chapter 4

4. melbourne's roads - more traffic, more congestion

Melburnians rely heavily on the road network because of their high dependency on private motor vehicles. Victoria's freight task is also dominated by road transport.

As noted in Chapter 2, even if car use has peaked relative to public transport use, there will continue to be more and more vehicles on Melbourne's roads for the foreseeable future. In addition – as a number of organisations pointed out in submissions and consultations – even if the Victorian Government's goal of 20 per cent public transport use by 2020 is achieved, the vast majority of person trips will still use the road network.

This means that for most Melburnians, access to an efficient, safe and well-managed road network will continue to be vitally important in their daily lives.

Changes to the road network

A number of major projects are completed or underway that will improve Melbourne's road network and connections to and from the city, including:

- EastLink – a 40 km tollway from Mitcham to Frankston
- Monash-CityLink-West Gate upgrade – a major package of measures to improve traffic flow and safety
- Deer Park Bypass – a 9 km, four lane freeway between the Western Highway and the Western Ring Road
- Pakenham Bypass – a 20 km bypass between the Princes Highway at Beaconsfield and Nar Nar Goon Road
- Dynon Port Rail Link – which will move rail traffic to the Port of Melbourne beneath Footscray Road, relieving a major traffic bottleneck.

In addition, construction has commenced on the Geelong Ring Road – a 25 km bypass of Geelong that runs from the Princes Freeway at Corio to the Princes Highway at Waurn Ponds, with links to the Midland and Hamilton Highways.

Planning is also underway for the Western Ring Road upgrade – a $2.25b project that will include widening of the road, extra lanes and improved signage and signals.

4.1 The road network

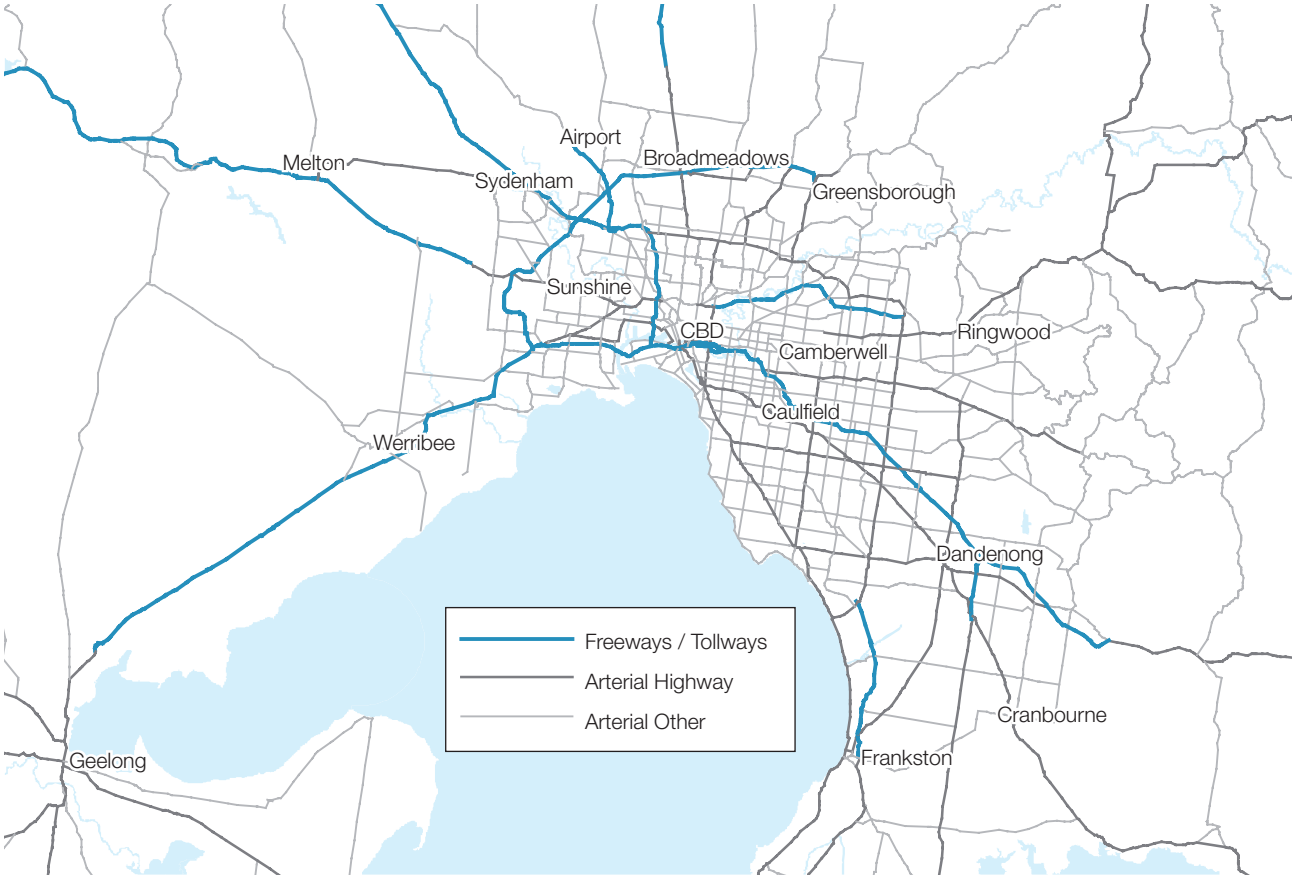
Melbourne's road network is made up of an extensive and well-developed grid of major roads that includes tollways, freeways and arterial highways. These major roads largely radiate from the CBD, with the exception of the Western Ring Road (which provides an orbital route connecting freeways to the west and north of the CBD) and the new EastLink route (which will link the Frankston Freeway to the Eastern Freeway).

Apart from the city's toll roads, VicRoads is responsible for the management and development of the major arterials of Melbourne's road network, known as the declared road network. Outside the declared network, roads are managed, maintained and developed by local councils.

Theoretically, the total carrying capacity of Melbourne's road network is well in excess of current levels of use. However, the practical capacity of the network is affected by demand during peak periods, environmental and operational constraints, and the fact that around 80 per cent of daily travel occurs on approximately 20 per cent of the road network. These practical limitations mean that traffic density is high at a number of key points on the network – freeways, major arterials, river crossings, important collector roads and strategic intersections – leading to congestion.

While congestion is a growing problem across the city, Melbourne's roads have been able to accommodate substantial increases in commercial and private travel over recent decades. Through continual development and management, the road network has served the city well for many years.

Figure 44 – Melbourne's major road network



Source: VicRoads

4.2 More traffic

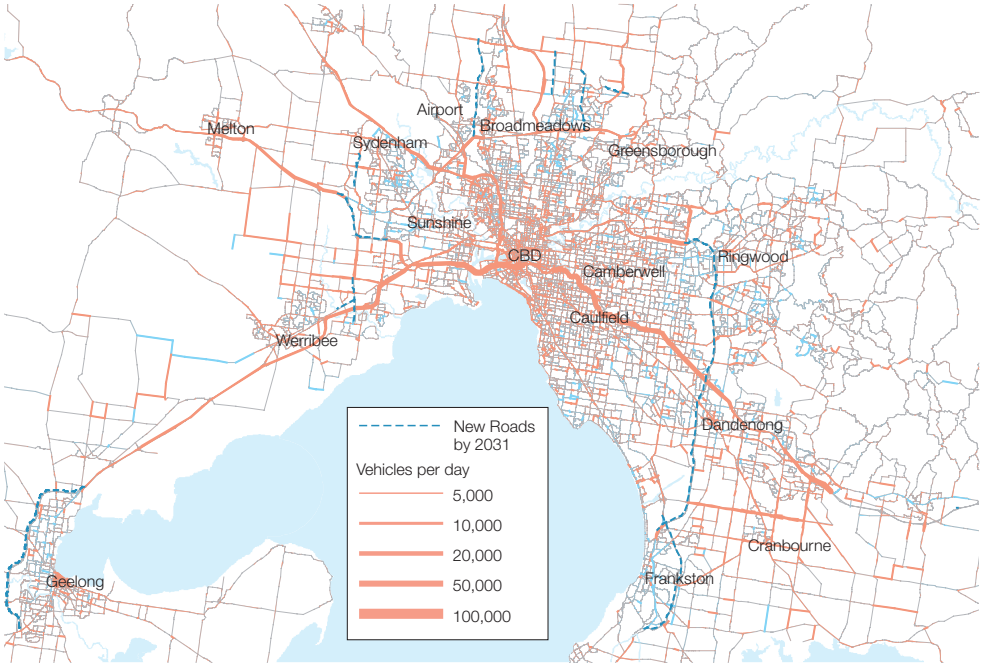
The growing demand for travel means much higher traffic volumes on the city's roads. As discussed in Chapter 2, even with strong increases in public transport, Melbourne faces the daunting task of managing at least an additional 3 million car trips per day by 2031.

Traffic analysis undertaken for the EWLNA shows that, while many key routes across Melbourne are already operating at or near capacity, they still face very significant growth in traffic volumes over the next 25 years.

Figures 45, 46, 47 and 48 show growth in traffic volumes between 2006 and 2031 for the entire metropolitan area and the Study Area. Table 11 shows the daily trip demand in 2006 and 2007.

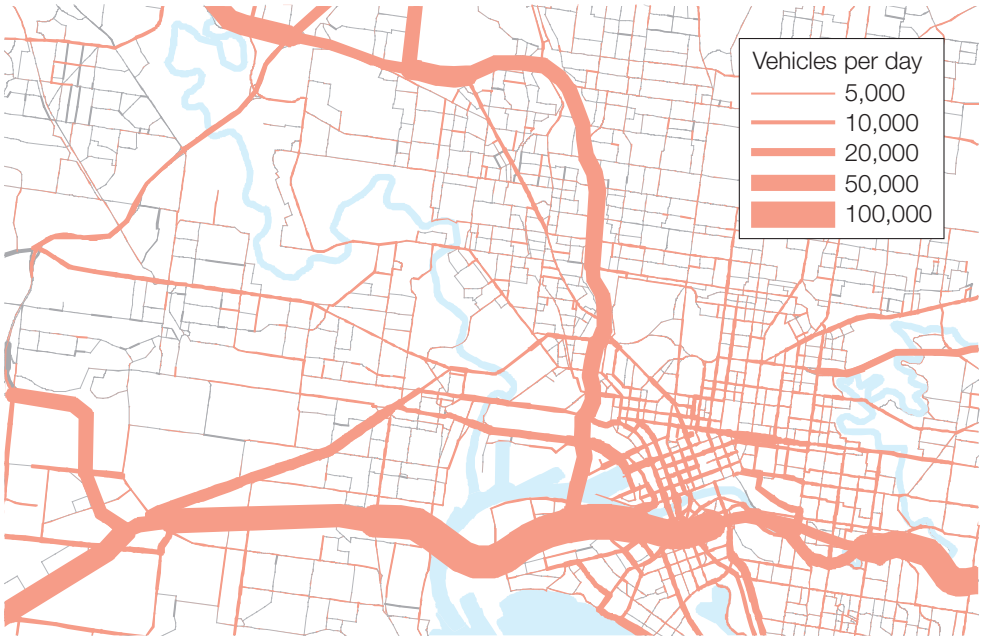
These figures – combined with analysis by the EWLNA – show that many roads that are currently at or approaching capacity will become more and more congested over the next two decades.

Figure 45 – Modelled traffic growth (roads), 24 hour, 2006 to 2031, Metropolitan wide



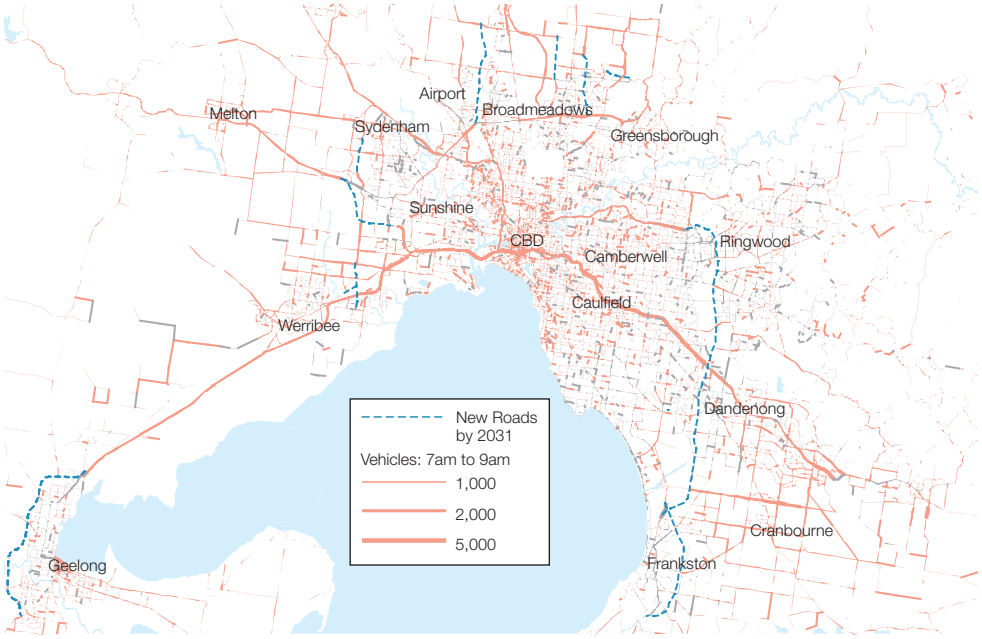
Source: EWLNA (Veitch Lister)

Figure 46 – Modelled traffic growth (roads), 24 hour, 2006 to 2031, Study Area



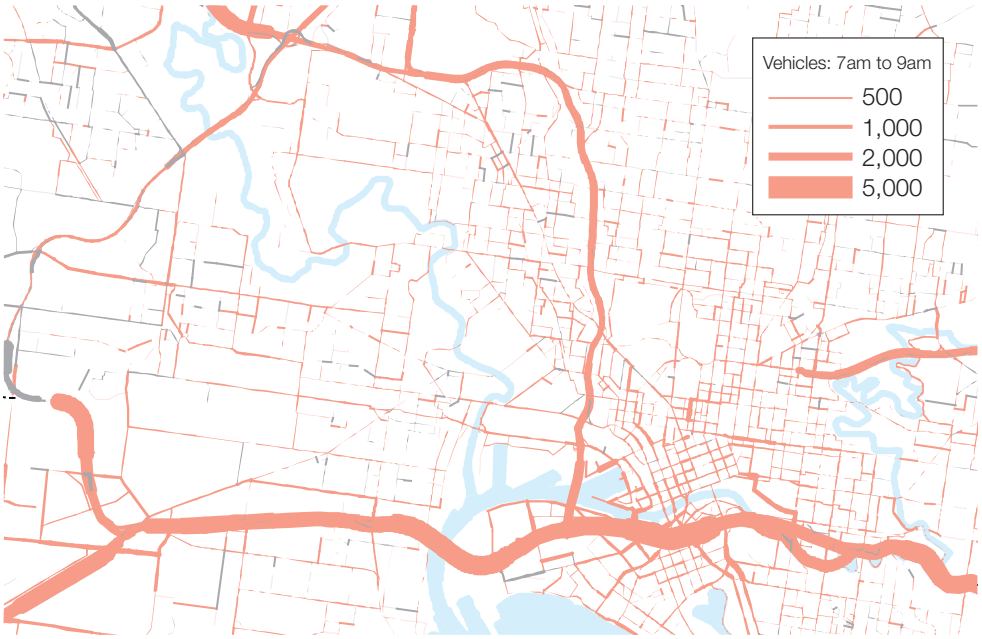
Source: EWLNA (Veitch Lister)

Figure 47 – Modelled traffic growth (roads), AM peak, 2006 to 2031, Metropolitan wide



Source: EWLNA (Veitch Lister)

Figure 48 – Modelled traffic growth (roads), AM peak, 2006 to 2031, Study Area



Source: EWLNA (Veitch Lister)

Table 11 – Trip demand summary, All day, 2006 and 2031

Road Name	Location	Current Volume (2006)	Predicted Growth	Predicted Volume 2031
Western Ring Road	South of Deer Park Bypass	113,000	33%	150,700
Princes Hwy West	West of Western Ring Road	141,000	38%	194,300
Geelong Road	East of Francis Street	42,000	91%	80,200
Calder Freeway	West of Western Ring Road	87,000	47%	128,100
West Gate Freeway	West Gate Bridge	165,000	41%	235,000
Monash Freeway	East of Toorak Road	150,000	42%	213,500

Source: EWLNA (Veitch Lister)

Notably, the EWLNA modelling also shows that:

- The road network is already widely congested in the morning peak.
- The reason that the modelled traffic growth in the morning peak is relatively limited (as illustrated in Figures 47 and 48) is a reflection of the road space available, rather than the demand for travel. The growth on the Monash-CityLink-West Gate corridor is a result of the congestion relief that will be provided by the increase in width currently under construction (in conjunction with the Freeway Management System).
- There are very significant increases in projected growth across the network for daily travel between now and 2031. This increase in demand will be predominantly east-west traffic rather than north-south traffic.
- Within the Study Area, the greatest increases will be along the primary routes such as West Gate Freeway, Geelong Road/Ballarat Road/Smithfield Road/ Racecourse Road and Footscray Road.
- The consequence of the growth in demand and the finite road capacity is that inter-peak traffic will become much heavier, with peak period traffic congestion being experienced over many more hours of the day.
- For traffic from the west, the road (and rail) networks will be under immense pressure (even with the extra lane on the West Gate). This will impact upon the ability to travel from the west to the city.

4.3 More congestion

Congestion is usually defined as excess demand for road travel: when the travel demand is greater than the capacity of the available road space, congestion occurs and traffic is prevented from moving freely, quickly and reliably. Congestion is characterised by slower speeds, longer trip times, more volatile trip times and increased queueing and has a number of costs, including travel delays, driver stress and frustration, increased accident risks, wasted fuel, greater air pollution, reduced community amenity and higher costs to business.[1]

It is clear that Melbourne's road network is already experiencing significant congestion – and that predicted higher traffic volumes will generate even higher levels of congestion along major routes in the future.

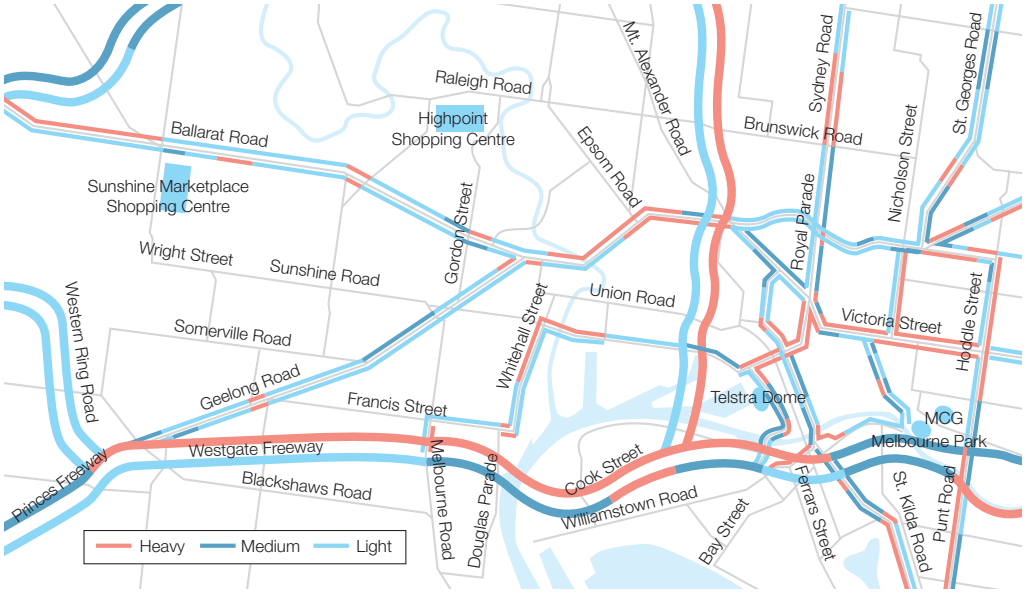
Figure 49 and 49b show the main locations of current morning peak congestion within the EWLNA Study Area and metropolitan wide. Roads such as the Tullamarine and West Gate Freeways will experience increasing levels of congestion as traffic volumes increase.

The majority of roads north of the CBD are also predicted to have congestion issues in 2031, especially around their intersections with Alexandra Parade. This is due to the predicted significant increases in traffic demand along Alexandra Parade and along major north-south routes such as Nicholson Street. In addition, more people will be seeking to avoid congestion on cross city routes by 'rat running' through inner north streets.

There will also be a significant increase in congestion in the inner west, particularly along arterial roads that link with Maribyrnong River crossings.

1. See the end of this section for a further discussion on the costs of congestion.

Figure 49 – 2006 Morning peak congestion, Study Area



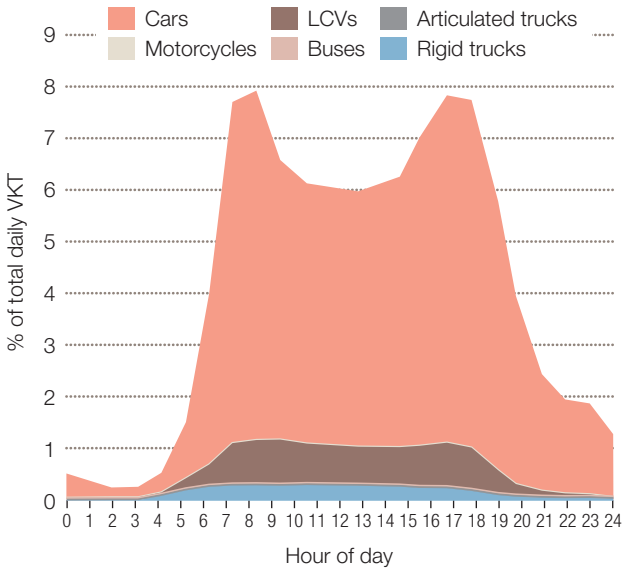
Source: VicRoads

Figure 49b – 2006 Morning peak congestion, Metropolitan wide.

Source: VicRoads

Increasingly, congestion is spreading beyond the peak periods. While many Melburnians see congestion as a 'peak hour problem', as travel demand increases and trips become more complex, more travel is taking place outside the morning and evening peak periods. The inevitable result is that more congestion will occur on Melbourne's roads for extended periods of time.

Figure 50 – Typical daily VKT profile by vehicle type, Australian metropolitan traffic



Source: BITRE (2007)

Figure 50 shows the travel pattern (by vehicle type) in Australian capital cities. The Bureau of Infrastructure, Transport and Regional Economics has observed that:

> *"This pattern of limited growth in peak periods, while growth in periods around the peak remains strong, is already apparent in recent yearly data for particular city links (due to many major metropolitan roads already operating close to their rated capacity at certain times of day)."*[2]

The BITRE drew particular attention to Victoria, noting that "practically all the growth" in Melbourne's freeway traffic volume over the last few years has occurred outside the peaks.[3] This is supported by analysis undertaken for the EWLNA that shows a substantial increase in off peak road traffic to 2031 (see Figure 51).

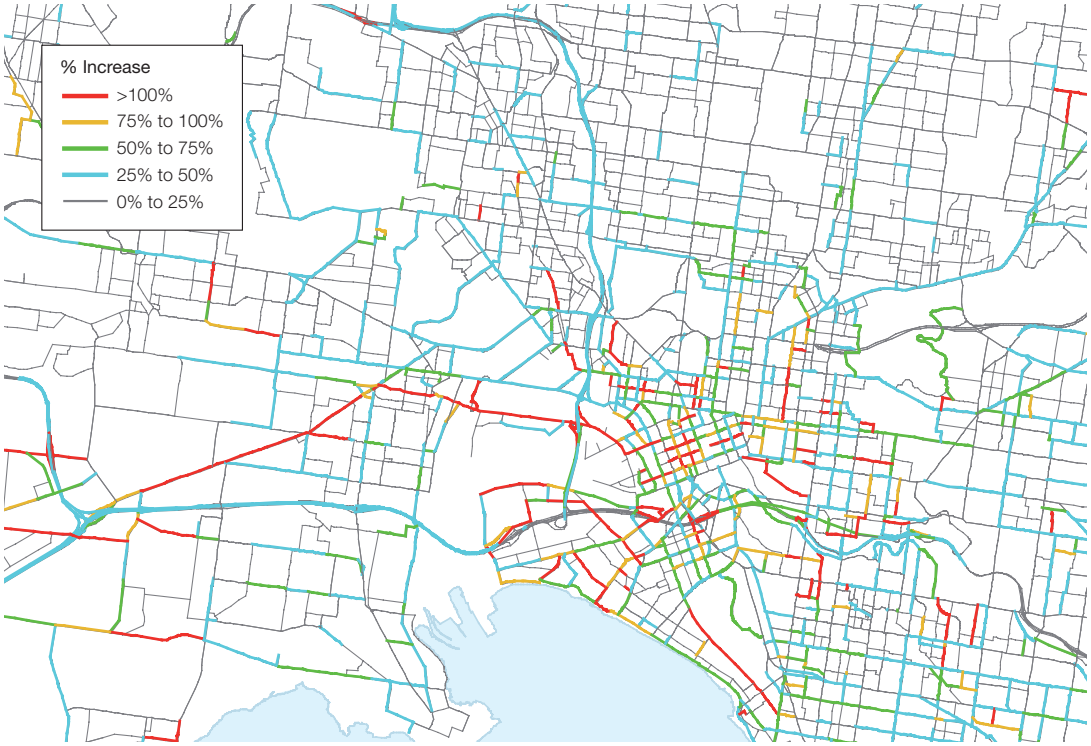
In particular, this modelling shows a significant increase in off peak traffic along the Geelong Road/ Buckley Street/Footscray Road route, as well as a general increase in east-west travel to the north of the central city. This increase is caused in part by spillover from a congested West Gate Freeway.

These patterns of congestion – combined with growing travel demand and increasing traffic volumes – suggest that there are likely to be very few cross city connections with spare capacity during peak periods, with most connections also under increasing pressure in non-peak periods.

Current and predicted patterns of congestion also indicate particularly negative consequences for Melbourne's west. The limited number of river crossings (and cross city travel options) to and from the west is already a significant constraint on the overall transport network – and will become an even greater constraint as travel demand grows. The evidence is very clear that these routes will become increasingly congested. When combined with the increasing congestion on rail travel from the west, this will severely curtail the efficiency of important cross town journeys to and from the west and to and from the central city.

2. BITRE (2007), Working Paper 71: Estimating urban traffic and congestion cost trends for Australian cities, Commonwealth of Australia, Canberra, p.97
3. BITRE (2007), p.97

Figure 51 – Growth in off peak road traffic, 2006 to 2031



Source: EWLNA (Veitch Lister)

4.3.1 Managing congestion

As many submissions to the EWLNA pointed out – and as recent studies by the Council of Australian Governments (COAG), the Bureau of Infrastructure, Transport and Regional Economics and the Victorian Competition and Efficiency Commission indicate[4] – the failure to take action to tackle congestion in Melbourne will have significant economic, social and environmental repercussions.

Reducing road and rail congestion has been the subject of increasing attention in Victoria. As well as commissioning VCEC to examine the issue, the Victorian Government has taken specific action to tackle road and rail congestion. Initiatives include the M1 upgrade, upgrades to North Melbourne station and the overall rail network, and the development of a cross-town SmartBus network.

The Government has also introduced a congestion levy in the CBD. The annual levy – currently $800 – applies to off-street, long-stay parking spaces for cars or larger motor vehicles within a defined area and is payable by car park owners and operators. The levy aims to reduce peak period traffic congestion, improve CBD amenity and encourage public transport use for journeys to and from the city's CBD.

Across the transport network, a number of traffic management measures are being used to manage congestion. Public transport (bus and tram) priority lanes are being used along parts of the network, along with capacity increasing measures such as 'ramp metering', contra-flow lanes and en-route information. However, along with other Australian cities, Melbourne is at a much earlier stage in the application of these measures than many European cities. Some measures – notably tram priority and bus-only lanes have also encountered opposition from local councils, businesses and residents.

4. COAG: Council of Australian Governments (2006) *Review of urban congestion trends, impacts and solutions*, Report prepared for the Council of Australian Governments by the Competition and Regulation Working Group, Canberra; BITRE: Bureau of Infrastructure, Transport and Regional Economics (2006), *Estimating Urban Traffic and Congestion Cost Trends for Australian Cities*, Commonwealth of Australia, Canberra; Victorian Competition and Efficiency Commission (2006), *Making the Right Choices: Options for Managing Transport Congestion*, Final report, State of Victoria, Melbourne

A 2006 consultancy report for the Council of Australian Governments (COAG) prepared by Booz Allen Hamilton notes that Australian urban freeways are averaging around 1,600 to 1,700 vehicles per lane per hour during peak periods, whereas flows of 2,100 vehicles per lane per hour have been demonstrated overseas where urban freeways are 'managed'. These results suggest that traffic management systems can increase the capacity of 'unmanaged' freeway routes by up to 25 per cent.[5] (Currently, Melbourne's freeway lane volumes vary from 1,300 vehicles per lane to over 2,000. The proposed freeway management system being delivered by VicRoads will assist in maintaining higher lane volumes.)

As stated by Booz Allen Hamilton:

> *"Australian experience with some 'traffic management systems' is relatively limited. Ramp metering has been used in several cities, and variable message signs are increasingly used on the major urban road networks. However, to date, these measures have tended to be introduced at specific locations, rather than applied to overall links in the network. It is this 'corridor management' approach that is increasingly being used overseas, and which, in at least some cases, is leading to significant increases in network capacity."*[6]

The Study Team notes that traffic management systems are part of the M1 upgrade and that VicRoads is implementing a management system for Melbourne's freeway network. This will support other sophisticated ITS systems (such as Drive Time, SCATS, which controls more than 2,400 of Melbourne's signalised intersections, and Automatic Incident Detection Systems) that VicRoads uses to maximise the efficiency of the road network.

At the national level, COAG has recognised that urban congestion is a significant problem, noting that "there is no single 'silver bullet' solution to rising congestion pressures" and that a range of infrastructure and non-infrastructure measures will be needed to tackle the problem. COAG has identified a number of strategies to tackle congestion, including improving the provision of public transport, implementing options that promote and support car-sharing, car-pooling and parking restraints and considering price-based measures to slow the growth in demand.[7]

The COAG review cited international and Australian experience indicating that pricing measures stand out as the most effective option for alleviating congestion and improving the efficiency and productivity of the transport network (at least when delivered as part of a total package of complementary measures). COAG noted that such measures can provide a 'carrot' to encourage travel in less congested times of day or less congested modes, as well as a 'stick' for those travelling when the costs of travel, including congestion costs, are highest. Managing demand through price-based measures was also seen to have the advantage of 'locking in' gains from new infrastructure, which can be achieved through structured toll regimes.

The Study Team believes that it is important to acknowledge that, while these responses may reduce the costs of congestion, it is not possible or realistic to eliminate congestion altogether. It should be acknowledged that congestion is a sign of economic success, that some congestion is unavoidable and that cities can – and should – tolerate a level of congestion because it contributes to reducing the growth in demand for motor vehicle travel.

Study Team Findings

Congestion on Melbourne's roads is growing and predicted higher traffic volumes will generate even higher levels of congestion in the future along important cross city and central city access routes.

The highest increases in traffic will be experienced on the West Gate Freeway (and the M1 route generally), the Western Ring Road, Calder Freeway and Geelong Road. Levels of traffic congestion will increase substantially along key east west arterial routes, such as Footscray Road, Dynon Road, Geelong Road and Bell Street.

As traffic demand grows, the limited number of river crossings to and from the city's west will act as a very significant constraint on the broader road network.

5. Booz Allen Hamilton (2006), *Study of Successful Congestion Management Approaches and the Role of Charging, Taxes, Levies and Infrastructure and Service Pricing in Travel Demand Management*, Consultancy Report Prepared for Council of Australian Governments, Review of Urban Congestion Trends, Impacts and Solutions, Final Report, November 2006
6. Booz Allen Hamilton (2006), p.10
7. COAG (2006)

4.3.2 Congestion pricing – does Melbourne need it?

One way to manage the growing demand for car travel is to make better use of existing road space. One means of doing this is road pricing (or road user charging), where motorists pay for driving on a particular road, driving at a particular time or driving in a particular area.

While a number of submissions to the EWLNA called for road pricing, it is important for Melburnians to understand what this means: that drivers would be charged to drive on roads they currently use for 'free'.

Road pricing is based on the premise that the price charged will affect the levels of road use. In the absence of pricing, road users do not necessarily appreciate the full cost of driving. Road pricing forces drivers to consider the value of discretionary travel. Other than road tolls (which in Australia are used solely to fund new infrastructure), the primary aim of most road pricing is to ensure an optimal level of road use by allocating scarce road space to trips with the highest economic value.

Different forms of road pricing

The different types of road pricing include:

- *Direct charges to road users* – charges (such as tolls) are applied to the people who actually use and benefit from a particular road, tunnel or bridge. Generally, these charges aim to raise revenue to recoup the cost of building and/or operating the infrastructure; however, they can also be used to manage traffic demand, especially during peak periods.
- *Direct charges to road network users* – charges are applied across the network, usually with the aim of reducing overall or specific congestion. These charges include congestion pricing (where charges are varied according to the time of day, with higher prices for congested conditions and lower prices for less congested times); cordon pricing (where charges are levied for driving in a particular area – usually a city's central district); and High Occupancy Toll (HOT) lanes (where low occupancy vehicles are allowed to use lanes reserved for high occupancy vehicles if they pay a toll). Truck only tolling (TOT) – where a toll only applies to commercial vehicles, sometimes in dedicated lanes – is also becoming more popular.
- *Charges to motor vehicle users* – charging that is targeted towards particular aspects of motor vehicle use. The most common of these charges are motor vehicle registration fees and fuel levies. Distance-based charges (where road users pay for the distances they travel) are often proposed as a replacement for motor vehicle registration fees, with the aim of reducing congestion and reflecting the real road costs of each vehicle's use of the road network.

Like other Australian cities, Melbourne already has several forms of road pricing, including road tolls and registration fees. Parking fees and fines are also a form of road pricing, discouraging motorists from taking up road space. The CBD congestion levy (which applies to off-street, long-stay parking spaces) is also a pricing mechanism that aims to reduce traffic congestion in the central city.

In recent years, considerable debate has taken place about the need for congestion or cordon charging in Melbourne – and a number of submissions to the EWLNA called for the introduction of such charges in one form or another.

The benefits and problems of congestion charging

Overseas experience shows that the benefits of well-targeted road pricing schemes can include:

- reductions in congestion levels;
- reductions in travel times;
- improved responsiveness to changes in travel demand;
- increases in public transport use; and
- environmental benefits.

Road pricing schemes can also generate revenue, which can be used to fund transport improvements (or directed into other areas of benefit to the community). Alternatively, these schemes can be 'revenue neutral', where the road price is offset by a reduction in other vehicle charges (such as motor vehicle registration fees). This has the effect of moving from 'taxing' vehicle ownership to 'taxing' vehicle use.

The 2006 VCEC inquiry into congestion observed that the greatest benefits are likely to be realised where pricing schemes are 'network-wide'. Where schemes are restricted to particular areas or sections of a network, the congestion-reducing impact will be undermined by the potential to divert traffic onto other parts of the road network.[8]

Most cities that have introduced congestion charging have also recognised that greater benefits will be delivered when the charging scheme is accompanied by other measures. For example, prior to trialling congestion charging, Stockholm introduced expanded bus services and new park-and-ride spaces. Similarly, Singapore introduced its scheme as part of a comprehensive package of measures, including the doubling of parking charges, new park-and-ride facilities, new bus shuttle services from fringe parking lots to the city's downtown area and encouraging flextime in companies and government agencies.[9]

While congestion charging can deliver significant benefits, it can also leave some people worse-off:

- those who cannot be flexible with their travel times;
- those who have no or few alternative travel options; and/or
- those who cannot afford to pay the charges.

In many cities, this usually means low- and middle-income earners in the outer suburbs who need to travel to the central city for work during peak periods.

Some of these aspects can be addressed through exemptions from or reductions in charges (for local residents, people with disabilities, car pools and so on). Others are more difficult to address and require investment in public transport and other options to relieve the hardship caused by the introduction of charging. It is generally acknowledged that reasonable public transport alternatives need to be in place to ensure that transport disadvantage is not exacerbated by the introduction of road pricing.

The economic impact on the city's CBD (the most likely area nominated for cordon charging) also needs to be considered. For example, to minimise the impact on business activity within the charging area, schemes may need to include exemptions or reductions for some commercial vehicles.

Privacy is another concern. Essentially, congestion charging schemes require drivers to divulge their locations at particular times of the day. This raises issues about how this information could be used by or shared with other agencies. For example, despite initial assurances that information from London's cordon charging scheme would not be shared with other agencies, from July 2007 Transport for London has been required to provide police with real-time access to data from cordon charge cameras. While privacy advocates have expressed concerns about such developments, others argue that this simply reflects the growing use of new technologies (such as automatic number plate recognition) in the fight against crime and terrorism. Irrespective of the practical application of these technologies, personal privacy issues need to be widely discussed – and safeguards put in place – before congestion charging schemes would be accepted by the community.

For these and other reasons, road pricing has proven to be a problematic political choice for governments. For example, while cordon pricing in London has delivered substantial benefits and appears well-regarded by Londoners, plans to extend road pricing in the UK have attracted criticism and public opposition.

8. VCEC (2006), p.289
9. Ibid, p.222

In 2005, following extensive public and political debate, Edinburgh City Council's proposal for a cordon charging scheme was overwhelmingly rejected at a referendum – with around 75 per cent of voters rejecting the charge.

Stockholm's cordon pricing scheme was also not introduced without considerable political angst and a sharp divide in community support – with 52 per cent of residents of central Stockholm voting 'yes' in a referendum to accept cordon pricing, but all 14 surrounding municipalities voting 'no'. Following the referendum, the scheme went ahead and is delivering significant benefits to the city.

Summing up European cordon charging schemes in 2006, the Economist Intelligence Unit noted that:

> *"At the highest level, there are two fundamental factors that will determine whether a road user charging scheme is successful or not: it has to work, and it has to be made acceptable to the voting public. Failure in either of these basic requirements will doom the project."*[10]

Public perceptions that the scheme is 'fair', that it is designed to deliver a clear traffic benefit and that it is accompanied by highly visible new investment in public transport can help to overcome community scepticism and opposition.

Congestion charging for Melbourne?

In its 2006 report on congestion, VCEC noted several important issues in relation to road use charging in Melbourne – including the paucity of reliable public information on the responsiveness of Melburnians' driving decisions to changes in road costs and little knowledge of the likely costs and benefits of various road charging schemes in Melbourne.[11]

In March 2007, the Victorian Government responded to the VCEC report, setting out its attitude towards VCEC proposals relating to road user charging:

- The Government supported-in-principle a trial of time-of-day tolls on current toll roads, but noted that it did not support an increase in tolls and would work with operators to design a trial without increasing current tolls.
- The Government did not support a trial of HOT lanes on new lanes constructed in Melbourne, specifically ruling out additional tolls.
- The Government did not support a feasibility study of road use charging in Melbourne, saying that it was not needed at this time.

The Government reiterated its 'three pillars' policy on tolling roads, which is that tolls will only be considered where the road cannot be built within current budget capacity; that there will be no tolls on existing roads; and roads will not be closed to 'funnel' people onto the toll road.[12]

The Study Team believes that some form of congestion-targeted road charging is inevitable in Melbourne, although this may be a decade or more away. As the Economist Intelligence Unit has observed:

> *"It is increasingly clear that road user charging will need to be integrated into urban traffic-management strategies in the future if authorities are to have any hope of beating congestion."*[13]

Without some form of road user charging, there will come a point in Melbourne's future where congestion levels can only be reduced by the combination of lower levels of population and economic growth. These are not outcomes most Melburnians would consider desirable.

10. Economist Intelligence Unit (2006), *Driving change: How policy makers are using road charging to tackle congestion*, Report from the Economist Intelligence Unit, London, p.2

11. VCEC (2006), pp. 290-291
12. DTF: Department of Treasury and Finance (2007), *Victorian Government Response to Victorian Competition and Efficiency Commission's Final Report*, State of Victoria, Melbourne. See Chapter 10 for further discussion on the Government's tolling policy in relation to the EWLNA recommended projects.
13. Economist Intelligence Unit (2006), p.22

However, the Study Team's view is that congestion or cordon charging is likely to only deliver substantial benefits where there are alternatives to commuting to the central city by car – particularly from the city's middle and outer suburbs. Sufficient alternatives do not exist at the present time in Melbourne. As already discussed (see Chapter 3), the Team believes that a generational 'step-up' in public transport is needed and that this must be delivered – or be in the advanced planning stages – before introducing congestion or cordon charging. The Team notes that the recommendations contained in this report will increase travel alternatives to the CBD, ultimately making such charges more effective and publicly acceptable.

In the case of a cordon charge around central Melbourne, an alternative bypass route should also be available for people wishing to travel across the city without incurring the charge. Again, the Study Team notes that the EWLNA recommendations provide additional options for cross town travel.

In the meantime, Melburnians must recognise that the issue for the city is not if, but when, congestion charging should be introduced. The Study Team's view is that – irrespective of other transport initiatives undertaken across the city – Melbourne needs to be much better prepared to take this step when required.

Finally, the Study Team notes that even in a world with road pricing, a strong economic case can still be made for continued investment in transport infrastructure. Indeed, the need for alternative transport options arising from road pricing will require more transport infrastructure.

Study Team Findings

Congestion and/or cordon charging can deliver significant benefits in the right circumstances and when combined with other measures. However, such charging will only deliver these benefits where there are adequate alternatives to commuting to the central city by car and additional options for cross town travel (in relation to a cordon charge).

These alternatives do not exist at the present time in Melbourne and a substantial investment in public transport needs to be made before introducing congestion or cordon charging. Taking up the EWLNA recommendations will increase travel alternatives to the CBD and for cross town travel, ultimately making these charges more effective.

Given Melbourne's rapid growth, road user charging is inevitable, although is it probably a decade or more away. That is a matter for the Victorian Government to determine.

The rising costs of congestion

Congestion occurs for the simple reason that road space is a scarce resource. As demand for this space increases, congestion occurs at particular times and places across the transport network.

Like most major cities around the world, transport congestion is a significant and growing problem for Melbourne. Congestion is more than a source of annoyance and frustration for people travelling around the city: it also imposes substantial costs on Melbourne – and Victoria.

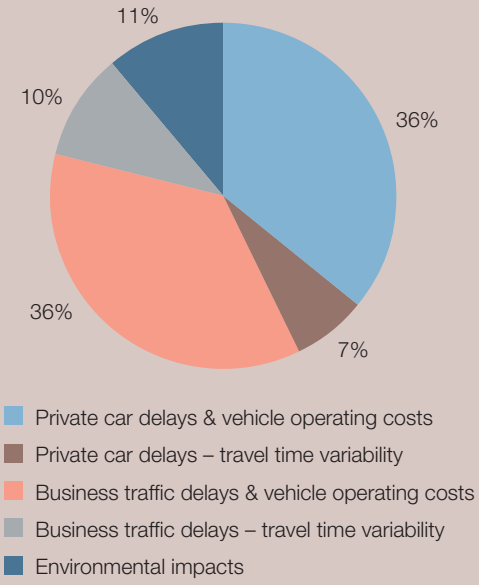
Over the next two decades, Melbourne is expected to experience significant increases in the costs of congestion. These costs include delays, unreliable trip times, higher vehicle operating expenses, higher business costs, increased air pollution, and noise and amenity impacts.

Two recent studies – the Bureau of Infrastructure Transport and Regional Economics (BITRE) and the Victorian Competition and Efficiency Commission (VCEC) – have examined the question of quantifying the costs of congestion. Each study used a methodology relevant to their scope of enquiry and included different impacts in their calculation of the costs of congestion. Neither study is necessarily 'more correct' than the other: calculating the costs of congestion is not an exact science. However, both studies show that the annual cost of congestion is substantial and, left untreated, will at least double by 2020.

The BITRE has estimated that the avoidable costs of congestion for Melbourne accounted for around $3 billion in 2005 and will increase to around $6.1 billion by 2020.[14] VCEC has made a different projection, estimating that the annual economic costs of congestion are between $1.3 billion to $2.6 billion – or around 0.6 to 1.2 per cent of Victoria's GSP.[15] In working through the differences between the calculations used for the two studies, VCEC concluded that for their purposes, the data supported an estimate at the lower end of their range.

Figure 52 is taken from the VCEC study and shows a breakdown of the costs of congestion in Melbourne. Costs to business are around 46 per cent of the total, but this impact is felt by a significantly smaller number of road users than the equivalent private car impacts, indicating that a higher cost per journey is being met by business.

Figure 52 – Breakdown of the costs of congestion in Melbourne, 2005



Source: VCEC (2006) – based on BITRE analysis

As the BITRE and VCEC studies are comprehensive and current, the EWLNA did not seek to re-address the overall question of the cost of congestion for Melbourne. Chapter 9 sets out the likely economic benefits of the various transport interventions recommended by the EWLNA. These benefits quantify similar effects to those captured in the BITRE and VCEC congestion studies, but are not directly comparable as they have been calculated using different models and methodologies.

However, the recommendations made by the EWLNA are based on the same conclusion as reached by VCEC and the BITRE: that if nothing is done about congestion in Melbourne, the costs could double within the next 15 years, with serious economic and environmental repercussions for the city and for Victoria. As VCEC, the BITRE and other reports make clear, doing nothing about congestion is not an option – as the demand for travel increases, ways have to be found to ensure that urban congestion does not also increase exponentially. That is likely to mean a range of interventions, from major road and rail infrastructure projects to travel demand management measures and road pricing.

14. BITRE (2006)
15. VCEC (2006)

4.4 Looking ahead – the 'no new roads' argument

There's no doubt that, in the decades ahead, the demand for personal travel in Melbourne will increase substantially. Much of this demand will be met by motor vehicle travel, although there will be a significant increase in the use of public transport. There is also no doubt that the movement of goods around the city will increase dramatically – with most of this demand continuing to be met by the road network.

At the same time, the nature of trips within Melbourne is changing, with more cross city trips, shorter trips and more trips that link together different purposes and destinations.

As noted throughout this report, the number of car trips in Melbourne will not decline in the decades ahead. Cars may become smaller or more fuel efficient, but they will continue to be the preferred mode of personal transport for Melburnians. In addition, an increasing amount of public transport (buses and trams) requires road space.

The reality is that unless Melburnians are willing to entertain a major reduction in car travel or endorse an extensive demand management program to force substantial additional mode change (such as the tolling of existing roads, congestion charging or more widespread road pricing), new road infrastructure will be required to meet growing travel demand.

While the mobility provided by roads comes at a cost (in terms of accidents, pollutants and congestion), roads also deliver economic and social benefits, such as supporting and driving economic growth, and providing people with access to jobs, education, health care and other services. It should also be acknowledged that the road transport sector is becoming much more sustainable, with the development and uptake of new vehicle technologies likely to have a strong impact on reducing the sector's environmental footprint over the coming decades.[16]

The Study Team rejects the view expressed in some submissions to the EWLNA that taking a decision in 2008 to build no new major roads in Melbourne represents a viable option for the city's future. It makes little sense to completely close down an option for the city while road-based transport still comprises the vast majority of travel and is likely to continue to do so for the foreseeable future – and at a time that is possibly a critical turning point for the development of more sustainable motor vehicles.

The evidence indicates that a multi-modal approach is needed to meet growing and changing travel demand within the city. When planning to meet future travel patterns, the objective should be an optimal mix of modes. It should be recognised that different modes of travel are better suited to different types of trips: mass transit systems are very well suited to shifting large numbers of people along defined corridors, while complex, multi-purpose trips suit the flexibility of the motor vehicle. For these reasons, the Team's view is that – given current congestion problems in the central city – providing additional car access to the CBD should not be a priority for the transport network; however, improving such access by public transport should be a priority.

Clearly, many residents of the inner city are becoming less dependent upon cars and more interested in taking up options such as walking and cycling. This should be strongly encouraged and supported by government. However, these same opportunities are not available to Melburnians living in the outer suburbs, particularly in relation to the longer distances people have to travel to work. While action needs to be taken to improve urban density and deliver better public transport options to the outer suburbs, rejecting any new road options will simply increase the transport disadvantage already experienced by these Melburnians.

The Study Team also rejects the 'absolute' position expressed in some submissions that 'Melbourne cannot build its way out of congestion'. The fact is that Melbourne must stay ahead of gridlock. While some level of congestion is unavoidable in a large city (and helps to 'manage' the demand for car travel), doing nothing is not an option. If Melbourne's – and Australia's – response to congestion is not escalated, the costs of congestion are likely to grow considerably. Major road projects are not necessarily the only response to congestion; but they can, and should, form part of balanced multi-modal response.

Study Team Findings

The view expressed in some submissions that taking a decision in 2008 to build no new major roads in Melbourne does not represent a viable option for the city's future.

A multi-modal approach is needed to meet growing and changing travel demand within the city.

16. Further discussion of new vehicle technologies is included in Chapter 8.

What other cities are doing

Melbourne is not alone in having to find ways to manage transport congestion in the face of a rising demand for travel, driven by strong population growth. Many cities around the world are exploring and adopting new approaches to tackling congestion and discouraging car use in inner city areas.

London (UK) – In 2003, London introduced a charging scheme in an effort to reduce inner city congestion and discourage the use of private cars. The scheme imposes a charge on vehicles entering the Central London area between 7.00 am and 6.00 pm. Since the scheme came into effect, traffic volumes have been reduced by 15 per cent within the charge zone, travel times by 19 per cent and delay times by 30 per cent. More than 500,000 charge payments are made each week and the scheme generates annual revenue of around 190 million (which is invested in public transport), although it has proven very costly to administer.

Singapore – Singapore was the first city to implement a cordon-based congestion pricing scheme in 1975. The charging area is much smaller than London's and charges vary during the day, with the highest charges incurred for travel during peak periods. The scheme has reduced the number of single occupant vehicles coming into the zone and shifted a significant number of trips from peak to non-peak times. Since the scheme's introduction, congestion in the zone has been reduced by 40 per cent, weekday traffic volumes have decreased by 20 per cent and average speeds have increased by 31 per cent.

Stockholm (Sweden) – In August 2007, Stockholm introduced a congestion pricing scheme, following a seven month trial and a referendum. Stockholm uses Automated Number Plate Recognition (ANPR) technology to charge all vehicles entering or exiting the charging zone (which includes the city centre) between 6.30 am and 6.30 pm. Charges vary according to the time of day. The scheme aims to reduce traffic congestion and improve air quality in central Stockholm. Revenue from the scheme will be used to build new roads in and around the city.

Zurich (Switzerland) – Zurich has introduced parking restraints to reduce congestion and car travel in the central city, and to encourage commuters to use public transport to get to work. Parking maximums apply to new developments and redevelopments, with offices permitted to have a maximum of one space for 10 employees and lower maximums applying in areas with high levels of public transport. No long-stay parking is provided in the city centre. As a result, a very high proportion of peak period journeys into the city centre are made by public transport: just 19 per cent of visitors to the city travel by car, with 33 per cent travelling by tram or bus and 25 per cent travelling by train.

4.5 Melbourne's cycling 'boom'

While cycling still represents a very small proportion of all travel within Melbourne (around 2 per cent), the city's bicycle culture has strengthened in recent years and cycling is growing in popularity. The evidence indicates a steady increase in the numbers of people turning to cycling as a way of moving around the city, with particularly strong growth in the numbers commuting by bicycle.

4.5.1 The bicycle network

Around one half of households in Melbourne have a bicycle. However, just 2 per cent of people use a bicycle on a daily basis, travelling for an average cycling time of 45 minutes and an average distance of 8.8 km.[17]

Melbourne's bicycle network consists of the:

- Principal Bicycle Network (managed by VicRoads and comprising around 3500 kilometres of existing and proposed on-road and off-road bicycle routes of which around one-third has been completed)

  The main aim of the Principal Bicycle Network is the creation of an interconnected, accessible and safe network of well-used routes across the city. The network includes on-road routes (dedicated bicycle lanes) and off-road paths. The network has been enhanced and extended in recent years, although some significant gaps remain.

- Municipal Bicycle Network (local cycling routes managed by councils)

- Metropolitan Trail Network (recreational routes in Melbourne coordinated by Parks Victoria).

There are three main groups of cyclists in Melbourne:

- Commuter or transport cyclists – people who cycle to specific destinations, such as work, education, the shops or visiting friends. This group is made up of experienced riders (who usually seek direct routes to their destinations, ride faster than other groups and are confident riding on the road) and less experienced riders (who are not confident on the road and prefer to use off-road and secondary routes).

- Recreational cyclists – people who cycle for health, sport and recreational reasons. This group includes 'serious' or 'high intensity' cyclists (who are training for events or undertaking long distance rides and who are comfortable riding on the road) and recreational cyclists (who are less confident on the road and prefer to use off-road bike trails).

- Visitor or tourist cyclists – a group that is generally less confident sharing road space with vehicles and more likely to make shorter trips on bike trails in or near the CBD using rental bicycles.

Currently, the Principal and Municipal Bicycle Networks are mainly used by commuter cyclists, while recreational riders mainly use the off-road Metropolitan Trail Network (with the exception of well-used, on-road recreational routes such as Beach Road).

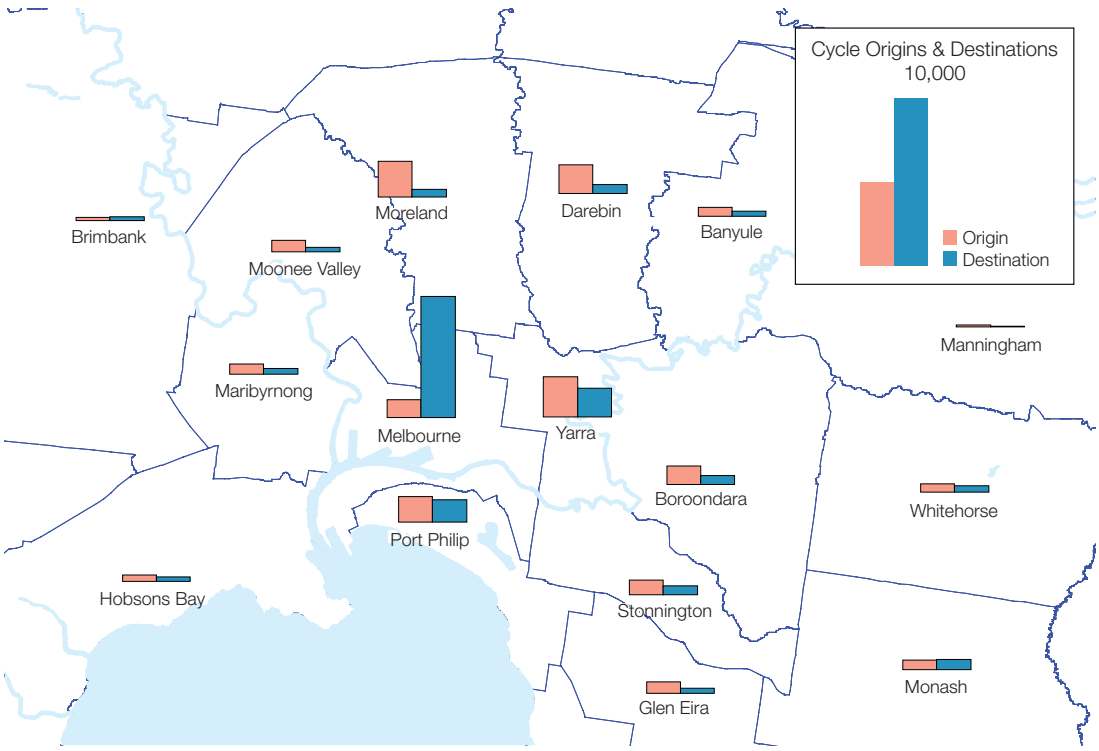
A Newspoll survey conducted for Bicycle Victoria in 2004 found that the vast majority of cyclists in Melbourne used their bikes for recreational reasons: fun/leisure (86 per cent), health/fitness (75 per cent) and sport/training (13 per cent). Transportation was given by 24 per cent of those surveyed as the main reason for using their bikes.[18]

17. Figures provided by Walking and Cycling Branch, Department of Infrastructure

18. Bicycle Victoria (2004) *Healthy paths = Healthy people*, Results of Newspoll survey, available via Bicycle Victoria website: www.bv.com.au

4.5.2 Cycling – growing in popularity

Figure 53 – Cycling to work in Melbourne, 2006



Source: DOI (2008) and EWLNA

The 2006 Census Journey to Work figures – along with data and analysis from other sources – show a very definite cycling 'boom' occurring in Melbourne. In 2006, around 18,000 journeys were made to work each day by bicycle, up from 12,000 in 2001.[19]

The strongest growth in commuter cycling is in the inner city, as shown in Figures 53 and 54.

The City of Melbourne's *Melbourne Bicycle Account* reports that the greatest growth is occurring on the four main cycling 'arteries' to the central city:

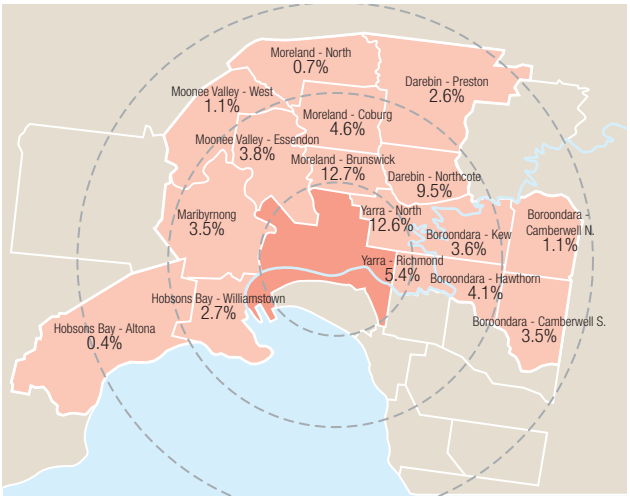
- Footscray Road (a separated path) – up 37 per cent
- Canning Street, Carlton (a street that restricts through car traffic) – up 35 per cent
- Capital City Trail / Yarra River (a separated path) – up 33 per cent
- St Kilda Road – bicycles represent 22 per cent of morning peak traffic.[20]

Previous work undertaken by VicRoads also found an overall increase in cycling trips to work between 1976 and 2001, including a strong increase in trips to work in the CBD and the Cities of Yarra and Port Phillip. VicRoads noted that "in particular, the City of Melbourne is the major attractor for cycling trips to work in Melbourne".[21]

Since the 2006 Census, Bicycle Victoria's 'bike count' program has shown an annual increase in rider numbers of around 20 per cent.[22]

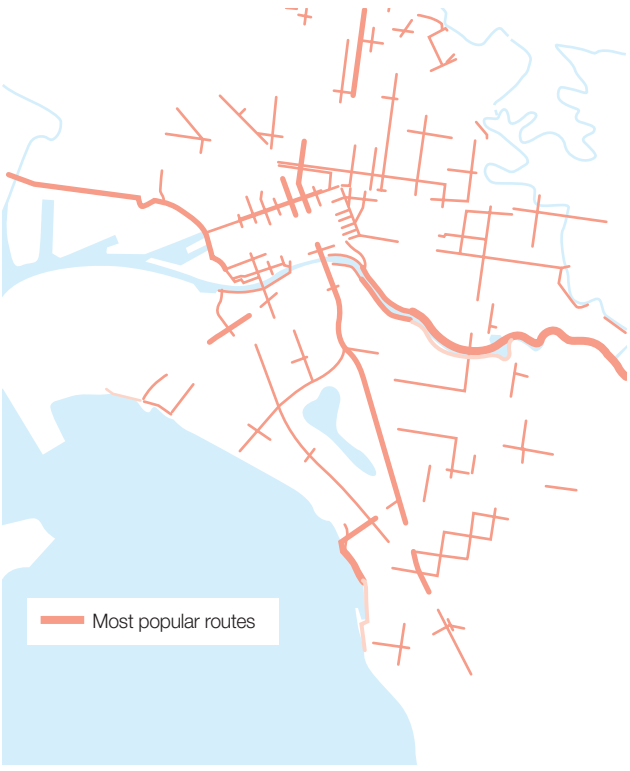
19. DOI (2008)
20. City of Melbourne (2007), *Melbourne Bicycle Account – Cycling Census 2007*, City of Melbourne
21. VicRoads (2004), *Cycling to work in Melbourne 1976 to 2001*, State of Victoria, Melbourne
22. Bicycle Victoria – *Super Tuesday 2008* count

Figure 54 – Cycling journeys as a percentage of total journeys to work, 2006



Source: Walking and Cycling Branch, DOI

Figure 55 – Main commuter arteries – Cycle traffic counts, March 2007



Source: City of Melbourne (2007)

4.5.3 Supporting and encouraging cycling

Cycling clearly delivers significant personal and community benefits, from improving people's health to contributing to reducing congestion and GHG emissions. While cycling is growing in popularity, the 'boom' is taking place mainly in the inner city: the picture is not so bright in the middle and outer suburbs.

Bicycle Victoria has noted that while most cycling in Melbourne's outer suburbs used to be to schools and shops, "it is nearly non-existent now, as wide busy roads and few bicycle lanes and shared paths are a discouraging environment for cycling".[23]

There is also some evidence that while many Melburnians like the notion of cycling, they are discouraged for various reasons from becoming regular riders or commuters. The 2004 Newspoll survey conducted for Bicycle Victoria found that while 47 per cent of adults in Melbourne own or have access to a bike, only 14 per cent of those ride at least once a week and 9 per cent never ride at all.[24] These results are supported by figures provided by the DOI Walking and Cycling Branch that show around 52 per cent of households in Melbourne having a bicycle, but just 2 per cent of people using a bike on a daily basis.[25]

The Newspoll survey found that having access to a bike path was an important element in regular cycling, with almost half of the people surveyed saying they did not have easy access to a path. The Super Tuesday counts also suggest that encouraging significant numbers of people to cycle requires a bicycle network of higher quality, with no gaps and featuring off-road and separated networks. This reflects overseas experience where separated bicycle networks have encouraged high levels of cycling. The Inner Melbourne Action Plan also recognises that "the stronger the separation between bicycles and cars, the more people will cycle."[26]

The City of Melbourne has also observed that:

> *"The keys to a greater uptake of cycling across the city are well signed pathways, secure lock-up facilities, well-connected and fluent pathways, and most of all a safe cycling environment."*[27]

23. Bicycle Victoria website: www.bv.com.au
24. Bicycle Victoria (2004)
25. Figures provided by Walking and Cycling Branch, Department of Infrastructure
26. Cities of Melbourne, Stonnington, Port Phillip and Yarra and Melbourne Docklands (December 2005), *Inner Melbourne Action Plan: Making Melbourne More Liveable*, p.19
27. City of Melbourne (2007), p.3

The recent study conducted by the DOI Walking and Cycling Branch identified three categories of barriers to people choosing walking and cycling ahead of other modes of transport: physical, emotional and practical.[28]

- *Physical barriers* include time (with a trip length of around 45 minutes – 15 to 20 km for a cyclist – being a key barrier beyond which other modes of transport will almost certainly be faster), weather (even regular commuter walkers and cyclists are put off by cold, wet or extremely hot conditions) and pathway and road surfaces (with the lack of dedicated walking and cycling tracks or lanes, poor road and path surfaces and poor lighting all acting as deterrents to walking and cycling).
- *Emotional barriers* include safety (an issue not only in terms of personal security and safety from others, also the fear of injury), boredom (travelling the same route can lead to boredom, especially where fewer dedicated bike lanes and walking paths exist) and feelings of inferiority (walking and cycling are considered to be excellent recreational pursuits but 'poor relations' to the car as a mode of transport).
- *Practical barriers* include flexibility (with the need to run multiple errands in one trip making walking and cycling inconvenient, where heavy items need to be carried, where other passengers are involved or where cyclists need to combine cycling with other public transport services) and changing and storage facilities (the lack of changing and storage facilities at the destination point can make it unfeasible to use cycling and walking).

A range of suggestions for action to overcome these barriers and increase cycling in Melbourne have been put to the Study Team through submissions and consultations and include:

- Improving connectivity across the cycle network, including completing the Principal Bike Network and fixing gaps in the network
- Making it easier to combine cycling with other modes of travel, including improving cycling connections with train stations and making it easier to travel with a bike on trains and buses
- Separating cyclists and motorists on major routes (through the use of Copenhagen lanes, cycle boxes and other measures)
- Developing polices to encourage use of electric bicycles for trips of less than 10 kilometres
- Creating parking pods or cycle 'superstations' (also known as end-of-trip facilities) at various locations to provide secure parking, showers and lockers for commuter cyclists
- Undertaking promotional campaigns to encourage the use of cycling as an alternative to car travel for short trips
- Introducing bicycle hire schemes, particularly in the inner city or around major suburban centres.

Specific route proposals made to the team include:

- Securing the future of well-used north-south commuter cycling routes into the city, including improving travel times along these routes and improving the interaction between these routes and major east-west traffic routes
- Upgrading cycling links within Melbourne's west and between the west and the CBD
- Improving conditions for riders along Hoddle Street and Punt Road (or developing a north-south route adjacent to Hoddle Street and Punt Road)
- Improving connections to the main commuting routes from the west and the east to encourage greater numbers of cyclists from outside the inner city.

Bicycle Victoria also emphasised the need to make provision for cycling in any major transport infrastructure projects proposed by the Study Team, including on-road and off-road paths, cycle boxes, parking pods and cycle facilities at railway stations.

The Team notes that large scale infrastructure projects offer opportunities to enhance cycling facilities. For example, Melbourne's EastLink project includes a new 3 m wide walking and cycling trail that runs most of the length of EastLink (around 35 km), providing access to parkland, reserves and wetlands, and connecting with other trails.[29]

The Study Team recognises that supporting and encouraging cycling is an important part of improving Melbourne's east-west connections – as a beneficial activity in itself and in making a contribution to reducing congestion. The Team notes the work already underway through VicRoads, the City of Melbourne, the Department of Infrastructure, local councils, Bicycle Victoria and others to improve cycling opportunities and increase rider numbers.

The Team has considered a range of cycling options within the context of improving east-west transport connections and has incorporated some of these options into its recommendations to the Victorian Government.

28. These barriers were identified in discussion with the Waking and Cycling Branch of the Department of Infrastructure

29. A description of the EastLink trail can be found via www.eastlink.com.au

Study Team Findings

There are sound reasons for supporting and encouraging greater take-up of cycling within the Study Area – including health, environmental and neighbourhood amenity reasons, as well as making a contribution to reducing inner city congestion.

Cycling should be treated as a separate, distinct traffic category, with a co-ordinated, whole of government approach adopted to planning and financing cycling initiatives.

Opportunities exist – and should be taken – to tackle bottlenecks and potential supply problems, improve the connectivity of the cross city bicycle network and generally provide a better environment for cycling in Melbourne.

All new major transport infrastructure projects in Melbourne should include improved cycling access as a key goal, including planning for cycling initiatives at the very early planning stages, making provision for enhancing the cycling environment (such as on-road and off-road paths, cycle boxes, parking pods and cycle access to and facilities at train stations) and leveraging cycling opportunities from the additional above ground space provided by tunnel projects.

What other cities are doing

Many cities are actively promoting and planning for higher levels of walking and cycling, especially in congested inner city areas, and are achieving success in encouraging high numbers of people to cycle to work each day.

Copenhagen (Denmark) – Copenhagen provides a safe and efficient cycling environment for residents, resulting in more than 36 per cent of the city's population cycling to work each day. The city considers cycling to be a distinct traffic category, with its own separate road area, and provides cycle tracks on all major roads (with a total cycle track length of approximately 350 km) and bicycle parking at train stations and bus terminals. This infrastructure makes cycling competitive with cars and buses in relation to travelling speed over distances of up to five kilometres.

Bogotá (Columbia) – Bogotá's CicloRuta is one of the most extensive urban bicycle networks in the world – comprising around 340 km of bike-only transport lanes that connect residential areas with the city's education and work centres, as well as providing recreational cycling opportunities. Since 2000, bicycle use in Bogotá has increased from 0.2 per cent to 4 per cent (of total trips in the city). A large part of the CicloRuta's success can be attributed to the comprehensive, co-ordinated nature of its overall design and planning, which has resulted in a network with few gaps and good flows.

Los Angeles (USA) – Los Angeles aims to have its entire metropolitan bus fleet equipped with front-mounted bike racks within four years. Each rack holds two bicycles and has an easy-to-use spring-action latch that allows quick mounting and dismounting of a bicycle. The Los Angeles Metropolitan Transport Authority (MTA) expects the main users of bus bikeracks to be cyclists who are several kilometres from the start of a bike route.