed above, the physical ability to transfer safely and quickly is essential for public transport to operate to its full potential and to minimise passenger congestion at interchanges.

Key issues include:
- need for pedestrian crossing facilities and lights that put transferring passengers before cars. Absent or unresponsive crossing facilities can easily cause passengers to miss connecting services and extend journey times by 20 minutes or more;
- a requirement for the design of station buildings and precincts to provide for easy transfer between services. Pedestrian amenity, ease of transfer and accessibility must be requirements for any redevelopment projects to be approved;
- a need for ticketing systems to facilitate fast transfer and not be the cause of undue entry or exit delays. We note that London has adopted a zoneless system for its buses and removed the need to tag off upon leaving the vehicle.

4.2.6 Safety and security

The fear of violent crime can be a major deterrent to many would-be public transport passengers, particularly women. In order to ensure public transport remains a usable service for as broad a cross-section of society as possible, we support increased staffing at railway stations and on trains and trams across all hours of operation to increase safety and security for passengers and staff alike.

Streets and suburbs should be designed to maximise visibility and safety for pedestrians and cyclists. Specific 'Designing out Crime' measures (such as permeable street layouts, buildings addressing streets, absence of high fences abutting footpaths, well-lit footpaths parallel to roads, etc) must be part of new projects and redevelopments.

4.3 Parking

There is a risk that the recently introduced CBD parking levy could lead to leakage of activity away from the CBD (which is well-serviced by public transport) to areas where public transport is less well-developed, leading to a net increase in car journeys. This risk could be mitigated by the consistent application of parking restraint measures across the entire metropolitan area. These measures should include:

- removal of minimum parking requirements in urban planning regulations if such amendments to the Victoria Planning Provisions have not already been made (Shoup 2005); and
- removal of concessions for the provision of parking under the *Fringe Benefits Tax Assessment Act 1986* (Cwth).

The future viability of strip shopping precincts is important both to the businesses operating along them, and in minimising car journeys to larger, car-focussed shopping centres. Due to the importance of street parking in protecting the amenity of strip shopping precincts and enabling access to businesses along them, we strongly oppose the introduction of clearways. In addition to causing serious harm to the vibrancy of the local area, clearways act to encourage additional traffic as discussed in section 4.1 above. Where high traffic volumes are impeding road-based public transport, this should be addressed through measures that allow improved public transport performance without harming local amenity, such as traffic signal priority and right-turn bans.

4.4 Carpooling

Carpooling is often suggested as a solution to traffic congestion. While it may be faster than poor quality public transport (e.g. meandering buses in the absence of public transport priority programs), carpooling only works if two or more people have similar origins, destinations and times of travel. In effect, carpooling combines the worst aspects of cars with the worst aspects of public transport: there is no network effect (where people can take advantage of intersecting routes to access more destinations); and there is an immense cooperative effort required.

With increasingly dispersed working hours, origins and destinations, the PTUA considers that carpooling's inflexibility will mean that it will only ever be attractive to a diminishing minority of commuters. In contrast, good public transport, with its 'go anytime anywhere' capability, has much broader appeal.

Furthermore, even the proponents of carpooling recognise that only a small proportion of people using carpooling previously travelled in single occupant cars. Many studies point to a net increase in vehicles, with the majority of users shifting from public transport services (e.g. RIDES for Bay Area Commuters 1999).

4.5 Congestion pricing

Sir Humphrey Appleby of *Yes Minister* might conceivably describe the introduction of congestion pricing and road user charging as a "courageous" decision, however such moves would enjoy much greater public acceptance were they accompanied by significant improvements in public transport as an alternative means of mobility (e.g. James 2003; Productivity Commission 2004a; MVA 2005).

Box 4.3 – Public perceptions of charging

"They need their cars because they don't have access to public transport so it's a just a tax on working families."
Property Council of Australia executive director Jennifer Cunich
'Business baulks at parking levy', *NineMSN*, 23 September 2005

Michael Wittaker, 47, of Mitcham, said he was fed up.
"I'm sick of the Bracks Government money grab. First it was tolls, now it's parking," he said.
"On top of petrol prices . . . I'm just trying to get to work and make a living. I challenge Bracks to try to commute from Mitcham to the city on public transport. Out there a car isn't a luxury."
Gale Schupack, 27, of Toorak, said: "It's disgraceful. Public transport -- that they are insisting we use -- isn't good enough to warrant me leaving my car at home."
Geoff Pyman, 32, also of Toorak, said "They're not providing any more public transport into the city, and they're just going to force more people on to trams that can't cater for the number of commuters they already have."
'Parking tax anger', *Herald Sun*, 23 September 2005

Theoretically road user charging, as opposed to fuel excise, is a more appropriate instrument to internalise some of the externalities of motoring such as noise pollution and road wear (EEA 2004). In practice, however, applying road user charges to all but a relatively small number of key arterial roads is unlikely to be technically and/or politically feasible, especially in the case of existing roads (e.g. James 2003; Productivity Commission 2004a). This limitation would mean that large numbers of vehicle journeys could avoid road user charges altogether, particularly most of the shorter, local journeys that are best suited to a switch to non-motorised modes of transport and are driving much of the growth in local traffic (e.g. "Mum's taxi" to educational and sporting venues; Mees 2000; Bargwanna & Mason 2001; Lyth-Gollner & Dowling 2002).

The marginal cost of a journey, including road user charges, is often a second order factor in decision making, especially when a large proportion of the costs of motoring are fixed holding costs such as finance and depreciation, registration and insurance. Primary considerations include the availability and quality of alternatives such as public transport and relative journey times compared to potentially congested roadways. Road user charges may have to be very high - arguably higher than what is politically acceptable - to shift journeys away from private cars unless the public transport network offers an acceptable level of geographic coverage, speed and comfort. Such a network is founded upon an extensive backbone of fast, high capacity train services that are interlinked and fed by coordinated tram and bus services which receive priority over other road users. Furthermore, all of these services must be frequent and full-time to minimise door-to-door travel times and waiting for connections.

4.5.1 How to spend it

If some form of road user or congestion charging was introduced, the government would face the decision of how to allocate the revenue. The worst public policy outcome would be to earmark (or hypothecate) the revenue specifically for roads. The central aim of user charging is to minimise externalities in the form of congestion, pollution, etc. Allocating the revenue from road user charging to the encouragement of the activity that is causing the externalities would be self-defeating. As discussed above, rather than easing congestion, road capacity enlargement would only lead to induced traffic through the "rebound effect". Hypothecating revenue from road user charges to roads could be compared to allocating the revenue from gaming machine taxes to building more casinos, or installing cigarette vending machines in the state's schools with the proceeds of tobacco taxes.

The PTUA would encourage the government to allocate this revenue to enhancing non-car transport options that meet the community's underlying demand for mobility - including for the many people that are unfit to drive, lack confidence or are otherwise high-risk behind the wheel – without contributing to car-dependent land-use patterns that generate additional motor vehicle journeys and pollution. The current lack of adequate alternatives to the car – especially in outer suburbs - is contributing to the generation of many radial and cross-town car journeys through congested areas that themselves may be relatively well-serviced by public transport. The contribution of road pricing to congestion minimisation can only be optimised by the provision of alternatives to the car in both congested areas of the city and in areas where journeys begin and end. Hypothecating revenue from road user charges towards making fast, fulltime public transport services available to all Melbourne residents would simultaneously contribute to managing urban congestion as well as various other policy objectives such as cutting greenhouse emissions, lowering the road toll and increasing access and participation in employment and education.

4.6 Other demand management approaches

4.6.1 Distance-based fees

Distance-based fees, such as registration and insurance that increase with higher mileage, guard against "rat-running" and leakage of activity to locations that are not as well served by public transport as central parts of the city[6]. This approach to charging would be based upon sound actuarial principles that recognise increased risk

[6] For discussion of distance-based charges, see http://www.vtpi.org/tdm/tdm10.htm

from increased travel and would enable lower insurance premiums for businesses and households that contribute to congestion reduction through reduced motor vehicle use (see Box 4.4). This is to be contrasted with the higher overall pollution and incidence of crashes that go hand-in-hand with the induced traffic that would flow from expanded road capacity (see section 1.3). Fuel excise may also serve as proxy for this as fuel use increases with distance travelled.

Box 4.4 – Vehicle testing

In addition to high-cost, high-technology options, actual distance travelled could be verified by various low-cost means including:
- conducting random audits;
- upon vehicle transfer; or
- as part of an annual road worthiness and emissions test similar to those conducted by licensed testers in NSW and New Zealand.

Annual vehicle testing

Research indicates that vehicles without a current certificate of inspection are three times more likely to be involved in a crash where someone is injured or killed (VACC 2005). Similarly, a program of vehicle emissions testing is one of the most cost-effective means of improving urban air quality (Australian Academy of Technological Sciences and Engineering 1997). Furthermore, the recent Inquiry into Sustainable Cities by the Commonwealth Parliament has recommended that the states introduce mandatory vehicle emissions testing as a means of improving urban air quality. Compulsory vehicle testing would be far more effective at lowering "the risk of accidents" and reducing "pollution levels in our cities" than attempting to improve traffic flow through road capacity expansion and would require much less expenditure to achieve it. The annual vehicle test would also provide an opportunity for an independent third party to confirm odometer readings for distance-based charges including registration and insurance.

4.6.2 Carbon credits for reduced motor vehicle use

Given the significant contribution of the transport sector to greenhouse emissions (see section 3.2.5), "second best" policy options could be explored such as granting carbon credits for reduced motor vehicle use under schemes similar to the NSW Greenhouse Gas Abatement Scheme.

4.7 World's best practice

In order to identify appropriate policies for the UK, the British Commission for Integrated Transport (CfIT) commissioned a useful study of strategies being implemented to manage traffic growth and congestion in a range of cities worldwide (MVA 2005). The key elements for success that emerged from the study included:

- integration of transport and land-use planning;

- improving the coverage and quality of public transport (particularly when complementing land-use policies);
- improvements in alternatives to the car;
- improved public transport reliability;
- measures designed to restrain car use are "sold" by improving other modes, including public transport and active transport;
- fares and ticketing are integrated across modes;
- reduced supply of parking; and
- reallocating road space to non-motorised alternatives.

4.7.1 Lessons from London

A great deal is often made of the role of congestion charging in reducing traffic in central London in recent years. While pricing is likely to have played a significant role, it is important to also note that London had undertaken significant upgrades to its public transport infrastructure, such as the Jubilee line extension and Docklands light rail, and continues to invest in improved public transport off a relatively high baseline of service. As shown in Table 4.2, Melburnians have much further to go and much longer to wait to use the rail system compared to Londoners.

Table 4.2: Comparison of rail services in Melbourne and London

		Melbourne	London
Rail density (track km per km^2)		0.08*	0.30#
Typical frequencies	Peak	10-20 min	3-7 min
	Off-peak	20-30 min	4-8 min

Source: Transport for London 2005; Metlink 2005
** Includes suburban heavy rail and tram systems.*
 # Includes Underground, Docklands Light Rail and Tramlink.

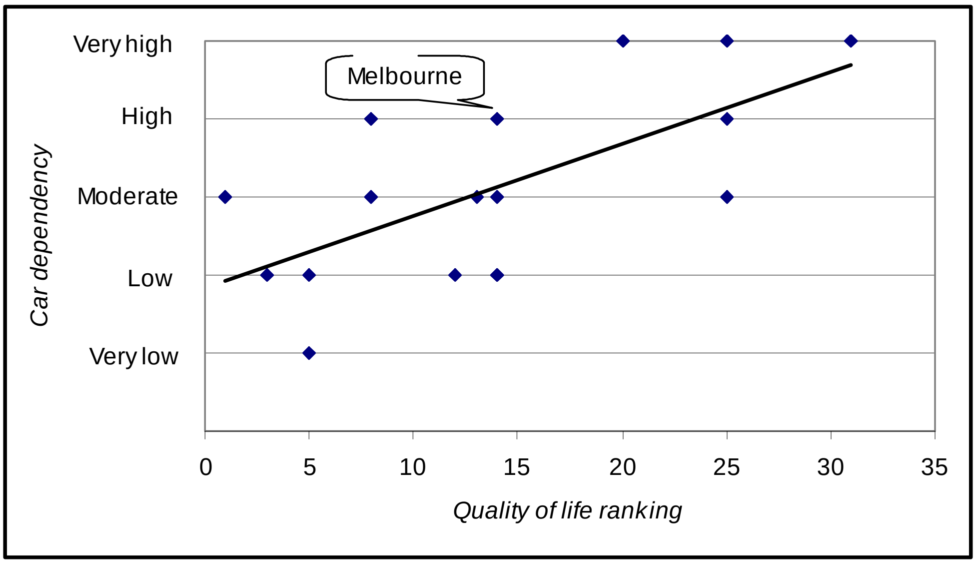
The vastly superior level of convenience offered by the London Underground compared to Melbourne's public transport is undoubtedly a key factor in the success of London's congestion charge in reducing traffic. If Melbourne is to achieve any success in managing congestion, public transport must be made more convenient as outlined in section 4.2.

4.8 Transport and Liveability

Melbourne prides itself on being one of the world's most liveable cities according to the Economist Intelligence Unit. Given the high rating given to Melbourne by this survey, it is unsurprising that local and state governments would choose to quote this liberally. It should be noted, however, that Melbourne has recently lost first place to Vancouver – a city that ceased construction of new freeways over ten years ago and has invested heavily in its public transport system.

Furthermore, Melbourne fares less well in another major survey of global liveability conducted by Mercer. In the Mercer survey, a significant correlation appears between higher rankings and lower car dependence. Virtually all of the cities ranked more highly by Mercer have lower levels of car dependency than Melbourne, and none of the more highly ranked cities are more car-dependent. Notably, Los Angeles does not feature in the top 50.

Figure 4.6: Quality of life and car dependency in the world's most liveable cities



Sources: Mercer 2005; Newman & Kenworthy 1989

Melbourne also prides itself as being a diverse, creative and enterprising city. The State Government encourages skilled and business migrants to choose Melbourne over other cities. A common feature of creative cities is efficient and well-used public transport systems. A study of the 'creative class' found that "the availability of subway and rail transportation was a key factor cited by creative people in the interviews and focus groups for *The Rise of the Creative Class*, trumping amenities like bike trails, coffee bars, and music venues" (Florida 2005, p.201). Hence if we are to attract world-class talent, we need world-class public transport.

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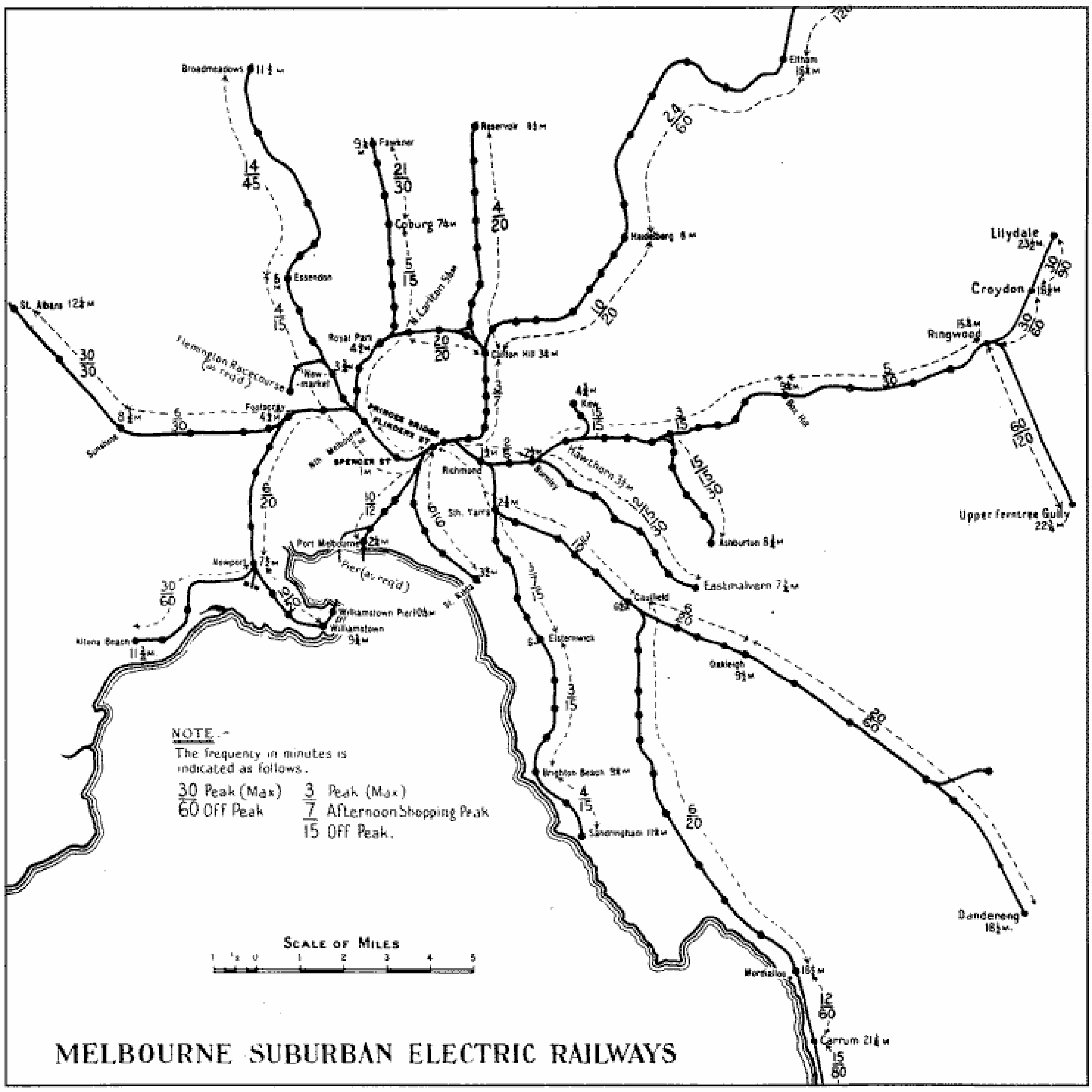
ATTACHMENT A



ATTACHMENT B

Selected gaps in tram network that hinder integration of transport modes