investing in transport

East West Link Needs Assessment

A Study by Sir Rod Eddington

The Hon. John Brumby MP
Premier of Victoria
1 Treasury Place
Melbourne VIC 3000

Dear Premier,

In 2006, I was asked by the Victorian Government to conduct an investigation into the best transport solutions for connecting Melbourne's eastern and western suburbs. I accepted this challenge because I am very conscious of the importance of a modern, quality transport network to the future prosperity of Melbourne and Victoria. As a resident of Melbourne, I am also passionate about making sure that our city remains an attractive, liveable and successful place as it continues to grow.

I am very pleased to present my report – Investing in Transport – to you and the government.

I have set out my recommendations – and the evidence supporting them – in my extensive main report. I am also releasing an Overview document that summarises my findings and recommendations. In addition, I am making available online a number of very detailed supporting documents and reports.

I would like to extend my personal thanks and appreciation to the Study Team that has so capably and enthusiastically supported me throughout this investigation:

Andrea Brown	Kristy Heaney	Matt Phelan
Tony Canavan	Mark Knudsen	Geoff Rayner
Jacqueline Flitcroft	Andrew Korr	Leanne Seddon
Graham Gosby	John Matthews	

I would also like to thank the many individuals, organisations, community groups and local councils who made submissions to the study – as well as those who gave their time to assist me during site visits and consultations. I particularly thank the Victorian Government Inner Agency Advisory Group and its chair, Alf Smith, for their valuable contribution, and the specialist consultants and other advisors who provided important input to the study.

The recommendations contained in this report are my own. I know that the major transport infrastructure projects are both expensive and disruptive, but cities with inadequate transport networks pay a high economic and social cost. I hope everyone recognises that as they debate my recommendations.

I trust you will find my report informative, and a useful contribution to future transport investment in Melbourne.

Rod Eddington
Melbourne
March 2008

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The Melbourne of today is a successful city. That success is built in part on the transport decisions and investments made by previous generations – and it is a legacy that has served Melbourne well.

Making the right decisions about the future of Melbourne's transport network is about much more than predicting and providing for greater travel movements over the coming decades. It is about the significant economic, social and environmental benefits that will be generated by the appropriate transport infrastructure. It is also about investing in the transport connections needed to support the development of a more innovative, competitive and sustainable city.

In 2006, the Victorian Government asked me to investigate the best solutions for improving transport connections across Melbourne's east-west corridor. In meeting this request, I have taken the view that the East West Link Needs Assessment (EWLNA) should be more than another transport planning study. That is why I have adopted an approach that explores not only existing and future travel patterns, but also the economic and structural changes influencing those patterns and the types of journeys that will drive Melbourne's economy and shape the future of the city.

I have identified a number of factors that will be critical to Melbourne's growth and prosperity over the next 30 years:

- Melbourne's strong economic and population growth means that there will be a very substantial increase in demand for travel – by public transport and by private motor vehicles. It also means substantial growth in the volume of freight being moved around Melbourne and to and from the city's ports and airports.
- The nature of Melbourne's economy is changing. The city's economic success is increasingly less dependent upon traditional industries such as manufacturing and more dependent upon 'knowledge' and 'business' services. This shift to a services economy is generating different patterns of travel to ensure good access to skilled workers, to other services, to business clients and to national and international markets.
- Networked cities are the cities of the future. In the years ahead, Melbourne will need a flexible, fully connected transport network to reduce road and rail congestion and to support the economic journeys that are critical to a modern economy.
- The vibrancy and strength of central Melbourne will continue to be critical to Victoria's prosperity. Many high income, highly sought after jobs will continue to be located in the CBD and inner urban region (including growing precincts such as Parkville and Docklands). This will place further pressure on peak period transport connections to the central city.
- Melbourne's density is an important factor in its future success. More dense and compact cities generate less demand for travel and save on infrastructure costs – savings that translate into improved competitiveness and stronger economic growth.
- Melbourne's long-term prosperity will require the city to find new ways to succeed and grow in a carbon-constrained world. Higher levels of investment in public transport are vital, as is the development of urban areas that are conducive to walking and cycling. However, the evidence is clear that the number of trips made by car in Melbourne will increase by a substantial amount for the foreseeable future – and the city's road network must be able to cope with this increasing demand in an efficient and sustainable manner.

These 'future signposts' provide guidance about where transport investments will generate the most value for Melbourne. They also have specific implications for the EWLNA. In particular, I have taken the view that any transport proposals put forward by the study must make a substantial contribution to:

- Improving opportunities in Melbourne's west and supporting the strong population growth taking place in the west. As analysis undertaken for this study shows, Melbourne is a city with a significant east-west divide. Aside from historic issues of social disadvantage, this divide leads to reduced opportunities for jobs and business growth in the west.
- Supporting the growth and consolidation of Melbourne's 'knowledge centre' around Carlton and the Parkville precinct. This area, with its unique concentration of world class research institutes, teaching hospitals and universities, will be critical to Victoria's leadership in industries such as biotechnology, medical research, health services and education.

I am very conscious that this report comes at a time of heightened interest in, and awareness of, climate change. My strong view is that we must move towards a situation where substantial cuts in emissions are made by the transport sector and where transport users meet all their external environmental costs. The full range of measures needed to achieve this goal is beyond the scope of this study; however, I share the views of the Stern Review and others that the significant social and economic benefits of transport must be acknowledged in assessing how, where and when emissions reductions should occur.

The EWLNA Study Team has also assessed the environmental impacts of all options considered by the study, as well as giving close attention to issues of community and neighbourhood amenity.

As required by my terms of reference, the Study Team has fully explored the existing and potential demand for travel across Melbourne and within the Study Area. I have taken into account the characteristics valued by Melburnians as they move around the city: reduced travel times, reliability in travel times, reasonable costs, comfort, safety and security. I have endeavoured to strike a balance between the high value Melburnians place on their personal mobility and the economic, social and environmental factors that will secure Melbourne's future success.

I want to make clear that I do not support – and I have not adopted – a 'road versus rail' approach to transport planning. I do not consider this to be a helpful or realistic distinction. Instead, I have examined which modes of transport best fit the journeys that are important to Melburnians: for example, rail services are clearly effective at getting large numbers of people to and from workplaces in the central city, but are much less effective at meeting other travel needs. Instead of favouring one mode over another, I have looked for the right combination of modes that offer the best options for meeting Melbourne's east-west transport needs over the next 30 years. For these reasons, I have focused strongly on increasing access to the central city by public transport.

I have made two major infrastructure recommendations:

- A new 17 kilometre rail tunnel linking Melbourne's fast-growing western and south-eastern suburbs – a generational 'step-up' in the city's rail capacity and Melbourne's first 'metro' style passenger line.
- A new 18 kilometre cross city road corridor that provides a much-needed alternative to the West Gate Bridge, while also delivering substantial economic, transport and amenity benefits to Melbourne.

I have also recommended a number of smaller initiatives that will help to address transport issues in the east-west corridor.

In making these recommendations, I have developed options that focus first on solving current transport problems, but that will also contribute to fixing future problems. I have also aimed to develop options that make better use of Melbourne's existing transport infrastructure and that leave open opportunities to build further on that infrastructure in the future.

It is important to understand that (as directed by my terms of reference) my report is not intended to be a list of transport priorities or a broad transport strategy for Melbourne or Victoria. My recommendations focus on new east-west connections within a defined Study Area and I believe there is a strong case for the initiatives I am proposing.

It should also be noted that the infrastructure projects I have recommended come with major construction impacts, something that is unavoidable when 'retro-fitting' large-scale transport projects into the middle of an established, modern city such as Melbourne. While most of these impacts are temporary, Melburnians need to make some critical decisions about whether they are prepared to endure this short-term disruption for the long-term benefits these projects will deliver.

The Victorian Government also needs to make critical funding decisions if it is to meet growing community demands for improved transport, particularly public transport. New sources of funding will need to be found - including increased state borrowing and other potential revenue options that I have identified in my report.

My recommendations are grounded in extensive research and modelling carried out by the Study Team and a group of expert consultants. They take into account the many submissions forwarded to me by individuals, local councils, community organisations and business groups. I thank all those who made submissions to the study and those who met with me or members of my team. I recognise that not everyone will agree with my recommendations, but I believe they deserve fair consideration as a balanced and measured response to tackling some of Melbourne's major transport dilemmas.

The evidence is clear: doing nothing is not an option. Melbourne needs better east-west transport connections to address core congestion problems within the transport network, to meet rapidly increasing travel demand, to support a growing population and to keep pace with the changes taking place in the city's economic and urban structure. The evidence is also clear that a failure to take action will undermine Melbourne's future prosperity and reduce the benefits being generated by the city's growth and development. Yes, the cost of improving these transport connections is substantial – but the cost of inaction is far greater.

Making transport decisions that extend well into the future requires bold thinking. I believe that my report reflects such thinking and planning – and that my recommendations represent the 'next generation' of transport investment needed to secure Melbourne's continuing success. I strongly believe that by taking these actions, we will not only ensure that Melbourne is much better placed to manage rapid growth and change – we will also create a very significant transport legacy for the city's future.

Rod Eddington
Melbourne
March 2008

Study background and scope

Background

In March 2006, as part of its *Meeting Our Transport Challenges* action plan, the Victorian Government announced the appointment of Sir Rod Eddington to lead the East West Link Needs Assessment (EWLNA) – an independent investigation into the best transport solutions for connecting Melbourne's eastern and western suburbs. In early 2007, the Government established a Study Team to provide support and expert advice to Sir Rod Eddington in preparing his report.

In making its decision to establish the EWLNA, the Government noted the following:

- Over the last ten years, there have been two major east-west road developments in Melbourne: the linking of the Monash and West Gate Freeways (via CityLink) and the Western Metropolitan Ring Road. The majority of east-west traffic is carried on these two links, which experience significant congestion during peak periods. Currently, this congestion represents 60 per cent of Melbourne's total freeway congestion.
- The Monash – CityLink – West Gate corridor is one of Victoria's more important road connections, providing access to Melbourne's CBD from the south-east and the west, as well as being a vital link between the east and west of the city, and an important connection to Melbourne for Geelong and western Victoria.
- Melbourne is heavily reliant on the corridor as the only major east-west link that supports freight and private travel between Melbourne's western and south-eastern suburbs. Strong growth in suburbs along the route and increased freight through the Port of Melbourne are putting significant pressure on the corridor and surrounding arterial roads. While the Government's $1 billion Monash – CityLink – West Gate improvement package will enhance the corridor's capacity over the next four to five years, full capacity will be reached within two decades.
- The Victorian Government continues to give high priority to public transport and has made a substantial commitment to improving Melbourne's public transport network, including an expansion of cross-town bus services and upgrades to boost rail capacity. Public transport solutions are essential to improving travel along the corridor, to reducing congestion in Melbourne's CBD and improving amenity in local communities.
- While previous studies have examined sections of the east-west corridor, it is responsible and prudent to investigate the needs of the whole corridor and to carefully evaluate the various proposals that have been put forward to improve Melbourne's east-west connections, including tunnels, railway extensions, buses and freeways.

Against this background, the Government recognised that an additional east-west link will be needed in the future and that an independent study offered the best opportunity to assess the long term transport requirements of such a corridor and to develop options to meet future demand for travel across Melbourne.

The EWLNA is also set within the broader strategic context of Commonwealth, Victorian and Local Government policies – policies that will influence the development and implementation of transport improvements in Melbourne's east-west corridor. The Study Team has carefully considered these policies and their objectives, and has built them – where appropriate – into the study's framework for assessing and recommending options. Further detail on these polices can be found in Appendix D.

Study Scope

With specific reference to an additional east-west transport corridor for Melbourne, the Victorian Government asked Sir Rod Eddington to inquire into and report on:

1. Current transport volumes and patterns, and the likely changes to these volumes and patterns over the next 30 years, including the impact of Melbourne 2030, other Government policies and anticipated economic growth
2. The capacity of existing and planned infrastructure to meet these future transport requirements
3. How to balance the needs of freight traffic with the needs of residents in areas adjacent to freight movements
4. Development of options to address capacity constraints and future demand, future needs of port and associated commercial traffic including the Government's 30/2010 target, and opportunities for public transport in the corridor
5. In developing options, consideration will be given to a range of measures to meet future demands. Contribution to the achievement of *Growing Victoria Together* transport targets will also be considered as part of the assessment
6. Funding issues, including sequencing of projects according to public and private funding capacity, and the capacity of the construction industry to deliver.

The Government also asked Sir Rod Eddington to undertake community and stakeholder consultation as part of the review.

Study Area

The core Study Area for the East-West Link Needs Assessment extends from the Western Ring Road at the Deer Park Bypass to east of Hoddle Street at the Eastern Freeway. This area has been defined to include the local communities and suburbs that are likely to experience the greatest impacts from any additional east-west links.

While focused on this core area, the Study Team has also considered the many external influences that impact on the area (such as climate change, and the movement of freight across Melbourne and Victoria). The Team also explored the likely effect of improved east-west connections on Melbourne's economic growth and urban development.

The Study Team received some specific ideas and proposals that were outside the study scope, such as the completion of the Metropolitan Ring Road. these proposals have not been considered by the EWLNA.

Study Process

In March 2007, Sir Rod Eddington released a Study Overview for the East West Link Needs Assessment. The Overview outlined the key issues to be canvassed by the Study Team and invited interested persons or groups to make a submission.

The Study Team received and considered more than 130 submissions. Sir Rod Eddington and/or members of the Study Team also met with around 70 stakeholders, including business and community groups, corporations and local councils. Appendix A lists all submissions received and consultations undertaken by the Study Team; Appendix B sets out a summary of issues raised by submissions and consultations. Submissions can be viewed at the EWLNA website.

The EWLNA Study Team commissioned seven specialist teams to undertake research, provide expert advice and assist in developing and testing options to meet future transport needs in Melbourne's east-west corridor. Appendix G lists these teams. Full copies of relevant reports prepared by some of these teams are available at the EWLNA website.

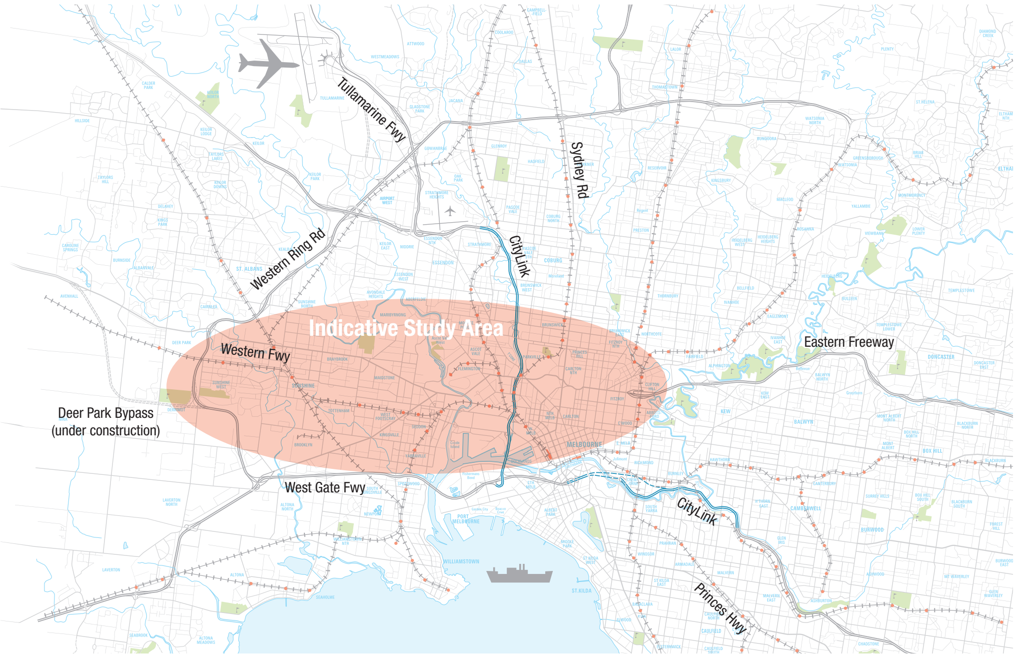
The Study Team conducted its investigation in three phases:

- Phase 1 examined the current situation in the Study Area, explored existing and future drivers of the demand for transport along the east-west corridor and identified problems in meeting that demand. Phase 1 also generated a broad range of transport options and developed a framework to assess these options. During this phase, the Study Team also examined how Melbourne's economic growth and changing demographics are influencing the demand for travel.
- Phase 2 involved an appraisal of a number of options, including developing options to engineering feasibility stage and undertaking modelling to ascertain the impacts, costs and benefits of each option. Options were then narrowed down to a set of final proposals that best met the EWLNA terms of reference.
- Phase 3 fully developed, appraised and analysed the final proposals using detailed transport modelling, high level costing and options for financing, delivery, sequencing and governance.

In conducting its investigation, the Study Team adopted a time frame of 30 years and beyond.

Further detail about the assessment and modelling process adopted by the Study Team is set out in Appendix F.

Figure 1 – EWLNA core Study Area



List of recommendations

The EWLNA has made 20 recommendations, which are listed below. Full details of these recommendations are set out in Chapter 9.

Recommendation 1

Planning work should commence for the staged construction of a new 17 kilometre Melbourne Metro rail tunnel linking Melbourne's booming western and south-eastern suburbs and providing a major increase in the capacity of the rail network.

Recommendation 2

The Victorian Government should bring forward the construction of a new rail connection from Werribee to Sunshine (the Tarneit link) to significantly improve the frequency and reliability of services from Werribee, Geelong, Ballarat and Bendigo.

The Government should commit to using the new rail tunnel and Tarneit link as the foundation for extending the metropolitan rail network further to the west within the next 15 years.

Recommendation 3

During the planning and construction of the rail tunnel, the Victorian Government should continue to make better use of the existing network to increase capacity, including commencing work on the electrification of the network to Sunbury to boost services on the Sydenham line.

Recommendation 4

Planning work should commence on the staged construction of a new 18 kilometre cross city road connection extending from the western suburbs to the Eastern Freeway.

Recommendation 5

Community amenity in the inner west should be restored by implementing a Truck Action Plan to remove truck traffic from local streets in the inner west. The plan should include a series of targeted road improvements that form an effective bypass around residential areas, reinforced by local truck bans.

Recommendation 6

Public transport to the Doncaster region is best provided by rapid, high quality bus services, additional bus priority measures and a major new bus-rail interchange at Victoria Park. To deliver this standard of services, the DART upgrade announced in the 2006 *Meeting Our Transport Challenges* plan should be introduced as soon as possible, along with additional service enhancements and bus priority measures undertaken in conjunction with Recommendation 4.

Recommendation 7

A number of specific links should be progressively built to improve cross city cycle connections and cater to the growing number of Melburnians cycling to work.

Recommendation 8

The Victorian Government should work with local councils and relevant agencies to escalate city-wide implementation and enforcement of priority measures for trams and buses.

Recommendation 9

A dedicated fund should be established to facilitate the development of Park & Ride facilities, with priority given to improving access to rail services in Melbourne's west and facilitating public transport patronage in the Doncaster corridor.

Recommendation 10

The Victorian Government should re-evaluate its 30/2010 rail target (which aims to move 30 per cent of freight from and to all Victorian ports by rail by 2010), given the clear finding by the EWLNA that it cannot be met. The Government should create a new strategy and work with industry to develop and implement a detailed action plan for moving more freight by rail.

Recommendation 11

The Government should take action to increase rail's share of freight by:

- Ensuring the development of a single, common user, interstate, intermodal freight terminal north of the city on the Melbourne to Sydney rail corridor
- Developing the standard gauge rail freight network to connect the interstate intermodal terminal with the key metropolitan freight hubs
- Making and announcing concrete planning decisions about the future sites for metropolitan freight hubs
- Ensuring that all future transport plans build in the connection of the Port of Hastings to the interstate standard gauge rail network.

Recommendation 12

The Port of Melbourne Corporation should be given overall responsibility for implementing an intermodal hub network in Melbourne, including responsibility for achieving the Government's revised rail freight target.

Recommendation 13

Given the projected increase in the metropolitan freight task, the Government should take further action to improve the efficient movement of road freight by permitting the introduction of high productivity freight vehicles on designated routes.

Recommendation 14

The Government should continue to implement *Melbourne 2030* and take stronger action to accelerate the development of vibrant suburban hubs in Melbourne's west, particularly Footscray, Sydenham, Sunshine and Werribee.

Recommendation 15

Through the Council of Australian Governments – and working with the Australian automotive industry – the Victorian Government should pursue measures to bring Australia into line with European CO_2 emissions standards for motor vehicles.

Recommendation 16

The Government should develop a clear strategy for increasing the proportion of low emission, efficient vehicles operating in Melbourne.

Recommendation 17

The Victorian Government should seek early discussions with the Commonwealth Government regarding a funding contribution from AusLink towards some or all of the EWLNA recommended projects.

The Government should also work with the Commonwealth to extend AusLink to transport projects designed to relieve urban congestion.

Recommendation 18

The Victorian Government should consider a funding structure for the proposed new Metro rail tunnel that includes contributions by beneficiaries (including public transport users and property owners across Melbourne).

Recommendation 19

The Government should re-evaluate its current road tolling policy to ensure that the long term benefits of new road investments can be fully realised (including public transport priority, improved cycling opportunities, road network balance and improved local amenity).

Recommendation 20

A single statutory authority should be created to deliver the EWLNA recommended projects, using a 'corridor approach' to planning, managing and delivering the full suite of projects.

Summary of findings

As Melbourne's economy and population grows, so too will the demand for travel within the city.

Over the next 25 years – with at least 1 million more people living in the city – the demand for travel in Melbourne will grow by more than 30 per cent. There will be more and more people travelling to work by train, more people using trams and buses, and many more people driving around the city for work, business, social or recreational reasons.

Alongside this strong population growth, Melbourne's economic and industrial base is changing – shifting away from traditional manufacturing towards services, knowledge-oriented industries and more advanced manufacturing with a high-technology base. This shift is also driving growth and change in the way people travel around the city, with more emphasis on distribution and logistics, face-to-face contact, fast and efficient international connections and industry clustering. Amongst other things, these changes are generating more travel outside traditional peak periods.

While there has been a major resurgence in train travel in recent years – a resurgence that is likely to continue – cars will remain Melburnians' preferred mode of personal transport for the foreseeable future. Over the next 25 years, the overall demand for car travel in the city will increase by 30 per cent, making access to an efficient, safe and well-managed road network indispensable in the daily lives of the vast majority of Melbourne's residents.

With strong growth and development taking place in Melbourne's inner city, and the western and south-eastern suburbs, these areas will experience the greatest growth in travel. In particular, Melbourne's west – which is undergoing a major transition – will face considerable travel pressures due to its limited transport connections with the CBD, the inner and middle-east and the Port of Melbourne.

As Melbourne grows, so too will the need to move goods around the city. Melbourne's overall freight task will increase by around 3 per cent a year from now until 2020 and the amount of freight carried by road will grow by more than 50 per cent.

This strong growth in the movement of people and goods around the city means that major new investment is needed to ensure that Melbourne has a reliable, flexible, efficient and fully connected transport network – one that not only supports future transport demand, but that also makes a contribution to Melbourne's future success.

In relation to cross-city (or east-west) travel, new investment is needed to address some of the major transport-related problems facing Melbourne:

- *The growing demand for train travel is placing the rail network under considerable strain:* The recent major resurgence in train travel shows no signs of slowing and is putting the rail network under pressure during peak periods. Capacity constraints on the rail system mean that, even after interim measures are taken, the Northern and Caulfield Rail Groups will shortly 'hit the wall', with demand outstripping available capacity some time in the next 10 years. Capacity constraints in the inner core of the network also preclude line extensions to the western suburbs. With demand for public transport likely to continue to grow, Melbourne's rail network must be expanded.
- *Melbourne is over-reliant on the West Gate Bridge:* Melbourne's transport network is highly vulnerable to constraints and disruptions on the West Gate Bridge. At present, even a minor incident on the bridge can have a costly and highly disruptive effect – bringing traffic across the inner west to a halt and spreading across the city's entire transport network. In the longer term, a major incident that rendered the bridge unavailable for an extended period of time would have potentially catastrophic economic repercussions that would extend well beyond Melbourne. Growing congestion on the bridge during peak periods is also having negative economic and business impacts. There is a need for an alternative to the bridge.
- *Road congestion is growing:* Increasing levels of demand for travel are already generating congestion on Melbourne's road network – and the problem will worsen as the city's population grows. While some congestion is unavoidable in a large, growing city like Melbourne, it also imposes substantial costs on the city – most of which are borne by business. The failure to reduce congestion levels over the coming decades will have serious economic, social and environmental repercussions for Melbourne – and for Victoria.
- *There is no connected east-west link across the north of the city:* Strong and growing demand exists for trips across the city (from the west to the east and vice versa), with at least 210,000 vehicles making daily cross-city journeys of varying lengths. Current routes are disconnected and often run along inappropriate suburban streets, forcing people to seek alternative routes as they try and wend their way across town. As well as placing key east-west roads under increasing pressure (leading to significant congestion), this growing volume of cross city traffic also leads to a large amount of 'rat running' through streets in Melbourne's inner north.
- *Transport issues are more pressing in the west:* Strong population growth is outstripping local employment growth in the city's west, creating significant travel pressures as more people travel to the city and to the inner- and middle-eastern suburbs for work or business. These pressures are exacerbated by the limited number of road crossings over the Maribyrnong River. Relatively poor transport accessibility is holding back the west from attracting businesses and developing more local jobs. Improved transport connections are critical to supporting growth in the west and reducing Melbourne's 'east-west divide'.
- *The freight task is growing rapidly:* With the freight task predicted to grow by 50 per cent by 2020 and container volumes through the Port of Melbourne likely to increase fourfold, there is a need to manage freight movements through Melbourne more efficiently. This will require improved road and rail connections to the port, finding ways to reduce the number of heavy trucks on Melbourne's roads and developing a clear plan to move more freight by rail. There is also an urgent need to address the level of truck traffic through Melbourne's inner west.
- *Connections to the city's airports are becoming more critical:* Melbourne International Airport and Avalon Airport are forecasting substantial passenger growth. While air freight passing through these gateways – and through Essendon Airport – will remain relatively small in volume, it will continue to increase in importance for the transportation of high value and urgently needed goods. Travel time reliability is absolutely critical for airport connections, which are already being affected by growing congestion on the West Gate-CityLink-Monash corridor, the Western Ring Road and the Metropolitan Ring Road.
- *Public transport services to Doncaster need improving:* Public transport from Doncaster to the central city does not fully meet the needs of residents, with existing bus services running infrequently and providing lower levels of service off-peak and on the weekends. Improvements to public transport along this corridor are needed and should aim to achieve patronage levels at least as high as adjacent areas.
- *Commuter cycling is booming and should be encouraged:* While coming off a relatively low base, there has been a substantial increase in commuter cycling in Melbourne in recent years. This is a welcome development and should be encouraged by addressing gaps in the east-west cycling network that act as a disincentive to more people cycling to work.

To address these and other issues, the EWLNA is recommending two large, 'next generation' rail and road infrastructure projects, along with a number of other significant investments and initiatives. These investments will help to ensure that the city's transport network is capable of supporting Melbourne's strong population growth, as well as helping to secure the future drivers of economic growth and prosperity across the city.

chapter 1

1. melbourne - a changing and growing city

1.1 Economic growth and change

Melbourne is a vibrant, dynamic and forward-looking city that continues to attract people, investment, businesses and jobs. Melbourne's confidence in the future is being driven by strong population and economic growth, the development of new strengths in traditional and emerging industries and a growing international reputation for innovation, creativity and diversity.

While continuing to grow and change, Melbourne retains many of the features that make it one of the safest and most liveable cities in the world. A 19th century legacy of gracious buildings, public parks and gardens, wide streets and colourful alleys and laneways helps to keep central Melbourne accessible and attractive. At the same time, new landmarks – such as Federation Square, Southern Cross Station, the Eureka Tower and the Melbourne Convention Centre – are bringing a contemporary edge to Melbourne.

Long the heartland of Australian manufacturing, Melbourne has succeeded in restructuring and diversifying its industry base and is now recognised as an international centre for creative industries (such as film, design and fashion), service industries (such as financial, property and business services, and education) and relatively new industries (such as biotechnology and nanotechnology). Parkville and Docklands are emerging as hubs of excellence in biotechnology and medical research, health care, education, film, design and finance. Melbourne's economy is further enhanced by its acknowledged status as Australia's arts and cultural centre and the nation's sporting capital.

While strong economic, population and jobs growth give Melburnians every reason to look to the future with confidence and optimism, the city faces some significant challenges in managing these 'symptoms of success'. These challenges include minimising the impacts of strong population growth, maintaining Melbourne's competitive edge in an increasingly tough global environment, managing environmental pressures such as climate change and water, and ensuring that the city remains a destination of choice for skilled workers, students, investors and international visitors.

Transportation is an essential element in meeting these challenges and shaping the future growth and structure of the city. Over the coming decades, the city's transport system will play a critical part in ensuring that Melbourne retains its liveability and attractiveness, while continuing to enjoy solid economic and jobs growth. Investment in transport infrastructure will also help to determine the locations for the next wave of jobs and business growth in Melbourne.

The EWLNA Study Team's view is that decisions made now about Melbourne's transport future must focus not only on anticipated travel demand, but also on the best ways to support the likely future drivers of Melbourne's and Victoria's prosperity.

In particular, the Team believes that improved east-west connections should be designed to support Melbourne's future success by:

- Improving public transport access to and from the growing central city area
- Creating new opportunities, facilitating development and improving access to jobs in Melbourne's west
- Meeting the growing demand for cross city travel
- Supporting strong residential and business growth in the central city
- Improving community amenity and liveability
- Significantly improving connectivity across the city's transport network
- Benefiting growing areas in the city's south-east.

Victoria's robust economy

Victoria has now enjoyed more than a decade of solid economic growth.

Over the past eight years, Victorian GSP grew by an average annual rate of 2.9 per cent – the highest of Australia's non-resource states. In 2006-07, Victoria's economy grew by 2.7 per cent and is expected to grow by around 3 per cent over the next four years.

Victoria's unemployment rate remains at historically low levels (4.5 per cent in January 2008) and labour force participation is at near record levels. Over the last 12 months, Victoria produced the most jobs of any Australian State.

Business investment is also at very high levels, averaging more than 10 per cent per year over the past six years. In 2007, Victoria also had the highest value of building approvals of any state ($19.1 billion).

In the September quarter 2007, exports of merchandise goods increased by 6.4 per cent over the previous quarter, the strongest quarterly growth since June 2005. In 2006-07, exports of services also grew strongly, increasing by 8.3 per cent – well above the national average of 6.9 per cent.

These results show that, while facing significant challenges, Victoria's economy is in robust shape, is performing well and should continue to grow solidly into the future. The implications of this economic and employment growth for Melbourne include a greater demand for transport generally, an increased freight task (and growing pressure on important freight links, such as the Port of Melbourne and Melbourne Airport) and greater demand for passenger travel during commuter peak periods.

Transport and Melbourne's economic success

Work undertaken for the EWLNA[1] makes a compelling case for the link between transport and the economy. This work recognises that transport occupies a central role in the everyday functioning of an economy and that, as an economy develops, the demand for transport increases.

In particular, this work explains the direct correlation between growth in income, as measured by Gross State Product (GSP) and growth in the demand for passenger and freight transport. Population is another key driver in the demand for transport services. While GSP and population continue to grow, Melbourne will experience strong growth in the demand for transport across all modes.

The forecast increase in the demand for passenger and freight transport in Melbourne reflects a vibrant and strong economy, with the broader economic and political fundamentals in place that are conducive to continued investment and growth. This presents a challenge for policy makers in managing the demand for transport in a way that enables – rather than constrains – Melbourne's capacity to move forward as a modern, innovative and internationally competitive economy.

Transport improvements alone are rarely able to drive major economic change. A range of underlying factors must be in place for transport investments to have an impact on an economy's performance. These can be summarised as:

- *Economic conditions* – There needs to be a stable macroeconomic policy climate, positive externalities (agglomeration economies and labour market economies), a buoyant economy and an availability of labour with the right skills.
- *Political and institutional conditions* – There needs to be a broader policy environment conducive to investment, including supporting legal and organisational policies and processes, and the efficient management and governance of existing infrastructure.
- *Investment conditions* – There need to be well functioning capital markets and an availability of capital.[2]

1. Work undertaken by Meyrick and Associates, in conjunction with Econsearch and Steer Davies Gleave. See Meyrick and Associates (2008a), *Transport and the Economy,* Report prepared for the EWLNA
2. This summary is based on the summary included in the 2006 UK Eddington Transport Study (U.K. H.M. Treasury and Department for Transport (2006), *The Eddington Transport Study*, Main Report, Department of Treasury and Department for Transport, London, p.15)

The Study Team has concluded that Melbourne meets these conditions.

Even with these conditions in place, intervention to improve transport efficiency is not necessarily a pre-requisite for economic growth and development in Victoria. However, there are two important considerations that are relevant in supporting such intervention.

First, with the prospect of congestion costs for Melbourne doubling over the next 15 years, a 'do-nothing' approach is untenable in terms of the resulting costs to business and the loss of community amenity. A level of intervention and investment is justified to avoid some of these costs.

Secondly, transport plays an important facilitating role in bringing together the various resources, production and leisure activities of society. In this sense it is an enabler of economic activity, including social interaction. Transport has the capacity to reduce the physical separation of those activities that support economic growth and development. There is an economic case for intervention to address constraints where the benefits at least equal the costs.[3]

The Study Team considered the current and future transport needs of the Melbourne economy, recognising that different industrial sectors have different requirements (such as access to ports and airports, links with other urban areas and access to labour and customers). The Team also assessed how the Victorian economy may develop over the foreseeable future, noting the changes that are occurring as a result of the continuing restructuring of the Melbourne economy away from manufacturing and lower level services towards higher level service industries.

Higher level service industries are typically high density, which will lead to growth in Melbourne's employment base and number of commuters. The expected growth of the city's high level service industries will also put demands on the local road network, as the amount of light commercial vehicles and business journeys by private car increases. While the manufacturing sector's economic domination is declining, it remains an important force in the Victorian economy and the continuing success of manufacturing will require good access across the supply chain – from international and domestic gateways to local roads and manufacturing/distribution points. With the globalisation of many sectors, efficient transport logistics and distribution are an essential element to Melbourne's continued growth and competitiveness.

3. This is consistent with the view of the Eddington Transport Study that it is important to look for evidence where transport demand is nearing or exceeding supply.

The Study Team also looked at how and where transport constraints are likely to manifest themselves. The Team distinguished between two types of transport constraint that could reduce the potential for economic development:

- Absolute constraints – where there are unexploited opportunities from 'missing' links in a transport network
- Marginal constraints – where the cost of movement is increased (for example, by overcrowding on public transport, congestion on highways or other real or perceived costs, such as accident risks).

The Study Team's conclusion is that the greatest potential for economic development is when new links are put in place to relieve absolute constraints. However, developed economies (such as Melbourne's) have usually exploited most available opportunities for major new links or significant 'step-changes', leaving very few realistic and cost effective options.

As noted by the UK Eddington Transport Study:

> *"For developed economies, the debate should be focused on the capacity and performance of the existing network... … The relationship between transport and growth in a mature economy is … likely to be an incremental one."*[4]

The scope for transport investment to unlock economic development in a mature economy such as Melbourne's is limited to a large extent to relieving future pressures on the existing network, rather than building completely new networks. The Eddington Transport Study concluded that to unlock this development through transport in the UK, it was important to identify evidence of transport demand nearing or exceeding supply. The EWLNA's analysis suggests that, if unaddressed, growth in transport demand over time in Melbourne will significantly reduce the network's performance. For example, as highlighted by recent reviews of urban congestion, a 'do nothing' approach to tackling increasing congestion in Australian cities will result in very substantial economic and social costs.[5]

After identifying future problem areas on the network, determining the types of users who will suffer deteriorating conditions and ensuring that the other conditions for transport to influence growth are present, the Study Team turned to identifying the right transport solutions for Melbourne. The Team's analysis established a general outline of the areas where transport improvements will be needed to underpin Melbourne's future success:

- *Ensuring good access to international and interstate markets* – Transport is especially important for firms that trade goods and services interstate and internationally. Good access to and from the city's 'gateways' (its ports, airports and intermodal hubs) is critical to the success of these firms – and to Melbourne's and Victoria's national and global competitiveness.
- *Ensuring good access to skilled labour* – By maintaining the cost of commuting at reasonable levels – and providing a range of travel options – the transport network ensures that firms have access to an adequate supply of skilled labour. It also encourages people to participate in the workforce.
- *Ensuring good flows across the day for freight and commercial journeys* – Firms use the transport network to receive and deliver goods, interact with other businesses and provide service to customers. Time is money for businesses – and faster, more reliable and more efficient transport links save firms money and enable them to reach larger markets at a low cost. Improved transport connections also enable customers to travel further to compare and purchase goods, leading to a more competitive business environment, lower prices and increased efficiency.

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4. U.K. H.M. Treasury and Department for Transport (2006), p.13
5. See Victorian Competition and Efficiency Commission (2006), *Making the Right Choices: Options for Managing Transport Congestion*, Final report, State of Victoria, Melbourne; 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. Also see further discussion of congestion in Chapter 4 of this report.

1.1.1 Melbourne's changing economic and industrial base

Melbourne's booming economy, industrial strengths and increasing diversity are among the major forces driving Victoria's growth.

Melbourne continues to be Australia's centre for manufacturing, reflecting Victoria's position as the nation's leading manufacturing state (accounting for more than 30 per cent of national manufacturing turnover). However, Melbourne's manufacturing strengths are shifting away from traditional products and processes towards more advanced areas with a high-technology base, such as scientific and medical equipment, high precision machinery, advanced automotive manufacturing, new materials and micro-manufacturing.

While manufacturing remains one of Melbourne's largest employing industries, the sector's relative share of employment has fallen significantly over the last 30 years as the city's industrial base has become increasingly services-oriented. The services sector's contribution to Victoria's economy is growing rapidly – up from 32 per cent of Gross State Product (GSP) in 1991 to 42 per cent in 2006. Melbourne is leading this trend and has developed internationally recognised strengths in diverse areas such as property and business services, financial services and insurance, biotechnology, aerospace design, ICT, tourism and education.

Melbourne's manufacturing sector has also drifted outwards, away from the central city. Manufacturing jobs in central Melbourne and the inner and middle suburbs have declined substantially over the last 30 years, but have increased in outer areas such as Hume, Knox and Greater Dandenong.[6]

Financial services now comprise Victoria's third largest industry sector, with Melbourne becoming a regional centre for several financial services areas, including education and training, back office processing and superannuation. Jobs in the finance industry increased by 97 per cent between 1971 and 2001, with more than one half of new finance industry jobs created in Melbourne being located in the City of Melbourne. Similarly, employment in the property and business services sectors almost doubled between 1971 and 2001, with almost one quarter of new jobs in these sectors being located in the central city.[7]

Employment in the education and health sectors is also growing strongly. Melbourne is now a major international education centre, second only to London in the number of foreign fee-paying students attending tertiary institutions. Melbourne is also recognised internationally for its leadership in medical research and life sciences and is on-track to become one of the top locations for biotechnology in the world.

New industry clusters have emerged and are contributing to the changing face of the city. For example, the Parkville life sciences/biotechnology precinct is focused on major hospitals and universities to the north of the CBD. Similarly, employment in the higher education sector is concentrated around major universities and colleges in Parkville and the central city. Docklands is emerging as a financial services precinct and a media and entertainment hub. Southbank is a growing arts and entertainment centre and St. Kilda Road is a concentrated corridor of business services.

As Melbourne's – and Victoria's – economy becomes more services-oriented, it is also generating changes in travel patterns, away from a focus on providing manufacturers with raw materials towards an emphasis on distribution and logistics, face-to-face contact, fast and efficient international connections and industry clustering. The city's transport network can – and should – play a key role in ensuring that these changed travel journeys can be made reliably, quickly, efficiently and competitively.[8]

6. DSE: Department of Sustainability and Environment (2006), *Melbourne Atlas 2006*, accessed at www.dse.vic.gov.au
7. Ibid
8. A more extensive discussion of the role of transport in Melbourne's economy is set out in Meyrick and Associates (2008a), *Transport and the Economy*, Report prepared for the EWLNA. A more extensive discussion of the impact of the services economy is set out in SGS Economic and Planning (2008b), *The E-W Transport link, Urban Structure and Victoria's Prosperity*, Report prepared for the EWLNA.

Growth and change in a services economy

As Melbourne's economic base shifts away from manufacturing towards services, a number of factors will drive change in the structure and composition of the city, and have an impact on the demand for travel:

- *Relative accessibility* – as an area becomes more accessible relative to other areas, it is more likely to experience business and employment growth in key service sectors such as property and business services, education, finance and insurance, health and community services and hospitality (accommodation, cafes and restaurants). In turn, this growth generates greater demand for transport and increases the pressure on existing transport infrastructure.
- *Clustering or 'agglomeration'* – as an area becomes more dense (with firms clustered more closely together and travel distances reduced), productivity at the firm level increases. Where major infrastructure investments promote clustering or higher density development in a particular region, that region is likely to gain competitive advantages over other regions – leading, ultimately, to higher levels of investment, business and employment growth.
- *Changing nature of innovation* – with innovation now a driving economic force, firms increasingly need to be part of interactive networks that include a multiplicity of suppliers and customers, as well as advisers from the advanced business services sector (such as designers and marketers). Local affiliations and proximity to business services are critical to maintaining these networks, suggesting that more compact, better connected centres will be more conducive to innovation.
- *Changing economic journeys* – with greater global integration of markets, more outsourcing and a move away from traditional 'mass production manufacturing', the journeys that are important to Melbourne's economy are changing. The journeys that matter most to a services economy include face-to-face meetings, negotiations and transactions, personal contact with clients, advisers and suppliers, and relatively fast and efficient international connections (through airports and ports).
- *Increasing light commercial vehicle (LCV) use* – the services sector tends to generate growth in LCV traffic, reflecting the diverse nature of the sector and its demand for services that are highly dependent upon transport (from domestic services such as plumbing and lawn mowing through to computing services, legal and medical services, and cafes and restaurants). This LCV growth also increases the demand for road space.

Improvements to the city's east-west connections need to be considered in terms of their capacity to influence these factors and provide strategic support for the growing services economy.

Study Team Findings

The city's transport system plays a central role in the everyday functioning of Melbourne's economy. As Melbourne's economy and population grow, the demand for travel will increase very substantially over the next 30 years.

As Melbourne shifts towards a knowledge-based services economy, significant changes are occurring in the city's important economic journeys, including changes in travel demand and travel patterns. Melbourne's transport network must be able to support these changes, as well as contributing to opening up new jobs and business opportunities across the city.

1.1.2 A strong, vibrant and growing city centre

The City of Melbourne is now home to nearly 70,000 residents, with another 40,000 expected to call the central city home over the next 15 years. The CBD has a daytime business, working and visiting population of more than 730,000, with the number of weekday visitors to the CBD expected to increase to one million per day by 2014.[9]

As the Melbourne City Council pointed out in its submission to the EWLNA:

> *"This is the growth that Victorians have asked and planned for over the last 30 years. The City of Melbourne is now both a great place for people and an economic powerhouse. We must make sure these attributes are sustainable and the growth potential is achieved without destroying the liveability that makes Melbourne special."*[10]

Central Melbourne is enjoying especially strong jobs and business growth. Melbourne City Council's 2006 Census of Land Use and Employment (CLUE) reports increases of more than 10 per cent in the number of businesses and jobs in the central city between 2004 and 2006. CLUE records that, in the two years to 2006, total employment in the City of Melbourne increased by 10.6 per cent, or about 35,000 employees – compared to only 2 per cent growth in the previous two year period.[11]

CLUE also reports that the City of Melbourne now has almost 14,000 business locations, around 10 per cent more than in 2004. The largest industry in the central city is business services, employing more than 53,000 people.[12]

Between 2004 and 2006, the number of residential apartments in the City of Melbourne grew by almost 6,000 dwellings, with most growth occurring in the central city and Docklands.

KPMG's *Population Growth Report 2007* notes that more than 7,000 residents are moving into Melbourne's central city each year, exceeding the numbers being added to the city's fastest growing suburbs.[13] In his foreword to the report, demographer Bernard Salt argues that "there can be no greater measure of how Australian values have shifted in a single generation than in the numbers that track the rise of downtown living".[14] This shift is likely to continue, with central Melbourne attracting an increasing number of residents over the coming decades.

Central Melbourne's growth is being fuelled by the emergence of a number of highly successful, specialised inner city precincts.

- The **Docklands precinct** is the largest urban renewal project in Australia, with around 20,000 people expected to live in the area by 2020. More than 7,000 people commute to Docklands each day, working at firms that range from small retail outlets to large corporations such as the National Australia Bank, Channel 7, the Bendigo Bank, Lend Lease and AXA. The ANZ has announced that it will develop Australia's largest office building at Docklands, catering for more than 5,500 staff. Since 2002, the number of businesses based at Docklands has more than tripled and total employment has almost quadrupled – and more than 40,000 workers will be based in the precinct by 2020.[15]

  The popularity of Docklands signals a strong shift in jobs and residential growth patterns within central Melbourne, with significant flow-on effects for travel to and from the city.

- The **Parkville precinct** – on the northern edge of the Melbourne CBD – is an increasingly important location for residential and business growth. The precinct is home to a number of nationally and internationally recognised hospitals, research institutes and tertiary education institutions – with Melbourne University alone having more than 40,000 students and staff. More than 23,000 people come to work in the precinct each day, of which 60 per cent are employed in health services and 16 per cent in education. More than 35,000 tertiary students attend university or TAFE courses in the precinct and full time students make up nearly 44 per cent of the resident population.[16]

9. City of Melbourne (2006b), Melbourne City Research, Melbourne, accessed at www.melbourne.vic.gov.au
10. City of Melbourne submission to the EWLNA (2007)
11. City of Melbourne (2006a), *CLUE: Census of Land Use and Employment*, Melbourne, accessed at www.melbourne.vic.gov.au
12. Ibid
13. KPMG (2007), *Population Growth Report 2007*, KPMG, Melbourne
14. Ibid
15. Figures from City of Melbourne (2006a) and Growing Docklands Factsheet, accessed at www.melbourne.vic.gov.au; and 'Docklands Population Boom', *The Age,* Business Day section, 6 February 2008
16. Figures from DHS: Department of Human Services (2005), *Parkville Precinct Strategic Plan*, State of Victoria, Melbourne

Over the coming decades, the Parkville precinct will continue to generate significant employment and economic opportunities in education, health and biomedical research. Good transport access to and from Parkville will be needed to sustain the precinct's ability to attract and retain skilled workers and build productive connections between firms, universities and hospitals. Building these capabilities will be critical to the international competitiveness and success of Victoria's biotechnology, tertiary education and health care sectors.

- Since the 1980s, successive Victorian governments and Melbourne City Council have focused on renewing the **Southbank precinct** – on the southern edge of the CBD – from a rundown industrial area to an entertainment, arts, business and residential hub. Public and private sector investment in the precinct has contributed to significant residential growth over the past decade, with Southbank's population expected to grow to around 13,400 by 2016 (up from around 2,200 in 1996). This growth is being fuelled largely by young residents, with full-time university or TAFE students making up 20 per cent of the population. Around 33,000 workers are employed in Southbank and very high numbers of visitors to the precinct's facilities sustain the area's economy and workforce.

  There is likely to be considerable residential and business development in Southbank over the next 10 to 15 years, underpinned by landmark projects (such as the Melbourne Convention Centre and the Melbourne Recital Centre) that will further improve the area's amenity and attractiveness.[17]

- The **St Kilda Road precinct** has experienced strong residential growth since the 1990s, although this growth has slowed in recent years. Around 5,500 residents live in the South Yarra – St Kilda Road district and more than 13,000 people work in the area.[18] While the growth of Docklands has had an impact on the area, recent office building sales and decisions by Seek, Oracle and L'Oreal to take up office space on St Kilda Road suggest that the precinct's fortunes are again on the rise.[19]

  Alongside improved office leasing prospects, good opportunities for high density residential development are likely to encourage further institutional and private investment over the coming decade, contributing to further residential and business growth in the St Kilda Road district.

These positive developments suggest that the city's extended central core will be the driving force for jobs, business and investment growth within Melbourne – and Victoria – for the foreseeable future.

Redefining the CBD

Melbourne's CBD is likely to remain Victoria's primary job location and job generator for the foreseeable future.

However, the Study Team believes that a broader definition of 'the CBD' is needed, covering a larger employment zone that encompasses the existing CBD, the Parkville precinct, Docklands, Southbank, St Kilda Road and other inner suburban areas – including Footscray.

Over the next 25 years:

– *Docklands* will continue to expand as a location for financial and insurance services, as well as being a new, strongly growing residential centre

– *Parkville* will become an increasingly important, internationally recognised centre for education, health care, medical research and biotechnology

– *Southbank* will consolidate its reputation as an internationally-recognised arts and entertainment precinct and high quality residential neighbourhood

– *St Kilda Road* is likely to continue to strengthen as an important office precinct and as a location for high quality residential apartments

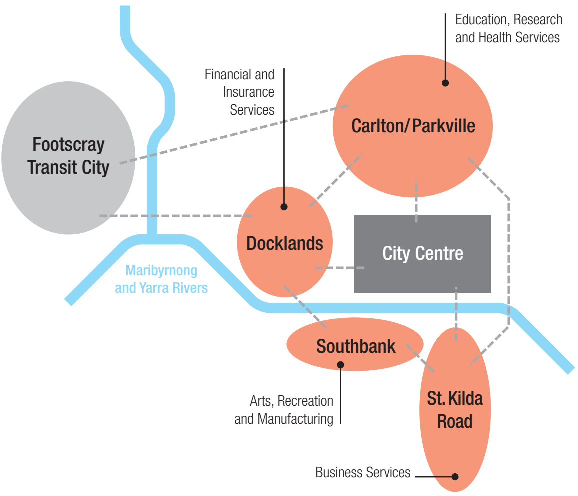
Good public transport accessibility will be critical to the future success of this redefined CBD area, removing the need for a car to commute to work and giving businesses in the central city access to skilled workers.

17. Figures from DSE: Department of Sustainability and Environment (2006b), *Southbank Plan*, State of Victoria, Melbourne
18. City of Melbourne (2006a)
19. Dunlevy, Maurice, 'Seek and Oracle find St Kilda Road', *The Australian*, 23 August 2007; Acting Minister for Industry and Trade, 'L'Oréal sets up head office in Melbourne in trade coup', Media Release, 5 November 2007, accessed at Victorian Government media site: www.dpc.vic.gov.au/pressrel

1.1.3 Integrating Footscray with the central city

One of the strongest patterns emerging in the EWLNA Study Area is the rapid growth taking place in the city's west (see Chapter 1.3: The new face of Melbourne's west). Currently, jobs and business growth in the west are lagging behind population growth. The Study Team believes that improvements in east-west transport links will play a critical role in ensuring that the inner west (particularly Footscray) shares in the benefits and opportunities being generated by the central city's growing and changing economy.

Figure 2 – A 'new economy' city – an expanded CBD



Footscray's central commercial and retail precinct is around 6 km from the centre of Melbourne – and yet it has remained largely isolated from the economic changes and business growth taking place in the central city. This is due largely to historic and geographic reasons – and to the relatively low levels of private and public investment in Melbourne's west, compared to the east.

Footscray has now been identified as a Transit City in the Victorian Government's *Melbourne 2030* framework (see Chapter 1.2.2). The Transit Cities program aims to encourage urban development around public transport – creating new housing, shops and services, as well as more local jobs. As part of this program, the government is undertaking a major new initiative over the next three years, called *Footscray Renewal,* which initially includes:

- new residential developments in the station precinct;
- upgrades to Nicholson Street mall and other main streets in central Footscray;
- a new, modern pedestrian bridge and public forecourt at Footscray rail station; and
- a new 'one-stop planning shop' to support local development.

This style of 'transit oriented development' (TOD) has emerged around the world as a strong force in the revitalisation of urban areas and will generate significant new opportunities for economic, business and residential growth in Footscray. But it will also create reciprocal advantages for the central city economy – with a major new urban renewal project on the CBD 'doorstep' likely to provide new business, investment and service opportunities for centrally located firms.

These developments are likely to further change the face of Footscray and the inner west. But the Study Team believes that more is required. There needs to be a shift in emphasis to begin to see Footscray as an important part of the central city and to incorporate Footscray into planning and thinking about the future of Melbourne's CBD. In other words, Footscray should be considered by city planners in the same context as Parkville and Docklands – as part of an expanded CBD that is the 'engine room' of Victoria's shift to a services economy.

Such an approach would challenge established perceptions of Footscray by firmly integrating it into this new, services oriented city economy. Combined with the enhanced transport links and the removal of trucks from the inner west being proposed by the EWLNA, this approach would give Footscray the potential to leverage off its proximity to the central city and reinvigorate the inner west by shifting away from the area's traditional reliance on manufacturing. It would improve the inner west's access to the advanced business services that it needs to boost business growth, as well as the area's capacity to attract and build a 'new economy' workforce.

Footscray could also leverage new opportunities from the presence of Victoria University in the heart of the suburb and its proximity to the Parkville education, health and research precinct – opportunities that will be further enhanced by the EWLNA's rail recommendations.

The inner west already enjoys a diverse multicultural mix that contributes to a retail, café, social and creative community culture not dissimilar to Carlton in the 1970s or Fitzroy in the 1980s. Improving transport links to the central city and to the east of the city provides scope to build on this culture and attract residents, businesses and visitors alike.

In particular, the Study Team can see no reason why – with much better transport links to the central city – Footscray cannot build a new industry base and a new generation of knowledge based businesses, attracted by lower costs than in the CBD and by the prospect of being part of a growing, vibrant and multicultural inner city community.

Study Team Findings

Central Melbourne will continue to be Melbourne's and Victoria's principal generator of jobs, business and investment growth. However, a broader definition of 'the CBD' is needed, which incorporates the existing CBD, the Parkville precinct, Docklands, Southbank and St Kilda Road – as well as Footscray and the inner west.

In particular, the Parkville precinct is likely to become an increasingly important generator of employment and economic opportunities in education, health and biomedical research. Good transport access to and from the precinct is vital to building Melbourne's capability in these areas and sustaining the international competitiveness of Victoria's biotechnology, tertiary education and health care sectors.

There needs to be a shift in emphasis to see Footscray as an important part of the central city and to incorporate Footscray into planning and thinking about the future of Melbourne's CBD. Improved east-west transport connections will be critical to integrating Footscray into the growing central city economy and driving the inner west's shift to a more services and knowledge oriented economy.

1.1.4 Shaping the city's growth

Around the world, there is now recognition that large-scale transport projects can make an important contribution to re-shaping a city's economic landscape and urban structure.

Several submissions to the EWLNA reflected this view and expressed the opinion that major transport projects should be considered not only from the perspective of addressing current transport problems, but also from a broader urban change perspective. For example, the City of Brimbank stated:

> *"The provision of transport infrastructure itself is a core element influencing the character and form of new metropolitan development."*[20]

In particular, the Study Team recognises that major transport projects can re-shape a city's structure as firms and households move to take advantage of locations offering superior accessibility to skills, production inputs, customers, and goods and services. This is supported by recent experience in Australian cities with respect to the Western Ring Road, CityLink and EastLink in Melbourne and Westlink (M7) in Sydney. Similarly, Melbourne's last major public transport expansion – the underground rail loop – had a significant revitalising impact on the central city, particularly the northern end of the CBD.

Analysis undertaken for the Study Team shows that transport accessibility is critical to an area being able to attract and retain jobs and households. The analysis also shows that the sectors most sensitive to changes in relative accessibility are knowledge intensive or advanced business services – the sectors that will drive Melbourne's future prosperity.[21]

Over the coming decades, firms operating in these sectors will make significant investment and locational decisions that will affect the shape of Melbourne. In this context, major transport projects must be assessed for their capacity to influence these decisions and spark the features needed to make Melbourne's economy more innovative and competitive.

20. City of Brimbank submission to the EWLNA (2007)
21. See SGS Economics and Planning (2008b)

Australian and international evidence indicates that these features include:

- A strong and vibrant central city (or CBD)
- Strong and vibrant suburban centres
- Efficient public transport links between these centres
- Flexible employment zones that allow a blending of production, logistics and office uses
- 'Employment rich' residential areas to support home-based and micro-business development
- Efficient use of road capacity
- Excellent airport accessibility.[22]

In particular, the Study Team notes that while Melbourne's increasingly powerful urban core will remain a key driver of jobs and growth, vibrant suburban centres will also play a major role in ensuring that the entire metropolitan area is geared to the services economy. This means attracting much higher numbers of knowledge intensive and advanced business services into these suburban centres.

At present, Melbourne's potential growth centres outside the central city are Ringwood, Dandenong and Frankston in the east. The relative advantages and 'self sufficiency' of these regions will be reinforced further by the opening of EastLink. With a greater concentration of business services in the east, these regions seem set to grow and prosper over the coming decades.

In the city's west, a very different picture emerges. Compared to the eastern side of the city, the west maintains a much stronger commuter dependency upon the central city. With the possible exception of Footscray, there are no major hubs in the west that are well-placed to attract investment, drive growth and become 'self sufficient'.

Improving Melbourne's east-west connections has the potential to significantly improve relative accessibility in the city's western suburbs. This will create new residential, business and development opportunities and lead to a boost in employment in the services sector – especially in property and business services, an area where the west has fallen behind the eastern suburbs and the central city. In turn, this will have positive implications for growth across the entire metropolitan area.

However, for improved connectivity to be most effective, the west needs strong focal points capable of attracting investment, employment and creative talent. If Footscray is incorporated into the central city area, this role falls to Sunshine, Sydenham, Werribee and Geelong. Strategies need to be developed to ensure that these centres make the most of the improved accessibility and connectivity generated by the EWLNA recommended projects.

22. For a more detailed discussion on these aspects, see SGS Economics and Planning (2008b)

The Study Team's view is that major transport decisions in Melbourne must first address current significant problems within the transport network (most notably the increased congestion accompanying strong population and economic growth). Secondly, these decisions must contribute to tackling future problems and providing Melbourne with the strongest foundation possible for future economic success. This approach moves beyond the more traditional method of seeking to 'predict' future travel patterns and then 'provide' a solution. Such an approach also explores where Melbourne might want to create new or improved travel connections in the interests of a more socially, environmentally and economically sustainable city.

The Team notes that, in part, the Western Ring Road exemplifies this type of approach. Arguably, this link was not Melbourne's highest priority project when it commenced, although it certainly aimed to address perceived traffic issues at the time. Essentially, the Western Ring Road 'moved up the list' of priorities partly because it could be constructed relatively easily and partly because it improved connectivity across the road network in an area where this was lacking. However, the construction of this road – together with CityLink – has 'reshaped' the pattern of urban growth in Melbourne and established new interactions that may not have been fully anticipated at the time the road was being planned.

In developing options for the east-west corridor, the EWLNA has combined extensive modelling of current and future travel demand with an assessment of the 'city shaping' power of new, large scale projects. The EWLNA has aimed first to identify and address current problems within the transport network (most notably the increased congestion accompanying strong growth). Secondly, the study has explored options that will also contribute to tackling future transport problems. Finally, the study has paid careful attention to how Melbourne and Victoria will 'earn a living' over the next 30 years and the cross city transport links that will do most to support the future drivers of Melbourne's success.

Study Team Findings

Major transport projects in Melbourne must address current problems within the city's transport network, contribute to tackling future problems and provide Melbourne with the transport connections needed for future economic success.

In developing options for improved east-west connections, modelling of current and future travel demand should be combined with an assessment of the 'city shaping power' of new, large scale transport projects.

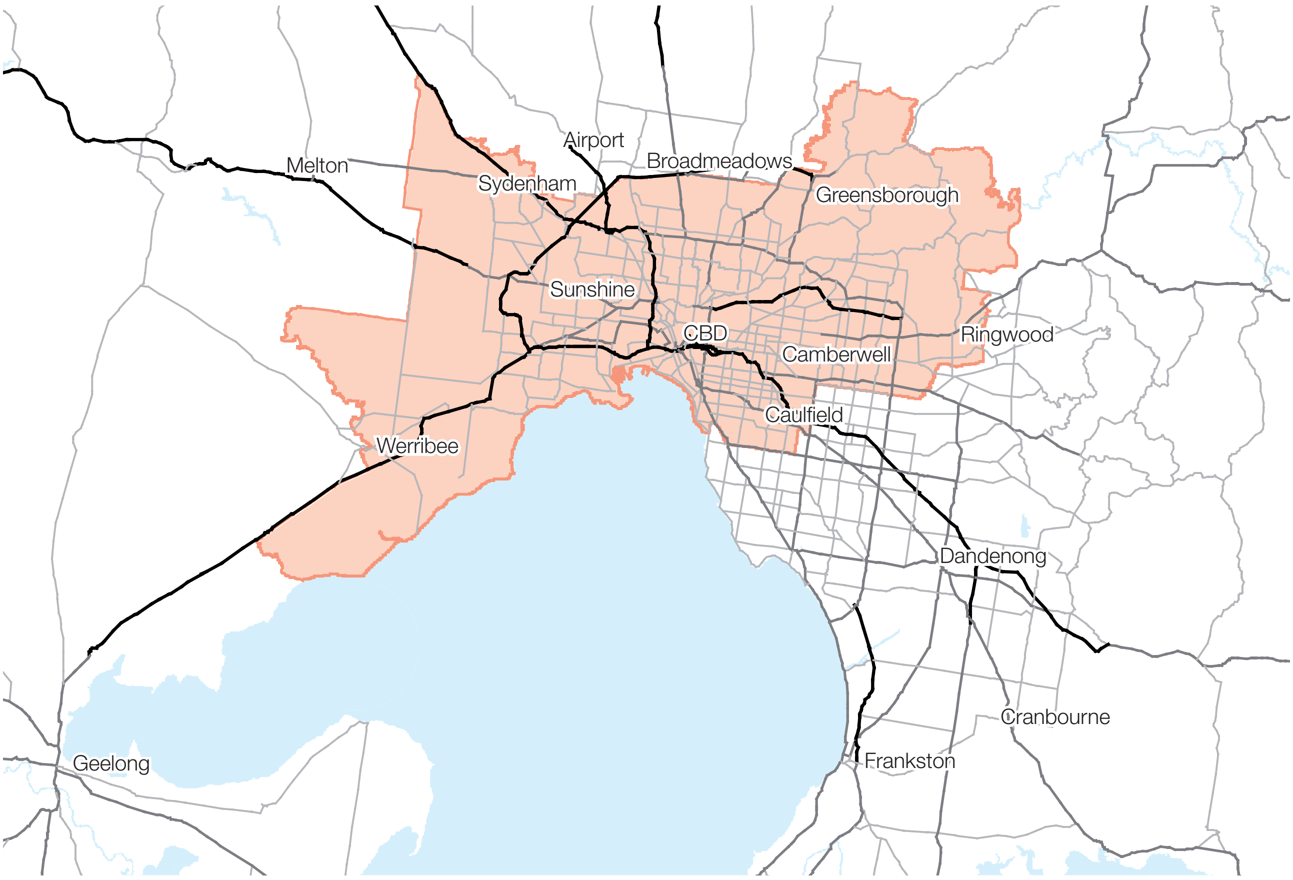
In the context of supporting the city's future growth, strategic transport issues are much more pressing in the west of Melbourne, where transport accessibility is relatively poor, than in the east.

1.2 Urban growth and change

Melbourne continues to attract people and investment from across Australia and around the world. The city is growing rapidly, generating significant changes in traditional patterns of population, industry and employment distribution – changes that will have a profound influence on the future demand for travel across Melbourne.

While focused on the EWLNA core Study Area, the Study Team recognised that many broader influences impact on growth and travel demand in the area. Accordingly, demographic analysis undertaken for the EWLNA has covered a much broader area, encompassing the 39 Statistical Local Areas (SLAs) that are likely to experience the greatest impacts from east-west transport improvements.

Figure 3 – EWLNA broader study area (for demographic analysis)



1.2.1 A rapidly growing population

Melbourne is experiencing its biggest surge in population since the 1960s, with the population increasing by nearly 1,500 each week – more than any other Australian capital city. Between 2001 and 2006, Melbourne's population grew more strongly than in the previous five years (at an annual growth rate of 1.5 per cent) to reach a population of more than 3.7 million.[23]

Consultancy firm KPMG has noted that this growth is being fuelled by "high levels of overseas migration, strong interstate migration and a high birth rate".[24] KPMG's analysis of the 2006 Census indicates that if these current growth rates continue, Melbourne will overtake Sydney as Australia's biggest city by 2028.

Some areas of Melbourne are growing at a much higher rate than others. As Figures 4 and 5 show, Melbourne's outer growth areas have been growing rapidly since 1996, with growth in the central city picking up pace over the last five years. These figures also show population growth in Melbourne has shifted westwards over the last 10 years.

Recent analysis of population growth in Melbourne carried out by the Victorian Government shows that the rate of growth between 2001 and 2006 exceeded expectations by a significant margin in several parts of Melbourne – see Figure 6. As the Department of Infrastructure has noted, this helps to explain public transport patronage being above expectations on certain routes.[25]

Table 1 – Population growth in Melbourne and Victoria, 1996 to 2006

Population	1996	2001	Average annual growth rate 1996-2001 (per cent)	2006	Average annual growth rate 2001-2006 (per cent)
Melbourne	3.3 million	3.5 million	1.1	3.7 million	1.5
Regional	1.3 million	1.3 million	0.9	1.4 million	0.8
Victorian	4.6 million	4.8 million	1.1	5.1 million	1.3

Source: ABS (2006)

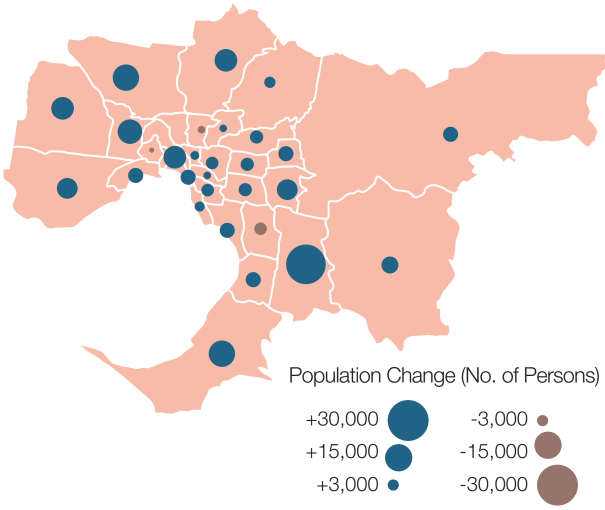
Table 2 – Population growth in Melbourne and Victoria, 2006 to 2051

Population	2006	2031	2051
Melbourne	3.7 million	4.5 million	5.0 million
Regional	1.4 million	1.7 million	1.6 million
Victorian	5.1 million	6.2 million	6.6 million

Source: ABS (2006)

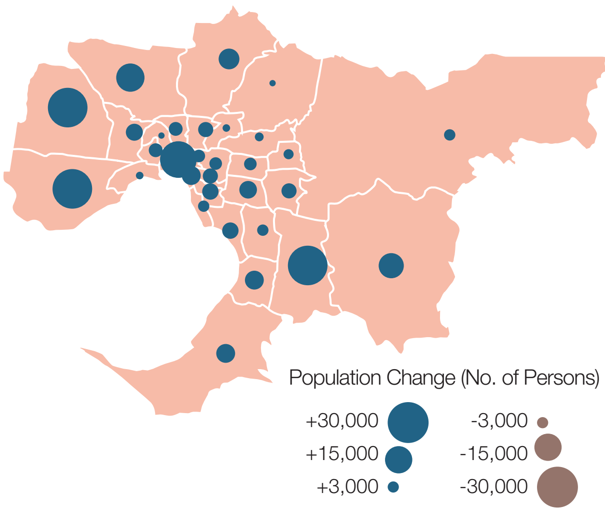
23. ABS (2006), Population Projections, Australia, 2004 to 2101, Cat no. 3222.0, Commonwealth of Australia, Canberra
24. KPMG (2007) and see KPMG, 'City rivals suburbia in population growth as Gen X, Gen Y and Empty-Nesters re-invent the great Aussie dream', Media Release, 12 November 2007
25. DOI (2008), *Transport Demand Information Atlas for Victoria 2008, Volume 1: Melbourne*, State of Victoria, Melbourne, p.58

Figure 4 –Population growth, Melbourne LGAs, 1996 to 2001



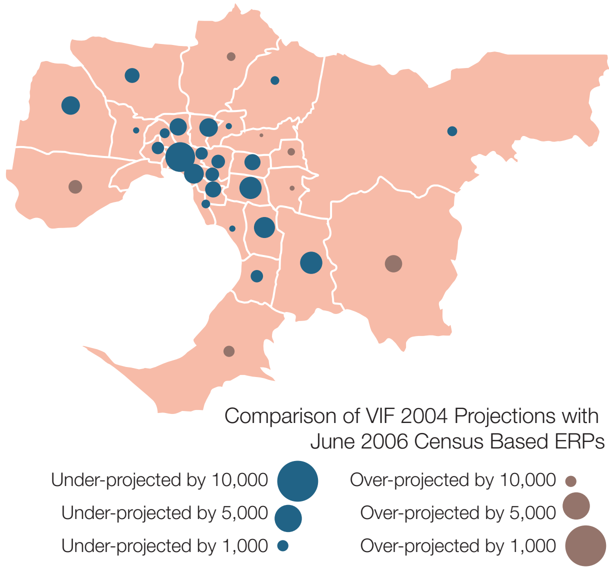
Source: DOI (2008)

Figure 5 – Population growth, Melbourne LGAs, 2001 to 2006



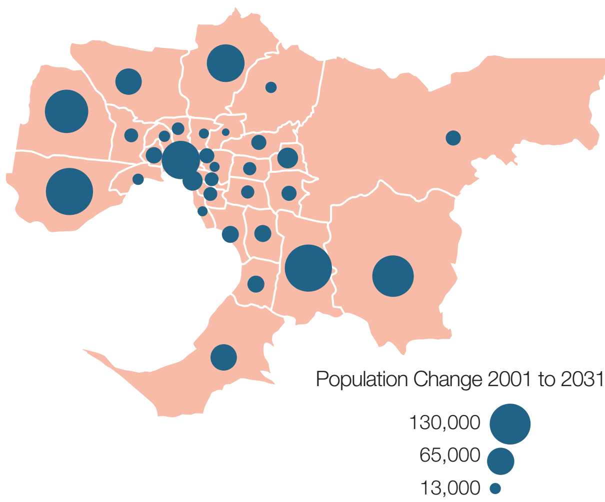
Source: DOI (2008)

Figure 6 – ABS estimated resident populations 2006 versus VIF Projections 2004



Source: DOI (2008) – ABS: Australian Bureau of Statistics; VIF: Victoria in Future

Figure 7 – Average annual population growth Melbourne LGAs, 2001 to 2031



Source: DSE (2004)

Looking ahead, current ABS projections are for Victoria's population to increase from 5.1 million in June 2006 to 6.2 million in June 2031 and 6.6 million by 2051 (see Table 2 and Figure 7).[26] The majority of this population increase will occur in the Melbourne metropolitan area, with the city's population increasing from 3.7 million in 2006 to 4.5 million people in 2031 – adding slightly less than 1 million people (or around 500,000 new households) to the city. By 2051, Melbourne's population will reach 5 million, with the city having to find space to accommodate an additional 800,000 households than in 2006.

Recent analysis undertaken by the Victorian Government indicates that Melbourne's growth is running ahead of these projections. The Government has indicated that, if current growth continues, Victoria's population will hit 6.2 million by 2020, rather than 2031 – and Melbourne's population will increase by one million a decade earlier than predicted.[27]

The municipalities of Melton, Wyndham, Hume, Whittlesea, Casey–Cardinia and Melbourne are projected to accommodate the highest amounts of Melbourne's total population growth to 2031.[28] Between 2001 and 2031, these areas are forecast to grow at an annual average rate of between 1.1 per cent (Hume) and 3.8 per cent (Melton).[29]

By contrast, Melbourne's eastern suburbs are growing at a much slower rate. For example, between 2001 and 2031, the municipalities of Manningham, Banyule and Whitehorse are forecast to grow by an annual average of 0.5 per cent, 0.1 per cent and 0.3 per cent respectively.[30]

Over the next 25 years, Melbourne's strong population growth will generate increasing pressure on the city's transport network, existing infrastructure and public and community services. It will also increase pressure to make more land available for industry, commerce and residential development. Managing these pressures poses significant economic, social and environmental challenges.

Study Team Findings

By 2031, Melbourne's population will reach 4.5 million – adding slightly less than 1 million people (or around 500,000 new households) to the city. The flow-on effect of this will be a substantial increase in the demand for personal and freight travel across the city.

26. ABS (2006)
27. Premier of Victoria, 'New zone to boost housing in growth areas', Media Release, 4 March 2008, accessed at Victorian Government media site: www.dpc.vic.gov.au/pressrel. Complete modelling and analysis of Census 2006 data for the Victorian Government will be available in mid-2008.
28. DSE (2006), *Melbourne Atlas 2006,* accessed at www.dse.vic.gov.au
29. DSE (2004), *Victoria in Future 2004, Victorian State Government Population and Household Projections 2001–2031*, State of Victoria, Melbourne
30. DSE (2004)

1.2.2 Changing patterns of growth and density

In 1851, Melbourne's settled area covered around 14 square kilometres. By the early 1880s, that area had increased sixfold. Between 1971 and 2004, the next rapid period of expansion, Melbourne almost doubled again in size. In the 1950s, before most households owned cars, 70 per cent of Melburnians lived within a 10 kilometre radius of the GPO. By 2001, the vast majority of the population lived outside this 10 kilometre radius.[31]

Melbourne's natural landscape has led to greater growth pressure on the historically more appealing eastern suburbs than on the western suburbs. But that is changing, with a significant increase in the population of Melbourne's west likely to occur over the next 25 years. The centre of Melbourne's residential population is in the vicinity of Glen Iris and has consistently shifted eastwards – until recently. Now, it has halted and is expected to move west as 2030 approaches.[32]

Until the 1990s, Melbourne – like most Australian cities – experienced consistent population loss from the inner city. A process of 're-urbanisation' commenced in the mid-1990s and has intensified as the supply of inner city dwellings has increased to meet demands from young professionals, students (especially international students) and – to a lesser extent – retirees. As noted in Chapter 1.1.2, a significant 'downtown shift' is now taking place in Australia's cities, a trend that is likely to intensify over the next decade. However, the longer term trend of people moving to the outer suburbs is still very much in evidence.

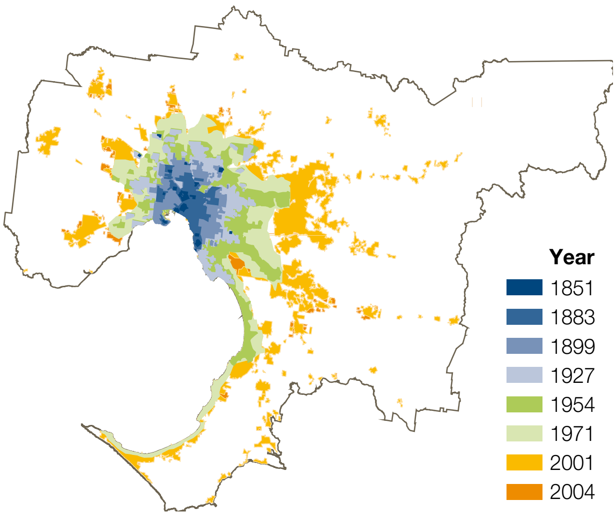
Population growth is also closely linked with urban expansion in Australian cities, which are dispersed, low density cities compared with many others. Melbourne now accommodates around 3.7 million people over nearly 2,000 square kilometres. In contrast, Paris accommodates more than six million people in half that area.[33] Melbourne's population density is not only lower than most European cities, it is also lower than many large American cities (such as Washington, San Francisco and Los Angeles).[34]

While levels of population density increased in Melbourne between 1996 and 2006, much of this increase is concentrated in the inner city and the 'middle suburbs' (see Figure 9). The western suburbs and outer metropolitan fringes (the 'growth' areas of Melbourne) continue to have relatively low density.

31. DSE (2006)
32. DSE (2006)
33. DSE (2006)
34. DSE (2006)

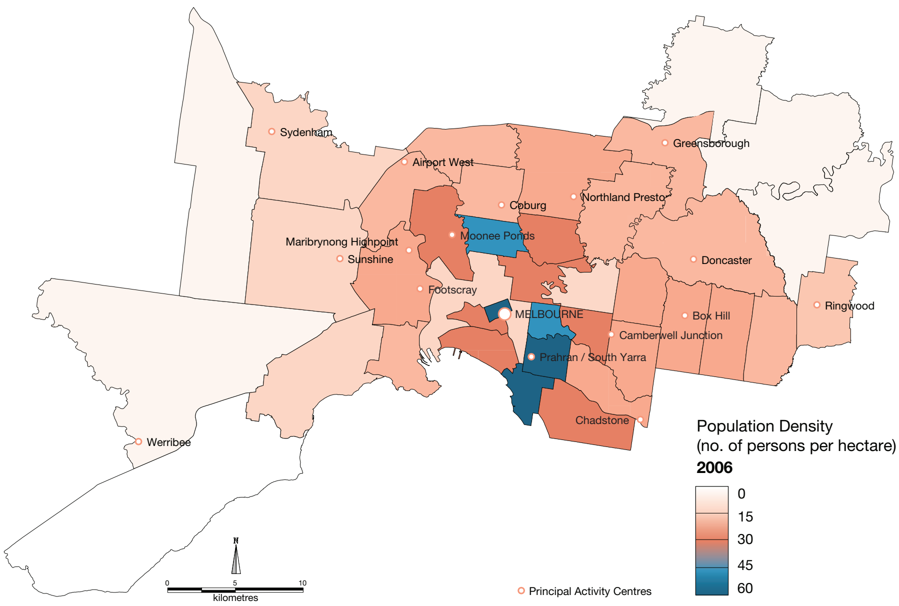
While the average number of people in each household is getting smaller across Melbourne, new houses are becoming larger (expanding from an average floor size of around 169 m^2 in 1984 to around 226 m^2 in 2001).[35] This trend suggests that, even as the city's population grows, many Melburnians continue to prefer a low density, high-mobility suburban lifestyle. This has significant implications for the city's future ability to provide infrastructure and services, including transport.

Figure 8 – Melbourne's growth 1851 to 2004



Source: DSE (2006)

Figure 9 – Population density 2006



Source: EWLNA (SGS Economics and Planning)

While low density cities like Melbourne have many lifestyle advantages, they also generate significant economic, social and environmental costs. However, while there are clear benefits associated with the move towards higher density development, it often meets resistance and can exacerbate community tensions. Residents often oppose higher density developments, seeking to maintain the perceived 'character' of their neighbourhoods. There are pressures from developers and others to push beyond set urban boundaries. As areas become more densely populated, there is the potential for greater conflict between residents' interests and other interests – reflected in growing concerns and complaints about matters such as truck traffic on local streets or noise levels from entertainment and sporting venues.

Maintaining a policy of increased urban density raises significant challenges for Australian governments, including overcoming infrastructure and land capacity constraints, reducing the impact of development on neighbourhood character, ensuring that urban consolidation or intensification is of a high quality, and changing the preference many people have for low density communities. However, the very substantial benefits that can be realised make these challenges worth pursuing.

35. Department of Sustainability and Environment (2002), *Melbourne 2030*, accessed at www.dse.vic.gov.au/melbourne2030online

Urban density and Melbourne's economy

Figure 10 – Melbourne 2030: Growth Boundary and Green Wedges

Source: DSE (2002) *Melbourne 2030*

There is now a strong body of research exploring the connection between a city's density and its economic performance. This research indicates that more compact, higher density cities achieve significant benefits, including:

- reductions in the amounts of energy and water consumed;
- reductions in vehicle trips and vehicle kilometres travelled;
- reductions in the rate of loss of biodiversity (as a result of lower rates of conversion of green space to residential use);
- reductions in the volume of building materials consumed and savings in dwelling construction costs; and
- improved human health as a result of less car use and greater pedestrian activity.

The Victorian Government recognises the benefits of a more compact city in its *Melbourne 2030* framework, which aims to manage growth and change across metropolitan Melbourne. Under *Melbourne 2030,* all new suburban development is to be contained within a designated urban growth boundary. Growth will be accommodated by increasing the density of development in established activity centres near existing infrastructure (especially transport infrastructure). These actions are designed to contain growth on the city's fringes to reduce urban expansion into surrounding rural land. Analysis by SGS Economics and Planning shows that, if fully implemented, *Melbourne 2030* would generate a 2.8 per cent lift in Victoria's GSP and create an additional 82,000 jobs, compared to letting Melbourne follow a 'business as usual' growth pattern.[36]

Five Principal Activity Centres have been announced by the Victorian Government as locations for major redevelopments under the Transit Cities program: Dandenong, Frankston, Ringwood, Sydenham and Footscray. By focusing development at centres with good transport access, *Melbourne 2030* aims to reduce car trips, make the most of existing facilities and services, and create viable and vibrant community hubs.

36. Spiller, Marcus (2006), 'Competitive cities – the role of urban design', Presentation to the New Zealand Ministry for the Environment's Urban Design Champions' workshops, February 2006, Wellington, Auckland and Christchurch

Victoria's Commissioner for Environmental Sustainability has noted that this style of transit oriented development (TOD) "has proved highly successful overseas in building up transit [public transport] patronage". The Commissioner has also observed that "there is evidence of a powerful market force for TODs internationally", with American studies indicating that many people would prefer to live within walking distance of a train station in order to save household income due to reduced car expenses.[37]

Internationally, methods of urban containment, such as growth boundaries, are considered to be some of the most effective strategies for managing growth in Western cities. Evidence is emerging that urban containment results in the more efficient delivery of publicly provided goods and services, reduces development costs, improves agricultural productivity and reduces energy consumption. A study by Griffith University's Urban Policy Program has found that 'controlled urban growth' (as opposed to uncontrolled sprawl) delivers major savings to government in terms of infrastructure and service costs, a reduction in kilometres driven and savings in personal travel costs.[38]

37. Commissioner for Environmental Sustainability (2007), *Creating a city that works*, Position paper, State of Victoria, Melbourne, p.19
38. Urban Policy Program (2003), *The Difference that Metropolitan Strategies Make: Lessons to be Learned*, Research paper for Planning NSW, Griffith University, Nathan

Study Team Findings

A more compact city will generate major economic, social and environmental benefits. However, the evidence strongly suggests that Melburnians will continue to prefer their low density, high-mobility suburban lifestyles – raising significant challenges for the city's transport network.

The Victorian Government should resist pressure to weaken *Melbourne 2030* and should take even stronger action to accelerate the development of vibrant suburban hubs in Melbourne's west, notably Footscray, Sydenham, Sunshine and Werribee.

New investment in Melbourne's transport network offers the opportunity to make planning decisions that support more sustainable population growth by continuing to encourage higher density development along public transport corridors, the creation of high- and medium-density suburban centres, the redevelopment of inner urban sites and a greater diversity of housing and development options.

1.2.3 Accessibility and growth

Accessibility is a significant factor in the locational decisions of firms and households. Changes in accessibility can significantly alter growth patterns and the shape of a city: an improvement in a suburb's accessibility compared with other suburbs will boost its capacity to attract and retain businesses, jobs and households.

Generally, areas in Melbourne's east are more accessible than those in the west. However, analysis undertaken for the EWLNA indicates that the relative accessibility of Melbourne's north east, north west and western suburbs has improved in recent years, principally due to the Western Ring Road and CityLink. These investments have boosted the relative accessibility of the north eastern, north western and western suburbs, sparking new investment in logistics based businesses, manufacturing and housing. [39]

Similarly, EastLink is likely to have a significant effect on urban structure and productivity in the city's eastern suburbs. As Table 3 shows, the number of jobs accessible from the centre of Ringwood within a 30 minute drive is predicted to increase by 67 percent to almost 350,000 by 2011 (without allowing for any growth in the employment base of eastern Melbourne). Dandenong is predicted to enjoy a 75 per cent increase in its jobs catchment to almost 380,000 jobs by 2011.

In other words, the relative accessibility of these centres will improve significantly over the next few years, making Ringwood and Dandenong much more attractive to business and other services – leading to more jobs, greater wealth, more households and stronger economic growth.

There is no corresponding improvement in job catchments predicted for Melbourne's west. In fact, Werribee – located in one of the city's major growth areas – looks set to experience a significant decline in the number of jobs located within a 30 minute drive by 2011.

Figure 11 – EastLink and transit cities

Source: EWLNA (SGS Economics and Planning)

39. SGS Economics and Planning (2008a), *Demographic, Social and Land Use Analysis*, Report prepared for the EWLNA

Table 3 – Job Catchments – 30 Minutes Drive – Melbourne's Transit Cities, 2006 and 2011

	Number of jobs within 30 minutes drive		% change 2006 - 2011
	2006	2011	
Box Hill	430,602	505,543	17%
Broadmeadows	164,088	168,975	3%
Dandenong	216,532	378,260	75%
Epping	135,057	141,039	4%
Footscray	573,854	654,102	14%
Frankston	72,088	92,617	28%
Ringwood	208,162	347,898	67%
Sydenham	25,007	26,271	5%
Werribee	58,201	47,003	-19%

Source: SGS (2008b)

This analysis confirms that accessibility is a key factor in an area's capacity to attract and retain jobs and households. Other things being equal, this suggests that any improvement in the accessibility rating of an area relative to other areas in metropolitan Melbourne will lead to significant urban adjustment – with the area with improved accessibility being able to attract and retain a higher number of jobs and households, compared to a scenario where its accessibility rating is unchanged.

This connection between accessibility and urban adjustment has implications for any changes in Melbourne's east-west transport connections, with significant adjustment likely to follow improvements to accessibility delivered by new transport links.

Study Team Findings

Transport accessibility is a key factor in a region's capacity to attract and retain jobs and households. New and improved cross city connections are likely to lead to significant urban adjustment, with regions with improved accessibility able to attract a higher number of jobs, businesses and households.

Transport disadvantage

Transport systems play an important role in reducing social disadvantage by providing access to jobs, services and social networks. People and households without access to sufficient affordable transport are considered to be 'transport disadvantaged'.

In areas where public transport is not readily available, people without access to a car are likely to experience significant disadvantage. In particular, older people, people with a disability, young people and people who have difficulty understanding English are more likely to have problems accessing transport and are more likely to experience longer travel times to services, jobs and activities.

While still a relatively undeveloped area of research in Australia, a growing body of evidence indicates that "location within the metropolitan urban structure … has become a key determinant of households' and individuals' access to employment and other opportunities".[40]

A number of researchers and commentators view transport disadvantage as a particularly acute problem in Australian cities because they sprawl to a greater extent than equivalent sized cities overseas and because low income households tend to be located on the city fringes (rather than in the inner city).[41]

In Melbourne, areas where housing is affordable are often areas with relatively poor accessibility to public transport. These areas tend to be the outer or 'fringe' suburbs – a situation that has been hastened by 'gentrification', where higher income households have gradually displaced poorer households from inner city areas.[42]

Insufficient public transport options can lead to 'forced car ownership', where households are 'forced' to own and operate multiple private vehicles due to a lack of transport options. Research by Professor Graham Currie from Monash University shows high rates of 'forced car ownership' in low income households outside Melbourne's inner city.[43]

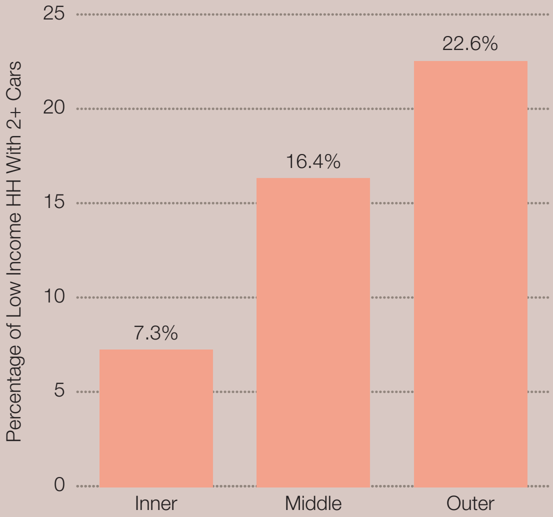
As transport now ranks with housing as a major household expenditure item (see Figure 13), having to own more than one car significantly increases the financial stress on low income households. Transport disadvantage is likely to be exacerbated as petrol prices rise – with the households in Melbourne most likely to be hard hit by high petrol prices located in outer suburban areas, due to their high car dependency and fewer alternative transport options.[44]

Transport also has an impact on other aspects of social disadvantage. A good transport network can reduce social isolation and contribute to a higher quality of life by improving the availability of a wider variety of goods and services, creating new recreational opportunities, providing access to social networks and activities, and opening up new lifestyle choices. Increasingly, transport's impact on the environment is also seen as having consequences for broader social wellbeing, with noise, pollution and other negative impacts affecting people's quality of life.

The EWLNA Study Team notes that the Victorian Government has taken action to tackle transport disadvantage, particularly significant improvements to bus services in outer suburban areas. The Team has taken issues of transport disadvantage into account in exploring options for east-west travel.

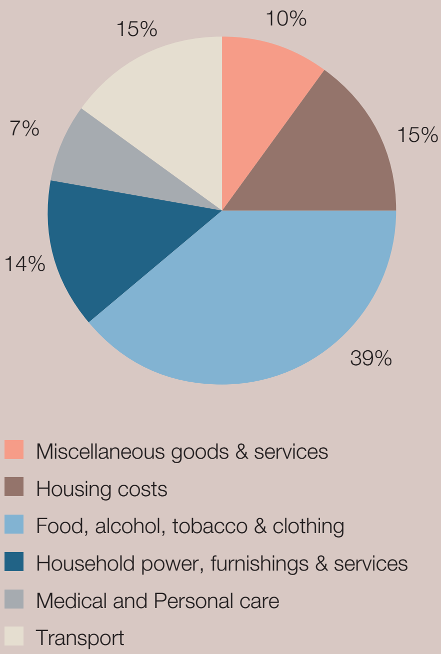
40. Dodson, J., Gleeson, B. and Sipe, N. (2004), *Transport Disadvantage and Social Status: A review of literature and methods,* Urban Policy Program Research Monograph 5, Griffith University, Brisbane
41. See Monash University Engineering (2007), 'Poor on fringes will be isolated as car costs rise', Media Release, 28 June 2007, accessed at www.eng.monash.edu.au/news/fringes.html
42. See for example, Dodson, J. (2004), *Is there a spatial mismatch between housing affordability and employment opportunity in Melbourne?* Conference on the State of Australian Cities, Parramatta, Urban Frontiers Program, University of Western Sydney; Cheal, C. (2003). *Transit Rich or Transit Poor: Is public transport policy in Melbourne exacerbating social disadvantage?* Faculty of Architecture, Building and Planning. University of Melbourne, Melbourne; and Currie, G., Stanley, Janet and Stanley, John (eds) (2007), *No Way to Go: Transport and Social Disadvantage in Australian Communities,* Monash University ePress, Melbourne
43. Currie, G. and Senbergs, Z. (2007), 'Exploring forced car ownership in Melbourne', Australasian Transport Research Forum, Melbourne
44. See Dodson, J. and Sipe, N (December 2005), *Oil Vulnerability in the Australian City*, Research Paper 6, Urban Research Program, Griffith University, Brisbane, p. 23; and Senate Standing Committee on Rural and Regional Affairs and Transport (February 2007), *Australia's future oil supply and alternative transport fuels*, Final Report, Commonwealth of Australia, Canberra, p.68

Figure 12 – Percentage of low income households (less than $500/week) with more than two cars



Source: Currie and Senbergs (2007) – based on ABS 2001 Census data

Figure 13 – Melbourne's household expenditure



Source: EWLNA – based on ABS Household Expenditure Survey, Victoria, 2003 to 2004

1.3 The new face of Melbourne's west

One of the most significant changes taking place in Melbourne in recent years has been the strong growth and changing fortunes of the city's western suburbs.

As the Western Transport Alliance observed in its submission to the Study Team:

> *"Melbourne's West is undergoing a major transition from an industrialised area, primarily attracting first home buyers and newly arrived migrants, to a dynamic growth area offering affordability and attracting a broad cross section of society".*[45]

1.3.1 The changing fortunes of the west

Change in the west is being driven by very strong population growth. According to the Department of Sustainability and Environment's *Victoria in Future 2004* projections, the population in Melbourne's west will grow by 34.4 per cent between 2006 and 2030, compared with population growth of 22.6 per cent for Melbourne overall.[46]

Victoria in Future 2004 paints a picture of rapid growth across the west between 2001 and 2031, with the population of Melton growing from 52,000 to 161,000 (205 per cent), Wyndham growing from 87,000 to 208,000 (139 per cent) and Hume growing from 135,000 to 186,000 (37 per cent).[47]

In its submission to the EWLNA, the City of Wyndham noted that strong population growth trends in the west are likely to continue:

> *"There are strong indicators that Melton and Wyndham, and to a lesser degree Brimbank, will continue to experience substantial growth, and an increasing likelihood that the northern growth areas of Hume and Whittlesea will also become increasingly important in terms of metropolitan growth towards the end of the current decade".*[48]

Traditionally, Melbourne's western suburbs have been the location for industrial and service uses, especially heavy and noxious industries such as petrol refineries, petro-chemical industries, munitions manufacturing, chemical products manufacturing, transport and freight depots and the storage of dangerous materials. The presence of these industries – and a general lack of amenity across the western suburbs – gave them an unattractive industrial image that curtailed residential growth. With poor infrastructure and lower levels of private investment also hindering growth, Melbourne's west fell behind other parts of the city.

However, recent years have seen these suburbs become more popular residential locations, fuelled by their perceived proximity to central Melbourne (and the upgrading of access to the CBD through the West Gate Bridge, City Link and the Western Ring Road), relatively low house prices and improving amenity. Heavy industry across the region has reduced, with some larger industrial sites now being redeveloped as planned residential communities.

In the inner west, amenity has improved significantly (aside from those areas affected by truck traffic). As the east and south east suburbs spread further away from central Melbourne, suburbs such as Yarraville, Seddon, Footscray, West Footscray and Maidstone are now seen as attractive areas with good access to inner city services and jobs. Twenty years ago, Footscray stood near the bottom of Melbourne's property prices; today, it is a sought after suburb, with house prices moving up the scale.

The outer western suburbs are now Melbourne's major growth area, with the municipalities of Melton and Wyndham among the fastest growing local government areas in Australia. New housing estates on the western fringe – such as Caroline Springs, Sanctuary Lakes and Point Cook – reflect the area's growing wealth and popularity. Further housing estates are under construction or being planned.

Williamstown – the original European settlement in the region – is now a middle-income suburb with increasingly expensive waterfront homes. Western bayside suburbs, such as Altona and Werribee South, previously relatively undeveloped for residential purposes, are now experiencing strong growth.

However, despite this recent growth, analysis undertaken for the Study Team indicates a clear east-west division in Melbourne in terms of trends in household characteristics, skills, education background and employment. The analysis shows a pattern of established affluence in Melbourne's eastern suburbs, while the western and outer fringe areas have a lower socio-economic profile.[49]

45. Western Transport Alliance Submission to the EWLNA (2007), p.16
46. DSE (2004)
47. DSE (2004)
48. City of Wyndham submission to the EWLNA (2007), p.16
49. SGS Economics and Planning (2008a)

While 40 per cent of Melbourne's population is located in the west and 60 per cent in the east,[50] resources, services and investment are skewed in favour of the eastern parts of the city. For example, the vast majority of large corporate shopping centres (such as Chadstone, Southland, Eastland, Knox City and Doncaster Shoppingtown) are located in the east. These centres are major retail performers and travel generators across metropolitan Melbourne. The distribution of community infrastructure (such as schools, hospitals and TAFEs) also favours Melbourne's east.[51]

While recent initiatives, investment and population growth are starting to redress the imbalance, the east-west divide in metropolitan Melbourne's economic and social structure is likely to continue into the future. Outcomes in the western suburbs are likely to remain different to those in the east and south, especially with respect to skills and educational attainment. This is partly due to the west having to accommodate a high number of overseas migrants, many of whom will take time to establish themselves and improve their skills and incomes.

There is no doubt that the transition occurring across Melbourne's west is generating new opportunities, but it is also creating economic, social and environmental challenges – particularly in relation to the provision of infrastructure.

Significant opportunities exist to tackle these challenges and advance the region's social and economic development. These opportunities include greater support for growth and development in major suburban centres and improved transport accessibility.

Several submissions to the Study Team expressed concern that insufficient attention has been given to the rapid growth in the west. The Study Team agrees with these assessments and with the view expressed by the City of Wyndham that:

> *"The EWLNA needs to consider the overall context of the metropolitan area and the respective transport networks to serve the region, rather than focus on a network that caters for a projected level of population/ employment and growth scenario".*[52]

The Study Team recognises – and has carefully considered – the vital role that improved transport connections can play in overcoming Melbourne's east-west divide, in creating new investment, business and employment opportunities in the west and in boosting the competitiveness of the western regional economy.

What the west needs

Several groups – including local councils, the Western Transport Alliance and Melbourne's West Area Consultative Committee – have identified the economic challenges the west must meet over the next 10 to 15 years, including:

- Supporting the region in shifting towards a more service-oriented economy and away from its traditional reliance on the manufacturing industry for jobs
- Facilitating and supporting new business investment, particularly in industry sectors with the potential for growth during the coming years
- Improving skills within the western region workforce and improving business access to skilled workers
- Generating more locally based jobs
- Improving infrastructure across the region, particularly better transport links within the west and between the west and the CBD
- Managing urban sprawl
- Boosting business and employment opportunities in suburban centres and Transit Cities in the west.

50. DSE (2006)
51. See SGS Economics and Planning (2008a)
52. City of Wyndham submission to the EWLNA (2007), p.18

1.3.2 Melbourne's east west divide

While the face and fortunes of the western suburbs are changing, there is still a significant divide between Melbourne's east and west in terms of terms of skills, household income, employment and socio-economic disadvantage.

Skills

The skills composition of Melbourne's population remains skewed towards the city's east, with the proportion of the population that has attained post-school education (at the level of Postgraduate Degree, Graduate Diploma and Graduate Certificate, Bachelor Degree and Advanced Diploma and Diploma) significantly higher in the inner city and eastern suburbs. Proximity to education institutions and access to quality housing, public transport and basic services are key factors that have contributed to this settlement pattern.

Comparatively, there is a significantly lower proportion of skilled people within the western suburbs and outer metropolitan fringes. In the west, the outer metropolitan areas of Melton East and Wyndham South have attracted higher numbers of skilled people due to recent investment in housing. While this has contributed to a slight re-balancing of the citywide skills composition, the east-west divide remains very much in evidence.

As noted by the National Institute of Economic and Industry Research, this difference in skills levels represents "a significant disadvantage to the [western] region, particularly since competition to attract higher skilled businesses is high. In other words, without the appropriate capacity of local human capital, the potential to attract highly skilled business to the region is severely diminished."[53]

Jobs

The highest concentration of jobs is in central Melbourne, with the Melbourne Local Government Area (LGA) accounting for 19.2 per cent of total employment across the broader metropolitan areas. Almost 53 per cent of Melbourne's employment is located in two geographical areas: 'inner Melbourne' (comprised of the Melbourne LGA and four adjoining LGAs) and the south east Melbourne economic hub. Other LGAs with a high concentration of jobs include Port Phillip, Yarra, Dandenong and Kingston.[54]

In the last major travel survey conducted in Melbourne (the Victorian Activity Travel Survey of the late 1990s), Melbourne's top 20 work destinations were mostly in the inner city. The highest number of trips to work was to the CBD, followed by Carlton and the St Kilda Road area.[55]

However, most Melbourne municipalities have experienced jobs growth over the last 30 years. The greatest jobs shift was to Greater Dandenong, while Wyndham, Hume, Whittlesea and Casey also enjoyed strong increases in jobs numbers. Local government areas that experienced a decline in job numbers between 1971 and 2006 include Maribyrnong, Moreland, Darebin, Hobsons Bay and Yarra.[56]

An examination of employment by occupational categories across the city also indicates a significant division between east and west, with a significantly higher concentration of managerial and professional jobs located in the eastern suburbs.[57]

Household income

Overall, the eastern suburbs continue to retain a higher proportion of high income households.

As with skills distribution, the outer west areas of Melton East and Wyndham South are in a better position than the other western suburbs. This may reflect the high numbers of new homebuyers in these areas, as their demographic profile is likely to align with the highest income earning period in the family life cycle. However, relatively high incomes in these outer areas do not necessarily point to a fundamental socioeconomic shift, as indicated by the continuing under-representation of higher skill groups.

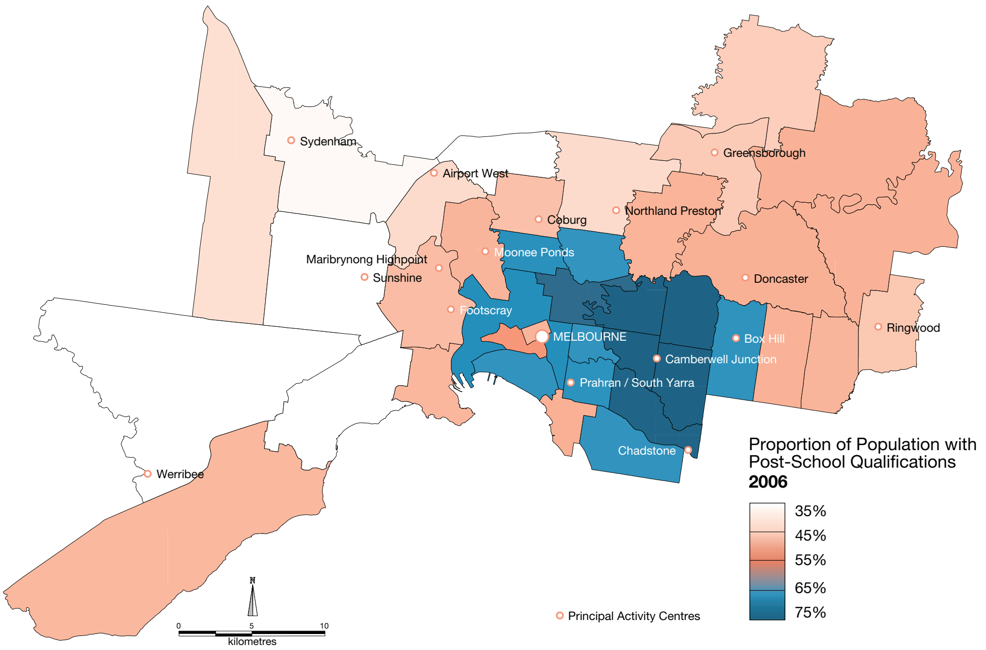
Socio-economic disadvantage

The Socio-Economic Index of Disadvantage (SEIFA), developed by the Australian Bureau of Statistics, is based on a range of indicators of disadvantage, including income, education, wealth and living conditions. SEIFA measures the level of social and economic well-being of a region relative to other regions, with low values indicating areas of disadvantage and high values indicating areas of advantage and relative affluence.

Mapping the SEIFA index across the EWLNA Study Area shows a clear east-west divide in relation to the wellbeing of communities, with a significant proportion of municipalities in Melbourne's west being comparatively less well-off than their eastern counterparts.

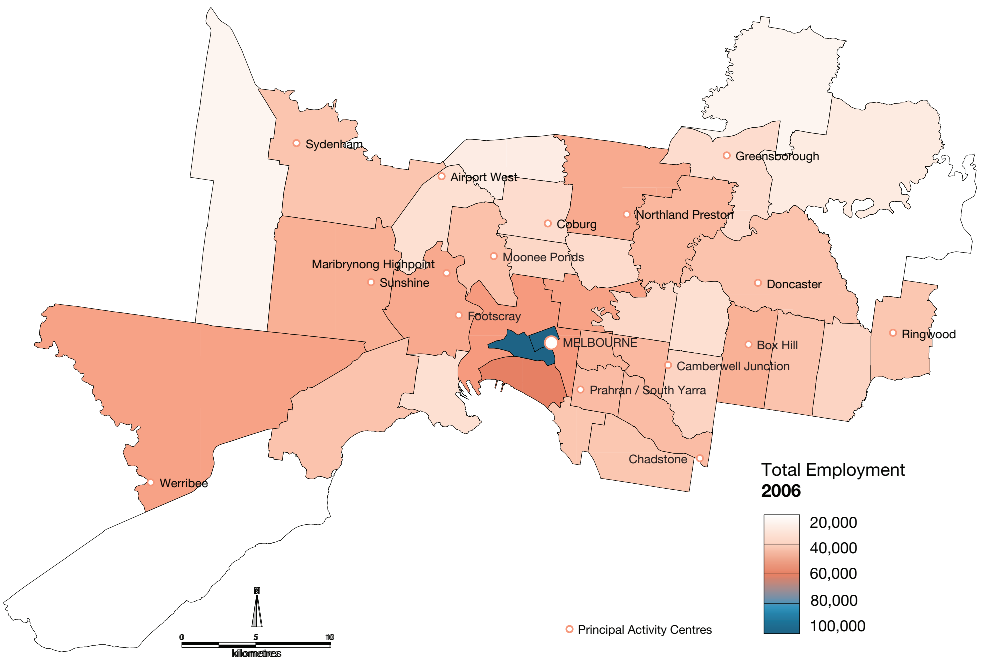
53. National Institute of Economic and Industry Research (2004), *Growing Melbourne's West: Challenges and Opportunities – An Economic and Social Analysis of Melbourne's Western Region,* Report prepared for Melbourne's West Area Consultative Committee (MWACC), Melbourne
54. DOI (2008) and see SGS Economics and Planning (2008a)
55. DSE (2006)
56. Ibid
57. SGS Economics and Planning (2008b)

Figure 14 – Education attainment, 2006



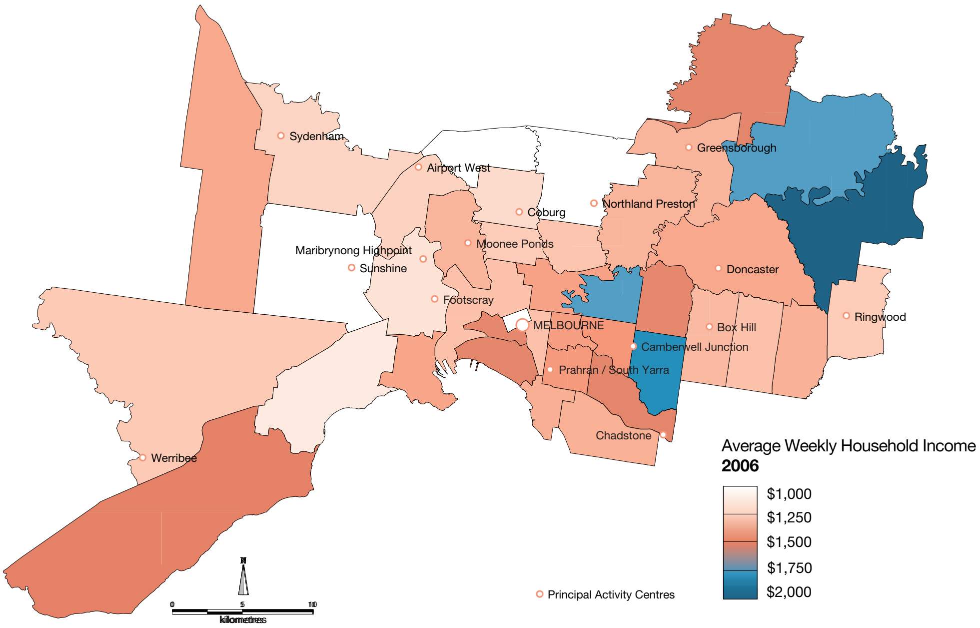
Source: EWLNA (SGS Economics and Planning)

Figure 15 – Total employment by SLA, 2006



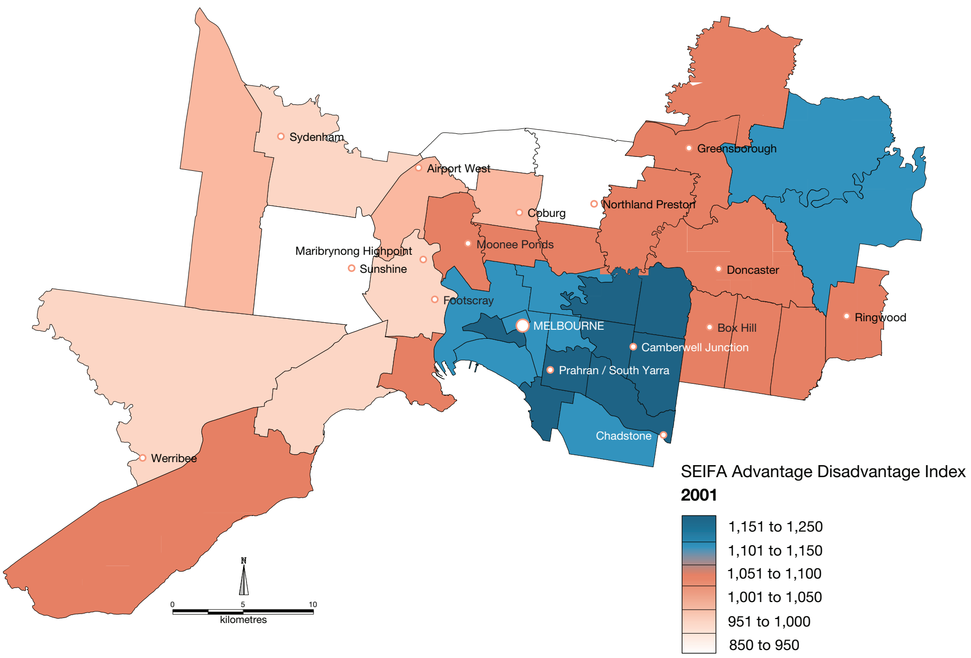
Source: EWLNA (SGS Economics and Planning)

Figure 16 – Weekly household income profile, 2006



Source: EWLNA (SGS Economics and Planning)

Figure 17 – SEIFA Index for Advantage\Disadvantage, 2001



Source: EWLNA (SGS Economics and Planning)

Study Team Findings

Melbourne's west is undergoing a major transition, driven by strong population growth that is clearly outstripping employment growth, exacerbating travel pressures from and to the west.

The transport network in the west is not as developed as that in the east, with lower levels of access to employment, services and education.

There continues to be a clear east-west divide in terms of trends in household characteristics, skills, education background and employment. Improved transport connections are critical to overcoming this divide, supporting strong growth in the west and boosting the competitiveness of the western region economy.

chapter 2

2. mobility matters

Melburnians value their mobility very highly and expect the city's transport network to keep pace with their travel requirements – requirements that will grow and change along with the city.

2.1 Melbourne's transport network

As well as moving people, Melbourne's transport network services the needs of business and industry by moving goods coming into and leaving the city. While the network cannot meet each and every demand for travel, the city's roads, trains, trams and buses generally provide a reasonably good standard of service for passengers and freight – although the network is clearly under increasing pressure.

Despite criticisms of the transport network, it has served Melbourne well over the years and has many positive characteristics, including the capacity to move large numbers of people to and from the city centre during peak periods and a well-established public transport system that is growing in patronage and accessibility. Compared to many other cities around the world, Melburnians are fortunate to have access to a modern transport network that is generally safe and reliable – although the network clearly has some weak points and inefficiencies.

Melbourne's transport network comprises the road network, public transport systems (rail, tram and buses), walking and cycling infrastructure and freight hubs such as the Port of Melbourne and Melbourne Airport.

The network comprises:

- Around 3,400 km (11,000 lane-km) of multi-lane freeways, tollways and arterial roads
- 430 km (742 track-km) of rail lines
- 245 km (490 track-km) of tram lines
- 5,300 route-km of bus routes.

Table 4 shows the distribution of this infrastructure in terms of inner, middle and outer Melbourne, and clearly shows the domination of road infrastructure in the outer suburbs.

Figure 18 – Melbourne's transport network

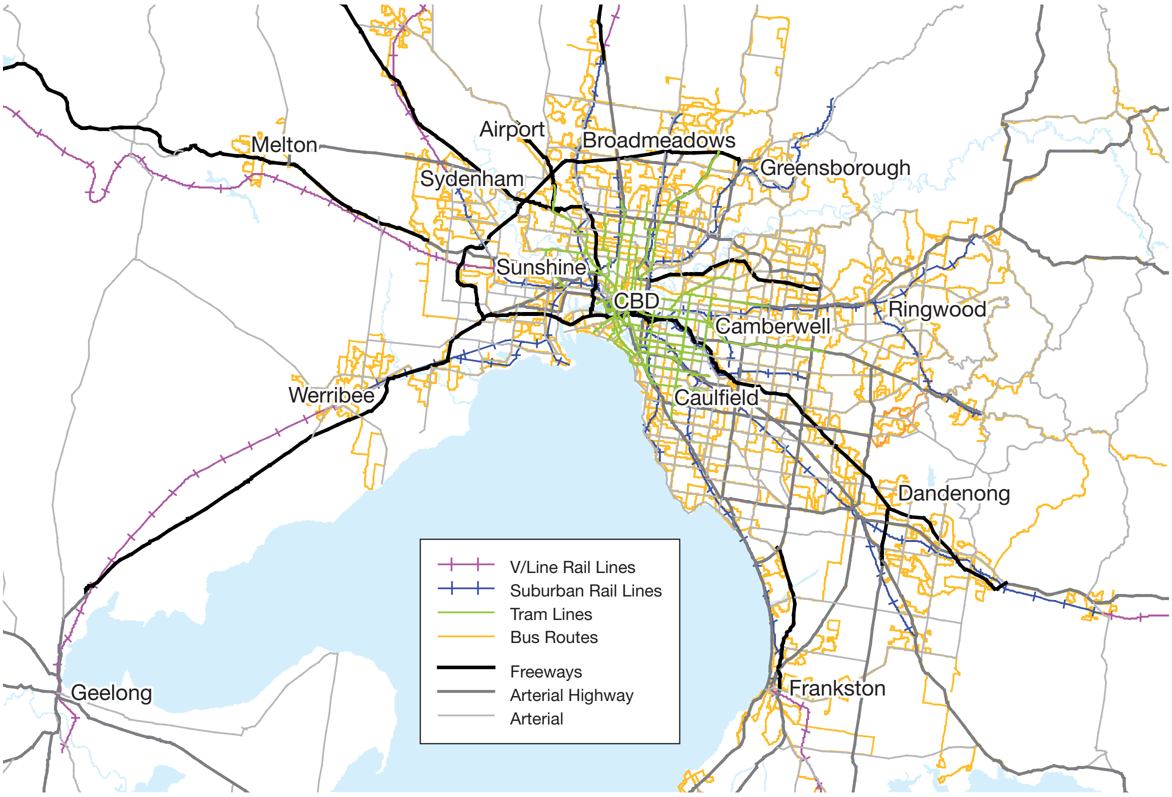


Table 4 – Transport infrastructure across Melbourne

		Inner	Middle	Outer	Total
Road lane km	Freeways, tollways	140	450	1,130	**1,720**
	Major highways	30	280	1,390	**1,700**
	Primary arterials	200	1,180	3,140	**4,520**
	Secondary arterials	150	600	2,330	**3,080**
	Collectors	150	1,020	2,180	**3,350**
	Local streets	1,260	11,450	22,400	**35,110**
	Total	**1,930**	**14,980**	**32,570**	**49,480**
	Freeways, highways & arterials	**520**	**2,510**	**7,990**	**11,020**
Bus	Route km (one direction)	386	1,979	2,954	**5,319**
Tram	Line km (one direction)	188	300	2	**490**
Train	Line km (one direction)	88	418	236	**742**

Source: EWLNA (SKM Maunsell et al)

Detailed descriptions of the history and characteristics of Melbourne's transport network are available from a variety of sources and the Study Team has not attempted to replicate these accounts.[1] The following section provides a brief overview of the history of the network, while short descriptions of the public transport, road and cycling networks relevant to the EWLNA are set out in Chapters 3 and 4.

2.1.1 Growing with the city

Melbourne's transport network has played a critical part in growing, shaping and reshaping the city over the last 150 years. From the late 19th century, the network has developed largely along radial lines, extending further and further out from the city centre as Melbourne has grown and expanded. The radial nature of the network first took shape in the 1880s when strong jobs and business growth in the CBD was accompanied by the rise of 'surburbanisation', as many middle class people chose to move from 'bustling' inner Melbourne to the more 'tranquil' suburbs.

Melbourne's early growth and development was supported by the city's public transport system, with the suburban railway network more than doubling in length during the 1880s – extending mainly to the eastern and south eastern suburbs. Growth in the public transport system slowed during the Great Depression, although the system was heavily used during the Second World War.

While the desire for car travel was increasing during these years, the cost of buying and running a car remained out of most people's reach. As late as 1951, only one in eight Melburnians owned a car and around 60 per cent of journeys to work were made on public transport. It wasn't until the 1950s, when Melbourne experienced another boom period, that car ownership soared and public transport use dramatically declined.

The significant take-up in car travel in the 1950s and 1960s further changed the shape of the city, extending the perimeter of Melbourne's suburbs well beyond the train and tram lines laid down in the late 19th century and reinforcing the suburban growth of the pre-war years. It also transformed Melbourne from a city of pedestrians, cyclists and train travellers into a city dominated by the car.

This domination was further entrenched by Melbourne becoming Australia's car manufacturing capital during the 1950s, with General Motors commencing production at Dandenong in 1951 and Ford establishing operations at Broadmeadows in 1956.

1. See for example: *Melbourne Miles* by Max Lay for a detailed history of the development of the city's road network and Graeme Davison's *Car Wars* for an account of the role of cars in the growth of Melbourne. A history of the city's public transport network can be found at the Department of Infrastructure website: www.doi.vic.gov.au. A more detailed examination of the various components of Melbourne's transport network is also set out in a report prepared for the EWLNA: SKM Maunsell/Evans and Peck (2008a), *Transport Supply and Demand (Existing and Future)*

By the 1960s, rising car ownership was causing traffic congestion across the city and an escalating road accident toll. Reflecting concerns that Melbourne's roads could no longer cope with the growing demand for car travel, the city entered a period of extensive freeway development that included the construction of the Tullamarine, West Gate and Monash Freeways, and the extension of the Eastern Freeway, from the late 1960s to the mid-1980s. This period was characterised by community conflict over specific freeways and the general future direction of Melbourne's transport network. Many large road project proposals were shelved and reservations deleted following this period, until freeway building experienced something of a 'revival' in the 1990s, with the earlier radial freeways being complemented by the construction of CityLink, the Western Ring Road and – more recently – EastLink.

Over the last 30 years, Melbourne has also seen major developments in public transport, including the underground rail loop, multimodal ticketing and the extension of the tram and bus networks. However, while there has been substantial investment in large scale road projects in recent years, public transport investment has remained relatively modest, with no large scale project undertaken in the city since the construction of the City Loop in the 1970s and early 1980s. Most commentators agree that the primary force in shaping postwar Melbourne has been the rise in car travel – and the accompanying pressure to extend and enhance the road network.

Over the years, Melbourne has benefited from the foresight and vision of its transport planners and of successive state governments. In the 1970s, in response to the escalating road toll, Victoria led the world in the introduction of road safety initiatives such as compulsory seat belt wearing, random breath testing and .05 blood alcohol limits. This same era delivered substantial investment in major pieces of transport infrastructure – notably the West Gate Bridge and City Loop – at a time when the state's financial position was considerably less robust than at present.

The EWLNA Study Team believes that foresight and vision continue to be vitally important to Melbourne's transport future – and that a renewed commitment should be made to delivering the modern transport infrastructure and projects needed to keep pace with the growth and change taking place across the city.

The City Loop

In June 1970, the Leader of the Opposition, Mr Holding, asked the Minister of Transport:

> *"Now that parliament has been told that the Government intends to proceed with the underground rail loop, can the Minister of Transport inform the House how it is proposed to finance the project?"*

The Minister of Transport, Mr Wilcox, replied:

> *"I cannot inform the House as to the financing of the underground rail loop, but I have no doubt that at the proper time everybody in the community will know exactly what is happening."*[2]

It is an exchange unlikely to be repeated in a modern parliament. But it does reflect the bold and farsighted nature of the decision taken in 1970 to commence construction on the Melbourne Underground Rail Loop.

At the time, Victoria's economy was in poor shape. There was talk of spending cutbacks in many areas, the Commonwealth Loan Council was placing constraints upon the states' ability to borrow funds and many capital expenditure programs were being pruned.

The role of Melbourne's CBD was changing, with some commentators convinced that the CBD was in decline as a centre of employment and activity. Back in 1970, the CBD was represented by the 'Golden Mile', an area even smaller than the 'Hoddle grid', with decision makers seeing little potential for expansion outside this area (with the possible exception of the RMIT). The future impact of technology on work patterns was also creating significant uncertainty.

2. Victoria, *Parliamentary Debates*, Legislative Assembly, 17 June 1970, p.49

The state's railways were a source of constant concern for the government. Many people believed that the rail network was in terminal decline, with patronage decreasing for many years and motor car use growing rapidly. Other than some electrification works, there had been no extensions to the rail network in the preceding 15 years. Faced with increasing operational losses, the Victorian Government offered to hand over ownership and control of the state's railways to the Commonwealth at no cost: the Commonwealth declined the offer. The Commonwealth also declined requests from Victoria and New South Wales for assistance to pay for major rail extensions.

While the times were uncertain ones for decision makers in Victoria, the push for an underground rail loop was driven by two factors:

- First, the capacity of Flinders Street Station was a constraint on the operations of the rail network, with most services terminating at the station and then having to reverse out. In peak periods, this severely restricted the number of trains that could use the station.
- Secondly, with train services centred around one central location, there was a considerable crush of people approaching and leaving Flinders Street Station in peak times. The planned Loop aimed to relieve this pressure by converting the Melbourne rail terminal into a five-station complex.

While the Loop was responding to congestion and population growth, it also sought to address future growth, with forecasts at the time showing Melbourne's population reaching 3.7 million in 1985. In reality, it took another 20 years to reach that figure, but it was apparent back in 1970 that the city would face acute growing pains in coping with an increasing population if Melburnians' mobility needs could be met only by car travel. Rail transport was seen as a critical part of the overall transport solution.

The concept of the Underground Rail Loop was not new. Variants had been discussed for over 40 years and it was a key recommendation of a six-year review of the transport network that culminated in the 1969 Metropolitan Transport Plan. Nor was the Loop the only suggestion to solve the city's transport problems. Other ideas with much lower costs were favoured by some, but the Loop proposal stood out as a solution not just to the constraints at the time, but as a way to improve service, double capacity and shape the future of the city.

Given the financial constraints of the time, financing the Loop was a difficult task. The Government proposed the establishment of an authority to borrow the funds required for construction. The cost of the project would be shared by those that stood to benefit most, with equal quarter shares contributed by rail users, the City of Melbourne (on behalf of property owners in the City), the Melbourne Metropolitan Board of Works (on behalf of property owners in Melbourne's suburbs) and the Victorian Government (on behalf of the people of Victoria).

Rail users were to be charged a levy of one cent per journey (at a time when 50 cents was a common ticket cost). The MMBW $20 million share was to be met out of the Metropolitan Improvement Fund (levy), perhaps at the expense of road funding, and the City of Melbourne was free to meet its share as it saw fit. One reason for seeking a contribution from the City of Melbourne was that its constituents would benefit ultimately from the increase in land values generated by the Loop.

The estimated cost of the Loop was $80 million, with construction planned to take seven years. A review of Annual Reports for the Melbourne Underground Loop Authority shows that the actual cost was in excess of $400 million and that stations opened progressively from 1981 to 1985. The contributions from the MMBW and the City of Melbourne were never increased beyond the original $20 million: ultimately, the State of Victoria funded the cost increase.

Other ideas were canvassed for financing the Loop. These included the use of special lotteries and the compulsory acquisition of land likely to increase in value as a result of the Loop's construction, with the Victorian Government later selling the land at a profit. The idea of motorists contributing to the cost of public transport in order to reduce road congestion was also considered.

The Loop was finally completed in 1985 with the opening of Flagstaff Station. Today, it is hard to imagine Melbourne coping without the Loop. Like many major infrastructure projects, its construction and financing were difficult and controversial at times, but there is no doubt that it has served Melbourne very well – only now approaching capacity, more than 20 years after its completion.

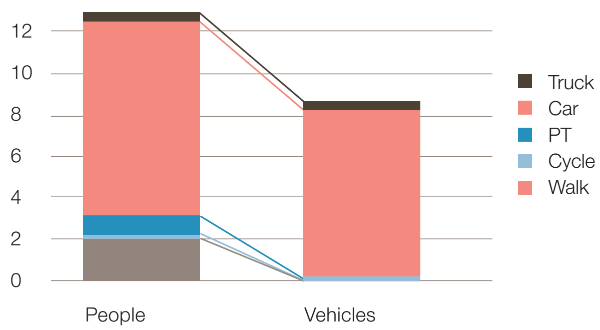
2.2 Current demand for travel

Melburnians move around the city for a variety of reasons – for work, education, business, shopping, visiting family and friends, and sporting and recreational activities. The ability to move relatively easily around Melbourne at different times of the day is a basic function of the city's economic and social activity – and one that Melburnians value highly.

Across the city, strong economic and population growth is driving an escalating demand for personal travel.

On a typical weekday, nearly 14 million trips are made across Melbourne (including freight trips). The vast majority of this travel is by car.

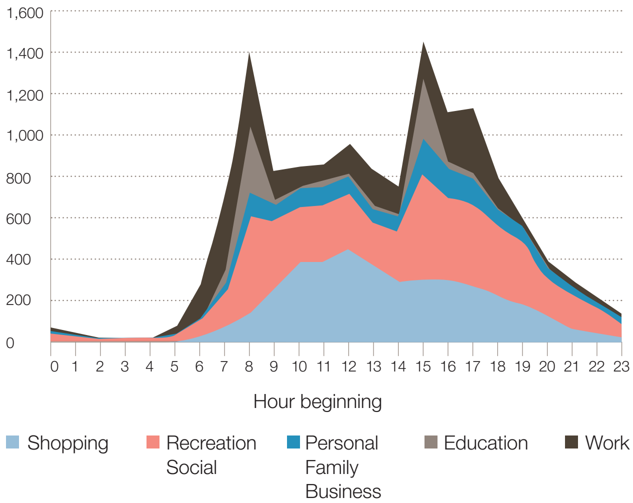
Figure 19 –Typical daily travel in Melbourne, 2001



Source: EWLNA (SKM Maunsell et al – using VATS 2001 data)
Note: Model data is calculated for 2006 and includes all trips in the greater Melbourne area.

About 30 per cent of daily personal trips occur in the peak periods, with around half of the morning peak and around 30 per cent of the afternoon peak made up of trips for work and education. Figure 20 shows the number of trips in each category by time of day, stacked to give the total number of trips occurring each hour.

Figure 20 – Trip purposes by time of day, 2001



Source: EWLNA (SKM Maunsell et al – using VATS 2001 data)

As Figure 20 shows, Melburnians make different types of trips at different times of the day:

- Shopping trips are largely influenced by retail business hours and peak around midday.
- Recreational/social trips are highest in the afternoons and evenings, peaking around 3pm to 4pm.
- Personal/family business trips have a similar distribution throughout the day to shopping, but with an afternoon peak around 3pm to 4pm.
- Education trips show abrupt peaks in the morning and the evening, coinciding with school and college times.
- Work trips also have abrupt morning and evening peaks. However, a significant number of work trips also take place during the day and in the evening (reflecting travel for business during the day and travel by shift, hospitality and part-time workers).

Many of these trips are linked – people may do some shopping on the way home from work; they may take their children to school on the way to work; or they may visit friends on the way to a sporting activity. The need for this flexibility is a significant challenge to expanding the mode share of public transport, with the convenience of car use giving Melburnians a greater ability to link two or more trips several times a day.

Fast facts: moving people around Melbourne

- Melburnians make 13.5 million personal trips across the city each average working day, with more than 10 million of these trips made by car.
- About 30 per cent of all trips occur in the morning and evening peak periods.
- On a daily basis, 78 per cent of Melburnians use motor vehicles (cars, trucks or motorcycles) to travel around the city, 7 per cent use public transport, and nearly 15 per cent walk or cycle.
- Across the city, around 14.5 per cent of people use public transport to get to work (77 per cent use cars). More than 60 per cent of Melburnians who have jobs in the central city areas use public transport for all or part of their journeys to work.
- Travel to school accounts for 17 per cent of morning peak hour traffic in the metropolitan area.

Travel demand data sources

There are many different sources and measures for calculating current travel demand and mode share, and predicting future trends in travel demand. Unless otherwise indicated, the EWLNA Study Team has used the following primary data sources:

- Modelling conducted specifically for the EWLNA (see Appendix F for details)
- Data provided by VicRoads
- Data provided by the Public Transport Division (PTD) and the Walking and Cycling Branch of the Victorian Department of Infrastructure
- The *Transport Demand Information Atlas for Victoria 2008*, released by the Department of Infrastructure in February 2008
- The Victorian Activity and Travel Survey (VATS), which was conducted in 2001. The personal travel and activity data detailed in VATS is currently being updated via the Victorian Integrated Survey of Travel and Activity (VISTA); however, the results of this survey will not be available until later in 2008.
- Journey to Work (JtW) figures from the 2006 Australian Census, as analysed by the Study Team and the Department of Infrastructure.

2.2.2 Modes of travel

Melburnians travel around the city by car (as driver or passenger), public transport (train, tram or bus), cycling and walking. On a daily basis across the city, 78 per cent of people travel by car; 7 per cent by public transport and nearly 15 per cent by walking or cycling.

An analysis of VATS data undertaken for the EWLNA confirms that public transport use is highest (around 25 per cent) for radial movements to and from the inner city and very low (2 to 3 per cent) for movements wholly within the outer suburbs. Non-motorised travel is most popular in the inner city (49 per cent – due to the high number of walking trips that take place in central Melbourne).[3]

When it comes to travelling to work, transport mode share patterns change significantly. The most recent Journey to Work (JtW) figures from the 2006 Census show that 77 per cent of Melburnians use cars to travel to work, while 14.5 per cent use public transport.

These figures show that, while Melburnians still made more car journeys to work in 2006 than in 2001, the share of total journeys made by car has fallen by nearly two percentage points. This fall reflects strong increases in the use of public transport (especially trains) and walking and cycling to work.

The number of journeys to work in which public transport was used for all or part of the journey increased by 17 per cent over the five years to 2006, while the number of car journeys increased by 6 per cent. Recent evidence indicates that public transport share would have increased even further since the 2006 Census.

As shown in Table 5, using the train, cycling and walking grew significantly in popularity between 2001 and 2006, exceeding the rate of population growth. Table 6 also shows that car commuting has grown more slowly than employment growth and that driving the car to the station and catching the train to work has declined (with some evidence to indicate that this may be due to overflowing or inadequate parking facilities at railway stations).

3. The results of this analysis are set out in SKM Maunsell/Evans and Peck (2008a)

Table 5 – Modal shares of daily journeys to work in Melbourne Statistical Division, 2001 and 2006

Travel mode	2001 daily journeys	2001 (per cent)*	2006 daily journeys	2006 (per cent)*
Public transport	164,075	13.4	192,375	14.5
Car	966,839	78.7	1,021,051	77.0
Bicycle	13,201	1.1	18,937	1.4
Walking	35,384	2.9	47,983	3.6
Other	48,688	4.0	46,189	3.5
Sub-total (left home journeys to work)	**1,228,187**	**100.0**	**1,326,535**	**100.0**
Worked at home	58,959		59,684	
Did not go to work	154,761		163,568	

* The percentage figures shown are the percentages of 'Left home journeys to work', which do not include the number of people who worked at home and those people who did not go to work on Census day.

Source: DOI (2008) – using ABS Census 2006 data

Table 6 – Growth in modal journeys to work in Melbourne Statistical Division, 2001 to 2006: Average annual growth rate – AAGR (per cent)

Travel mode	AAGR (per cent)*	2006 daily journeys
Car as driver	1.2	948,046
Car as passenger	-0.6	70,629
Train, any mention as a method	3.2	133,517
Train, sole method	4.7	84,216
Train and tram	2.5	9,727
Train and bus	2.5	10,005
Train and car as driver	-0.3	18,872
Train and car as passenger	-3.4	4,758
Train and bicycle	2.2	1,085
Tram, any mention as a method (not including train)	2.0	33,712
Tram, sole method	1.7	31,746
Bus, any mention as a method (not including train or tram)	0.7	16,626
Bus, sole method	1.6	14,844
Bus and car as driver	-6.6	704
Bus and car as passenger	-4.7	1,078
Bicycle, any mention as a method	7.5	18,855
Walked only	6.3	47,984
Total left home journeys to work	**1.6**	**1,326,535**

* The figures shown are the percentages of 'Left home journeys to work', which do not include the number of people who worked at home and those people who did not go to work on Census day.

Source: DOI (2008) – using ABS Census 2006 data

2.2.3 Commuting patterns

The 2006 Census Journey to Work data also shows that public transport use is much higher for those Melburnians who work in the central city, with more than 60 per cent of these workers using public transport for all or part of their journeys to work.

As the Department of Infrastructure noted in its analysis of the 2006 Census JtW figures:

> *"For those Melburnians who work in the CBD, using public transport to get to work has always been popular, and increased in popularity between 2001 and 2006."*[4]

Generally, Melburnians' travel patterns indicate that the further away from the central city people live, the more likely they are to use their cars to get to work – but they are also more likely to be working relatively close to home.

Evidence from specific municipalities reinforces these commuting patterns.

- In the City of Yarra (an inner city municipality where most residents work in or around the central city), around 35 per cent of residents use public transport to travel to work.
- In the City of Casey (in Melbourne's south east), just 6.6 per cent of people use public transport to get to work (81 per cent drive their cars). This aligns with data showing that around one quarter of Casey workers have jobs in Casey, another quarter commute to nearby Greater Dandenong and only 6 per cent have jobs in the central city.
- In the City of Boroondara (which is relatively close to the central city and where one third of workers have jobs in the CBD), 20 per cent of workers use public transport for all or part of their journeys to work, while 66 per cent drive their cars.
- In the City of Wyndham (in Melbourne's west), nearly 10 per cent of residents use public transport, while nearly 78 per cent drive their cars to work. Wyndham has a relatively high share of commuting by public transport (for an outer suburb) because nearly 20 per cent of residents work in the central city.[5]

Mapping the most recent Journey to Work data from 1996 to 2006 shows that public transport has overtaken the car as the dominant mode of travel for people travelling to work in the city of Melbourne, with car use declining. However, the broader picture across Melbourne highlights the continuing dominance of the car (see Figure 21). Journey to Work data also shows the large number of people commuting to and from the suburban centres of Ringwood, Dandenong and Frankston (see Figure 22).

Table 7 – Modal shares of journeys to work with a destination in the Inner Melbourne Statistical Local Area, 2006*

	Daily journeys	Share of left home journeys to work** (per cent)
Train, tram or bus only	62,906	45.2
Public transport used for all or part of journey to work	83,760	60.2
Car as driver	32,144	23.1
Car as passenger	6,294	4.5
Bicycle only	3,133	2.3
Walked only	7,677	5.5

* The Inner Melbourne Statistical Local Area closely corresponds to the Melbourne CBD, bounded by Flinders, Spring, Latrobe and Spencer Streets.

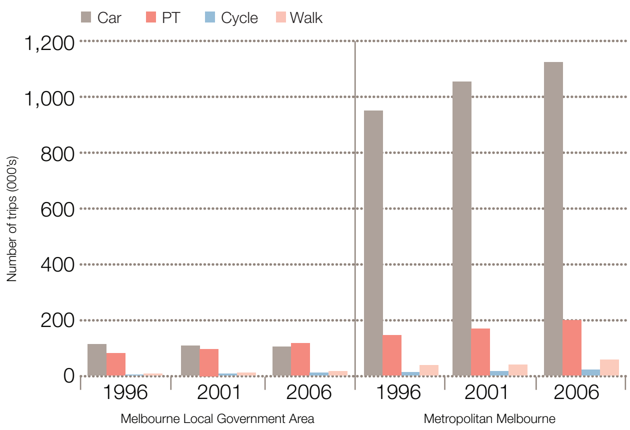
** 'Left home journeys to work' do not include the number of people who worked at home and those people who did not go to work on Census day.

Source: DOI (2008) – using ABS Census 2006 data

4. DOI (2008)

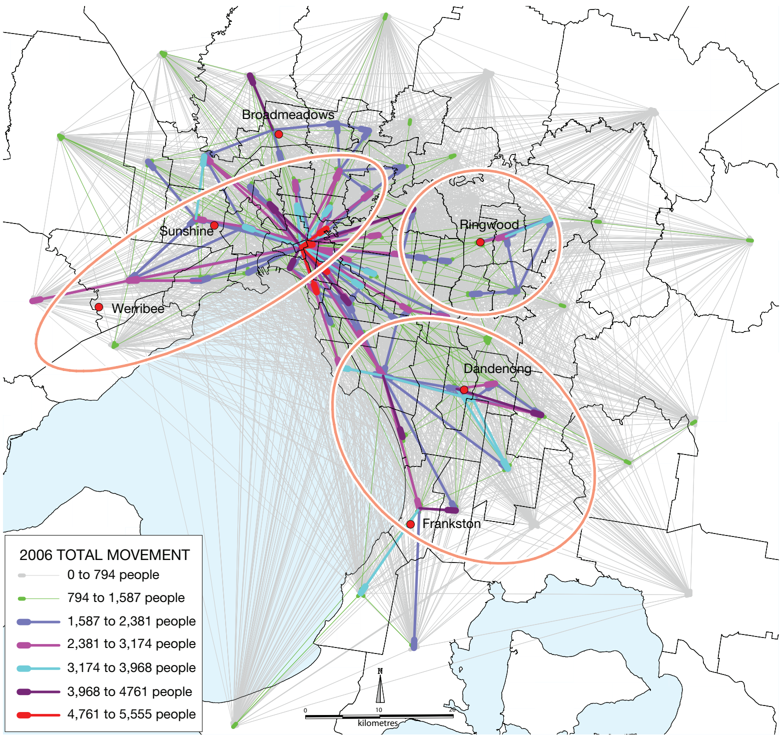
5. Data from DOI (2008)

Figure 21 – Journey to work patterns of travel, 1996 to 2006



Source: EWLNA (using ABS census data)

Figure 22 – Journey to work patterns of travel, 2006



Source: EWLNA (SGS Economics and Planning)

2.3 Future demand for travel

Over the next 30 years, Melbourne's continuing growth will be accompanied by a very large increase in the demand for travel – for work, personal and business reasons.

In order to understand the future demand for travel, the EWLNA Study Team engaged expert modellers to prepare a multi-modal transport model. The model used historical data, together with the latest demographic forecasts to predict future demand for each mode of travel.

This modelling indicates that overall travel demand in Melbourne will grow by 34 per cent between 2006 and 2031 – to a total of around 19 million trips a day. Travel in the morning peak period is predicted to grow by 30 per cent to a total of around 2.6 million trips.[6]

While growth in public transport use is forecast to increase very substantially, it will continue to remain relatively low compared to car travel. In 2031 the daily number of public transport passenger trips is predicted to be around 1.4 million; however, the daily number of person trips by private vehicle is expected to be nearly ten times higher – around 14 million.

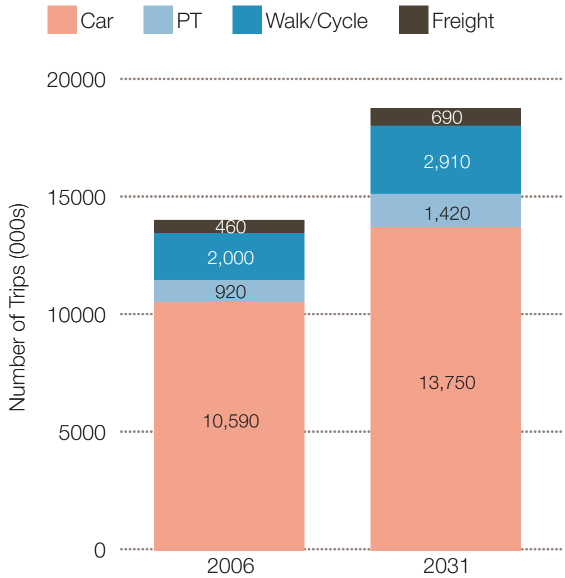
In terms of mode share, the model indicates that there will be a continuing and significant mode shift towards public transport (of around 15 per cent) and a smaller shift towards walking and cycling. However, while growth in car use is predicted to slow slightly, the actual number of trips made by car on Melbourne's roads will still increase by a very substantial amount. Recent projections by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) indicate a 19 per cent increase in total car vehicle kilometres travelled (VKT) in Melbourne between 2005 and 2020.[7]

The BITRE's projections for growth in total VKT in Melbourne to 2020 also confirm that the vast majority of this growth will come from cars, although travel by light commercial vehicles (LCVs) will also increase at a substantial rate (see Figure 25).

When using transport models to predict the future demand for travel, it is important to apply judgement to the results to ensure that they align with current experience. It is also important to recognise how travel behaviour and patterns might change in the future as a result of new community attitudes or government policies.

An example of this approach can be found in the Study Team's analysis on future rail demand (see Chapter 3), where the Public Transport Division's analysis of the most recent resurgence in patronage has been incorporated into consideration of future rail demand, along with the EWLNA modelled outputs. Another example is the modelling undertaken by the EWLNA of a future 'carbon constrained world' (see Chapter 8), where large shifts in community attitude and government policy have been explored. In both instances, the mode share of public transport is greater than the projections discussed in this chapter; however, the demand for car travel will also increase well above today's levels.

Figure 23a – trip demand summary, 2006 and 2031



Source: EWLNA (Veitch Lister)

Fast facts: moving people in around Melbourne in the future

- Overall travel demand in Melbourne will grow by 34 per cent between 2006 and 2031 – to a total of around 19 million trips a day.
- Travel in the morning peak period will grow by 30 per cent to around 2.6 million trips
- Growth in travel demand will be strongest in the inner city and in the west and south of the city
- Public transport use will continue to grow strongly, increasing its share of travel by at least 15 per cent (based on historic travel patterns, although recent patronage figures suggest higher growth may occur)
- While the mode share of car travel will decline very slightly, the overall demand for car travel will increase by 30 per cent by 2031.

6. For further analysis of projected travel demand, see SKM Maunsell/Evans and Peck (2008a)
7. BITRE (2007), *Working Paper 71: Estimating urban traffic and congestion cost trends for Australian cities*, Commonwealth of Australia, Canberra, p.47

Figure 23b – Public Transport and Road Growth 2006 to 2031 AM Peak, Metropolitan wide.

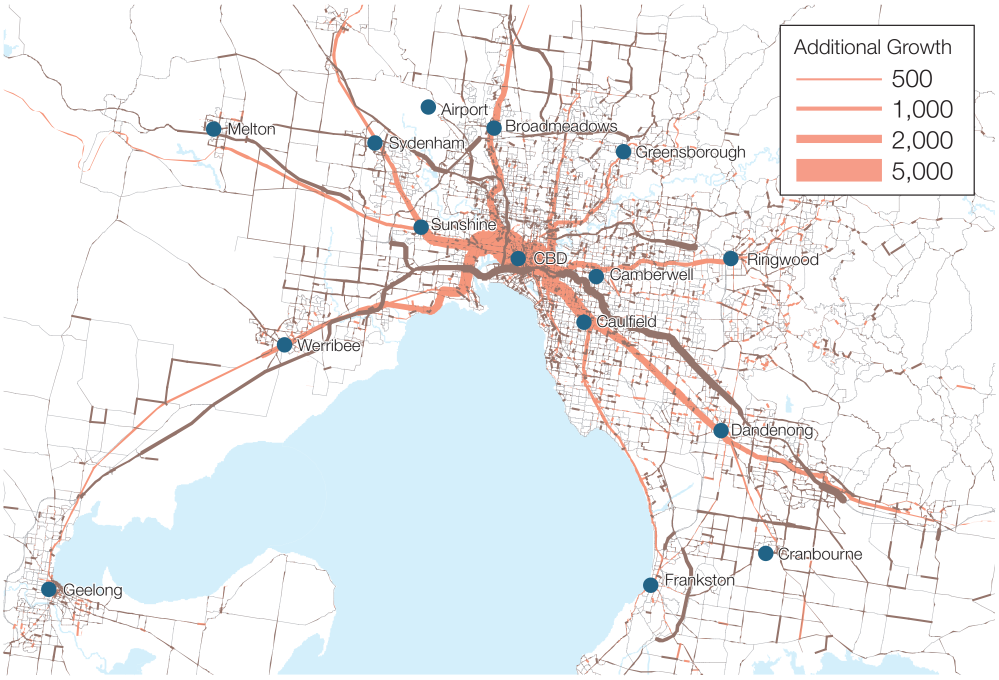
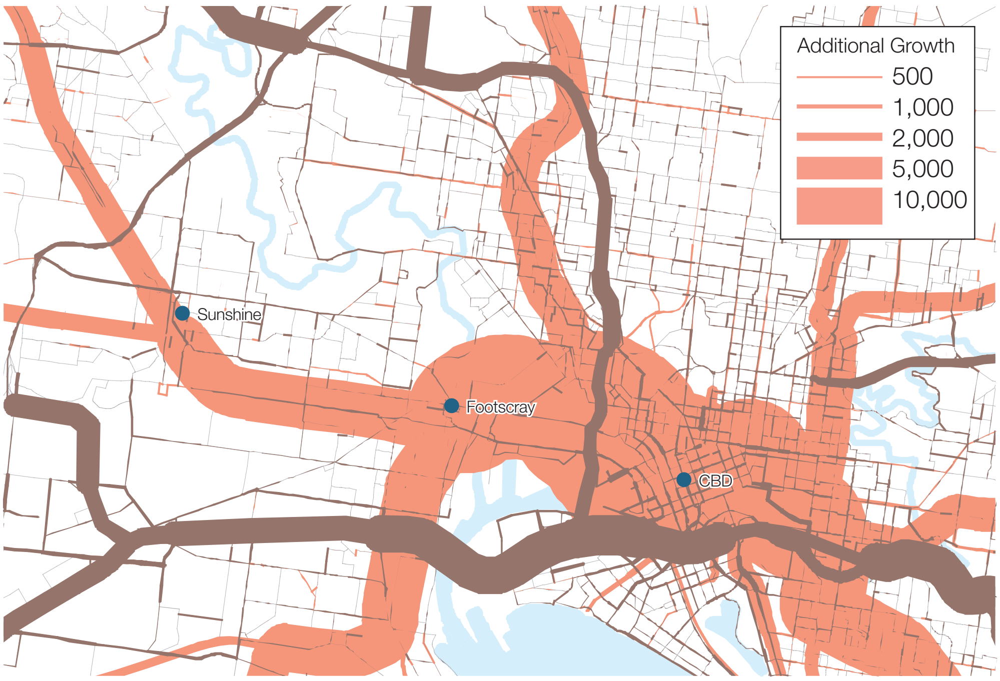


Figure 23c – Public Transport and Road Growth 2006 to 2031 AM Peak, Study Area.



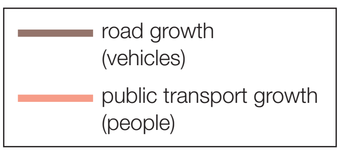
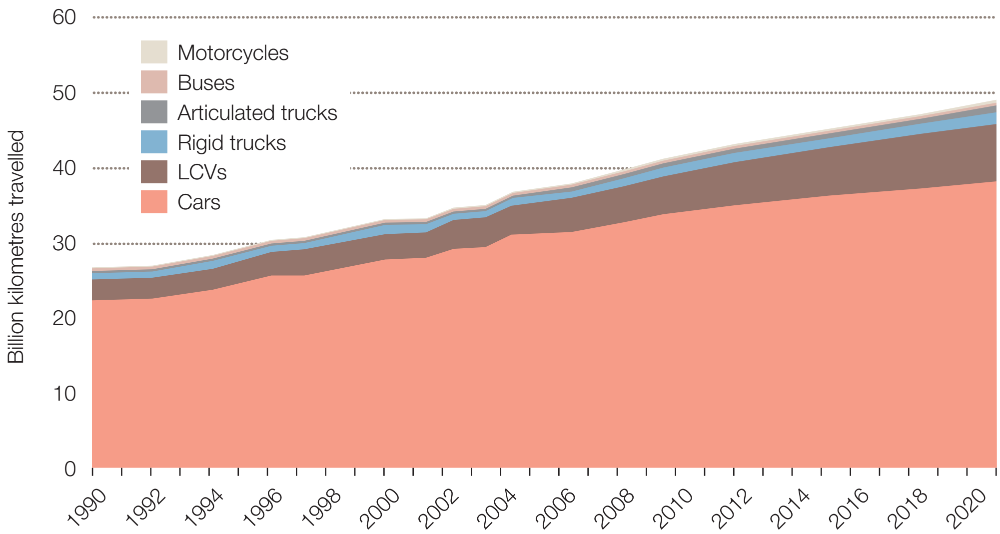


Table 8 – Growth in trip demand, Melbourne, 2006 and 2031[8]

Thousand Trips			All day			AM Peak		
			2006	2031	% growth	2006	2031	% growth
Melbourne	Car		10,590	13,750	30%	1,520	1,900	25%
	PT		920	1,420	54%	220	340	55%
	Walk/Cycle		2,000	2,910	46%	210	290	38%
	Subtotal		13,510	18,080	34%	1,950	2,530	30%
	Freight		460	690	50%	70	100	43%
	TOTAL		**13,970**	**18,770**	**34%**	**2,020**	**2,630**	**30%**
	People Mode Shares	Car	78.4%	76.1%	-3%	77.9%	75.1%	-4%
		PT	6.8%	7.9%	15%	11.3%	13.4%	19%
		Walk	14.8%	16.1%	9%	10.8%	11.5%	6%

Source: EWLNA (SKM Maunsell/Evans and Peck)

Figure 24 – Total projected VKT for Melbourne to 2020



Source: BITRE (2007)

8. Modelling analysis undertaken by SKM Maunsell/Evans and Peck with the aid of Veitch Lister Consulting's Zenith transport model, which is calibrated (using available information) to reflect the situation in 2006. Details of this modelling are set out in Appendix F, and in specialist reports available at the EWLNA website.

Modelling undertaken for the EWLNA also shows some significant changes in the reasons for making trips. As Table 9 shows, the greatest growth is predicted to occur in freight trips (49 per cent), non-home-based recreational trips (48 per cent) and work-based trips (46 per cent).

Table 9 – Trip purposes, 2005 to 2031

Thousand trips modelled	All day		
	2006	2031	%growth
Home-based education	1,210	1,500	23%
Home-based recreation	7,340	9,420	28%
Home-based work	2,685	3,410	27%
Non-home-based recreation	3,690	5,450	48%
Work-based trips	810	1,180	46%
Freight trips	510	760	49%

Source: EWLNA (SKM Maunsell et al)

The rise in freight trips is discussed further in Chapter 6. The increase in 'work-based' work trips reflects a growing trend associated with the transition to a services economy: more business-related travel involving face-to-face contact and travel involving the delivery of services (as distinct from the delivery of goods). It also reflects an increased blurring of the lines between personal trips and work trips.

When viewed alongside the industry, demographic and work changes taking place across Melbourne, these changes suggest that future travel demand in Melbourne is likely to involve more short trips, more linked trips, more door-to-door travel, and travel to and from a more dispersed range of origins and destinations. As the RACV pointed out in its submission to the EWLNA:

> *"It is particularly important to note that more complex, multi purpose and destination trips are becoming more prevalent in the community. This will be particularly so in off peak, non-urban and suburban locations."*[9]

The nature of these complex trips favours the flexibility and convenience offered by the motor vehicle – another factor in the likely continued domination of the car as Melburnians' preferred mode of transport.

STUDY TEAM FINDINGS

As Melbourne's population and economy grows, the demand for travel will increase very substantially.

Overall travel demand in Melbourne will grow by 34 per cent between 2006 and 2031, with the strongest growth occurring in the inner city and in the west and south of the city.

Public transport use will continue to grow strongly, increasing its share of travel by 15 per cent. Overall, public transport is likely to account for a mode share of nearly 8 per cent of all motorised and non-motorised trips in 2031 (although growth over the last three years suggests this number could be higher).

While the rate of growth in car travel will slow slightly, the overall demand for car travel will increase by 30 per cent. Car travel will continue to be the preferred mode of personal transport for Melburnians for the foreseeable future and access to an efficient, safe and well-managed road network will continue to be indispensable in the daily lives of the vast majority of the city's residents.

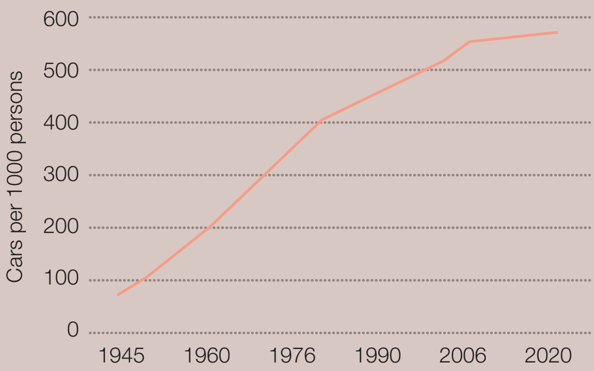
9. RACV submission to the EWLNA (2007), p.6

Our love affair with the car

> *"Like a human love affair, our love affair with the car unfolded, step by step, from its first moment of distant admiration through casual acquaintance, infatuation and deep bonding to taken-for-granted familiarity."*[10]

Australians have enjoyed a long love affair with the car. Out of a population of 20 million, 12 million Australians are licensed to drive and there were 14.8 million motor vehicles on our roads in 2007, an increase of 12.2 per cent since 2003.[11] Car ownership is projected to increase over the next decade, although there is some evidence that it may have reached saturation levels.

Figure 25 – Projected car ownership in Australia



Source: BITRE (2002b)

Like the rest of Australia, Victorians own more motor vehicles than ever, spend longer commuting and generally prefer to drive rather than use public transport. Despite increases in the price of petrol and the costs of owning a car, passenger vehicle registration in Victoria increased by 7 per cent between November 2001 and October 2005 (more than twice the rate of Victoria's population growth).[12]

The continuing popularity of car travel presents a very significant challenge to the Victorian Government's aim of increasing the share of trips made by public transport. In 2007, a survey conducted by the Australian Automobile Association found that:

- 9 in 10 Victorian motorists rate their car as important in their daily lives, with two thirds regarding their car as 'extremely important';
- 9 in 10 drive their car every day or most days of the week; and
- less than 2 in 10 use public transport at least once a week.[13]

The 2005 Household Travel Survey conducted by the NSW Ministry of Transport asked people living in metropolitan Sydney for the reasons they chose public transport or private vehicle to travel to work. For those choosing to commute by car, the most frequently cited reasons were:

- speed of travel (48 per cent);
- inaccessibility of public transport (33 per cent) and problems with public transport (26 per cent); and
- convenience – including 'more comfortable' (20 per cent), 'no waiting' (20 per cent), 'can make trip whenever' (20 per cent) and 'arrives closer to destination' (18 per cent).[14]

These results support other evidence indicating that travel times, flexibility and comfort are powerful motivators in people opting to use cars over public transport. In an analysis of the survey results, the Transport Data Centre noted that even if public transport could match these factors, "the shift from the car is not assured" as there are commuters "who are simply captive to the car and unlikely to shift to public transport".[15]

continued next page...

10. Davison, G. (2004), *Car Wars: How the Car Won our Hearts and Conquered our Cities*, Allen and Unwin, Crows Nest
11. ABS (2007), *Motor Vehicle Census*, Cat no: 9309.0, Commonwealth of Australia, Canberra
12. SKM Maunsell/Evans and Peck (2008a)
13. Australian Automobile Association (2007), *Motorists' Attitudes and Priorities in 2007*, AAA Survey of Motorists' Attitudes, Conducted by ANOP Research Services Pty Ltd, 9th in series, Provided to the EWLNA by the RACV
14. Transport Data Centre (2007), *2005 Household Travel Summary: Summary report*, NSW Ministry of Transport, Government of NSW, Sydney
15. Corpuz, Grace (2007), *Public Transport or Private Vehicle: factors that impact on mode choice*, Paper delivered to 30th Australasian Transport Research Forum, Transport Data Centre, NSW Ministry of Transport, Government of NSW, Sydney

Despite the popularity of the car, there is substantial evidence that Australia's heavy car dependency has significant negative impacts, including:

- environmental (urban sprawl, air pollution, noise disturbance and GHG emissions);
- economic (vulnerability to changes in global oil production, increasing traffic congestion and the need to provide urban infrastructure across a more dispersed geographic area);
- social (isolation, unequal access to services and reduced community amenity); and
- health effects (disability and death caused by road trauma, respiratory illnesses caused by air pollution and obesity caused by reduced levels of physical activity).

Recent research conducted in Sydney suggests that the total social cost (including externalities) of running a car is 80 cents per person-kilometre, compared with 40 cents per person-kilometre for rail and 43 cents per person-kilometre for buses.[16]

Despite these impacts, Australians continue to prefer travel by motor vehicle over all other modes of transport. Generally, people who use public transport still own a car and will use it regularly (often daily) for different types of trips. Most predictions of growth in urban travel are that increased demand will be met largely by car travel – although growth in per capita car travel is likely to level out over the next decade. These predictions are based on the assumption that, while petrol prices, congestion and environmental concerns will lead to ongoing increases in public transport use, most Australians will remain very reluctant to give up the personal mobility provided by cars.

While it is vitally important for governments to pursue increases in public transport patronage and to promote changes in travel behaviour, the indicators are that Australians – and Melburnians – will continue their love affair with the car, although the object of their affection will shift from large, petrol- or diesel-fuelled vehicles to smaller, more environmentally friendly vehicles.

16. Glazebrook, G. (2006), *Taking the con out of convenience: The true cost of transport modes in Sydney*, Faculty of Design, Architecture and the Built Environment, University of Technology, Sydney (forthcoming)

chapter 3

3. public transport - on a roll

Melburnians are returning to the city's public transport system in historically large numbers. Indeed, recent public transport patronage growth has been so strong that Metlink was probably guilty of an understatement when it noted in its submission to the EWLNA that:

> *"Melbourne's public transport system is enjoying a major resurgence".*[1]

The last time public transport enjoyed these levels of patronage was in the 1950s – before car ownership became widespread across the city. But – clearly – the change is on. In the last three years, patronage on Melbourne's public transport system has grown substantially, with most of the growth being on Melbourne's trains.

Analysis undertaken for the Study Team clearly identifies rail as the key public transport mode in Melbourne in terms of its capacity to move large numbers of people. However, the growing demand for train travel suggests that, in the absence of further investment, it is the public transport mode that will be most constrained in the future.

3.1 Melbourne's public transport network

Melbourne's public transport network consists of trains, trams and buses. The train and tram networks have largely developed along radial lines, while buses mostly provide local and orbital links. The network plays two key roles in the functioning of the city:

- Mass transit – primarily for people commuting to work, school or education in central Melbourne during peak periods
- Social transit – primarily for people traveling during off-peak periods or at weekends and for people who do not have easy access to alternative forms of transport.

Public transport use tends to be concentrated in the inner and middle suburbs of Melbourne, where there is a dense network of infrastructure that includes railways, tram lines and bus routes. Beyond the inner suburbs, public transport infrastructure comprises radial train services and feeder and orbital buses.

3.1.1 Rail network

Melbourne's passenger (broad gauge) rail network has been in place for more than 100 years, with the radial bones of the network being laid down in the late 19th century. The last piece of major rail infrastructure constructed in Melbourne was the City Loop, which opened in stages during the 1980s. The most recent network extension was the electrification of the Broadmeadows line to Craigieburn, which opened in September 2007.

Melbourne's rail system performs four functions:

- It provides more than 1,860 suburban passenger rail services each day that carry around 200 million passengers each year.
- It provides access to and from central Melbourne for V/Line passenger rail services that carry 15 million passengers each year – people who are commuting or travelling to and from towns and regional centres along the Geelong, Ballarat, Bendigo, Wodonga and Traralgon corridors.
- It provides access to and from central Melbourne for interstate passenger trains to Sydney and Adelaide.
- It provides for freight trains into and out of Melbourne – mostly to and from rail terminals adjacent to the Port of Melbourne.

The network is an extensive one, comprising around 430 kilometres of rail lines, 209 stations and 170 trains. The majority of the network consists of double track, although there are around 65 kilometres of single track and 30 kilometres of triple or greater track. 'Park & ride' travel is a significant feature of the system, with the suburban network including free parking spaces for around 30,000 cars.

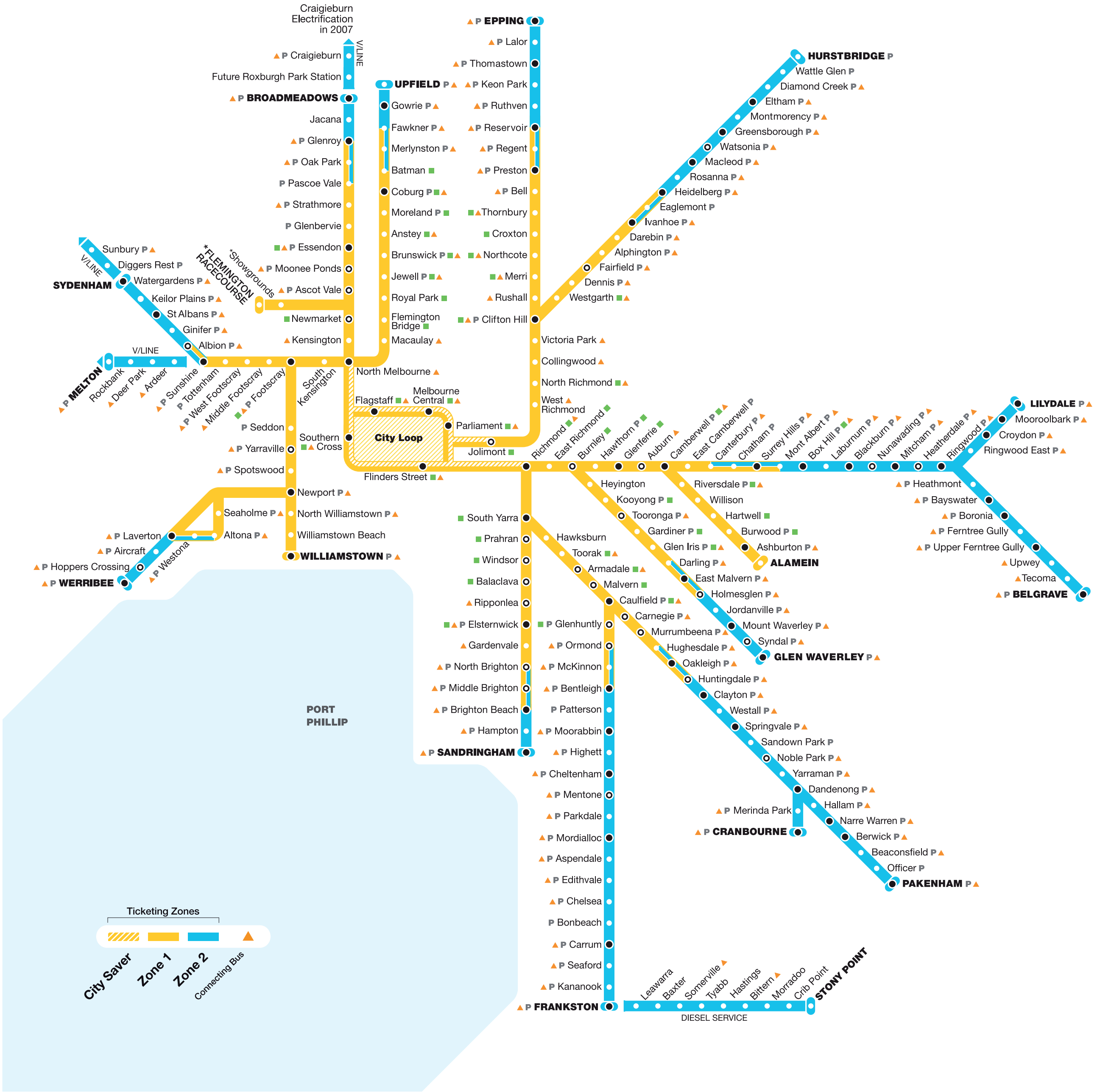
The network is laid out on a radial basis with the CBD at its hub. A total of 16 lines progressively converge on the CBD in four distinct rail 'groups':

- Northern Rail Group – Werribee, Williamstown, Sydenham, Craigieburn and Upfield lines
- Caulfield Rail Group – Sandringham, Frankston, Cranbourne and Pakenham lines
- Clifton Hill Rail Group – Hurstbridge and Epping lines
- Burnley Rail Group – Lilydale, Belgrave, Alamein and Glen Waverley lines.

The four groups converge on the Inner Core Network, which comprises the Melbourne Underground Rail Loop, Flinders Street Station and Southern Cross Station, as well as the links to North Melbourne, Jolimont and Richmond Stations. Three stations are located on the underground loop: Parliament, Melbourne Central and Flagstaff.

1. Metlink submission to the EWLNA (2007), p.4

Figure 26 – Melbourne's passenger rail network



Source: Public Transport Division (DOI)

The network is oriented around moving large numbers of commuters into and out of central Melbourne. In the morning peak period, around two thirds of travel from suburban stations has a final destination at a City Loop or Inner Core station (with around 68 per cent of travellers going to work and around 25 per cent going to school, university or college). Over the course of an entire day, around half of all trips are oriented toward the City Loop or Inner Core stations.

Each rail group operates through the Loop, with one track dedicated to each group. However, not all lines operate through the Loop because of capacity constraints and conflicts with other lines. These trains travel direct to Flinders Street and either travel through the CBD or reverse back out.

Running these four rail groups is a complex operation, especially during the morning peak hour when more than 100 suburban and V/Line trains arrive in central Melbourne.

As with the road network, Melbourne's rail network has a theoretical daily capacity that exceeds demand. However, there is a considerable imbalance between heavily loaded peak period trains and relatively lightly loaded off-peak trains. This imbalance means that the network runs at capacity for relatively short periods, while trains throughout the rest of the day carry relatively low numbers of passengers – although recent patronage growth has meant significant loads on a number of off-peak services.

Changes to the rail network

A number of changes to the network were announced through the Victorian Government's *Meeting Our Transport Challenges* statement, including:

- Track duplication – Clifton Hill to Westgarth, Keon Park to Epping
- Track triplication on the Dandenong line
- Sunshine track triplication/quadruplication
- New train stabling facilities near Werribee
- Signalling upgrade – Hurstbridge line, Werribee line
- Loop reversal – Clifton Hill group
- New stations at Lynbrook, Cardinia Road, Point Cook, Coolaroo
- Additional platforms at Sandringham, Pakenham, Dandenong
- Expanded Park and Ride facilities
- New trains
- Station interchange upgrades across the network.

3.1.2 Tram network

Melbourne's tram network is now the largest in the world in terms of operational track length (after St Petersburg recently removed some track from its network). The network includes around 240 kilometres of double track, 475 trams and 1,813 tram stops. Trams operated along 27 routes and carried 150 million passengers in 2006-07 (the highest level for several decades).

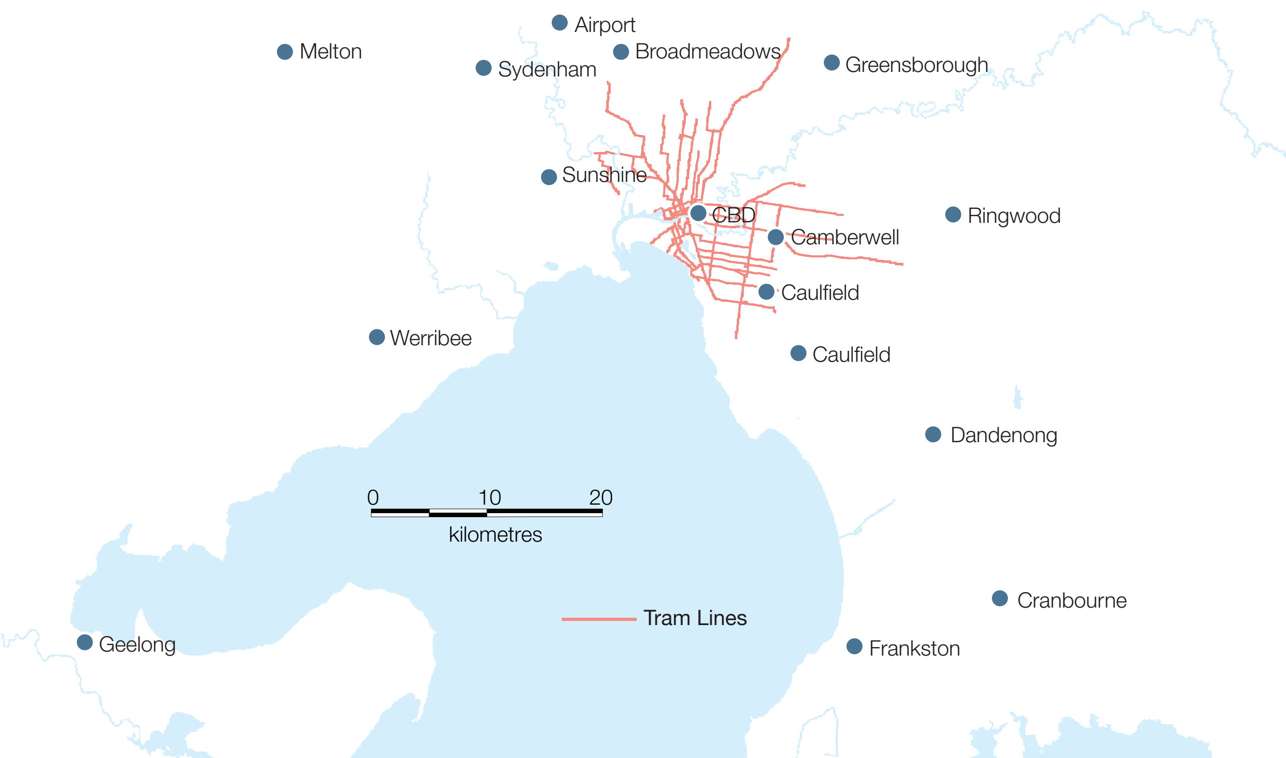
The tram network extends from the CBD to inner and middle suburbs and is largely a high capacity commuting option for inner city residents. Operations are carried out in four different environments:

- Shared on-street operations (sharing the road with other vehicles)
- Exclusive right of way operations
- Segregated in road median operations
- Segregated on-street operations.

Currently a range of trams are in service across the network, from 50-year old W class trams (operating along heritage routes) to modern D class level access trams.

Tram operations are much less complex than rail operations. Trams generally run the full distance between terminals all hours of the day and week, with regular service frequencies along each route of 4 to 8 minutes during peak periods, 8 to 12 minutes during the day and 15 to 20 minutes in the evenings and at weekends.

Figure 27 – Melbourne's tram network



Source: EWLNA

Reliability is the key issue for tram operations in Melbourne, with several factors playing a role:

- Tram stops are located at varied spacing along each route. Most stop intervals are between 200 and 500 metres, but in places they are less than 200 metres. While close stop spacing increases convenience in terms of access, it reduces the average speed of the service – making tram travel frustrating for passengers, especially commuters.
- Most tram routes converge on the CBD, with many routes sharing track and stops as they get closer to the central city. This increases the frequency of services, but can also lead to irregular service frequencies, imbalanced passenger loads, congestion and slower speeds.
- Unlike the separated tram systems in many other cities, the vast majority of Melbourne's network involves shared on-street operations. This means that priority for trams is a significant issue, with delays caused by traffic signals, obstruction by other road vehicles and traffic congestion. These delays mean that service speeds are slow by world standards, averaging 15 km/hour across the network and slowing to an average speed of 11 km/hour in the CBD.[2] While the segregated sections of track achieve speeds of around 25 km/hour, this represents only a small portion of the network; however, these sections are a good indicator of the speeds that can be achieved when priority is given to trams.

Changes to the tram network

In recent years, a number of extensions have been made to the tram network, including:

- Routes 30 and 48 extended to Docklands
- Route 109 extended from Mont Albert to Box Hill
- Route 75 extended and a new tram/bus interchange built at Vermont South

Other improvements to the network include:

- Extension of tram operating hours on Friday and Saturday nights
- Extension of the Think Tram program (which gives more priority to trams to improve travel speeds)
- Replacement of stepped access trams with low floor, level access trams (and the leasing of five new high capacity, low floor trams ahead of the next delivery of new trams)
- Replacement of kerb access and safety zone stops with raised platform stops
- Introduction of tramTRACKER, which enables passengers to call or SMS a remote tram tracking system to find out when the next tram will arrive.

3.1.3 Bus network

Around 250 bus routes serve metropolitan Melbourne, recording approximately 85 million boardings each year. Most services operate in the middle and outer suburbs, with only a relatively small number of routes serving the CBD and inner suburbs.

In general, buses provide public transport in areas of the city that are not close to the rail and tram networks and they are the only form of public transport that is easily accessible for a great many Melburnians.

Buses perform several important functions:

- Radial routes link middle and outer suburbs with the CBD (especially those areas that are distant from or between rail and tram routes, such as the western suburbs and the Doncaster corridor).
- Orbital cross-town routes link major suburban centres, providing opportunities for cross-town travel without having to go through the CBD.
- Feeder routes provide access to local shopping centres, service centres and railway stations.

While buses are the primary form of public transport in many cities around the world, historically Melbourne has not managed its bus network particularly well by global standards. While other cities have moved to high capacity, sophisticated Bus Rapid Transit systems, buses have remained something of a 'poor relation' in Melbourne's transport network.

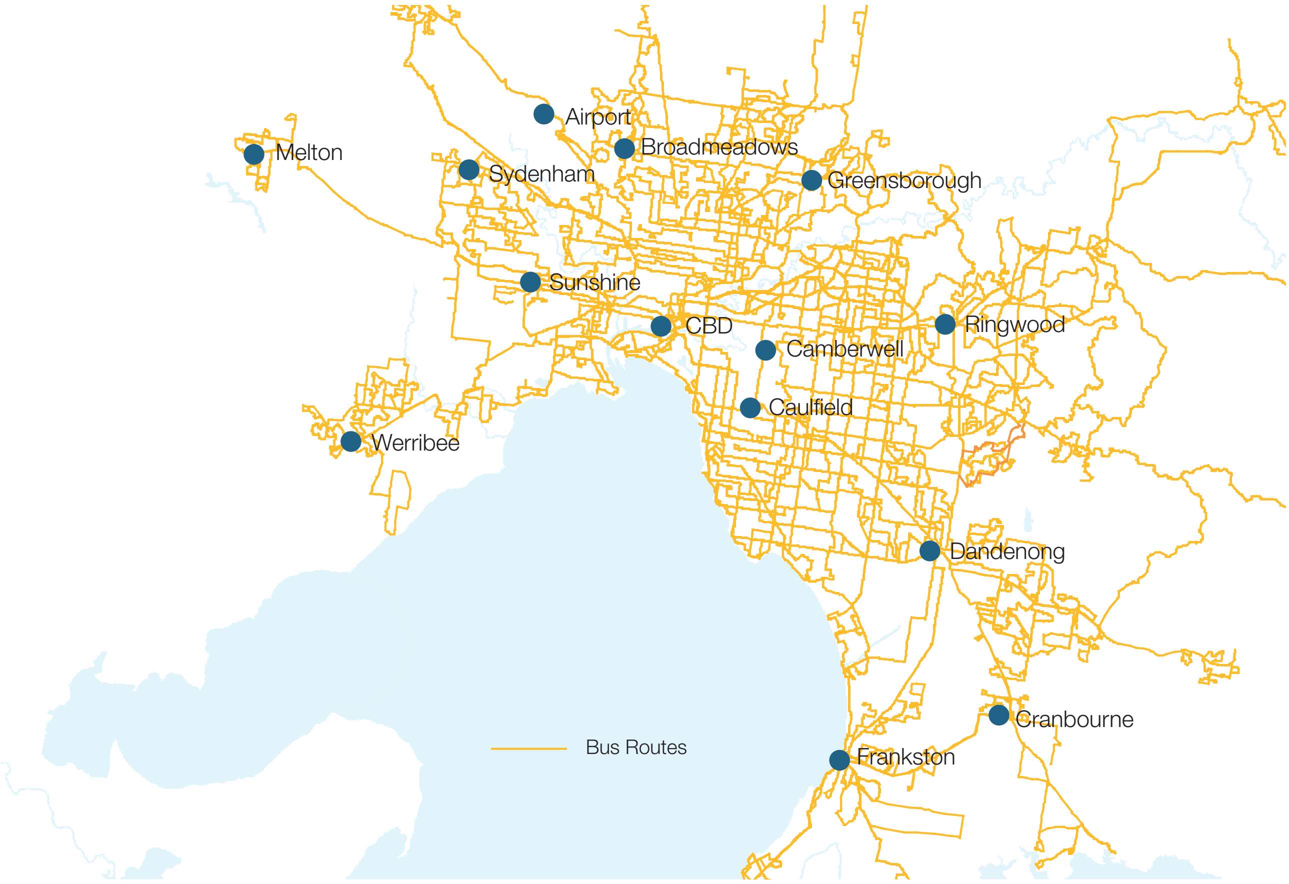
For many years, the city's buses have not provided a convenient transport option for most people due to low frequencies and limited hours of operation. Until recently, most routes did not operate later than 7pm on weekdays and many routes do not operate on Sundays. In many suburbs, bus frequencies have been low compared to tram services and services between key activity centres have been indirect and circuitous.

Through its *Meeting Our Transport Challenges* statement, the Victorian Government is significantly improving bus services across Melbourne. Additional services, route extensions and more frequent services should make bus travel a more attractive and convenient travel option.

New SmartBus routes are also improving the range and reliability of bus services across the city. These routes operate 19 hours a day at no more than 15 minute intervals for most of the day on weekdays and 30 minute intervals on weekends. The SmartBus rollout will deliver a higher quality bus service along new orbital routes across Melbourne, giving people more options to make a cross-city trip without having to change buses or pass through the central city. Four new SmartBus orbital links are currently planned for Melbourne.

2. Metlink submission to the EWLNA (2007)

Figure 28 – Melbourne's bus network



Source: EWLNA

While the use of bus services across the city is increasing – and services are being improved and extended – the bus network still faces constraints to further growth, including:

- Restricted hours of operation and low service frequencies
- Indirect and circuitous routes
- Limited provision of up-to-the-minute information on services and timetables
- Vulnerability of services to accidents and congestion.

Changes to the bus network

Changes to the bus network being made through the *Meeting Our Transport Challenges* statement include:

- A new network of cross-town SmartBus routes on major arterial roads, including four new orbital routes through Melbourne's suburbs
- Improvements to local bus services, including new routes, extensions to existing routes and upgrades to services on more than 250 routes (with services running later and more frequently)
- Additional measures to give buses priority at intersections
- Minimum service standards applied to all routes, including minimum service frequencies and hours of operation
- Upgrading of services to Doncaster as part of the Doncaster Area Rapid Transit (DART) project to provide a level of service that is comparable with trains and trams (see Chapter 7).

3.2 Melbourne's trains – a resurgence in patronage

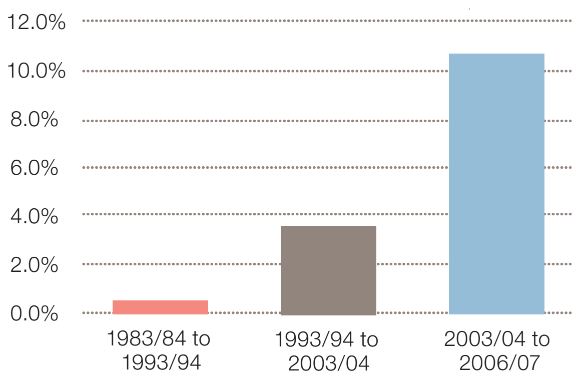
Across the city, the demand for train travel is increasing. Patronage growth on Melbourne's rail network has been more than 30 per cent over the past three years – an annual average growth rate of 10.2 per cent, a sharp contrast to the 1 or 2 per cent growth rates over the previous two decades. There are no signs of this growth slowing.

This strong growth means that in 2007, an additional 160,000 people were travelling each day on Melbourne's trains compared to 2002. With a typical electric suburban train in Melbourne regarded as overcrowded when it holds more than 800 people, this represents the equivalent of an extra 200 trainloads.

In 2007-08, Melbourne's train system will carry about 200 million passengers[3] – an historically high number exceeding the peak of the 1940s and 1950s. However, when measured in passenger kilometres – rather than simple passenger numbers– today's rail system performs a much greater task than in the 1950s (see *Melbourne's trains – then and now*, page 76).

When discussing the resurgence in rail travel, it is important to keep in mind that the overall number of trips being made each day in Melbourne is growing rapidly. This means that, while public transport's share of daily journeys to work has grown from 13.4 per cent in 2001 to 14.5 per cent in 2006,[4] the number of car trips still greatly exceeds public transport trips by a factor of 5 to 1 (although car trips are growing at a slower rate).

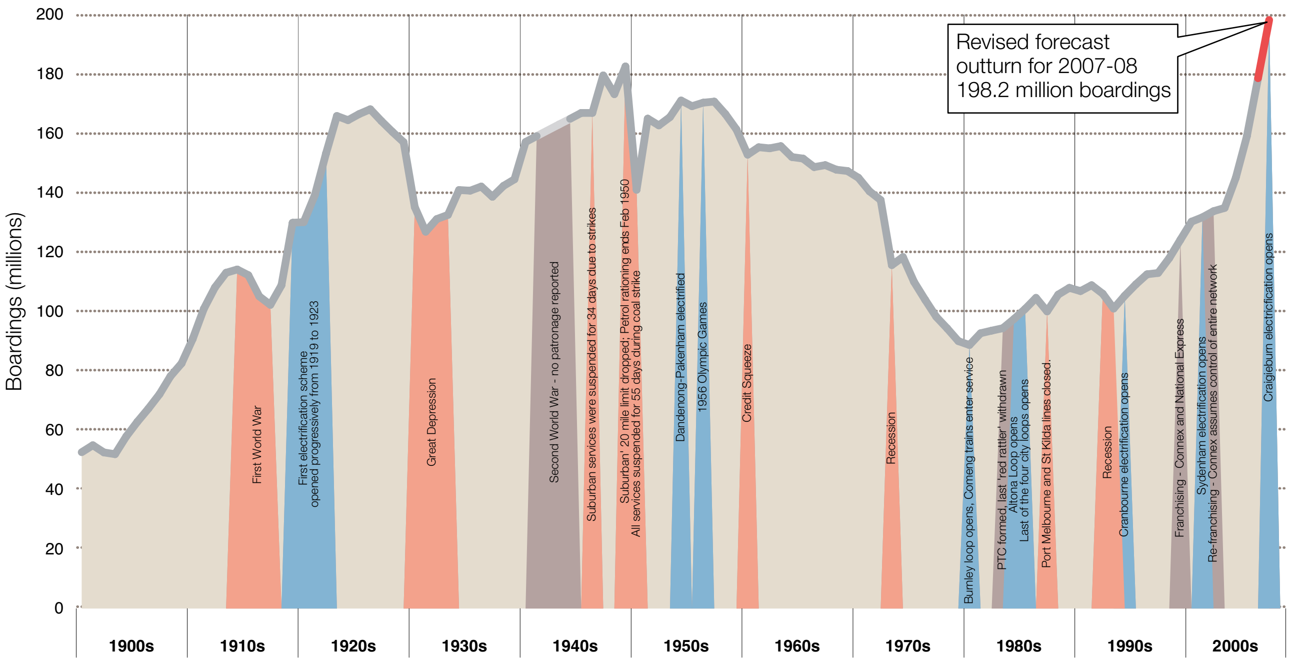
Figure 29 – Train average annual patronage growth, 1983 to 2007



Source: Public Transport Division, DOI

3. Information provided by the Public Transport Division, Department of Infrastructure
4. DOI (2008) - Using ABS Census 2006 data

Figure 30 – Estimated metropolitan train patronage, 1900s to 2000s (excluding Commonwealth Games)



Note:
Prior to 1982-83 patronage was enumerated as journeys derived from ticket sales.
Figures prior to ths date have been factored up by 5% to allow for journeys involving more than one train boarding.

Source: Public Transport Division, DOI

3.2.1 Why the resurgence?

A recent survey conducted by the Public Transport Division (PTD) of Victoria's Department of Infrastructure provides some explanation for the resurgence in rail travel in Melbourne.

First, the size of the public transport market is expanding due to strong population and jobs growth in central Melbourne and in the city's growth corridors, particularly the middle suburbs where public transport provides a good alternative to car travel. As noted throughout this report, public transport's largest market is delivering people to work in the central city: in the past three years, strong CBD employment growth has meant that more people need to get to work in the city and are using public transport for that purpose.

Secondly, there is some evidence of a shift in people's travel behaviour. While this is difficult to determine, many factors appear to have aligned to make public transport more attractive, including rising petrol prices, increased congestion, the abolition of Zone 3, the desire for more exercise, environmental concerns and parking costs. In addition, many Melburnians tried out the public transport system for the first time, or after a long break, during the 2006 Commonwealth Games – and discovered the benefits of train travel. Some of that market has been retained.

The PTD survey shows the importance of cost issues in changing people's behaviour, with petrol prices and parking costs (including the Victorian Government's congestion levy) strongly influencing Melburnians' travel choices. The relative convenience and low stress aspects of travelling by train were also strong factors, especially among older travellers, suggesting that traffic congestion is having an impact on behaviour. Environmental concerns about greenhouse gases and climate change were a factor, although not generally people's primary concern.

A number of submissions to the EWLNA argued that as petrol prices continue to increase, more and more people will turn to public transport. The PTD survey supports this to some extent, with many people making the shift away from private vehicle travel saying that they have done so due to petrol price increases.

However, car owners will consider whether public transport is a viable alternative to using their cars based on a number of factors in addition to petrol prices, including the type of trip, its origin and destination, the urgency of the trip, the perceived safety of the trip and the time available to complete the trip. The fact that car travel is better suited to a wider range of trips than public transport is reflected in the evidence that, while public transport enjoys a strong market share in daily work trips to the central city (see Chapter 2.2.3), the vast majority of all trips around Melbourne are made by private vehicle.

Melbourne's trains – then and now

With the city's train system only recently exceeding the number of passengers carried in the 1950s, some Melburnians ask the question: if the system could carry that many people 50 years ago, why is it so hard today?

The geographic expansion of Melbourne (with low density land use and widely spread employment and residential locations), together with the introduction of express commuter trains, means that a direct comparison between the passenger numbers carried today and those carried in the 1950s is more complex than simply counting passengers.

Melbourne has changed considerably since the 1950s – and so has the way the city's trains are operated. In the 1950s Melbourne's population was around 1.5 million, with 70 per cent living within 10 km of the GPO. Today, Melbourne's population is moving towards 4 million, with around 16 per cent of people living within 10 kilometres of the GPO.[5]

Industry was concentrated in the inner and middle suburbs, meaning that people had very short journeys from home to work. In addition, very few people owned cars – in 1950, there were less than 200,000 cars in Melbourne (around 113 vehicles per 1,000 people) compared to today's 3.5 million vehicles (around 680 vehicles per 1,000 people).[6]

With such short journeys to work and with so few people owning cars, there was no great demand for express trains over such short distances, and no competitive pressure from car travel. Melbourne's trains ran regular services of short distances compared to today, with very few express trains.

In 2008, express trains are a highly valued part of the metropolitan train timetable, with some Melburnians commuting 40 or even 60 km each day from the outer suburbs to the CBD. Express trains were introduced partly as a response to competition from the rise in car ownership: as car ownership exploded in the 1960s, people began to leave the public transport system and a long steady decline commenced that has only recently turned around.

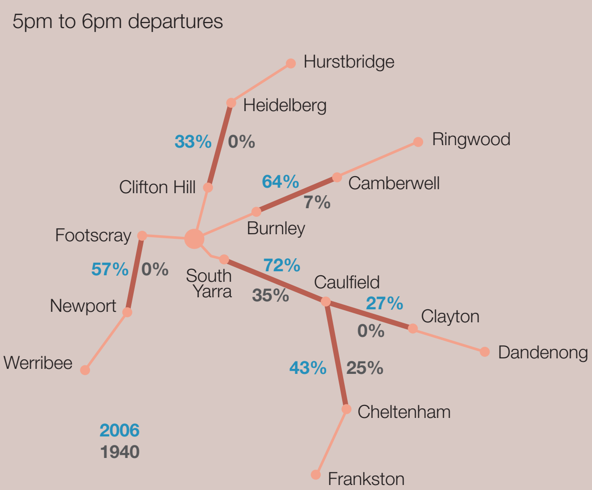
Express trains 'eat up' capacity. Where express trains share track with 'stopping all stations' trains, greater space between trains must be 'hard coded' into the timetable, limiting the number of trains that can be run on the line. Reducing the number of express trains would help to increase capacity, but would significantly increase travel times from the outer suburbs and may dissuade commuters from using the train at all. Boarding data supplied to the EWLNA shows a clear commuter preference for express trains, with maximum loads on these trains and 'stopping all stations' trains carrying significantly lower loads.

The distance people travel on the train has also increased as the city has grown. Today, the average journey length is around 18 km; in 1930, it was less than 11 km. The result is that when the number of passenger kilometres run today is compared to that of the 1950s, the load being carried by the system in 2008 is far greater.

In addition, the peak hour 'spike' is far more extreme today than in the past. Today, the system has to cope with a peak period of extreme demand that is 50 per cent greater than 1969, stretches system capacity and makes it difficult to meet that demand with extra services.

These differences between the way the system operated in the 1950s and today mean that direct comparisons about passenger numbers are misleading.

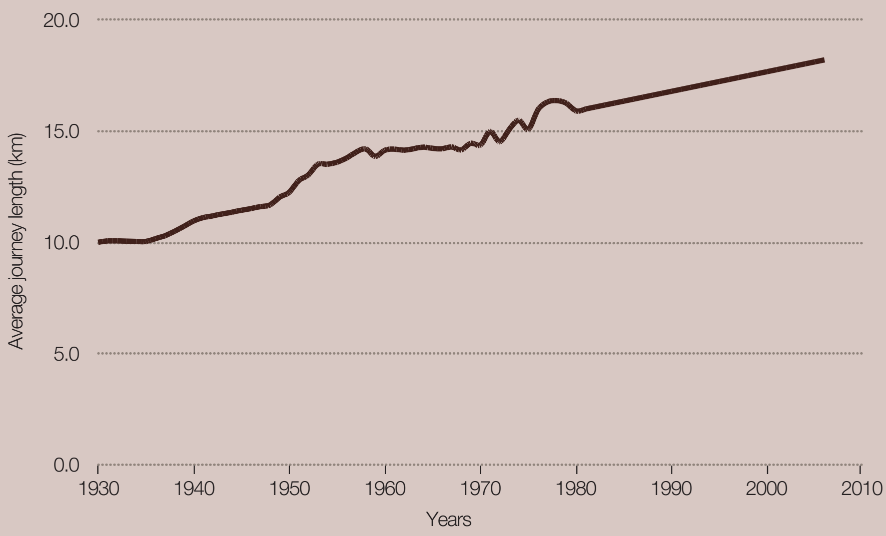
Figure 31 – Percentage of trains running express, 1940 and 2006



Source: Public Transport Division, DOI

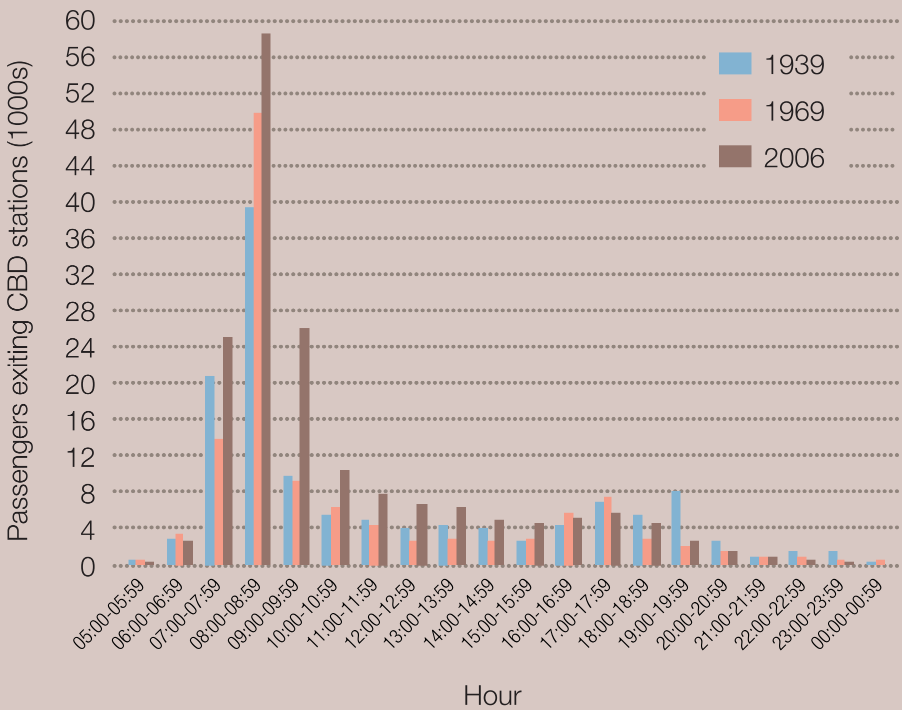
5. DSE (2006)
6. DSE (2006)

Figure 32 – Average distance passengers travel by train, 1930 to 2006



Source: Public Transport Division, DOI

Figure 33 – CBD station exits, 1939, 1969 and 2006



Source: Public Transport Division, DOI

3.2.2 Future growth and trends

Planning for service changes and capacity enhancements to Melbourne's rail system requires long term forecasts of patronage demand. In some ways, making such forecasts and then shaping the system to meet them is self-fulfilling. If no system capacity or operational changes are made, patronage will inevitably plateau at capacity; making more system enhancements and improving the service will attract more people.

As noted in Chapter 2.3, the Study Team used a multi-modal transport model and worked with the Public Transport Division (PTD) to consider the possible impact of the recent resurgence in rail patronage. This resulted in a range of rail patronage forecasts used by the Study Team as the basis for considering the need for enhancements to the rail network. Not surprisingly, given the recent growth rate, the PTD forecast was higher than the Study Team model output.

At the upper level, the PTD forecast recognises that the key drivers of recent growth are not expected to abate in the immediate years ahead: population growth will continue, as will growth in CBD employment. With the price of oil expected to trend upwards, the PTD forecast assumes that petrol prices will rise in real terms and that other factors, such as environmental concerns and congestion, will also continue to influence modal choice.

At the lower level, the EWLNA transport model forecast examines the demand outcome in the event that recent trends are a short term aberration and that only population and CBD employment growth drive patronage, rather than behavioural change in the longer term.

Accordingly, the patronage forecast range assumes:

- *PTD forecast* – a continuation in the factors driving behavioural change in recent years at a lower, but still historically high, growth rate of **6.6 per cent** per annum, tapering off after 2021. The forecast growth rate would vary from line to line in the network.
- *EWLNA transport model* – assumes that patronage growth will follow more historic patterns and grow along with the size of the market (through population growth and CBD employment growth), with other issues that have recently driven patronage growth continuing for a short period, then tapering off. This scenario is the equivalent of **2.1 per cent** patronage growth per annum. The forecast growth rate would vary from line to line in the network.

The EWLNA transport model predicts a public transport modal share of motorised trips of around 9 per cent by 2031. If capacity is not provided to allow patronage to grow to its potential, the Study Team believes the Victorian Government's 20/2020 target (public transport comprising 20 per cent of motorised trips by 2020) cannot be met.

Given Government policy and recent changes in community travel behaviour, it is important that (when planning the future rail network) the ability to meet public transport patronage objectives is not constrained by capacity limitations. Accordingly, the Study Team considers there is a compelling argument for making network investment decisions based on the higher PTD forecast.

Achieving the level of behaviour change assumed by this forecast would go a long way towards contributing to the Victorian Government's 20/2020 target.

Applying these forecasts to Melbourne's four rail groups, it is evident that the strong growth in train travel will place the rail network under considerable additional stress, with the greatest pressure occurring on the Northern and Caulfield Rail Groups due to capacity constraints.

As shown in Table 10, strong patronage growth is already taking place across all line groupings, but the strongest growth is occurring in Melbourne's growth corridors. The most pronounced is the Northern Group, servicing Melbourne's rapidly growing west, north-west and northern suburbs. Each year for the last three years, this group has recorded a very substantial 13 per cent increase in patronage.

The number of trains that will be required to service this increasing passenger demand is substantial. Using the Northern Group as an example, about 20,000 people catch the train during the busiest hour in the morning peak. By 2021, this will have increased to 45,000 people, if recent behavioural change continues. Even if recent behavioural change does not continue, population growth and employment trends will see passenger numbers increase to 36,000 in the busiest hour.

Table 10 – Annual patronage growth forecasts, AM peak hour

	Actual 2004-2007	EWLNA Transport Model 2008-2031	PTD 2008-2031
Northern	12.9%	3.1%	9.5%
Caulfield	8.4%	1.7%	5.5%
Burnley	4.3%	0.9%	3.4%
Clifton Hill	5.9%	2.1%	7.0%
All Services	7.6%	2.1%	6.6%

Source: Public Transport Division, DOI

With the standard capacity of Melbourne's trains at 800 passengers per train trip, growth of this magnitude will require very substantial increases in peak hour services.

Of course, the spare capacity on each line grouping varies. Where there is spare capacity on the network, increasing the number of services is as 'simple' as purchasing new rolling stock, making timetable additions and commencing operation of the services.

However, in some instances, minor or major infrastructure works are necessary before new services can be added. In addition, the timetabling changes required to add services can have a negative impact on customers. For example, the removal of a popular express service or a City Loop service – or the slowing down of a V/Line service – may create a pathway for an additional train, but would be regarded by some as a reduction in service. The end result is an increase in overall services for commuters.

3.2.3 A system under strain

As people board Melbourne's trains at record levels, the signs of strain in the system are beginning to show.

Since 2005, the number of trains suffering 'load breaches' has been rising steadily (see Figure 34). A load breach is defined as more than a rolling average of 798 people on board (bearing in mind that there are typically 528 seats on a suburban train). Not only are there more trains suffering load breach; the amount by which they are in breach is increasing.

While reliable statistics are not available, there is evidence that many people are being left behind on platforms, unable or unwilling to board excessively crowded trains. This is most likely to occur when a train service has been cancelled or is running late.

Melbourne's rail operator Connex, in conjunction with the Victorian Government, has been introducing new services to meet and encourage the growing demand for train travel. However, as the train network runs closer to capacity – and more trains are added to an already crowded timetable – there is less room to recover from incidents and delays, and the overall reliability of the network deteriorates.

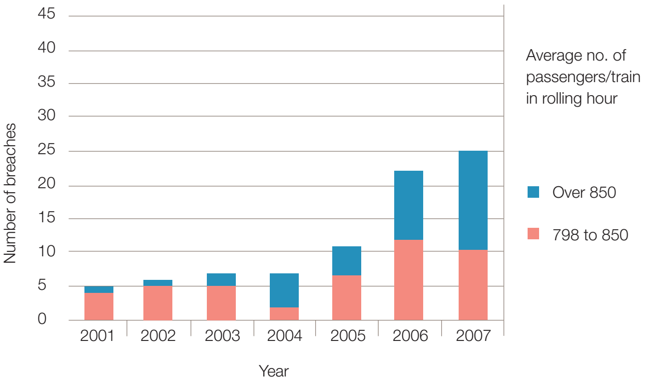
Incidents will always occur, many outside the control of the rail operator: vandalism, passengers falling ill and level crossing accidents fall into this category. There are also system failings: trains breaking down, signal faults, track maintenance, capital works, driver shortages and long 'dwell' times at stations as people try to alight and board crowded trains. When there are gaps in the schedule, incidents or breakdowns can be more easily 'worked around'. As the gaps in the timetable are taken up to provide more services, the impact of these incidents is more difficult to manage and more trains are adversely affected.

Figure 35 shows reliability levels in recent times on Melbourne's suburban rail system during the morning peak. It shows a system that is losing its flexibility to recover when incidents occur. It also shows a system beginning to feel the first signs of capacity constraint.

These results demonstrate that while the surge in train patronage is welcome and should be encouraged, finding ways to meet the demand is proving problematic. This is reflected in declining levels of public satisfaction with the train system. At the same time that Melburnians are returning to the system, growing problems of reliability and overcrowding are having a negative impact on people's perceptions and feelings about the quality of their travel experience.

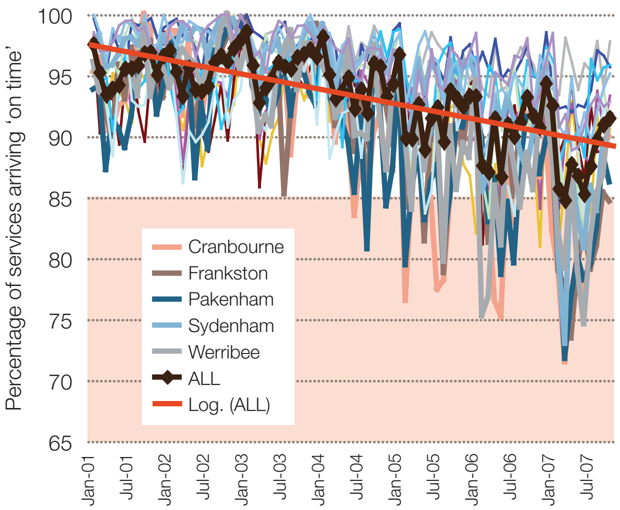
This decline in customer satisfaction is another manifestation of a system under strain (see Figure 36). Importantly, it also undermines efforts to encourage more people to shift away from private vehicle travel in the future.

Figure 34 – Train overcrowding – load breaches on morning peak period trains, 2001 to 2007



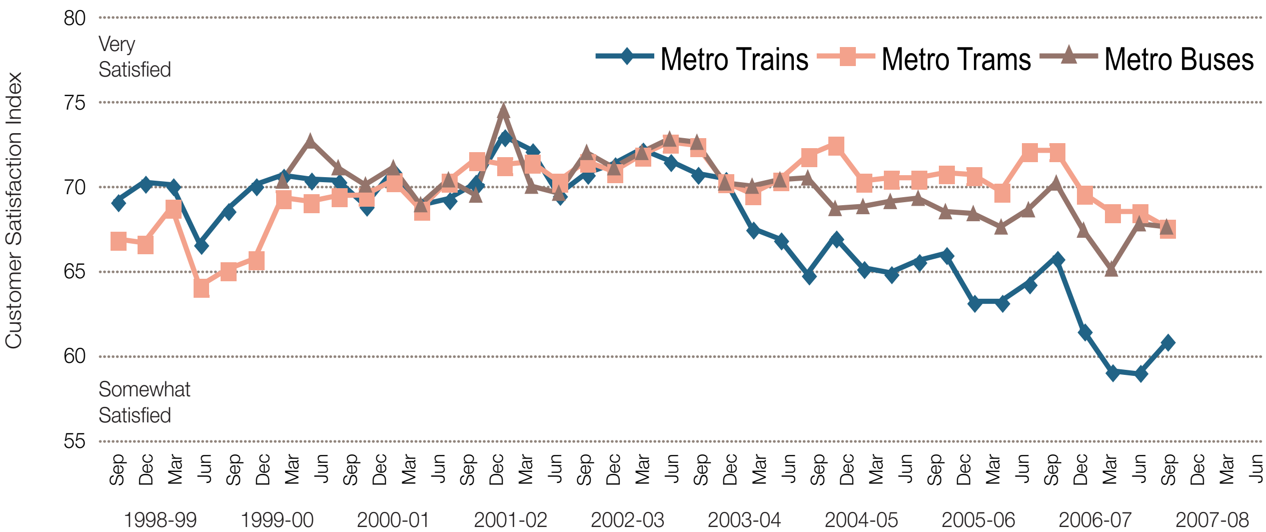
Source: PTD and EWLNA. (Figures are average annual growth. Projections assume a high initial growth rate, tapering off over time.)

Figure 35 – Reliability of morning peak services, 2001 to 2007



Source: Public Transport Division, DOI

Figure 36 – Customer satisfaction index for overall satisfaction with metropolitan public transport



Source: Public Transport Division, DOI

3.2.4 Limits on rail capacity

The design of rail network infrastructure, the operational systems used to control the movements of trains, the design and length of trains, and the design of stations all contribute to the rail system's capacity. In particular:

- The *geographic reach* of the network affects its capacity. Melbourne's track network has not altered much since the early 1940s. With the exception of the Melbourne Underground Rail Loop, and extensions of the electrified network to Pakenham, Cranbourne, Sydenham and Craigieburn, there has been little change in the broad reach of the network. However, as many people who live beyond the network's reach drive to their nearest stations to commence their train journeys, network extensions may reduce some car travel to and from these stations but will not necessarily translate into greatly increased rail patronage.
- *Single or double track* is a major determinant of system capacity. Since the 1940s, much of the single track has been duplicated, allowing for bi-directional running, although some single track remains on the network.
- *Train pathways and stopping patterns* also affect capacity. Each railway line has a finite number of train pathways[7], which are determined by the characteristics of the infrastructure and the frequency and type of trains operated. Because express services are provided for longer distance commuters (and usually share the same track as other trains that stop at all stations), the timetable must be constructed to provide enough space between trains to allow free running for express services without running up against slower trains. This reduces the number of pathways that can be provided on each line.

  On many of the Metro systems that people experience when travelling in cities such as London, Paris and Singapore, all trains run end to end and stop at all stations. In such instances, with all trains running to uniform stopping patterns, it is possible to add many more train pathways to a line. However, adopting this option in Melbourne would mean the reduction or removal of express services at great disadvantage to outer suburban commuters – and, ultimately, at the expense of public transport patronage.
- The track configuration at *junctions and terminal stations* directly influences the capacity of the network and the number of pathways that can be provided. Trains need to be separated at points of conflicting movements to ensure safe operations. Melbourne's rail network has many such points of conflict, with lines converging as they approach the city centre near stations such as Footscray, North Melbourne, South Yarra, Caulfield and Clifton Hill. The network plan in Figure 37 shows how every junction and conflict point reduces the capacity of the lines joining at that point.

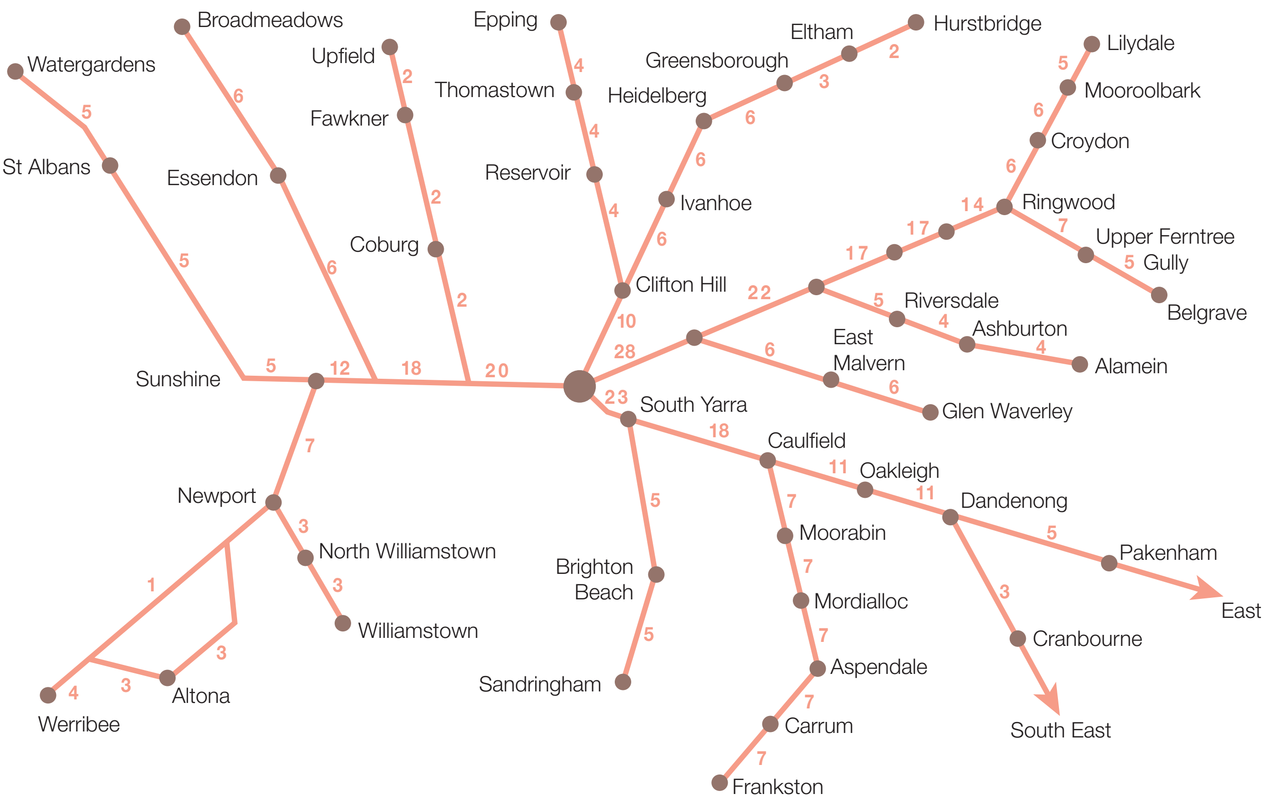
  For example, in the afternoon peak hour on the Werribee line, four trains run to Werribee. The 20 train per hour limit between the city and North Melbourne means that Werribee services cannot be increased without reducing services on the Williamstown, Watergardens, Broadmeadows or Upfield lines.

  Similarly, the seven trains to Frankston in the evening peak period cannot be increased without an impact on Cranbourne or Pakenham services.

  While this analysis is a little simplistic (shuttle trains between conflict points and other timetable variations can squeeze more local services from the system), it demonstrates that the high number of junctions and conflict points in Melbourne makes large service increases difficult without major infrastructure works.
- *Other constraints* affecting the capacity of the system include signalling systems (with more sophisticated systems enabling smaller 'headways' between trains); power supply capability (with some substations along the network supplying only two trains, while others provide for more than five trains); train dwell times (with trains spending longer at stations as trains and platforms become more crowded); and passenger access and egress (with the controlled movement of passengers onto stations, platforms and trains a key factor in minimising delays).

7. The railway timetable is constructed on the basis that a train can run without being held unduly at stations, from origin to destination. This train run is termed a pathway. A mixture of stopping patterns for trains sharing a track reduces the number of pathways that can be provided.

Figure 37 – Number of services departing Melbourne between 5pm and 6pm, 2006



Source: Public Transport Division, DOI

3.2.5 Expanding rail capacity

Good economic management demands that the best use is made of existing assets before investing in expensive new ones.

The Study Team notes that the Victorian Government has recognised the need – and taken action – to expand the capacity of Melbourne's public transport network. The Government's 2006 *Meeting Our Transport Challenges* statement provides $2 billion for rail network and service improvements and $1.3 billion for new trains and trams.

PTD has identified two stages of system enhancement to augment capacity across the network:

Stage 1: Immediate initiatives

A program of operational changes, new infrastructure works and pricing incentives are underway or are being planned to expand peak capacity until the arrival of new generation rolling stock (commencing in 2013) and to allow maximum utilisation of this new stock when delivered. These initiatives include:

- Demand management initiatives – including free 'early bird' travel to encourage passengers to travel before the morning peak period and the 'Flex in the City initiative, where employers permit flexible work hours for employees to further encourage commuters to travel outside peak hours.
- Interim rolling stock – steps are being taken to expand the available train fleet in advance of new generation trains, including the purchase of 18 trains of the current style (to be delivered from late 2009) and associated train stabling and maintenance facilities; and the introduction by Connex of more efficient train maintenance procedures that have already released an extra 9 trains for daily service and are expected to release a further 4 trains by the end of 2008.
- Simplified operating patterns – including aiming to have no more than two stopping patterns on the one track; simplified timetables supported by depot and maintenance facilities that will allow direct running into and out of service without complicated positional runs; exploration of the potential to run more trains direct to and from Flinders Street rather than through the City Loop; and the upgrading of Laverton Station (to allow more services to run on the Werribee line).

- Separation of metropolitan and V/Line services in the south-east through the triplication of sections of the Dandenong line.
- Additional tracks – implementing the MOTC program of works that includes adding tracks to existing lines, improving platforming at terminal stations, adding new stabling and maintenance facilities and upgrading signalling.

Stage 1: Additional initiative – Sunbury electrification

As noted throughout this Chapter, the Northern Group of lines are under significant pressure from growing patronage. The Sydenham line services are the most heavily loaded on the suburban railway network, with strong growth projected into the future.

Patronage on the line has grown by 55 per cent over the past three years – the most rapid growth on the network. Peak hour services are severely overcrowded, with trains regularly carrying more than 1100 passengers. The increase in patronage has also led to a substantial decline in reliability, with peak period train services on the Sydenham line declining from 96 per cent in 2002-03 to 82 per cent in 2006-07.

Capacity on the line can be significantly improved with the electrification of the line to Sunbury.

The extension of electrified services to Sunbury would allow an additional 2,800 passengers to be carried in the morning peak period. It would relieve the chronic overcrowding on the Sydenham line and improve reliability of services. It would also provide Sunbury and Diggers Rest with a quality of service comparable to other parts of the Melbourne metropolitan area.

The EWLNA Study Team notes that this project would deliver very significant benefits to Melbourne's growing west and north-west and could be undertaken in the short to medium term.

Stage 2: New generation trains

The replacement of existing trains and the provision of new services provides an opportunity to provide more capacity commencing in 2013. With nearly one half of the existing train fleet being replaced over a period of eight to 10 years, two main options are available for the design of the new fleet:

- Double-deck trains
- Single deck trains re-configured for increased capacity.

Double deck trains offer more capacity on each train but the longer loading and unloading times (longer dwell times) reduces the numbers of trains that can be run. New single deck trains could be designed with wider doors for reduced dwell times and higher passenger capacity through different seating configurations. Either option will allow for a 25 per cent increase in effective line capacity.

The design of existing central area stations, especially in the underground loop, effectively precludes the operation of significantly longer trains. However, the Study Team notes that any new piece of standalone rail network infrastructure could be designed to allow for longer trains.

Study Team Finding

The Victorian Government should continue to make better use of the existing network to increase capacity and should commence work on the electrification of the network to Sunbury to boost services on the Sydenham line.

3.2.6 Hitting the wall – reaching rail capacity

At the completion of these Stage 1 and 2 capacity improvements, there will be sufficient capacity to operate reliable rail services for the long term on the Burnley Rail Group. With strong growth occurring to the north of Melbourne, further capacity may be needed on the Clifton Hill Group in the medium term.

However the recent and forecast growth on the Northern and Caulfield Rail Groups is expected to outstrip the available capacity much sooner. The balance between patronage growth on the Northern Group and Caulfield Group, and the capacity that can be provided through the Stage 1 and Stage 2 initiatives, is shown in Figures 38 and 39.

Capacity is depicted by the red line – the upper limit based on 1,000 people on board the train; the lower limit based on 800 people on board.

As these figures clearly show:

- With a load limit of 800 people per train, the significant spare capacity that was available in 2000 has been totally absorbed by the recent patronage growth.
- New initiatives will not keep pace with growing demand on the Northern Rail Group.
- Substantial overcrowding will be evident in 2013 and beyond on the Northern Group and 2019 and beyond on the Caulfield Group.

In effect, the optimal number of services that can be provided on these groups will not cater sufficiently for the projected growth in demand over the medium to longer term. Furthermore, network extensions into growth areas such as Melton will not be possible if additional capacity is not provided on the existing network.

As the Public Transport Division has noted, without the provision of substantial additional capacity on the Northern and Caulfield Rail Groups:

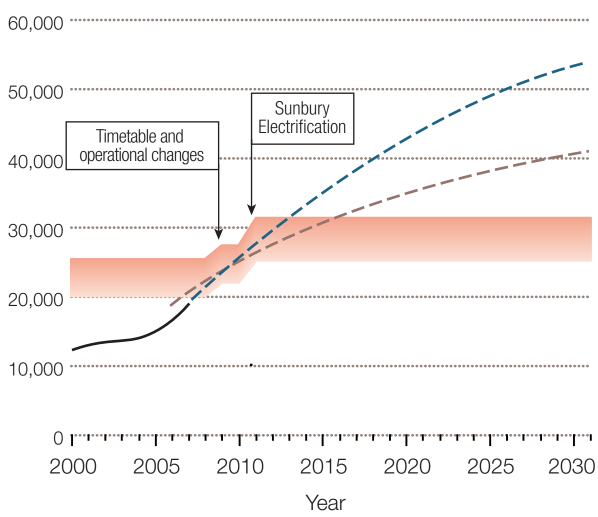
> *"…the network's reliability will diminish and its ability to provide a competitive public transport option to the growth areas of Melbourne will be significantly constrained. Furthermore … this constraint will also have a negative affect on the growth of central Melbourne."*[8]

Growth in mode share of the rail network will be significantly inhibited should capacity improvements be limited to the Stage 1 and 2 initiatives. While the completion of the MOTC initiatives and the replacement of the existing Comeng fleet will enable the network to carry around 110,000 passengers in the morning peak hour (without load breaches), demand will continue to grow well beyond that level.

Clearly, additional steps are needed to provide more capacity for the Northern and Caulfield Rail Groups as a matter of priority. The Study Team believes that this requires a 'generational step-up in rail capacity' – and that this step-up can only be achieved through major investment in substantial new network infrastructure.

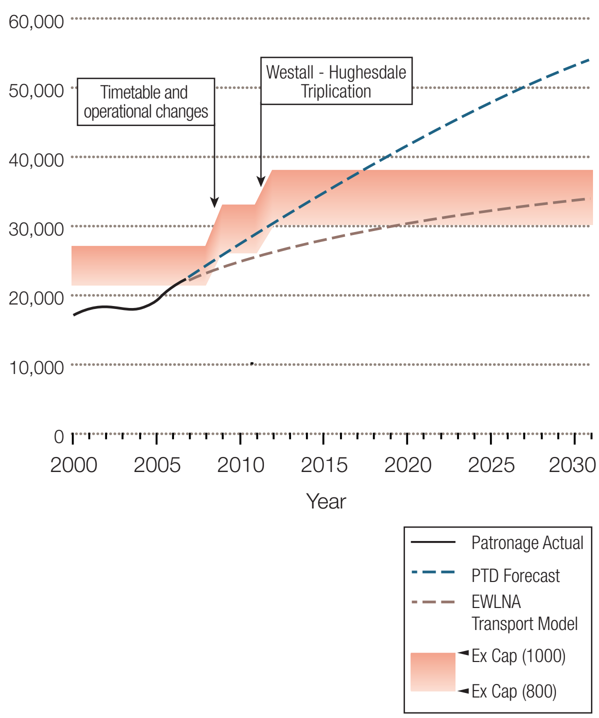
It is apparent that Melbourne's rail network has reached the point where it is experiencing the first 'growing pains' associated with moving from a suburban rail network to the 'metro style' system enjoyed by large European cities.

Figure 38 – Northern Rail Group: patronage versus capacity



Source: EWLNA

Figure 39– Caulfield Rail Group: patronage versus capacity



Source: EWLNA

8. PTD: Public Transport Division (2008), Analysis on rail capacity, Report prepared for EWLNA

While localised improvements can be made in different parts of the network, moving towards a 'metro style' system will require the 'untangling' of the inner core of the rail network in order to free up capacity across the board – because the inner core junctions, terminal stations and the loop are creating the bottlenecks that preclude timetable additions and outer network extensions to the city's growing west.

The Study Team notes that the seriousness of the looming capacity crisis on the Northern Rail Group is exacerbated by road capacity issues facing those parts of Melbourne served by this rail group. With the West Gate Bridge and the limited road crossings over the Maribyrnong River also lacking the capacity to cater for projected motor vehicle traffic growth, the failure to address rail capacity issues on the Northern Rail Group will leave current and potential rail patrons from the fast growing Geelong, Werribee, Altona and Tarneit areas with little alternative but to use their cars – further increasing congestion on roads to and from the city's west.

The Team's view is that the correct transport strategy for Melbourne is to provide excellent public transport services as the priority mode for daily journeys into the central city.

Together with the PTD, the EWLNA Study Team examined a range of track infrastructure and signalling options to deliver the 'generational improvement in rail capacity' required to address these issues. In particular, five options were explored in detail:

- Expansion of the Melbourne Underground Rail Loop
- Expanding the viaduct between Southern Cross and Flinders Street stations
- Connecting the Northern and Burnley underground loops
- Upgrading the signalling system
- Developing a new east-west rail tunnel.[9]

3.2.7 A new rail tunnel

After evaluating these options, the Team has concluded that a new east-west rail tunnel, augmented by a new Tarneit rail line, is the option that delivers the best results for Melbourne in terms of creating more metropolitan and V/Line train paths and bringing significant numbers of additional commuters into the city in the morning peak period.

In particular, a new rail tunnel offers the prospect of:

- Providing significantly improved capacity for the Northern Rail Group (an 80 per cent increase) and the Caulfield Rail Group (a 60 per cent increase), catering for forecast high population growth in areas served by these lines
- When combined with a new Tarneit line, substantially improving travel reliability for V/Line Geelong, Ballarat and Bendigo services
- Providing easy train-to-train connections for all Melbourne rail users wishing to access the new link to Parkville, St Kilda Road, Footscray, Caulfield and all stations beyond these points
- Improving service reliability through complete sectorisation of all Northern Rail Group lines and removal of conflict points and junctions
- Providing a seamless underground rail connection between Footscray and the rest of the inner city, contributing towards absorbing Footscray into the central city core and stimulating economic growth in the west
- Providing a new direct underground rail connection to the important areas of Parkville, Southbank and St Kilda Road
- Simplifying and 'untangling' a large part of the inner core network, creating the opportunity to add new services to the growing outer western and north-western suburbs in the future
- Taking two passenger lines underground near Caulfield, creating the opportunity in the future to develop a dedicated standard gauge freight line to Dandenong and Hastings
- Improving capacity for travel in the busy Melbourne University – St Kilda Road corridor, relieving pressure on tram services in Swanston Street and St Kilda Road
- Taking the first step towards a 'metro-style' system in the longer term.

The Study Team's view is these very substantial benefits can only be delivered by a new rail tunnel and that Melbourne should take this 'once in a generation' opportunity to significantly improve the rail network and encourage an even greater uptake in public transport within the city.

9. A detailed evaluation of these options is contained in the PTD report prepared for the EWLNA.

Tarneit Link

The Study Team's view is that, in order to extract the full capacity benefits from the new tunnel, it will be necessary to being forward construction of the third and fourth tracks from Footscray to Sunshine (already committed to in Meeting Our Transport Challenges) to enable the construction of a new rail link from West Werribee to Sunshine (the Tarneit link)

The Tarneit link would deliver substantial benefits, including delivering a major boost in capacity on the Werribee line, providing residents in the growth areas of Tarneit and Derrimut with a high standard rail link and improving the number and reliability of services on the Geelong, Ballarat and Bendigo lines.

Flow-on impacts

The development of a 'new generation' rail tunnel is designed to increase capacity in order to run more rail services to Melbourne's west and south-east. Additional rail services in the future will require more rolling stock and will involve more rail traffic interfacing with the road network at level crossings. Such flow-on impacts are recognised by the Study Team, but have not been explored in detail on the basis that these impacts will be common to all service expansions.

Study Team Findings

Across the city, the demand for train travel has grown by more than 30 per cent over the past three years and shows no signs of slowing.

This growth is putting the rail network under considerable pressure, with the Northern and Caulfield Rail Groups likely to 'hit the wall' and outstrip available capacity within the next decade.

To move more people and encourage even greater public transport patronage, the capacity of Melbourne's rail network must be expanded. To achieve the required capacity – and to provide a foundation for further extensions in the passenger rail network – major new investment is needed to deliver a 'generational improvement' to the city's rail network.

Without major investment in capacity, the Victorian Government's 20/2020 target cannot be met.

Melbourne must take the bold first step towards a modern rail 'metro' by building a new cross-city rail tunnel. This tunnel will not only expand capacity, it will also deliver very substantial economic, social and environmental benefits for Melbourne.

What other cities are doing

Several cities have recognised the importance of boosting public transport and are making major investments in their rail networks.

London (UK) – London's Crossrail project is a major new cross town railway link that will connect central London with Heathrow and commuter areas east and west of the city. The line will run through twin tunnels under the centre of London, passing over and under existing sections of the underground railway, as well as passing under the Thames River. The project will cost around £16 billion and aims to provide 40 per cent of the extra rail capacity that London will need over the coming decade.

Beijing (China) – Beijing's planning authorities have recently given permission for six new subway lines, with work scheduled to begin in late 2008. The six new lines have a total length of 152 km.

Shanghai (China) – The Shanghai metro is one of the youngest in the world and among the most rapidly expanding. The first line opened in 1995 as a north-south axis from the Central Station to the southern suburbs; by the end of 2007, the network had reached a total length of 227 km, with 161 stations and 8 lines.

Madrid (Spain) – In 2007, the Madrid Metro became the second largest metro network in Europe after London (415 km). In 2006, the total length was 227 km with 236 stations (counted separately for each line), but with the completion of a major four-year expansion programme in spring of 2007 and another short extension, the total length of the network is now 284 km.

Buenos Aires (Argentina) – is one of South America's biggest cities with 3 million inhabitants (and 12 million in the larger metropolitan area). For a city of this size, the metro rail network is small, although it is by far the oldest subway in South America. After losing many passengers during the 1980s, the Subte was privatised and is now operated by Metrovías, which immediately started refurbishing stations and buying new rolling stock to replace older trains, some of which have been running since the Subte opened. The total network is now around 46.8 km in length and totally underground.

3.3 Buses and trams – also growing strongly

Alongside strong growth in train travel, Melbourne's buses and trams are also enjoying significant increases in patronage.

3.3.1 Expanding bus services

Patronage across the bus network grew strongly over the past year (increasing by 7.4 per cent) – driven in part by the development of SmartBus routes and the first service extensions introduced under the Victorian Government's 2006 *Meeting Our Transport Challenges* statement.[10]

Bus patronage has been stable or has grown only slowly over the last 25 years due to the historic affordability of private car travel, the change in commuting patterns and changing demographics. The recent recovery in patronage has not been as strong as for rail – this may be the result of the relative low speed of buses (due to sharing road space with other vehicles), which means they generally do not provide a fast commuter trip option.

In its submission to the EWLNA, Metlink points out that this recent growth in patronage has led to overcrowding on a number of peak-hour services, with some commuters unable to board full buses. Metlink notes that instances of overcrowding along the east-west corridor include Eastern Freeway services, services along the Sunshine to Footscray corridor, and services from Footscray to East Melbourne.[11]

In areas relevant to the EWLNA, a number of bus routes with an east-west orientation operate in the inner northern areas to complement the tram and train network. Metlink states that several of these routes suffer overcrowding and/or are subject to high levels of congestion.

The Study Team notes that the major expansion of the SmartBus network and the extension of local services being undertaken as part of *Meeting Our Transport Challenges* will significantly improve cross city and localised public transport options. Evidence to date suggests that these service extensions have been well-received by Melburnians and that strong patronage growth will continue as services expand.

The Team also notes that – unlike rail – demand for specific services can be managed relatively easily, with services added or extended as required. While expressing the view that there needs to be a particular focus on extending bus services in Melbourne's growing west, the Team has made a general recommendation in relation to the importance of priority and bus-only lanes and specific recommendations in relation to new bus services for the Doncaster region (see Chapter 7).

10. SKM Maunsell/Evans and Peck (2008a)
11. Metlink submission to the EWLNA (2007)

3.3.2 Steady growth on trams

Melbourne's tram network is a highly valuable piece of the city's infrastructure. With a number of European cities now looking to rebuild tram networks previously closed down (and finding it a very costly exercise), Melbourne's tram network should be acknowledged as a great asset for the city and one that would be extremely difficult to replace.

According to Metlink, Melbourne's trams carried 150 million passengers in 2006-07 (the highest level for many years) and have been recording steady growth in patronage at an average of 2.9 per cent each year.[12] However, in the 12 months to September 2007, patronage growth is reported to have climbed to 5.3 per cent – an unprecedented level.[13]

Similar to bus and train patronage, tram patronage declined from the 1950s to the 1970s, reflecting increasing private car ownership and the convenience and speed advantage of cars. Patronage began picking up in the 1980s as congestion, fuel costs and parking costs began to increase. Demographic changes have also played a part, with Melbourne's inner suburbs becoming more gentrified and the tram service being a highly accessible form of transport for the increasingly dense inner city.

Overcrowding on trams regularly occurs along routes connecting with Bridge Road, St Kilda Junction and Lygon Street and on the various routes that intersect with Alexandra Parade. Yarra Trams has responded by reallocating large trams to resolve these issues. However, the limited number of large trams available across the fleet means that this strategy has now reached a limit.

The Victorian Government has acknowledged this and recently announced that it will lease five new high capacity, low-floor trams to meet patronage growth (until the next delivery of new trams occurs in 2010-11).[14]

The steady increase in tram patronage has occurred alongside the increase in traffic congestion in the inner city. This congestion will continue to affect the reliability, regularity and speed of tram services. The fact that tram patronage continues to grow in the inner city despite these problems may indicate a latent demand for tram use, and result in stronger growth in tram patronage once these issues are resolved.

12. MetLink submission to the EWLNA (2007)
13. Minister for Public Transport, 'Five more trams to be added to metropolitan system', Media Release, 7 February 2008, accessed at Victorian Government media site: www.dpc.vic.gov.au/pressrel
14. Ibid

Other than the St Kilda Road route, more trams can be run on existing tracks, provided the network is freed up from car congestion through greater priority. Compared to other cities, Melbourne runs fewer trams on the available network. This means that there is some room to meet future patronage increases.

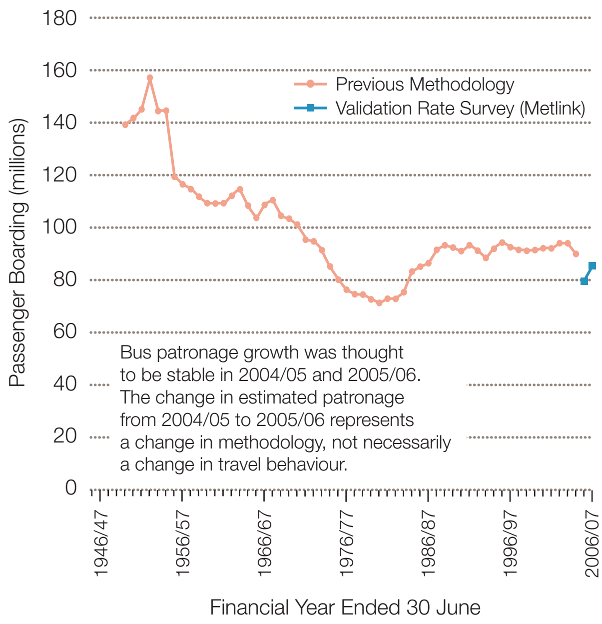
The Study Team notes that its recommendation for new rail infrastructure will provide a travel alternative for many people using the St Kilda Road tram services, relieving pressure on this busy route.

Busiest tram route in the world?

St Kilda Road and Swanston Street may be the busiest tram route in the world with:

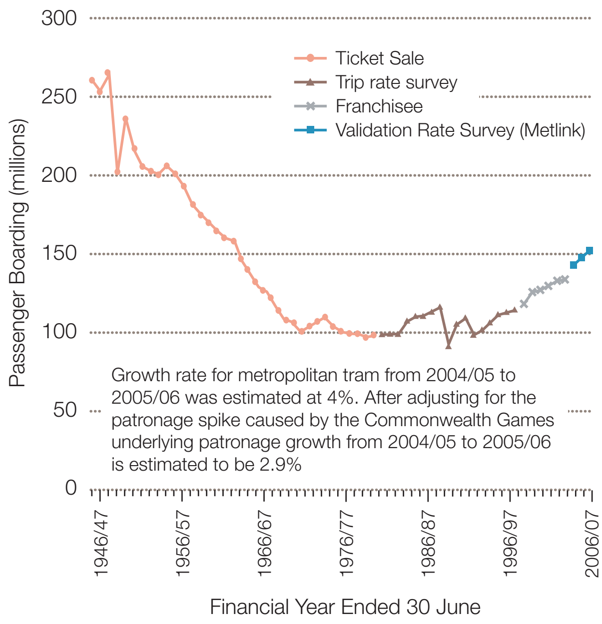
- A service every one minute (each way)
- Daily patronage (at Domain interchange) of 40,000 passengers on 1,400 trams
- Around 75 per cent of all motorised passengers travelling on trams along St Kilda Road (25 per cent are in cars and taxis)
- Trams representing 8 to 9 per cent of all vehicles on St Kilda Road
- Federation Square tram stop handling more people that any rail station except Flinders Street.

Figure 40 – Estimated metropolitan bus patronage, 1945-6 to 2006-07 (excluding Commonwealth Games)



Source: Public Transport Division (DOI)

Figure 41 – Estimated metropolitan tram patronage, 1945-46 to 2006-07 (excluding Commonwealth Games)



Source: Public Transport Division (DOI)

3.3.3 Priority issues

The more efficient allocation of road space (in favour of mass transit and particularly during peak periods) is important to improving public transport patronage and reducing car use. With successful tram and bus services dependent upon priority in the inner city – and with congestion increasing in these areas – establishing more priority measures for trams and buses, and ensuring the consistent and effective enforcement of these measures, is critical to the city's transport future.

Buses

Bus services operate entirely within existing road space and compete with other users for this space. While there has been some progress in providing bus only lanes, these are compromised by local conditions, car parking requirements, existing legislation that allows for left turning vehicles to enter bus lanes and inadequate enforcement. For example, the T2 lane (northbound on Hoddle Street) is generally regarded as a failure, with buses frequently stranded in general traffic.

Bus priority options are being developed for the Doncaster Area Rapid Transit (DART) project (see Chapter 7), bus only lanes along freeways and toll roads are being considered and Lonsdale Street in the CBD has peak hour bus lanes. However, the Study Team believes that more can be done (in conjunction with local councils) to improve and enforce these priority options across the city.

Trams

As already noted, most of Melbourne's tram network shares road space with other vehicles. One consequence of this road-sharing is declining tram speeds due to general traffic congestion.

The Victorian Government's Think Tram program is intended to protect trams from the impact of increasing traffic congestion to enable them to operate more effectively and to ensure that growth in tram travel is not stifled.

To achieve greater tram priority, the Victorian Government and relevant agencies face some bold and difficult decisions regarding road space allocation between private vehicles and trams.

As Figure 42 illustrates, the Melbourne tram network runs fewer trams per section of track when compared to other tram services during peak hours. With successful tram and bus services dependent upon priority in the inner city – and with congestion increasing in these areas – establishing more priority measures for trams, and ensuring the consistent and effective enforcement of these measures, is critical to improving public transport patronage.

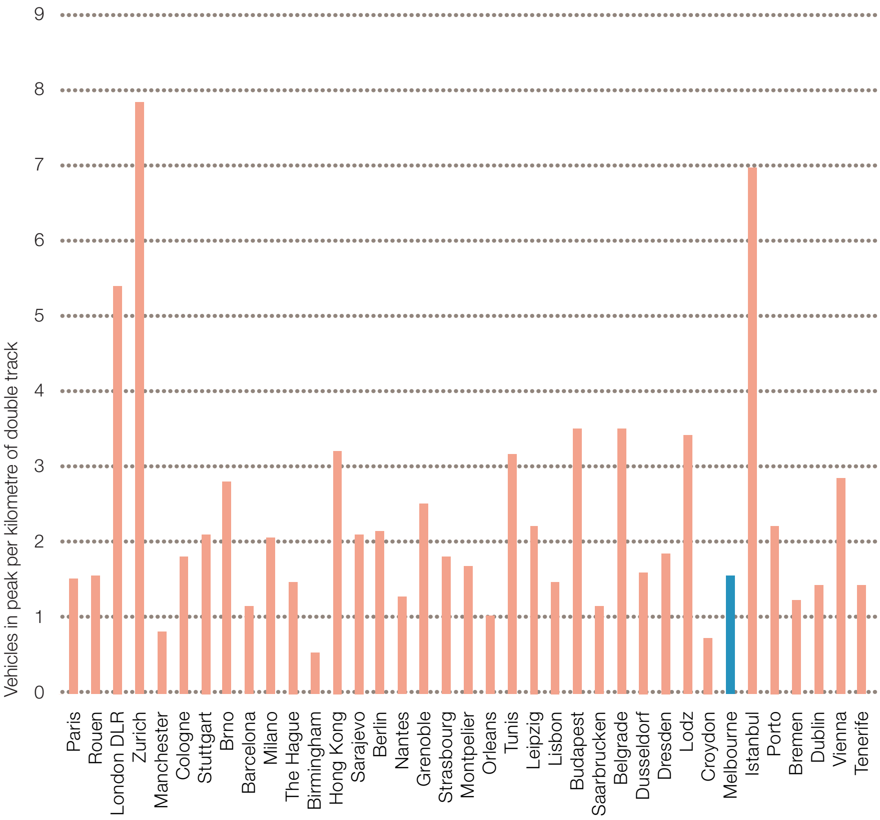
The only major east-west routes in the west are along Mount Alexander Road (routes 55 and 59) and Racecourse Road (route 57). There will be some traffic relief along these roads associated with adopting the EWLNA road recommendations, which will create the opportunity to improve tram running times along these east-west routes. However, it is important to note that this will not be achieved without an impact upon other road users.

Think Tram

The Think Tram program includes:

- Platform stops (in the CBD) to improve dwell times, amenity and access for people with disabilities
- Tram separation (curbing) and defined tram lanes – 20 km installed
- Intersection reprogramming, including 'T lights' and right hand turn phases
- Improved signage on tram lanes
- Introduction of some new peak period tram lanes
- The 'obey the yellow' campaign, which aims to educate motorists about the function of tram lanes.

Figure 42 – City comparisons: density of operation – vehicles in peak per kilometre of double track



Source: UITP International Light Rail Committee (2007), Working Group for Light Rail Statistics Report

3.4 Park & Ride facilities

Park & Ride facilities effectively expand the reach and accessibility of the rail network, and also help to transfer parking demand from the central city to suburban locations.

Park & Ride facilities are critical to improving public transport patronage, especially along growth corridors. A recent NRMA audit of Park & Ride facilities in Sydney found that more than 40 per cent of motorists who currently drive all the way to work would prefer to park at a station and commute if there were sufficient car parking spaces available.[15]

While this percentage is unlikely to be as high in Melbourne, it does suggest that improved Park & Ride facilities could have a significant impact on improving train patronage and reducing traffic congestion. As noted in Chapter 2.2.2, evidence from the 2006 Census of a decline in Melbourne in driving the car to the station and catching the train to work may also be due to inadequate parking facilities at railway stations.

The Victorian Government's 2006 *Meeting Our Transport Challenges* plan allocated $90 million towards additional Park & Ride spaces across Melbourne – with the aim of providing an additional 5,000 car spaces over the next 10 years. Since MOTC was announced, Park & Ride facilities have been upgraded at a number of stations, including Laverton, Beaconsfield and Cranbourne.

However, as MOTC noted, many current facilities are at or near capacity – reflecting the popularity of the program, but also raising issues about how best to provide for growing demand in the future.

A survey conducted by the Public Transport Division (DOI) in October 2006 identified 30,000 car parking spaces at metropolitan stations, with 40,000 commuter cars parked in, or close to, these facilities and stations.[16] With the abolition of Zone 3 fares, the PTD estimates that the demand for car parking at former Zone 3 stations increased by 15 to 25 per cent within a year. Much of this increase in parking is spilling out into adjacent shopping centres and residential streets.[17]

The forecast strong growth in train travel (see Chapter 3.2), suggests that the demand for Park & Ride facilities is likely to increase considerably. While noting the Victorian Government's significant efforts in this area, the Study Team believes that an even greater concerted effort must be made to ensure that Park & Ride facilities keep pace with rail patronage.

Achieving a consistent flow of funds to continually expand Park & Ride facilities has proven difficult given the many competing demands for public transport investment. The Team believes that a dedicated fund should be established to identify sites, purchase land and construct additional Park & Ride facilities, with priority given to providing more car spaces at stations in the city's growing west and north-west, and along the Doncaster corridor.

15. Besser, Linton, 'Lack of parking puts train users on road', *The Sydney Morning Herald* (25 February 2008)

16. Information provided by the Public Transport Division (DOI)
17. Information provided by the Public Transport Division (DOI)

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

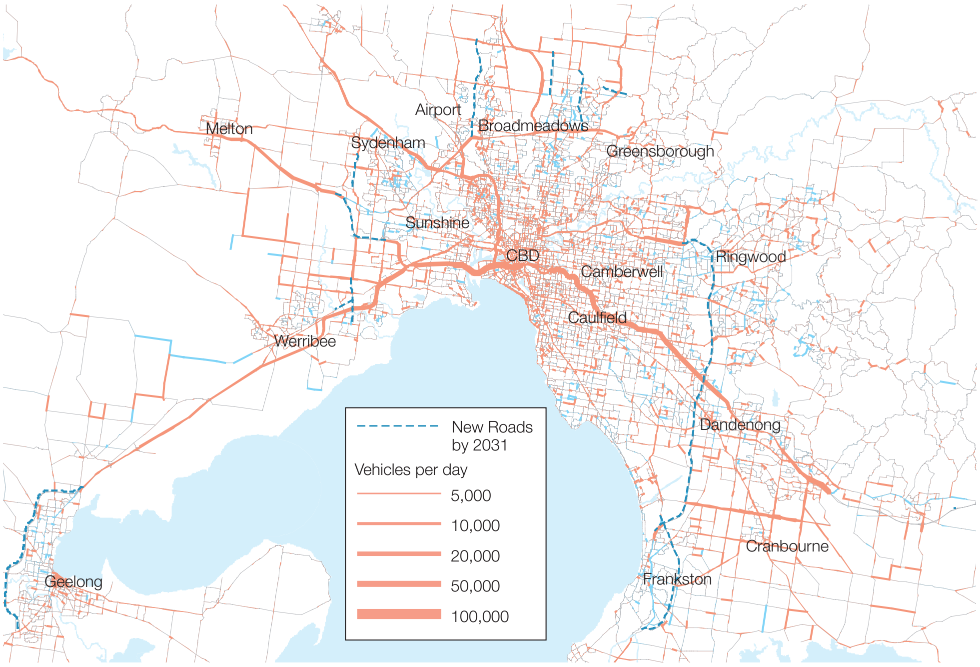
The growing demand for travel means much higher traffic volumes on the city's roads. As discussed in Chapter 2, even with strong increases in public transport, Melbourne faces the daunting task of managing at least an additional 3 million car trips per day by 2031.

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.

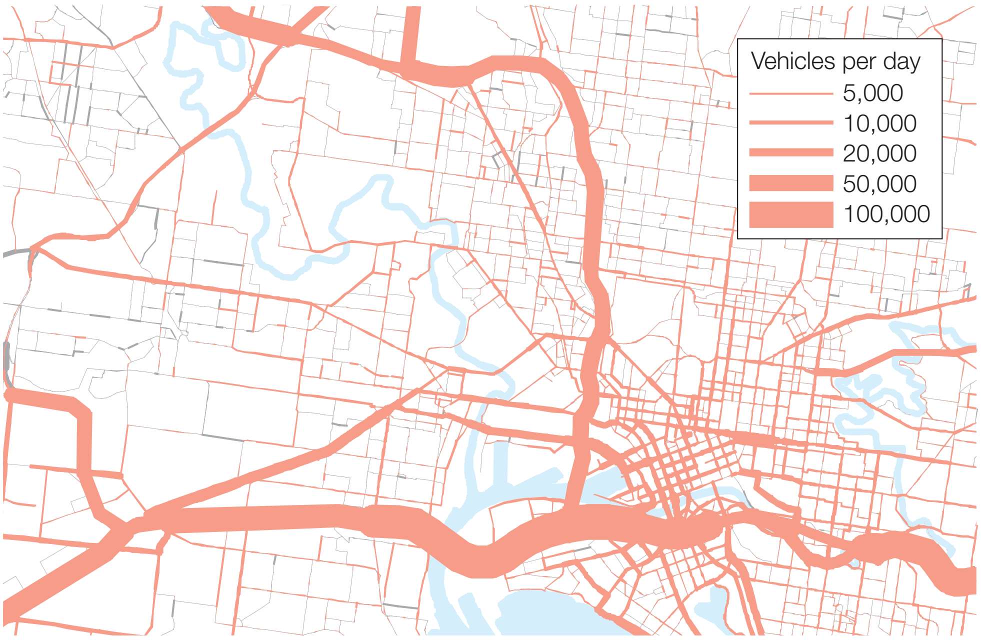
These figures – combined with analysis by the EWLNA – show that many roads that are currently at or approaching capacity will become more and more congested over the next two decades.

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



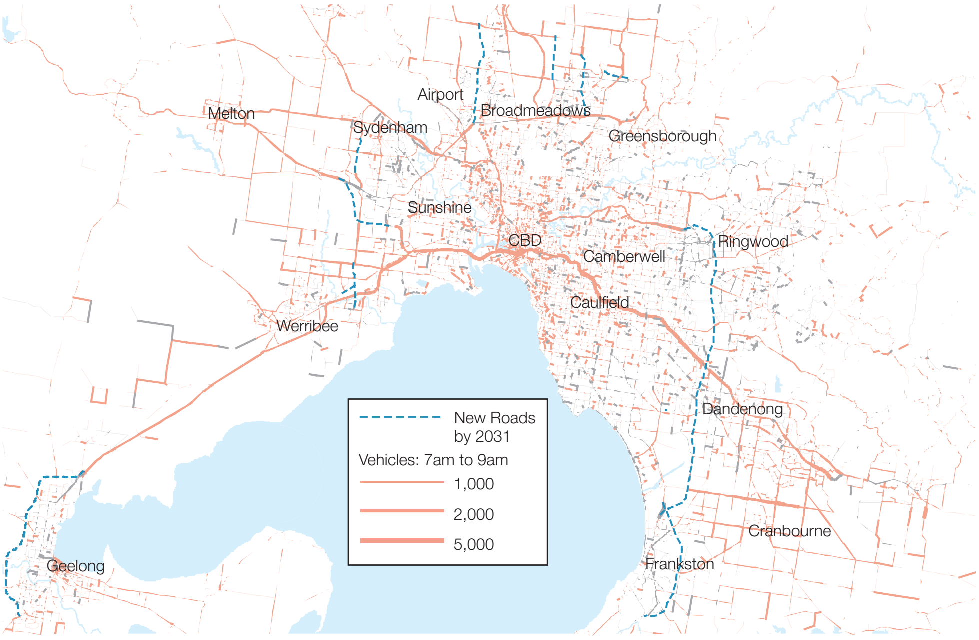
Source: EWLNA (Veitch Lister)

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



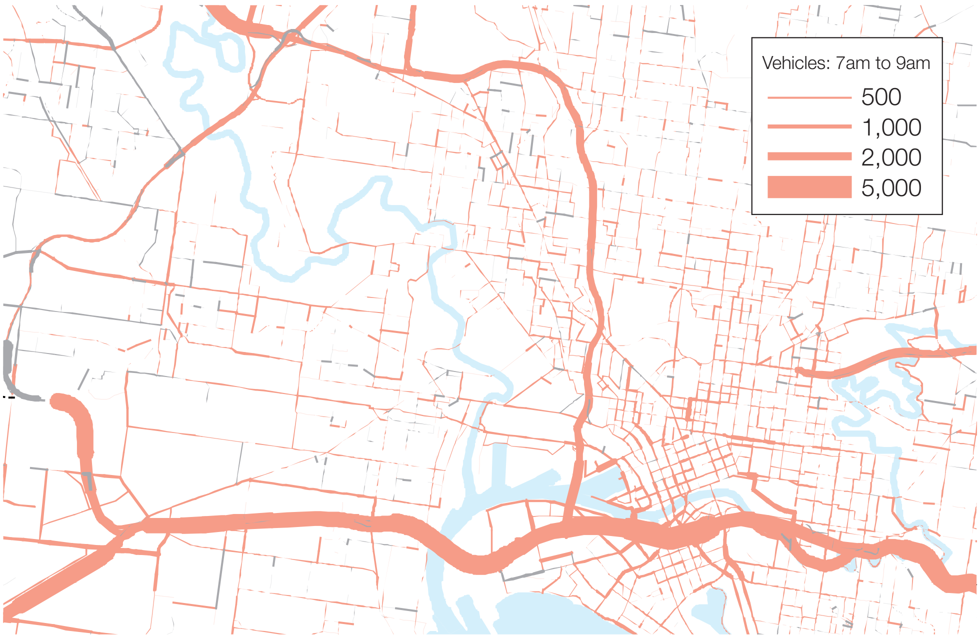
Source: EWLNA (Veitch Lister)

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.

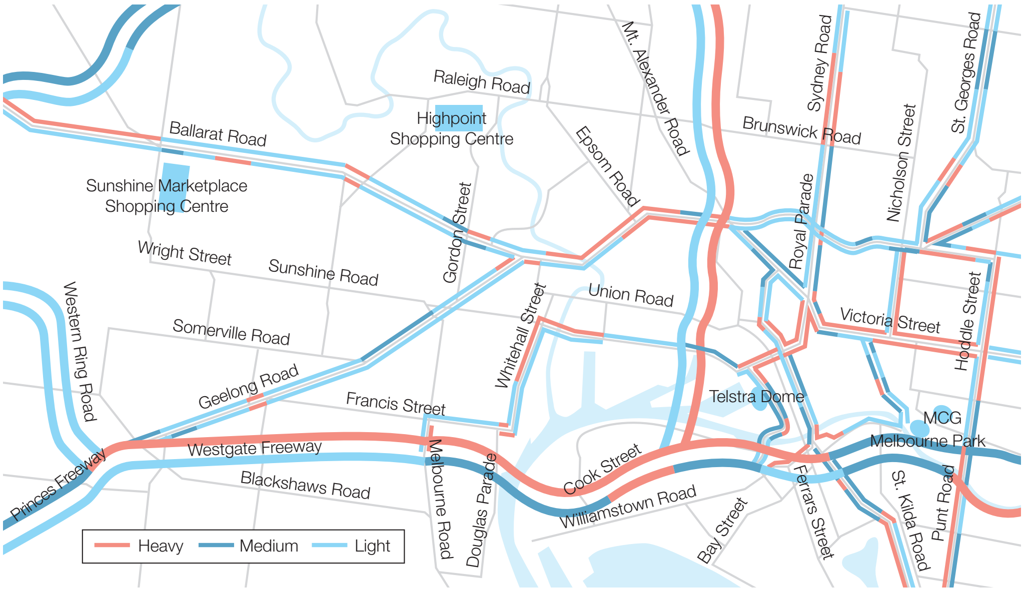
Figure 49 and 49b show the main locations of current morning peak congestion within the EWLNA Study Area and metropolitan wide. Roads such as the Tullamarine and West Gate Freeways will experience increasing levels of congestion as traffic volumes increase.

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



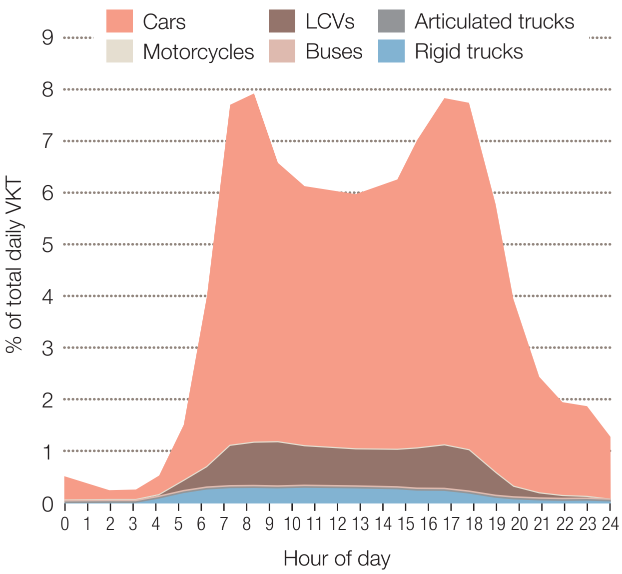
Source: VicRoads

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).

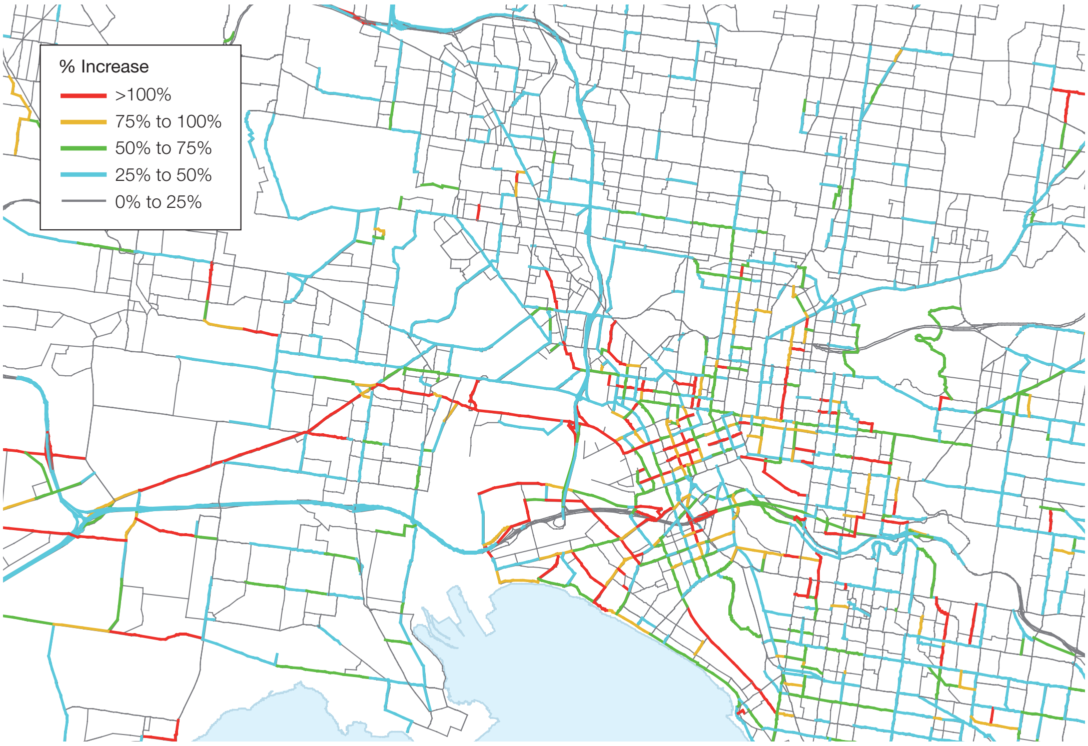
In particular, this modelling shows a significant increase in off peak traffic along the Geelong Road/ Buckley Street/Footscray Road route, as well as a general increase in east-west travel to the north of the central city. This increase is caused in part by spillover from a congested West Gate Freeway.

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.

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

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.

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.

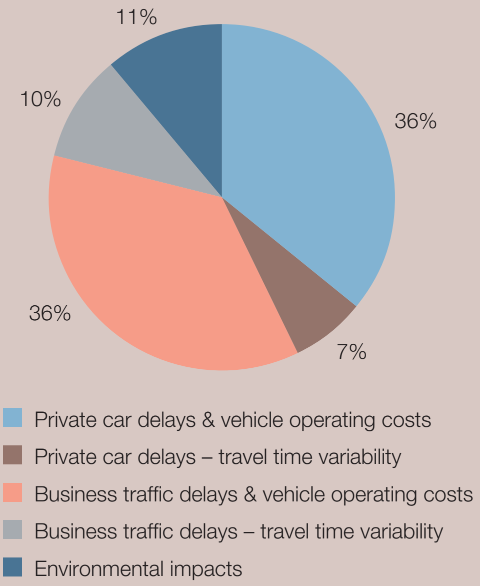
Over the next two decades, Melbourne is expected to experience significant increases in the costs of congestion. These costs include delays, unreliable trip times, higher vehicle operating expenses, higher business costs, increased air pollution, and noise and amenity impacts.

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).

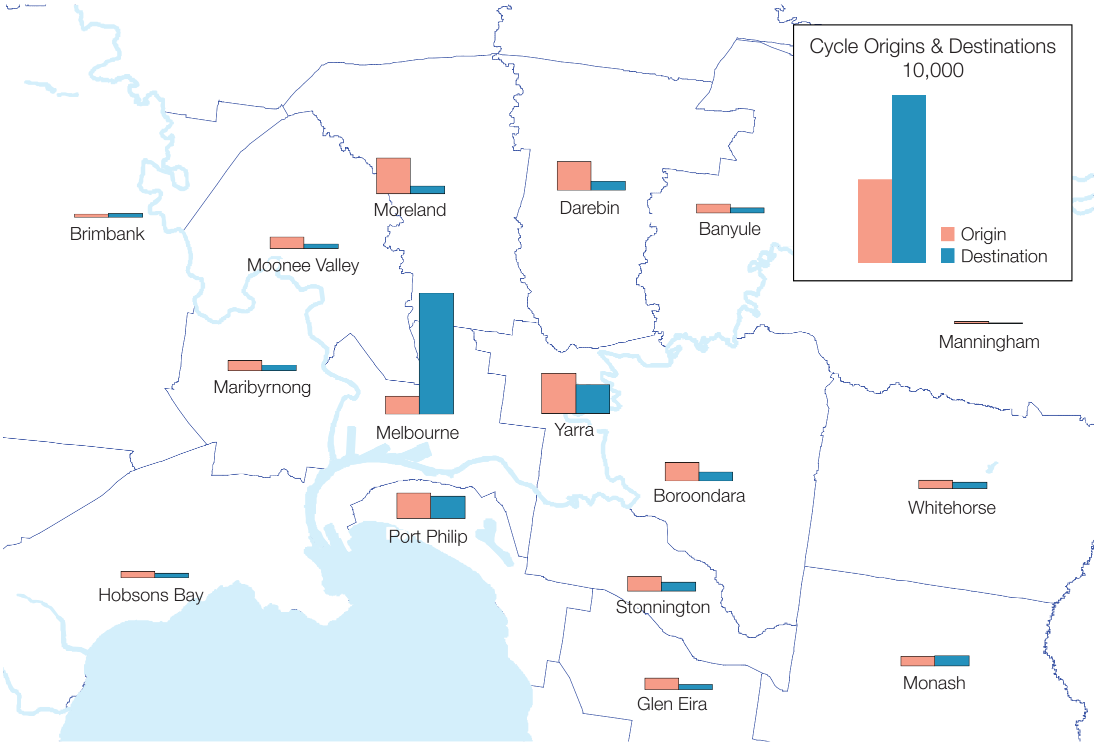
A Newspoll survey conducted for Bicycle Victoria in 2004 found that the vast majority of cyclists in Melbourne used their bikes for recreational reasons: fun/leisure (86 per cent), health/fitness (75 per cent) and sport/training (13 per cent). Transportation was given by 24 per cent of those surveyed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

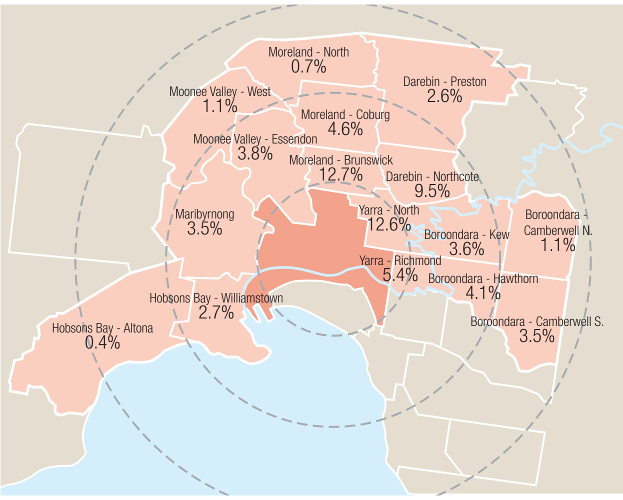
- Footscray Road (a separated path) – up 37 per cent
- Canning Street, Carlton (a street that restricts through car traffic) – up 35 per cent
- Capital City Trail / Yarra River (a separated path) – up 33 per cent
- St Kilda Road – bicycles represent 22 per cent of morning peak traffic.[20]

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]

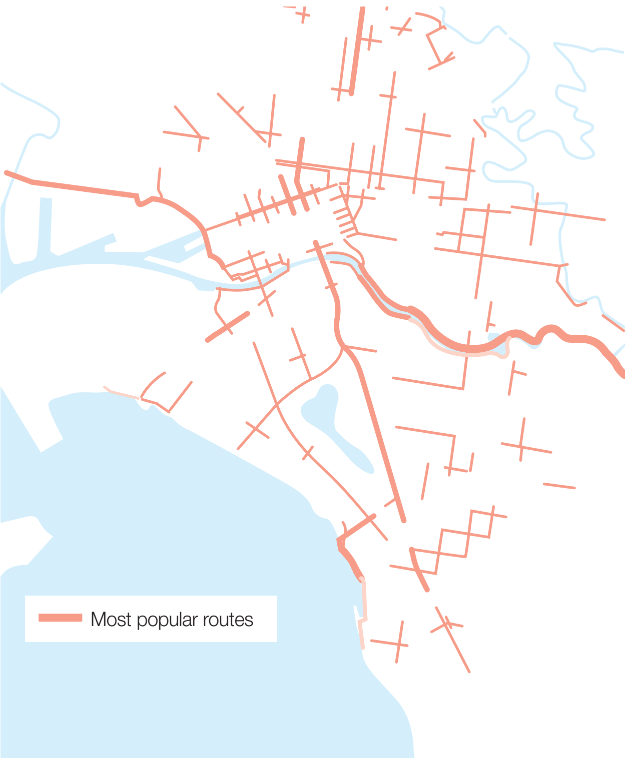
19. DOI (2008)
20. City of Melbourne (2007), *Melbourne Bicycle Account – Cycling Census 2007*, City of Melbourne
21. VicRoads (2004), *Cycling to work in Melbourne 1976 to 2001*, State of Victoria, Melbourne
22. Bicycle Victoria – *Super Tuesday 2008* count

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.

chapter 5

5. east-west road travel

As discussed in Chapter 3, the growing demand for suburban passenger rail travel in Melbourne is placing the rail network under considerable strain, with the dramatic growth in demand on the Northern Rail Group lines likely to exceed the capacity of the system within a decade. The Study Team has recognised the urgency of responding to the increasing demand for rail travel in its recommendations, supporting the principle of encouraging even greater mode shift to public transport for commuters.

However, even with a significant shift to rail for peak period travel, roads will continue to be a vital and major component of a balanced metropolitan transport network. Importantly, in terms of Melbourne's public transport, trams and buses also rely upon an efficient road network.

The key east-west roads in the EWLNA Study Area are currently at capacity in the morning peak and significant ongoing traffic growth will put the road network under further pressure. While Chapters 2 and 4 examined demand on the transport system generally, this chapter focuses more specifically on east-west road travel in the Study Area.

Through modelling and analysis, the Study Team has found that:

- Transport options for travel across the city between the west and east are seriously congested.
- Notwithstanding the Monash-CityLink-West Gate freeway upgrade, within a relatively short time the extra capacity being provided on that route will be fully taken up during peak periods.
- With the exception of the Monash-CityLink-West Gate freeway, the east-west roads within the study area are disconnected and poorly suited to efficiently moving high volumes of traffic.
- Congestion on key east-west routes – and the accompanying frustration, inefficiency and cost of travel – will be significantly worse in the future unless action is taken to make some provision for traffic growth.
- Current network limitations in relation to east-west travel have a negative impact on private travel, freight transport and road-based public transport.

Modelling undertaken for the EWLNA confirms what every person travelling across Melbourne knows: that the increasing demand for travel, the growing urban freight task and the growing number of cars on Melbourne's roads are generating increasing levels of congestion on major cross city routes. While the main points of congestion can be identified relatively easily, it is useful to examine the nature of these constraints and their implications for future transport planning.[1]

5.1 The demand for cross city travel

Before focussing on the demand for cross city travel, it is relevant to reflect on the nature of travel in an urban road corridor. Travel is rarely end-to-end: instead, the traffic volumes along roads are accumulated from many shorter trips along the way.

The EWLNA has a broad Study Area, extending from the Western Ring Road to the Eastern Freeway: a distance approaching 20 kilometres. Submissions to the EWLNA suggested that any east-west road improvements would be seeking to satisfy a demand for travel from one side of the Study Area to the other – in other words, travel that extends right across the city. These submissions expressed the view that – because the demand for such travel is demonstrably low – there is no justification for considering a new road link. However, it is important to note that the Study Team did not expect to discover pent-up demand for travel between Werribee and Ringwood: such journeys will always be a minor component of general travel along the east-west route.

In general, urban freeways and major arterial roads provide very efficient, high capacity travel along a corridor. Interchanges and intersections are located at regular spacings (rarely more than a few kilometres apart and commonly less than two kilometres apart along freeways) to facilitate the entry and exit of traffic. Traffic along an urban corridor comprises a constantly changing customer load as cars, trucks, buses, vans, heavy and light commercial vehicles join and leave the main carriageway. Longer trips are less common: for example, the majority of trips along a freeway are several kilometres in length, rather than tens of kilometres.

- *On the M1* – Current traffic volumes along the M1 vary from around 130,000 to nearly 200,000 vehicles per day along the length of the corridor. Of the traffic approaching the West Gate Freeway west of the Western Ring Road, around half crosses the West Gate Bridge, but only 12 per cent proceeds to the Burnley Tunnel. A similar analysis conducted closer to the CBD confirms that of all east-bound traffic crossing the West Gate Bridge, only 25 per cent continues to the Burnley Tunnel.
- *On CityLink* – CityLink is a complex arrangement of tunnels, viaducts and surface freeways covering around 20 kilometres and linking directly to the Monash, West Gate and Tullamarine Freeways. Again, the majority of travel is along discrete sections of CityLink, rather than its entire length. For this urban tollway, the average trip is understood to be around two and a half 'sections'.

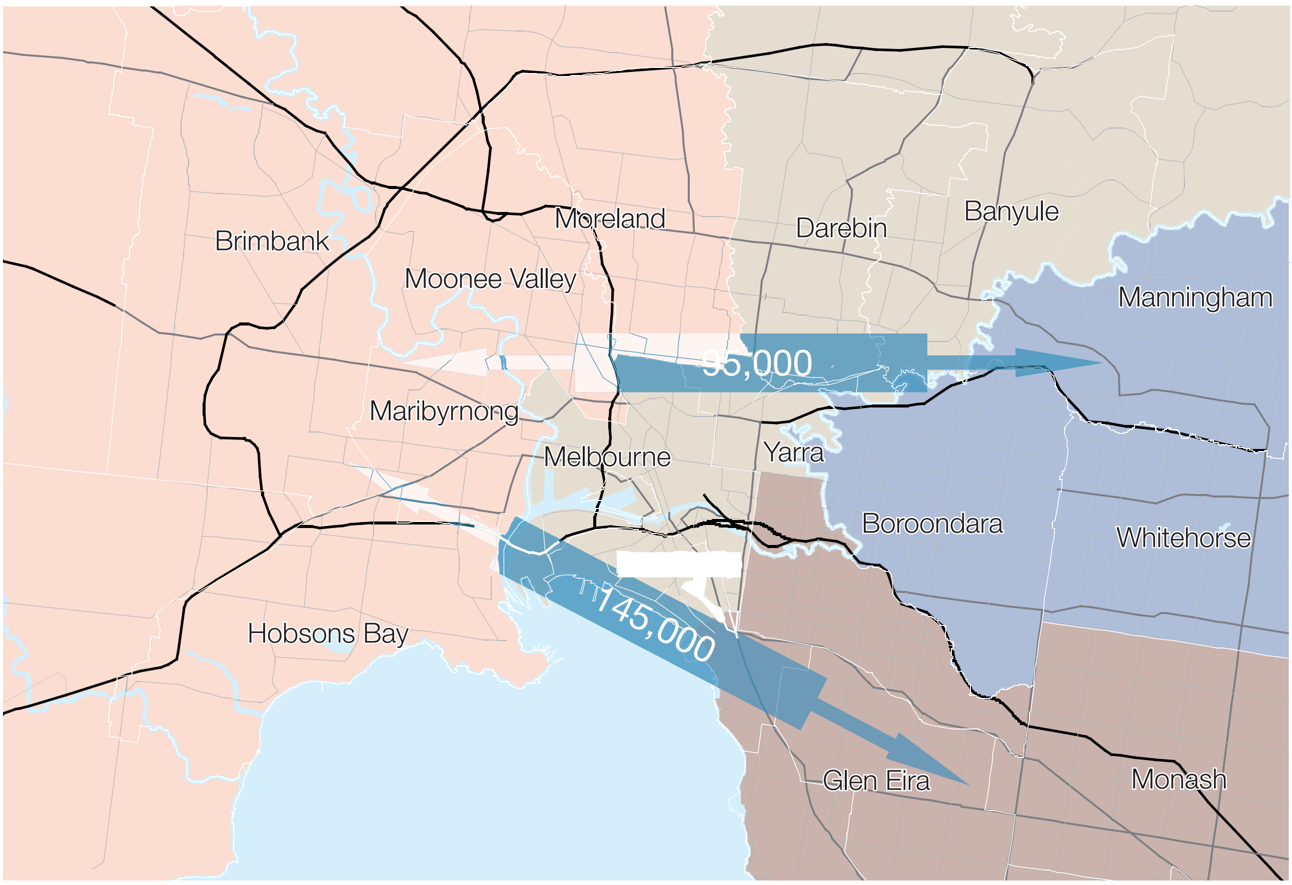
1. Further detail on this subject is provided in SKM Maunsell/Evans and Peck (2008a)

- *On EastLink* – This new road will extend nearly 40 kilometres from Donvale to Frankston and will join the Eastern Freeway at Springvale Road to the Frankston Freeway at Rutherford Road. Seventeen interchanges along the length will divide the road into travel 'sections' and allow traffic to join and leave the road. ConnectEast expects that most trips will be two or three sections long and that only around 5 per cent of vehicles will travel the full distance.

The same pattern is clear when considering cross town traffic from the west and across the north of the city, where the trip pattern is one of accumulated short trips – not long trips across the breadth of the city.

A simple illustration of one aspect of the demand for cross-city travel in Melbourne's inner and middle suburbs is shown below.

Figure 56 – Current (2006) east-west travel daily demand across Melbourne



Source: EWLNA (Veitch Lister)

This figure shows the number of trips across the Cities of Darebin, Yarra and Melbourne as a simple demonstration of this component of total east-west vehicle demand. Currently, around 95,000 vehicles make these cross city trips on a daily basis. The equivalent analysis for travel between the west and the south east of the city reveals that 145,000 trips are being made each day – in other words, there is a substantial volume of local trips being made across the north of the city, as well as to the south.

In addition to these 95,000 vehicles, there are also many vehicles making shorter trips from the eastern and western areas into the central areas (shown in cream - Figure 56) and within the blue and pink areas. These trips are also ‘cross city’ movements in the same way that much of the city-bound traffic on the Monash Freeway and the West Gate Freeway is part of the cross-city movement on that corridor. These trips include more ‘popular’ journeys – such as travel between the Tullamarine Freeway and the Eastern Freeway, and from the Western Highway to the CBD – and other, more irregular journeys, such as trips from the outer to the inner west, the inner west to inner north or inner east, and trips across the inner north. While these trips may be relatively short – for example, Footscray to Carlton, Moonee Ponds to Northcote, Richmond to Docklands – they either use the major cross city routes or divert to east-west suburban roads to avoid congestion on these routes. As modelling undertaken for the EWLNA shows, these diversionary journeys will contribute to increasing congestion on local roads, especially in the inner north. Overall, the number of daily journeys across the inner north is around 210,000 vehicles each day.

To examine cross city journeys more closely, the EWLNA undertook a screenline analysis at a number of key locations across the metropolitan area (as shown in Figure 57). This analysis counts the number of vehicles crossing all roads intersected by the screenline (on a daily or peak period basis). It provides an appreciation of the level of expected transport growth on the declared road network across each of the screenlines.

Of particular interest is the screenline that roughly follows the line of the Maribyrnong River, from the Bay to Raleigh Road. This screenline traverses the major constraints in this part of Melbourne’s transport network and is a pivotal crossing for east-west traffic.

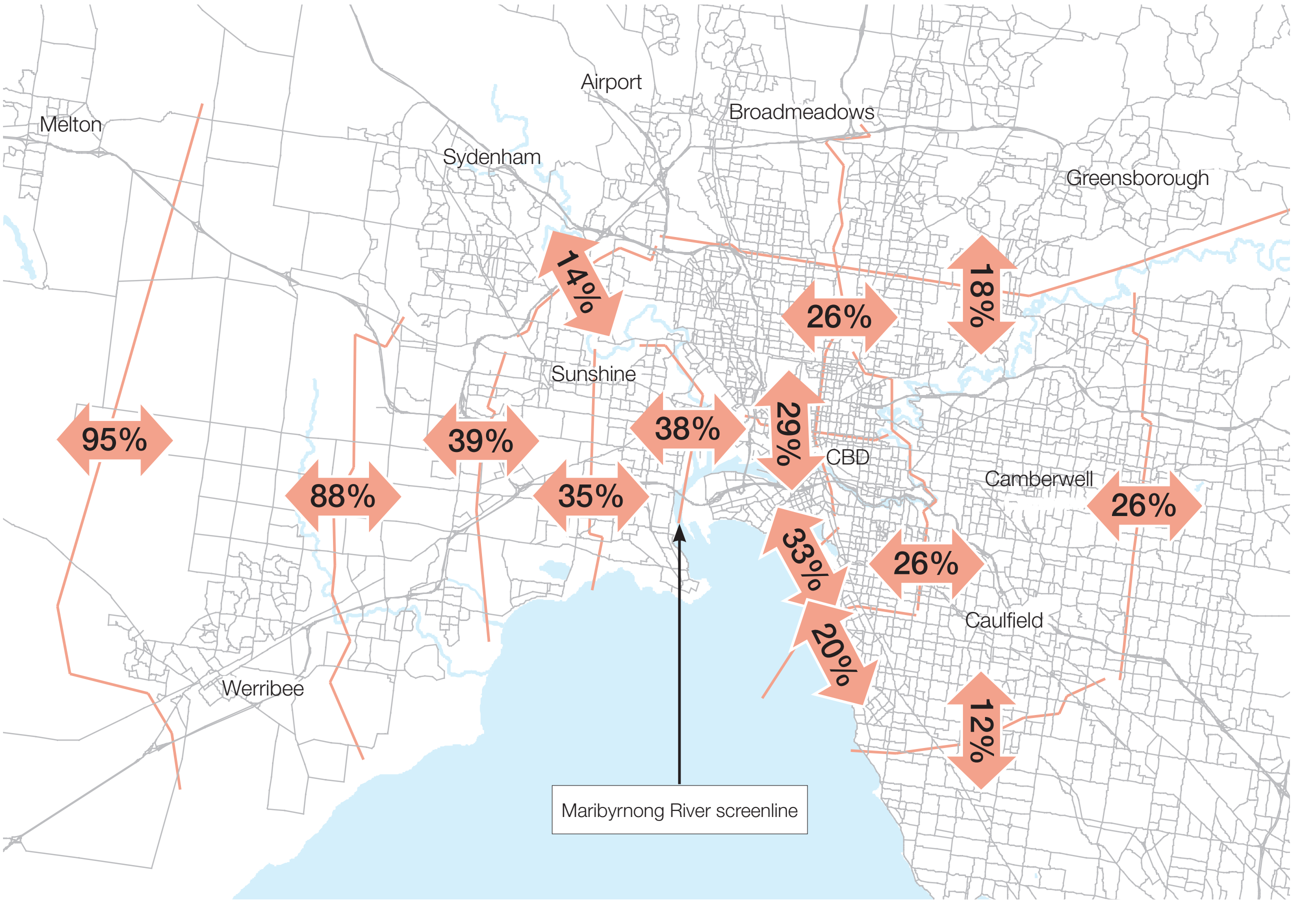
Current daily volumes across this line on an average week day are approximately 320,000 vehicles (of which 11 per cent are commercial vehicles). Modelling indicates growth in vehicles travelling across this screenline of nearly 40 per cent by 2031, with a 50 per cent increase in commercial vehicle volumes over the same period. This equates to an additional 120,000 vehicles. Most of these additional vehicles (nearly 90 per cent) will be trying to travel on the main arterial roads crossing the screenline (West Gate Freeway, Footscray Road, Dynon Road and Ballarat Road). Each weekday, around 5,000 of these extra vehicles will be trying to travel east in the morning peak period bringing the total peak traffic volume to 34,000. This is comparable to demand for an additional two freeway or three arterial road lanes heading east across the Maribyrnong River in the morning peak, and in the opposite direction for the evening peak.

Current daily public transport demand across this screenline (determined by counting the number of passengers on rail lines that are intersected by the screenline) is around 85,000 people, the majority of whom (around 95 per cent) travel on the heavy rail network. Modelling indicates growth in public transport demand over this screen-line of nearly 100 per cent by 2031 (or around 85,000 extra people travelling on public transport services in both directions throughout the day). Nearly 16,000 of these extra trips will be people travelling east in the morning peak hour (which equates to demand for at least an extra 16 trains during this period). This analysis demonstrates that the overall travel demand across this screenline will be very high. Current infrastructure for rail and road will be inadequate to the task of meeting this demand

Further to the west, the screenlines reveal an even more dramatic picture, with daily growth of around 90 per cent predicted for the roads (although from a lower base volume).

Table 12 shows the traffic allocated to the particular roads crossing the Yarra and Maribyrnong Rivers. The table shows that while the rivers are a distinct barrier to east-west travel, predicted growth is very high. The table includes the passenger numbers on the rail lines crossing the screenline to give the full sense of the overall growth in east-west travel.

Figure 57 – EWLNA road screenlines, all day growth, 2006 to 2031



Source: EWLNA (Veitch Lister)

Table 12 – 'Maribyrnong' screenline – 24 hour, 2006 and 2031

Road Name	Current Volume (2006)	Predicted Growth	Predicted Volume (2031)
Raleigh Road	34,000	21%	41,000
Farnsworth Avenue	9,000	32%	12,000
Smithfield Road	39,000	25%	47,000
Dynon Road	35,000	32%	47,000
Footscray Road	35,000	67%	58,000
West Gate Freeway	165,000	41%	235,000
Road Total	**317,000**	**38%**	**440,000**
Rail	84,000	98%	166,000
Rail Total	**84,000**	**98%**	**166,000**
People Total*	**432,700**	**50%**	**650,000**

* Assumes vehicle occupancy of 1.1 persons per vehicle

Source: EWLNA (Veitch Lister)

An analysis of the growth across the Maribyrnong River screenline shows that the total daily projected growth is more than twice the growth level during the peak period. This reflects the finite number of lanes available during the peak, with the most likely result being further peak spreading. This analysis indicates that these roads would be operating at capacity for the greater part of the day.

In any event, the Maribyrnong screenline shows a very substantial increase in travel demand in the morning peak from west to east – a demand that existing transport infrastructure will not be able to meet. This is supported by other evidence indicating that growth in cross town movements is likely to be significantly greater from west to east than in the other direction – in other words, 'west-east' travel rather than 'east-west' travel. As noted throughout this report, the main driver of this increase is the strong residential growth in the west and north-west, which is not being accompanied by corresponding growth in jobs located in the west.

Further east the picture is less dramatic, but daily growth in east west traffic of around 25 per cent by 2031 is still predicted. Traffic movements in this area are less obviously east west, with the model confirming significant movements between the east and the north-west.

One influence in this travel pattern is Melbourne Airport. In 2006-07, Melbourne Airport recorded around 22 million passenger movements and 180,000 aircraft movements, making it Australia's second busiest airport after Sydney.[2] More than 3,200 international and domestic flights arrive at and depart from the airport each week.[3]

The airport also handles 350,000 tonnes of air freight each year, with 21 dedicated freight services arriving and departing from Melbourne each week[4]. In addition, more than 11,000 people work in the Melbourne Airport precinct.[5]

All these activities generate considerable traffic to and from the airport. Analysis by the EWLNA Study Team of the origin and destination of this traffic shows that between 15 to 20 per cent would gain a benefit from an east-west link running from the end of the Eastern Freeway to CityLink. In other words, around 20 per cent of Melbourne Airport-related travel is to and from areas in Melbourne's eastern suburbs: an improved east-west connection would give these people faster, more convenient access to the airport, whether they are passengers, workers or businesses using air freight.

The EWLNA undertook an analysis of traffic on a number of selected freeways and arterial roads ('select links'), several of which are set out in the figures below. These illustrate the complexity of the origins and destinations of vehicles travelling along the links.

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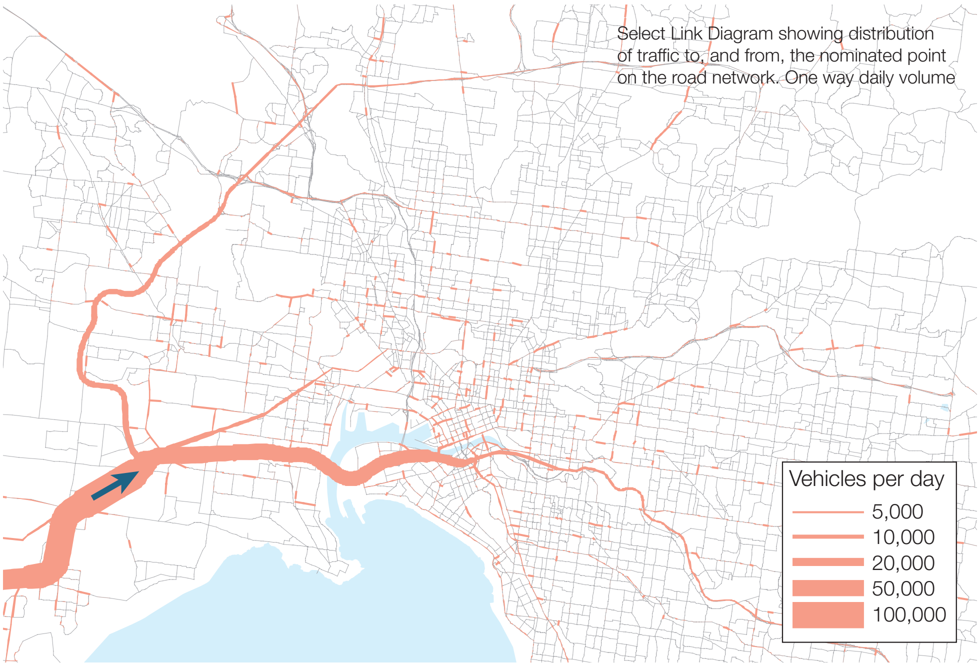
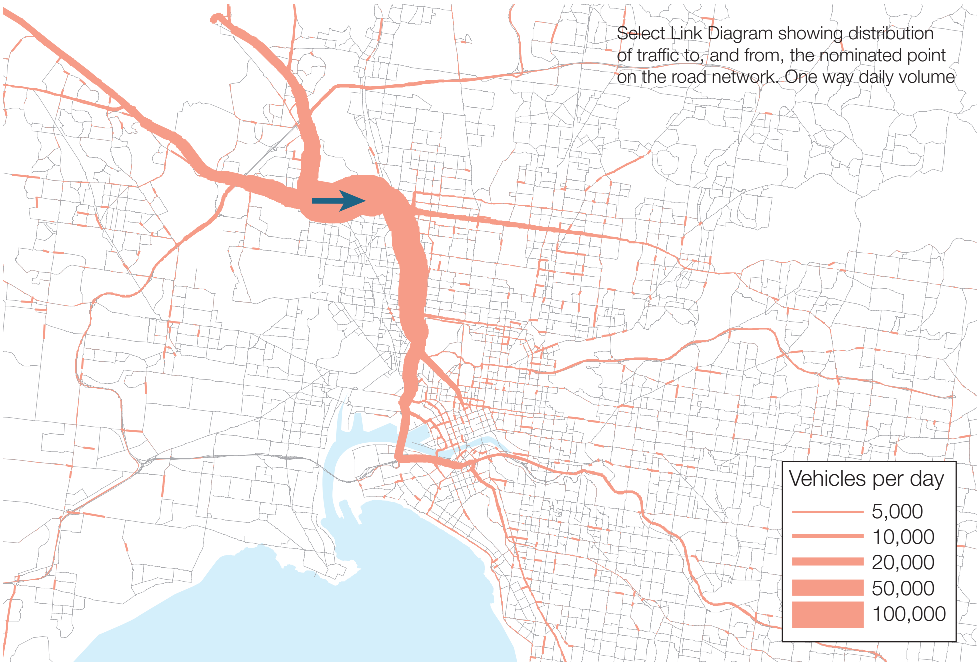
2. BITRE: Bureau of Infrastructure, Transport and Regional Economics (January 2008), Avline 11, Department of Infrastructure, Transport, Regional Development and Local Government, Commonwealth of Australia, Canberra
3. Melbourne Airport website: www.melbourneairport.com.au
4. A surprising example is the annual export of 30,000 live goats by airfreight.
5. Melbourne Airport website: www.melbourneairport.com.au

Figure 58 – Select east-west link: Princes Freeway (Geelong Road) – eastbound, west of Western Ring Road



Source: EWLNA (Veitch Lister)

Figure 59 – Select east-west link: Tullmarine Freeway – eastbound, east of Bulla Road

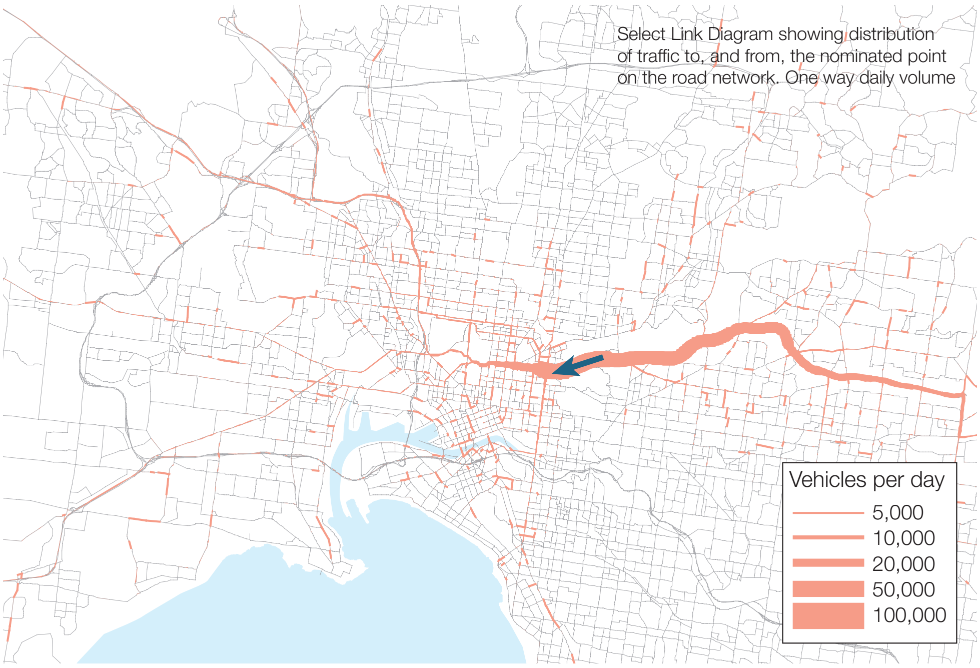


Source: EWLNA (Veitch Lister)

Figure 60 – Select east-west link: Dynon Road – eastbound at Maribyrnong River

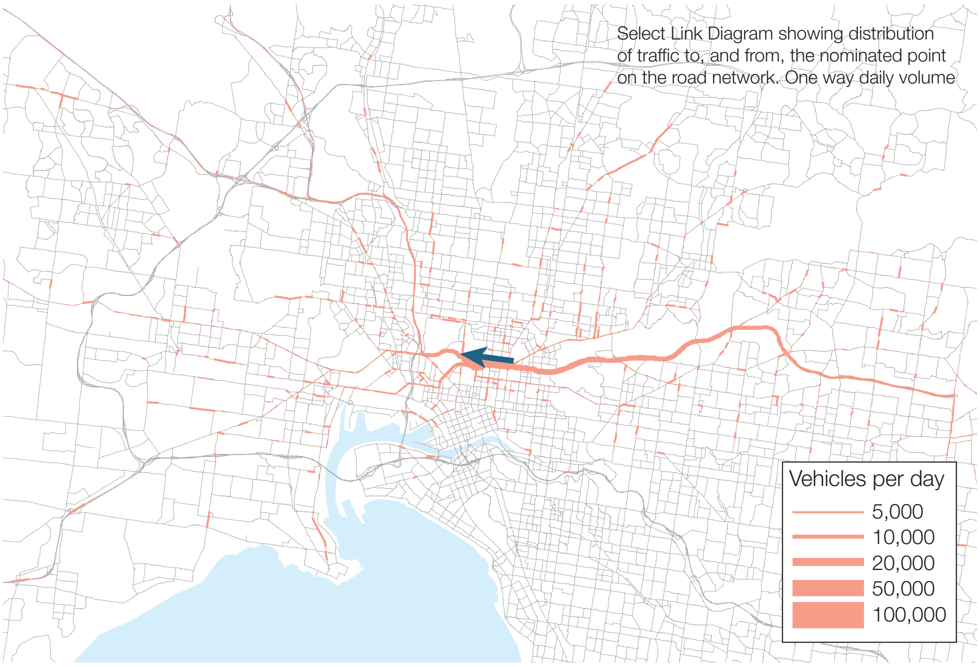
Source: EWLNA (Veitch Lister)

Figure 61 – Select east-west link: Eastern Freeway – westbound, east of Hoddle Street



Source: EWLNA (Veitch Lister)

Figure 62 – Select east-west link: Cemetery Road – westbound, east of Royal Parade



Source: EWLNA (Veitch Lister)

The select links highlight both the clear demand for east-west travel and the myriad routes that drivers traverse when navigating east-west and west-east.

For instance, routes in the Study Area such as Cemetery Road and Brunswick Road display a clear west-east and east-west travel flow, while major roads such as CityLink (Western Link) and the Eastern Freeway have very complex travel patterns dispersing across a grid of roads around the CBD, as well as showing a strong CBD bias.

The select link analysis also underlines that the demand for travel is diverse and that the traffic at any one point on the network is an accumulation of trips that start and finish in widely dispersed areas.

Much discussion on east-west travel demand focuses on the Eastern Freeway. However, the select link analysis shows that many of the 210,000 vehicles battling their way across the north of the city each day use a variety of routes. In many instances, routes designed for local traffic are being clogged by 'through' vehicles that are 'improvising' a path across the city by zig-zagging their way through the network.

In submissions and consultations, a number of groups also argued that there was considerable 'latent' demand for direct east-west connections – especially in relation to freight movements – with people currently choosing a mixture of routes to zig-zag or 'rat run' their away across the city, avoiding congested locations. The Victorian Freight and Logistics Council (VFLC) observed that:

> *"Desire lines for travel are not necessarily directly east-west. Due to poor connections and over capacity routes connecting the western and central Melbourne regions with the south-eastern suburbs, an enhanced east-west connection would provide an alternative."*[6]

This evidence – and the location of congestion points along the inner city road network – suggests strong and growing demand for trips that run across the city, although not necessarily the full distance from one side of town to the other or along direct east-west routes. The challenge for Melbourne's transport network is to accommodate these trips without an accompanying increase in congestion.

6. VFLC submission to the EWLNA (2007), p.2

Reclaiming suburban streets – traffic and the inner north

For some time, residents and community groups in Melbourne's inner northern suburbs have been expressing concerns about the impact of heavy traffic flows on neighbourhood amenity in the region.

In its submission, the North & West Melbourne Association observed that major transport routes passing through the inner suburbs "have impeded connectivity, movement and amenity within our community".[7] Similarly, the Carlton Residents Association pointed out that "excessive traffic levels have substantial negative impacts on community life and health".[8]

The City of Yarra also noted that local streets in the municipality "currently experience much higher levels of traffic than their function as local streets would suggest. The impacts of these high traffic levels are significant – as well as pollution, noise and community separation, high traffic levels have significant economic and social impacts."[9]

Amenity issues in the inner-north are largely the result of high traffic volumes (mostly cars) through these suburbs during peak periods, the congestion that results from large volumes of north-south traffic intersecting with large volumes of east-west traffic and 'rat running' through suburban streets to escape this congestion.

The current east-west road link between Flemington Road and Nicholson Street that runs across Melbourne's inner north is already at capacity during peak periods and there is little opportunity to increase capacity without major incursions into Royal Park and other properties abutting the route. The lack of alternative east-west routes across the northern CBD also compounds the concentration of traffic on the Elliot/ Macarthur/Cemetery/Princes/Alexandra Parade route.

Over time, the high traffic levels on this east-west route have led to an increase in the 'green' traffic signal time given to the route at the expense of north-south routes. In turn, this has led to increasing delays to tram and bus services operating along north-south routes such as Royal Parade and Lygon, Nicholson, Brunswick and Smith Streets. Pedestrians, cyclists and motorists using these routes are also penalised.

As well as the impact on residents, commuters and visitors to the region also experience difficulties caused by the high traffic flows through the area. These difficulties include problems with parking, the shortage of safe pedestrian connections between the University and hospital campuses, and delays in moving through or around the area by car or bus as a result of traffic congestion.

While a number of submissions spoke of the need for amenity improvements in this area, many did not see a new road link as offering benefits in this regard. The Study Team believes that this is not the case: a road project that removes large amounts of traffic from passing through this area has the potential to deliver very substantial amenity benefits, particularly if accompanied by imaginative urban planning, improvements in public transport and more walking and cycling options. The Team notes that other cities around the world are exploring the option of directing more traffic into tunnels to improve the surface environment, provide better conditions for walking and cycling, and free up new urban space for residential development.

As congestion on cross city routes grows, a new road link will also reduce the volume of traffic 'rat running' through inner suburban streets to avoid congested routes and intersections.

As noted elsewhere in this report, the 2003 NCCC draft strategy found that an east-west road tunnel would deliver significant benefits to the inner-north, including removing traffic from Royal Park, reducing traffic levels and delivering positive environmental benefits. The Scenario Appraisal conducted for the NCCC recognised that the tunnel could deliver opportunities for traffic relief and improved amenity. The appraisal noted that measures such as "lane reductions, exclusive public transport lanes and/or resetting of traffic signals to favour north-south public transport and traffic" could ensure that spare road space created by the tunnel would not be used by additionally generated or re-routed road traffic.[10]

In exploring potential new east-west road links, the Team has been particularly conscious of the need to ensure that these options also include measures that will significantly improve amenity in the inner-north – over and above removing traffic from suburban streets.

7. North & West Melbourne Association Inc submission to the EWLNA (2007), p.1
8. The Carlton Residents Association Inc submission to the EWLNA (2007), p.2
9. City of Yarra submission to the EWLNA (2007), p.26

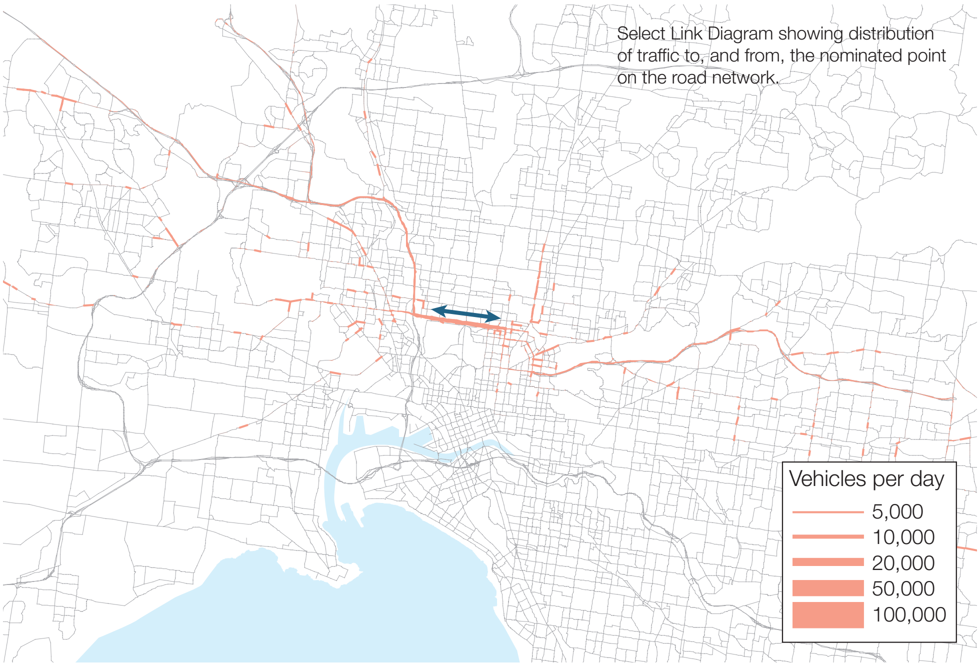
10. DOI (August 2003), NCCC Scenario Appraisal Report, p.33

5.2 The main east west routes

Melburnians use a number of routes for east-west travel across the city. These routes include the major freeways (which have been purpose-built for high volumes of traffic) along with other arterial roads, and city streets that are not suited to high traffic volumes. These routes are used for a variety of complex travel purposes: moving freight, commuting to work, many and varied local private and business trips, and road-based public transport.

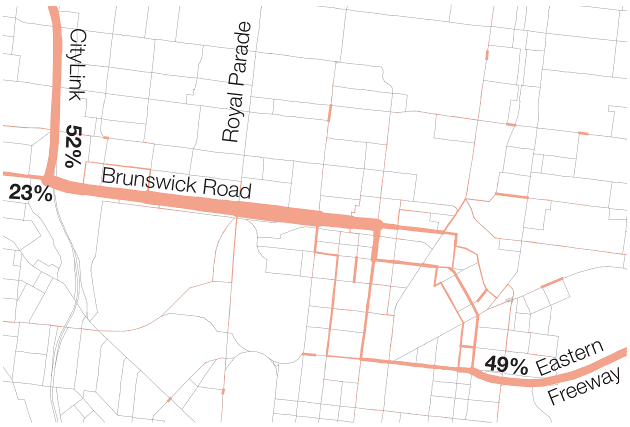
As the major arterials become congested, motorists seek alternative routes, increasingly resorting to using many of the minor roads crossing the area to make their journeys. The select link analyses for Brunswick Road provide a good illustration of this (see Figures 63 and 64).

Figure 63 – Select east-west link: Brunswick Road (two-way)



Source: EWLNA (Veitch Lister)

Figure 64 – Select east-west link: Brunswick Road (two-way), detailed



Source: EWLNA (Veitch Lister)

In the past, traffic congestion led to widespread filtering through residential areas as drivers attempted to bypass peak-period traffic queues, causing annoyance to residents and declining local amenity. Now, 'through' traffic is generally confined to a fixed number of options, as local governments have resorted to Local Area Traffic Management (LATM) devices and other strategies to discourage 'rat-running'. These LATMs take various forms: speed humps are common, although more drastic measures such as closing roads to through traffic are also used extensively. In the inner west, truck curfews have also been used to try and reduce the impact of heavy vehicles seeking a way through the suburbs.

The intent behind these measures is to channel through traffic along the major road network. However, the discontinuous nature of most major east-west routes means that many vehicles still 'work their way' across the city using local roads, with negative impacts on local amenity.

Regardless of the number of 'rat-runs' that are still available, a key feature of Melbourne's east-west routes is that they have to cross the Yarra or Maribyrnong Rivers and there are very few options available for making these river crossings. The two rivers represent a physical east-west divide, with the river crossings becoming 'choke-points' for traffic attempting to travel across the city from west to east and vice versa.[11]

To the east, the daily queues on the Eastern Freeway are a constant reminder that this is the last of the major freeways terminating on the fringe of the inner city, with the freeway coming to an abrupt halt at Hoddle Street. The RACV noted in iits submission to the EWLNA:

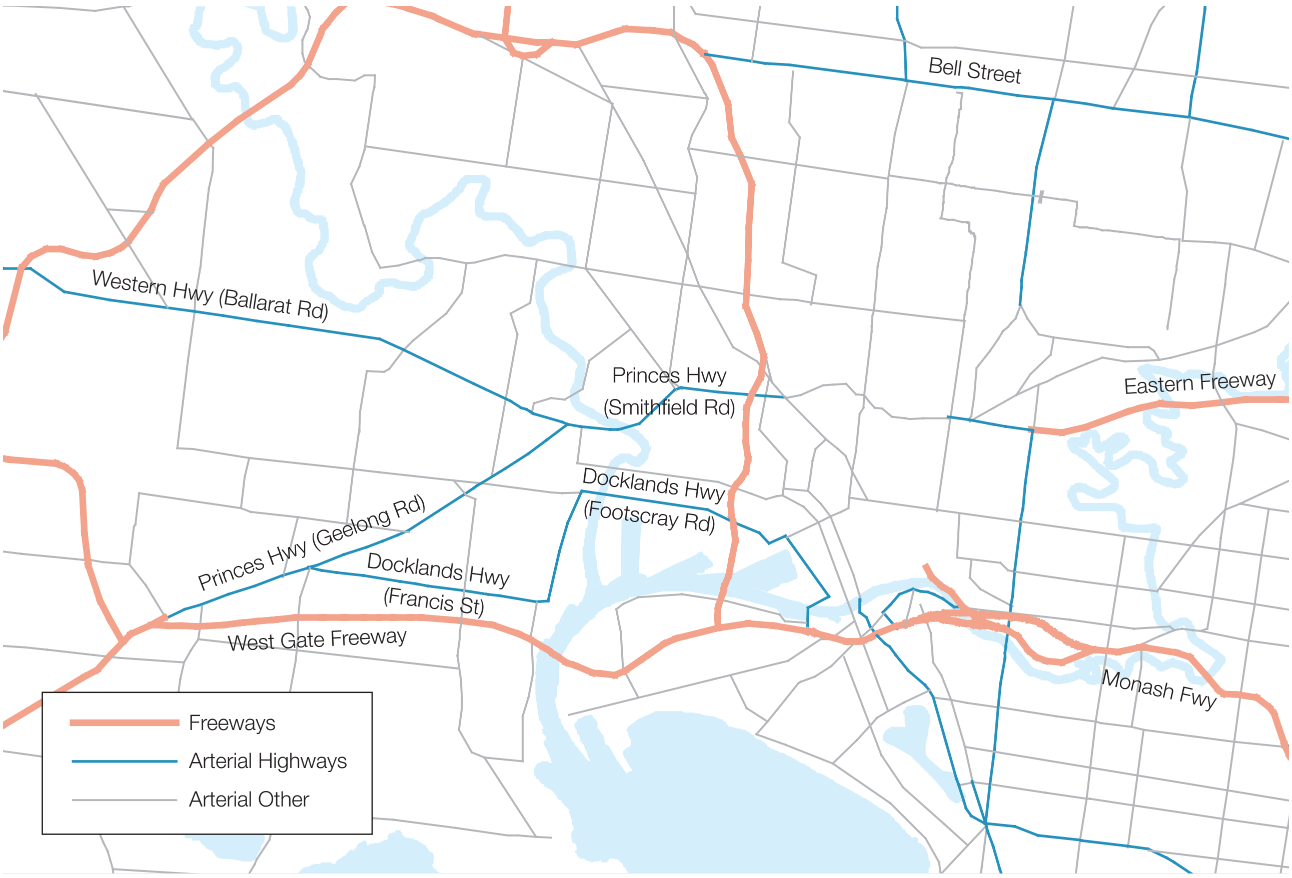
> *"The Eastern Freeway needs to be better connected, not just at its terminus at Hoddle Street, but across the Western Highway."*[12]

11. The social and demographic aspects of Melbourne's east-west divide are set out in Chapter 1.
12. RACV, submission to the EWLNA (2007), p23

A consideration of the key cross-city routes in Melbourne's west (as set out in Figure 65) provides an appreciation of the city's east-west travel problem. These routes are:

- West Gate Freeway (over the Yarra River)
- Footscray Road (over the Maribyrnong River)
- Dynon Road (over the Maribyrnong River)
- Ballarat Road – Smithfield Road (over the Maribyrnong River)[13]
- Eastern Freeway.

Figure 65 – Key east-west routes across Melbourne



Source: EWLNA

13. Strictly speaking, there are other crossings of the Maribyrnong River further north – Farnsworth Road and Raleigh Road – but these are less significant east-west routes.

Monash-CityLink-West Gate Freeway (the M1)

The M1 is Melbourne's most important road and the key east-west arterial in the EWLNA Study Area. The current demand on this road is immense, with traffic volumes varying from 130,000 vehicles per day to nearly 200,000 vehicles per day along the length of the route.

The corridor is congested during commuter peak periods, with congestion also building up during non-peak weekday periods (when freight movements continue relentlessly) and weekends and holidays (with high levels of recreational travel). Morning traffic queues stretching from the West Gate Bridge back to the Western Ring Road (and even as far as Laverton) are common and – for west-bound traffic in the evenings – delays are felt as far east as Malvern on the Monash Freeway as traffic slows to a crawl over the West Gate Bridge.

Travellers on the M1 are experiencing reduced reliability (with significant variance in travel time from day to day) and lower speeds (often deteriorating to stop-start conditions). Inbound morning peak travel speeds along some sections of the West Gate Freeway have almost halved over the last 10 years and travel time reliability is becoming increasingly variable. For example, between the Western Ring Road and Todd Road, the maximum travel time along the West Gate Freeway is now nearly three times the average travel time (or an additional 34 minutes). This variability on one of the city's major freight routes is a significant concern to the freight industry, as well as a cause of frustration to motorists.

As part of the Government's *Meeting Our Transport Challenges* program, major improvement works are underway along the M1. These improvements will see additional lane capacity provided, supported by a Freeway Management System that will manage vehicle access to the freeway to ensure that hourly lane volumes are maximised. The combination of these measures will provide congestion relief.

The critical link along this road is the West Gate Bridge. The M1 upgrade includes modifications to the bridge that, in combination with a program of bridge strengthening measures, will allow five lanes to operate in the peak direction.[14]

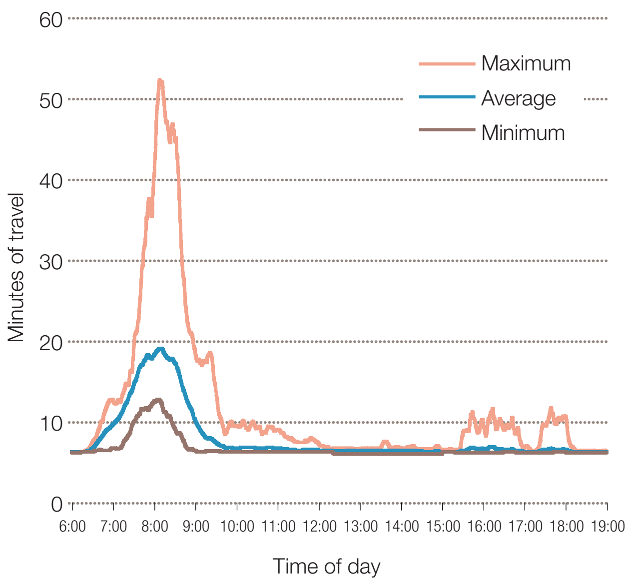
Modelling undertaken by VicRoads recognised that the M1 upgrade was essential, but that it would only result in a moderate period of respite from further intervention to the network – with traffic demand exceeding capacity within 10 to 15 years. The Study Team agrees with this assessment and the Team's own analysis has confirmed that traffic across the West Gate Bridge will continue to increase to around 235,000 vehicles per day by 2031 (a 41 per cent increase from the current volume of 165,000 vehicles). This represents substantial traffic growth outside the morning and evening peak periods. In other words, the extra lanes across the bridge will be fully utilised within a relatively short period of time as people and goods continue to travel across the city in growing numbers.

VicRoads modelling also indicated that the demand for travel along the full length of the M1 warranted the investment in the corridor being made through *Meeting Our Transport Challenges*, rather than the creation of an alternative route. However, VicRoads concluded that an alternative route to the north would be a complementary and necessary project in the future. Once the current M1 work is completed, options for further capacity increases on this route are limited: the bridge and tunnel constraints are obvious, but median space further east along the Monash Freeway will also be fully utilised.

Modelling by the Study Team shows that the M1 corridor will remain the key route across Melbourne and highlights the very strong 'desire line' along this route. This is not surprising, given the development of Melbourne around the geography of Port Phillip Bay. Land use in Melbourne is skewed from the south-east to the west, with the Bay funneling traffic to the edge of the city for this element of east-west travel. In fact, if traffic relief for the West Gate Bridge were the only consideration, a good theoretical response would be a road crossing of the Bay, linking North Altona to St Kilda (and on to Malvern). While constructing a tunnel under the Bay, or a viaduct and bridge above it, would be technically feasible, this would not achieve many of the objectives of the EWLNA and would also introduce an array of new, complex issues.

14. See page 136 for a more detailed discussion about the West Gate Bridge.

Figure 66 – West Gate Freeway – inbound travel time, WRR to Todd Road, weekdays 15/10/07 to 1/11/07



Source: EWLNA – based on VicRoads data

Footscray Road

It is deceptive to look along Footscray Road – it gives the impression of a very wide arterial road, with extensive capacity. It is the spine of the Port of Melbourne's road system and provides essential access to the docks and railheads for the high volume of container trucks and other freight vehicles needing to access this area each day. But despite its eight lanes, Footscray Road has little to offer east-west travel in the broader sense, other than as a link between Footscray and the city.

At its western end, Footscray Road narrows to four lanes (two each way) across the Maribyrnong River (Shepherd Bridge) and has no high-capacity connection further west. Buckley Street provides the direct link to Geelong Road and Sunshine Road, but is a narrow and constrained road that runs through the residential and commercial areas of Footscray and Seddon, and is increasingly unsuited to through traffic. Buckley Street is currently two lanes, but as Footscray becomes a more dense urban area, through traffic on existing streets such as Buckley Street will be even less welcome. Traffic from Footscray Road currently disperses across a number of connecting roads, including Somerville Road and Francis Street, where the impact of this traffic is of major concern to many residents.

The eastern end of Footscray Road is similarly compromised. The connection to CityLink is clearly important and provides links to high standard roads to the north and south-east. Closer to the city, opportunities are provided to either access the city from Footscray Road or connect to major arterials for travel further east and south-east. However, these connections are circuitous and do not provide high capacity east-west routes.

Footscray Road carries 35,000 vehicles per day, and is vitally important to the Port of Melbourne. Grade separation of the rail line crossing Footscray Road is in progress to ensure that both rail and road are able to operate efficiently; however, this is a local measure designed to resolve the conflict between more frequent and longer trains coming to the port and the current traffic on Footscray Road. It is not a measure directed towards improving broader east-west connectivity.

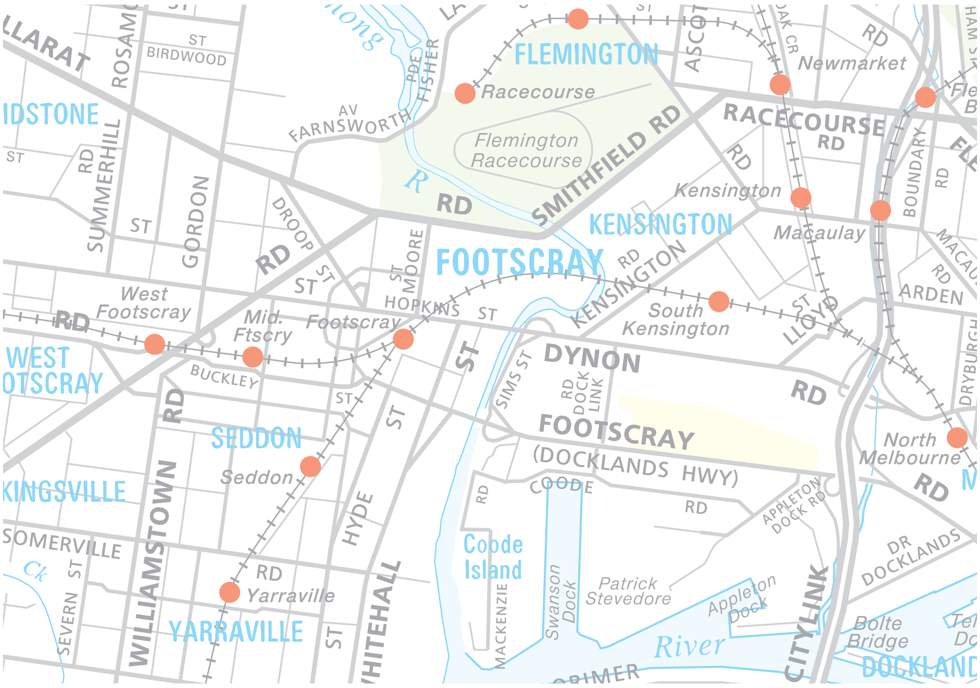
Dynon Road

Dynon Road is another disconnected route. Again, four lanes (two each way) are provided across the Maribyrnong River (Hopetoun Bridge), but making a direct connection to the high capacity Geelong Road requires travel along Barkley and Hopkins Streets through the heart of Footscray. These streets are highly unsuitable for through traffic and will become even more so in the future. This means that Dynon Road traffic needs to connect to the south via Whitehall Street (and then run through residential streets) or travel north along Moore Street to Ballarat Road – another circuitous and largely residential route.

At its eastern end, Dynon Road has northerly connections to City Link, but otherwise provides access to the city, or further east, via Spencer Street.

Dynon Road also carries 35,000 vehicles per day.

Figure 67 – Footscray and Dynon Roads at the western end



Source: Melway (2008)

Ballarat Road – Smithfield Road

The Lynch's Bridge crossing of the Maribyrnong River, linking Ballarat and Smithfield Roads, looks more promising, but is also constrained. The four-lane bridge links to divided roads on each side of the river. To the west, the road connects to Geelong Road and Ballarat Road. Geelong Road is a wide, multi-lane arterial road, generally accepted as capable of handling extra traffic. Ballarat Road west of Geelong Road is less generous, comprising an undivided four lanes, although VicRoads has maintained a planning overlay to widen this section to a better standard.

The main problem lies to the east, where Smithfield Road connects to Racecourse Road through the middle of the Kensington shopping and community precinct, which also includes an area of high density housing. This stretch of the east–west route winds under height restricted rail overpasses, along a 40 kph road, is shared with trams and passes several signalised road and pedestrian crossings. It is not – and has no prospect of ever being – a key traffic arterial. Traffic along this section of the route is highly congested, with volumes along Racecourse Road being virtually the same as Footscray and Dynon Roads – around 37,000 vehicles per day.

Figure 68 – Racecourse Road through Kensington

Source: EWLNA

In summary, the east-west river crossings are limited, with no 'rat-runs' as alternatives to current traffic congestion. In addition, with the exception of the M1, these crossings do not provide sufficient through road capacity or connectivity with the rest of the network to serve east-west traffic. As Melbourne grows and develops, the current connectivity through Footscray and Kensington will be further constrained.

Eastern Freeway

The Eastern Freeway is the last of the 'unconnected' freeways leading towards the city. The construction of CityLink, which joined the Monash Freeway (then the South Eastern Arterial), the West Gate Freeway and the Tullamarine Freeway, provides an effective southern and western bypass of the inner city and directs tens of thousands of vehicles each day onto a high standard road and away from less suitable city streets. The Eastern Freeway remains unconnected, with no equivalent northern bypass of the city. The freeway carries around 140,000 vehicles each day, which are deposited to or drawn from Hoddle Street and Alexandra Parade, and numerous city and inner urban streets beyond.

There are two prevailing myths about Eastern Freeway traffic.

- *Myth 1 – Eastern Freeway traffic congestion would be 'fixed' by a heavy rail service to Doncaster.* Chapter 7 and Appendix C canvasses this issue more fully and the Study Team has confirmed that a significantly enhanced public transport service to the Doncaster/Manningham area is warranted and will result in an increase in public transport patronage. In turn, this will mean some associated reduction in the number of cars on the freeway. But the queue on the Eastern Freeway is not caused primarily by traffic from Doncaster. Modelling undertaken for the EWLNA shows that most of the vehicles arriving at the end of the Eastern Freeway during the morning peak period have not travelled from the Doncaster/Manningham region. The single biggest origin of traffic entering the freeway (33 per cent) is at Springvale Road, well to the east of the region.

  The completion of EastLink, which will soon connect to the eastern end of the Eastern Freeway at Springvale Road, will provide further connectivity to the road network in the east and facilitate an alternative traffic path to that of the M1, particularly for heavy vehicles. The impact of this connection will be known before long, but modelling indicates that daily traffic on the Eastern Freeway could increase by up to 10 per cent as a result of EastLink. There is no evidence to indicate that a rail line to Doncaster (or the proposed substantial increase in bus services to the region) will ameliorate traffic congestion at the end of the Eastern Freeway to any significant extent: in fact, traffic demand on the freeway will continue to grow and the part of the traffic stream that is crossing the city, rather than accessing it, will continue to filter through inner-northern suburbs and along city streets.

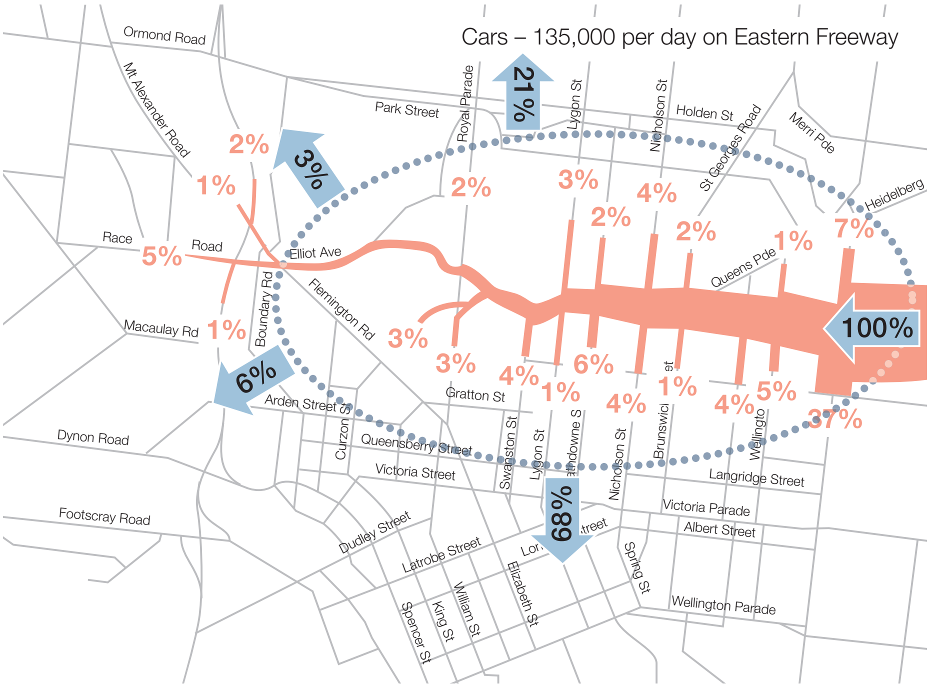
- *Myth 2 – Nearly all of the Eastern Freeway traffic is destined for the inner city.* This misconception may have arisen from an interpretation of the origin and destination analysis for the 2003 Northern Central City Corridor draft strategy.[15] The NCCC produced diagrams (see Figure 69) showing that traffic from the Eastern Freeway distributed along Hoddle Street and the roads crossing Alexandra Parade, with only 5 per cent of cars and 8 per cent of trucks continuing to the west. However, this presents a distorted view of traffic distribution (and further NCCC modelling for a future link would have identified and addressed this issue).

  First, given the roads in question, the traffic distribution is not surprising: at the end of the freeway, there are ten freeway-standard traffic lanes (five each way). By the time traffic reaches Macarthur Avenue in Royal Park, the corresponding 'connection' is a two-lane road (one lane each way). The traffic distribution is as much a function of the roads available, which progressively reduce in capacity towards the west, as it is a reflection of the demand for a particular direction of travel.

  Secondly, when the Study Team analysed how traffic from the Eastern Freeway is distributed (with the analysis closely matching the NCCC distribution), it revealed that around 40 per cent of the daily traffic from the freeway travels beyond the central city area – to the south and the west (See Figure 71). That is the case with the current network: in the future, EastLink will add a new dimension.

15. See page 139 for a more detailed discussion of the NCCC strategy.

Figure 69 – NCCC traffic distribution from the Eastern Freeway

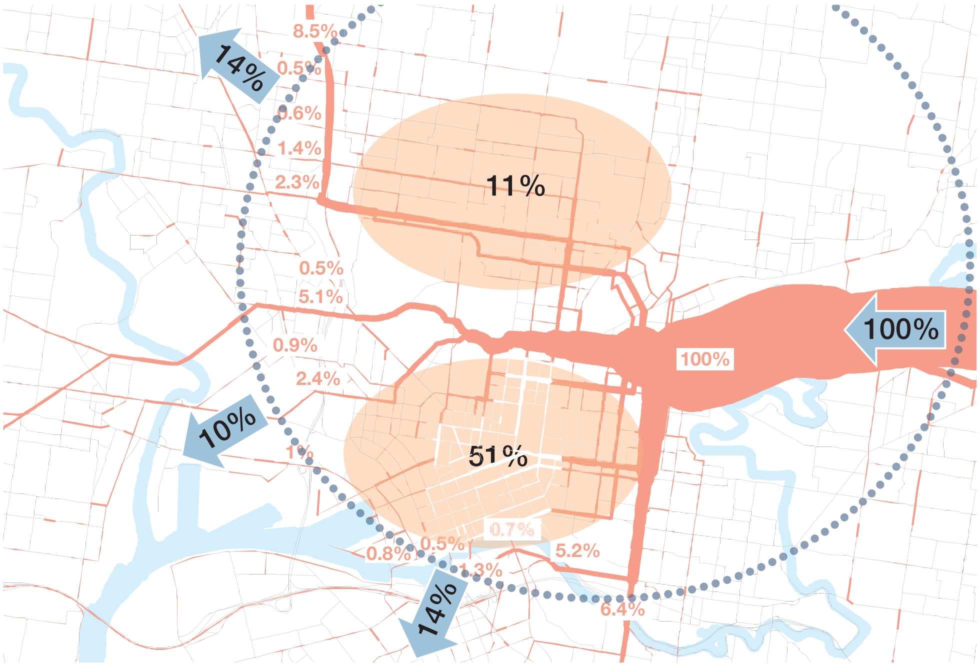


Source: NCCC (2003)

Figure 70 – EWLNA modelling of NCCC traffic distribution

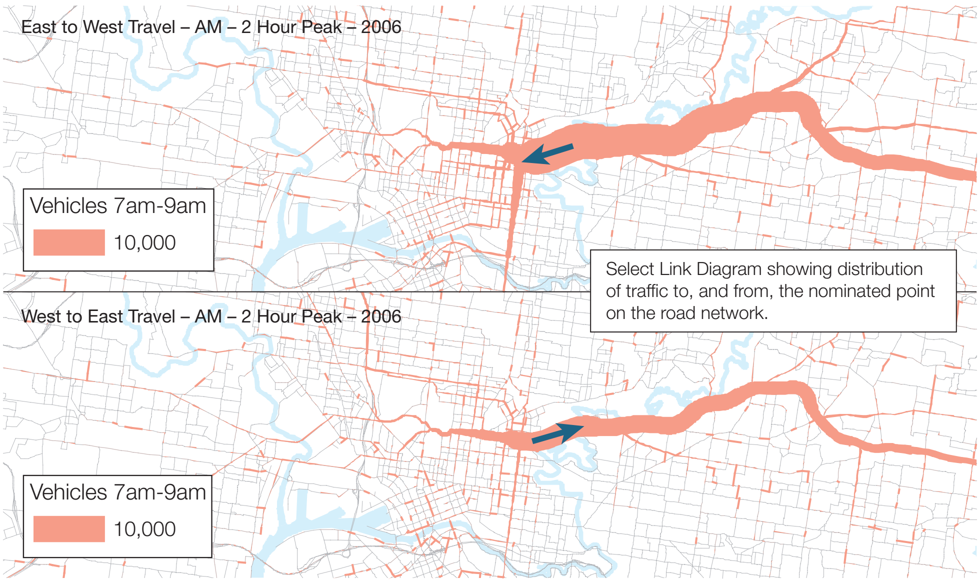
Source: EWLNA (Veitch Lister)

Figure 71 – EWLNA modelling showing traffic distribution across a broader area



Source: EWLNA (Veitch Lister)

Figure 72 – Comparison of AM peak eastbound and westbound traffic



Source: EWLNA (Veitch Lister)

Daily congestion is experienced now at the city end of the Eastern Freeway, principally in the morning peak, with queues forming from Hoddle Street as far back as the Chandler Highway. This congestion results in low travel speeds, although bus, taxi and high occupancy lanes give better service to these classes of vehicles. The roads accepting Eastern Freeway traffic include:

- Hoddle Street – which suffers from heavy congestion between the Eastern Freeway and Victoria Parade, carrying over 5,500 vehicles in the morning peak.
- Alexandra Parade – which carries over 5,000 vehicles in the morning peak at its eastern end, with around 2,000 turning off before Swanston Street. Alexandra Parade is one of inner Melbourne's busiest routes and experiences prolonged congestion during both peak periods. Weekend traffic is also congested, with traffic jammed along the length of the street at times. Key locations of congestion along Alexandra Parade are at the intersections of Brunswick Street and Nicholson Street, both of which are heavily used for CBD access (especially by trams).

Some less direct travel paths are adopted by through traffic to bypass the worst areas of congestion. The long queues on the Eastern Freeway each day have the effect of pushing cross town traffic further north (to roads such as Brunswick Road and Bell Street). This can have a 'knock-on' effect, with Eastern Freeway congestion influencing traffic as far north as the Metropolitan Ring Road (although the effect is relatively minor at this distance).

What is less obvious from this picture is the growing west to east travel demand. Many submissions to the EWLNA mentioned traffic in the context of an east to west movement; however, traffic from the western approaches is expected to grow significantly in the coming years, given the imbalance between population growth and employment opportunities in the city's western suburbs, with some of this traffic wending its way across the top of the city. Figure 72 shows the westbound traffic accessing the Eastern Freeway in the morning peak, compared to eastbound traffic. This is now a very substantial traffic movement.

Many other roads play a role in east-west travel, but the key routes described above are the main avenues. These routes illustrate the constraints within the EWLNA Study Area: constraints that will continue to worsen as traffic growth increases in line with Melbourne's strong population growth.

5.3 Transport connections to and from the west

The evidence for action in relation to improved links to and from Melbourne's growing west is particularly compelling. With strong economic and population growth forecast for the coming decades, the region's transport infrastructure is coming under significant pressure – pressure that will only continue to escalate.

The Study Team strongly agrees with the assessment of the Member for Kororoit and the Member for Keilor in their submission that:

> *"The need for improved transport solutions from the western region of Melbourne is beyond dispute."*[16]

It is clear that growth in the west is proceeding at a rapid pace. It is also clear that transport options and services in the city's east are much better than in the west – and that the supply of transport in the west needs to improve significantly to keep pace with growth.

There is a clear and demonstrated need for better transport connections within the western suburbs – and the Study Team notes that the Victorian Government is upgrading bus services in the region (including extended operating hours and extra services) as part of *Meeting Our Transport Challenges*. However, the most critical links for the west are with central Melbourne, with the inner and middle east and with the Port of Melbourne. These are the connections that will support the region's most important economic journeys and underpin long term growth.

In the Study Team's view, five regional transport issues are critical to improving these connections:

- Addressing the lack of rail capacity through North Melbourne and the City Loop (boosting rail services to and from the west)
- Increasing road capacity across the Maribyrnong River
- Reducing Melbourne's reliance on the West Gate Bridge
- Increasing access to businesses, services and jobs in the inner and middle eastern suburbs
- Improving access to the Port of Melbourne (while reducing the number of trucks on local roads in the inner west).

16. Haermeyer, Andre MP and Seitz, George MP submission to the EWLNA (2007), p.1

These issues are canvassed elsewhere in this report. However, it is worth reiterating some of the significant benefits for Melbourne's west in successfully tackling these issues:

- Significantly improving relative accessibility and density, boosting the west's capacity to attract and retain businesses, jobs and households
- Reducing social disadvantage by improving access to the central city – for work, education and other purposes
- Opening up new business opportunities and employment growth (especially in the services sector)
- Improving the area's competitive advantage as a Transport, Distribution and Logistics hub
- Incorporating Footscray into the inner city economy
- Providing the efficient transport connections needed to sustain residential and industrial/commercial growth in the west and in Geelong.

Over the longer term, further investments will need to be made to ensure the west's transport infrastructure keeps pace with growth. These investments may include extensions of the rail network, further improvements to bus services and new intermodal freight facilities. The Study Team has been careful to ensure that opportunities exist to leverage further investment, development and extensions to the transport network from the EWLNA recommended options.

Analysis of increasing travel demand fuelled by population and commercial growth in the west shows that a failure to address these critical issues will effectively 'shut out' the west and entrench Melbourne's east-west divide. Doing nothing about these issues is not an option.

Study Team Findings

Strong and growing demand exists for trips across the city, although not necessarily the full distance from one side of town to the other, or along direct east-west routes.

Melbourne's major cross city routes are coming under increasing pressure and are already experiencing significant congestion – constraints that will continue to worsen as traffic growth increases. There are very few cross city routes with spare capacity during peak periods.

In particular, serious capacity constraints are being felt now along the M1 (Monash-City Link-West Gate Freeway corridor) and the western end of the Eastern Freeway. Levels of traffic congestion are also increasing substantially along key east west arterial routes, such as Footscray Road, Dynon Road, Geelong Road, Racecourse Road and Bell Street.

There is widespread 'rat-running' along inappropriate roads in the inner north as east west routes become more congested.

Demand for cross town movements is likely to be significantly greater from west to east than in the other direction – in other words, 'west-east' travel rather than 'east-west' travel – and current infrastructure will not be adequate to meet this demand. The growth in demand for travel across the Maribyrnong screenline by both rail and road will overwhelm existing infrastructure, leading to significant peak-spreading and an inability to make trips when they are needed.

There is a need for better transport connections from, to and within the western suburbs, with the most critical links for the west being with central Melbourne, the inner and middle east, and the Port of Melbourne. These connections will support the region's most important economic journeys.

Substantial new investment in the city's road network is needed to meet the growth in cross-city travel demand. A failure to make this investment will lead to significantly increased congestion, greater transport disadvantage, and unnecessary constraints upon economic growth, especially in the central city and the west.

5.4 West Gate Bridge – the city's transport keystone

The West Gate Bridge is something of a Melbourne icon – and a unique and critical element in the city's transport network. It is also a transport 'keystone', with delays and congestion on the bridge rippling out to affect the entire road system.

At present, the bridge serves as the major connection from the city's west and Geelong to inner Melbourne and to the south and south-east. The bridge is also Melbourne's most important land freight route (with 15 per cent of traffic over the bridge comprising commercial vehicles) and its continued effectiveness is essential to efficient freight movements to and from the Port of Melbourne, across Melbourne, to and from western Victoria and interstate.

The Western Transport Alliance has noted the particular value of the bridge to Melbourne's west:

> *"This link provides the principal road access and link between the west, the central Melbourne district and the Port of Melbourne. The constraints have social, environmental and economic impacts on the west, on Melbourne and western Victoria, and affect:*
>
> - *people's ability to travel on the road network and by public transport;*
> - *the achievement of the State Government's clearly stated policy objectives on community travel and movement of freight in/out of the Port;*
> - *the movement of freight generally and freight movement in/out of the Port specifically; and*
> - *four of Melbourne's five designated growth areas in terms of railway access, and three growth areas in terms of direct road access."*[17]

5.4.1 Melbourne's reliance on the bridge

The reliance on the West Gate Bridge as the principal road connection from the west into Melbourne means that the city faces short-term and long-term strategic risks should the bridge become unavailable for use.

In the short-term, even a minor traffic incident such as an accident or a car breakdown can have a severe, costly and disruptive effect – bringing traffic across the inner west to a halt and spreading across Melbourne's entire transport network. In the longer term, an incident that restricted access to the bridge or rendered it unavailable for an extended period of time would have potentially catastrophic economic repercussions that would extend well beyond Melbourne.

As Figure 73 shows, the unavailability of the Bridge would have a major impact on traffic flows across the entire road network, with severe congestion occurring in and round the central city.

Geelong Road, Footscray Road, Whitehall Street, CBD Streets and many other roads would be inundated with major traffic increases. From these roads in the vicinity of the bridge, the effect ripples outwards, with roads across the city feeling the impact.

The West Gate Bridge

The bridge is 2583 metres long, 37 metres wide and 58 m high.

Thirty five workers lost their lives when a section of the bridge collapsed during construction.

The bridge was completed and opened to traffic in 1978.

Construction of the bridge took around 13,000 tonnes of steel, 500,000 bolts and 90,000 cubic metres of concrete.

It was built to handle 40,000 vehicles a day and now handles nearly 160,000 vehicles every day

The bridge is constantly being maintained and upgraded, and was strengthened in the early 2000s.

The bridge is currently undergoing a major strengthening and upgrading project (jointly funded by Victoria and the Commonwealth)

17. Western Transport Alliance submission to the EWLNA (2007), p.4

Figure 73 – Traffic consequences of the West Gate Bridge being unavailable

Source: EWLNA (Veitch Lister)

The risks associated with the bridge becoming unavailable or constrained include:

- Additional costs to road users due to traffic queues, using alternative routes, lost time, missed or late deliveries, more fuel used, absenteeism, and general loss of productivity
- Additional direct costs to the transport industry
- Disruption to the operations of the Port of Melbourne
- Impacts on community amenity from commercial vehicles using alternative routes
- Negative impact on Geelong's economic development
- Highly negative impact on growth and development in Melbourne's west.

5.4.2 Congestion on the bridge

As noted by several submissions and consultations, congestion on the bridge during peak periods is already having an impact on traffic to and from the west, with negative economic and business impacts.

Currently, around 165,000 vehicles use the bridge each day. This will grow over the coming years, reaching around 220,000 vehicles per day by 2020 and 235,000 by 2031.

Table 13 – Future traffic volumes, West Gate Bridge, 2031

	Current volume	Percentage change	Predicted volume
West Gate Bridge	165,000	41%	235,000

Source: EWLNA (Veitch Lister)

As commuters from the west experience on a daily basis, the practical carrying capacity of the West Gate Freeway during peak periods is already fully taken up. Alternative routes along Footscray Road, Dynon Road and Racecourse Road are also near capacity. While traffic management measures may improve traffic flows and reduce congestion, there is very limited potential to accommodate significant volume increases across the bridge or along current alternative routes. With strong population growth occurring in Melbourne's west, these routes will become further constrained.

While the Government's current upgrade of the Monash – City Link – West Gate corridor will deliver significant improvements in travel time reliability and traffic flow, the capacity of the corridor remains constrained over the longer term by the capacity of the West Gate Bridge. As the Committee for Werribee noted:

> *"While pleased with [the] proposals for contra-traffic flows and signalisation of ramps to improve peak hour traffic flows on the West Gate Freeway, the CFW is concerned that this will be a very short term solution [and] a longer term structure or vision is required for 2020 or beyond."*[18]

Similarly, Metlink expressed the view in its submission that the upgrade "will possibly reach full capacity by around 2025".[19]

In its 2006 report on congestion in Melbourne, the Victorian Competition and Efficiency Commission drew attention to concerns about congestion on the bridge, noting that inquiry participants had called for a range of measures to address the problem, including duplication of the bridge, a tunnel under the Yarra, alternative road connections, the reallocation of road space on the bridge and improvements to public transport.[20] VCEC noted that while the improvements to the M1 corridor will be helpful, "in the longer term, pressures to address the issue of a second Yarra crossing will become even more pronounced".[21]

In its 2005 report, *Freight Forward,* the Victorian Freight and Logistics Council also called for action to address congestion on the bridge to expand urban freight capacity, noting that "there is a common view among industry respondents that the duplication of this facility and its integration into the port traffic streams is urgent".[22]

The Study Team shares the widespread concerns about Melbourne's dependency on the West Gate Bridge and agrees that it make little sense to place so much reliance upon one structure. While acknowledging the options available to duplicate the bridge, the EWLNA has recommended a broader solution to traffic issues in the east-west corridor that also delivers an alternative to the bridge. This has the advantage of not only addressing a major vulnerability in Melbourne's transport network, but also delivering a long-term alternative to the West Gate Bridge that is part of a more flexible, fully connected cross city network.

Study Team Finding

The Study Team shares the widespread concerns about the short- and long-term vulnerability of Melbourne's transport network as a result of over-reliance on the West Gate Bridge. The team believes that Melbourne needs the 'insurance' of a long-term alternative to the West Gate Bridge and that action should commence as soon as possible to develop and deliver such an alternative.

18. Committee for Werribee submission to the EWLNA (2007)
19. Metlink submission to the EWLNA (2007)
20. VCEC (2006), p.161
21. VCEC (2006), p.280
22. Victorian Freight and Logistics Council (2005), *Freight Forward: An Industry Perspective on Transport Infrastructure in Victoria*, Melbourne, p.50

The NCCC draft strategy

A substantial number of submissions to the Study Team pointed to the 2003 Northern Central City Corridor draft strategy, which – for a range of reasons – did not recommend a tunnel link between the Eastern Freeway and the Tullamarine Freeway. These submissions used the NCCC strategy to justify their conclusions that no additional east west road connection was required. Many of these submissions called instead for a heavy rail line to Doncaster.

The Study Team believes that this line of reasoning is flawed and notes that the narrow scope of the NCCC strategy renders it of limited value to the broader requirements of the East West Link Needs Assessment.

To meet its brief, the Study Team needed to look well beyond the analysis undertaken by the NCCC strategy, which was restricted to the area between the Eastern Freeway and CityLink. In particular, the NCCC analysis focused on Parkville, Princes Hill, Carlton and Fitzroy and on the destination of westbound Eastern Freeway traffic. It did not examine eastbound traffic from the central and western suburbs or traffic on other key east-west routes. It did not examine the broader transport needs of the city's west.

The scope of the EWLNA required the Study Team to analyse cross town connections within the overall structure of Melbourne's arterial road network and within the context of the economic and social implications of such connections for the western part of the city – a much broader analysis than that required by the relatively narrow study area and terms of reference of the NCCC strategy.

It is also important to note that the NCCC strategy did not recommend a road tunnel largely on the basis of its high development cost (and associated low benefit/cost ratio), not on the basis that insufficient numbers of vehicles would use the tunnel.

Although the NCCC analysis drew upon traffic modelling results for its study area, the strategy also used an origin-destination diagram of existing traffic exiting the Eastern Freeway. This diagram is often used to 'demonstrate' that there is limited demand for traffic to travel further west. While the diagram is useful in helping to understand traffic distribution off Alexandra Parade at the time, its limitations should be acknowledged: aside from the focus on Eastern Freeway westbound traffic (and not on adjoining streets), it does not identify the ultimate destination of the traffic once it left the NCCC study area.

It should also be noted that, notwithstanding the NCCC strategy's stated aim of reducing car travel, the strategy found that a tunnel would deliver significant benefits, particularly a significant reduction in traffic and improved amenity on surface streets.

For example, the NCCC strategy found that "an east-west tunnel is the only real way to remove traffic from Royal Park, but it is difficult to justify the expense … based on relief to this area alone".[23] The strategy also stated that "a tunnel reduces traffic levels on the surface east-west route significantly (especially if it is constructed with intermediate ramp access). It would also attract traffic from other regional routes, such as Victoria Parade, Brunswick Road, Bell Street and City Link, although the volumes from each route are not significant enough to make a noticeable difference to their traffic performance or the amenity of surrounding areas".[24]

The strategy further recognised that if a tunnel was not built, "there is little expectation that freight traffic levels will be reduced in the inner north; they will continue to grow in line with growth in economic activity …".[25]

In addition, the NCCC Scenario Appraisal Report observed that an east-west road tunnel could deliver "social and broad-scale economic benefits and generally positive environmental benefits".[26]

The Study Team also notes that, despite a number of submissions citing the NCCC strategy as justification for both opposition to a road tunnel and support for a heavy rail link to Doncaster, the strategy did not recommend such a rail link.

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23. DOI: Department of Infrastructure (August 2003), *Northern Central City Corridor (NCCC) Strategy*, Draft strategy, State of Victoria, Melbourne, p.35
24. DOI (August 2003), *NCCC Strategy*, p.35
25. DOI (August 2003), *NCCC Strategy*, p.35
26. DOI (August 2003), *NCCC Scenario Appraisal Report*, p.33

chapter 6

6. moving goods - the growing freight task

The movement of goods around Melbourne is vitally important for the city's economy and for the quality of life and wellbeing of Melburnians. From an imported container on the back of a B-double truck carrying the latest consumer goods from China to a load of fresh vegetables from the Werribee market gardens making its way to the wholesale food market, freight transport is a critical part of the supply chain of every business in Melbourne – and has an impact on the daily routine of every household in the city.

Without freight transport, the city's supermarket shelves would be empty, offices and businesses would be unable to function, buildings and homes could not be constructed, and factories and assembly lines would grind to a halt. In short, freight is absolutely essential to the functioning of a modern, growing city.

But the movement of goods in Melbourne is much more than just a truck moving from a warehouse to a store. Every movement is an 'economic journey' and, increasingly, these journeys extend beyond Australia's national boundaries. Victoria is the location for a number of important international freight gateways, such as the Ports of Melbourne, Geelong, Hastings and Portland, and Melbourne's International Airport at Tullamarine and the supporting airports of Essendon and Avalon.

These gateways generate substantial volumes of freight that move from, to and through Melbourne. The efficient movement of freight through these gateways is essential to sustaining Melbourne's position as the central hub of Victoria's freight network and the largest centre for freight operations in Australia – and to underpinning a transport, distribution and logistics sector that contributes around $21 billion annually to the Victorian Gross State Product (GSP) or 8.9 per cent.[1]

As Melbourne's economy and population grows, so too does the amount of freight being moved around the city (the freight task). Most of this freight is moved by road and – when coupled with the projected growth in car traffic – the city faces considerable challenges in reducing the impact of traffic congestion on the freight task and ensuring that freight moves around Melbourne as efficiently as possible.

6.1 Melbourne's growing freight task

Along with other Australian cities, Melbourne's freight task reflects industry and demographic changes, as well as global and national trends in freight transport. As Melbourne's transport network comes under growing pressure, there are adverse impacts on the efficient, reliable and cost-effective movement of goods around the city.

People using the network for personal trips often overlook the fact that the transport network also exists to serve the needs of industry. The routes used to move goods around Melbourne are also popular routes for moving people. As the demand for freight and personal travel grows, these routes are becoming increasingly congested, affecting the reliability of freight movements. Over time – as well as responding to changes in personal travel – Melbourne's transport network needs to respond to economic and industry changes to ensure that it does not become a constraint, effectively undoing the work being undertaken by local industry to reduce costs and improve competitiveness.

6.1.1 The urban freight task

The nature of the freight task in Australian cities is growing and changing, as standards of living rise and the economy becomes more oriented towards services and knowledge based activities. Essentially, the freight task in the nation's large cities now falls into five main categories:

- Urban goods that are moving from docks to warehouses and then on to retailers and consumers
- Courier parcel services and mail deliveries
- Bulk materials associated with building and construction and waste management
- The urban component of long distance intercity freight transport
- Primary produce (such as grains and dairy products) that are passing through the city to ports for export.[2]

1. ABS (2005), Yearbook Australia 2005, Commonwealth of Australia, Canberra

2. See BITRE (2006b), *Report 112: Freight measurement and modelling in Australia*, p.29

As the BITRE and others have noted, economic growth invariably flows through to increased demand for urban freight. Some commentators have expressed the view that the shift to a services economy may 'decouple' freight growth from overall economic activity, leading to fewer freight movements. In fact, the opposite appears to be occurring – and several factors are emerging that are likely to ensure a continuing increase in the demand for freight capacity in Australian cities.

Increasingly, people expect a greater choice and variety in the type and range of products they purchase. The dramatic increase in e-commerce has led to more home deliveries – and more frequent deliveries – of goods and services.

Changes in industry production processes also mean that many firms no longer store supplies of materials and rely instead on a larger number of 'just-in-time' freight deliveries. The relative decline in domestic manufacturing also means that more imports are coming into cities – goods that then have to be dispersed.

Another trend is the growth of large scale warehousing and distribution centres, which consolidate freight (either from the one large company or similar goods from different firms and sources), and use state-of-the-art technologies to manage and track these goods across a wide (often national) area.

Many of these trends generate more freight movements and place pressure on the urban transport network to deliver goods quickly, reliably and cost-effectively.

Currently, these attributes are offered by road transport, with the result that the vast majority of metropolitan freight in Australia's cities is carried by road – a situation that is likely to continue into the foreseeable future. As the National Transport Commission has observed:

> *"Although interstate rail volumes are expected to grow as track infrastructure investment ramps up, road transport is likely to handle the brunt of [Australia's] freight growth."*[3]

This dominance reflects road transport's advantage in being able to offer door-to-door pick-up and delivery, as well as the intensely competitive nature of the road transport industry that has seen real road freight rates fall by over 44 per cent since 1971.[4] However, as urban congestion increases, particularly in Sydney and Melbourne, demand by firms is growing for more intermodal terminals (combining road and rail transport) located alongside key industrial/warehousing nodes.

3. National Transport Commission website: www.ntc.gov.au
4. BITRE (2004b), *Working Paper 60: An Overview of the Australian Road Freight Industry*, Commonwealth of Australia, Canberra, p.6

National freight trends

Changes in Melbourne's freight task reflect national trends. The BITRE has identified trends between 2003 and 2020 as including:

- An increase in non-bulk freight of 82 per cent in tonne-kilometre terms
- A slight increase in road's share of national non-bulk freight (from 74 per cent to 76 per cent) and a decline in the rail share (from 21 per cent to 17 per cent)
- Average growth in capital city freight tonne-kilometres of 3 per cent a year
- Rail to remain the largest mode in shipping bulk freight (46 per cent share in 2003, 45 per cent in 2020), followed by sea freight (30 per cent and 29 per cent)

Other national trends having an impact in Melbourne's freight task include:

- Increases in truck lengths and load carrying capacity
- Bigger ships operating in Victorian ports
- Longer interstate trains and double stacking of containerised freight.

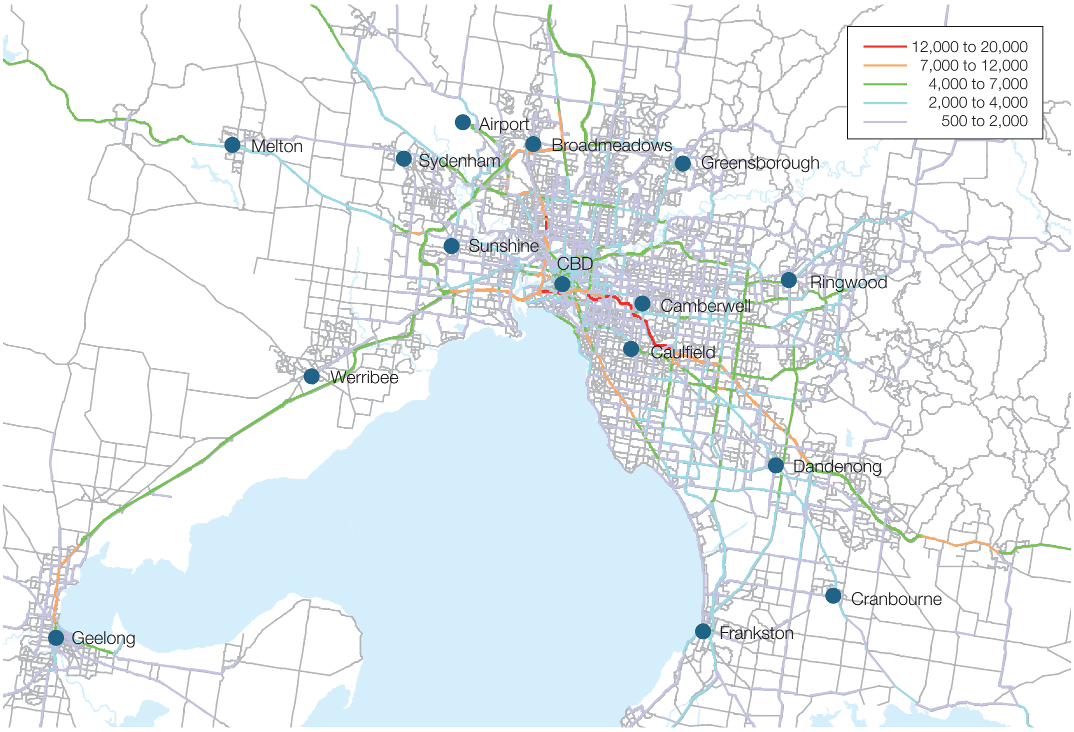
6.1.2 Melbourne's freight network

The main freight routes in Melbourne's road network are identified in Figures 74 and 75, which show the main routes used by commercial vehicles in Melbourne in 2006 and likely to be used in 2031. These figures show the important current and future roles played by the West Gate Freeway, Western Ring Road, the Hume Highway, the Princes Freeway (west) and the Monash Freeway in moving freight around Melbourne.

These figures also show that freight traffic in Melbourne will continue to be concentrated around three key areas: the Port of Melbourne and related industrial areas, the north and north western corridor along the Western Ring Road and around Somerton, and the south and south eastern corridor, centred on Dandenong.

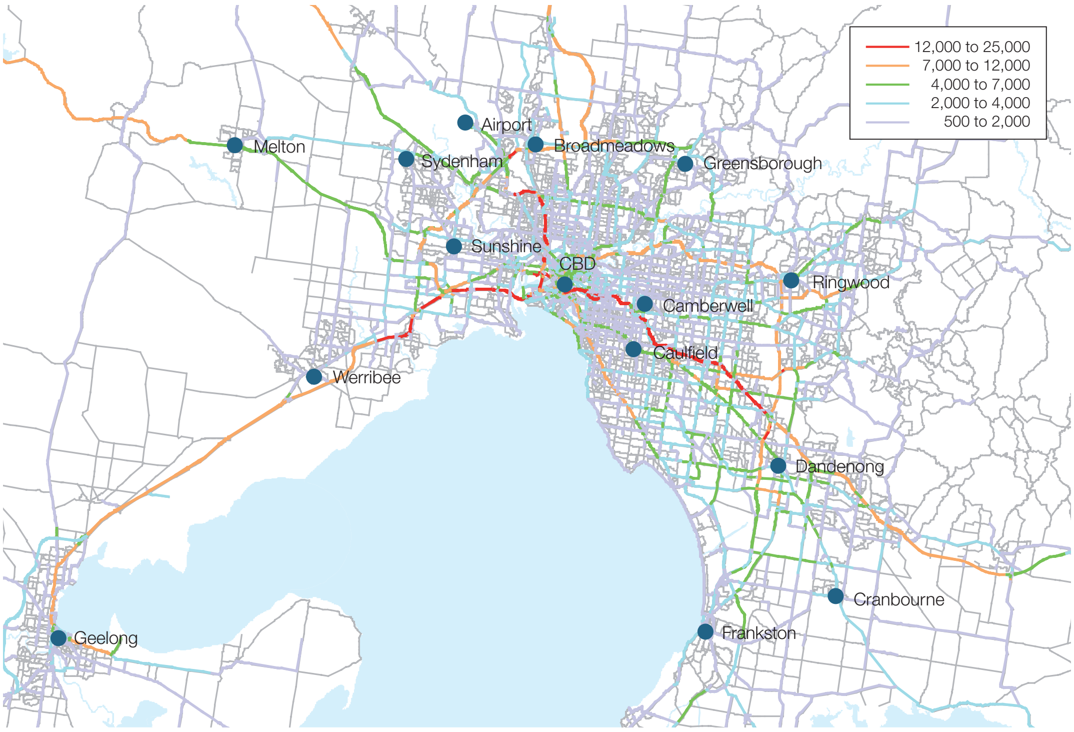
Freight hubs are becoming an important element in the metropolitan freight task and are increasingly recognised as playing a key role in reducing congestion and managing the growing freight task. As businesses aim to reduce costs by improving the efficiency of their supply chain, large distribution centres with cross-docking facilities are starting to take over from smaller warehouses. In Melbourne, such centres are developing in and around Somerton (in the city's north) and in Altona, Spotswood, the Dynon precinct, Swanson Dock and Dandenong.

Figure 74 – Metropolitan commercial vehicle movements, all day, 2006



Source: EWLNA (Veitch Lister)

Figure 75 – Metropolitan commercial vehicle movements, all day, 2031



Source: EWLNA (Veitch Lister)

Melbourne also has three freight airports – Melbourne Airport (Tullamarine), Essendon Airport and Avalon Airport. Melbourne Airport handles around 30 per cent of Australia's air freight, making it the nation's second largest airfreight hub. More than 350,000 tonnes of freight pass through the airport each year, with 21 dedicated freight services arriving and departing from Melbourne each week[5]. While the amount of freight handled by these airports is relatively small, this freight is usually valuable or perishable – and timely delivery is especially important. All freight to and from these airports is moved by road.

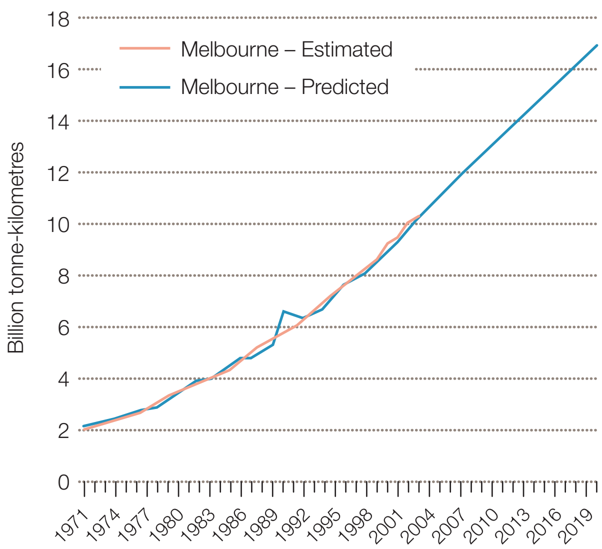
6.1.3 The size and nature of the freight task

The size of Melbourne's freight task is increasing rapidly – and has been growing at a faster rate than the economy and the population.

The BITRE estimates that the freight task in Melbourne has grown by an average of nearly 5 per cent a year over the last 20 years and will continue to grow by an average of 3 per cent a year from now until 2020 (see Figure 76).[6] If this growth occurs, Melbourne's road freight task will grow from around 11 billion tonne kilometres today to around 17 billion tonne kilometres by 2020 – an increase of more than 50 per cent.

Growth in the freight task will be accompanied by a number of changes in the dynamics of the transport, distribution and logistics industry, including a significant increase in the use of light commercial vehicles (LCVs) in the city and more and larger articulated trucks on regional routes.

Figure 76 – Estimated and predicted urban freight task, Melbourne, 1971 to 2020



Source: BITRE (2006b)

5. Melbourne Airport website: www.melbourneairport.com.au
6. BITRE (2006b), *Report 112: Freight measurement and modelling in Australia*, Commonwealth of Australia, Canberra; and BITRE (2007), *Working Paper 71: Estimating urban traffic and congestion cost trends for Australian cities*, pp.41 and 42

Most freight in Melbourne is carried by heavy trucks and the numbers of trucks operating in the city are increasing. However, while most Melburnians are aware of the trucks using the city's freeways and arterial roads, these trucks actually make up a relatively small share of the urban traffic stream (around 6 per cent). Combined with the fact that a large proportion of truck movements are scheduled outside peak periods, trucks generally do not have a great impact on traffic congestion in Melbourne – other than in localised areas (where they can have a significant impact on congestion and neighbourhood amenity) and along routes such as the M1.[7]

While trucks are getting larger in general, new types of high productivity trucks are also becoming more prevalent. These vehicles use innovative design and technology to deliver productivity benefits through small increases in length (using self-steering axles), small increases in width or more axles and better load distribution. The introduction of high productivity vehicles across Australia is being facilitated through national Performance Based Standards (PBS), which have been endorsed by the Council of Australian Governments.[8]

The freight task in Melbourne is also characterised by the rapidly growing number of light commercial vehicles (LCVs) on the city's roads. LCVs are now the most common way in which freight is moved around the city and make up around 15 per cent of the traffic stream.[9]

The 2006 VCEC inquiry noted that "the number of light commercial vehicles on the road [in Melbourne] is growing faster than the number of cars and trucks"[10] and that this growth has an impact on congestion, especially around retail centres.

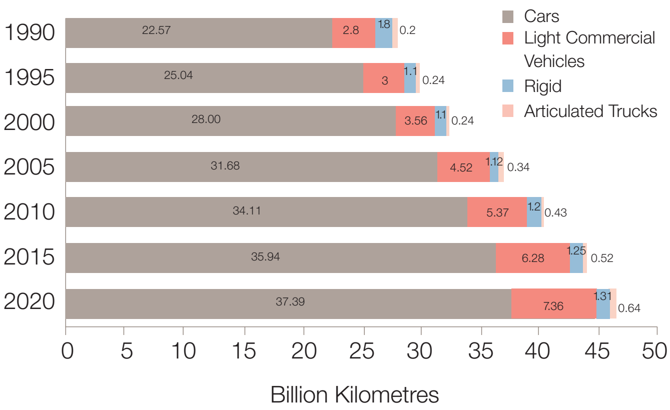
The BITRE's work on the future freight task in Melbourne indicates that by 2020, cars will account for almost 80 per cent of the total kilometres travelled in metropolitan Melbourne. Freight vehicles will make up most of the remainder, with the strongest growth occurring in LCVs (as shown in Figure 77).

Forecasts by VicRoads support these figures and also show a very substantial increase in freight carried by LCVs. However, it is important to note that freight growth from LCVs will come mainly from increased vehicle numbers and distances travelled, while growth from articulated trucks will come from the volume carried and the distance travelled.[11]

Trucks currently make up just 4 per cent of traffic on the Eastern Freeway – although the City of Melbourne and others have argued that the completion of EastLink will lead to an increase in freight traffic along the freeway, and through the central city corridor to CityLink and the Port of Melbourne. Predicted commercial vehicle movements (see Figure 75) provide support for these views.

7. Ibid, p.30
8. Details on the PBS reform can be found at the National Transport Commission's website: www.ntc.gov.au
9. Ibid, p.30
10. VCEC (2006), p.xxxii
11. VCEC (2006), p.48

Figure 77 – Contribution to Melbourne traffic (1990 to 2020)



Source: BITRE (2004)

Table 14 – Commercial vehicle growth on key routes, 2006 to 2031

Route	Commercial vehicle growth
West Gate Bridge	55%
Princes Freeway (west of the Western Ring Road)	98%
Princes Highway (Geelong Road) in the west	200%
Princes Highway (Smithfield Road)	61%
Dynon Road over the Maribyrnong River	37%
Footscray Road over the Maribyrnong River	68%
CityLink / Monash Freeway	53%
Alexandra Parade	23%

Source: EWLNA (Veitch Lister)

6.1.4 The Port of Melbourne

The Port of Melbourne is Australia's leading container port and one of Victoria's most important assets – contributing more than $5.4 billion to the state's economy each year and directly providing jobs for more than 18,000 people. [12]

The port has experienced 13 consecutive years of growth in trade – a trend that is expected to continue over the next 20 years. The Port of Melbourne Corporation (POMC) has noted that by 2035:

> *"While it is unlikely that the size of the port will greatly exceed the current 500 hectares, it will be handling more than four times the number of containers, more than three times the volume of Bass Strait trade, more than two and a half times the number of new motor vehicles … and double the quantity of bulk products."*[13]

This very significant increase in trade volumes will not only generate infrastructure and operational issues at the port; it will also increase the pressure on surrounding landside infrastructure and the broader road and rail network.

As shown in Table 15, the port is managing strong growth in almost all classes of trade and most of this growth is being accommodated by the road network.

Overall, around 80 per cent of freight moving into the port is transported by road, generating around 1.2 million truck visits to the port each year.[14] While the growth of freight movement through the port has an impact on the broader road network, it has particular implications for local streets near the port, the West Gate Bridge and the West Gate Freeway and associated road links to industrial areas and logistics facilities in the west. It also has an impact on amenity in residential areas adjacent to the port.

Around 77 per cent of international containers that pass through the Port of Melbourne have origins/destinations within the Melbourne metropolitan area. This figure is expected to increase to 84 per cent by 2035.[15] At present, every single container leaving the port with a city destination is carried by road – confirming the impact on the city's road network of the port's growth.

12. Port of Melbourne Corporation (2006), *Port Development Plan 2006-2035*, Melbourne, Victoria, p.4
13. POMC (2006), p.22
14. VCEC (2006), p.317
15. DOI (2006), *Melbourne Port@L Strategy: Consultation Draft*, State of Victoria, Melbourne

Table 15 – Port of Melbourne trade growth and transport arrangements[16]

Commodity classification	Volume (2006)	Average Annual Growth Rate (1996 to 2006)	Landside transport arrangements
International containers and interstate containers on international ships	Approx 1.7 million TEU	7.9%	79% road 21% rail
Tasmanian trade	Approx 434,000 TEU equivalents (consisting of containers, motor vehicles, breakbulk and Wheeled Cargo Carrying Units)	5.5%	Virtually 100% landside movements by road
Motor vehicles	286,000 equivalent units	10.8%	Virtually 100% by road from the port. A few move interstate by rail to/from Dynon.
Break bulk (mostly timber, iron and steel)	840,000 mass tonnes	2.9%	Most landside freight by road
Dry bulk (eg cement, grain, fertiliser, sugar, gypsum, stockfeeds)	Around 3.13 million mass tonnes	3.9%, excluding new grain trade commencing in the analysis period	Mainly handled by conveyors and pipelines within the port area, with some distribution to end users by rail but mostly by road. Exception is export grain, which is moved mainly by rail.
Liquid bulk (petroleum products, chemicals)	Around 4.1 million mass tonnes	-1.7%	Nearly all handled by pipeline between the port and depots and then distributed almost exclusively by road tankers to end consumers (eg petrol stations) across the city and country Victoria

Source: EWLNA (Veitch Lister)

A 2003 study conducted for the Department of Infrastructure[17] identified the most important locations where import containers are unpacked (accounting for nearly two thirds of all import containers):

- South East (Dandenong)
- Altona – Laverton North
- Broadmeadows – Somerton.

Development patterns since 2003 suggest that these areas would account now for an even higher proportion of unloading destinations.

The loading locations for export containers are much more dispersed, with the most important locations being:

- Western Victoria (nearly one third)
- Inner Melbourne and the port (around one fifth)
- Altona – Laverton North (one tenth)
- South East Dandenong (one tenth)
- NSW (predominantly the Riverina) (one tenth).

Around 11 per cent of container moves are to and from container parks, located in the inner and outer western suburbs and near the port.

16. Figures provided by the Port of Melbourne Corporation
17. SKM (2003), *Port of Melbourne Container Origin Destination Study*, Department of Infrastructure, State of Victoria, Melbourne

The 2003 study also found that only one quarter of containers move directly between exporter and the port – or between the port and importer – with the balance moving via various interim locations. On average, containers are estimated to make eight separate journeys between departing the port as an import box and arriving back as an export box (three journeys from port to importer; one journey to and one from a container park, and three more journeys from exporter to port).

Unfortunately, more recent data is not available regarding container origins and destinations. In its 2007 Review of Port Planning, the Essential Services Commission (ESC) pointed out the importance of having ready access to data about freight trends. The ESC noted the "considerable reliance" on the 2003 study for estimating container movements and stated that the study "needs to be updated".

The ESC also made the observation that:

> *"…a better database may also be an important element in facilitating supply chain efficiency and increasing the mode share of rail."* [18]

The Study Team endorses these comments.

Melbourne Port@L

The Port of Melbourne and the adjacent Dynon rail precinct are being integrated into a single intermodal hub through the Victorian Government's Melbourne Port@L strategy.

The strategy aims to improve road and rail links from the port and support the development of outer urban intermodal facilities by:

- Improving rail and road access to and between rail and shipping terminals
- Using information and communications technology to improve supply chain performance
- Reducing road congestion around the port
- Freeing up land around the port for freight-related activities
- Encouraging outer metropolitan intermodal terminals to service the Port
- Increasing the port's capacity, including its container terminal capacity at Swanson Dock.

The Port@L strategy includes the relocation of the Melbourne Wholesale Markets from their Footscray Road location and the removal of at-grade crossings to allow longer trains to operate in the port and eliminate traffic delays on Footscray Road.

18. Essential Services Commission (2007), *Review of Port Planning: Final Report*, Melbourne, p.242

6.1.5 Managing the freight task

Managing the growth in urban freight – and the strong growth in trade through the Port of Melbourne – raises many challenges for the city and its transport network.

The issues holding back greater freight efficiency in Melbourne can be summarised as:

- Congestion along key freight routes, especially the M1 and the Western Ring Road
- The growing demand for car travel that leaves commercial vehicles competing for road space
- Deteriorating and volatile journey times
- Truck size restrictions and inefficient use of trucks
- Local curfews and restrictions in residential areas
- Driver shortages.

A number of measures are being undertaken to address these issues. For example, to minimise the number of port trucks on Melbourne's roads, the Port of Melbourne Corporation and the freight industry are encouraging a significant increase in truck utilisation by:

- Increasing the number of high productivity trucks
- Encouraging more efficient stevedoring systems and practices
- Integrating supply chain logistics to ensure that the proportion of loaded inbound trucks with an outbound load (and vice versa) is increasing.

The POMC and the Victorian Government are also undertaking changes to improve the capacity and efficiency of the road network within and surrounding the port.

The Government has also indicated its support for moving a greater amount of urban freight by rail, including the development of a network of intermodal hubs across the city (see Chapter 6.2).

A number of industry stakeholders expressed their frustration to the EWLNA Study Team that Victoria does not have a Freight and Logistics Strategy. These stakeholders argued that Victoria does not appear to have a clear policy for action on planning for future freight corridors, the siting and protecting of intermodal hubs, or making land reservations to secure freight-related developments and transport initiatives.

The Victorian Freight and Logistics Council (VFLC) has noted that, while draft strategic land use studies have been developed for the state's commercial ports, "there are no state level provisions for buffering of these vital assets".[19] The EWLNA Study Team understands that the Department of Infrastructure is currently undertaking a study into the freight network and intermodal freight options, which is expected to report in the first half of 2008.

The VFLC has also pointed out that Melbourne's west currently undertakes a large share of freight management for the eastern and south-eastern suburbs. The Council believes that – for the foreseeable future – there will be a sizeable freight task moving west to east across Melbourne because of the availability of distribution centres, depots and warehouses in the western suburbs. [20]

A number of submissions to the EWLNA also argued that 'high productivity' trucks are an important element in managing the growth in the metropolitan freight task. While recognising community concerns about 'bigger trucks', the Study Team's view is that high productivity vehicles operating on designated routes offer the real prospect of reducing the number of trucks on Melbourne's roads (relative to the growth in the freight task). For example, the National Transport Commission has noted that:

> *"If an inter-capital network for B-triples was established on the Australian mainland beyond road train routes modelling shows a national linehaul truck operator with 60 B-double and semi-trailer trucks could:*
>
> - *reduce the number of trips by one in four*
> - *save 3.7 million kilometres of truck travel annually*
> - *reduce operating costs by 22 per cent*
> - *reduce the fleet to 42 trucks (30 per cent fewer)."*[21]

Regardless of these positive developments in managing the freight task, there will still be a significant increase in the amount of freight traffic carried on Melbourne's roads in the short to medium term. In other words, the vast majority of the goods needed and used by Melburnians will be moved around the city by road for many years to come – and at increasing levels. The Study Team believes that this reality needs to be accepted by Melburnians and by the various tiers of government, with solutions to maintain and improve road freight efficiency developed accordingly.

6.1.6 Industry concerns

Consultations undertaken by the Study Team revealed several specific industry concerns relating to the freight task in Melbourne.

- *Congestion concerns* – industry noted the growing congestion on Melbourne's roads and the negative impact on freight transport. The consequence of congestion for industry is not only increased travel time, it is also the unreliability of travel time. Increasingly, businesses plan their logistics operations around tightly controlled access windows and delivery schedules. Where journey times are unreliable, industry's response is to increase the assumed journey time. This has the effect of 'building-in' the effects of congestion even on days when it is not present.

  One major Victorian producer and exporter told the Study Team that it had formally increased the assumed journey time for its daily deliveries from the east of Melbourne by 30 minutes in order to ensure reliable arrival time. Similarly, in its submission to the VCEC congestion inquiry in 2006, Coles Myer noted that it had to allow for additional journey times as a result of a 9 per cent increase in the average turnaround time for deliveries across metropolitan Melbourne over the preceding three to four years.[22]

  Clearly, where travel times are reliable, industry is able to schedule its transport and logistics activities in the most efficient manner.

- *Supply chain management* – An important point made by industry is the increasing importance of supply chain management. This management recognises the 'chain' of materials and goods from all ends of the product lifecycle and aims to reduce the total cost to business of the product lifecycle (of which transport is only one cost). This approach changes thinking about some transport related decisions. For example, it might be more efficient to build a state-of-the-art logistics centre on the other side of the city in order to improve inventory control and industrial relations than to locate different parts of the same business in close geographic proximity.

  These changes have had the effect of spreading activities geographically and have contributed to the significant increase in transport and logistics centres located in the north and west of Melbourne. Such locations are also on major interstate freight routes and provide better connections to and from the Melbourne 'city-gate'.

19. Victorian Freight and Logistics Council submission to the EWLNA (2007), p.4
20. Ibid, p.7
21. National Transport Commission (2007), *COAG backs B-triple network*, Fact Sheet, Canberra, accessed at www.ntc.com.au
22. VCEC (2006), p.60

- *Higher productivity trucks* – Industry also noted that high productivity trucks have the potential to reduce the growth in truck numbers and significantly improve the efficiency of freight transport. Industry stakeholders expressed their frustration with the Victorian Government's failure to approve suitable routes for the operation of these vehicles in Victoria.

  In its submission to the EWLNA, the Victorian Transport Association stated that growth in freight being 'soaked up' by the use of more productive trucks has stalled, "with authorities less keen to approve more productive designs" such as the adoption of High Efficiency Container Transporters and High Cube freight vehicles. The VTA noted that productivity improvements "can be done with next to no cost and very quickly" and that the Victorian Government could approve the use of high productivity vehicles "today without additional infrastructure investment".[23]

- *Shifting to the freeways* – The Study Team notes that there is a high level of acceptance in the transport industry for measures that reduce congestion and improve travel times and reliability, including pricing for road use and charging for initiatives that complement industry efforts to improve productivity and efficiency. In its submission to the EWLNA, Transurban pointed out that commercial vehicle traffic is growing fastest on CityLink and strongly on the city's freeways, while declining on the arterial road network – indicating a preference by freight operators for using (and paying for) higher quality roads.[24]

  The Victorian Transport Association's submission reinforced this point, noting that "freeways are the preferred mode for freight" and that truck use of freeways in Melbourne has increased by 40 per cent in the last 10 years.[25]

Study Team Findings

Melbourne's overall freight task will continue to grow by an annual average of 3 per cent from now until 2020, leading to a 50 per cent increase in the road freight task (measured in tonne kilometres).

The vast majority of Melbourne's freight will continue to be carried by road, with the biggest increase in freight vehicles on Melbourne's streets being Light Commercial Vehicles.

Industry generally prefers to have trucks using freeways (rather than arterial roads) and has demonstrated a willingness to pay for the use of freeways.

The opening of EastLink is likely to result in increased truck numbers on the Eastern Freeway as trucks travelling between Melbourne's south-east and the north look to bypass the city centre.

There is significant potential to reduce future growth in the number of trucks on Melbourne's roads by increasing the use of high productivity vehicles.

Without action taken to improve management of the freight task, industry will face significant additional costs from increased travel times and unreliable travel times.

23. Victorian Transport Association submission to the EWLNA (2007), Supporting material accompanying submission
24. Transurban submission to the EWLNA (2007), p.11
25. Victorian Transport Association submission to the EWLNA (2007), Supporting material accompanying submission

Some typical freight journeys

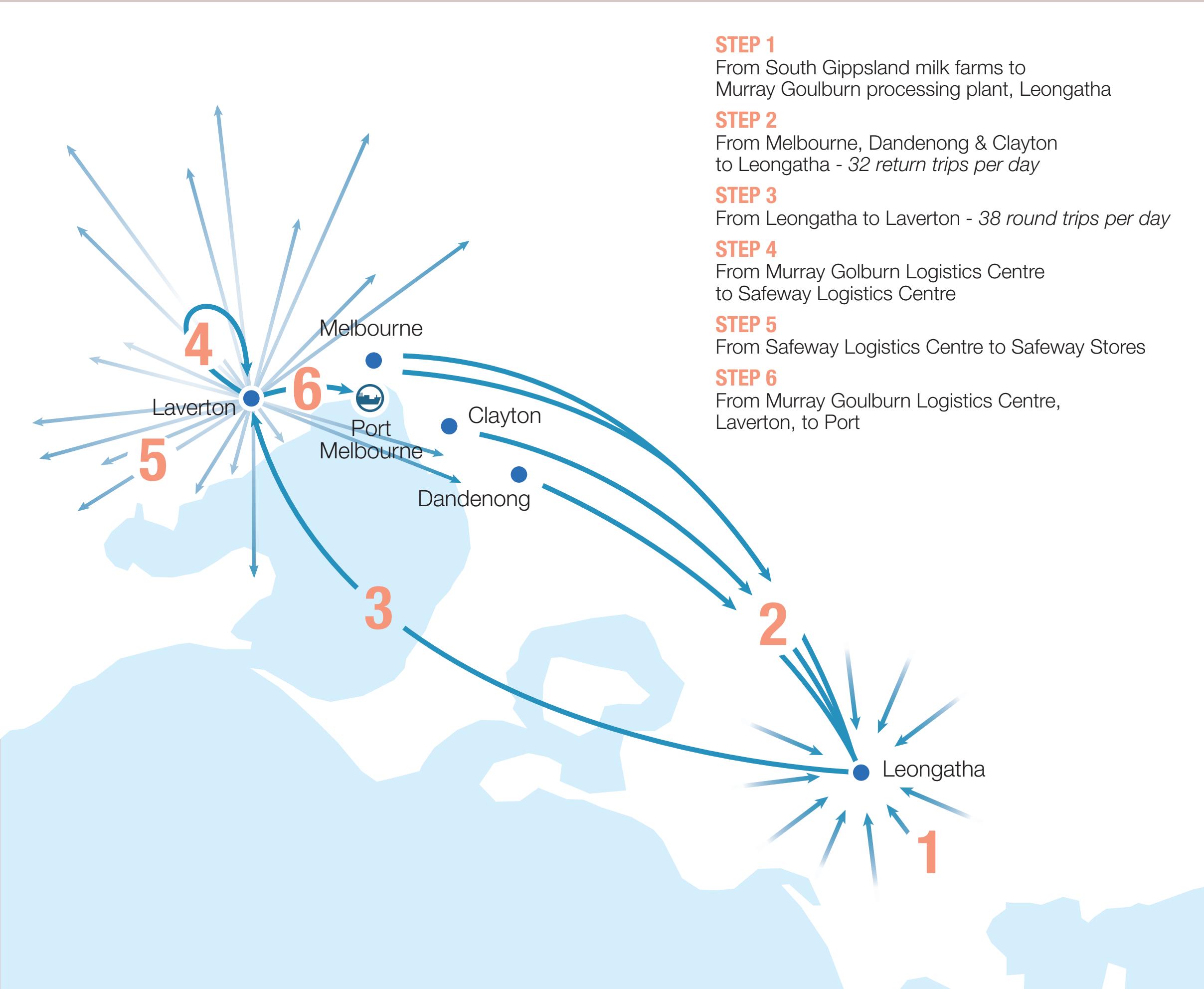
Every day, a vast range of freight is moved around Melbourne – from clothing and food to furniture and whitegoods; from cars and building materials to office supplies and household waste; from the smallest electronic components to massive pieces of factory machinery.

For many Melburnians, the appearance of goods in shops, supermarkets and mail boxes is taken for granted. But the production, sale and distribution of these goods can involve different vehicle types (such as heavy trucks, light commercial vehicles and tractors), different modes of transport (air, sea, rail and road) and various forms of transport infrastructure (rural and city roads, ports and intermodal terminals).

The Study Team has explored some typical freight journeys to give a sense of the complexity of the freight task and the importance of maintaining a freight network that is as flexible and efficient as possible. Two examples of these journeys are illustrated in Figures 78a and 78b.

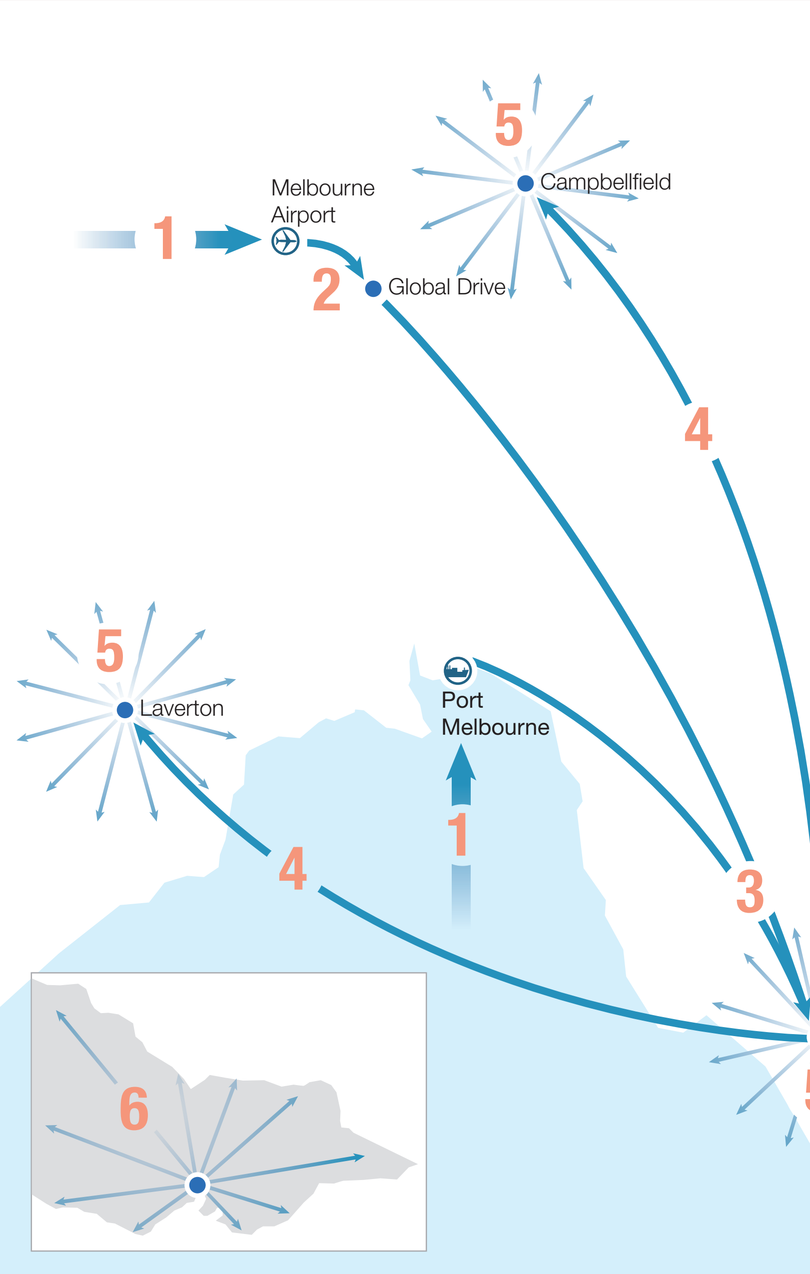
For more detail about these and other freight journeys, see the Transport and the Economy report prepared for the EWLNA.

Figure 78a – A tub of butter - from farmer to supermarket



Source: EWLNA

Figure 78b – A Pioneer plasma TV - from manufacturer to living room



STEP 1
From China by air landing at Melbourne Airport.
From China by sea landing at Port.

STEP 2
From Airport to frieght depot at Global Drive. Tullamarine by truck.

STEP 3
From Tullamarine to Pioneer's main warehouse at Braeside by truck.
From Port to Braeside by truck.

STEP 4
From Braeside to distribution centres at Laverton, Hallam and Campbellfield by truck.

STEP 5
Distribution from Laverton.
Hallam and Campbellfield to retail outlets by truck.
Distribution from Braeside to retail outlets by truck.

STEP 6
Distribution throughout Victoria by truck.

Source: EWLNA

There are several other road trips associated with this journey, including returning the empty container from the Braeside warehouse to a container park and moving waste packaging to a recycler.

6.2 Rail freight – part of the answer, but no silver bullet

Many people see getting more freight off trucks and onto rail as the solution to reducing the growing number of trucks on Melbourne's roads. With just 16 per cent of port-related freight in Victoria moved by rail,[26] increasing rail's share of freight is clearly a highly desirable goal. The Victorian Government has acknowledged the importance of this goal by setting a target of moving 30 per cent of freight from and to all ports by rail by 2010 (known as the 30/2010 target).

Public submissions to the EWLNA showed a very high level of support for transporting more urban freight by rail, particularly to and from Melbourne's major freight centres in the west (Altona/Laverton), south-east (Dandenong) and north (Somerton). To meet this objective, submissions and consultations gave strong support to the development of intermodal hubs in these centres – with the aim of moving significant amounts of freight by rail between the port and the intermodal hubs, greatly reducing the number of trucks on roads around the port and in Melbourne's inner suburbs.

But a few cautionary observations must be made before discussing what is needed to boost rail's share of freight transport.

For a start, the nature of rail is fixed. This means that rail is 'good' at moving large volumes of freight from one fixed location to another fixed location. With its high proportion of 'below wheel' fixed costs, the economics of rail transport mean that, typically, the longer the distance the better. Accordingly, rail lends itself well to interstate freight movements and regional freight movements.

However, in urban areas, freight movements are shorter and do not necessarily run between two fixed points: an efficient metropolitan freight movement usually involves multiple pick-up and drop-off points that the rail network simply cannot reach. Given these characteristics, it's not surprising that all metropolitan freight movements in Melbourne are made by truck.

Despite these limitations, there are clear opportunities to increase rail's share of freight generally, without compromising freight efficiency and in a way that reduces heavy truck movements in and out of central Melbourne.

Winning market share on the massive Melbourne to Sydney corridor is rail's biggest opportunity and biggest challenge. Even a small increase in such a large market will deliver substantial reductions in trucks on the Hume Highway and substantial increases in the rail task. To support the large investments planned by the Australian Rail Track Corporation (ARTC) along this corridor, Victoria needs to adopt a strategy that shifts major interstate rail intermodal operations away from South Dynon in the centre of Melbourne to a state-of-the-art facility that maximises rail efficiency north of Melbourne, positioned on the corridor itself. By taking this action, an increase in rail's share of freight transport will not have the perverse effect of bringing more trucks to the railhead in central Melbourne and it will allow Melbourne's landside port development plans to be facilitated.

To provide further support to this opportunity, the interstate rail network should ultimately be directly linked to Melbourne's south-east, to enable interstate freight originating from Dandenong (and eventually the Port of Hastings) to stay on rail and avoid metropolitan truck movements wherever possible.

As the Chairman of the recent *Victorian Rail Freight Network Review,* former Deputy Prime Minister Tim Fischer AM, has pointed out, investing in rail freight requires 'nerves of steel'. If rail succeeds in winning decent market share on the Melbourne to Sydney corridor, critical mass will begin to emerge for rail freight and attract the confidence of logistics managers. From this point, rail can begin to compete with road for freight share in regional Victoria and metropolitan Melbourne.

26. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division

6.2.1 Port shuttles and the 30/2010 target

The main initiative put forward by submissions to the EWLNA to increase metropolitan freight movements is the concept of port shuttles. Port shuttles involve regular rail freight movements between the Port of Melbourne and intermodal terminals in the suburbs, from where trucks would then be used to make local movements.

Today, the amount of metropolitan port freight moved by rail is so negligible, it is effectively zero. Any port freight that is carried by rail has a regional or interstate origin or destination.

Currently, 77 per cent of international containers moving to and from the Port of Melbourne has an origin or destination within 40 km of the centre of Melbourne – in other words, it is metropolitan, not regional, freight.[27] The port predicts that this trend will grow over the next 20 years. While a regular service between two fixed points is consistent with rail's strengths, the relatively short lengths of these journeys (and a perceived lack of critical mass) make it very difficult for rail to be competitive with road when transporting metropolitan freight.

In any discussion of port shuttles, it is also important to appreciate that there are around 9,000 daily truck movements into and out of the port (including the Webb Dock area).[28] The number of commercial vehicle movements each day across Melbourne is around 500,000. In other words, any shift from trucks to trains into and out of the port, while welcome and desirable, is addressing a localised issue that involves a very small proportion of total commercial traffic. It is not the single 'silver bullet' solution to issues across the broader urban freight transport network.

With the aim of facilitating port shuttles and rail freight generally, the Victorian Government has already proposed an enhanced network of intermodal terminals to assist in managing the forecast growth in trade and projected congestion on the metropolitan road network. At this stage, the enhanced network will include terminals at three intermodal precincts (Altona/Laverton, Dandenong and Somerton). These terminals will be linked to major interstate regional rail corridors and have the potential to be supplied by shuttle trains from Asciano's South Dynon Rail Terminal and/or the adjacent Dynon/North Dynon Rail Terminal in the Port of Melbourne precinct.

Victorian Rail Freight Network Review

Following its 'buy back' of the country rail network in 2007, the Victorian Government commissioned former Deputy Prime Minister Tim Fischer AM to lead a panel of experts to review and recommend a future strategy for Victoria's intrastate country rail freight network.

The result was the Victorian Rail Freight Review, with the panel's final report being handed to the Government in December 2007.

The panel's work mainly focused on country Victoria, making recommendations for a targeted investment program to rehabilitate neglected rail assets in a methodical, prioritised manner and to address issues affecting rail's relative competitiveness, such as certainty of network access for operators, network access pricing and access to rolling stock.

The Review was conducted at a time when drought has severely affected the grain-dominated rail freight task, leading to the main operator Pacific National announcing it was ending its intrastate Victorian operations.

The Review did venture into urban freight issues, encouraging the development of metropolitan freight hubs in Melbourne's key industrial areas and calling for broad and standard gauge access to the Port of Hastings when it is developed. It also supported recent and planned moves to improve the port-to-rail interface at Melbourne Port.

The EWLNA Study Team notes that the Fischer Review's observations in relation to metropolitan rail freight are in broad agreement with the EWLNA findings.

27. DOI (2006)
28. Ibid. A truck entering the port is counted as one movement. When the truck leaves the port, it is counted as another movement.

Figure 78c – Melbourne's intermodal network

Source: DOI (2006)

In addition to serving local industrial catchments, the metropolitan terminals will facilitate freight movements out of Melbourne to interstate destinations. The transfer of containers to and from trucks will occur at these terminals – resulting in reduced congestion in inner Melbourne and at the port, generating land use, environmental and amenity benefits.

While this is a sound approach – and will assist in meeting the Victorian Government's future rail freight target – experience to date shows that rail has not been able to compete with trucks over the short distances involved in metropolitan freight movements.

Currently, the amount of port freight carried by rail is around 16 per cent, consisting entirely of intrastate or interstate freight movements.[29] A summary of rail freight movements is outlined in Tables 16, 17 and 18, including estimates of the amount of freight required to be moved by rail in metropolitan areas if the Government's 30 per cent rail freight target is to be achieved.[30]

The figures for 2008 paint an even gloomier picture for metropolitan rail freight. Since the cessation of the CRT rail shuttle from Altona in early 2007, not a single container of metropolitan freight is moved by rail. Every container leaving the port with a Melbourne metropolitan destination is moved by truck, and all containers moved from Melbourne's suburbs to the port are moved by truck.

A brief examination of the CRT port rail shuttle, which operated between the port and the CRT terminal in Altona, highlights the problems facing metropolitan rail freight.

The shuttle, which was capable of moving 60,000 containers a year, ceased operating in early 2007 due to the rising costs of operating a rail service to the port compared with road transport. CRT told the Study Team that the difference between transporting a container by road and rail from the Altona depot to the port was $53 per container in favour of road. According to CRT, the increased stevedoring charges foreshadowed at the end of 2006 effectively ended the rail shuttle, although other factors such as the inability to guarantee train paths into the port also contributed to its closure. CRT acknowledge that Patrick attempted to support the 30/2010 target by offering the same booking fee for containers arriving by road (with certain conditions that were unable to be met commercially).

Some industry stakeholders contend that the reliability of train paths into the port at guaranteed times (to provide certainty for stevedores) is a more important issue than differential pricing for trucks and trains.

In making general observations about the viability of port shuttle services, CRT has asserted that:

> *"The expensive lesson learned from the now defunct Melbourne port shuttle operation is that the general marketplace will not support metropolitan port shuttle rail services when road transport is a much cheaper alternative, principally as a result of the differential charges levied on shipping containers at the port, and in part due to the service provider.*
>
> *What CRT's experience has shown is that a level playing field must be created for the transport of freight by road and rail for short haul rail to be a financially viable transport alternative."*[31]

A port shuttle has been proposed by Austrak from its intermodal facility in Somerton, which has a throughput capacity of 600,000 containers per year. The 114-hectare facility has attracted some large tenants including Coles Myer, Linfox, Kraft, Visy and Masterfoods. The general manager of Austrak, Bill Green, told the Study Team that the Government's 30 per cent target is both 'sensible and achievable' and that industry is voting 'with its feet' by locating at intermodal facilities with high standard rail facilities.

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29. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division
30. Note: these tables show a slightly higher rail share than the current situation.
31. CRT Group (2007), Submission to the Review of the Interface between the Land Transport Industries and the Stevedores at Port Botany, Independent Pricing and Regulatory Tribunal of New South Wales, p.4, accessed at www.ipart.nsw.gov.au

Table 16 – Port related containerised freight by rail, 2006

Origin / Destination	TEU	% of Total
Interstate	212,000	63.5%
Regional	114,000	34.1%
Metropolitan	8,000	2.4%
Total	**334,000**	**100%**

Table 17 – Containerised port freight task, 2006

	2006		Required					
Total containerised freight task	**1,878,000**		**20%**	**22%**	**24%**	**26%**	**28%**	**30%**
Estimated TEU on rail	17.8%	334,000	375,600	413,160	450,720	488,280	525,840	563,400
Inter / Intrastate	17.4%	326,000	326,000	326,000	326,000	326,000	326,000	326,000
Metropolitan (TEU)	0.4%	8,000	49,600	87,160	124,720	162,280	199,840	237,400
Metropolitan (% of total freight task)			2.6%	2.6%	4.6%	8.6%	10.6%	12.6%

Table 18 – Forecast containerised port freight task, 2010

	2010		Required					
Total containerised freight task	**2,434,000**		**20%**	**22%**	**24%**	**26%**	**28%**	**30%**
Estimated TEU on rail	30%	730,200	486,800	535,480	584,160	632,840	681,520	730,200
Inter / Intrastate	CAGR	3.0%	367,000	367,000	367,000	367,000	367,000	367,000
Metropolitan (TEU)			119,800	168,480	217,160	265,840	314,520	363,200
Metropolitan (% of total freight task)			4.9%	6.9%	8.9%	10.9%	12.9%	14.9%

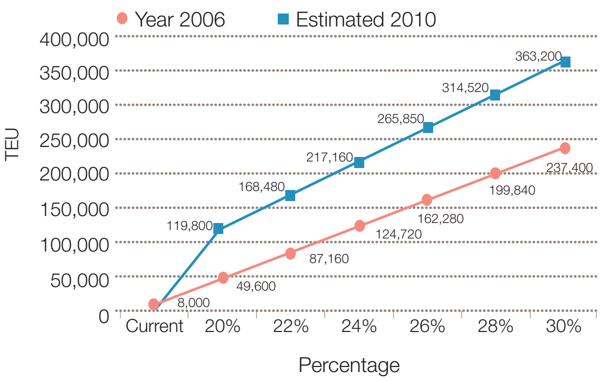
NB: Interstate and intrastate freight on rail is assumed to grow at 3 per cent CAGR between 2006 and 2010.
Source for Tables 16, 17 and 18: VFLC (2007)

6.2.2 Making the shift to rail

The Study Team notes that notwithstanding strong support within the community, the Victorian Government's stated commitment to rail freight and the push from some industry figures, the current amount of metropolitan freight carried by rail is effectively zero.

Based on current forecasts for container trade, more than 360,000 containers would need to be moved by rail to metropolitan hubs by 2010 to achieve the Government's target for rail freight. While the 30/2010 target is a laudable policy objective, the Study Team's view is that it cannot be met.

Figure 78d – Estimated port container modal shift required to achieve 30/2010 target (in TEU)



Source: VFLC (2007)

But issues associated with achieving the 30/2010 target should not be confused with the overall need to increase rail's share of port freight in the longer term. As discussed in more detail below, when future port volumes are taken into account, it is critical that rail is used in conjunction with road to move the growing number of containers coming through the port. It is clear that the volumes of freight will be so large that road alone should not continue to carry the entire metropolitan load.

Recent developments in the intermodal sector give cause for optimism. The Federal Government is investing significant funds from its national AusLink program into the Victorian rail freight network, including metropolitan and regional intermodal hubs and improved rail connections into the Port of Melbourne and the Port of Geelong. Importantly, funding of $80 million has been allocated to the network of intermodal hubs in metropolitan Melbourne at Altona/Laverton, Dandenong and Somerton.

The Victorian freight network strategy (currently in development) is expected to provide further direction on the development of intermodal hubs. However, the Study Team believes that further initiatives can be taken by the Victorian Government and that the key driver necessary for change is government action to facilitate and/or regulate the development of intermodal hubs and to provide the necessary infrastructure to allow the movement of metropolitan freight by rail.

Some supporters of port shuttles have argued that government intervention may require some form of public subsidy or underwriting to support rail until it can compete with road transport. While this option has been proposed by some intermodal operators and was discussed during consultations with the Study Team, the Essential Services Commission in its draft Review of Port Planning rejected this option. The ESC concluded that subsidies would impose inefficient structures on industry and instead emphasised the need for rail infrastructure to support port shuttles and actions to facilitate intermodal hubs.

A number of practical issues also impede metropolitan rail freight, including a lack of guaranteed train paths due to competition with passenger trains and community amenity issues. Previous strategies have identified train paths and noise impacts from freight trains as key issues to resolve.

Other states, particularly New South Wales, are wrestling with the same dilemma. In Sydney, the Australian Rail Track Corporation (ARTC) is soon to start construction of the $192 million Southern Sydney Freight Line – a new 35 kilometre single track dedicated line for freight services between Sydney and Melbourne, Adelaide and southern NSW and between Port Botany and south western metropolitan intermodal terminals. The line will be built alongside the existing tracks used by CityRail for passenger services. While some noise walls will be provided as part of the project, noise continues to be a contentious issue as freight trains will be running within the existing rail reservation close to residential communities.

Similar issues will need to be addressed if regular port shuttles were to operate along existing suburban passenger rail corridors in Melbourne. For example, an intermodal terminal in Dandenong may give rise to a number of costly grade separations and – possibly – the installation of noise walls to protect residents from noise generated by large numbers of freight trains.

Establishing an intermodal terminal in Dandenong will be critical to the success of a network of hubs across Melbourne – but it also appears the most problematic location. The Dandenong rail line is already one of the most congested passenger lines in Melbourne and is experiencing strong patronage growth. It also crosses a significant number of major arterial roads and runs adjacent to a number of residential communities.

As noted by the Essential Services Commission in its review of the impact of port planning on competition, the Government's 30/2010 rail share target is heavily dependent on the operation of port shuttles from areas such as Dandenong, which in turn are heavily dependent on major infrastructure projects that cannot be completed by 2010.[32] As stated above, the only sensible conclusion in the face of these issues and difficulties is that the Government's rail target will not be met.

While not criticising the notion of setting a mode share target, the Study Team believes that the target should be re-evaluated by the Government. This re-evaluation should be accompanied by a comprehensive plan to move more freight by rail.

While remaining optimistic about the future for rail freight, some industry leaders are critical of the lack of a clear policy framework to guide the establishment of hubs. The Victorian Freight and Logistics Council's *Toolkit for the Development of Intermodal Hubs in Victoria* has outlined industry concerns:

> *"There is no intermodal hub policy at present which enables industry to comprehend a consistent scenario of government support and investment within which the private sector can develop these hubs."*[33]

For intermodal hubs to receive the focus and resources they need, the Study Team's view is that a government 'sponsor' or lead agency should be given the role of implementing a network of hubs. The Victorian Freight and Logistics Council has suggested that the Port of Melbourne Corporation could assume this responsibility. Given that the operation of port shuttles to suburban hubs would form an integral part of the landside port network, as well as being essential to managing and meeting the port's own growth projections, this appears a sensible suggestion. This change to port governance arrangements could include responsibility for achieving a new target for port rail freight.

In addition to the measures outlined above, the Government needs to make planning decisions about possible future sites for metropolitan hubs. This will protect development opportunities for intermodal hubs before the remaining appropriate sites are acquired and/or developed by private interests or for other industrial uses. Given the scale of the hubs, their rail and road access requirements and community amenity issues, there will only be a limited number of appropriate sites in any geographic location.

32. Essential Services Commission (2007)
33. VFLC (2007), *A Toolkit for the Development of Intermodal Hubs in Victoria*, Melbourne, p.7

6.2.3 Rail freight network issues

The Study Team has mainly focussed on physical transport infrastructure issues that will facilitate and stimulate growth in rail's share of freight.

Victoria's main rail freight facilities are South Dynon Rail Terminal and Dynon/North Dynon Rail Terminal, both located at the Dynon precinct directly adjacent to the port. Trains carrying freight to and from Sydney, Adelaide/Perth and regional Victoria operate from these facilities.

Despite its proximity to the port, at least 70 per cent of rail freight going through Dynon is not related to the port at all – it is domestic freight.[34]

While rail enjoys strong market share from Melbourne to Adelaide/Perth (around 80 per cent[35]), on Australia's most important trade route between Melbourne and Sydney, rail only has 10 per cent market share.[36] With a total land transport market of around 12 million tonnes, increasing market share on the Melbourne to Sydney route is rail's biggest opportunity and also its biggest challenge.

To this end, the Australian Rail Track Corporation (ARTC) is investing $1.3 billion on the Melbourne/Sydney corridor in a bid to match the efficiency of road transport with quicker journey times, longer trains and faster turnarounds. The ARTC is aiming to boost rail's market share from 10 to 30 per cent over the next five years. With the overall freight task always growing, such an outcome would mean a massive increase for the rail freight task.

Because of the large market between Melbourne and Sydney, any incremental improvement in rail's market share takes many trucks off the road: a 1 per cent increase in rail's market share on this route would take around 5,000 trucks per year off the Hume Highway. But perversely – and highlighting the complexity of this issue – because of the location of key rail facilities at Dynon, this modal shift will also lead to more truck movements into the heart of Melbourne and adjacent to the Port of Melbourne, as drop-offs and pick-ups from interstate trains increase.

The South Dynon Rail Terminal handles virtually all interstate rail freight. While its location immediately adjacent to the port appears ideal, the reality is that more than 70 per cent of freight handled at the terminal has nothing to do with the port. Apart from attracting more truck movements into central Melbourne, the terminal's location also brings more freight train movements right into central Melbourne – alongside commuter trains and local residents.

34. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division
35. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division
36. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division

Despite the rail terminal's close proximity to the port, the port is not ideally configured to streamline the loading of trains with port freight. For this reason, the Port Development Plan and Melbourne Port@l strategy suggest an expansion of port landside property to absorb the Melbourne Wholesale Food Market and the Dynon rail area.

Moving the main non-port rail activity elsewhere creates an opportunity to use this area to re-configure rail's interaction with the port to enhance efficiency and give port shuttles a chance of success.

However, the main benefit of relocating the interstate rail terminal is the opportunity to create a terminal on the Melbourne to Sydney corridor that maximises rail efficiency and improves competitiveness on that corridor.

The other key element in the rail freight story is Melbourne's south-east. Dandenong (and, in the future, the Port of Hastings) is the origin and destination of large freight volumes, but it is the only major freight location in Melbourne without a standard gauge connection. Ideally, more freight originating from Dandenong that is not bound for metropolitan Melbourne should travel by rail. To achieve this, a standard gauge rail connection for freight is needed, connecting Dandenong and ultimately the Port of Hastings to the interstate standard gauge network. The Study Team's view is that this connection should be built into all future transport plans.

Such a connection will not be easy to achieve. Strong population growth in the south-east means increasing train patronage. Melbourne's suburban trains travel on broad gauge tracks, not standard gauge tracks. Rail capacity set aside for freight is capacity not available for passengers.

The EWLNA's recommendation to construct a passenger rail tunnel creates an opportunity to accommodate the long-term passenger and freight needs on the Dandenong line. This means that the track triplication announced in *Meeting Our Transport Challenges* must proceed, but by taking two passenger tracks underground at Caulfield, freight trains can share this corridor in the future.

The timing of a connection between Hastings and the standard gauge network has not been considered by the Study Team. That is a function of demand and freight policy generally. However, in framing its recommendations, the Study Team has 'planned in' this long-term requirement in the belief that rail freight to Dandenong and Hastings, both port-related and non-port-related, has a great opportunity for success in the future.

6.2.4 Future actions

A new interstate and intermodal freight terminal

The Study Team believes that the establishment of a single, large, common user, interstate and intermodal freight terminal, located away from the port and on the national standard gauge rail network would be an extremely positive development. The terminal would need to be connected to Melbourne's arterial (preferably freeway) road network. Ideally, the terminal would be located north of Melbourne on the Melbourne to Sydney rail corridor.

Locating such a terminal in the city's south-east (as suggested by some observers) is not a preferred option, as it would draw trains and trucks unnecessarily to that area and across Melbourne.

The development of such a terminal would be a positive development for the following reasons:

- It would remove the need for truck movements delivering non-port freight to and from the railhead to come into central Melbourne, the point of most congestion on the road network.
- It would stimulate greater efficiency for interstate rail operations in its competitive battle with road freight. The design of a new rail terminal would aim to maximise efficient train movements, minimising the need to break trains up below full length and minimising the need for shunting movements around the terminal. It would also include well-designed road connections to facilitate efficient road pick-up and drop-off. In making this recommendation, the Study Team notes that government should consider the extent to which a new terminal could build upon the investment already made by the private sector at the AusTrak Somerton intermodal terminal.
- It would remove the need for interstate and domestic freight trains carrying non-port freight to terminate in central Melbourne, where rail access paths are scarce and conflicts with passenger trains are prevalent.
- It would free up critical space in the Dynon area, creating the opportunity to re-configure the port area consistent with the long-term goals of the Melbourne Port@l initiative. This includes the opportunity to expand the landside capacity of the port, consistent with the goals of the Port Development Plan. It also creates the opportunity to re-design the rail to port interface in a way that improves rail freight efficiency, facilitating the introduction of rail port shuttles.

The interstate freight terminal would need to be common user. The viability of rail is strongly linked to critical mass. Because rail does best with long distances and large volumes, a single large interstate terminal stands a better chance (at least initially) of being successful in attracting market share than a number of separate terminals. For the terminal to succeed in a competitive rail market (and to lower potential barriers to entry for new rail freight operators), it must be open access for all operators of rail freight services.

Recent indications of possible changes in the main rail freight operators in Victoria further underscore the need to ensure any new terminal developed with public funds is open to different operators.

Standard gauge network to key metropolitan hubs

In addition to the establishment of an interstate freight terminal located away from the port, Melbourne must develop a standard gauge network connecting the interstate terminal and the interstate network to the key metropolitan hubs of Dynon (the port), Altona/Laverton (west), Somerton (north) and Dandenong/Hastings (south-east). Obviously, the interstate terminal and one of the metropolitan hubs could be the same facility. The timing of a south-east standard gauge connection would be determined by the level of demand for freight and can only occur after the development of a passenger rail tunnel from Footscray to Caulfield (as proposed by the Study Team).

The development of this network is important because it enables domestic (non-port) freight being generated in Melbourne's main industrial areas to connect to the national interstate network, providing an alternative to road and creating the opportunity for rail to compete with road by eliminating double handling caused by breaks in the gauge. Such a network would also connect port-related freight to both the main interstate network/terminal and the key metropolitan areas.

Of the three metropolitan areas, only the south-east connection is missing – and yet this is the most important. Dandenong is now the largest industrial zone in Australia and a major source and destination for freight. In addition, Victoria's Integrated Port Strategic Framework states that progressively from 2020 (but certainly from 2030), the Port of Hastings will begin handling large volumes of international containers.

There is no standard gauge connection to Melbourne's south-east. The Dandenong line is a broad gauge line that carries suburban electric trains and V/Line diesel trains to Traralgon and Bairnsdale. Considerable patronage growth is forecast for this corridor as Melbourne's population continues to expand.

One of the recommendations being made by the EWLNA Study Team is for a new passenger rail tunnel beneath central Melbourne connecting Footscray with Caulfield on the Dandenong line. Apart from providing much needed passenger capacity, the development of this tunnel creates the opportunity to allocate space on the surface rail alignment for a future dedicated standard gauge freight line on the Dandenong line and to the Port of Hastings. It achieves this by removing two passenger lines from the surface and taking them underground. The triplication of passenger tracks on the Dandenong line announced in *Meeting Our Transport Challenges* would still need to proceed.

The Study Team notes that, due to the growing passenger demand it will not be possible to dedicate standard gauge tracks for the purposes of freight without the provision of new passenger lines.

The development of a new passenger rail tunnel creates the opportunity for a dedicated standard gauge freight line from Dandenong, but only as far as Richmond. Beyond that point, to connect to the interstate standard gauge network, freight trains need to travel through or under the city to connect at Dynon or further west.

The Study Team has identified several options for future consideration by the Victorian Government:

- A rail freight tunnel beneath the city from Richmond through to the west near Tottenham. A tunnel emerging near the port would be highly problematic due to extremely low gradients; as an alternative, it may be possible to move freight across the city using the EWLNA recommended passenger rail tunnel (with dual gauge) at night. However, a direct connection to the port would not be possible.
- Freeing up space on the rail viaduct between Flinders Street Station and Southern Cross Station by creating more capacity elsewhere for passenger trains currently using the viaduct (there is no spare capacity and all lines are broad gauge). This could be done by:
  - building another passenger rail tunnel in the future for the Werribee to Sandringham route (this also creates future opportunities to provide connectivity to the Docklands area); or
  - linking the existing Northern and Burnley Rail Groups in the existing underground loop and terminating Sandringham trains at Flinders Street Station.

The alternative to using the Dandenong line to provide the rail freight connection is to construct a new rail line through Melbourne's east. The new EastLink alignment is often mentioned in this context. Such an option would require extensive tunnelling, as there is no space for a freight line over much of the alignment. The line would then proceed from Ringwood along the Eastern Freeway or through Melbourne's north-east to link with the Melbourne to Sydney line to the north of Melbourne.

The Study Team has not analysed this alternative, but notes that such an investment for a rail freight-only functionality compared to using an existing alignment (such as the Dandenong line) appears extremely costly and unlikely.

Figure 79 – Potential freight connection – Dandenong line

Source: EWLNA

Developing port shuttles and optimising rail efficiency

As noted earlier, there are currently 9,000 daily truck movements in and out of the Port of Melbourne, with rail's share of port-related traffic around 16 per cent.

Table 19 shows projections developed by the Study Team (based on the Port of Melbourne Corporation's analysis) for truck movements in 2035 under a range of different scenarios.

As shown in the table, if there is no improvement to today's rail share by 2035, there will be a truck entering or leaving Webb Dock every eight seconds – assuming 24-hour operations at Webb Dock and two containers per truck. If Webb Dock was restricted to 15 hour operations at Webb Dock (due to amenity issues in nearby residential areas), a truck would enter or leave the dock every five seconds.

Trucks accessing or leaving Webb Dock would use a newly constructed Todd Road connection to access the West Gate Freeway. Putting aside the obvious logistical issues created by such a truck volume at Webb Dock itself, significant traffic volumes would also be generated along the already congested West Gate Freeway (where traffic volumes are forecast to increase by more than 40 per cent from current levels by 2031 in the absence of investment to provide an alternative route for east-west traffic).

The situation at Footscray Road for trucks entering or leaving the Swanson and Appleton Dock area of the port is similar. If there is no improvement to the current rail share, by 2035 there will be a truck every ten seconds entering or leaving the port via Footscray Road (assuming 24-hour operations) – even more frequently if truck efficiency targets are not met.

Any expansion in the capacity of the Swanson/Appleton area above the 4 million containers assumed in the Port Development Plan would see this truck volume increase accordingly.

These are extremely large local volumes that present substantial challenges for local road connections, logistical arrangements within the port and the amenity of nearby residents and businesses. Should rail's share be permitted to decline, the situation will only deteriorate further.

The Study Team's view is that steps must be taken to ensure a substantial rail freight share for port traffic and that port rail shuttles represent the best opportunity for that to occur. The team's view is that a situation should not be permitted to develop where, because rail does not carry a material share of metropolitan port-related freight, there are massive volumes of trucks travelling in and out of the Swanson and Appleton Dock areas as well as the Webb Dock area, causing significant degradation of local amenity and disruption to local businesses.

Other efficiency improvements are being pursued to reduce overall truck movements in and out of the port, including steps to increase the average number of containers per truck (which has increased from 1.05 to 1.17 per truck since 2004[37]). The Port of Melbourne Corporation aims to increase this to 2 containers per truck by 2035. Another efficiency measure is to reduce the number of empty trucks arriving or leaving the port: since 2004, this has reduced from 41 per cent to 36 per cent.[38]

In addition to these measures, the Study Team believes the following actions are necessary:

- Should Webb Dock be developed in the future as an international container port, it must be configured from the outset to provide rail connections that maximise rail efficiency.
- The Victorian Government should use the opportunities generated by the relocation of non-port freight to a new interstate intermodal terminal (as recommended by the EWLNA) to free up land and redesign the Dynon area to improve rail freight efficiency and expand landside capacity generally.
- However, the development of Webb Dock means the effective 'splitting' of the port. Along with the obvious difficulties involved in providing a rail bridge or tunnel connection (such as interference with recreational marine craft and operational difficulties in running freight trains along such a bridge), this will make it difficult and expensive to achieve a high capacity, efficient rail connection. Accordingly, the Victorian Government should also consider the option of redeveloping the Swanson/Appleton area – therefore consolidating rail in one area – and then compare this option to Webb Dock before finalising its Webb dock plans. However, this does not suggest that redeveloping the Swanson/Appleton area is without problems.
- The rail connections into the Swanson/Appleton area should be re-configured to improve the efficiency and reliability of rail operations. This re-configuration has been proposed by the Victorian Government in its 2007 AusLink II submission to the Commonwealth Government.

The Study Team has not undertaken the detailed work required to recommend specific rail connection improvements into the port area at either Swanston/Appleton or Webb Dock. The Team notes that the timing of any such improvements is linked to the resolution of the pricing and practical issues discussed earlier. However, the Team's firm view is that strong and positive action needs to be taken if any progress is to be made towards significantly increasing rail's share of freight and significantly reducing truck traffic to and from the port.

Study Team Findings

The Victorian Government's target of increasing rail's share of port freight to 30 per cent by 2010 cannot be met. This target needs to be reviewed and a new strategy developed, in consultation with industry, to move more freight by rail.

As well as reviewing the 30/2010 target, the Government should take new actions to increase rail's share of freight generally. These new actions should include the establishment of a major new common user intermodal terminal, the development of a standard gauge rail network in Melbourne, and other steps to ensure that rail has a material share of port freight in the future.

The Port of Melbourne will be limited in its capacity to manage a fourfold growth in containers by 2035 without major improvements in neighbouring road and rail infrastructure.

Without port rail shuttles, the growth in container volumes will lead to higher truck volumes in the vicinity of the port.

Developing an urban intermodal network is critical to managing the growing volume of goods moving through the port.

For rail freight's share of port traffic to grow, effective and focused governance is needed. The Port of Melbourne Corporation is ideally suited to take on this responsibility.

37. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division
38. Figure provided by Department of Infrastructure's Freight Logistics and Marine Division

Table 19 – Forecast truck movements to and from the Port of Melbourne (2035)

Assuming two containers per truck (currently 1.17 per truck)

Scenarios	Truck movements per day – Webb Dock (Monash Freeway via Todd Road)	Truck movements per day – Swanson and Appleton (Footscray Road)	Total Truck Movements per day, assuming two containers per truck
16% rail share	10,000	8,500	18,500
20% rail share	9,500	8,000	17,500
30% rail share	8,500	7,000	15,500
No rail	12,000	11,000	23,000

Assuming 1.5 containers per truck (currently 1.17 per truck)

Scenarios	Truck movements per day - Webb Dock (Monash Freeway via Todd Road)	Truck movements per day - Swanson and Appleton (Footscray Road)	Total Truck Movements per day, assuming 1.5 containers per truck
16% rail share	13,000	11,000	24,000
20% rail share	12,500	10,000	22,500
30% rail share	11,000	9,000	20,000
No rail	16,000	13,500	29,500

Source: EWLNA

6.3 Uneasy neighbours – truck traffic and the inner west

As many submissions to the Study Team made clear, the issue of heavy vehicle traffic in the inner west has been an intractable and emotion-charged issue for more than a decade. Despite extensive consultation and community debate, culminating in the introduction of limited truck curfews in Yarraville, heavy freight traffic in residential areas remains a source of community concern and frustration.

Night time and weekend curfews operate along Francis Street and Somerville Road in Yarraville, prohibiting all non-local heavy vehicles. The Victorian Government also signed a Memorandum of Understanding with local petrochemical companies to reduce the number of trucks travelling on Francis Street each day, while VicRoads developed an education campaign to encourage freight operators to use the West Gate Freeway/Bolte Bridge for night time journeys to and from the Port of Melbourne and rail freight terminals. These measures have had limited success.

Annual truck counts conducted by VicRoads since 2002 show that the amount of heavy vehicle traffic has not diminished to any marked extent, with extremely large numbers of trucks continuing to use streets such as Francis Street and Somerville Road. In the area bounded by the Maribyrnong River in the east, Hudsons Road in the south (Spotswood), Geelong Road in the west and Buckley Street (Footscray) in the north, the number of truck movements has averaged 20,000 per day since the targeted VicRoads counts commenced. In 2007, the aggregated truck movements totalled around 20,200 in this area, with a concentration of around 7,000 trucks per day in Francis Street, Yarraville. Other streets with large numbers of trucks include Buckley Street, Somerville Road and Williamstown Road.

In its submission to the Study Team, the Maribyrnong Truck Action Group (MTAG) stated that the number of trucks escalated dramatically in the 1990s after the completion of major road projects:

> *"After the completion of the Western Ring Road in 1996 and CityLink in 1999, levels of truck traffic in the inner west increased dramatically. Currently in excess of 17,000 heavy trucks a day use residential streets in Maribyrnong. Francis Street Yarraville carries a great deal of this truck traffic (around 7000 trucks a day), it is a residential street lined on both sides with houses, it is also fronted by a community centre and a childcare centre, in addition there is a primary school less than 100 meters from the street."*[39]

The reasons for the amount of heavy vehicle traffic are varied. While it should be noted that not all trucks moving through the area are port-related, the location of Yarraville between the port and major industrial centres further west is a major contributing factor. The West Gate Freeway/Williamstown Road/Francis Street route is seen by some operators as a shorter and more direct route to the port than the West Gate/Bolte Bridge route, with some smaller operators also using the route to avoid tolls on CityLink. As noted in the City of Maribyrnong's submission:

> *"Much of this port related truck traffic is choosing to travel along streets through Yarraville and Footscray to avoid the congestion, costs and other constraints on the freeway network. Improved freeway access to the port or dedicated truck access is needed to cater for the expected truck traffic growth."*[40]

The siting of container yards close to the port and residential areas is a further factor. Fourteen container yards are located within the City of Maribyrnong and the most direct routes from the yards to the port are via Somerville Road and Francis Street. While it is likely that container yards will slowly be forced out of the inner suburbs as the value of land in close proximity to the city becomes more attractive for residential uses, this is likely to be a gradual process as some yards have long-term leasing arrangements.

With the Port of Melbourne Corporation predicting a four-fold increase in container trade by 2035, the problem of heavy vehicles in the inner west will be further exacerbated unless direct intervention is taken to reduce the number of trucks in residential areas. While the development of intermodal hubs may assist in removing some trucks from the Yarraville area, the number of trucks will continue to increase in real terms as the overall size of the freight task rapidly increases.

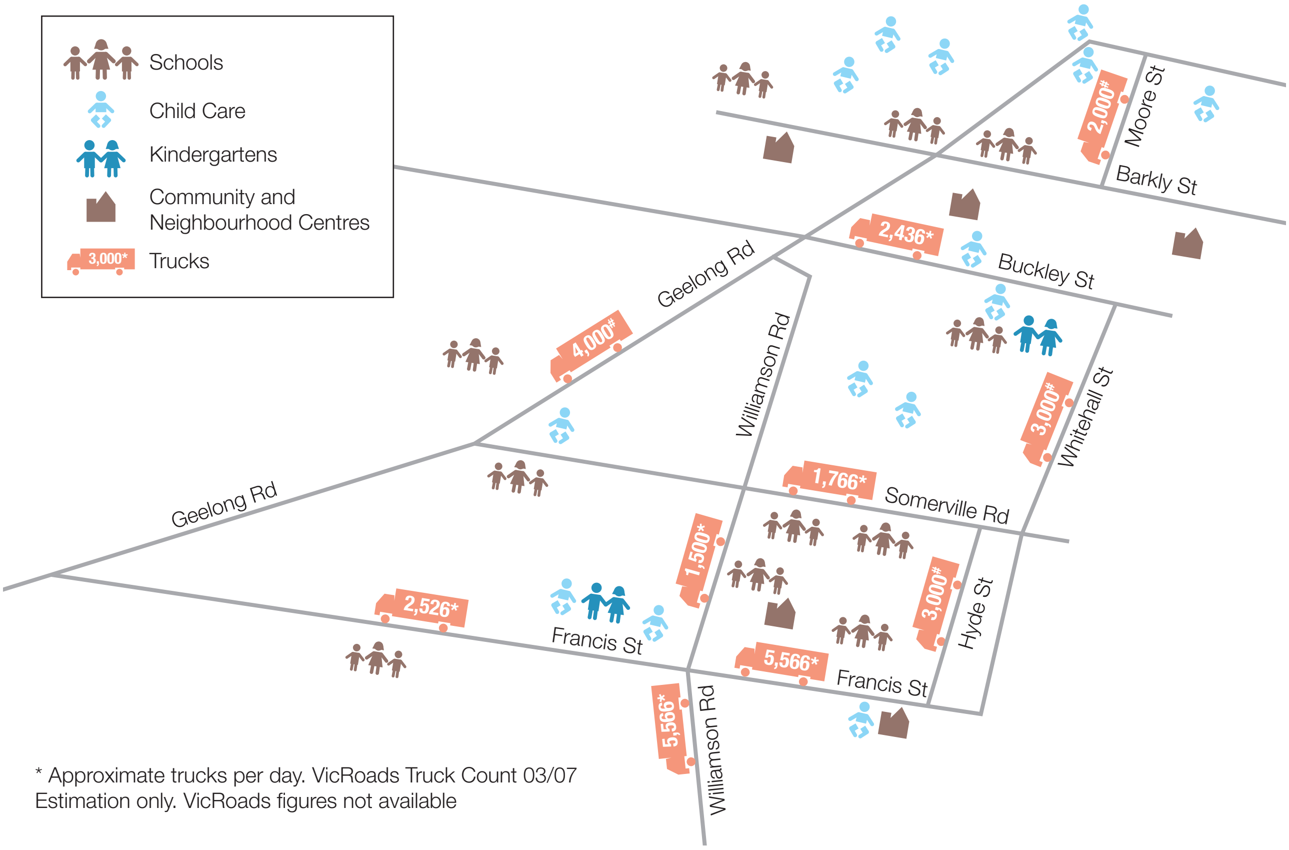
This point is reinforced by the Victorian Government's draft Melbourne Port@l strategy, which highlights the growth in container trade with an origin/destination in metropolitan Melbourne (see Chapter 6.1).

When viewed alongside predicted strong population growth in the western region of Melbourne, the extent of the looming transport management problem in the inner west is profound.

39. Maribyrnong Truck Action Group submission to the EWLNA (2007), p.10

40. City of Maribyrnong submission to the EWLNA (2007), p.20

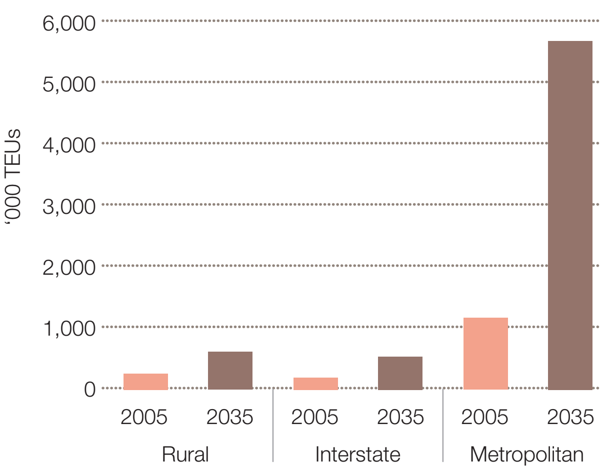
Figure 80 – Community activity in the inner west along current major freight routes



* Approximate trucks per day. VicRoads Truck Count 03/07
Estimation only. VicRoads figures not available

Source: MTAG

Figure 81 – Forecast growth in international container trade by origin/destination



Source: DOI (2006)

The Maribyrnong Truck Action Group (MTAG), the City of Maribyrnong, members of the former Francis Street Working Party and residents all suggested infrastructure and policy options to tackle the problem. The list of physical options included:

- A new link from the West Gate Freeway connecting to Whitehall Street and the port, effectively bypassing the eastern end of Francis Street (this option was opposed by the City of Hobsons Bay)
- New and improved north-south road links through Brooklyn/Tottenham to the West Gate Freeway to improve connections from industrial/warehouse/transport logistics sites in Tottenham and Brooklyn to the West Gate Freeway. The proposed alignment could include Tottenham Parade, Paramount Road and Dempster Street as a key north south truck route linking to Geelong Road–Millers Road and the Freeway
- A new bridge across the Maribyrnong River connecting Whitehall Street to MacKenzie Road on Coode Island. A new crossing of the Maribyrnong river south of Footscray road connecting Whitehall Street to MacKenzie Road would provide a good truck link into the port road network, linking to Coode Road and Dock Link Road
- Improved road connections between Footscray Road, Dynon Road and CityLink
- A Tunnel under Buckley Street/Napier Street between Geelong Road and Footscray Road. The City of Maribyrnong suggests such a tunnel would provide additional east-west road capacity from the western suburbs to Footscray Road; good connections with Geelong Road to the port, creating an attractive freight route for industry in the western suburbs; the separation of through traffic, including trucks, from local traffic accessing Footscray and Seddon along the route; reduced trip times; and an opportunity to maximise land value and amenity.

The Study Team has evaluated these and other options and made a number of recommendations to address this issue.

Study Team Finding

The level of truck traffic in Melbourne's inner west is unsustainable from a community amenity and safety point of view, and a solution should be sought to address the problem.

Projects recommended by the EWLNA should make a substantial contribution to addressing this issue.

chapter 7

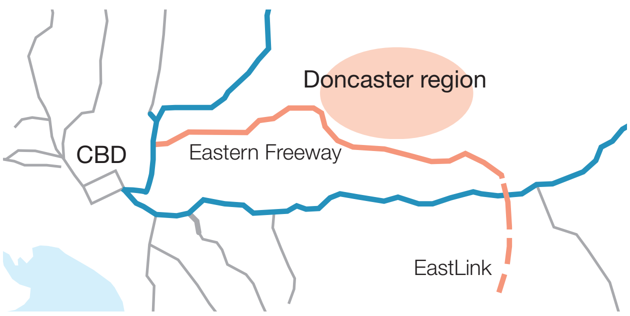
7. public transport and the doncaster corridor

A significant number of submissions to the EWLNA addressed transport issues in relation to the Doncaster region. The Study Team has explored these issues as part of its brief to examine opportunities for public transport in Melbourne's east-west corridor.

7.1 Background

The Doncaster/City of Manningham area is located around 12 km from the Melbourne CBD. It is a mainly residential area, with urban areas in the west and central part of the region and rural properties and hobby farms in the east. The region is home to 116,000 residents, forecast to grow to 132,000 by 2031 – an average annual population increase of 0.5 per cent.

Figure 82 – The Doncaster catchment



At present, around 8,500 of the region's residents commute to work in central Melbourne each day.[1] Figures from the 2006 Census show that well over half (60 per cent or 5,100 people) of all Manningham commuters to central Melbourne drive to work, while a smaller amount (37 per cent or 3,150 people) catch public transport.[2] Of those commuters using public transport, two thirds use buses along the Eastern Freeway and one third travel by either the Ringwood or Hurstbridge rail lines.

As shown in Table 20, levels of commuting by public transport in the Doncaster/Manningham area are significantly lower than in neighbouring municipalities: around 37 per cent, compared to 51 per cent in Banyule and 56 per cent in Whitehorse and Maroondah.

These figures suggest that the public transport options in the region do not meet the transport needs of many residents. They also suggest that the provision of better and more frequent public transport services to the region could significantly increase the use of public transport.

Commuters using improved public transport to the Manningham region would also include people outside this catchment, such as residents of Boroondara, Whitehorse and Banyule. To the extent such a service is used depends upon its accessibility (including the nature of stops/stations and parking and drop-off facilities).

Using the 2006 Census figures, an improvement to public transport services in Manningham could be expected to increase journey to work mode share in the morning peak period from 37 per cent to the 56 per cent currently experienced in Whitehorse and Maroondah.

This would be an increase of 1,600 people using public transport, out of the 8,500 Manningham residents who work in central Melbourne. This number is unlikely to grow significantly in the years ahead due to the demography of Melbourne. Indeed, the number of central Melbourne workers living in Manningham has actually decreased by 700 since the 2001 census.

1. EWLNA – using ABS 2006 Census data. This includes all potential commuters (including those who worked at home and did not go to work on Census day). This definition of central Melbourne includes the ABS Statistical Local Areas of Melbourne (c) – Inner, Melbourne (c) – Southbank and Docklands, and Melbourne (c) – Remainder. This broad definition has been used by the Study Team because it captures most employment destinations within the central city and enables the best comparison of public transport modes.
2. Ibid

Table 20 – Corridor Journey to Work mode share comparisons to the central city (including CBD, Docklands and Southbank), 2001 and 2006

	Manningham		Banyule		Maroondah		Whitehorse		Metro Melbourne average	
	2001	**2006**	2001	**2006**	2001	**2006**	2001	**2006**	2001	**2006**
Car	63.8%	**59.1%**	46.9%	**42.6%**	41.9%	**39.6%**	42.6%	**39.0%**	45.9%	**40.9%**
Public Transport	32.2%	**36.9%**	48.1%	**51.0%**	53.9%	**56.0%**	52.3%	**55.9%**	44.1%	**45.7%**
Walking & Cycling	0.3%	**0.6%**	1.1%	**2.2%**	0.3%	**0.8%**	0.5%	**1.1%**	5.3%	**9.2%**
Other JTW	3.8%	**3.4%**	3.0%	**4.1%**	4.0%	**3.6%**	4.6%	**4.0%**	4.7%	**4.3%**

Source: EWLNA – using ABS Census 2006 data

Doncaster – Fast Facts

Manningham resident population (2006 Census)	**116,000**
Current two-way daily bus patronage (Eastern Freeway buses)	**11,600**
Manningham residents working in central Melbourne	**8,500**
Freeway buses arriving in the city before 9am	**62**
AM peak patronage on freeway buses	**3,300**
Manningham residents catching public transport to work in CBD	**3,150**
Manningham residents catching bus to work in CBD	**2,110**
Manningham residents catching train to work in CBD	**1,040**

7.1.2 Existing public transport services

The Doncaster/Manningham region's public transport services are provided mainly by buses. The 2006 Census shows that 67 per cent of Manningham workers who travel to the central city by public transport use buses, compared to around 3 per cent using buses for commuting in the surrounding municipalities.[3]

At present, express bus services along the Eastern Freeway provide a reasonably high frequency connection from the Doncaster area to the inner north and the Melbourne CBD during peak periods. Routes 301-309, 313, 315, 316 and 319 provide around 62 services that arrive in the CBD between 7am and 9am on weekdays, carrying around 3,300 passengers. The services take between 25 and 50 minutes to travel from Doncaster to the CBD. Generally, these bus services are well-patronised and are increasing in popularity.

The 2006 Census Journey to Work figures show that (compared to 2001):

- Bus and rail patronage in the corridor has grown from 32.2 per cent to 36.9 per cent
- Commuting by motor vehicle has declined from 63.8 per cent to 59.1 percent
- The number of central city commuters from Manningham has decreased by about 700 (8 per cent) over the last five years (compared to a 9 per cent increase in overall numbers of people commuting to the central city from the rest of metropolitan Melbourne).[4]

The existing freeway bus services will not have been immune from the recent increase in public transport patronage in Melbourne. As the submission from Metlink to the EWLNA indicates, the mode share of public transport trips from the Doncaster region to the central city would now be higher than recorded in the 2006 Census.[5]

In the broader north east corridor, rail services are provided by the Hurstbridge and Ringwood lines. According to the 2006 Census, around 32 per cent of Manningham public transport users use these lines to access the central city. The most recent load surveys indicate that the Hurstbridge line is exceeding the load standards of an average of 800 passengers per train in the busiest peak hour, with several trains also exceeding this level on the Ringwood Line.

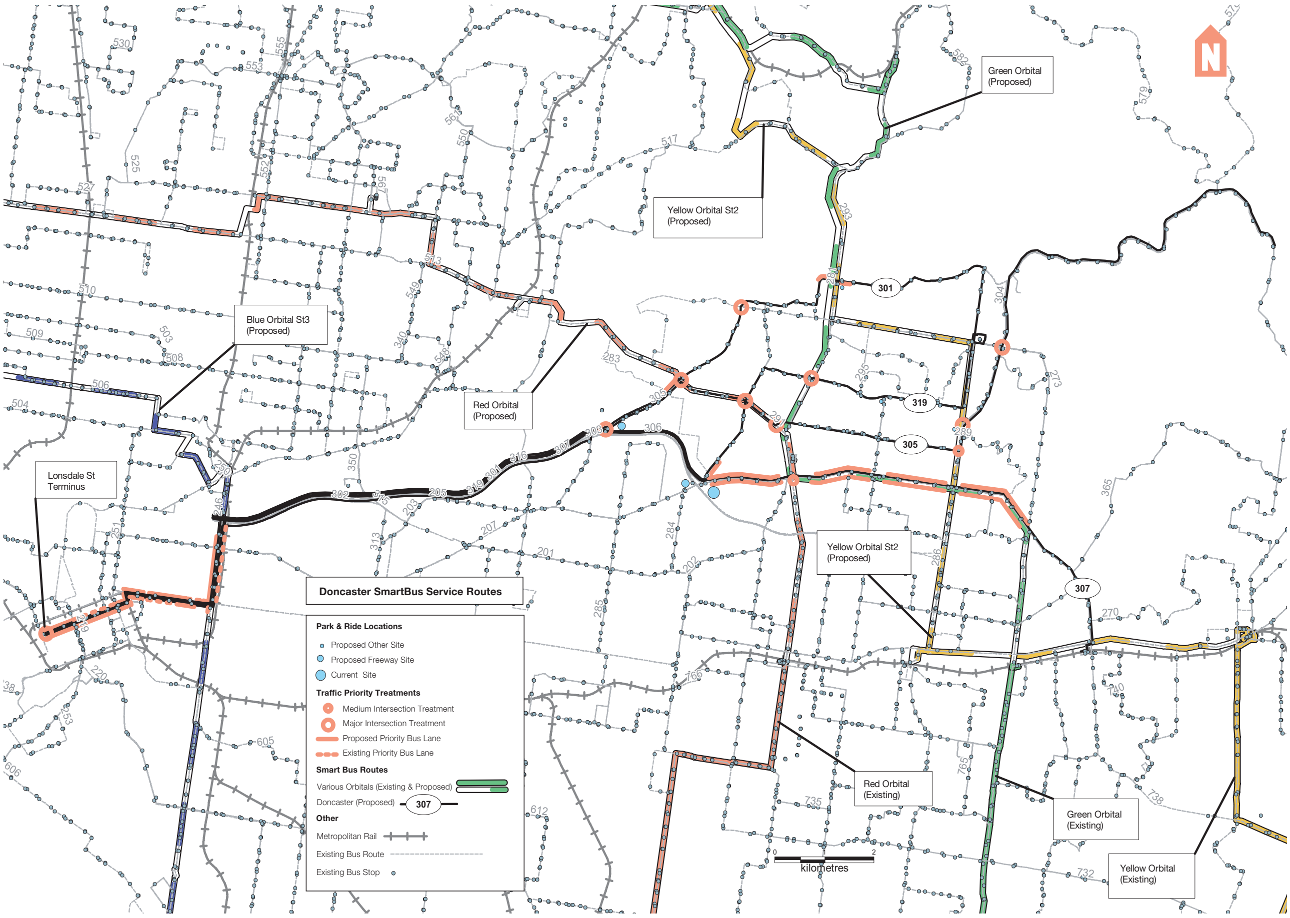
The Victorian Government has recognised the need for improvements to public transport services in the region and has provided $80 million to the Doncaster Area Rapid Transit (DART) project with the aim of upgrading bus services in the Doncaster/Manningham corridor 'to a level of service comparable to rail'. Commencing in 2009-10 (subject to final budget allocations), the upgrade will include increased hours of operation, more frequent services, road bus priority measures, more Park & Ride facilities and improved accessibility for people with disabilities and restricted mobility. The Bus Association of Victoria has estimated that the DART upgrade will generate an extra 3,000 to 4,000 trips each day by 2016[6].

Manningham and adjacent areas will also benefit from two orbital SmartBus routes commencing in 2009. The Red Orbital will connect Box Hill, Doncaster, Heidelberg, Northland, Preston, Coburg, Essendon and East Keilor. The Green Orbital will connect Doncaster, Greensborough, Broadmeadows and Sydenham.

The evidence from other parts of Melbourne is that bus upgrades (especially SmartBus services) have boosted patronage considerably – to nearly 50 per cent along some routes.[7] This suggests that a strong increase in bus patronage is achievable from the DART upgrade and the new orbital routes, leading to an overall increase in public transport mode share in the region.

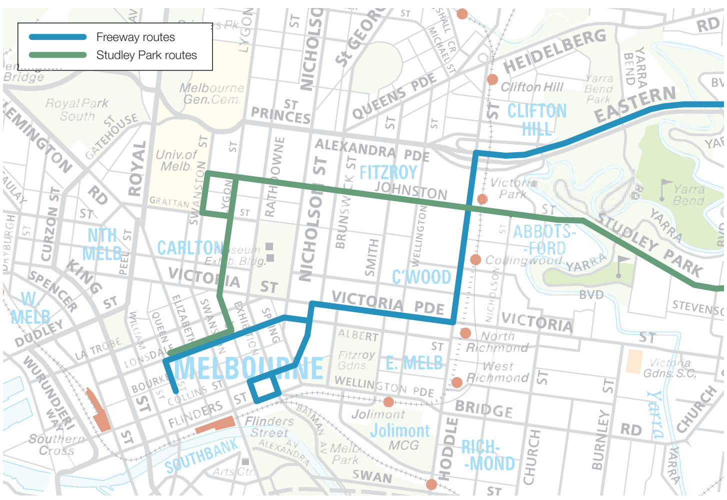
3. ABS 2001 and 2006 Census data
4. ABS 2006 Census data
5. Metlink submission to the EWLNA (2007), p.38
6. Ibid, p.17
7. Minister for Public Transport, 'SmartBus still the smart transport choice for eastern suburbs', Media Release, 20 December 2007, accessed at Victorian Government media site: www.dpc.vic.gov.au/pressrel

Figure 83 – Bus services in the Doncaster corridor – local links



Source: Public Transport Division (DOI)

Figure 84 – Bus services in the Doncaster corridor – links to the central city



Source: Public Transport Division (DOI)

7.1.3 Issues raised by submissions

Submissions to the EWLNA raised several issues about transport in the Doncaster corridor. The main assertions made by these submissions were:

- Public transport services and mode share in the region are poor compared to other corridors
- The recent growth in bus patronage and the success of Doncaster Park & Ride indicates support for public transport, but existing services have limitations in meeting the region's travel needs
- A heavy rail link would relieve traffic congestion at the western end of the Eastern Freeway

The Study Team has carefully examined these issues.

Low public transport mode share

As noted above, levels of commuting by public transport in the Doncaster/Manningham area are significantly lower than in neighbouring municipalities. The most common observation about this situation is that the lack of heavy and/or light rail services in the area has led directly to a relatively low public transport mode share and relatively high car ownership.

A comparison of existing service levels on the region's freeway bus services with neighbouring heavy rail lines shows that the frequency of some bus routes is relatively low and that there is a lack of late night, off-peak and weekend services.

This comparison suggests that the frequency and the availability of public transport services in the Doncaster corridor (when compared to adjoining heavy rail services) is significantly lower than in neighbouring areas – although the variety of local bus routes (see Figure 83) provides a local, close-to-home service that is potentially more convenient and flexible than a single local train station.

The Member for Doncaster, Mary Wooldridge, canvassed the views of her constituents in preparing a submission to the EWLNA and noted that:

> *"….there was much frustration with the current bus services offered to Doncaster residents, both during peak hour and also at weekends and outside of peak time. This is not confined to submissions to this study, it is a constant discussion point when transport is mentioned in Doncaster … It is clear from the many views of bus patrons that at the very least they want improvements to their current services as quickly as possible."*[8]

The Study Team agrees with the observation made in a number of submissions that public transport services in Doncaster are poor compared to other corridors.

Limitations of existing bus services

There are a number of limitations on the effective operation of existing bus services in the Doncaster corridor:

- As the demand for public transport continues to rise, peak period bus services must be added to keep pace. This increase in services is accompanied by issues of available parking spaces and adequate drop-off points.
- The frequency of services remains low, particularly in off-peak periods and at the weekend. Weekend services run hourly, compared to a 20 minute frequency in heavy rail services in adjoining municipalities. However, while bus frequencies might be lower than nearby rail services, the Doncaster region has the advantage of multiple bus routes servicing different streets, compared to a single corridor heavy rail service.
- Hours of service are also often cited as a shortcoming of the current bus services. Many of the weekday services do not continue beyond 9.00pm or 10.30pm, and some routes cease by 6.30pm. For many people who are unsure about when their working day or post-work activities may end, these finishing times are a disincentive to using public transport compared to the flexibility of a car. By contrast, rail services typically continue beyond midnight and later on Friday and Saturday nights.
- Service reliability is also an issue. Travel times for bus services can fluctuate significantly when buses compete with cars for road space. Recent improvements in road space prioritisation aim to improve this aspect of Doncaster corridor services, through the addition of dedicated bus lanes along Hoddle Street, Victoria Parade and along Lonsdale Street in the CBD. Doncaster buses also avoid car congestion by using the emergency lane on the Eastern Freeway.

  While these developments are positive, there remains considerable scope for improvement, particularly for journeys home from the city after work. Buses still get caught in congestion on Victoria Parade and the transit lane on Hoddle Street is still full of single occupant vehicles blocking the route of buses. This leads to widely fluctuating travel times that act as a disincentive for people to use the services.

8. Member for Doncaster submission to the EWLNA (2007), pp.7-8

Table 21 – Comparison of existing service levels – Eastern Freeway bus services and Hurstbridge and Ringwood rail lines

Services	Monday - Friday			Saturday		Sunday	
	Peak Freq (min)	Last Service	Typical Freq (min)	Last Service	Typical Freq (min)	Last Service	Typical Freq. (min)
301	5	6:26 pm	30	No Service			
302	13	11:12 pm	60	11:30 pm	60	7:39 pm	90
303	13	Weekday Peak Only		No Service			
304	9	9:55 pm	30	9:30 pm	60	9:10 pm	60
305	9	10:25 pm	30	11:00 pm	60	6:05 pm	60
306	13	Weekday Peak Only		No Service			
307	4	9:07 pm	30	9:08 pm	60	9:22 pm	60
308	4	Weekday Peak Only		No Service			
309	13	6:08 pm	60	No Service			
313	13	Weekday Peak Only		No Service			
315	13	Weekday Peak Only		No Service			
316	13	Weekday Peak Only		No Service			
319	4	3:38 pm	60	No Service			
Hurstbridge Rail Line	6	12:05 am	20	1:10 am	20	1:10 am	20
Ringwood Rail Line	5-10	12:05am	15	1:10 am	20	1.10 am	20

Last Service = last service departing the CBD (Queen Street – Bus/ Flinders Street Train)
Typical Frequency = Typical daytime frequency (peak period frequencies are higher)

Source: EWLNA – using information provided by the Public Transport Division (DOI)

Growth in bus patronage and Park & Ride facilities

Patronage on Doncaster bus services has grown – to the extent that some services are now overcrowded.

The 2001 Census found that PT mode share for the journey to work from Manningham to central Melbourne was 32.2 per cent. In the 2006 Census, this had risen to 36.9 per cent – a significant increase in modal share. However, it is important to keep these numbers in perspective. The mode share increase over this five year period was offset by a reduction in the number of city workers living the area: overall, the actual increase was not great.

Nevertheless, in its submission to the EWLNA, Metlink reported that bus patronage in the Doncaster region has increased by a further 8 per cent in the 12 months since the 2006 Census.[9] Metlink's view was that this increase was being driven by better bus services and the introduction of Park & Ride sites.

In 2003, a Park & Ride facility (with parking for 400 cars) was opened at Doncaster Road along the Eastern Freeway. This facility has rapidly outgrown its designed capacity, with parking spilling over into neighbouring streets. At present, there are around 2,500 bus boardings each weekday at the facility, the vast majority of which are headed towards the city. This increase in demand has been met by increased peak period services – and these services continue to be very well patronised.

Clearly, as bus patronage grows, these peak period services and accompanying parking capacity issues must be addressed – and should be addressed – by DART.

9. Metlink submission to the EWLNA (2007), p.38

The NCCC strategy

As noted in Chapter 5, the draft Northern Central City Corridor Strategy was released in August 2003. While the NCCC covered a more limited study area than the EWLNA, it did discuss transport issues along the Doncaster/Manningham corridor.

The strategy proposed consideration of a Doncaster Area Rapid Transit (DART) system as part of improvements to public transport in the inner northern suburbs. As proposed by the NCCC, DART would replace current bus services with dedicated bus, light rail, heavy rail or a 'hybrid' system. The NCCC noted that preliminary studies favour light rail or a hybrid system (mainly on cost grounds), but that detailed feasibility studies are needed to establish the best option.

Congestion on the Eastern Freeway

One observation when discussing the potential for enhanced public transport services to the Doncaster/Manningham region is that such services would relieve the daily congestion that occurs at the western end of the Eastern Freeway. This observation is based on the commonly held view that most of the traffic arriving at the end of the freeway during the morning peak period is coming from Doncaster.[10]

Each day, some 70,000 vehicles travel westbound along the Eastern Freeway from the east towards Hoddle Street and Alexandra Parade. During each morning peak period (between 7am and 9am), 40 per cent exit at Hoddle Street and 60 per cent continue on to Alexandra Parade. This causes considerable congestion at the end of the Eastern Freeway and regularly results in traffic queuing back along the freeway as far as the Chandler Highway exit.

Analysis undertaken for the EWLNA shows that most of these vehicles have not travelled from the Doncaster/Manningham region. The single biggest origin of traffic entering the freeway (33 per cent) is at Springvale Road, well to the east of the region (see Figure 85).

Another common belief is that a heavy rail service to the area will substantially reduce this congestion. However, analysis by the EWLNA shows that a large amount of Eastern Freeway traffic entering from the north and further east originates within 2 km of an existing train station (on the Hurstbridge and Ringwood lines). This is shown in orange in Figure 85.

In many instances, the drivers of these vehicles either reside near well-established heavy rail services or drive by existing rail services and stations each morning (although, as noted In Chapter 3, parking at train stations is at a premium). In other words, despite having access to a rail service to the central city, these commuters choose to travel by car. This may simply be a personal preference or it may be that many of these commuters require their cars during the day for work-related tasks or for multi-purpose trips (such as picking children up from school after work). This suggests that some of these vehicles will continue to drive along the Eastern Freeway irrespective of the provision of new or enhanced public transport services to the Doncaster/Manningham catchment. This is not peculiar to Doncaster – as noted in Chapter 2, many people are simply wedded to car travel.

These conclusions are reinforced by further EWLNA analysis of possible rail options for the corridor that show very clearly that an increase in rail patronage would occur largely at the expense of other public transport in the region (the adjacent rail lines and particularly existing bus services).[11]

Accordingly, while congestion at the western end of the Eastern Freeway is an important transport network issue (and an important issue for cross-city travel), it does not occur solely as a direct result of the level or type of public transport services provided to the Doncaster/Manningham region.

Analysis undertaken by the Study Team indicates that a multi-modal approach is needed to relieve congestion at the end of the Eastern Freeway: improved public transport capacity and access into the city, and improved road connections for through traffic to bypass the city and travel beyond the CBD.

However, it is vital that Doncaster corridor public transport services heading to central Melbourne are able to bypass, or have priority over, private motor vehicles to avoid being caught up in this congestion and further discouraging public transport use.

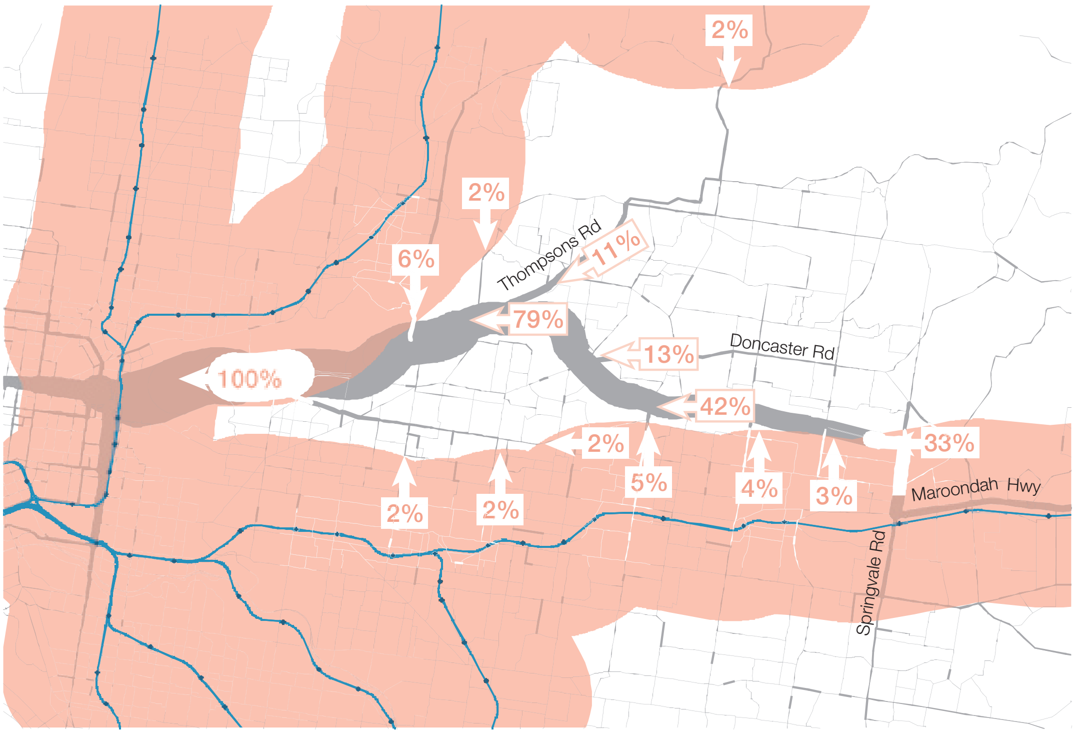
As the City of Yarra noted in its submission:

> *"Public transport is clearly a preferred method for catering for commuters due to the efficiency of movement in transit way space."*[12]

10. See Chapter 5 for further discussion about congestion at the western end of the Eastern Freeway.

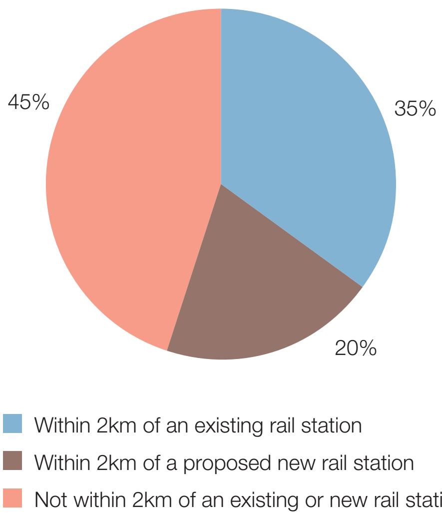
11. See Chapter 7.2
12. City of Yarra submission to the EWLNA (2007), p.11

Figure 85 – Percentage distribution of origins for all traffic exiting the Eastern Freeway at Hoddle Street and Alexandra Parade, AM peak



Source: EWLNA (Veitch Lister)

Figure 86 – Origins of traffic at the end of the Eastern Freeway, AM peak – proximity to rail options



Source: EWLNA (Veitch Lister)

7.2 Exploring the options

The Study Team has reviewed a range of public transport options in the Doncaster corridor, including:

- Heavy rail
- Light rail
- DART (with further service enhancements).

These options are set out in more detail in Appendix C.

Table 22 summarises the options reviewed by the Study Team. These options assume a frequent, reliable service to the heart of the Manningham/Doncaster region, accompanied by the most flexible options for access to the central city and Parkville (Melbourne University).

The Study Team's view is that the quickest and most cost-effective way of achieving a substantial boost in public transport along the Doncaster corridor is through the planned DART upgrade, with some additional service enhancements. These enhancements would leverage off the DART upgrade by delivering:

- Much higher bus priority through new bus-only lanes and ramps, and greater enforcement of bus-only lanes (including continuous bus-only lanes from the end of the Eastern Freeway into the CBD)
- A major new interchange at Victoria Park Station, giving passengers a choice to travel directly to the central city or to Carlton/Melbourne University and Parkville, as well as further west or south-east via a new Parkville underground rail station.
- Tram-like service levels and hours of operation (7 day operation to midnight, 5 minute or better peak and daytime service)
- New hybrid buses
- Expanded Park & Ride facilities

With the right measures in place, these enhancements could cut the travel time between Doncaster Hill and Melbourne Central from around 38 minutes to 25 minutes – approaching the travel time that could be achieved by a dedicated rail line. These enhancements have the potential to provide the residents of the Doncaster/Manningham region with a state-of-the-art public transport service to the central city.

Projected patronage

A fixed rail link via the Eastern Freeway would have little local catchment along the freeway due to its inaccessibility. Few houses are within walking distance of any stops along the freeway, requiring nearly all access to be by car or bus. Major car parks would need to be constructed adjacent to the freeway.

Analysis by the EWLNA shows the total potential patronage in 2021 of approximately 25,500 (all day, two way). This should be considered in context with current (2007) patronage on the Hurstbridge line (around 38,000) and the Frankston line (around 51,500). In addition, these figures include boardings from outside the Doncaster/Manningham region and assume stops along the Eastern Freeway (irrespective of the difficulties in accessing these stops or the challenges in providing adequate Park & Ride facilities to service these stops).

The analysis also shows much of the rail patronage would relocate from the existing freeway bus service and the Ringwood and Hurstbridge heavy rail lines, with a smaller number of people shifting from private cars (see Figure 87).

In summary, the EWLNA analysis indicates that implementing an $80 million DART initiative in 2009 will provide a substantial boost to patronage in Doncaster as it addresses many of the shortcomings identified in existing public transport services.

The Study Team modelled the different options to compare patronage levels in 2021.

The rollout of DART should see bus patronage increase to over 15,000 trips per day in 2021, with a further boost to 20,000 trips per day through the implementation of further priority measures identified by the Study Team (see Figure 87).

These measures have the ability to provide commuters with the same frequency and hours of operation as heavy or light rail – and to deliver those services quickly. The flexibility of a bus service also allows a rapid response to any unexpected increase in patronage or any change in catchment characteristics.

The Study Team acknowledges that the expectations of some residents of the Doncaster area have been raised in relation to a rail link. This is unfortunate as the substantially improved services offered by an enhanced DART service can provide a bus service that is as fast, comfortable and reliable as a fixed rail service. As a number of submissions to the EWLNA pointed out, bus has proved to be a successful rapid mass transit system in many cities around the world and there is no reason why buses cannot perform the same role along the Eastern Freeway for the Doncaster area.

The EWLNA analysis shows that a heavy or light rail service to Doncaster would attract a relatively small number of extra people to the public transport system, with most people using the services simply switching from services such as DART or the Hurstbridge and Ringwood rail lines.

Compared with the patronage of 20,000 forecast from the enhanced DART service, the analysis shows that of the 24,500 daily trips made if a heavy rail solution was implemented, only 2,500 of these trips would be new public transport users (see Figure 87).

In the case of light rail, an additional 6,000 trips would be new public transport users.

While this modal shift is desirable and important, when the relatively small number of additional people switching from private vehicles is taken into account – and when compared to other public transport priorities competing for government funds – such heavy or light rail investments would not represent value-for-money for Melburnians.

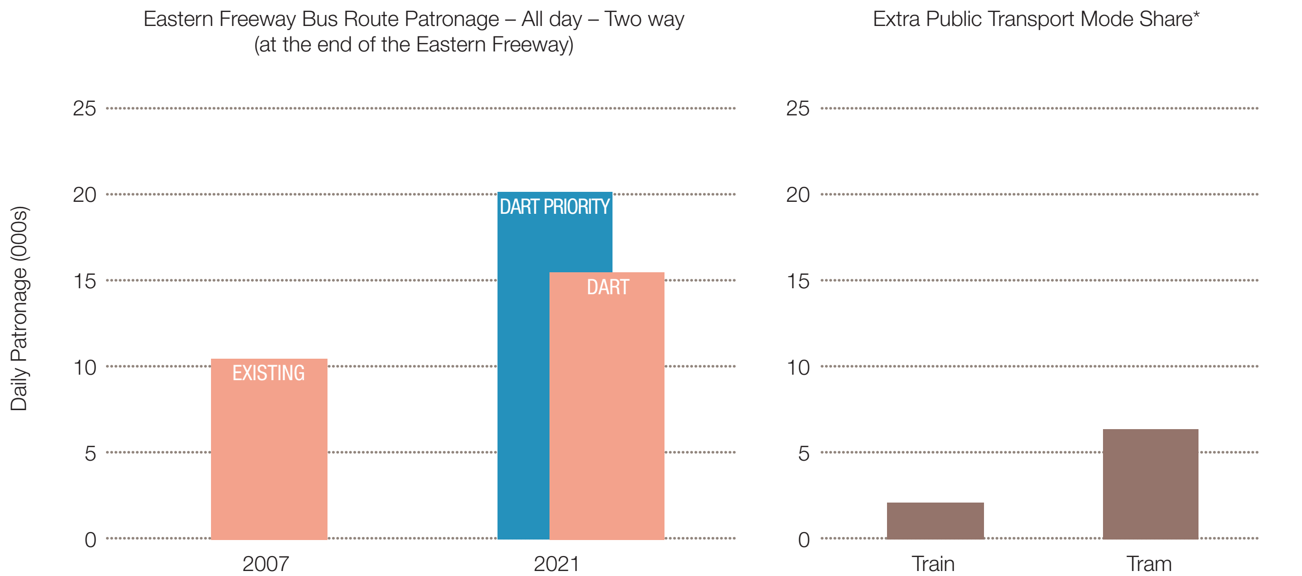
By way of comparison, the recommended $8.5 billion 'new generation' rail tunnel recommended by the EWLNA will provide capacity to meet demand for an additional 40,000 in the morning peak hour on Melbourne's busiest rail groups – the Northern and Caulfield Groups.

The challenge and the opportunity in Doncaster is to implement a world class rapid bus service that dispels once and for all the notion that buses are not as 'good' as trams or trains. In fact, with local street access and with main road priority, Doncaster should look forward to one of the best public transport services in the city.

Table 22 – Summary of Doncaster options

	Existing	Heavy Rail	Light Rail	Enhanced DART service
Capital cost	n/a	$1.7 b - $2 b	$600 m - $710 m	$230 m - $280 m
Journey time	34 to 47 minutes	25 to 30 minutes	35 to 40 minutes	25 to 35 minutes
Environmental impact	Low	Low to moderate	Low	Very low
Total PT trips per day by 2021	10,500	24,500	25,500	20,000

Figure 87 – Extra patronage under different transport modes



Source: EWLNA (Veitch Lister)

* The net increase in public transport use after allowing for people already using public transport switching to the new service.

What DART should deliver for Doncaster

Based on preliminary discussions with the Public Transport Division of the Department of Infrastructure, and the EWLNA's own modelling of required bus services, the Study Team believes that the DART upgrade should include a minimum 50 per cent boost to peak hour services to relieve current overcrowding and to provide for future growth.

Even more substantial increases should be provided in off-peak and weekend services, including a 100 per cent increase in weekend services running from 6am to midnight.

To achieve the desired increase in patronage, DART must provide commuters with a frequency of service and hours of operation similar to existing tram and heavy rail services in neighbouring municipalities.

The Study Team believes that service improvements under the initial DART roll-out should include:

- Minimum 50 per cent increase in peak hour bus services into the CBD
- Minimum 100 per cent increase in weekend services into the CBD
- Peak hour frequencies of around 5 minutes
- Weekend services from 6am to midnight
- Upgrading of a number of routes to SmartBus standard

The roll-out must deliver a major improvement to public transport services along the Doncaster corridor. It must also provide passengers with a bus system that has the quality and popular features of rail services combined with the flexibility and cost advantages of buses. It must aim to be a rapid transit, high capacity transport system with major elements that include:

- Dedicated, bus-only priority lanes or rights of way along routes
- Special stations
- High frequency services
- The use of intelligent transport systems to keep passengers informed about travel times and wait times.

The benefits delivered by similar bus rapid transit systems in cities around the world are well documented and include:

- Performance improvements – such as travel time savings, greater reliability, improved safety and greater capacity
- Higher levels of bus (public transport) patronage
- Relatively low capital costs per mile of investment
- Environmental benefits – where hybrid/low carbon buses are used, DART also has the potential to make a contribution to reducing GHG emissions.

Study Team Findings

Currently, the Doncaster corridor is not as well-served by public transport as adjoining municipalities. Existing bus services connecting the area to central Melbourne offer levels of service that do not fully meet residents needs, resulting in relatively low levels of patronage for public transport.

The quickest and most cost-effective way of achieving a substantial boost in public transport along the Doncaster corridor is through the planned DART upgrade, accompanied by further service enhancements.This has the potential to provide residents of the Manningham/ Doncaster region with a state-of-the-art public transport service to the central city that is as fast, comfortable and reliable as a fixed rail service – at around one tenth of the cost.

Building a heavy rail link to Doncaster would not significantly relieve congestion at the city end of the Eastern Freeway.

The Study Team's view is that the evidence does not support investment of between $600 million and $2 billion in a heavy or light rail link to the Doncaster area being given priority. When the relatively small number of additional people switching from private vehicles is taken into account – and when compared with other public transport priorities – these investments do not represent value-for-money for Melbourne.

Implementing DART and the EWLNA recommended enhancements has the potential to give Doncaster a world class rapid bus transit service that is one of the best public transport services in the city.

chapter 8

8. transport and the environment

8.1 Climate change

There is now little dissent from the view that climate change is happening, is highly likely to be caused by human activity and is accelerating. As the UK Stern Review noted:

> *"The scientific evidence is now overwhelming: climate change is a serious global threat and it demands an urgent global response."*[1]

This view has been endorsed by the interim report of the Garnaut Climate Change Review, which states that:

> *"The large majority of the relevant scientific opinion, and of the leadership of the learned academies of science in the countries of great scientific accomplishment, hold the view that human-induced climate change is with us, and that it is already affecting natural and human systems and will increasingly create risks to current patterns of human settlement and activity."*[2]

Similarly, the Intergovernmental Panel on Climate Change recently observed that global debate is now focusing on responses to climate change – on what must be done to slow its progress and ameliorate its effects.[3]

This view is accepted by the Victorian Government, which presented – and signed – a Declaration on Climate Change to the Council for the Australian Federation (CAF) in February 2007 that formally recognises "the scientific evidence demonstrating that human activities are already having an impact on the global climate and that to avoid dangerous climate change, deep cuts in global greenhouse gas emissions will be required by mid-century".[4]

The Study Team shares the view of the Victorian Government that climate change presents a real risk to the state's economy and the environment, and that action needs to be taken to reduce greenhouse gas (GHG) emissions. The Team notes that tackling transport's GHG emissions is part of a broader agenda that extends well beyond the scope of the EWLNA and that Victoria's new Office of Climate Change is investigating initiatives to reduce emissions from the state's transport sector.

While concurring with the view expressed by the Stern Review and others that "cost effective emission savings from transport are initially likely to come from improvements in the fuel efficiency of oil-based transport vehicles, behavioural change, and use of biofuels",[5] the Study Team recognises that transport cannot be immune from targeted action to reduce emissions and that it is essential to consider the impact of new transport projects on climate change and GHG emissions.

8.1.1 Transport's contribution to GHG emissions

Globally, transport is the third largest contributor to GHG emissions (after stationary energy – or power – and land use). Currently, transport contributes around 14 per cent of emissions worldwide and has been the fastest growing source of emissions worldwide, due to the continuing growth in car transport and the rapid expansion of air transport.[6]

As shown in Figure 88 the largest single source of direct GHG emissions in Australia is the stationary energy sector (electricity, gas and water), which accounts for 50 per cent of Australia's emissions. In 2005, 14 per cent of all GHG emissions in Australia were generated by the transport sector, with 87.9 per cent of these emissions coming from road transport. Between 1990 and 2005, these emissions grew by 29.9 per cent, increasing by around 1.8 per cent each year.[7]

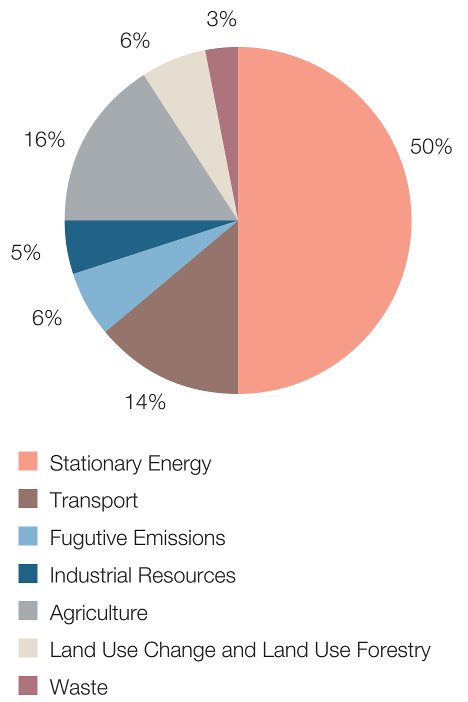
1. U.K. H.M. Treasury (2006), *Stern Review: The economics of climate change*, September 2006, United Kingdom, Department of Treasury, p.vi
2. Garnaut, Ross (2008) *Climate Change Review: Interim Report to the Commonwealth, State and Territory Governments of Australia*, Canberra, p.8
3. IPCC: Intergovernmental Panel on Climate Change (2007), *Climate Change 2007: The Physical Science Basis (Summary for Policymakers)*, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, Switzerland
4. CAF: Council for the Australian Federation (February 2007), Declaration on Climate Change, available at the Department of Premier and Cabinet website: www.dpc.vic.gov.au
5. U.K. H.M. Treasury (2006), Annex 7.c
6. Ibid, p.356
7. All figures sourced from: Australian Greenhouse Office (2007), *National Greenhouse Gas Inventory 2005*, Department of the Environment and Water Resources, Commonwealth of Australia, Canberra

GHG emissions from transport are estimated to grow by more than 40 per cent between 1990 and 2010 and by more than 60 per cent between 1999 and 2020.[8] While these projections are for a relatively strong rate of growth in emissions (around 1.7 per cent a year between 2000 and 2020), the average projected growth rate is slightly below that of the 1990s (of about 1.9 per cent a year).[9]

The Bureau of Infrastructure, Transport and Regional Economics has noted that the scale of this forecast growth points to the fact that Australian transport demand is highly dependent on underlying economic and population growth.[10] The BITRE's projections of GHG emissions cover three scenarios (base case, high and low), with the BITRE noting that the high and low trends are not necessarily plausible scenarios for the future.[11]

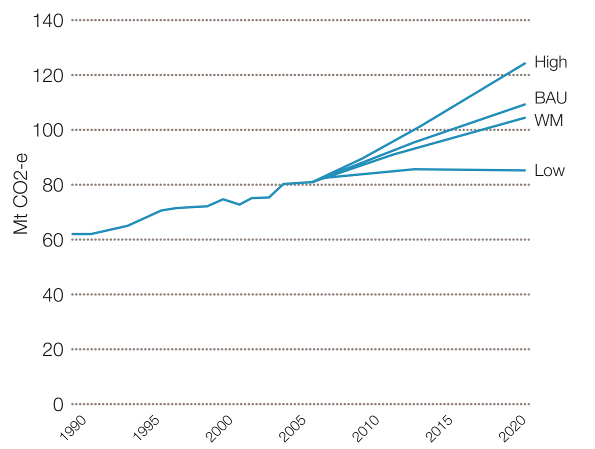
In Victoria, transport is also the second largest producer of GHG after stationary energy production. In 2005, energy production generated around 55 per cent of all GHG emissions attributable to Victoria, while transport across all modes generated 16.9 per cent of total Victorian emissions. Emissions from the transport sector grew by 26.5 per cent between 1990 and 2005.[12]

Figure 88 – Australia's GHG emissions by sector – 2005



Source: Australian Greenhouse Office (2007)

Figure 89 – GHG emissions from the transport sector, 1990 to 2020



Source: BITRE (2007), Department of Climate Change analysis
Note 1: WM = 'With Measures' best estimate; BAU = 'Business as usual'
Note 2: High and low scenarios are variations on the 'With Measures' scenario

8. Australian Greenhouse Office (2006), *Transport Sector Greenhouse Gas Projections 2006*, Department of the Environment and Heritage, Commonwealth of Australia, Canberra. See also: BITRE (2003), *Greenhouse Gas Emissions to 2020*, Information Sheet 21, Commonwealth of Australia, Canberra. In 2008, the programs and functions of the Australian Greenhouse Office were taken over by the Department of Climate Change. This report continues to refer to the Australian Greenhouse Office in relation to publications released prior to this change in administrative arrangements.
9. BITRE (2003b), *Greenhouse Gas Emissions to 2020*, Information Sheet 21
10. BITRE (2005), *Greenhouse Gas Emissions from Australian Transport – Base Case Projections to 2020*, Department of Transport and Regional Economics, Commonwealth of Australia, Canberra
11. Ibid
12. AGO: Australian Greenhouse Office (2007b), *Victorian Greenhouse Gas Inventory 2005,* Department of Environment and Heritage, Commonwealth of Australia, Canberra

8.1.2 Modes of transport and GHG emissions

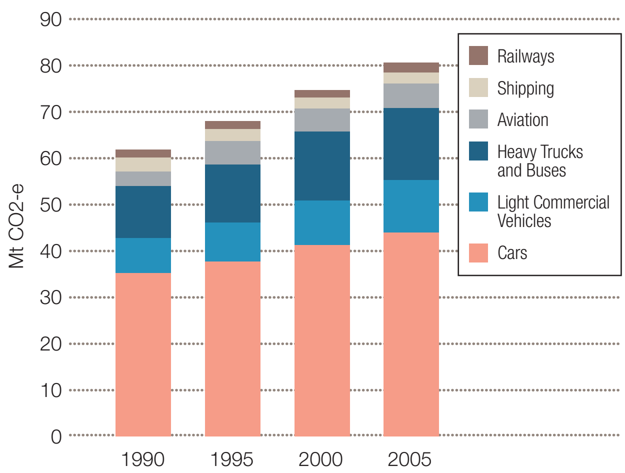
Currently in Australia, passenger cars account for more than half of the transport sector's GHG emissions. Emissions from cars increased by 25 per cent between 1990 and 2005;[13] however, car emissions grew at a slower rate than emissions from light commercial vehicles (LCVs), trucks and buses.

In Victoria, road transport was responsible for more than 90 per cent of emissions from the transport sector in 2005, although it should be noted that this calculation by the Australian Greenhouse Office does not include emissions associated with the use of electricity by Melbourne's metropolitan train and tram system.[14] Cars continue to contribute the majority of GHG emissions and are expected to contribute 56 per cent of emissions in 2008, with 25 per cent of emissions coming from trucks and other commercial vehicles.[15]

Victoria's Commissioner for Environmental Sustainability has noted that the current greenhouse intensity of car use in Melbourne is particularly high compared to many other cities – due largely to Melbourne's low urban density, which generates longer trip distances than comparable international cities. The Commissioner has observed that these relatively high levels of transport energy intensity mean that "attention must focus on ensuring that inefficient car use is minimised through better urban planning and design".[16]

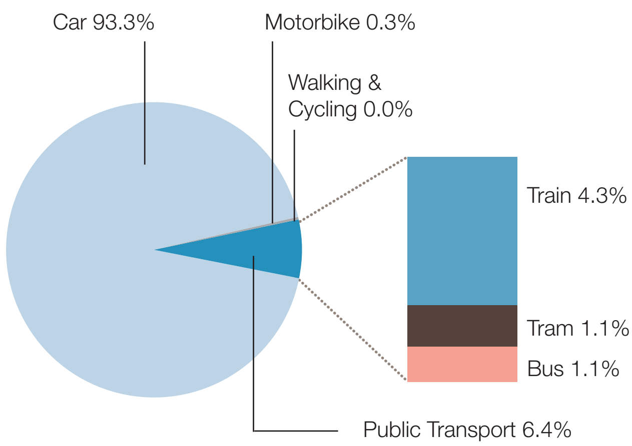
In Melbourne, recent research undertaken by Victoria's Department of Infrastructure shows that the overwhelming majority (more than 93 per cent) of GHG emissions from land passenger transport are being generated by motor vehicles (see Figure 91).[17]

Figure 90 – Total transport emissions by sub-sector in Australia, 1990 to 2005



Source: Australian Greenhouse Office (2007)

Figure 91 – Percentage of total passenger transport GHG emissions in Melbourne by mode



Source: Public Transport Division (DOI)

13. Australian Greenhouse Office (2007), *National Greenhouse Gas Inventory 2005*
14. This electricity use is accounted for within the energy industries sector: AGO (2007b)
15. BITRE (2002b), *Report 107; Urban Pollutant Emissions from Motor Vehicles: Australian trends to 2020*, Commonwealth of Australia, Canberra
16. Commissioner for Environmental Sustainability (2007), *Creating a city that works*, Position paper, May 2007, State of Victoria, Melbourne, p.8
17. Information provided by Public Transport Division (DOI)

8.1.3 Future trends

Australia-wide, by 2020, cars are expected to still be the largest single contributor to transport emissions, but the proportion of emissions they contribute will have decreased from around 57 per cent (in 2000) to around 50 per cent.[18] Emissions from cars will also grow at a slower rate (around 0.8 per cent a year) between 2005 and 2020 (see Figure 92).[19]

Aviation and LCVs are projected to have the strongest rates of growth (each averaging around 2.6 per cent per year).[20]

In Victoria, GHG emissions from transport are predicted to rise a further 16.4 per cent by 2020 (from 2005 levels). Of this, motor vehicles (cars and road freight vehicles) are expected to continue to contribute the greatest percentage of emissions.[21]

Over the next few decades, Melbourne's strong economic and population growth will fuel growing transport demand. The high value Melburnians place on personal mobility suggests that the demand for car travel will continue to rise, but at a slower rate as car ownership reaches a saturation point. These trends suggest that Melbourne faces some significant challenges in reducing GHG emissions from transport.

The EWLNA modelled future travel patterns in Melbourne in a 'carbon constrained world' in order to understand that changes that would occur in travel behaviour in such an environment. The Study Team examined a future scenario that looked ahead to 2031 to assess the impact of:

- an immediate overnight doubling in the cost of private vehicle travel, including a doubling in the price of petrol, parking and other vehicle costs relative to other household expenditure items (with no other change in disposable income;
- a 25 per cent decrease in the cost of public transport; and
- a large increase in city density (see Figure 93).

The modelling indicated that while the growth predicted for private vehicle trips will reduce by around 6 per cent compared to the EWLNA 2031 base case, the overall number of vehicle trips taking place each day in Melbourne will still be nearly 2 million more than today – due largely to population growth.

However, increasing city density does reduce the kilometres people travel, with a 19 per cent reduction projected in the model, compared to the EWLNA base case of 'business as usual'. This can be expected to reduce CO_2 emissions by a similar proportion.

While public transport's share of travel increases, also by around 6 per cent, it is a much smaller number per day in volume terms compared to the reduction in private vehicle trips. A number of conclusions can be drawn from the modelling of this scenario:

- As motor vehicle traffic volumes will always greatly exceed public transport trip volumes, any measures to reduce GHG emissions from motor vehicles will be the most effective.
- In the long term, increases in urban density can be very effective in reducing future GHG emissions, or at least limiting emissions growth.
- Modal switch to public transport reduces GHG emissions and should be pursued, but in aggregate volumes for the whole city, such a shift may be more limited in its effectiveness than other measures.

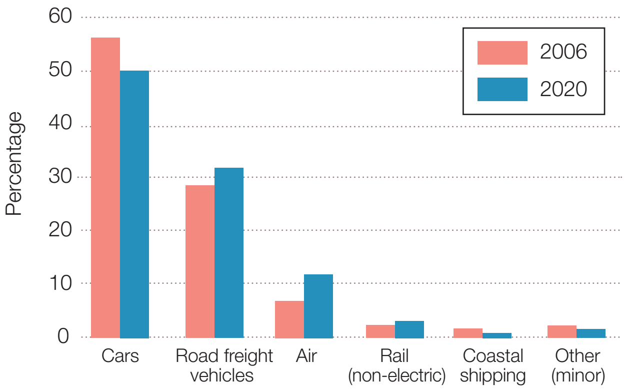
While recognising that Melbourne's transport sector must play its part in reducing GHG emissions, the Study Team believes that the timing and extent of GHG reductions demanded of the transport sector should be measured against the significant economic and social benefits delivered by the sector. As the Stern Review noted:

> *"Transport is one of the more expensive sectors to cut emissions from because the low carbon technologies tend to be expensive and the welfare costs of reducing demand for travel are high. Transport is also expected to be one of the fastest growing sectors in the future. For these two reasons, studies tend to find that transport will be among the last sectors to bring its emissions down below current levels".*[22]

This does not absolve Victoria's transport sector from the need to achieve substantial reductions in emissions; nor does it mean that transport should be 'left to last'. Substantial cuts in GHG emissions must be made by the transport sector and Victoria – and Australia – must move towards a situation where all transport users meet their external environmental costs. However, it does suggest that it may be in Victoria's long term interests to seek more immediate reductions from sectors where restrictions come at less economic and social cost (such as building efficiencies and stationary energy demand), while pursuing more aggressive measures to boost the numbers of efficient, 'clean' vehicles on the state's roads and increase public transport patronage.

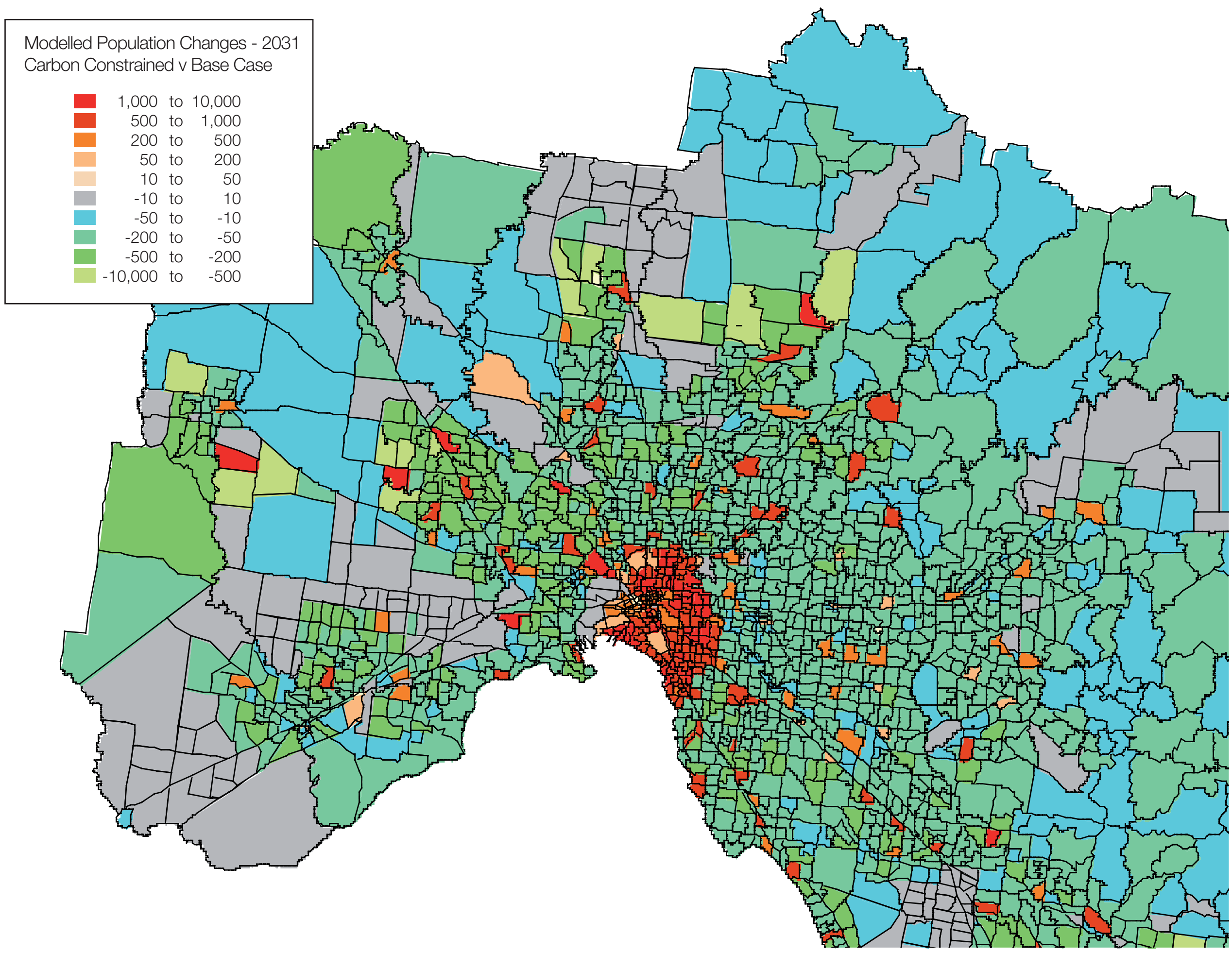
18. BITRE (2002a), *Report 105: Greenhouse Policy Options for Transport*, Commonwealth of Australia, Canberra
19. BITRE (2003), *Greenhouse Gas Emissions to 2020*, Information Sheet 21
20. BITRE (2005), p.ix
21. BITRE (2002b), *Report 107: Greenhouse Gas Emissions from Transport – Australian trends to 2020*
22. U.K. H.M. Treasury (2006), Annex 7.c

Figure 92 – Transport emissions by vehicle type (2000 to 2020)



Source: BITRE (2002)

Figure 93 – Demographics for EWLNA carbon constrained 2031 scenario



Source: EWLNA

8.1.4 Reducing GHG emissions from transport

In general, transport initiatives designed to reduce GHG emissions fall into three broad categories:

- Reducing travel demand
- Boosting public transport share
- Improving vehicle technologies

A sophisticated policy approach to reducing GHG emissions from transport combines all of these categories; however, it is important to understand the opportunities for large scale change and the relative effectiveness of each category in contributing to GHG reduction.

Reducing travel demand

Reducing or suppressing travel demand is a tough challenge, especially when confronted with a rapidly growing population, strong economic growth and an expanding city. Without adopting a draconian approach, the principal measures available to reduce travel demand involve regulating and/or encouraging different patterns of land use and persuading (gently or aggressively) people to change their personal travel behaviour.

Land use patterns

As noted earlier in this report – and confirmed by the EWLNA carbon constrained scenario – a growing body of evidence indicates that residents of high density areas tend to travel less. The Victorian Government has recognised the benefits of higher density development and taken action to promote a more compact Melbourne through its *Melbourne 2030* framework.

While a number of positive developments are occurring as a result of the framework, certain aspects – most notably the Urban Growth Boundary – are under pressure from developers, local councils and others. There also appears to have been little progress made towards more closely integrating transport and land use planning across Melbourne – although positive steps have been taken in the creation of the Growth Areas Authority, the appointment of a Coordinator General for Infrastructure and in giving planning referral powers to the Director of Public Transport.

Despite these issues, the Study Team believes that the aims of the *Melbourne 2030* framework are highly laudable from a transport perspective. In particular, overseas evidence suggests that the transit oriented development proposed for centres such as Footscray, Sydenham and Dandenong is likely to result in increases in public transport use and shorter, local trips replacing longer journeys. However, it is difficult to see these developments having a substantial impact on the overall demand for car travel within Melbourne over the next two decades.

The Victorian Competition and Efficiency Commission explored these issues in 2006 as part of its inquiry into congestion in Victoria and concluded that the overall impacts of land-use policies on road traffic and congestion are “likely to be limited in the short term, as urban development tends to occur incrementally”.[23]

The Study Team’s view is that, while initiatives such as *Melbourne 2030* must continue to be pursued, they will take time to make a major contribution to reducing GHG emissions from transport.

Changing people’s behaviour

Historically, Melburnians’ have not adjusted their travel patterns on the basis of environmental concerns. While the recent growth in public transport patronage may indicate some behavioural change as a result of growing awareness of climate change, most evidence suggests that increases in public transport patronage are due more to concerns about the increasing costs of travel, wanting to avoid inner city parking problems and perceptions of the greater convenience and accessibility of public transport.

There appears to be growing awareness about the adverse impacts of transport on the environment. A 2007 survey commissioned by the Australian Automobile Association (AAA) found that 8 in 10 Victorian motorists are concerned about the effect of motor vehicles on the environment – a significant change in attitude from previous years. However, this concern is taking time to translate into changes in travel behaviour: while significant numbers of respondents to the AAA survey believe that alternative technologies and fuels are the answer, only 14 per cent feel that driving less will help to reduce the effect of cars on the environment.[24]

23. VCEC (2006), p.312
24. Australian Automobile Association (2007)

Australians also show little inclination to purchase fewer cars. In 2007– for the first time – Australians purchased more than 1 million new motor vehicles in a single calendar year.[25] This indicates that, while many people say that they recognise the impact of cars on the environment, there is no corresponding behaviour change when it comes to their purchasing patterns (although it should be noted that new vehicles generally have a better emissions performance).

The type of cars being purchased also shows little evidence of being affected by environmental concerns In 2007, the number of new SUVs being purchased grew by more than 16 per cent.[26] As the Chief Executive of the Federal Chamber of Automotive Industries observed:

> *"The 2007 figures show it would be far too simplistic to conclude, as some have, that there is a general move by Australian consumers to smaller cars. While sales of smaller cars have been growing strongly, in 2007 sales of SUVs and 4x4 Pick-ups grew even faster."*[27]

The Study Team notes that there appears to be considerable scope for encouraging Melburnians to change their travel behaviour in relation to four particular areas:

- Shorter trips – While cars are the dominant mode of transport in Melbourne, more than 40 per cent of trips within the metropolitan area are less than 2 km long, and almost two-thirds are less than 5 km long.[28] There is clearly scope to encourage many more people to walk or cycle when undertaking short local trips.
- Trips to school – Between 17 and 21 per cent of all trips in Melbourne from 8.30am to 9am are children being driven to school.[29] There is clearly room to increase the number of these trips being made by walking, cycling or public transport.
- Single occupant trips – For around 90 per cent of commuter or peak period car trips in Melbourne, there is just one person travelling in the vehicle. Ride-sharing policies and schemes that encourage more people to travel together may help to remove some cars from Melbourne's roads, especially during peak periods.
- Peak period trips – Encouraging more people to travel outside peak periods or to use public transport during these periods would contribute to reducing GHG emissions from transport.

A range of measures can be used to encourage behaviour change in these areas, including community education and awareness programs (such as Victoria's *TravelSmart* program), specific initiatives (such as the 'Walking Bus' program or the Government's recently announced 'Flex in the City' initiative) and road pricing.[30]

In its examination of these and other measures, VCEC found that "international experience … suggests that although worthwhile, many of these measures will have a limited aggregate impact on congestion in Melbourne".[31]

The Study Team shares this view and believes that, as the general demand for car travel grows across the city, these measures can contribute to reducing GHG emissions when used in combination with other measures. However, it is highly unlikely that these measures alone will make a significant contribution to reducing overall GHG emissions from transport in Melbourne.

Boosting public transport mode share

Overall, public transport in Melbourne performs significantly better than cars when it comes to GHG emissions. However, when CO_2 emissions are analysed per passenger kilometre, the picture that emerges is a much more complex one – revealing that this performance is mainly due to the large number of people that are moved by public transport during peak periods, rather than to the inherent efficiency of Melbourne's trains and trams.

In fact, during off-peak periods, the GHG intensity of public transport increases to the point where it is higher than car travel (with average occupancy). As Victoria's Commissioner for Environmental Sustainability has noted:

> *"While GHG emissions from cars make up the greatest proportion of transport related emissions … Victorian modes that rely on electricity (trams and trains) have GHG full fuel cycle intensity levels on an average per-person kilometre basis that are comparable to motor vehicles".* [32]

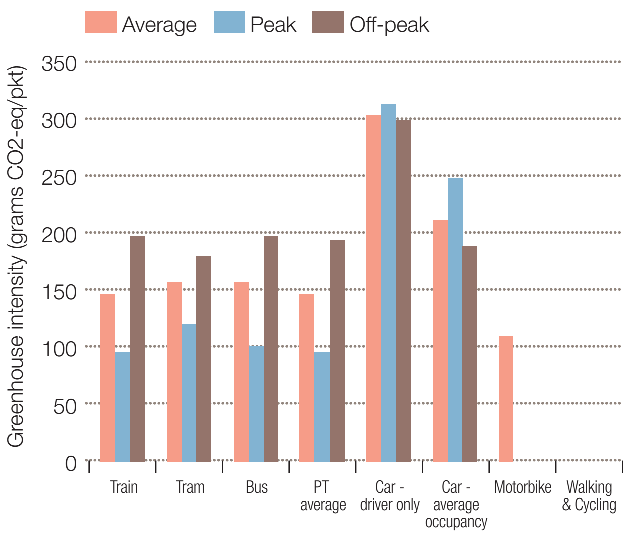
25. FCAI: Federal Chamber of Automotive Industries 2007, Vehicle Sales Reports, accessed at www.fcai.com.au
26. FCAI (2007)
27. See Federal Chamber of Automotive Industries, 'A milestone year for motor vehicle sales', Media Release, 7 January 2008, accessed at: www.fcai.com.au/medial
28. Patton, T. (October 2006), *Improving local access: a new program of demonstration projects*, Paper presented at Walk 21-VII, 'The Next Steps', The 7th International Conference on Walking and Liveable Communities, October 23-25 2006, Melbourne, Australia
29. Peddle, B. and Sommerville, C. (2005), Travel Behaviour Change through School Travel Planning: Mode Shift and Community Engagement – Results from 33 Schools in Victoria, 28th Australian Transport Research Forum, Sydney; VicHealth (2005), Walking School Bus Program. Funding Guidelines 2005-2006, Melbourne
30. See Chapter 4 for a more detailed discussion on road pricing.
31. VCEC (2006), p.302
32. Commissioner for Environmental Sustainability (2007)

This is due to Victoria being largely dependent upon brown coal for the State's electricity supply. This means that the operating GHG intensity of trams and trains is likely to be lower than motor vehicles during peak times (due to high occupancy rates and traffic congestion), but higher in non-peak times.

In the years ahead, efficiency gains in the stationary energy sector (such as clean coal technologies) will flow through to public transport and further improve its CO_2 performance, although these improvements will be relative to the improvements being made in road CO_2 performance.

Encouraging much greater use of public transport is a critically important element in reducing GHG emissions from transport. However, even under the most optimistic scenarios of modal shift to public transport, it will not be possible to achieve the magnitude of shift required to make a substantial impact on emissions over the next 25 to 30 years. Car travel will remain high – making emissions from motor vehicles a primary and urgent target for GHG reduction strategies.

Figure 94 – Average GHG intensities of public transport and cars in Melbourne



Source: Public Transport Division (DOI)

While every effort must be made to encourage public transport use, there are significant impediments to a large scale shift:

- Public transport is particularly effective when moving large numbers of people from a catchment area along a fixed route to a specific destination. While this makes public transport most effective for journeys to work and education in large centres, private motor vehicles remain the most flexible and convenient option for the millions of other journeys Melburnians make each day. Achieving a major mode shift in these other journeys is highly unlikely in the foreseeable future.
- Around 16 per cent of Melbourne's population lives within 10 km of the GPO.[33] Generally, these people have good public transport options and see public transport as a viable travel alternative for a range of trips. The vast majority of Melburnians live beyond that radius and do not have the same choices as inner city residents.
- In many parts of Melbourne – notably the outer suburbs – the car remains the most convenient and, in some places, the only travel option for some types of journeys: where trips are linked together (such as dropping the children off at school combined with grocery shopping and visiting a relative); where the trip takes place at a relatively quiet time of day; or where the trip involves a journey that would require several changes if undertaken by public transport (such as from car to train to bus).

  The most recent ABS Motor Vehicle Census shows that residents in Melbourne's outer suburbs purchase many more cars than people living in the inner city. Households with three or more cars have also increased rapidly in the outer suburbs, compared with inner Melbourne.[34]

  Even if Melbourne commenced a program of massive investment in rail extensions, it would take many years for projects to be completed – and these projects would still be unlikely to meet the diverse travel needs of people living in the outer suburbs.
- A significant section of the population simply does not have the option of shifting away from car travel. This includes tradespeople, delivery and salespeople, small businesses and others who need motor vehicles to conduct their businesses and earn a living.
- People's general preference for car travel means that there will be some people who will never shift from their cars, even where public transport is an available and attractive option.

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33. DSE (2006)
34. The 2007 ABS Motor Vehicle Census shows that two thirds of the additional 350,000 cars on Melbourne's roads over the last 10 years were purchased by people living in outer suburban municipalities. Households with three or more cars also increased rapidly in the outer suburbs. ABS (March 2007), 9309.0 – Motor Vehicle Census, Commonwealth of Australia, Canberra

In short, for every trip made on public transport in Melbourne, seven or eight trips are made by car. Even where very large gains are made in public transport, the growth in the actual number of car trips will always be much higher. As the Victorian Government noted in its 2006 *Meeting Our Transport Challenges* statement:

> *"There are limits to the impact that public transport system improvements can have. This is because the current number of people travelling by car is several times higher than those using public transport (meaning that a small reduction in car usage requires a very large increase in public transport usage in relative terms)."*[35]

In 2006, VCEC examined the impact of major public transport improvements on congestion in Victoria and overseas. VCEC noted that most improvements resulted in small reductions in road traffic volumes (of around 5 per cent or less). Even where improvements had a significant impact on traffic volumes, the reductions achieved were between 10 to 15 per cent.[36]

VCEC concluded that the net impact of public transport extensions on road congestion in Melbourne is likely to be small.[37] However, VCEC did note that a combination of options (such as public transport improvements combined with road pricing) may lead to more substantial and sustained reductions in congestion levels.[38]

The Study Team strongly endorses the need for improvements to public transport in Melbourne and notes that the greatest impact on road congestion (and therefore GHG reduction) from modal shift will come from increasing the use of public transport during peak periods. As public transport performs much better than cars in terms of GHG intensities per person kilometre during peak periods, investments that lead to an increase in public transport during these periods will make the most effective contribution to reducing emissions via modal shift.

35. Government of Victoria(2006), *Meeting Our Transport Challenges*, p.28
36. VCEC (2006), p.211
37. Ibid, p.305
38. Ibid, p.306

Improving vehicle technologies

Over the last two decades, significant advances have been made in reducing emissions from motor vehicles that affect air quality – with some industry observers stating that for a range of standard vehicles, the emissions from one modern vehicle are around 1/70th of the emissions from the equivalent vehicle of 20 years ago.

More recently, the emphasis in vehicle emission technology has shifted towards reducing GHG emissions.[39] The latest international motor shows provide strong evidence of this shift, with global car manufacturers unveiling an increasing number of 'cleaner, greener' vehicles and demonstrating substantial investment in new technologies aimed at reducing GHG emissions from their vehicles.

These technologies include advances in petrol and diesel engines, petrol-electric hybrid vehicles (combining battery power and a combustion engine), plug-in hybrid vehicles (powered entirely by an electric motor and battery charged) and hydrogen fuel cell vehicles. Cars that run on alternative biofuels – such as ethanol and biodiesel – are also being developed (although these fuels come with potentially significant environmental and social costs that must be addressed before thay are acceptable on a broader scale).

Globally, a combination of high fuel prices, consumer concerns about climate change, increasing pressure from governments and the realisation that fossil fuels are finite is encouraging manufacturers to give greater priority to pursuing these technologies. As General Motors CEO Rick Wagoner recently noted: boosting the use of these technologies is both a "business necessity and an obligation for society".[40]

In Australia, the Study Team's consultations with local car manufacturers revealed a commitment to – and growing investment in – initiatives aimed at improving fuel efficiency (to reduce CO_2 emissions), making exhaust emissions cleaner (to reduce atmospheric pollution) and pursuing energy diversification. These initiatives range from improved vehicle aerodynamics and tyre technology to new types of engines, such as electric, hybrid and hydrogen.

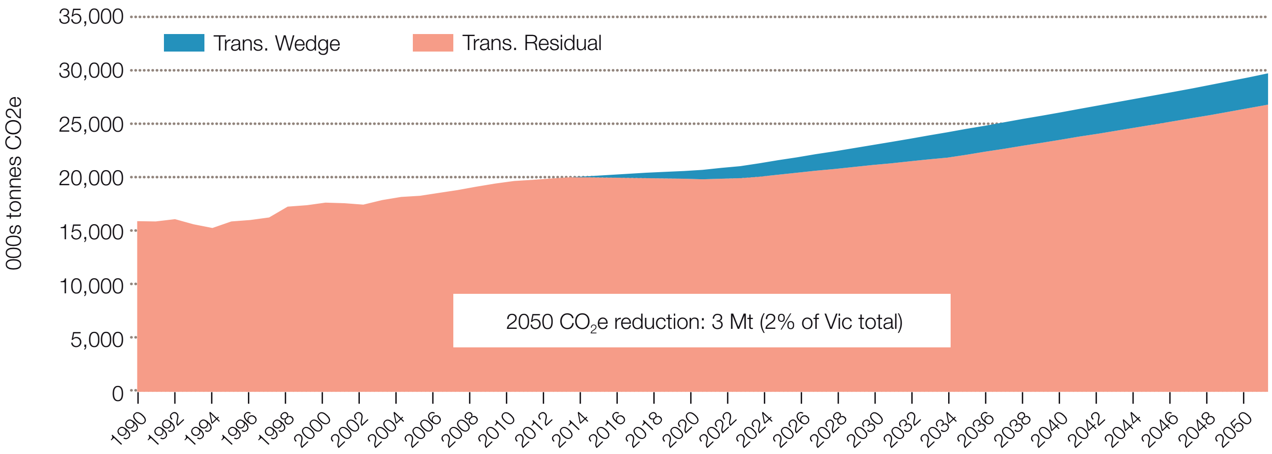
Evidence is emerging that these new vehicle technologies have the potential to deliver very substantial reductions in GHG emissions.

The US Environment Protection Agency has found that GHG reductions of up to 29 per cent could be achieved from hybrid electric cars; reductions of up to 80 per cent from optimised alternative fuel (ethanol) vehicles and reductions in excess of 90 per cent from fuel cell vehicles.[41]

39. The main GHG emitted by motor vehicles is carbon dioxide (CO_2). A vehicle's CO_2 emissions per kilometre are a product of its fuel efficiency (litres per kilometre) and its carbon emissions per litre.
40. 'Carmakers stress green at Detroit Motor Show', 14 January 2008, AFP, accessed at: http://afp.google.com/article/ALeqM5gEjnShnsRe11k1PfHukVH_fQXPAA
41. United States Environmental protection Agency (2007), *A Wedge Analysis of the US Transportation Sector*, Office of Transportation and Air Quality, US Government

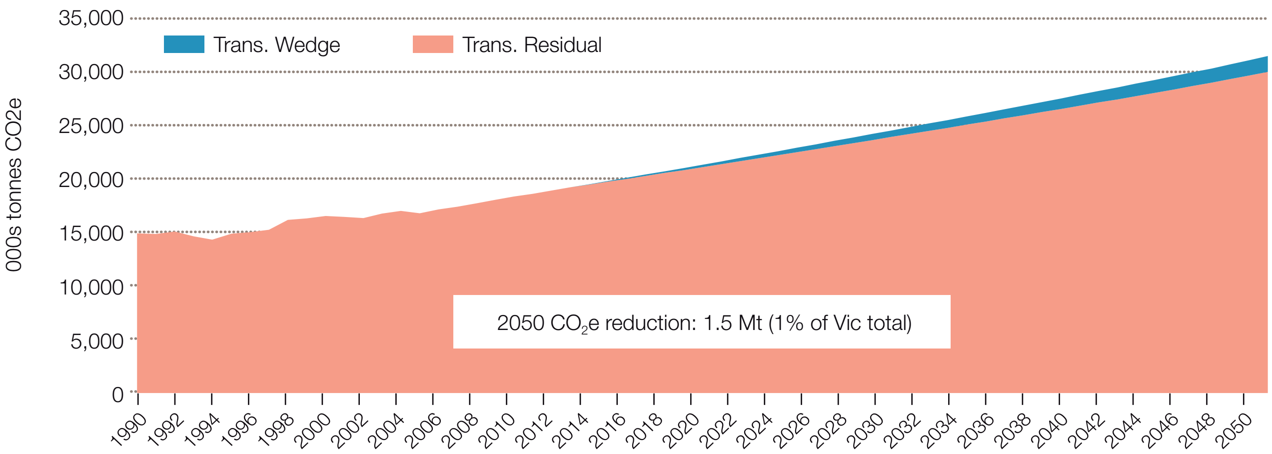
Impact on GHG reduction in Victoria

Figure 95a – Demand management



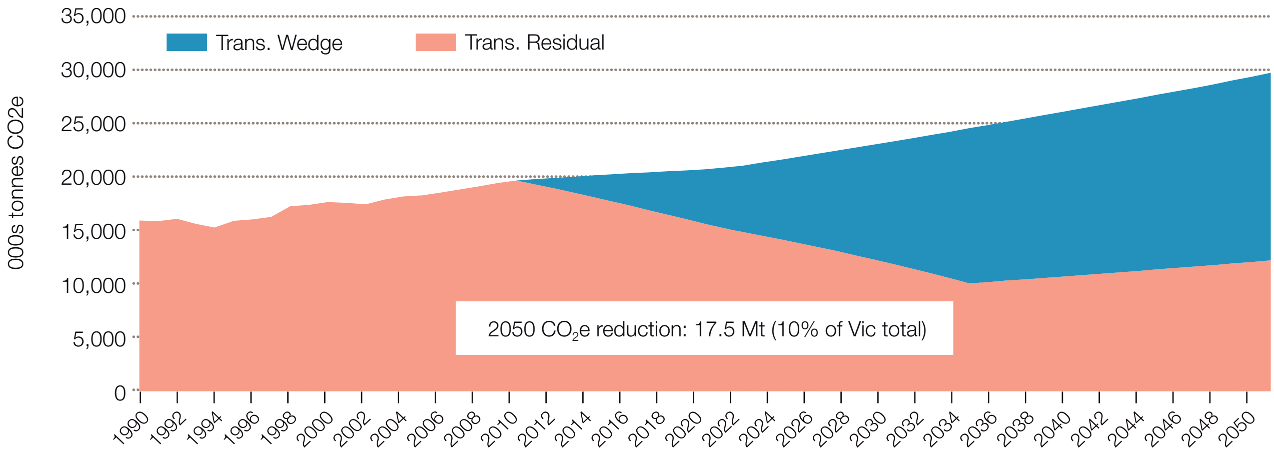
Source: Office of Climate Change (2008)

Figure 95b – Mode shift to public transport and rail freight.



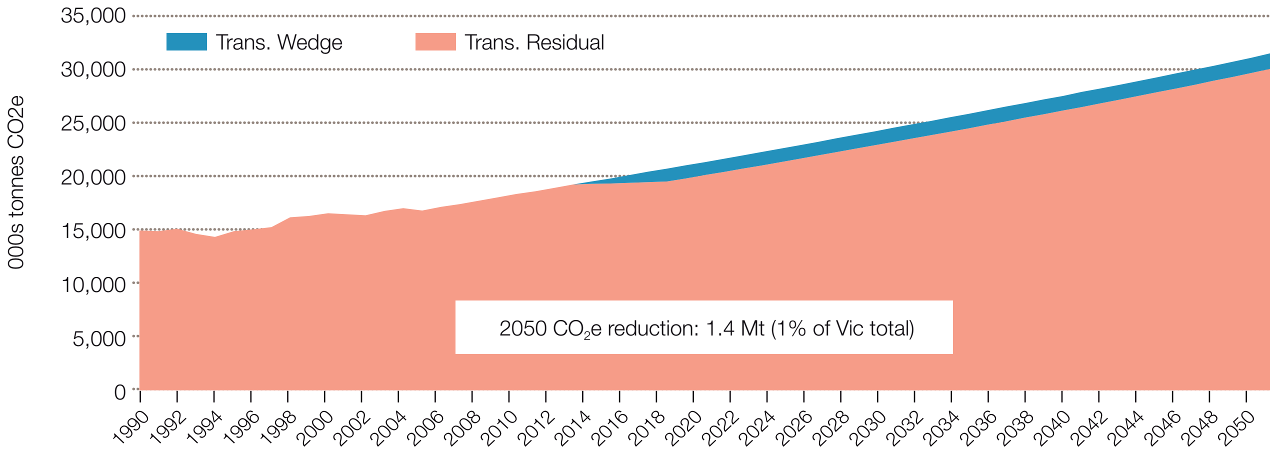
Source: Office of Climate Change (2008)

Figure 95c – Improved fuel and vehicle efficiency



Source: Office of Climate Change (2008)

Figure 95d – Increased vehicle occupancy



Source: Office of Climate Change (2008)

A 2007 analysis by the US Electric Power Institute found that if 'plug-in' hybrid vehicles could capture 60 per cent of market share in the United States, they could potentially help to reduce around 450 million metric tons in GHG emissions a year by 2050 (the equivalent of removing 82 million passenger cars from US highways).[42]

In Australia, the CSIRO has stated its belief that it is possible to reduce GHG emissions from the nation's transport sector by 37 per cent by 2020 and 80 per cent by 2040 and has stated that:

> *"To meet these targets, we see vehicles evolving from traditional internal combustion engine powered cars through to hybrid (combustion/electric) powered vehicles and, in the long term, possibly to hydrogen fuel cell powered vehicles."*[43]

Victoria's Commissioner for Environmental Sustainability has also observed that:

> *"The future is very optimistic for environmental vehicles. With the advent of hybrid and zero GHG fuel cells, GHG and air pollution will gradually decline (at least nationally)."*[44]

But there is still some way to go to achieve these sorts of results, with the current market share of conventional hybrid vehicles, such as the Toyota Prius, remaining very low. Some observers also believe that some of these technologies are untested and that their commercialisation and affordability are too far into the future to be of use in reducing GHG emissions. However, as shown by Figures 95a to 95d, recent analysis by Victoria's Office of Climate Change (OCC) found that improving fuel efficiency is easily the most effective way to reduce emissions from transport ahead of demand management measures, mode shift to public transport and increased vehicle occupancy. The OCC analysis also placed improved fuel technology in the top three measures that could be employed to reduce GHG emissions across the board by 2020.

Clearly, there are some uncertainties in these emerging technology trends. For example, considerable research and development still needs to be directed towards battery development before the benefits of plug-in hybrid vehicles can be fully realised. Similarly, the hydrogen fuel cell – which appears to offer very substantial benefits in reducing GHG emissions – is still at a relatively early stage of development.

However, there are already many vehicles in production that offer dramatically improved CO_2 emission levels compared to vehicles widely purchased in Australia. For example, Peugeot and Citroën achieved a combined fleet average of 140 grams of CO_2 per kilometre for all the cars they sold in France in 2006 – a considerable achievement.[45] Another French manufacturer, Renault, is already producing the Logan five-seater saloon, which has emissions of less than 100g CO_2/km – a good indicator of the small car performance that can be achieved in the near future.

Of course, a majority of vehicles within the broader vehicle fleet still have much higher CO_2 emissions, with larger 4WD vehicles averaging between 200g to 300g CO_2/km (and some well above 300g). However, Ford and GM have indicated their interest in exploring options for trucks, utes and 4WDs – recognising that these are the preferred vehicles for many American consumers.

42. Electric Power Research Institute (July 2007), *Environmental Assessment of Plug-In Hybrid Electric Vehicles – Volume 1: Nationwide Greenhouse Gas Emissions*, Palo Alto, California; See also: 'Hybrid cars can cut greenhouse emissions', Sydney Morning Herald, 20 July 2007, accessed via www.smh.com.au
43. CSIRO (2007), Overview: National Research Flagships – Flagship research into low emissions transport at: http://www.csiro.au/science/ps12m.html
44. Commissioner for Environmental Sustainability (2006), Review of procurement – Part 1 Government procurement of motor vehicles, A review of environmental, safety and cost considerations, State of Victoria, Melbourne
45. See for example: 'Peugeot/Citroen gets average CO_2 of 140g/km! Tops in France' accessed at http://www.autobloggreen.com/2007/05/16/peugeot-citroen-gets-average-CO_2-of-140g-km-tops-in-france/]

In Australia at present, most popular locally manufactured cars have GHG emissions in excess of 240g CO_2 per kilometre, with many models well over 300g CO_2/km.[46] This is significantly higher than Europe and Japan, where new cars average around 161g CO_2/km.[47]

However, a number of new cars are available in Australia with low GHG emissions. The Australian Government's *Green Vehicle Guide* lists several cars with emissions of less than 140g CO_2/km – including makes such as the Toyota Prius, Mitsubishi Colt, Honda Civic Hybrid, smart Cabrio and Coupe, Hyundai i30, Fiat Punto and Proton Savvy.[48] The range of smaller, more fuel efficient vehicles available in Australia is likely to expand significantly over the next five years.

Action and leadership by government

Despite these technological advances, there has been no significant change in the fuel efficiency of the Australian vehicle car fleet for four decades – because gains in technology have been traded off against 'extras' such as air conditioning and strong growth in sales of heavier, more powerful vehicles.[49]

For real improvements to occur across the fleet, stronger action will be required from governments to force the pace of change, including stricter regulation and changes to industry and procurement policies.

Currently, moves are underway in Europe and the United States to enforce mandatory emissions standards on car manufacturers. For example, in December 2007 the European Commission adopted a proposal for legislation to reduce the emissions level for new cars to 130g CO_2/km by 2012.[50] This will translate into a 19 per cent reduction in CO_2 emissions, placing the EU among the world leaders of fuel efficient cars.

The new world of 'clean cars'

The development of technologies to improve fuel efficiency and reduce CO_2 emissions is picking up pace rapidly. As car makers jostle for position in the growing 'green' marketplace, many different roads may lead to a more fuel-efficient future.

Toyota – the world leader in petrol-electric hybrid cars, Toyota aims to market a fleet of rechargeable hybrid vehicles to companies and governments by the end of 2010. Toyota also plans to sell a plug-in hybrid car by 2010 and is building a factory to produce the next-generation lithium-ion batteries needed for electric vehicles.

GM – plans to introduce eight new hybrid models in the US by the end of 2008 and a plug-in hybrid by 2010. GM has also unveiled two concept cars powered by bio-ethanol.

Ford – has introduced a new 'eco-friendly' technology called Ecoboost, which will deliver increased performance and lower emissions from Ford's current engine range. Ford aims to have a fuel cell or plug-in hybrid engine range on the market by 2013.

Honda – has developed a zero emissions, hydrogen powered fuel cell concept car, which it is marketing on a limited basis in the US and Japan in 2008.

Kia – has developed a petrol-electric hybrid sedan and a fuel-cell version wagon. Kia aims to include petrol-electric hybrids as part of its range from 2010.

Renault – around 40 per cent of cars produced by Renault meet the company's 'eco^2 concept', which requires vehicles to emit less than 140g CO_2/km, be 95 per cent end-of-life reusable and source at least 5 per cent of plastics used in production from recycling.

Further information can be found at the Australian Government's Green Vehicle Guide: **www.greenvehicleguide.gov.au**

46. See Australian Government's Green Vehicle Guide at www.greenvehicleguide.gov.au
47. European Federation of Transport and the Environment (2007), Regulating CO_2 emissions of new cars, Background Briefing, Brussels
48. More details are available from the Australian Government's Green Vehicle Guide at www.greenvehicleguide.gov.au
49. See BITRE (2002c), *Fuel consumption by new passenger vehicles in Australia*, Information sheet 18, Commonwealth of Australia, Canberra
50. See for example: European Commission (2007), *Reducing CO_2 emissions from light-duty vehicles*, accessed at: http://ec.europa.eu/environment/CO2/CO2_home.htm

In late 2007, the European Parliament adopted a plan that requires manufacturers to have average CO_2 emissions of 125 g/km across their model range by 2015 – with penalties and fines imposed on car makers who fail to meet these targets. According to the plan, average CO_2 emissions should not exceed 95g CO_2/km by 2020, with a possible further reduction to 70g CO_2/km or less by 2025.[51]

This plan reflects the European Parliament's recognition that mandatory standards are needed to compel motor vehicle manufacturers to produce vehicles with higher average fuel efficiency than new vehicle buyers would otherwise demand. It also suggests that a substantial improvement in emissions from cars is achievable within a relatively short time frame.

In Australia, emissions standards for new vehicles are set by the Australian Design Rules (ADRs), which reflect international standards developed by the UN Economic Commission for Europe – known as the *Euro* standards (these standards do not cover CO_2 emissions). Australia generally lags behind Europe in implementing the *Euro* standards: for example, the *Euro 2* standard was implemented in Europe in 1996, but only implemented in Australia in 2003. The *Euro 4* standard, which will apply in Australia from 2008, has been in force in Europe since 2005. However, the *Euro 4* standard will underpin the latest ADRs – bringing Australia into line with European GHG initiatives.

The Australian automotive industry and the Commonwealth Government have also entered into a voluntary agreement to reduce national average fuel consumption of new passenger cars by 18 per cent by 2010 (from 2001 levels).[52] The Department of Climate Change is converting this target to a CO_2 g/km target to align it with ADR requirements.

Around the world, countries and cities have adopted a range of other measures to encourage the take-up of more environmentally friendly vehicles, including differential registration pricing, differential congestion charging, exemptions from certain charges or taxes and changes to government procurement policies. In Victoria, the government has introduced several such initiatives, including a $50 registration discount for hybrid vehicles, a hybrid bus trial and a trial of 'green' taxi licences.

The Study Team believes that more can be done at local, state and federal government levels to improve the environmental performance of motor vehicles in Victoria. The Team's view is that a significant shift towards the types of vehicles that major manufacturers are now able to provide will require more than heightened awareness about climate change or concerns about petrol prices or minor incentives such as small registration discounts. The reality is that manufacturers will continue to meet market demands for larger, less efficient vehicles until there is a very substantial disincentive for people to buy, register and run vehicles with high CO_2 emission levels.

It is clear from the Study Team's consultations with car makers such as Toyota that manufacturers can – and will – respond accordingly if clear price signals are sent to consumers. A range of options are available for governments to deliver these signals, including:

- Tax incentives to encourage people to buy low emission vehicles (federal level)
- Tax disincentives to discourage the purchase of high emission vehicles (federal)
- Setting significantly lower registration fees for more environmentally friendly vehicles (state)
- Adopting much more stringent government procurement policies to ensure that publicly owned and operated fleets meet the highest emissions standards (local, state and federal).

The Team notes the recently announced review of Australia's automotive industry (to be undertaken by former Victorian Premier Steve Bracks for the Commonwealth Government) and believes that the review should examine the local industry's potential to contribute to reductions in GHG emissions.

Study Team Findings

While it is not within the scope of the EWLNA to recommend actions that government might take to reduce GHG emissions from Melbourne's transport sector, the Study Team notes the following:

Given the continuing high demand for car travel, improvements in vehicle technology are likely to be the most effective means of reducing GHG emissions from transport in Melbourne.

Using public transport in peak demand periods and car pooling are the most effective ways in which Melburnians can contribute to reducing GHG emissions from their personal travel.

There is considerable scope for government to take stronger action to improve the environmental performance of Victoria's vehicle fleet and encourage Melburnians to change their vehicle purchasing patterns and travel behaviour.

51. European Parliament (2007), 'MEPs back cuts in cars' CO_2 emissions', Media Release, 24 October 2007, accessed at: www.europarl.europa.eu/default.htm
52. Details of the NAFC target are set out on the Australian Greenhouse Office website at http://www.greenhouse.gov.au/transport/env_strategy.html

What other cities are doing

A number of cities around the world are adopting measures to reduce emissions from motor vehicles.

Stockholm (Sweden) – Stockholm has the highest percentage of clean vehicles in Europe, thanks to a program of city and federal incentives. The city is replacing all municipal vehicles with electric and electric-hybrid cars and is working with industry to set up biogas fuel stations (around 60 per cent of fuel stations in Stockholm sell alternate fuels). Stockholm also offers incentives for shifting to hybrid or alternatively fuelled cars, such as taxation discounts, free parking and congestion levy discounts.

San Francisco (USA) – San Francisco's Clean Air Vehicle effort has resulted in the city having one of the largest clean air municipal fleets in the world – with more than half of the city's buses and light rail services comprised of zero-emission vehicles; more than 700 cleaner air vehicles (compressed natural gas, hybrid and electric); more than 50 heavy duty vehicles on bio-fuel; 160 low-emission taxis; and 25 fire trucks and ambulances currently running on biodiesel. These efforts are expected to result in significant reductions in annual emissions

Berlin (Germany) – Berlin has established an inner city 'Environmental Zone' of around 88 km2 that is banned to vehicles with very high emissions. At present, the ban only affects 7 per cent of motor vehicles in Berlin, but from 2010 the zone will only be open to vehicles with low emissions. By creating the zone, Berlin aims to improve air quality in a very densely populated part of the city. The city has also implemented additional measures, including modernising its bus fleet and setting higher environmental standards for the purchase of municipal vehicles.

London (UK) – London is currently testing diesel hybrid electric buses with the aim of having 80 hybrid buses in operation by the end of 2008 and hybrids making up a quarter of the city's 8000-strong bus fleet by 2020. In February 2008, London also made changes to its cordon charging scheme, introducing higher charges for high emission vehicles and a 10 per cent discount for low emission vehicles.

New York (USA) – By the end of 2009, New York will have taken delivery of 850 new low-floor hybrid electric buses, giving the city the world's largest fleet of hybrid buses. In addition, the city has begun switching the rest of its bus fleet to a special ultra-low-sulfur diesel fuel. Not only is the switch having positive effects on air pollution in the city, it has also created a new market for cleaner vehicles and fuels. When New York's Metropolitan Transport Authority (MTA) first decided to use the fuel, it was not widely available in mass quantities in the USA. However, when fuel companies realised the MTA would eventually need to purchase more than 150 million litres of the ultra-low-sulfur diesel fuel, they started to produce it. In turn, this has made it easier for bus fleets in other cities to switch to the new fuel.

8.2 Changes and challenges in the study area

Issues of sustainable development at a local or neighbourhood level are becoming increasingly important to Melburnians. This is particularly the case in areas that are highly industrialised and urbanised. In these areas, local communities place a high value on protecting and enhancing natural and cultural heritage and on improving neighbourhood amenity.

A range of environmental and amenity concerns were raised with the Study Team through submissions and consultations. The Study Team recognises the significance of these concerns to communities within the Study Area, which includes some of Melbourne's most dense and industrialised suburbs. The Study Team has applied sustainability principles to its assessment of options and has identified environment values and issues within the Study Area, as well as future challenges and opportunities for improving the area's natural and cultural heritage, and neighbourhood amenity.

8.2.1 Flora and fauna

While inner Melbourne – including the Study Area – is largely urbanised, significant natural values remain. As the Victorian Biodiversity Strategy notes, Melbourne's urban areas have small remnants of habitat that are highly valued by local communities.[53] The biodiversity values remaining in these areas are particularly important in providing unique examples of pre-existing flora and fauna, protecting sites of biological significance and as seed sources for revegetation with indigenous species.

Prior to European settlement, the Study Area was covered by around 13 different native vegetation communities. Very few remnants of this native vegetation have survived. These remnants include the Derrimut Grasslands to the west of Melbourne, indigenous vegetation forming part of parks such as Pipemakers Park, Royal Park and Yarra Bend Park, and riparian vegetation alongside rivers and creeks in the area. Some of these remnants are of local and regional significance; other areas have been heavily modified and highly degraded.[54]

The loss of habitat has also had a dramatic impact on the number of animal species in Melbourne and in the Study Area. Work undertaken for the Study Team has identified the presence – or potential presence – of 46 rare, vulnerable or endangered fauna species within the Study Area and 23 rare, vulnerable or endangered flora species.[55]

Over the coming decades, flora and fauna within the Study Area is likely to continue to be threatened by development and growth. In particular, local councils face significant challenges in balancing the pressure for residential development with the protection of natural habitats and vulnerable species. However, growing community concern about these issues is delivering opportunities for including specific options for ecological improvement within development and infrastructure planning. These opportunities may include revegetation programs to protect waterways, plantings to reduce noise or improve amenity, and initiatives to offset the negative impact of development.

The Study Team notes that major transport projects within the area offer the opportunity for strategic programs to improve the current state of biodiversity characteristics, in addition to meeting the required offset options associated with the removal of any native vegetation.

8.2.2 Air quality

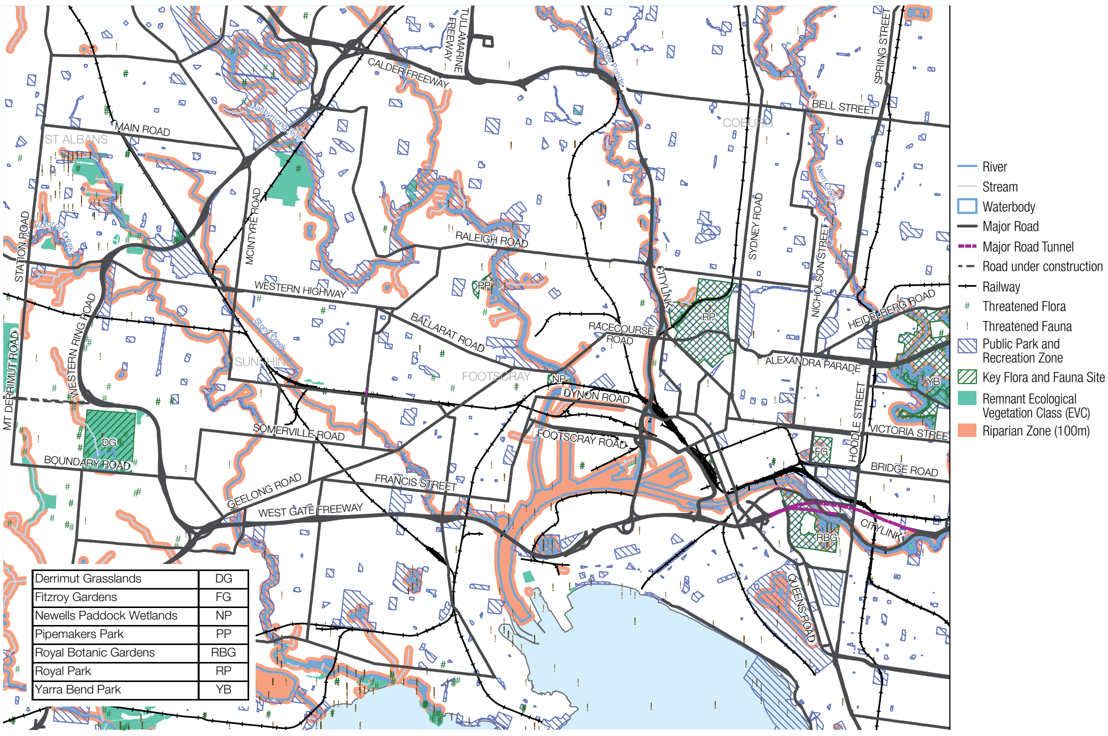
Air quality within Melbourne – and the Study Area – has improved over the last 25 years, due largely to emission controls on motor vehicles and greater industry compliance with environmental standards. Compared to similar cities around the world, Melbourne enjoys relatively good air quality.

The main pollutant in Melbourne is particulate matter, comprising minute particles emitted from some natural sources (such as bushfires and windblown dust) and from industrial processes, household wood heaters and open fireplaces, industrial incineration and motor vehicles. Particulate pollution is currently the major air quality issue requiring attention, with diesel-fuelled vehicles being a major contributor to such pollution.[56]

Motor vehicles are the major source of air pollution in Melbourne, contributing around 30 per cent of particulate matter to the city's overall air quality, 80 per cent of carbon monoxide (CO), 60 per cent of nitrogen oxides (NO_x) and 40 per cent of volatile organic compounds (VOCs).[57] However, while road vehicle use is increasing, levels of CO, NO_x and O_3 (ozone) have decreased since the mid-1980s.

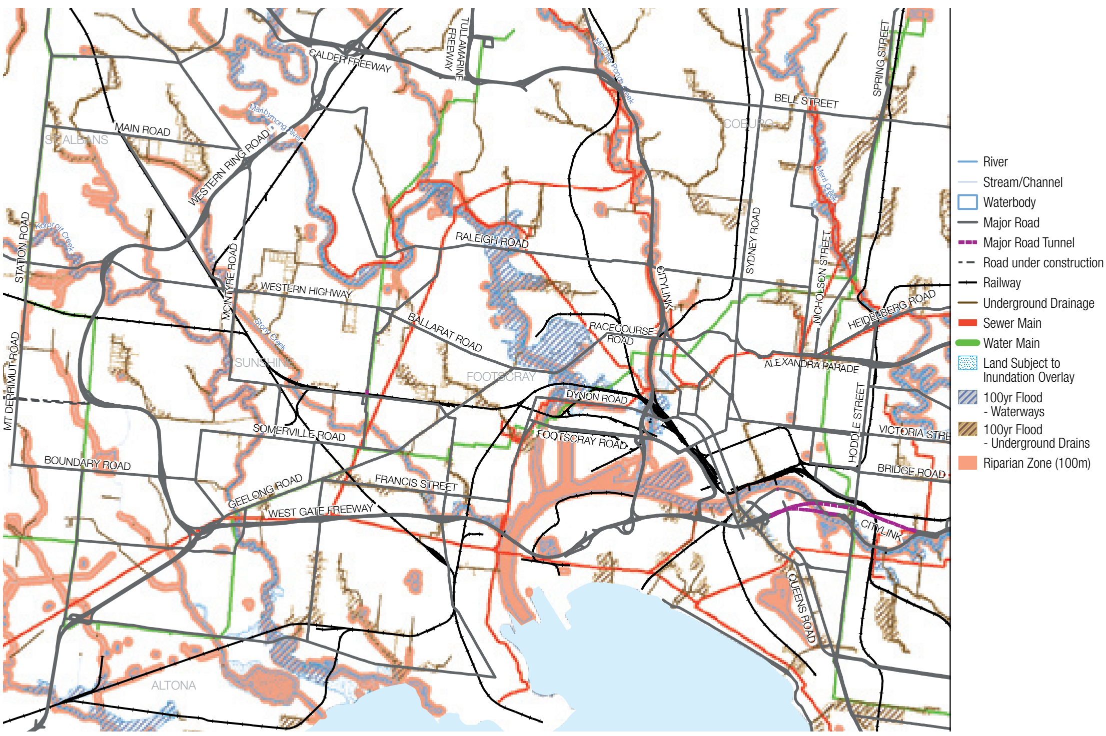
53. DSE: Department of Sustainability and Environment (1997), Victorian Biodiversity Strategy, accessed at www.dse.vic.gov.au
54. A list of key flora and fauna features is set out in SKM Maunsell (2008), *Environment and Heritage Issues Paper*, Report prepared for the EWLNA
55. Ibid
56. See EPA website: www.epa.vic.gov.au/air/aqa.aip
57. Environment Protection Authority Victoria (2006), *Victoria's Air Quality – 2005*, Publication 1044, State of Victoria, Melbourne

Figure 96 – Potential flora and fauna opportunities and constraints within the Study Area



Source: EWLNA (SKM Maunsell)

Figure 97 – Potential water resource opportunities and constraints within the Study Area



Source: EWLNA (SKM Maunsell)

The main future pressures on overall air quality in Melbourne will be population growth accompanied by an increase in the number of vehicles and a subsequent increase in the number of vehicle kilometres travelled. There may be a higher number of specific locations or 'hotspots' where air quality is affected by motor vehicle emissions. However, improvements in vehicle technology and controls on CO, NO_x and VOC mean that total vehicle emissions in 2020 are likely to be below those of 2006. This is not likely to be the case with particulate matter.[58]

Reducing particle pollution is likely to remain a significant problem in Melbourne, with ongoing efforts required to tackle the problem of diesel exhaust emissions.

For specific major transport initiatives, the challenges include identifying and managing any new air pollution 'hotspots' and providing walking, cycling and other options that will help to reduce the pressures on air quality.

8.2.3 Water quality

Rivers and creeks within the Study Area include the Yarra River, the Maribyrnong River, Merri Creek, Moonee Ponds Creek, Stony Creek and Kororoit Creek. Water quality in these waterways is of significant concern because they are highly important elements of urban biodiversity and are used for a range of water-based recreational activities. The quality of water flowing into Port Phillip Bay is also critical in determining the bay's ecological and economic future.

Water quality in the Study Area's rivers and streams varies considerably. Water quality in the Maribyrnong River is considered good, while water quality in the lower reaches of the Yarra River is moderate to poor. Water quality in Kororoit Creek is considered to be in fair condition while in the Merri Creek urban areas, water quality is very poor.[59]

Maintaining and improving water quality across the Study Area is likely to remain a significant ongoing challenge for local councils and communities, and for the Victorian Government. New housing and infrastructure construction will continue to threaten native riparian vegetation, the health of native fish and other fauna and the natural ecosystem connections between rivers, floodplains and wetlands.

However, there is increasing awareness of the importance of reducing the impact of new infrastructure on waterways, water quality and aquatic ecosystems. Communities now expect major transport and other infrastructure projects to include plans to manage water quality impacts, water sensitive construction processes and techniques to recycle or treat water runoff. Major projects also offer the opportunity to explore new ways of preserving and improving water quality in urban waterways.

8.2.4 Land contamination

Land contaminated by waste disposal and industrial activities is often discovered during changes to land use in Melbourne. The highly industrialised nature of the Study Area means that contamination is more likely to be a significant issue than in other parts of the city, with possible types of soil and groundwater contamination including heavy metals, polychlorinated biphenyl (PCB), asbestos, organochlorine, paint, oil and grease.

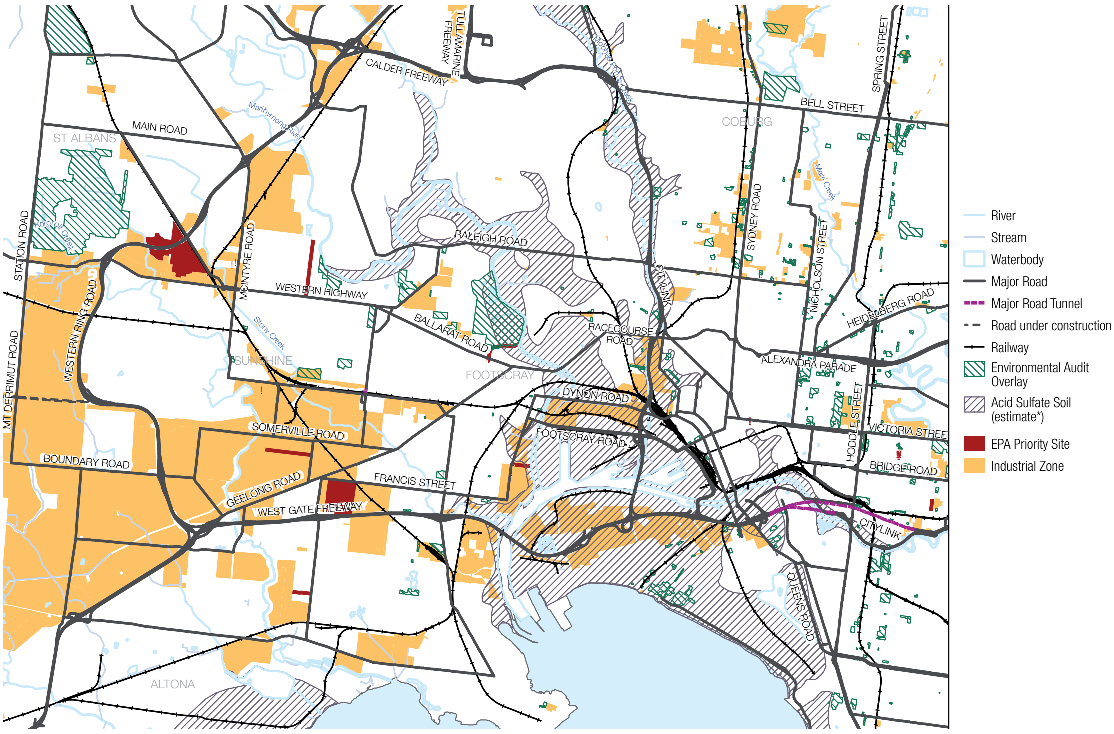
Twenty sites within the Study Area are listed as EPA Priority Sites (sites for which the EPA has issued a clean-up notice or a pollution abatement notice under the *Environment Protection Act* 1970). Typically, these are sites where pollution of land and/or groundwater presents an unacceptable risk to human health or to the environment. Sixteen of these sites are in Melbourne's west.[60]

In addition to sites listed on the EPA Priority Sites Register, there are likely to be numerous additional sites that have not been investigated or reported. In particular, naturally occuring acid sulphate soils (soils that contain significant amounts of iron sulfides) are probable in areas such as the Port of Melbourne, West Melbourne, Docklands, parts of Yarraville, Kensington and Flemington and alongside the Maribyrnong River, Yarra River and Moonee Ponds Creek.[61] These soils can have environmental, economic, engineering and health impacts, and can constrain development, construction and other activities, if not managed appropriately.

Contamination of soil and groundwater has the potential to increase costs and the time required to complete major developments. However, such developments also provide an opportunity to clean-up contamination, improve community amenity and explore new uses for contaminated and degraded land.

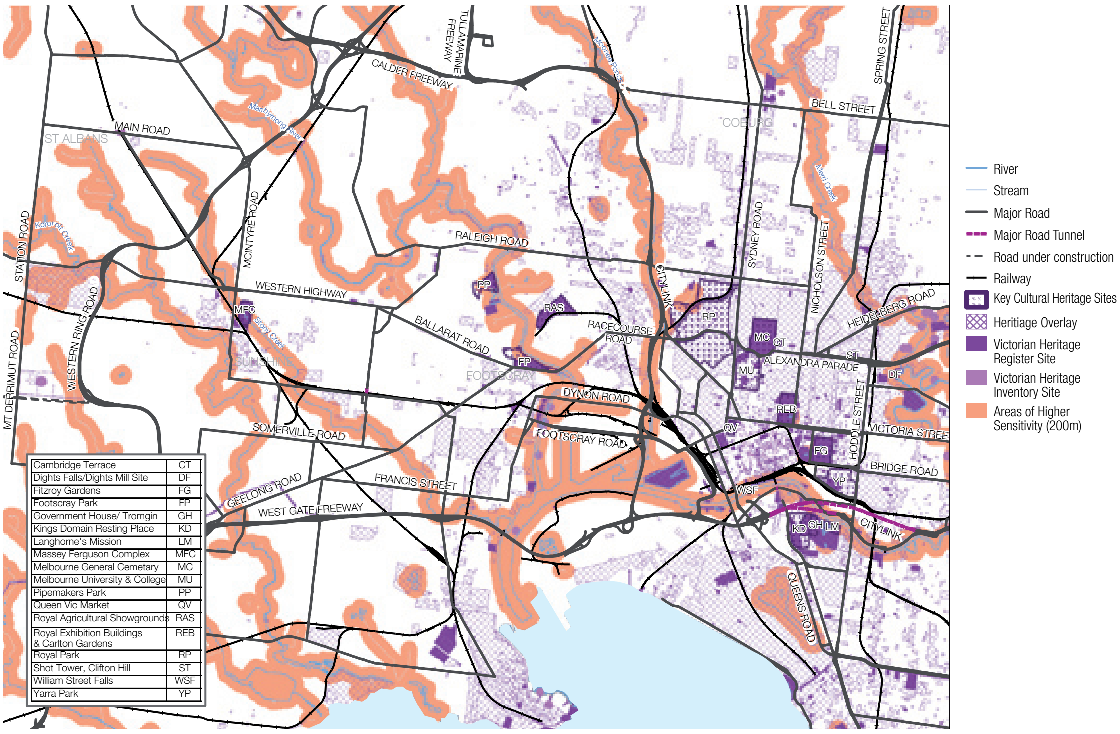
58. Beer, T., Borgas, M., Bouma, W., Fraser, P., Holper, P. and Torok, S. (2006), *Atmosphere Theme Commentary for State of the Environment Report 2006*, Department of the Environment and Water Resources, Australian Government, Canberra
59. Melbourne Water (2007), Melbourne Water Web Site, Our Rivers and Creeks, accessed at www.melbournewater.com.au. Details of water conditions within the Study Area are set out in SKM Maunsell (2008)
60. Environment Protection Authority Victoria (2007), Contaminated site information systems and Priority Sites Register, accessed at www.epa.vic.gov.au
61. SKM Maunsell (2008)

Figure 98 – Potential land contamination opportunities and constraints within the Study Area



Source: EWLNA (SKM Maunsell)

Figure 99 – Potential cultural heritage opportunities and constraints within the Study Area



Source: EWLNA (SKM Maunsell)

8.2.5 Noise and amenity

As Melbourne continues to grow, transportation noise is becoming an increasing source of community concern, particularly in residential areas. The effects of exposure to high noise levels include physical and psychological health problems, sleep disruption and disturbance to activities such as personal communication and learning.

Road transport causes the greatest noise impact in terms of the number of Melburnians affected. However, the extent and effect of road traffic noise in Melbourne is difficult to ascertain, with only a small number of community noise impact surveys conducted since 1970.

Using data from a 1999 Austroads report, the EPA has indicated that around 12 per cent of homes in Melbourne are exposed to road traffic noise of Leq (24 hr) 65 dBA at least once during a 24-hour period, when measured outside the house (research shows that one in five people will be highly annoyed with these noise levels and higher).[62] The significant increase in road transport over the last decade suggests that the percentage of Melbourne's population exposed to these noise levels is likely to have increased since 1999; however, noise mitigation measures are now routinely applied to major transport projects (in line with VicRoad's noise attenuation policy).

In a recent community study commissioned in April 2007 by the Maribyrnong Truck Action Group (MTAG), 55 per cent of residents surveyed in Melbourne's inner west felt that sleep was "usually being affected" by truck noise. Reporting these results in its submission to the EWLNA, MTAG stated that:

> *"It is not just residents living right on truck routes that are affected; many complain that truck noise carries a long way…."*[63]

Railway noise also has a significant impact on communities in Melbourne. Railway noise is generated by a number of different factors, including the interaction of wheels and rails, engines in diesel locomotives, train speed, warning devices and shunting. Very few studies have been undertaken in Australia into community responses to railway noise (or to changes in noise when a new railway line is built or an existing line upgraded). However, studies indicate that noise from rail transport is considered to be less annoying than noise from motor vehicles or aircraft.

While little direct evidence is available about the effects of transportation noise within the Study Area, a number of community groups and local councils have expressed concern about the impact of road traffic and railway noise on local amenity.

Traffic noise is likely to continue to be a concern to communities across Melbourne as the city's population grows and the demand for travel increases. While meeting community expectations to manage and minimise any additional traffic noise, major transport projects also offer the opportunity to significantly reduce existing traffic noise by re-routing traffic (especially trucks), altering traffic flows, revising land use plans and erecting new noise barriers and screenings.

8.2.6 Cultural heritage

Melbourne's unique cultural heritage includes significant Aboriginal sites and a substantial number of 19th century buildings, streets and open spaces.

Within the Study Area are a range of Aboriginal cultural heritage sites that are protected under State and Commonwealth legislation. A review conducted for the EWLNA has identified key Aboriginal heritage places within the Study Area, including places protected under the Melbourne Planning Scheme (such as the Kings Domain Resting Place and scarred trees in Yarra Park and Fitzroy Gardens) and places identified in the City of Melbourne's Draft Indigenous Culture and Heritage Framework 2006-2009 (such as the Maribyrnong River Valley, Kororoit Creek and Dights Falls).[64]

62. See EPA (2002), Road Traffic Noise Strategy Background Paper, Information Bulletin – based on Austroads (1999), *National Performance Indicators*, Sydney
63. MTAG submission to the EWLNA (2007), p.17
64. A full list of key Aboriginal sites in the Study Area is set out in SKM Maunsell (2008)

The Study Area also includes many significant European heritage sites. More than 530 places are listed on the Victorian Heritage Register, which lists places and objects of statewide significance, and around 1200 sites within the Melbourne CBD are listed on the Heritage Inventory, which lists all known places and objects with archaeological value or potential. Key European heritage places within the Study Area include the Royal Exhibition Buildings and Carlton Gardens, Royal Park, the Royal Agricultural Showgrounds, Footscray Park, the Maribyrnong River and Fitzroy Gardens.[65]

Continuing pressures contributing to the loss of cultural heritage places in the Study Area include urban redevelopment, reduced public sector budgets for preservation and restoration, and a lack of information and awareness about particular places.

While addressing the effect of major transport projects on heritage sites can act as a constraint on development, opportunities also exist for transport infrastructure to incorporate and enhance cultural heritage values. These opportunities can include the restoration of buildings adjacent to transport developments, giving local communities the option to purchase or manage heritage sites, entering into heritage agreements with local communities, and improving sites with plantings, signs or screenings.

8.2.7 Opportunities from transport projects

Within the Study Area, local councils, businesses and communities are concerned about maintaining liveability, amenity and environment and heritage values in their local areas. In submissions and consultations, a number of groups expressed concerns about traffic noise, the importance of maintaining open space and parkland, the quality of inner urban waterways and the loss of neighbourhood amenity caused by high traffic volumes on suburban streets.

Several submissions noted particular concerns about declining amenity in local communities along major truck routes and adjacent to the Port of Melbourne.

The Study Team’s view is that major transport projects potentially offer significant new opportunities to improve amenity and environmental values. These opportunities range from the removal of traffic from local streets and the creation of new bicycle lanes to initiatives that will increase native vegetation, improve urban waterways, clean up contaminated land sites and create new public spaces and artworks.

Melbourne’s EastLink project provides a good example of how a major transport project can be used to improve local environments, with around four million native plants and trees being planted as part of the project and 70 wetlands filtering rainwater off the motorway, creating new habitats for native species.[66]

A number of submissions noted that improvements to the city's road connections that involved major new surface roads could have a detrimental impact on liveability and amenity in Melbourne's inner suburbs. As the City of Melbourne observed:

> *"There is very little space for building any additional surface roads in inner Melbourne without damaging the urban environment, local amenity and the City's liveability."*[67]

The Study Team notes that, unlike surface roads, tunnel projects offer much greater opportunities for improving neighbourhood amenity by reclaiming road space for other uses, such as walking and cycling, and new residential and commercial development. In its submission to the EWLNA, the Tourism and Transport Forum Australia argued that its proposal for a road and rail tunnel in Melbourne could be seen as reflecting:

> *"a more subtle, and typically 'Melbourne' approach to urban development – by opening up space in inner suburban environments and reducing the intrusion of vehicular traffic on inner-city life."*[68]

65. A full list of key European heritage sites in the Study Area is set out in SKM Maunsell (2008)

66. A detailed description of these improvements is set out at the EastLink website: www.eastlink.com.au
67. City of Melbourne submission to the EWLNA (2007) p.8
68. Tourism and Transport Forum submission to the EWLNA (2007), p.5

Royal Park

Royal Park has a long and significant history. Originally an important Aboriginal camping ground, the park is perhaps best known as the starting point for the ill-fated 1860 Burke and Wills expedition. In 1868 and again in 1878 the size of Royal Park was reduced for housing allotments. In the 1880s more park land was used to make way for trams, trains and roads.

The Park was used for the stationing of troops during the First World War. During the Depression, the park's status as a 'commons' allowed it to be used as an address for many country people on sustenance as they sought work in Melbourne. In the Second World War, the park was a major Australian and American army base. Camp Pell remained located in the park after the war and more than 100 army buildings were used as emergency housing until the park was 'cleaned up' for the Melbourne Olympics in 1956. In the intervening years, another 2.5 hectares of park land were transferred to the Royal Children's Hospital.

The Netball Association opened a major stadium in the park in 1969. This stadium was replaced in 2000 by the State Netball and Hockey Centre. In the 1970s, the City of Melbourne took over the Royal Park Golf Club for public use.

Royal Park is cut into several parcels of land by the Upfield rail line, the West Coburg tramline and a number of roads, including Elliot Avenue and Macarthur Road – a significant east-west arterial road link that carries approximately 40,000 vehicles per day (two way) and creates a significant barrier across the park. The Royal Park Master Plan[69] (which guides the development of the park) acknowledges that some traffic routes across the park cannot be closed, but should be designed to allow convenient and safe crossing for park users and to minimise visual disruption of the park. The plan specifically suggests negotiating with VicRoads and other stakeholders to put Macarthur Road into a tunnel and investigate the closure of Elliot Avenue once the tunnel is built.

One of the major recommendations of the EWLNA is the cross city road tunnel. This would pass under Royal Park, providing an east-west link from the Western suburbs, the Port of Melbourne and the Tullamarine Freeway to the Eastern Freeway. The tunnel has the potential to remove a significant amount of surface traffic from crossing Royal Park, consistent with the park's master plan. (However, the closure of Elliot Avenue was not considered by the EWLNA.)

While this is a desirable outcome, it comes with some short term cost. The construction of the cross city tunnel would require an area of the park to be used as a works site to access tunnelling works. After the construction period, the area would be fully rehabilitated with the potential to significantly enhance the park, including revegetation works and the creation of a bird and animal habitat.

69. City of Melbourne (1998), *Royal Park Master Plan*, Melbourne, available at City of Melbourne website: www.melbourne.vic.gov.au

8.3 The EWLNA options

The assessment process adopted by the EWLNA included a detailed review of the potential environment and heritage impacts of each option considered by the Study Team.

This review adopted a broad focus around the alignment of each option, recognising that further engineering development would result in changes to the final form taken by the option. The primary purpose of the review was to identify any significant environment or heritage issues that should be considered in any further development of each option.

All construction related to the new rail and road infrastructure proposed by the EWLNA would be within the fully developed Melbourne urban area. Following review of the initial feasibility design for each of the options, the Study Team concluded that there would be no 'fatal flaws' associated with potential environmental or heritage impacts. However, the review identified issues that will require careful consideration during any further development of the options.

8.3.1 Impact of EWLNA recommendations on GHG emissions

As noted earlier in this Chapter, GHG emissions from transport in Victoria are set to grow by 16.4 per cent by 2020. Looking longer term – and keeping in mind the Victorian Government's target to reduce overall GHG emissions by 60 per cent in 2050 – emissions from transport are likely to rise by between 60 to 80 per cent over the next 40 years.

Clearly, action needs to be taken to reduce these emissions; however, the scale and range of measures that can be taken to achieve this outcome are beyond the scope of the EWLNA.

Some submissions to the EWLNA put the view that the 'worst thing' to do in terms of GHG emissions is to 'build more roads'. This view states that building more roads (or major new road extensions) increases Melbourne's reliance on cars, induces more car travel and undermines the attractiveness of public transport as an alternative to car travel. In the Study Team's view, many arguments about 'induced travel' fail to take into account the complex factors associated with travel demand and travel behaviour that come into play in response to increased road capacity.[70]

It should be acknowledged that travel is a 'derived demand' – in that people rarely travel for the sake of travelling, but for some specific purpose: work, education, social or recreational. This means that a new east-west road link is likely to facilitate greater efficiency in journeys that people were already making (although there may be a small increase in discretionary travel). Modelling undertaken for the EWLNA shows that this efficiency generates a very small reduction in future GHG emissions in Melbourne through reduced stop-start congestion and by removing traffic from adjacent roads that would become more congested as Melbourne's population grows.

In addition, the EWLNA recommendations do not extend the road network beyond the city boundaries or provide direct city access by road. The provision of an inner metropolitan road link should stimulate further development within the inner and middle suburbs (with careful planning controls), increasing urban density in line with *Melbourne 2030* and contributing to reducing or limiting growth in GHG emissions (as indicated by the EWLNA's carbon constrained future scenario).

The Study Team's view is that major road investments continue to have their place. However, investment in public transport is absolutely critical to ensure that modal share in transport optimises efficiency, minimises GHG emissions arising from growing travel demand and addresses transport disadvantage. This balance is reflected in the EWLNA recommendations.

8.3.2 Environmental review

The main environmental impacts of the recommended options are briefly discussed below.[71]

New east-west rail infrastructure

A significant portion of the proposed new east-west rail infrastructure would be constructed in tunnel, probably as two separate bores of seven to eight meters in diameter, placed approximately one diameter apart. The tunnel depth would vary from directly below the natural surface to a possible 50 metres below the surface under the CBD. Surface works would be required where stations are located and where the new rail infrastructure connects to the existing network, causing disruption during the construction period.

70. A discussion on induced travel is set out in Appendix E.

71. Further discussion is set out in SKM Maunsell (2008)

Construction

Whilst the wider range of potential risks has been assessed by the review, the most significant environmental and heritage risks associated with this type of construction are considered to be hydrogeological impacts and the occurrence within the Study Area of naturally occurring and man-made soil 'contamination'.

With today's advanced and improving tunnelling technology, hydrogeological impacts can be effectively managed during construction and 'tanking' or 'water-proofing' of tunnels is now considered an effective design and construction technique to ensure that the long-term influences of an underground structure do not impact on groundwater levels. As standard practice for different methods of tunnelling, underground grouting and compressed air support are used successfully to control water inflows in tunnels during construction. In addition, the use of Tunnel Boring Machines (where they are best suited as the tunnelling method), combined with fine tolerances and sealed pre-cast concrete segment linings, has provided further improvement in the control of hydrogeologic issues associated with tunnels.

Acid sulphate soils are a naturally occurring material located in Melbourne's central region. Excavation and exposure of this soil creates the potential for soil contamination. In addition, man-made contamination is likely to be encountered in any urban area with a long history of development. Again, currently available construction and soil treatment techniques enable these risks to be managed adequately, although this could have a bearing on the cost of construction. Any contaminated soils would be removed and located at approved locations or treated to the requirements of a relevant authority.

Operation

The most significant environmental and heritage risks associated with the operation of a new east-west rail tunnel are considered to be regenerated noise or vibration and longer-term hydrogeological impacts.

Surface noise associated with the operation of the new infrastructure would be restricted to those areas near west Footscray and east of Caulfield, where existing rail lines currently operate. The impact associated with additional trains running in these areas is not considered to be significant. Overall, the provision of extra services in tunnel would result in a net positive impact in relation to surface noise across the rail network.

Regenerated noise and vibration can be mitigated by vibration damping of the rails and rail beds, a well established technique. Costs associated with the use of these construction methodologies and design techniques to control hydrogeologic risk, soil contamination and noise have been incorporated within the project cost estimates.

New east-west road infrastructure

A significant portion of the proposed new east-west road infrastructure would be constructed in tunnels of varying sizes and construction methodologies, including cut and cover techniques directly below the surface and driven tunnelling to create tubes well below the surface. Driven tunnel tube diameter would vary between 12 and 15 metres, dependent on lane configuration. The tunnel depth would vary from immediately below the surface to a possible 30 metres below the surface.

Where the new link connects to existing roads (such as the Port of Melbourne area, the Tullamarine Freeway and the Eastern Freeway), interchanges would need to be constructed from the surface, causing disruption during the construction period. West of Footscray, the options being proposed would be constructed on the surface, incorporating elevated and surface roadways.

Construction

The construction issues associated with tunnelling are similar to those for the proposed rail infrastructure, with the primary difference being that larger tunnels create a larger exposure to hydrogeological risks and contamination due to the larger volumes of material being excavated.

As for the rail tunnel, these risks can be adequately managed using appropriate tunnelling technology and material handling techniques.

Other risks associated with surface works can be managed satisfactorily with currently available construction methods and environmental management measures.

Operation

The most significant environmental and heritage issues associated with the operation of a new east-west road are considered to be GHG emissions, tunnel ventilation, noise and hydrogeological impacts.

GHG emissions associated with the new road infrastructure have been analysed using the outputs modelled for the EWLNA. These modelling outputs indicate that the inclusion of additional road infrastructure results in decreases in GHG emissions as trips that would otherwise be made on congested local and arterial roads are reallocated to a new free-flowing road. However, these decreases are so small as to be statistically insignificant in the wider Melbourne area.

Ventilation of the tunnels would require a number of ventilation stations along the route – probably between four to six (two for each tunnel 'stretch', depending upon the final option adopted). The location of these stations would be subject to extensive design analysis. For other Melbourne tunnel projects, EPA approval processes have ensured community involvement in this analysis. In the case of CityLink, no negative impacts on local air quality have been found to be associated with ventilation stations. In some circumstances, local air quality may be enhanced by reducing local surface traffic and the resulting emissions.

Noise is always a risk associated with the operation of major new roads and noise amelioration guidelines would need to be implemented. New traffic noise would be limited to locations where traffic enters and exits the tunnel. Other parts of the road network would benefit from an overall reduction in traffic noise by taking thousands of vehicles beneath the ground.

Longer-term hydrogeological impacts would be controlled during the design and construction phase by the use of water-proofing design and construction techniques.

Costs associated with the use of these construction methodologies and design techniques to control hydrogeologic risk, soil contamination and noise have been incorporated within estimates of the project costs.

8.3.3 Legislative requirements

If the Victorian Government proceeds with the EWLNA recommended projects, further consideration will need to be given to the requirements of the *Environmental Effects Act 1978*.

The process for meeting these requirements is set out in the *2006 Ministerial Guidelines for the assessment of environmental effects under the Environmental Effects Act 1978*. In summary, where a project could have a significant effect on the environment, a proponent (in this instance the relevant part of government given the task of implementing the project) must ask the Minister for Planning whether an Environmental Effects Statement (EES) is required. This process is known as a 'referral'. In general terms, the threshold question considered by the Minister is whether the project, considered in its entirety, could have *significant adverse impacts* on the environment in a regional or state context. The Ministerial Guidelines outline the type of matters to be considered by the Minister as to whether an EES is required.

From the environmental matters considered as part of the Study, and having regard to the likely mitigation measures that would be adopted (including tunnelling techniques to minimise adverse groundwater impacts), it is possible that an EES would not be required for a rail tunnel project. Clearly, the matters identified in the Study Team's environment and heritage review would need to be carefully studied and understood before any final conclusion could be drawn in this regard.

A road tunnel is likely to be a different matter. Having regard to the matters to be considered by the Minister, it is highly likely that an EES would be required.

In either case, sufficient technical work needs to be undertaken to support the referral and to inform a decision by the Minister for Planning under the Act. That work could commence immediately and should include opportunities to consult with communities likely to be affected by the projects.

Study Team Finding

A number of environmental issues within the Study Area will need to be further considered if the projects recommended by the EWLNA are to proceed. However, there are no 'fatal flaws' or significant problems in relation to potential environment or heritage impacts that cannot be appropriately and effectively managed.

As with other major transport infrastructure projects, the EWLNA recommended options offer significant opportunities to redress previous environmental damage, improve future environmental outcomes and enhance neighbourhood amenity.

The large scale, broad solutions to reduce GHG emissions are beyond the scope of the EWLNA; however, the Study Team has assessed all options considered as part of the EWLNA in relation to their impact on GHG emissions. The final package of recommendations proposed by the team has a minimal – but beneficial – impact on overall GHG emissions in Victoria.

Peak oil

A number of submissions to the Study Team expressed concern about the impact of the future availability of oil supplies on Victoria's transport system. The Study Team recognises that governments and others making decisions about future transport options need to carefully consider the impact of diminishing global supplies of oil and the workings of a post-carbon global economy.

It is well-accepted that the world's oil reserves are finite and that world oil production will eventually reach a peak, before starting an irreversible decline – a concept known as 'peak oil'. However, there are differing views about the timeframe in which this will occur.

The 'depletionists' – such as the Association for the Study of Peak Oil (ASPO) – argue that half the world's oil supplies have been used already, that oil production has peaked or is about to peak and that a sudden downturn in oil production will occur in the very near future, with a major disruptive impact on national economies and the global economy.

The 'antidepletionists' – such as the USA Geological Survey and Cambridge Energy Research Associates (CERA) – have forecast longer timeframes. These groups argue that – due to technological advances, changing economies, improved knowledge about oil reserves and growth in non-traditional and unconventional liquid fuels – the world's remaining oil resources are sufficient to meet projected cumulative world demand for at least another 30 to 50 years, giving economies time to adjust. CERA has expressed the strong view that "not only will world oil production not peak before 2030, but that the idea of a peak is itself a dramatic and highly questionable image". CERA argues that global production will follow an 'undulating plateau' for one or more decades before declining slowly, possibly over several decades.[72]

The International Energy Agency (IEA) has stated that "world oil resources are judged to be sufficient to meet the projected growth in demand to 2030", although it does not rule out "a supply-side crunch in the period to 2015."[73] However, the IEA has noted that it regards current trends in energy consumption as "neither secure nor sustainable – economically, environmentally or socially".[74]

The 'peak oil' timing debate is made more confusing by the absence of reliable data, with both schools of thought agreeing that the amount of oil in the world is unknown. There is considerable disagreement about the total quantity of oil resources that will ever be produced and the amount of oil that can be recovered commercially from known resources. However, it is clear that the global demand for oil is continuing to increase, that the balance between supply and demand is much tighter and that supply disruptions will have a much larger influence on oil prices.

Since 2005, world oil prices have risen sharply, from US$30 a barrel in 2005 to the current level of US$110 a barrel. This increase has flowed through to retail petrol prices, increasing the cost of petrol in Melbourne from around AUD$1.15 a litre in 2005 to around AUD$1.45 a litre in 2008 – although the rising Australian dollar has softened this impact to some extent.

In Australia, demand for petroleum is projected to increase from more than 750,000 barrels per day to over 1.2 million barrels per day by 2029-30 – an increase of almost 2 per cent per year over the period.[75] Australia's self-sufficiency in oil is expected to decline significantly, with future discoveries not likely to make up for growth in demand and the decline in reserves.[76]

Irrespective of the uncertainty surrounding the timing of 'peak oil', it is clear that the demand for oil is unsustainable and must be reduced – and that market forces and technological progress must be encouraged to bring alternative fuels on stream in a timely way and in sufficient quantity to serve the 'post oil age'. Around the world, most countries have increased fuel prices above the market price and are directing increasing effort and investment into reducing the dependence of their transport systems on oil. As noted earlier in this chapter, leading automotive manufacturers are also investing heavily in R&D to develop more 'environmentally friendly' motor vehicles.

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72. Cambridge Energy Research Associates, 'Peak Oil Theory – 'World Running Out of Oil Soon' – Is Faulty; Could Distort Policy & Energy Debate', Media Release, 14 November 2006, accessed at www.cera.com
73. IEA: International Energy Agency (2007), *World Energy Outlook 2007 – Executive Summary*, OECD/IEA, Paris, p.4
74. IEA: International Energy Agency (2006), *World Energy Outlook 2006*, OECD/IEA, Paris, p.49
75. ABARE: Australian Bureau of Agricultural and Resource Economics (2005), *Australian Energy – National and State Projections to 2029-30*, Commonwealth of Australia, Canberra, p. 63
76. See discussion in Senate Standing Committee on Rural and Regional Affairs and Transport (February 2007), *Australia's future oil supply and alternative transport fuels*, Final Report, Commonwealth of Australia, Canberra, p.17

Some commentators predict that a significant increase in petrol prices over the next 25 years will lead to a much greater demand for public transport and a significant shift from road to rail freight. Others believe that it will stimulate the development and take-up of alternative fuel technologies and lead to people shifting not to public transport, but to more fuel efficient motor vehicles and to alternatives such as electric, hybrid, hydrogen and bio-diesel cars.

It is difficult to predict accurately the impact on Melbourne's transport network of the various peak oil scenarios; it is certainly not as straightforward as suggested by some submissions to the EWLNA. In some ways, the peak oil debate misses the point when it comes to travel behaviour. Irrespective of the timing of peak oil, the demand for mobility – people's need to move around – will still exist. Should the 'depletionists' be proved correct, the price of petrol will escalate dramatically in the very near future and the race for the alternative-fuelled vehicles will be even more competitive than it is today. Under such a scenario, as the EWLNA 'carbon constrained' modelling shows, more and more people will use public transport, and action needs to be taken to ensure that public transport options exist with sufficient capacity to meet this increased demand. But motor vehicles will still exist – and in greater numbers as the population grows: they just may not be running on petrol.

chapter 9

9. the way forward

The EWLNA is a strategic study; it is not a business case. The Study Team has identified the main transport challenges facing Melbourne and developed a number of specific projects to meet these challenges. These projects will need to be further developed and refined – and consultation processes put in place – before proceeding.

9.1 Melbourne metro – 'new generation' rail tunnel

- **Recommendation 1**

  Planning work should commence for the staged construction of a new 17 kilometre Melbourne Metro rail tunnel linking Melbourne's booming western and south-eastern suburbs.

- **Recommendation 2**

  The Victorian Government should bring forward the construction of a new rail connection from Werribee to Sunshine (the Tarneit link) to significantly improve the frequency and reliability of services from Werribee, Geelong, Ballarat and Bendigo.

  The Government should commit to using the new rail tunnel and Tarneit link as the foundation for extending the metropolitan rail network further to the west within the next 15 years.

It is clear that a generational 'step-up' in Melbourne's rail capacity is needed. This need can be met most effectively through the construction of a new 17 kilometre rail tunnel linking Melbourne's booming western, north-western and south-eastern suburbs – doubling the capacity of the heavy passenger rail network to the fastest growing areas of Melbourne.

Combined with capacity upgrades to which the Victorian Government is already committed, the new tunnel would provide capacity for at least an extra 40,000 commuters every hour and take a major step towards creating Melbourne's first 'metro' style passenger line (a common feature of successful overseas rail networks).

Project benefits

- Provides capacity for an extra 40,000 passengers per hour
- Provides more opportunities for travel by rail, with likely increases in public transport mode share
- Ensures that the Northern and Caulfield Rail Groups have sufficient capacity in the future
- Lays down the foundation for further extensions of the network into growing areas in the west
- Stimulates and supports continuing growth in the central city, including providing new rail links to the major precincts of St Kilda Road and the Parkville (hospital and university) precinct
- Opens up new opportunities for major urban redevelopment (residential and commercial) around new stations
- Provides new rail links between Footscray, Parkville and the central city, opening up new opportunities for the inner west to leverage jobs and business growth from the central city's growth
- Facilitates the integration of Footscray into the broader CBD area
- Improves capacity for travel in the busy Melbourne University – St Kilda Road corridor, relieving pressure on tram services in Swanston Street and along St Kilda Road
- Provides opportunities for increasing rail freight capacity when needed for the development of inland ports and the development of the Port of Hastings
- Provides opportunities for introducing new rail technologies and longer trains
- Provides easy train-to-train connections for all Melbourne rail users wishing to access Parkville, St Kilda Road, Footscray, Caulfield and all stations beyond these points
- When combined with the proposed Tarneit line, substantially improves the number and reliability of Geelong, Ballarat and Bendigo services
- Takes the first step towards building a metro-style network by 'unscrambling' the inner core of the network.

As noted in Chapter 1, the strong population growth in the west and north-west of Melbourne demands attention and immediate action – with forecast population growth in Wyndham and Melton alone expected to be 170,000 in the next 20 years.

As noted in Chapter 3, demand projections clearly indicate that without a major intervention to increase capacity on the heavy rail network, train lines serving the western and north-western suburbs will reach breaking point within a decade.

The Pakenham, Cranbourne and Frankston lines will reach capacity shortly after the western lines.

The implications of hitting this capacity wall include severe overcrowding, an inability to add extra services to cater for population growth and a deterioration in reliability. It would be a constraint on the growth of the central city and important suburban centres. In addition, the opportunities to increase public transport mode share to these areas would be compromised.

To provide for current and future growth – and to help to meet the city's key economic, social and environmental challenges – the Study Team believes that it is time for a generational 'step-up' in rail capacity and for Melbourne's next city changing rail project.

Project details

- A 17 km rail tunnel from Melbourne's west to south-east, consisting of twin 7 metre diameter tunnels at a depth of up to 50 metres below the city and 40 metres under the Maribyrnong River.
- A network of new, state-of-the-art underground stations at Footscray, the Parkville precinct, the city and along St Kilda Road. The option for a new station at North Melbourne should also be considered.
- Built in two stages, with stage one tunnelling running from Footscray to the Domain to provide for growth on the Werribee, Sydenham, Craigieburn, Williamstown and Upfield lines (the Northern Rail Group). The stage one route would start west of the existing West Footscray Station, with the tunnel running generally under the Maribyrnong River, under Kensington adjacent to J.J. Holland Park, under the North Melbourne Cricket Ground and the Royal Children's Hospital to the Parkville precinct. To complete stage one, the route would head south under Swanston Street and St Kilda Road to the Domain.
- Stage two tunnelling would run from Domain to Caulfield to cater for growth on the Pakenham, Cranbourne and Frankston lines (the Caulfield Rail Group) and would follow an alignment down St Kilda Road and Dandenong Road. Opportunities could be explored for stage two to involve cut-and-cover tunnelling along St Kilda Road and Dandenong Road to reduce the cost of tunnelling and station construction.

In order to extract the full capacity benefits from the new tunnel, it will be necessary to bring forward work included within *Meeting Our Transport Challenges* to enable construction of a new rail link from Werribee to Sunshine (the Tarneit link) and the construction of the third and fourth tracks from Footscray to Sunshine.

The Tarneit link would end conflict between Geelong regional trains and Werribee suburban trains by running V/Line services on a new alignment through the growth areas of Tarneit and Derrimut. This would deliver very substantial benefits across the entire rail network, including providing residents in new growth areas with a high standard rail link and improved reliability for regional commuters from Geelong, Ballarat and Bendigo. It would allow for a significant increase in suburban services on the Werribee line to meet increasing demand in the growth area of Wyndham.

Staging of project

Given the scale and cost of the project, the Study Team recommends that the tunnel be delivered in two stages.

Stage one would be a 9 km tunnel from Footscray to the Domain, removing conflicts and improving services to the Northern Rail Group. The tunnel would start at West Footscray, with a modern, new underground station under Footscray – at the heart of a major urban redevelopment of the inner west. Amenity improvements recommended elsewhere in the report would complement the tunnel initiative, providing a long-overdue impetus for stronger economic development in the city's west.

For the first time in Melbourne's history, the university, hospital and biotechnology precinct in Carlton would be linked to the heavy rail network with a new underground station in the vicinity of the medical/university precinct. From Carlton, the tunnel would continue to the CBD, with a new central city station. From the city, the tunnel would continue under Swanston Street and St Kilda Road to the Domain, with a new underground station under the Domain adjacent to the Shrine.

Stage two would be an 8 km tunnel from the Domain to Caulfield to improve services to the Pakenham, Cranbourne, and Frankston lines (the Caulfield Rail Group).

Tarneit Link

In order to extract the full capacity benefits from the new tunnel, the Study Team recommends bringing forward construction of the third and fourth tracks from Footscray to Sunshine (committed to in MOTC), to enable construction of a new rail link from West Werribee to Sunshine (the Tarneit link).

The Tarneit link would deliver very substantial benefits, including:

- Separates the Geelong, Ballarat and Bendigo trains from suburban trains as they approach Southern Cross Station
- Provides for a major increase in suburban services on the Werribee line to meet increasing demand in the growth area of Wyndham
- Ends conflict between Geelong regional trains and Werribee suburban trains, providing a substantial increase in reliability for both lines
- Provides a dedicated V/Line track on a new alignment through the new growth areas of Tarneit and Derrimut, giving residents in these areas a high standard rail link
- Allows a major boost in services, particularly much needed peak hour services, for regional commuters on the Geelong, Ballarat and Bendigo lines

The increase in capacity provided by the rail tunnel provides for long term growth, with allowance made for the running of longer trains should this new capacity also be used up in the future. Figures 100 and 101 show the sharp boost to capacity delivered by the tunnel on the Northern and Caulfield Rail Groups.

Project costs

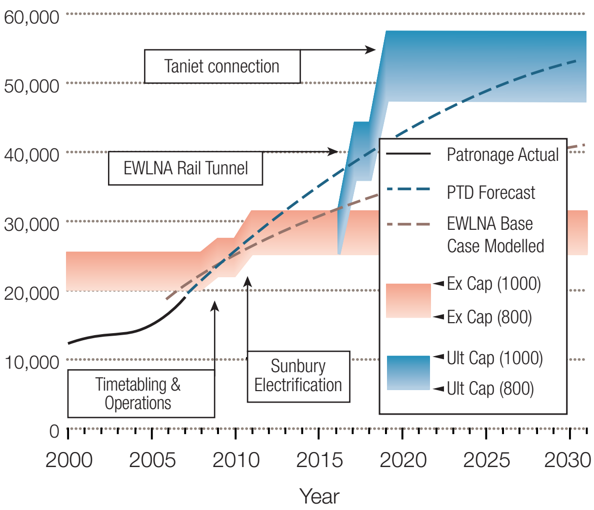
Estimated total project cost: $7.5 billion to $8.5 billion

Estimated cost stage one: $4.5 billion

Estimated cost stage two: $2.5 billion

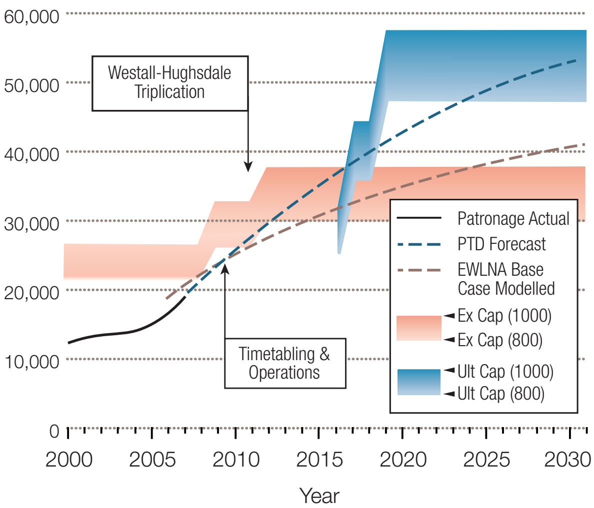
Additional cost to deliver the Tarneit connection: $1.5 billion (partly funded through MOTC)

Figure 100 – Northern Group – east-west rail tunnel with Tarneit link, patronage versus capacity



Source: EWLNA

Figure 101 – Caulfield Rail Group – east-west rail tunnel with Tarneit link, patronage versus capacity

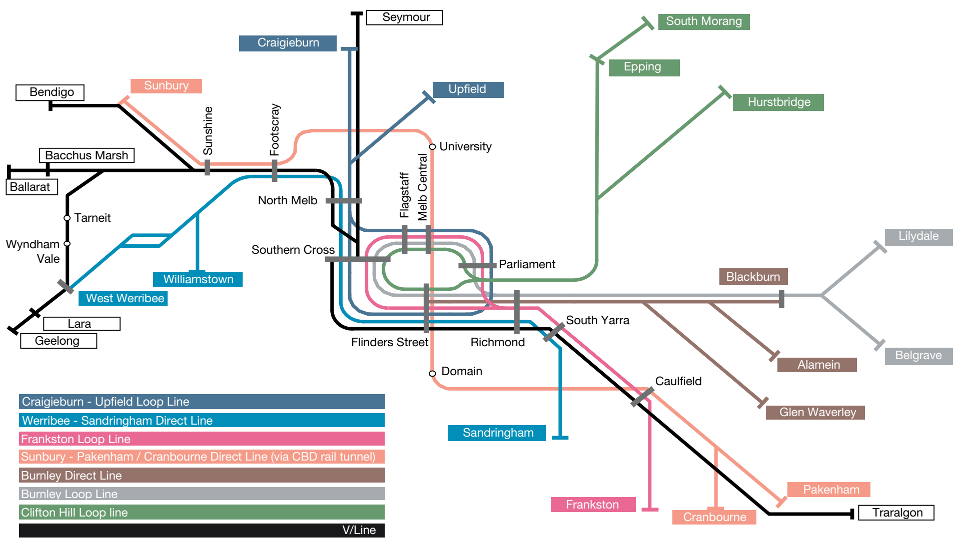


Source: EWLNA

Figure 102 – Melbourne Metro rail tunnel and Tarneit line

Source: EWLNA

Figure 103 – Rail network after the completion of the rail tunnel



Source: EWLNA (Public Transport Division, DOI)

9.2 Extension of the suburban network to Sunbury

- **Recommendation 3**

  During the planning and construction of the rail tunnel, the Victorian Government should continue to make better use of the existing network to increase capacity, including commencing work on the electrification of the network to Sunbury to boost services on the Sydenham line.

The Northern Group of lines is under significant pressure from growing patronage, with the Sydenham line facing particularly severe overcrowding.

Patronage on the line has grown by 55 per cent over the past three years – the most rapid growth on the network. Peak hour services are severely overcrowded, with trains regularly carrying more than 1100 passengers. To put this growth in perspective, each carriage is carrying an extra 65 passengers.

This surge in patronage has led to a substantial decline in reliability, with peak period train services on the Sydenham line declining from 96 per cent in 2002-03 to 82 per cent in 2006-07.

Capacity on the line can be significantly improved with the electrification of the line to Sunbury. Without this boost to capacity, there will be more instances of passengers being left behind at stations.

The extension of electrified services to Sunbury will allow an additional 2,800 passengers to be carried in the morning peak period. It would relieve the chronic overcrowding on the Sydenham line and improve reliability of services.

Sunbury is on the outer edge of the Melbourne 2030 Urban Growth Boundary. Electrification will join it to the rest of the metropolitan rail network and will also provide Sunbury and Diggers Rest with a quality of service comparable to other parts of Melbourne, including direct access to the Melbourne Underground Rail Loop.

The EWLNA Study Team notes that this project would deliver very significant benefits to Melbourne's growing west and north-west and could be undertaken in the short to medium term.

Project benefits

- Allows an additional 2,800 passengers to be carried on the Sydenham line in the peak hour
- Provides overcrowding relief at the earliest opportunity on the network's fastest growing line
- Provides a substantial lift in reliability on the Sydenham line from 82 per cent to more than 90 per cent in the morning peak period
- Provides Sunbury and Diggers Rest with a quality of service comparable to other parts of the Melbourne metropolitan area
- Removes the need for the replacement of 'life expired' V/Line locomotives and rolling stock that are currently use for Sunbury starter services

Project details

The project would involve the following elements:

- Electrification of tracks between Sydenham and Sunbury (15 km of track)
- Expanded park and ride facilities at Diggers Rest and Sunbury (around 600 spaces)
- Replacement of three V/Line diesel services (capacity 400 passengers) with five suburban electric services (capacity 800) in the peak hour

The Study Team recommends an early commencement of work on the electrification during the planning stages of the rail tunnel.

Project costs

Estimated total cost of Sunbury electrification: $216 million

9.3 A new east-west road connection

- **Recommendation 4**

  Planning work should commence on the staged construction of a new 18 kilometre cross city road connection extending from the western suburbs to the Eastern Freeway.

The Study Team has identified a long-term, strategic need for a new transport link from the west to the east of Melbourne.

The many factors that have led the Study Team to this recommendation are examined in this report and include:

- Melbourne's pressing need for an alternative to the West Gate Bridge
- Forecasts in population, economic and traffic growth that will place further pressure on Melbourne's only major east-west link, the West Gate-Monash corridor
- The growing freight task and the importance of freight efficiency to Melbourne and Victorian industry
- Increasing travel times, congestion and travel time volatility on Melbourne's road network, with peak conditions now extending across the day
- The strong and growing demand for cross city travel (particularly from the west) and the lack of direct cross city connections
- The need to provide network flexibility and connectivity by completing the key 'missing links' in Melbourne's transport network

Investigations by the Study Team have concluded that Victoria's most important trade routes – the West Gate-CityLink-Monash corridor and the Western Ring Road – are under enormous pressure from the rate of development and population growth to the west and north-west of Melbourne, and to the south-east.

Traffic modelling undertaken for the EWLNA highlights the extent of the pressure on the West Gate corridor, particularly the West Gate Bridge. As noted in Chapter 5, the bridge currently carries around 165,000 vehicles per day, forecast to increase to 235,000 vehicles per day by 2031.

In addition to traffic and economic modelling, the Study Team carried out a risk assessment on the West Gate Bridge, including modelling a scenario where the bridge was unable to be used for an extended period of time. The results of this modelling (see Chapter 5) highlight the urgent need to secure a second major river crossing from the west.

Engineering work has identified two options for a second river crossing that could be constructed as part of an 18 km freeway-standard transport link that would provide an alternative to the West Gate Bridge while also meeting long-term social and economic objectives for Melbourne and Victoria.

Project benefits

- Provides a long-term alternative to the West Gate Bridge
- Will carry more than 150,000 vehicles per day, relieving surface roads of this traffic
- Delivers another freeway standard river crossing from the west that has connections across the north of the CBD from the western suburbs to the Eastern Freeway, with connections to the Port
- Provides enhanced port connectivity and freeway connectivity, encouraging more trucks on to the appropriate freeway network and improving freight efficiency
- Helps to relieve congestion at the end of the Eastern Freeway by removing through traffic
- Facilitates more road space beneath the north of the city, creating the potential to improve public transport, create more walking and cycling opportunities and improve amenity
- Provides the opportunity to reduce 'rat running' through the inner north
- Creates the opportunity to improve north-south public transport movements on some of Melbourne's busiest tram routes
- Facilitates separated and dedicated bus lanes on either Johnston Street or Alexandra Parade, enhancing bus service travel times
- Reduces travel time volatility by providing network alternatives to the West Gate corridor and by increasing capacity
- Greatly enhances the connectivity of both Melbourne and Avalon airports
- Delivers a significant boost to amenity in the inner west by diverting through traffic and stimulating the Footscray Transit City
- Improves amenity and enhances the liveability of the city centre.

Project details

The Study Team identified two possible routes that start in the western suburbs and continue to the start of the Eastern Freeway at Hoddle Street.

Both routes form an alternative to the West Gate Bridge and provide connections to Footscray Road, Dynon Road, the port and CityLink.

While the western section of the project (from the western suburbs to the port) has two possible routes, the study identified a single alignment from the port area to the start of the Eastern Freeway.

The two options for the western part of the project are:

- A tunnel under Footscray and under the Maribyrnong River along the general alignment of Buckley Street, connecting Geelong Road and Sunshine Road to Footscray Road and Dynon Road. In the longer term, this would link to the Deer Park Bypass, along the alignment of the Tottenham rail yards.
- An elevated road over the Maribyrnong River connecting the West Gate Freeway near Williamstown Road to Footscray Road and Dynon Road. In the longer term, this would require widening of the West Gate Freeway from Williamstown Road to the Western Ring Road.

Sequencing of the full connection would ultimately be a decision for government: however, the Study Team's view is that the most urgent need is an alternative to the West Gate Bridge – in this instance, a tunnel under or a bridge over the Maribyrnong River, connecting to a northern bypass of the city.

In the short-medium term, the Study Team has identified two stages within the project:

1 The inner west to the port – 3 to 3.3 km

This is the Study Team's preferred first stage. As noted above, the Team identified two options to provide an alternative to the West Gate Bridge at this point.

(a) Construction of tunnels connecting Geelong Road and Sunshine Road to the port area, running under Footscray and under the Maribyrnong River along the alignment of Buckley Street, with a new interchange in the port area connecting to Footscray Road and Dynon Road. Most of the length would be constructed by tunnel boring machines, although the crossing of the Maribyrnong River would be constructed from the surface, in similar fashion to CityLink's Domain Tunnel under the Yarra River.

(b) An elevated road over the Maribyrnong River connecting the West Gate Freeway near Williamstown Road to Footscray Road and Dynon Road. The new road would also include a connection to Hyde Street, providing a new route for truck access into the port and allowing the implementation of further truck bans in Footscray and Yarraville.

Under both options stage one would emerge at a major interchange in the port precinct, providing connections to Footscray Road and Dynon Road at a new linking road connecting Footscray, Dynon and Ballarat Roads.

In the longer term, for the link to fulfil its potential as an alternative route to the West Gate Freeway, both options would need to be extended west a further 6km to the Western Ring Road **(stage 3)**. If option 1(a) was adopted, a direct connection from the tunnel at Geelong Road and Sunshine Road to the Western Ring Road at the Deer Park Bypass would be required. If option 1(b) was adopted, the West Gate Freeway would be widened from Williamstown Road to the Western Ring Road. Property acquisition would be required to implement either of the connections further west.

Construction of the connection to the Western Ring Road would begin after stages one and two were completed, around 2019.

2 West Melbourne to the Eastern Freeway – 8.9 km

West Melbourne to Flemington/Parkville

This section would require a mix of cut-and-cover and bored tunnel construction in order to traverse the fully developed inner city areas of Kensington and North Melbourne. From the port interchange, the route follows a north-east alignment adjacent to Kensington Rd, with J.J. Holland Park required as a staging point for deep tunnelling (to be fully restored at the end of construction).

Tunnels in this section would be two or three lanes in each direction.

Flemington/Parkville to Eastern Freeway

This section would carry the most traffic, with volumes of 80,000-100,000 vehicles per day (assuming tolls apply). The alignment for this connection would follow a route under Royal Park, Cemetery Road, Princes Street and Alexandra Parade. At the western end, the tunnels would diverge to provide long, two-lane connections to CityLink for north-bound traffic.

This section would provide three lanes in each direction, with most construction being done as driven tunnel construction, most likely by tunnel boring machines (TBMs), although there would be the opportunity to undertake some of the work as cut-and-cover construction at the eastern and western ends.

Tunnelling for this section would be a major undertaking, and it would be necessary to use a western portion of Royal Park as a staging point for construction (with the park being fully restored and enhanced at completion of the construction stage). There would also be significant temporary interventions from the surface between Nicholson Street and the Eastern Freeway.

Widening of the existing Eastern Freeway to allow the lane configuration necessary for traffic to enter the tunnel or exit to Hoddle Street and Alexandra Parade would be a necessary element of the work. Westerly ramps would be included near Hoddle Street and Queens Parade to facilitate local access.

The Study Team notes that while there is clearly a desire for city access by traffic leaving the Eastern Freeway, there are sound operational, functional and strategic reasons for this section to act as a northern city bypass, and city access ramps have not been included. The Team did not identify any significant demand for a southerly connection to CityLink.

Further recommendations

In addition to the route outlined above, the Study Team makes a number of important recommendations with regard to urban amenity and city access.

First, the Study Team has not provided city access ramps on the Eastern Freeway to CityLink section. Given existing congestion on north-south roads such as Nicholson Street and Smith Street, it would be difficult to provide city access without adding to current congestion problems and possibly causing queuing in the tunnels. As noted in this report, the Study Team's view is that public transport should be the priority for daily journey to work (and study) trips to the city.

Secondly, the Study Team recommends that the Government review its current policy with regard to 'downgrading' roads or reducing the capacity of roads as part of major toll road projects. Should the tunnel proceed, the Study Team believes the Government should allocate a lane each way on Johnston Street or Alexandra Parade as bus-only lanes. If the opportunity is not taken to improve priority for public transport and to improve community amenity, the reductions in surface traffic when the tunnel opened would be eroded over time by natural growth in traffic. Given the likely nature of cut-and-cover construction in Alexandra Parade, there will also be scope for significant landscaping and beautification works at the completion of construction, as well as opportunities for improving cycling and pedestrian options.

Thirdly, the Study Team recommends that the Government reserve a new road corridor to allow the connection of Dynon Road to Wurundjeri Way (through the E-Gate rail area), including a planning overlay for widening Dynon Road to six lanes. This would preserve access from the western suburbs (see Chapter 5 for a discussion on east-west routes) if port expansion impacted on the operation of Footscray Road.

Staging of project

The elements of the project should be sequenced in a way that provides a pipeline of major projects to ensure that expertise is not dissipated. The Study Team's view – based on its modeling and analysis – is that the alternative crossing of the Maribyrnong River is the highest priority, followed by the port to Eastern Freeway connection and lastly the connection to the Western Ring Road.

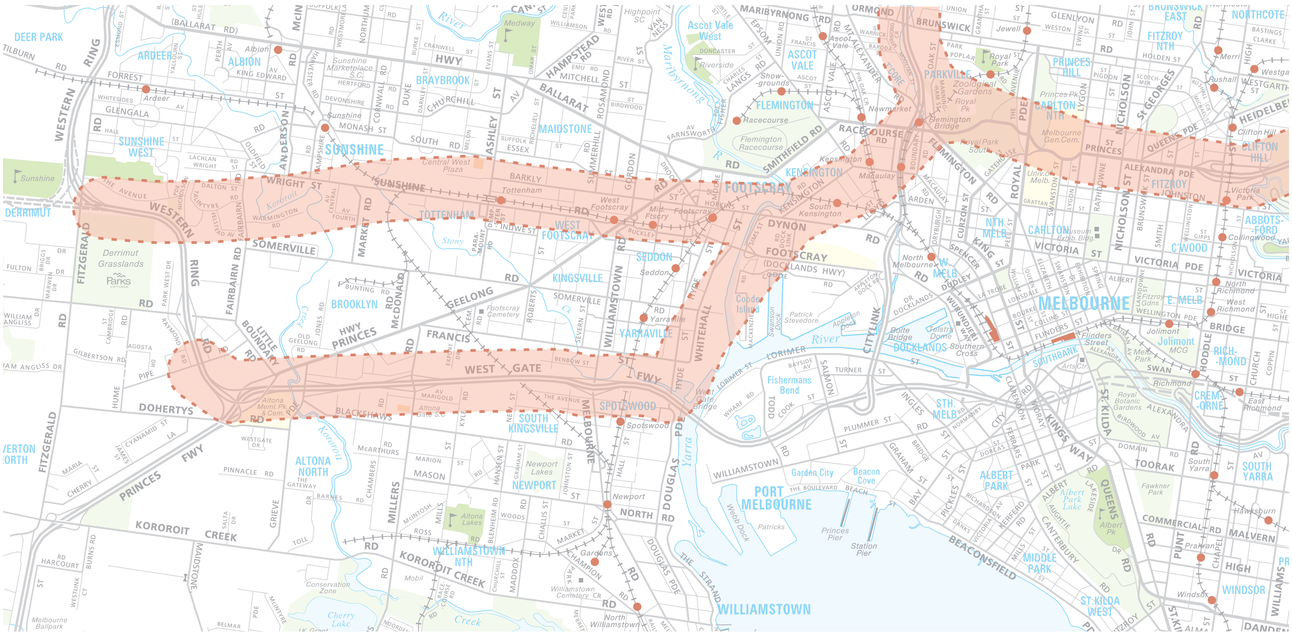
Project costs

Estimated cost Stage one: $2 billion

Estimated cost Stage two: $5.5 billion

Estimated cost Stage three: $1.5 billion

Figure 104 – New east-west road connection



Corridors for road options

Stations

Source: EWLNA

9.4 Truck Action Plan

- **Recommendation 5**

  Community amenity in the inner west should be restored by implementing a Truck Action Plan to remove truck traffic from local streets in the inner west. The plan should include a series of targeted road improvements that form an effective bypass around residential areas, reinforced by local truck bans.

The Study Team identified a clear need to improve amenity in the inner west, particularly in the Footscray and Yarraville areas (see Chapter 6). The Team believes the evidence is very compelling that the combined impact of freight growth through the Port of Melbourne and the growing role of the west as a hub for transport, distribution and logistics (TDL) is detracting from the liveability of the inner west.

While many roads in the area are significantly affected by large numbers of freight vehicles, the focus of most community concern is on Francis Street and Somerville Road. As noted in Chapter 6, Francis Street carries about 7,000 trucks per day and is often used as a short cut from the West Gate Freeway to the Port of Melbourne using the Williamstown Road/Francis Street/Whitehall Street route.

Public submissions suggested a number of projects to alleviate amenity concerns in this area, and the Study Team carefully evaluated the merits of a number of different options. Common to all options was the desire to provide significant improvements to community amenity and safety by reducing the amount of truck traffic on suburban streets, while at the same time providing the necessary freight connections for important economic journeys.

All suggested solutions had their own issues or difficulties. Ultimately, the Study Team identified a series of targeted road improvements that are designed to improve community amenity and stimulate economic development in the inner west, particularly the development of Footscray as a designated Transit City.

These improvements form an effective truck bypass around residential areas in the inner west. Elements of this action plan vary depending upon which of the longer road options is adopted (see Chapter 9.3 above)

Project benefits

- Significantly improves amenity in the inner west of Melbourne
- Significantly improves connectivity from the west to the port precinct for valuable freight journeys
- Contributes to stimulating urban renewal and economic growth in the inner west and supports the Footscray Transit City initiative
- Supports the objectives of the Port of Melbourne's Port Development Plan

Project details

The truck action plan includes a number of new and upgraded roads:

- A new link from the West Gate Freeway to the port, via Hyde Street. This would greatly reduce the need for heavy trucks to use Francis Street and Somerville Road to access the port.
- A new and upgraded north-south freight route along Paramount Road and Ashley Street in West Footscray. This route would link the Geelong Road, Sunshine Road and the Western Highway (Ballarat Road). Some of this route is within an existing road reservation (and is already marked in Melway).

On completion of these new links, there would be an extension of existing truck bans in the Yarraville/Seddon area, focusing on Francis Street and Somerville Road. Enforcement of these bans would also need to be significantly enhanced through the use of technology.

Depending upon which of the longer road options is adopted, the Study Team believes that a number of other road upgrades would be required to complete the Truck Action plan:

- Extending the Ashley Street/Paramount Road link along Cemetery Road to provide a direct link to the West Gate Freeway
- A new road connecting Footscray and Dynon Roads with Ballarat Road near Lynch's Bridge. This link would form a direct route to the port from Ballarat Road and would create an alternative to Moore Street, which currently carries around 2,000 trucks per day
- Widening of Ballarat Road, from Geelong Road to Ashley Street. Although it is recognised that this would involve significant acquisition, without this widening Ballarat Road will continue to act as a constraint on the network. There is an existing planning overlay on this road and VicRoads has already acquired some properties.

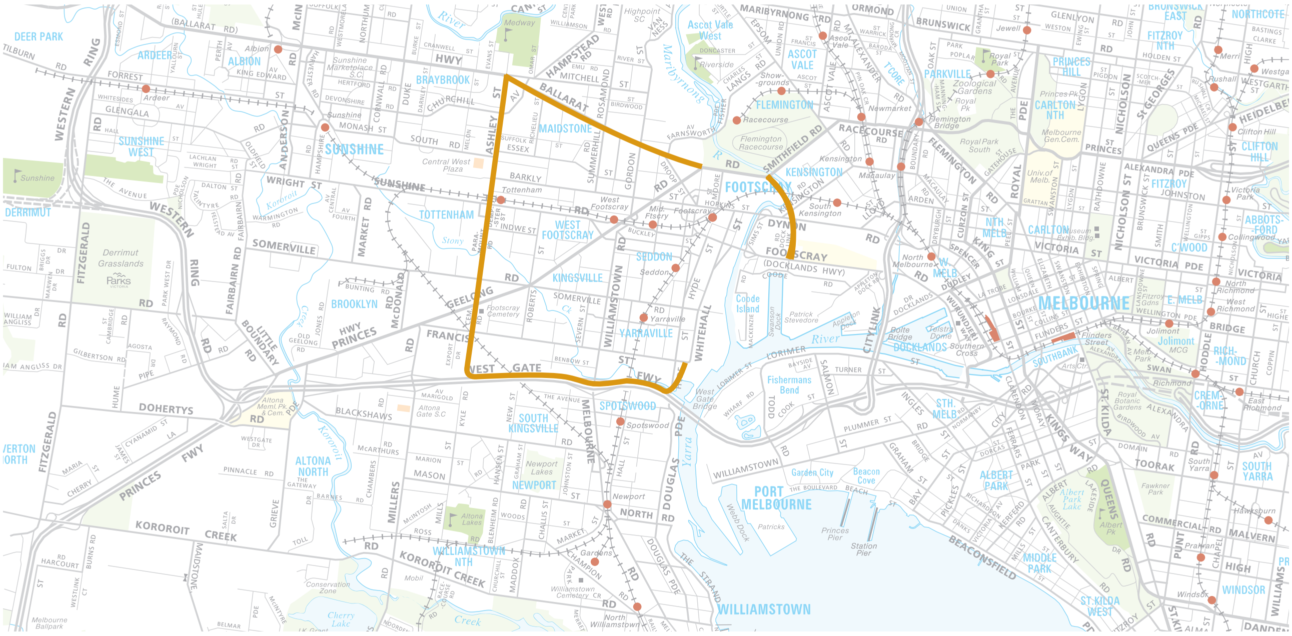
Staging of project

Given the severity of the amenity issues along Francis Street, the Study Team recommends that the Hyde Street connection from the West Gate Freeway and the AshleyStreet/Paramount Road widening be given priority. The other three elements of the Truck Action Plan would be determined as part of the community consultation for the east-west road option.

Project costs

Estimated cost of Truck Action Plan: $0.5 billion

Figure 105 – Truck Action Plan



Truck Action Plan

Stations

Source: EWLNA

9.5 DART – a new, state-of-the-art bus service for Doncaster

- **Recommendation 6**

  Public transport to the Doncaster region is best provided by rapid, high quality bus services, additional bus priority measures and a major new bus-rail interchange at Victoria Park. To deliver this standard of services, the Doncaster Area Rapid Transit upgrade announced in the 2006 Meeting Our Transport Challenges plan should be introduced as soon as possible, along with additional service enhancements and bus priority measures undertaken in conjunction with Recommendation 4.

The Study Team's view is that the quickest and most cost-effective way of improving public transport services – and achieving a substantial boost in public transport along the Doncaster corridor – is with buses.

The Study Team's recommendations build on the significant boost to bus service levels that are planned to be delivered along the corridor under the Doncaster Area Rapid Transit (DART) project, announced by the State Government in 2006 as part of the Meeting Our Transport Challenges statement.

Based on preliminary discussions with the Public Transport Division of the Department of Infrastructure, and the Study Team's own modelling of required bus services, the Study Team believes that the DART upgrade should include a minimum 50 per cent boost to peak hour services to relieve current overcrowding and to provide for future growth.

Even more substantial increases should be provided in off-peak and weekend services, including a 100 per cent increase in weekend services running from 6am to midnight.

To achieve the desired increase in patronage, DART must provide commuters with frequency of service and hours of operation similar to existing tram and heavy rail services in neighbouring municipalities.

With new environmentally friendly buses, high quality 'super stops', high levels of priority and tram-like service frequencies, the initial implementation of the DART upgrades would deliver a patronage boost of around 5000 trips per day (a 50 per cent increase).

Further priority improvements recommended by the Study Team have the potential to provide another significant boost to public transport patronage of around 5000 trips– almost doubling bus patronage from current levels by 2021.

This enhanced DART service would give the Manningham/Doncaster region a state-of-the-art public transport service to the central city that is as fast, comfortable and reliable as a fixed rail service (including more local services) – at a fraction of the cost.

Project benefits –stage one service improvements under DART

- Minimum 50 per increase in peak hour bus services into the CBD
- Minimum 100 per cent increase in weekend services into the CBD
- Peak hour frequencies of around 5 minutes
- Weekend services from 6am to midnight
- Upgrading of a number of routes to SmartBus standard
- Delivers a major improvement to public transport services along the Doncaster corridor
- Creates a high quality, rail-like bus service from Doncaster to the central city
- Encourages greater take up of public transport in the Doncaster/Manningham region
- Provides Doncaster residents (and others along the corridor) with new connections enabling them to travel to Melbourne University/Carlton, Parkville and further west without going through the city.

Project benefits – stage two priority measures

In addition to the stage one service improvements required under DART, the Study Team recommends further improvements that include:

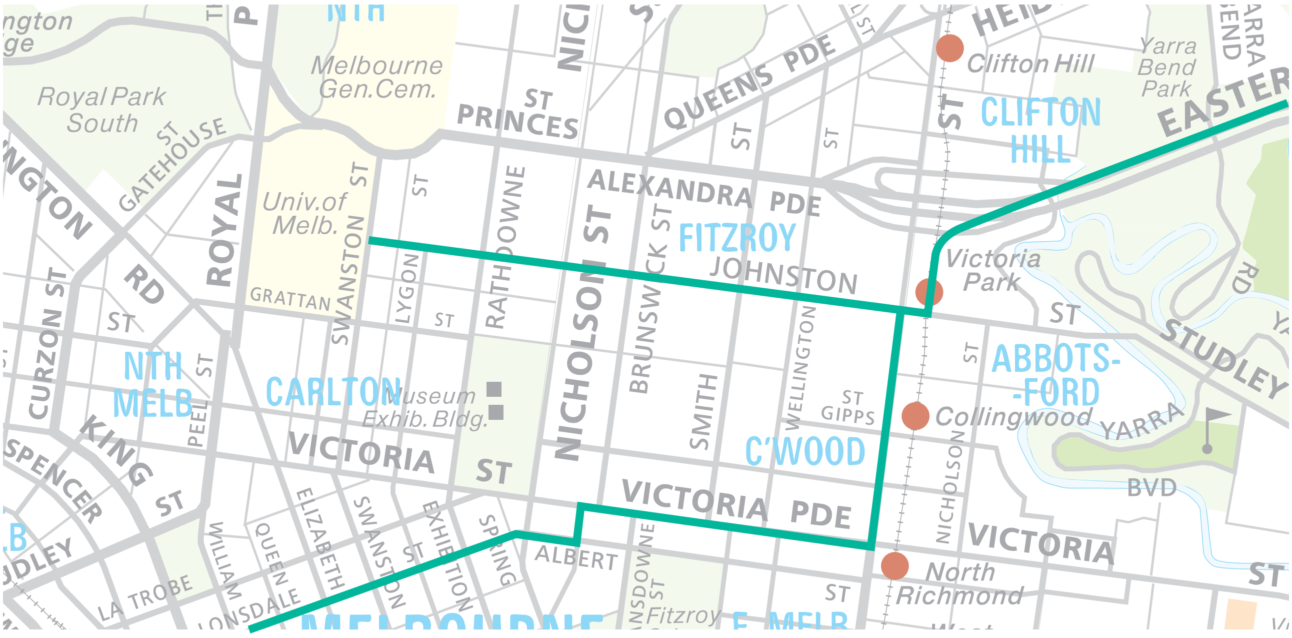
- New bus only ramps off the Eastern Freeway into a major new interchange at Victoria Park Station, including redevelopment of the existing station and possible further amenity improvements in the area
- Continuous bus only lanes from the end of the Eastern Freeway into the CBD
- Extensive work on Hoddle Street (northbound) to allow improved bus priority (with the aim of providing a continuous bus-only lane for outbound buses)
- In conjunction with the development of the EWLNA recommended east-west road link, a reallocation of road space to provide continuous bus only lanes along either Johnston Street or Alexandra Parade connecting to Melbourne University and the new Parkville underground railway station
- Strict enforcement of bus-only lanes
- If the loss of on-street parking for bus-only lanes is opposed by councils, the Study Team recommends that the Victorian Government use its powers to ensure public transport priority (also see Recommendation 8)

- New hybrid buses (as the first step in expanding the number of these buses across the network – also see Recommendation 16)
- Increased funding to significantly expand Park & Ride facilities along the DART routes to capitalise on the increase in express bus services, including adding a deck to the main Park & Ride facility at Doncaster Road. The Team's view is that the Victorian Government should consider establishing a dedicated fund for Park & Ride facilities (see Recommendation 9).

Project costs

Estimated cost of DART Plus: around \$250 million to \$300 million (including the \$80 million already allocated under DART)

Figure 106 – Enhanced DART Service



Doncaster Rapid Transit

Stations

Source: EWLNA

9.6 New cross city cycle links

- **Recommendation 7**

  A number of specific links should be progressively built to improve cross city cycle connections and cater to the growing number of Melburnians cycling to work.

Cycling is growing in popularity across Melbourne, with something of a 'boom' taking place in the numbers of people travelling to work by bicycle. The Study Team believes that there are compelling reasons for encouraging greater take-up of cycling – including health, environmental and neighbourhood amenity reasons, as well as making a contribution to reducing congestion – and that opportunities exist within the Study Area to tackle bottlenecks, improve the connectivity of the cross city bicycle network and generally provide a better environment for cycling.

The Study Team's view is that a number of small scale projects would significantly improve east-west cycling connectivity, improve safety for cyclists and cater for the growing number of Melburnians commuting to work by bicycle.

The strong increase in cycling along key routes demonstrates that providing good quality, separated bike paths will result in increased patronage from cyclists. Additional quality separated paths and appropriate intersection treatments will also make it easier for cyclists to travel across town.

Building a 'cycling culture' across Melbourne is hampered by a fragmented approach to cycling policy and infrastructure within government, with responsibility for cycling initiatives spread across several agencies, including VicRoads, the Department of Infrastructure, the Department of Human Services and local councils. The Team's view is that cycling should be treated as a distinct traffic category, with a co-ordinated, whole of government approach adopted to planning and financing cycling initiatives.

To achieve this, the Victorian Government should establish a long-term, strategic program for walking and cycling, supported by significant and reliable recurrent funding and located within one central department or agency. A key aim of such a program should be to make cycling an accepted alternative to cars and buses as a transport choice for shorter trips.

The Team also notes the importance of ensuring that all new infrastructure projects in Melbourne accommodate walking and cycling access at the very early planning stages. Should the Victorian Government proceed with the major infrastructure recommendations in this report, every effort should be made to ensure that walking and cycling opportunities are enhanced by these projects.

For example, in relation to the recommended rail tunnel, the Team would expect to see good walking and cycling access to the new stations and state-of-the-art cycle facilities at these stations. In relation to the proposed road link, opportunities should be taken to further extend the on- and off-road bicycle network.

Project benefits

- Significantly enhances cycling connections for people making journeys to and from the central city and across the city
- Supports the strong growth in commuter cycling (especially from the west) and encourages greater take up of cycling for travelling to work
- Provides much improved cycling connectivity around the central city by addressing specific gaps in the bicycle network

Project details

The Study Team recommends that priority be given to seven small scale projects designed to enhance east-west cycling connectivity.

Project 1: Extend the Federation Trail (which runs from Werribee to Millers Road, Brooklyn) from Millers Road to Hyde Street (around 4.2 km) and upgrade the existing facility from Hyde Street to Footscray Road (around 3 km), which links with the Riverside Park bike path to Williamstown. This extension would provide a high quality western link all the way from Werribee and Williamstown to Docklands and the central city.

Estimated cost: $17 million
Total length: 7.2 km

Project 2: Upgrade to a separated or 'Copenhagen' standard the east-west cycling link from the Maribyrnong Trail at Footscray to the northern CBD and on to the Capital City Trail at the Abbotsford Arts Precinct and the Collingwood Children's Farm. This route extends from the former stock bridge on the Maribyrnong Trail along Hobsons Road and Childers, Arden, Queensbury, Gertrude, Nicholson and Abbotsford Streets to the Capital City Trail. This upgrade would provide a high quality parallel link to Footscray Road, connecting the northern part of the central city to the Maribyrnong and Capital City Trails. It would provide a separated east-west cycling link across the city, giving access to Footscray, Kensington, North Melbourne, Carlton, Fitzroy, Collingwood and Abbotsford.

Estimated cost: $7 million
Total length: 8.8 km

Project 3: A separated cycling trail linking Melbourne University to the Capital City Trail via Johnston Street or Alexandra Parade (in conjunction with the development of the EWLNA recommended road link). This would provide a high quality eastern link to the Yarra River from Parkville and Melbourne University through Carlton, Fitzroy, Collingwood and Abbotsford. It would link with the Swanston Street 'Copenhagen' bike treatment and intersect with the important north-south cycling routes of Brunswick, Canning, Rathdowne and Napier Streets.

Estimated cost: $3 million
Total length: 3.3 km

Project 4: A separated bike lane ('Copenhagen' style) along Albert Street, East Melbourne, into Elizabeth Street, Richmond to Church Street. This would provide an eastern link for CBD commuters that crosses Lennox Street – an important north-south route.

Estimated Cost: $2 million
Total Length: 2.5km

Project 5: A separated bike lane along Highett and Crown Streets in Richmond to the Capital City Trail, then onto a new river crossing into Hawthorn. This new bridge would provide a high quality link from the eastern suburbs to the central city along Crown, Highett, Lennox and Albert Streets.

Estimated Cost: $5 million
Total Length: 2 km

Project 6: Bridge and trail upgrade around Merri Creek in the vicinity of Rushall Station (North Fitzroy/Northcote). While this is an area of high pedestrian and cycling traffic (including pedestrian access to the rail station and a popular commuter cyclist route), the narrow paths, rail underpass and bridge are unsuitable for the existing high levels of use. This project untangles and improves a significant cycling route to the north eastern suburbs of Northcote, Fairfield and Thornbury.

Estimated Cost: $4 million
Total Length: 0.4 km

Project 7: Upgrading the North Bank of the Yarra Trail (Charles Grimes Bridge to Princes Bridge), providing an alternative for cyclists to avoid pedestrian conflicts in Southbank and the Yarra Promenade. This project addresses a longstanding concern for cyclists by separating them from heavy pedestrian traffic around the Southbank entertainment precinct and providing quality access to and through the CBD. The project involves some construction complexities in building the new path along the northern bank of the river.

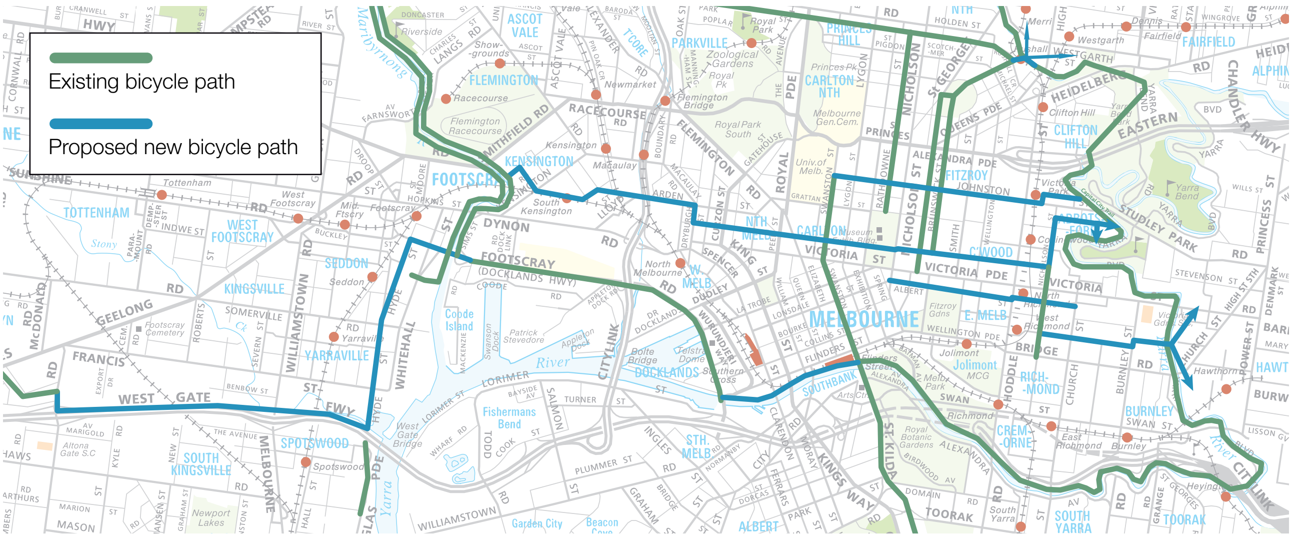
Estimated cost: $22 million
Total Length: 1.9 km

Project costs

Estimated total cost: $60 million

While not specifying specific funding sources for these projects, the Team notes that it could be possible for the IMAP (Inner Melbourne Action Plan) group of councils (the cities of Yarra, Port Phillip, Stonnington and Melbourne) to have access to the CBD congestion levy – as currently occurs with the City of Melbourne – to improve cycling connections within the inner city.

Figure 107 – EWLNA recommended cycling projects



Source: EWLNA

9.7 Better priority and access for public transport

- **Recommendation 8**

  The Victorian Government should work with local councils and relevant agencies to escalate city-wide implementation and enforcement of priority measures for trams and buses.

- **Recommendation 9**

  A dedicated fund should be established to facilitate the development of Park & Ride facilities, with priority given to improving access to rail services in Melbourne's west and facilitating public transport patronage in the Doncaster corridor.

Fast, frequent, reliable and comfortable bus and tram services are critical to increasing public transport patronage. These services share road space with other users, making them vulnerable to delays caused by traffic signals, obstruction by other road vehicles and traffic congestion.

The success of these services is dependent upon their ability to have priority over other road users during peak periods in the city centre. As congestion increases in and around the CBD, these services are at risk of becoming slower, less reliable and less attractive to commuters. While the Victorian Government has introduced measures to tackle this issue, a more forceful approach should be adopted to support the reliable operation of Melbourne's buses and trams to and through the central city. The Study Team sees such an approach as essential for the more efficient allocation of road space between private vehicles and mass transit, and critical to improving public transport patronage in Melbourne.

It is apparent that significant improvements in bus and tram speeds and reliability cannot be achieved without some impact on other road users. A balanced, multi-modal approach to transport in Melbourne requires that road users cede space to mass transit in the interests of overall transport efficiency.

The Study Team notes that the EWLNA recommended road tunnel will allow greater signalling priority for north-south trams and buses along Rathdowne Street, as well as a priority bus route along Johnston Street or Alexandra Parade.

Further actions to improve priority for public transport should include:

- Working with local councils to establish more bus-only lanes and tram fairways, and to enforce these lanes and fairways. Where the loss of on-street parking for these lanes is opposed by councils and/or traders, the Study Team recommends that the Victorian Government be much more proactive in enforcing public transport priority.
- Establishing more priority measures for trams.
- Working with local councils to establish a consistent, effective city-wide program of implementing and enforcing bus-only lanes and priority measures.

As discussed in Chapter 3, Park & Ride facilities are critical to attracting more people to public transport. While the Victorian Government is upgrading a number of these facilities, the Study Team believes that a more comprehensive and coordinated approach is needed.

Recognising the strong growth in the west and that extensions to the rail network are several years away (by the time the EWLNA rail recommendations are implemented), the Team recommends that the Government establish a dedicated fund to identify sites, purchase land and construct additional Park & Ride facilities – with priority given to providing more car spaces at existing stations in the city's growing west and north-west.

9.8 Increase rail's share of freight

- ### Recommendation 10

  The Victorian Government should re-evaluate its 30/2010 rail target (which aims to move 30 per cent of freight from and to all Victorian ports by rail by 2010), given the clear finding by the EWLNA that it cannot be met. The Government should create a new strategy and work with industry to develop and implement a detailed action plan for moving more freight by rail.

- ### Recommendation 11

  The Government should take action to increase rail's share of freight by:

  - Ensuring the development of a single, common user, interstate, intermodal freight terminal north of the city on the Melbourne to Sydney rail corridor
  - Developing the standard gauge rail freight network to connect the interstate intermodal terminal with the key metropolitan freight hubs
  - Making and announcing concrete planning decisions about future sites for metropolitan freight hubs
  - Ensuring that all future transport plans build in the connection of the Port of Hastings to the interstate standard gauge rail network.

- ### Recommendation 12

  The Port of Melbourne Corporation should be given overall responsibility for implementing an intermodal hub network in Melbourne, including responsibility for achieving the Government's revised rail freight target.

As explored in detail in Chapter 6, while the Victorian Government's target of increasing rail's share of port freight to 30 per cent by 2010 is a laudable policy objective, it cannot be met. This target needs to be reviewed and, following consultation with industry, a new plan should be developed for moving more freight by rail.

While most freight in Melbourne will continue to be carried by road, the EWLNA Study Team recommends that the following actions should be taken to increase rail's share of freight:

- The establishment of a single, large, common user, intermodal freight terminal, located away from the port and on the national standard gauge rail network. This terminal would need to be connected to Melbourne's arterial (preferably freeway) road network and would ideally be located north of the city on the Melbourne to Sydney corridor. This 'new' terminal could result from the development and extension of the existing Somerton terminal or be a new terminal altogether.
- The development of a standard gauge rail freight network in Melbourne that connects the interstate intermodal terminal with the key metropolitan hubs of Dynon (the port), Altona/Laverton (west), Somerton (north) and Dandenong/Hastings (south-east). By moving passenger lines underground, the new rail tunnel proposed by the EWLNA creates the potential to allocate a surface alignment for a future standard gauge dedicated freight line on the Dandenong line and to the Port of Hastings.
- The provision of strong, unequivocal support for port rail shuttles. In particular, the Government should:
  - Make and announce concrete planning decisions about possible future sites for metropolitan hubs
  - Give the Port of Melbourne Corporation the responsibility for implementing an intermodal hub network in Melbourne (including responsibility for achieving the Government's revised port rail freight target).

9.9 Improve truck efficiency

- **Recommendation 13**

  Given the projected increase in the metropolitan freight task, the Government should take further action to improve the efficient movement of road freight by permitting the introduction of high productivity freight vehicles on designated routes.

During the EWLNA consultations, industry stakeholders expressed the view that high productivity trucks have the potential to significantly reduce growth in the number of trucks on Melbourne's roads and that the Victorian Government could – and should – immediately approve designated routes for the operation of these vehicles in Victoria.

In February 2006, the Council of Australian Governments agreed to identify a suitable road network for these trucks, with the aim of improving the safety and efficiency of freight transport in Australia. The Australian Transport Council endorsed a limited, initial national network from 1 July 2007.

The National Transport Commission has noted that the benefits of allowing these trucks on designated routes include:

- Fewer, safer heavy trucks operating only on appropriate designated routes
- Fewer heavy trucks moving through suburban streets
- Less overall road wear
- Fewer trucks needed for the overall road freight task, meaning less fuel usage and lower GHG emissions.

While acknowledging that many people have concerns about even larger trucks on the roads, the Study Team believes that the evidence indicates very substantial benefits from the introduction of high productivity trucks on designated routes. In particular, productivity improvements in road freight transport are likely to be a strong driver in reducing growth in the heavy commercial vehicle fleet – with positive repercussions for Melbourne's road network generally and for communities currently dealing with increasing numbers of trucks on local roads.

The Team recommends that the Victorian Government work with industry to facilitate the introduction of these trucks, including the approval of designated routes for the operation of these vehicles in Victoria.

9.10 Continue to implement Melbourne 2030

- **Recommendation 14**

  The Government should continue to implement Melbourne 2030 and take stronger action to accelerate the development of vibrant suburban hubs in Melbourne's west, particularly Footscray, Sydenham, Sunshine and Werribee.

There is compelling evidence that more compact, higher density cities achieve significant economic, social and environmental benefits. While recognising the challenges for Australian governments in implementing policies to increase urban density, the very substantial benefits that can be realised make these policies worth pursuing.

The EWLNA Study Team notes the difficulties that the Victorian Government has faced in implementing its urban density framework, *Melbourne 2030*, but believes that such a framework is vitally important to Melbourne's ongoing liveability. The Team's view is that all communities in Melbourne have to play a part in urban consolidation in the interests of managing the city's strong population growth in a relatively equitable and sustainable manner. Accordingly, the Team recommends that the Government continue to implement *Melbourne 2030* and resist pressures to significantly alter the framework's parameters.

As noted throughout this report, the strong population growth in the city's west has outstripped local employment opportunities. There is a clear case for stimulating and supporting the development of attractive, vibrant suburban hubs in the west to create new employment and business opportunities, as well as improving amenity and liveability. While the Government is investing in the Transit Cities of Footscray and Sydenham within the Study Area, the EWLNA Study Team recommends that – given the rapid growth in the west – it take even stronger action to accelerate the development of these centres, as well as the major suburban hubs of Sunshine and Werribee.

9.11 More low emission, efficient vehicles

- **Recommendation 15**

  Through the Council of Australian Governments – and working with the Australian automotive industry – the Victorian Government should pursue measures to bring Australia into line with European CO_2 emissions standards for motor vehicles.

- **Recommendation 16**

  The Government should develop a clear strategy for increasing the proportion of low emission, efficient vehicles operating in Melbourne.

The Victorian Government's total motor vehicle fleet consists of around 20,000 vehicles and costs more than $300 million each year. However, only 6,600 of the total fleet are passenger vehicles that are operated by the ten 'core' government departments and subject to procurement and environmental policies.[1] These passenger vehicles are supplied via contracts with the four Australian-based passenger vehicle manufacturers: Ford, Holden, Toyota and Mitsubishi.[2] In relation to passenger vehicles, Victorian Government policy is to acquire only locally made vehicles, except where there is no Australian-made vehicle that meets fit-for-purpose criteria.

The Government has made three key environmental commitments in relation to procuring and managing these 'inner budget' passenger cars:

- reducing GHG emissions by 10 per cent;
- reducing the fleet by 5 per cent; and
- buying 100 hybrid Toyota Priuses.

Since 2001, the government has also purchased carbon offsets for its vehicle fleet emissions.[3]

In 2006, at the request of the Minister for Environment, the Commissioner for Environmental Sustainability undertook a review of Victorian Government motor vehicle procurement. The Commissioner stated that while the government's existing commitments "represent a good start … more can and should be done".[4] The Commissioner recommended a number of improvements to fleet procurement, including:

- A whole-of-government approach that covered the 'inner budget' fleet as well as vehicles operated by 'outer government' agencies
- A new comprehensive vehicle selection method, which includes a determination of which vehicles are fit-for-purpose and an evaluation of safety and environmental performance along with cost.
- New targets for the government fleet, including setting targets for the numbers of hybrid, LPG and other alternative fuel vehicles in the fleet; adopting a goal to match fleet emissions with the national average CO_2 emission target (when finalised); and developing travel demand strategies to reduce the need for vehicle use.
- The continuation of offsetting fleet CO_2 emissions.[5]

As the Commissioner noted, one of the major challenges in a more environmentally friendly fleet procurement policy in Victoria is that no hybrid vehicles are currently manufactured in Australia. Adopting tougher GHG reduction targets across the fleet would require the government to drop its policy of acquiring only Australian-made vehicles. With government vehicle procurement accounting for 13.7 per cent of passenger car sales in Victoria,[6] this could have a large impact on the local auto industry.

1. Commissioner for Environmental Sustainability (2006), Review of procurement – Part 1 Government procurement of motor vehicles, A review of environmental, safety and cost considerations, State of Victoria, Melbourne
2. In February 2008, Mitsubishi announced that it will end local manufacturing in March 2008.
3. EPA: Environment Protection Agency (September 2007), *Victoria's Greenhouse Gas Inventory Management Plan*, Publication 1168, State of Victoria, Melbourne
4. Commissioner for Environmental Sustainability (2006), p.5
5. Ibid, (2006), p.6
6. Ibid, (2006), p.64

Federal Chamber of Automotive Industries Chief Executive Andrew McKellar recently noted that:

> *"Maintaining economic viability of manufacturing investment does require a certain volume of fleet purchases. Fleet purchases are still a very significant part of the market and they are certainly a very important part of the market in terms of local producers."*[7]

The challenge of moving to a more environmentally friendly fleet while still supporting the local automotive industry can be addressed by working closely with the local industry to identify opportunities for producing vehicles with significantly reduced emissions and by phasing in tougher emissions targets for the government fleet over an extended period of time.

Overall, the Study Team's strong view is that there are positive opportunities for state and local government in Victoria to influence the production mix of Australian-based car manufacturers by clearly signalling their long term procurement intentions.

The Study Team also notes that former Victorian Premier, Steve Bracks, is currently leading a review of the automotive sector and has indicated that the impact of government fleet contracting arrangements would be included in his study.

Accordingly, the Team is recommending that the Victorian Government develop a strategy for increasing the proportion of low emission, efficient vehicles operating in Melbourne, including:

- Working with local councils to set clear targets for substantially increasing the proportion of low emission vehicles within state and local government vehicle fleets over the next eight years.
- Working with Australian-based car manufacturers to ensure that locally manufactured vehicles play a leading role in meeting these targets
- Working with local councils to implement incentives to shift private purchases to hybrid or low emission cars, such as registration and parking discounts.
- Setting aggressive targets to progressively increase the number of hybrid and other low emissions vehicles within the metropolitan bus fleet over the next eight years.

Given that Australia continues to lag behind world's best practice in setting and enforcing CO_2 emissions standards for cars, the Study Team is also recommending that the Victorian Government pursue measures through the Council of Australian Governments to bring Australia into line with current European standards.

7. Gordon, Josh, 'Spring Street backs gas guzzlers in fleet extension', The Age, 15 February 2008

9.12 Constructing and funding projects

- **Recommendation 17**

  The Victorian Government should seek early discussions with the Commonwealth Government regarding a funding contribution from AusLink towards some or all of the EWLNA recommended projects.

  The Government should also work with the Commonwealth to extend AusLink to transport projects designed to relieve urban congestion.

- **Recommendation 18**

  The Victorian Government should consider a funding structure for the proposed new Metro rail tunnel that includes contributions by beneficiaries (including public transport users and property owners across Melbourne).

- **Recommendation 19**

  The Government should re-evaluate its current road tolling policy to ensure that the long term benefits of new road investments can be fully realised (including public transport priority, improved cycling opportunities, road network balance and improved local amenity).

- **Recommendation 20**

  A single statutory authority should be created to deliver the EWLNA recommended projects, using a 'corridor approach' to planning, managing and delivering the full suite of projects.

The reasoning behind these recommendations is extensively canvassed in Chapter 10.

The Study Team did not set out to make conclusions on a particular procurement method for the projects recommended by the EWLNA; nor about whether the public or private sectors are best placed to fund these projects. There are clearly potential roles for both sectors and each would have its own advantages and disadvantages. These questions would usually be answered through a rigorous business case stage for a specific project. Such a process would be the logical next step for one or more of the larger EWLNA recommendations – in conjunction with relevant environmental assessments.

In developing the EWLNA recommended projects, the Study Team has been conscious of leaving open the Victorian Government's options in relation to planning, constructing and funding the projects. However, having considered the large cost of the projects in the context of Victoria's state budget, the Team is of the view that the projects recommended by the EWLNA cannot be delivered without new sources of external finance, including debt, to fund their construction. Any budget funding will need to be supplemented by new revenue sources in order to repay this external finance.

The Team's exploration of the construction and financing issues associated with these projects indicates that, with external finance and new revenue sources, appropriate sequencing and structuring, infrastructure projects of the scale described in this report can be funded prudently and efficiently, and can be delivered by the construction industry.

Of the various funding options considered by the Study Team, a model along similar lines to that used to finance the Melbourne City Loop was considered to be the most practical means of proceeding with the Melbourne Metro rail tunnel. A new statutory authority could be created with the requisite functions and powers to implement the project and work through Treasury Corporation Victoria to raise the required funds. Identifying new revenue sources requires careful consideration as it is likely to impact on a large number of people. As noted in Chapter 10, the Commonwealth Government also has a significant role to play in the development of the EWLNA options.

There could be an opportunity for the private sector to participate in the funding and delivery of the rail tunnel; however, this would need to be done in a manner that was complementary to the current and future operating environment and contractual structure for the Melbourne rail service. For what would be a relatively small, but important, part of the network, it might not be efficient to have a different party provide that facility. All options need to be considered, including investigation of whether there is potential to include some aspect of the rail tunnel construction, financing or operation with the future rail franchise arrangements.

As has become the norm for all very large urban road projects in Australia, tolls are likely to be necessary to help pay for the east-west road connection. While it is possible for the Victorian Government to undertake tolled projects itself, as has been done in New South Wales and Queensland, there is also an opportunity – and significant investor demand – for the private sector to develop the various stages of the road project. As explained in Chapter 10, the component parts of the road project have different attributes and for a number of reasons might be more or less suitable for private sector participation and might require a different level of government contribution. The different sections are also likely to have different suitability for AusLink funding. Generally speaking, important freight routes, and certainly those of national significance, have the potential to receive AusLink funding. That should be a priority for the Victorian Government in implementing the EWLNA recommendations.

In recommending that the Government re-evaluate its current road tolling policy to ensure that the long term benefits of new road investments can be fully realised, the Study Team was not considering whether that would improve the likely use of a toll road; rather, it was a genuine attempt to ensure that a balanced outcome could be achieved for the community as a whole. When new road capacity is added, there are opportunities to improve outcomes for other users of the road space, including public transport, cycling and local communities. In the future, there will also be an opportunity (or a need) to ensure that Melbourne's road space is used in an efficient and balanced way. At that time, there might be a desire to review the current tolling policy to ascertain whether it helps or hinders the most efficient use of Melbourne's road network. That review would be most likely to arise as part of a broader road pricing or congestion reduction initiative.

Finally, the Study Team's recommendation that the Government establish a statutory authority to deliver the EWLNA projects was in response to very strong feedback obtained during the study. It was universally accepted that the model that has been used very successfully in Victoria for procurement and delivery of large projects such as the Melbourne Underground Rail Loop, CityLink and EastLink would be the best way to proceed with the projects. The benefits of this approach were seen to be the ability to gather a highly capable team of professionals with the requisite skills and experience to match those of the private sector and enable them to 'get on with the job', free from the sometimes conflicting management demands of broader government departments. Whatever approach is taken, it should be remembered that these will be very large, very complex projects with difficult procurement and financing challenges. It will be in the Government's interest to ensure that the best possible arrangements are put in place and that people with the right skills are engaged. Given the long timeframe over which these projects would be delivered, the structure chosen must ensure that expertise gained can be retained and developed to be applied on future projects.

9.13 Timeline of projects

The Study Team recommends a staged approach to the delivery of the key recommendations, with planning to commence immediately upon acceptance of the EWLNA recommendations for the Melbourne Metro rail tunnel, the road tunnel, DART and the Truck Action Plan.

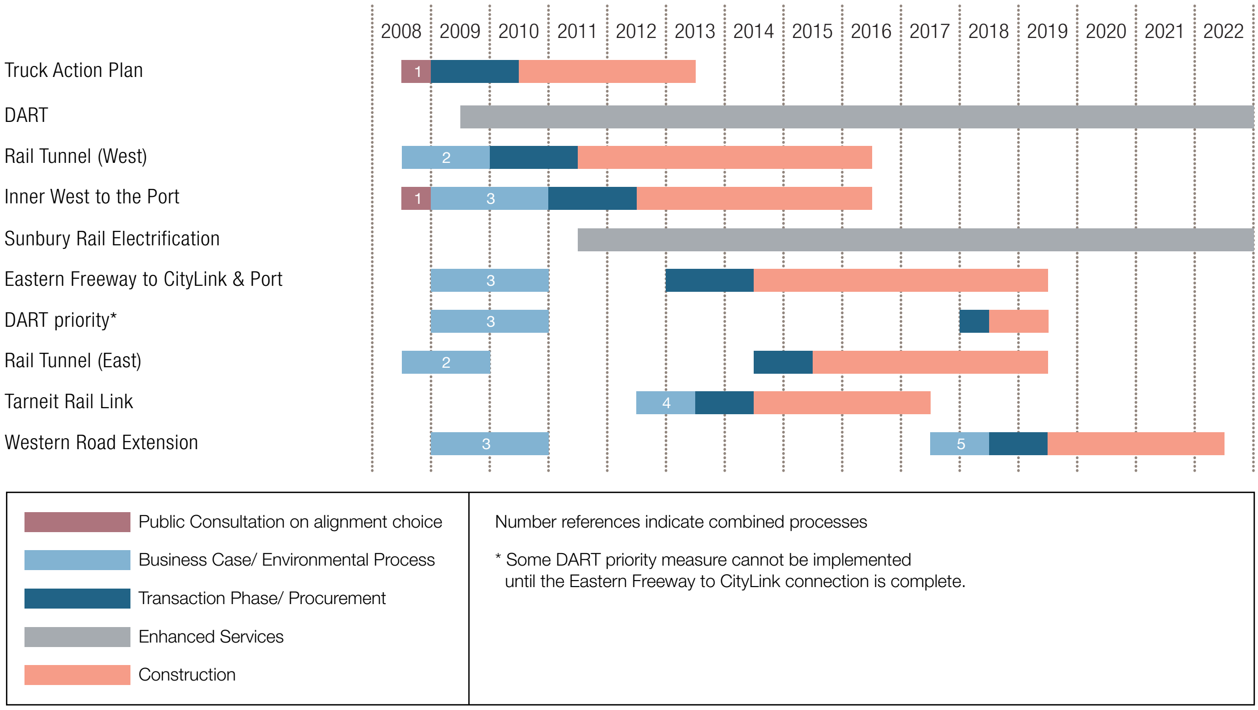
Detailed planning should commence immediately on the construction of the rail tunnel. This planning should resolve the location of stations, funding structure and environmental issues. As noted earlier, it is the view of the study team that the rail tunnel need not be subject to a full Environmental Effects Statement. This would allow earlier procurement and construction of the tunnel to meet the demonstrated and urgent capacity issues on the rail network outlined in Chapter 3.

Planning should commence concurrently on the road tunnel and Truck Action Plan, with the first priority being a community consultation process to resolve the preferred alignment for the route of the east-west road connection and, in turn, the full implementation of the Truck Action Plan.

As noted in Chapter 9.4, planning for procurement and construction of the Hyde Street connection and the Ashley Street/Paramount Road connection should commence immediately, with resolution of the other measures included in the Truck Action Plan to be determined as part of the community consultation around the alignment of the full east west route. This community consultation would ultimately form part of the Environmental Effects Statement, which the Study Team believes would be required for the east-west road link.

Under the process outlined above, procurement and construction of the first stage of the rail tunnel would be the first in a pipeline of major projects, along with elements of the Truck Action Plan. Construction of the first stage of the east-west road connection would commence in 2012 following an Environmental Effects Statement and the resolution of the final alignment as part of community consultation.

Figure 108 – Timeline of EWLNA projects



Source: EWLNA

The economic and community benefits of EWLNA projects

Table 23 – EWLNA economic and community benefits (present value $billion)

	Traditional Measure[8]	Other Measure	Cumulative
Costs			
Capital expenditure*	13.0		
Operating expenditure	2.0		15.0
Benefits			
Travel time saved	9.4		9.4
Vehicle operating costs saved	0.5		9.9
Reduced crash costs	0.3		10.2
Externalities	0.7		10.9
Public Transport revenue	0.2		11.1
Wider Economic Benefits		3.3	14.4
Community benefits of tunnelling (1)		*5.0*	*19.4*
Additional congestion relief (2)		*1.0*	*20.4*
Westgate Bridge redundancy (3)		*Not quantified*	*20.4+*
Accessability benefits (4)		*Not quantified*	*20.4+*
BCR			1.4+

* Note: Capital expenditure refers to a 'present value' amount and should not be confused with the construction cost amounts shown elsewhere in this report.

The substantial economic and community benefits of the transport infrastructure recommended by the EWLNA are described in considerable detail in the preceding chapters of this report.[8] Some of those benefits have been quantified by the Study Team's economic advisers. The remaining benefits, although not part of a traditional economic assessment, are no less important for Melbourne and should be recognised. For completeness, the Study Team has made an estimate of some of these further benefits, but recognises that they would be the subject of further investigation as part of any subsequent business case undertaken for the EWLNA recommended projects.

The traditional economic analysis of potential solutions was constructed around three main work streams:

1. A Benefit Cost Analysis, focusing on the direct impact of the proposed interventions
2. A quantitative assessment of the indirect or flow-on effects of the project using CGE modelling
3. An assessment of the broader economy-wide benefits that flow from improving the functioning of the transport sector.

The most significant economic benefits are to be found in the travel time savings for users of the transport network. These benefits have been derived based on the different user groups recorded in the EWLNA transport modelling and represent the difference between the modelled performance of the major transport projects and a 'base case' representation of the future without those projects.

In addition to the travel time savings, benefits are also quantified for vehicle operating costs saved, reduced crash costs, externalities and changes in public transport revenue. The present value of these benefits is $11.1 billion.

As was undertaken for the Eddington Transport Study in the UK, the Wider Economic Benefits were also analysed. After including these benefits, the benefits increase to $14.4 billion. These additional benefits were calculated using the UK Department for Transport published methodology.

The Wider Economic Benefits add around 35 per cent to the conventional transport user. The most significant contributor to this increased benefit is what is known as 'agglomeration economies'. This is the clustering effect that occurs when better transport allows more workers to be connected with more and better jobs, and when transport facilitates more efficient business interaction.

The further benefits not considered by the Study Team's economic advisers are presented separately in Table 23 and are described below:

1) There is a very large community benefit in placing the infrastructure in a tunnel. Tunnelling is extremely expensive but allows existing neighbourhood features of streets and parks to be largely protected, and can improve the amenity of local areas currently impacted by high traffic volumes. The estimate of the benefit set out in Table 23 is an indication of the possible additional construction cost over and above what might be incurred to deliver a similar project with minimal tunnelling.
2) A substantial economic and community benefit that is undervalued in the transport model is the reduction in congestion attributable to the various transport projects. Improving the reliability of the road network and reducing volatility of travel time for business has a potentially significant value that is difficult to measure. The transport model used to derive the transport user benefits cannot accurately represent peak period queuing and accordingly, understates the effects of congestion. Table 23 includes an indicative allowance based on the relativities of peak period travel times.
3) A benefit that was not quantified is the strategic benefit Melbourne's economy obtains from building network redundancy, such as providing an alternative to the Westgate Bridge. This effect can be thought of in the negative case of "what would be the economic consequences for Melbourne if that critical trade route was not available?"
4) The Demographic, Social and Land Use consultants to the EWLNA analysed the impact of transport interventions on the level of access to jobs and services for that part of the population that are currently deemed to be disadvantaged in this regard (those that are in the bottom three quintiles of the population).

As indicated in Table 23, the benefits that have been quantified total $20.4 billion. The non-quantified benefits would be in addition to the $20.4 billion, resulting in a BCR greater than 1.4. This BCR may appear lower than many earlier transport projects, but it represents the reality of retrofitting substantial infrastructure into a fully developed inner-city area, which requires extensive tunnelling.

In addition to the above benefits, transport projects also contribute to growing the Melbourne and Victorian economy through productivity improvements and other stimuli that flow-on to other industries. Economic analysis undertaken for the EWLNA using computable general equilibrium (CGE) techniques indicates that the Victorian Gross State Product (measured in 2021 and 2031 and inclusive of agglomeration impacts) would grow by between $0.6 billion and $0.8 billion or approximately 0.1 per cent and 0.2 per cent as a result of the EWLNA recommended projects. Employment in Victoria would grow by approximately 4,000 (full-time equivalents in 2031). This measure of the impact on the Victorian economy does not include the economic effects of the expenditure to construct the projects. Those effects would also be significant but have not been quantified by the Study Team as the approach focused on the likely longer term benefits to accrue from investment in the transport infrastructure.

8. Further details of this analysis is provided in Meyrick and Associates (2008b), Economic Benefits Paper, Report prepared for the EWLNA

chapter 10

10. Funding and delivery options

The Study Team has explored the capacity of the public and private sectors to fund the projects recommended by the EWLNA and considered whether the construction industry has the capacity to deliver these projects.

The projects recommended by the Study Team are very large by Australian and international standards:

- Public transport projects would cost around $8.5 billion (in 2007 dollars)
- Road projects would cost around $9.5 billion (in 2007 dollars).

The Study Team notes that it would be neither efficient nor prudent to build and pay for the entire recommended rail tunnel and road connection as one giant project. Staging the projects over time ensures that each project is a manageable size and does not place a disproportionate strain on the construction industry, while still enabling economies of scale and innovation. It also enables the Victorian Government to spread its funding requirements over many years and to manage financial risk by contracting in smaller elements. Future governments can adjust these timing decisions in response to the prevailing circumstances, including the impacts of future downturns in the economic cycle.

A relevant precedent for funding such a large step-up in the rail network is the Melbourne Underground Rail Loop. This was delivered by a special purpose statutory authority that borrowed the money required for construction and received revenue from the following sources in order to repay the loans:

- Melbourne Metropolitan Board of Works (MMBW) – rates levy across the metropolitan area (notionally a one-quarter share, reduced to 15 per cent after completion and later reduced to zero)
- Melbourne City Council (MCC) – rates levy for CBD properties only (started as a notional one-quarter share, which ended up being collected across the municipality and only contributing a 10 per cent share, later reduced to zero)
- A special levy on suburban rail fares of one cent per trip
- State share – the balance.

The MMBW and MCC shares were reduced and eventually abandoned due to a number of difficulties, including Victoria's poor financial position in the early 1980s and the need to consolidate debt, leaving the state to carry most of the costs of constructing the loop.

Relevant precedents for funding such a large improvement to the road network include the CityLink and EastLink Public Private Partnerships (PPPs). While the use of tolls to fund the recommended projects was canvassed as part of the EWLNA, the Study Team has not assumed that these projects would be delivered by the private sector in the same manner as CityLink and EastLink. Other smaller scale projects, such as the Western Ring Road and the Geelong and Craigieburn bypasses have been funded by a combination of Commonwealth and State payments, with no tolls.

The Commonwealth Government also has a significant role to play in the development of future EWLNA recommended options. Infrastructure Australia is an advisory council to the Commonwealth Government that will develop a strategic blueprint for future infrastructure and facilitate its implementation in partnership with the states, territories, local government and the private sector. Infrastructure Australia will also review the extent to which governments can better facilitate infrastructure investment, including through public-private partnerships and improved planning and approval processes. Given the scale of the EWLNA recommended projects, this contribution is likely to be extremely valuable. The Study Team notes that the Commonwealth Government's recently released Transport Policy Framework – A New Begining, nominates the east-west corridor as a possible priority national infrastructure project for consideration by Infrastructure Australia.

The Victorian Government has strongly supported the Commonwealth AusLink program and its role in developing the national transport network. Given the national significance of Melbourne's east-west corridor, the Victorian Government could reasonably expect AusLink funding to be forthcoming for at least part of these projects over the medium to long term.

The EWLNA Study Team has also noted preliminary comments by the Garnaut Climate Change Review that the introduction of an emissions trading scheme in Australia has the potential to generate a very substantial amount of government revenue. While noting that there will be competing priorities for this revenue, the review states that 'support for public infrastructure' is one area where revenue could be directed. This suggests that such a trading scheme could result in a contribution to transport infrastructure. The Victorian Government should monitor developments in this area.[1]

1. Garnaut, Ross (2008), *Emissions Trading Scheme Discussion Paper*, Garnaut Climate Change Review, Canberra

It is important to note that the EWLNA was not intended as a 'business case' to support a financial commitment to any particular project. If the Victorian Government adopts the Study Team's recommendations, a number of processes would need to occur, including relevant environmental assessments and the completion of business cases to support government investment and to identify the best value for money in procuring assets and services.

Accordingly, the Study Team has not made any recommendation on whether, or to what extent, the private sector should participate in the financing of the projects and whether PPPs are the best delivery option. However, given the scale of the projects, it is likely that funding would be required from both the public and private sectors for the projects to be delivered. While there is clear precedent for private sector participation in the delivery of new road infrastructure, there are fewer precedents for private rail investment.

Clearly, the amount of money required to pay for construction of the projects is beyond the usual annual Victorian state budget. An alternative would need to be found, such as funding construction through external financing (including debt) sourced through either the public or private sector. Delivering the recommended EWLNA projects in stages over time would assist in better matching the funding task with the capacity of the public and private sectors to deliver.

The Study Team's conclusion is that for the recommended projects to proceed, it is likely that new sources of external finance will be required to fund construction of the projects. Any budget funding would then need to be supplemented by new revenue sources in order to repay the external finance. These sources are explored below and are presented to the Victorian Government as a 'menu' of options that should be considered. Before proceeding with some or all of the EWLNA recommended projects, the Government would need to determine which revenue options should be further developed in the business case stage.

As governments no longer engage in direct construction activity of this scale, the private sector will be involved in the construction of any projects that proceed. The Study Team consulted with representatives from a number of large Australian and international construction companies to identify issues relevant to industry capacity. The results of those considerations are also presented below.

During the Study Team's consultations with the financial and construction industry about its capacity to deliver these large scale projects, the question was often raised about the Victorian Government's ability to deliver or – more accurately – procure such projects. Industry expressed the strong view that for very large projects, where significant amounts of money must be expended to bid for the project, it is critical that government processes are of the highest standard. The Study Team has summarised industry feedback below, in addition to the Team's own observations and comments on this matter.

Study Team Findings

The projects recommended by the EWLNA cannot be delivered without new sources of external finance (including debt) to fund the construction of the projects. Any budget funding will need to be supplemented by new revenue sources in order to repay this external finance.

With external finance and new revenue sources, appropriate sequencing and structuring, infrastructure projects of the scale described in this report can be funded prudently and efficiently, and can be delivered by the construction industry.

10.1 The financing task

To determine whether funding new infrastructure of this scale is beyond the means of the Victorian state budget, it is necessary to establish the size of the construction funding task.

As noted above, the Study Team has not made a specific recommendation about whether all or part of the project should be financed and delivered by the public or private sector. At this early conceptual stage of project development, financing has been considered in a broad, generic sense – assuming that debt is used to finance construction of the projects.

Should the Victorian Government proceed further with the recommended projects, it would need to identify the most appropriate funding and delivery model through the business case stage. Considerations relevant at that time would include the current position of the state budget, the level of forecast budget surpluses and the impact such a project could have on Victoria's credit rating.

One of the factors to be considered at the business case stage of the EWLNA recommended projects is the preferred allocation of risk between the public and private sectors and the value of transferring relevant risks. Recent PPP funded projects highlight the protection given to taxpayers by this delivery method. Under more traditional delivery methods, the major problems that occurred during the construction of the Burnley tunnel, the Lane Cove tunnel collapse and the Southern Cross Station cost overruns would have resulted in significant costs to taxpayers; instead, these costs were borne mostly by the private sector.

The following calculations are based on the notional cost of borrowing at 7 per cent in order to show the potential cash flow implications for the Victorian budget if the state borrows the money to construct the EWLNA recommended projects. In presenting these calculations, the Study Team is not suggesting that 7 per cent is the most appropriate cost of funds for the projects.

If each project was undertaken separately at the time indicated in Table 24 (and excluding any government contribution or revenue from sources such as tolls), the approximate annual interest costs and annual debt repayments over an assumed 60 years would be in the order of $2.5 billion per year.

The size of this financing task underpins the following discussion on whether, and how, the EWLNA recommended projects could be funded.

Table 24 – EWLNA recommended road and rail projects – the size of the financing task

	CONSTRUCTION		
	Start	Completion	Cost ($b 2007)
*Public Transport**			
Rail Tunnel (Footscray to Domain)	2011	2016	4.5
Rail Tunnel (Domain to Caulfield)	2015	2019	2.5
Tarneit Link	2015	2019	1.5
Total Public Transport			8.5
Road Link			
Truck Action Plan	2010	2012	0.5
Inner West to the Port**	2012	2016	2.0
Eastern Freeway to CityLink and Port	2014	2019	5.5
Western Extension	2022	2025	1.5
Total Road			9.5
Combined Total			**18.0**

* Doncaster bus upgrade not shown separately due to rounding
** The alternate alignment to Westgate Freeway has a lower cost
Note: All cost estimates in this report are expressed in 2007 dollars. When the projects come to be constructed in the future, these costs will be higher to allow for inflation and any other specific increases in the cost of construction.

Source: EWLNA

10.2 State infrastructure investment and budget capacity

Around Australia, cities, states and territories face similar challenges to Victoria in finding ways to fund the infrastructure required to support population and economic growth and drive industry change.

In recent years, several federal, state and territory infrastructure plans and projects have been announced. While the following discussion focuses on Victoria and the two other eastern states to our north (NSW and Queensland), major infrastructure programs are also underway in South Australia, Western Australia and nationally.

Table 25 below summarises a recent review of state budgets and infrastructure plans, showing the current intentions of Victoria, NSW and Queensland. In addition to the expenditure plans of these states, the Commonwealth Government and the Brisbane City Council are also major funders of transport infrastructure.

Queensland and NSW have announced that their infrastructure investment programs will partly be financed through increased government borrowings, budget sector contributions and the use of PPPs.

Table 25 – Investment in infrastructure – Victoria, NSW and Queensland, 2008 to 2011

$ billion	2008	2009	2010	2011	Total
Victoria	3.9	3.9	3.9	4.0	15.7
QLD	14.0	13.0	12.0	11.0	50.0
NSW	12.5	12.4	12.4	12.2	49.5
Total					**115.2**

Source: State Budget Papers

10.2.1 Victoria

The Victorian State Budget Update, released by the Treasurer in December 2007, shows that the state of Victoria is in a sound financial position and able to meet the Government's target of an annual operating surplus of at least $100 million – with the surplus target forecast to be exceeded over the forward estimates period. The Budget Update notes:

> *"The cash generated by these higher projected operating surpluses over the forward estimates will enable the Government to continue to make significant investments in infrastructure, with only modest increases in net debt.*
>
> *The provision of an effective infrastructure base is a key driver of economic growth. It facilitates an efficient transportation network, underpins the delivery of quality services, and is crucial to attracting business investment and promoting population growth.*
>
> *Since 2000-01, the Government has invested more than $16 billion in the delivery of infrastructure, with average annual investment exceeding $2.3 billion.*
>
> *The Budget Update shows estimated net infrastructure investment of $3.9 billion in 2007-08. Net infrastructure commitments over the forward estimates period, from 2008-09 to 2010-11, are currently expected to average $3.9 billion per annum …"*[2]

With $10 billion to be invested over 10 years, the 2006 transport plan *Meeting Our Transport Challenges* represented an investment program beyond the usual four-year forward estimates period. The EWLNA has provided an opportunity to look further over the horizon, beyond the budget cycle and beyond 10-year infrastructure plans.

The look over the horizon shows that a step-change is needed in the capacity of Melbourne's transport infrastructure. What is not evident is a matching step-change in the revenue side of the Victorian budget. Notwithstanding the healthy state of the budget and the forecast surpluses, the likely reality is that simply funding the status quo will continue to present a significant challenge for the state Treasury.

The Study Team did not identify anything to suggest that, in the ordinary course of events, there would be a profound shift in the financial capacity of the state that would allow funding of significant changes in infrastructure capacity. It is interesting to note that the New South Wales Government has recently faced a similar question in looking to make a significant investment in Sydney's road and rail network. The solution put forward in NSW (not yet confirmed) is to privatise part of the state's energy sector and use the proceeds to fund transport infrastructure. That option is not available to Victoria.

It is important to understand that the approach of the Study Team was to identify Melbourne's future transport needs without constraining the identification of options based on the availability (or otherwise) of funding. This approach also reflects the concerns raised in a number of submissions to the EWLNA about Victoria's history of under investment in public transport as a result of the large costs of such investment and few corresponding revenue sources.

2. State of Victoria (2007), *2007-08 Budget Update*, available at www.budget.vic.gov.au

10.2.2 Queensland and NSW

As a very large state, Queensland has a diverse range of infrastructure spending needs. Of relevance to the EWLNA is the spending in south east Queensland and Brisbane.

In June 2005, the Queensland Government released the South East Queensland Infrastructure Plan and Program (SEQIPP), setting out a 20 year major infrastructure development program from 2006 to 2026. The May 2007 update of the SEQIPP identified $82 billion of infrastructure spending to 2026. The more immediate pipeline of activity over 2007–2015 is set out in Figure 109.

In the roads sector, the Queensland Government and Brisbane City Council have adopted a deliberate strategy of presenting a pipeline of projects to the market to maximise competition. This strategy has resulted in:

- the $3 billion North-South Bypass Tunnel attracting three strong consortia;
- the $4 billion Airport Link / Northern Busway project attracting four strong consortia; and
- significant market interest in the next major project: the $2 billion Northern Link tunnel project.

In NSW, the State Infrastructure Strategy (SIS) was released in May 2006. Spending over the 10 year period of the SIS is expected to be more than $110 billion, with an average of more than $10 billion per year. Likely transport projects include improvements to bus, rail and ferry services, and road projects that include connections between motorways and a major extension of the M4 to the city.

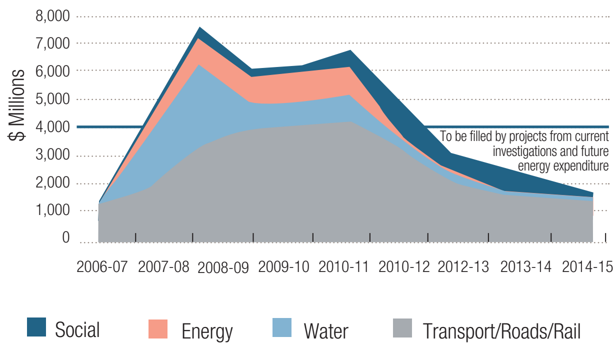
10.2.3 Major transport projects

Alongside the various state infrastructure plans, significant activity in the transport sector is likely to impact upon transport construction demand over the next few years. Given the specialist expertise and equipment that may be required as part of a road or rail tunnel project, planning and capacity issues are an important consideration in the structuring and sequencing of any potential project(s) arising from the EWLNA.

As Figure 110 shows, there is currently unprecedented competition for bidding and delivery resources for upcoming major transport projects in Australia – with most of these projects exceeding $2 billion in construction works.

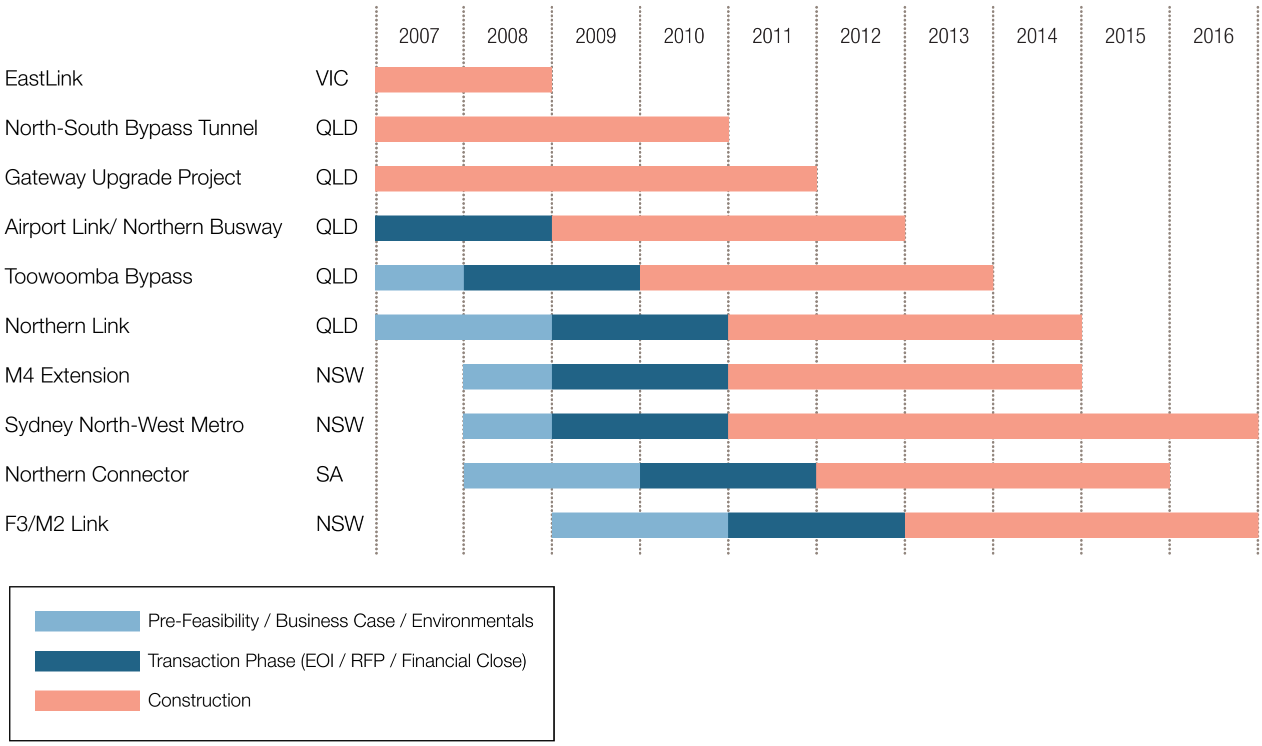
An indicative timeline for delivery of projects recommended by the EWLNA is included in Chapter 9.13. Based on that proposed timeline, there would be high levels of activity in 2009-10 and 2011-12. Any overlap with the projects listed in Figure 110 would need to be carefully managed to ensure that peak activity periods do not overlap.

Figure 109 – SEQ Infrastructure Plan activity 2007 to 2015



Source: SEQIP 2007 - 2026

Figure 110 – Market activity in major Australian transport projects, calendar years



Source: EWLNA (Ernst & Young)

10.3 Public funding capacity – revenue options

Irrespective of the type of finance used to fund construction, there is a cost of finance that must be met: interest must be paid on debt, debt must be repaid and any equity or similar investment must pay a suitable return. The Study Team identified a wide range of potential revenue sources that could be used to meet the costs of finance. Some of these options (such as tolls) are relevant whether the project is financed and delivered by the public or private sector; other options (such as municipal levies) are suitable only to government financing.

In its submission to the EWLNA, the Metropolitan Transport Forum (MTF) expressed the view that:

> *"Funding of all transport projects should be based on the triple bottom line, with social and environmental aspects being given the same regard as economics. To date this has not happened in Melburne, so it will present both a challenge and an opportunity to the Government."*[3]

The EWLNA has taken a triple bottom line approach to its assessment and adopted a multimodal approach in its consideration of transport options. The question of funding is difficult for all modes of transport and the Study Team has considered a range of options to assist in this regard. The MTF submission also notes that:

> *"... public transport improvements, for example, can benefit a much wider group of people than users of the system. Under these circumstances, it is reasonable to argue that the source of funding should also be spread beyond the system users."*[4]

In framing options for inclusion in its report, the Study Team sought to identify the link between those who benefit from a transport initiative and those who should pay for it.

The Study Team has outlined a potential 'menu' of revenue options that could be considered to partially offset government budgetary funding required for the EWLNA recommended projects or to service the debt or other finance that would be used to fund construction. These options can be grouped broadly under five categories (based on the principle that those who benefit from a project should contribute to its cost):

- *Direct charges to project users* – Direct charges are applied to consumers that actually use and benefit from the project. Charging tolls on road infrastructure is a common example of a direct charge.
- *Direct charges to network users* – Network users benefit from the project indirectly. For example, rail and other public transport users may benefit from more frequent or less crowded services with fewer delays if inner city heavy rail capacity is expanded. A special ticket levy is an example of a direct charge to network users.
- *Special levies on private parties* – This option seeks to capture a portion of the value created by a project from private parties who benefit from increased property values. A special property charges (such as an increase in rates) is an example of such a levy.
- *Commercial opportunities* – Revenue raised from opportunities for commercial development as part of any project.
- *Other government revenue options* – This option seeks to identify the value for the state created by the range of projects. This could include recognising the state's share of stamp duty and land tax as a result of increased property values or continuing to toll existing toll road infrastructure after the expiry of existing concessions and subsequent handback to the state.

10.3.1 Direct project user charges

Rail pricing

This option would involve charging a specific levy on users of either the new rail tunnel recommended by the EWLNA or users of the proposed new stations.

Charging a significant premium for rail travel to an airport station is not uncommon internationally. An Australian example of applying additional charges for using stations on a new rail line is Sydney's Airport Rail Link. The NSW Government entered into a PPP for the development of a new line to Sydney Airport in advance of the Sydney Olympics. The Government funded construction of the railway tunnels and the private sector constructed and operated the four rail stations. The private sector operator of the four stations (two of which are at Sydney Airport) charges a levy for use of the stations over and above the normal CityRail ticket price. The 'Station Access Fee' is currently $1.80 or $2.20 for the non-airport stations and $10.40 or $10.80 for the airport stations (for a single journey). Since its opening in May 2000, the line has suffered from disappointing patronage. For a number of reasons, including low patronage, the PPP company operating the line was placed in receivership in 2000. The company has continued to operate in receivership since 2000 and a sale process took place in 2006. The NSW Government declined requests to buy back the stations.

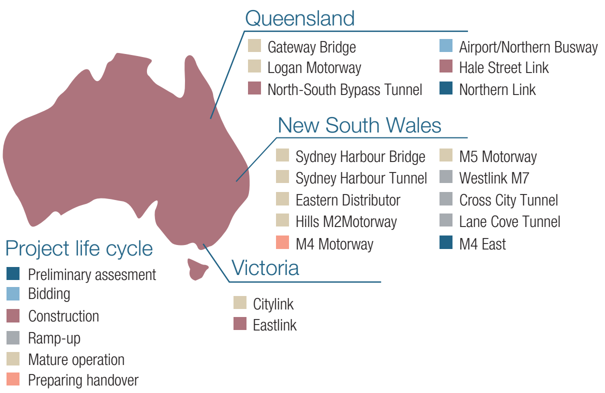
Another domestic example is the Brisbane Airtrain, which charges $13 for a single adult journey to/from the Brisbane CBD. Initial patronage on this facility was also well below expectations, with the PPP company involved narrowly avoiding going into voluntary administration in 2003. Recently, patronage has grown significantly.

3. Metropolitan Transport Forum submission to the EWLNA (2007), p.6
4. Ibid, p.4

In Melbourne, the current public transport ticketing system uses a multi-modal zone network ticketing charge rather than a charge per trip or a charge for using a particular station or piece of infrastructure. Directly charging users of the new rail infrastructure would be inconsistent with the current pricing model and – given the close proximity of city stations, a levy of sufficient size to make a meaningful contribution to the funding task might act as a disincentive to using the new stations.

In addition, as many users of the metropolitan rail and public transport network would benefit from the increased capacity generated by the rail tunnel in terms of more frequent services and fewer delays, a direct user charge would not necessarily result in those that benefit most from the infrastructure making the greatest contribution to its construction.

Figure 111 – Australian toll roads



Source: EWLNA, Ernst & Young

Road pricing / tolling

With very few exceptions, nearly all major urban road projects in Australia in the past 10 to 15 years have included user-pays toll charges. In recent years, all major new road projects have been financed and delivered in this way, with a combined infrastructure investment to date in excess of $12 billion. While people would prefer not to pay tolls, there is now broad acceptance by road users of tolling to obtain the use of new road infrastructure within a reasonable timeframe, and where significant travel time savings are created. Figure 111 shows the current status of toll roads in Australia.

Recent experience of some large scale toll road developments shows that toll revenue is not always sufficient to produce a viable private project without some government contribution. This is especially true of projects with a significant tunnel component. For example, the Brisbane City Council will contribute more than $400 million to the city's North South Bypass Tunnel (NSBT) and the Queensland Government will contribute up to $1 billion to the Airport Link project. In the 1990s, the Victorian Government made a contribution to the construction cost of CityLink.

Considering the future likely traffic volumes in Melbourne's east-west corridor and the construction cost estimates set out earlier in this chapter, it is unlikely that tolls alone would be sufficient to fund construction of the entire road project. Accordingly, the Study Team considers that it is appropriate to consider the project in its component parts and notes that it is likely that the level of required government contribution could vary widely across the different parts. For example, the western section of the project has very different financial characteristics to the eastern section (from the Eastern Freeway to CityLink), with the relationship of the construction cost and possible toll revenue likely to be more favourable in the east (resulting in any government contribution being lower).

By their nature, projects with a large tunnelling component are more expensive per kilometre than projects such as EastLink or CityLink, which have a large surface component.

At a practical level, the road connection will serve a number of different markets and is effectively a combination of three smaller projects:

- A connection between the Port of Melbourne and the West Gate Freeway or the western side of Footscray
- A connection between the Eastern Freeway, CityLink and the Port of Melbourne
- An upgrade of the West Gate Freeway to the Western Ring Road or a connection between the western side of Footscray and the Western Ring Road at Deer Park.

As noted earlier, each section would have different traffic profiles and demand, which may make some sections more suitable for tolls than others.

It is difficult to envisage such a large scale project – or indeed, any other comparable road project in Australia – proceeding without tolls being charged to users. Recent experience in Australia has shown that the private sector takes a more optimistic view of tolled traffic than the more conservative estimates of government; however, as seen in Sydney's Cross City Tunnel, there are significant financial consequences where the revenue forecasts are not met. In the case of the Cross City Tunnel, these consequences were all borne by the private sector. The possible consequences for industry of the Cross City Tunnel experience are considered further below.

As described earlier in this report, Melbourne's significant growth in traffic will result in increasing congestion at peak times, spreading over larger periods of the day. In these circumstances, a future toll road in inner Melbourne could reasonably include an element of time-of-day pricing (with higher tolls in peak hours) to maintain free flowing traffic along the new road. (It is also conceivable that toll charges could differentiate between the different emission categories of vehicles: schemes of this type are already in operation in other cities).

10.3.2 Direct charges to network users

Several alternative revenue sources in this category were considered by the Study Team and are set out below. Many of these revenue sources involve the consideration of broader policy options and – in some cases – could involve redistribution or adjustment to existing charges where government policy considerations may have changed.

Some of these alternatives are beneficial not only from a revenue generating perspective, but also for their contribution to achieving environmental objectives by including more specific pricing of road use and encouraging some modal shift to public transport options.

Direct charges to public transport network users

Commuters across the entire rail network and, to a lesser extent, the inner city public transport network are likely to benefit from the expansion of inner city heavy rail infrastructure. Benefits may include reduced crowding and travel time, fewer delays, new connections and more frequent services.

Melbourne's public transport ticketing system could be adjusted to include a special levy on tickets as a source of revenue to reduce the funding gap for rail infrastructure construction. Options include levying network users who enter the Zone 1 inner suburban network or the entire Melbourne metropolitan network (incorporating Zone 1 and Zone 2). Consideration would also need to be given to whether passengers on V/Line services that access the inner Melbourne stations should be included in a levy.

As noted earlier, there is a precedent for such an option, with a ticket levy forming part of the suite of funding mechanisms used to build the Melbourne Underground Rail Loop in the 1970s. The Study Team considers a ticket levy to be a logical and practical revenue option that warrants further examination by the Victorian Government.

Direct charges to road network users

Route or corridor charges

The construction of the proposed road project has the potential to ease traffic congestion across the east-west corridor, with benefits extending much further afield. For example, motorists who use the existing inner city network, but do not use the new road, would benefit from reduced congestion on existing road networks. In these circumstances, it can be argued that motorists receiving the benefit of reduced congestion caused by the construction of the new road could be charged to reduce the funding gap for the road. However, the Study Team notes that this is contrary to current Victorian Government policy. In addition, such a network-wide charge has never been applied in Australia.

A related question in this area that is worthy of consideration by the Victorian Government is whether the practice of tolling new additions to the road network while older pieces of the network remain toll free is sustainable. Within a relatively small geographic area in Melbourne, there are free east-west routes, such as the West Gate Freeway and the Eastern Freeway, alongside tolled routes such as CityLink and (potentially) a new east-west road connection. This can result in an imbalance of traffic between two parallel routes, which is undesirable from the perspective of overall road network efficiency.

Study Team Findings

Greater flexibility in tolling policy may be appropriate for large scale road projects in the future. If the Victorian Government proceeds to the next stage of development for an east-west road connection, it should review its current tolling policy to ensure that opportunities to improve urban amenity are captured, that priority routes for public transport can be created and that an efficient balance of use on the road network is achieved.

Cordon congestion charge

As noted earlier, a number of the world's most congested cities have considered and implemented a cordon congestion charge to provide a disincentive for road users to enter a prescribed inner city area. A cordon congestion charge could be applied to vehicles entering a specified central Melbourne area to generate revenue for new transport infrastructure.[5]

A specific congestion related charge does not necessarily have to generate new revenue to fund new infrastructure – an alternative is to make such a charge revenue neutral by reducing other taxes or charges, such as fuel excise. This is a complicated exercise in Australia, with fuel excise taxes being the responsibility of the Commonwealth and levied nationally.

Fuel levy

This option involves applying an additional fuel levy to the cost of petrol for retail consumers. A fuel levy would encourage a shift towards public transport and align with environmental concerns about road traffic. However, the imposition of a fuel levy at the state level is not possible as the High Court has ruled that Australia's states are unable to make such charges. The Study Team is unaware of any willingness by the current Commonwealth Government to review this position.[6]

5. Road pricing in the Melbourne context is discussed in greater detail in Chapter 4.
6. A recent study in Auckland into congestion and road pricing concluded that a local fuel levy was the most appropriate response for their particular circumstances.

Registration levy

An annual levy on all registered vehicles in the Melbourne metropolitan area is a revenue option that could be relatively straightforward to implement. A registration levy is also consistent with environmental objectives, potentially encouraging some modal shift from road to public transport by providing financial disincentives to road use and vehicle purchase. However, the converse could also apply: by increasing the fixed cost of vehicle ownership, car owners may feel more inclined to use their vehicles to get 'value for money'. In addition, initiatives that increase the fixed cost of car ownership may place a disproportionate burden on people without access to adequate public transport.

The rationale behind the existing annual registration fee is to charge road network users for the development and maintenance of road infrastructure. A proposed registration levy for major new infrastructure aligns with this rationale. Given the large number of – and likely growth in – vehicles registered in Melbourne, a registration levy could make a significant contribution to the funding task.

CBD parking levy

Private car parks in the Melbourne CBD are currently levied $800 per car space per year. An additional levy would be passed on to car park users through higher prices, providing a further disincentive to road users to drive in the central city. This revenue option may reduce CBD congestion and provide a further revenue source.

However, such a levy would not be a significant source of revenue in the overall funding task for an east-west road or rail transport link.

Road freight charge

Congestion on suburban roads surrounding the Port of Melbourne is a key focus for the EWLNA. A charge on road freight could be considered in the broad spectrum of revenue options (either a charge on the road network generally or a local initiative such as one based on trucks leaving the port). However, the Study Team believes it is difficult to justify distinguishing between different road users, even in the areas close to the port.

Alternatively, a toll charged on trucks entering residential streets around the port could be considered as a revenue option. While this would help to address neighbourhood amenity issues by discouraging trucks from moving through these areas, it would be inconsistent with the Truck Action Plan recommended by the EWLNA (which combines truck bans with alternative bypass routes).

10.3.3 Special levies on property owners

This revenue option seeks to levy property owners that benefit from increased values as a result of major infrastructure projects – and capture a portion of that value.

City of Melbourne rates levy

An improved public transport network in the inner city has the potential to increase property prices and deliver substantial benefits to businesses and residents located in the City of Melbourne. If this option is pursued, it would be appropriate to consider residential and non-residential properties separately, recognising that non-residential land owners are likely to benefit from improved access to the city for their tenants, employees and customers. The Study Team considers a rate levy to be a logical and practical revenue option that warrants further consideration by government.

Broader municipal levy

Most municipalities in the Melbourne metropolitan area enjoy the benefits of a comprehensive public transport system. By making further investment in public transport services, residents in these municipalities are likely to benefit from improved services and higher property values. The levy could be applied to the municipalities' existing rates base. It may encourage road users to shift to public transport as a result of improved services and because they would already be partially paying for public transport through the levy. Determining which municipalities are included or excluded from the levy may prove difficult. The Study Team considers a rate levy to be a logical and practical revenue option that warrants further consideration by government.

Levy on new developments in the western suburbs

The evidence is very clear that improved transport infrastructure has the effect of increasing property prices for existing land owners. Much of the current rapid growth in residential and industrial development in Melbourne's west has been driven by the availability of relatively cheap land in good proximity to the centre of Melbourne; however, transport infrastructure in the western suburbs remains underdeveloped. In theory, the Victorian Government could capture some of the benefit of rising land values generated by the proposed EWLNA projects to help pay for the infrastructure. In practice, such a levy would be challenging to implement. Determining the value of the increase in land prices attributable to the new transport infrastructure would be problematic; selecting the area to levy would also be complicated. A levy on new housing and industrial estates may be a more practical option.

Developer contributions are already in use in Victoria – and are growing in size and scope. At present, they are used mainly for the provision of local infrastructure within the new residential area; in only a few cases is there a meaningful contribution to the broader transport network. However, while these contributions could be increased, there comes a point where these charges may make land less affordable, driving residents and businesses even further afield.

Levy on new developments in the inner city

Similar to a levy on new developments in the western suburbs, a levy on new developments in the inner city is likely to have benefits and drawbacks. As noted earlier, inner city property owners are likely to benefit from improved inner city rail infrastructure and resulting increases in property prices. In part, this gain can be captured through general property levies, not just levies on new developments.

10.3.4 Commercial opportunities

Commercial opportunities can create value for large scale infrastructure projects through associated property and retail developments. One recent Melbourne-based example of a rail-based commercial opportunity is the retail development in the new Southern Cross Station precinct. Similar – and significant – commercial opportunities could be available at the newly constructed Melbourne Metro rail stations.

10.3.5 Other government revenue options

Tolling of existing toll roads after handback to government

Melbourne's two toll roads, CityLink and EastLink, are structured under concession arrangements. When the concessions expire, the toll roads revert back to the Victorian Government at no cost. One potentially attractive revenue option would be to continue to toll these roads after handback and use the revenue to service the cost of financing the EWLNA recommended projects. The CityLink concession is due to expire on 30 June 2034, while the EastLink concession will expire on 30 September 2043. There are circumstances under these concession arrangements where these expiry dates could change; however, at this time, the dates remain current.

Study Team Findings

Many revenue options are available to boost public funding capacity for large scale infrastructure projects. If the Victorian Government decides to proceed with all or part of the recommended projects, all revenue options should be fully canvassed through detailed business case analysis and in consultation with the Victorian community and the financial and construction industries.

In relation to the recommended rail tunnel, the Study Team's view is that arrangements similar to the plan used to fund the City Loop – including a ticketing levy and a municipal levy in addition to state contributions – offer the best prospects for funding the project in a fair, prudent and efficient way.

10.4 Public funding capacity – Commonwealth

The newly elected Commonwealth Government has made infrastructure development a high priority and has established Infrastructure Australia to better co-ordinate the delivery of national infrastructure. However, the Commonwealth has not signalled any significant change in the nature of funding for transport infrastructure, with the AusLink program remaining the means by which the Commonwealth contributes to the development of the national transport network.

At present, urban congestion is receiving considerable attention and the Commonwealth Government has indicated its willingness to work with the states and territories in finding solutions to the problem. While there is general recognition that improving public transport is critical to tackling urban congestion, the Commonwealth has not agreed to contribute funding to urban public transport improvements.

As part of its 2007-08 budget, the previous Commonwealth Government announced that it would invest an additional $22.3 billion in Australia's land transport system from 2009-10 to 2013-14. This new funding will be available under AusLink 2, the second stage of the national AusLink program (see Table 26).

In respect of road transport options, the AusLink process requires consideration and assessment of a privately financed model (which is likely to include user tolling) for any project in excess of $500 million. In addition, for any project where private funding is sought in parallel with AusLink funding, there are detailed requirements in respect of the procurement approach and the timing of AusLink payments.

AusLink only covers 50 per cent of the cost of approved metropolitan projects and state or territory governments are responsible for any cost overruns.

It is reasonable to assume that substantial funding would be available from AusLink for those sections of the road link servicing the West Gate corridor, the major western industrial areas (such as Altona and Laverton) and the Port of Melbourne. The Study Team believes that a compelling case can be made that other sections of the link also have statewide and national implications that extend beyond Melbourne's metropolitan area.

In general, the AusLink evaluation process is reasonably consistent with current Victorian Government approaches used in assessing major transport projects. Clearly, the most efficient process is for the Victorian and Commonwealth Governments to cooperate on a joint evaluation process for any proposed EWLNA projects seeking funding from AusLink.

Table 26 – Commonwealth AusLink funding

Administered Program	AusLink 2 2009-10 to 2013-14 $ billion
AusLink Investment Program	16.8
AusLink Black Spot Program	0.3
AusLink Strategic Regional Program	0.3
AusLink Roads to Recovery Program	1.7
Total AusLink Administered	**19.1**
Untied Local Road Grants	3.1
TOTAL LAND TRANSPORT INFRASTRUCTURE FUNDING	**22.2**

Study Team Findings

Given the scale of the EWLNA recommended projects, their importance to Melbourne and Victoria and their significance for the national transport network, the Victorian Government should seek early discussions with the Commonwealth Government regarding a funding contribution from AusLink towards some or all projects, or parts of projects.

10.5 Private funding capacity

As noted earlier, the scale of the projects recommended by the EWLNA is beyond the capacity of state budgets, even allowing for a Commonwealth contribution. If the Victorian Government decides to proceed with one or more of these projects, a detailed business case analysis would be required to ascertain optimum funding arrangements, taking into account matters such as state borrowing and whether private sector participation represents value for money. The Study Team has considered the potential of the private sector to finance projects, should the government seek their involvement.

Infrastructure finance operates in a global market for both equity and debt. While there are very large sums of money available for investment in projects, there is also a large – and growing – number of projects competing to attract these funds. Generally, an infrastructure project exceeding $1 billion is considered to be of a sufficiently large scale to attract the attention of international infrastructure finance. Projects of the size described in this report would rank amongst the largest of their type and would be considered 'international projects'.

A recent study undertaken by Ernst & Young showed that, in the period 2000 to 2030, average annual global infrastructure spending will be around $160 billion on rail projects, $760 billion for road projects, $1.4 trillion for telecoms infrastructure and nearly $3 trillion on electricity and water infrastructure.[7]

The need for this scale of infrastructure is driven by a range of factors, including:

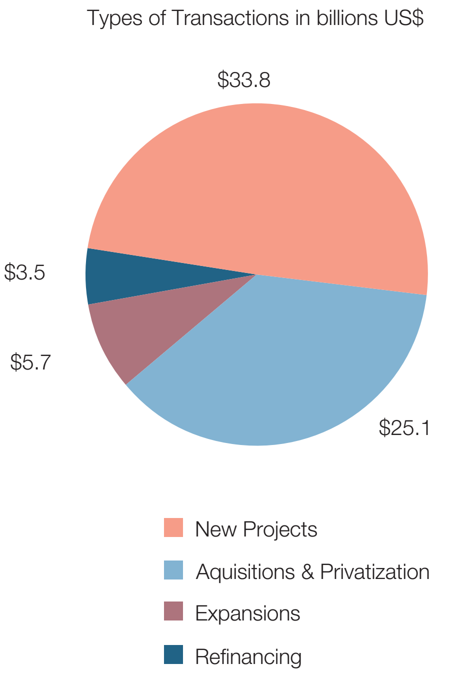
- Population growth
- Economic growth
- Increased global competition
- Insufficient or poorly planned public investment in infrastructure in the past
- Ageing and deteriorating infrastructure.

Ernst & Young has observed that:

> *"As the need to repair, replace, and modernise infrastructure continues, expenditures are reaching record levels worldwide—forcing governments to reach out to the private sector. The result has been a convergence of public need and private capital."*[8]

Globally, governments are increasingly accessing the private investment market to fund infrastructure projects – a trend that is likely to continue with the costs of development increasing as resources (land, labour and materials) become more scarce and/or more expensive due to demand and capacity constraints. The global scale of private sector involvement in infrastructure projects is indicated by Figure 112, which shows private sector transactions in transport over the two years from 2005 to 2007.

Figure 112 – Transportation infrastructure deals involving PPPs – January 2005 to February 2007



Source: Ernst & Young (2008)

The recent turmoil in international financial markets has had an impact on finance for some transactions. While in the short term there could be an increase in the cost of project finance, it is unlikely that banks or investors will be unwilling to participate in quality infrastructure projects in the future.

Victoria has been an active user of private funding for infrastructure, with Public Private Partnerships (PPPs) accounting for around 10 per cent of the state's expenditure on public infrastructure in recent years. Since 2000, 18 *Partnerships Victoria* projects have been contracted, worth around $5.5 billion of capital investment. A number of projects are currently being prepared for delivery as *Partnerships Victoria* projects, including the $3.1 billion desalination plant at Wonthaggi and a package of 11 schools in Melbourne's growth suburbs.

7. Ernst & Young (2007), *Investing in Global Infrastructure 2007: An Emerging Asset Class – Global Overview*, available for download at www.ey.com
8. See: www.ey.com/global/content.nsf/International/Real_Estate_Library_Global_Infrastructure_Emerging_Asset

There are strong indications of the benefits of the *Partnerships Victoria* approach. An independent review of *Partnerships Victoria* in 2004 found that each of the eight projects reviewed delivered equal or better value than public sector provision. Overall, the weighted average saving was 9 per cent against the public sector comparator (PSC), using the then prevailing discount rate.[9] A recent study by the Allen Consulting Group and the University of Melbourne for Infrastructure Partnerships Australia found that PPPs provide superior performance in both cost and time dimensions and that the PPP advantages increase (in absolute terms) with the size and complexity of projects.[10]

While Australia has a well developed and extremely capable market for privately financing infrastructure and developing Public Private Partnerships, there are real limits on the size of transactions. These limits are influenced by the specific characteristics of the project itself (in particular, the allocation of risk) and general market factors (such as the state of debt and equity markets, and the status of other competing projects). Notwithstanding the industry's successful completion of larger projects in recent years, the ability of construction contractors to financially guarantee delivery of larger and larger projects remains a practical constraint on project size.

The extent of allocation of risk to the private sector is relevant as it influences the pool of potential financial partners and the amount of finance available in the market. For example, in relation to road and rail projects, there is a difference in willingness to finance a greenfield toll road project at one end of the spectrum compared to a road or rail project where payment is made for availability of the facility and investors are not exposed to traffic risk.

In its consultation with participants in the Australian infrastructure finance industry, the Study Team found reasonable consensus that a practical upper limit of between $3 billion and $5 billion existed for an individual greenfield toll road. From a financing perspective, a project that is less exposed to unproven patronage risk or that has payments based on the availability of the facility could attract potentially higher levels of finance.

The market for financing toll roads in Australia is well developed, with very large projects being successfully financed through highly competitive bid processes. The toll road market can respond to projects that stand alone financially (such as EastLink) or it can respond to projects where partial government contribution is required when the forecast toll and other revenue is insufficient to fund the capital and operating costs of the project (such as the North South Bypass Tunnel, where the Brisbane City Council is contributing approximately $400 million to the cost of construction).

While industry feedback suggests that the road connection recommended by the EWLNA would be too large to be undertaken as one project, its component parts also have different characteristics – and these component parts are likely to exhibit different characteristics in the future. For example, the section between the Eastern Freeway and the Tullamarine Freeway has a reasonably well understood and mature traffic pattern when compared to the western end of the connection, which would service an area that is growing and changing extremely rapidly. Different characteristics apply to the proposed connections to and from the Port of Melbourne, which are strongly focused on commercial vehicles and where traffic is likely to grow strongly in line with the growth of the port.

Recognising the practical constraints of project size, the different characteristics and different timing of the needs of the area served by the road link, the Study Team's view is that the project should be broken down into three stages. The Study Team is confident that the market has the capacity to deliver the project in these stages. Integration between the stages would be critical and it would be desirable to ensure consistency of operation across the stages.

Using private sector finance to fund construction of a rail tunnel is a very different matter to financing a road project. The market for such financing is not well developed and, as noted earlier, the few examples that have occurred in Australia (the Sydney and Brisbane airport rail links) have not been very successful. In addition, the specific nature of the facility itself needs to be considered. Other proposals in Sydney to develop privately financed rail lines have encountered significant issues with rail network integration. A proposal to privately develop and operate a rail extension to Bondi failed to proceed, in part because of the difficulty in balancing the service needs of the proposal with the practical constraints of operating in a network context. By comparison, a recent proposal to develop a privately financed and operated rail line to the west of Sydney presumes that the railway will be completely independent of the rest of the network. In this way, the operator is in charge of its own performance.

The proposed rail tunnel recommended by the EWLNA would be a fully integrated part of the suburban rail network and train services would be normal suburban services. One option would be to privately finance and deliver the tunnel and/or station infrastructure and have private operators maintain the infrastructure in return for a payment based on the service availability of the facilities. However, this would need to recognise the current arrangements for operating the suburban rail network. This is similar to arrangements in PPPs such as Southern Cross Station and some hospitals and prisons, where the core services are performed by others.

The Study Team considers that while the private sector is capable of financing the rail tunnel, the existing operational and contractual framework of the Melbourne rail network would require careful consideration and might limit the flexibility available for private financing of the project.

9. Fitzgerald, Peter (2004), Review of Partnerships Victoria Provided Infrastructure, Report to the Treasurer of Victoria, Melbourne
10. The Allen Consulting Group and the University of Melbourne for Infrastructure Partnerships Australia (2007), Performance of PPPs and traditional procurement in Australia, Final Report, 30 November 2007, p.1

The Cross City Tunnel – has it affected private sector interest in toll roads?

Sydney's Cross City Tunnel (CCT) is the only one of 11 PPP toll road contracts signed in Australia to go into receivership. In 2007, CCT was sold to a Leighton/ABN Amro-led consortium for $700 million, which enabled the debt financiers to be fully repaid and equity to recover a small amount of their investment.

The Study Team believes that it is important to consider whether the CCT situation has had a material impact on potential private sector interest in toll road projects in Australia.

The main problems experienced by the CCT can be summarised as:

- *Inaccurate projection of traffic volume* – Cross City Motorway (the private sector entity established to build, own, finance and operate the CCT) grossly overestimated the traffic that would use the project. Publicly available data now shows that actual traffic is around 30 to 40 per cent of forecast levels.
- *Management of changes to surface roads* – The concept of 'traffic funnelling' emerged, where it was alleged that proposed surface works at various sites, such as William Street, were designed (and contractually committed by the NSW Government) to encourage traffic into the CCT. Importantly, these proposed changes to the road network were well documented in the environmental impact statement undertaken before CCT reached financial close and were seen at that time as being vital to improving local amenity.
- *The 'up-front payment versus toll' debate* – The tender process involved companies bidding an up-front payment to the NSW Government, based on a toll level set by the Roads and Traffic Authority. The NSW Government was criticised for adopting this structure, with many observers suggesting that structuring a tender process that focussed on an outcome of the lowest possible toll would have resulted in a more appropriate outcome.
- *Limited contract disclosure* – While the NSW Government has traditionally published contract summaries, it was heavily criticised for not releasing full details of the contracts, leading to a change of policy in this regard.

Despite these problems, it is important to focus on the following facts:

- Private sector investors in CCT have publicly stated that they have written down 100 per cent of their equity investment. Total equity in CCT exceeded $400 million.
- NSW taxpayers have incurred no cost for the financial failure of the tunnel company. In other words, the risk allocation that is central to the PPP concept has held successfully and revenue risk has been fully borne by the private sector. However, the NSW Government did incur costs to reverse the surface network changes and paid compensation to the tunnel company for failing to meet its contractual obligations (in total, this expenditure was less than the initial payment to the government).
- CCT has remained open for traffic and continued to operate within the contract requirements.
- To date, private investors, contractors and financiers have not been discouraged by the CCT experience. They continue to bid on opportunities: the North South Bypass Tunnel (NSBT) yielded competitive bids; the Airport Link / Northern Busway (AL/NB) project yielded four strong consortia; the Lane Cove Tunnel has traded its equity; a number of toll road PPPs in NSW and Victoria have refinanced on improved terms; and – most importantly – the CCT sale process yielded a strong list of private sector bidders. All of this has occurred in the 'post CCT' environment.
- Improvements in contract disclosure, the procurement process and the commercial terms of the PPP contract have been adopted as standard on more recent procurements, such as NSBT and EastLink.
- A number of important recommendations have been made by the various NSW Government inquiries into CCT.[11] These recommendations have been incorporated into the procurement processes for NSBT and AL/NB. Examples include no network restrictions as part of the PPP contract and full contract disclosure.

In summary, the lessons learned from CCT (already reflected in the approaches taken by the NSBT, EastLink and Airport Link projects) should be considered in the event the EWLNA projects progress to procurement. However, the empirical evidence is that the CCT experience has not affected private sector appetite in Australia for toll road projects.

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11. Parliament of New South Wales (May 2006), *The Cross City Tunnel and Public Private Partnerships*, Second Report – May 2006 and Department of Premier and Cabinet (December 2005), *Review of Future Provision of Motorways in NSW*, Infrastructure Implementation Group, State of NSW, Sydney

10.6 Capacity of the construction industry to deliver projects

Australia is an active participant in the sustained boom in infrastructure construction in our region. This raises a question about the capacity of the construction and finance sectors to respond to a major program of new infrastructure in Melbourne, given the number of projects underway or planned elsewhere.

The Study Team has consulted widely with the major participants in the construction industry. In summary, there is broad agreement within the industry about the following key messages:

- There is no lessening of appetite within the industry to undertake major new projects.
- Notwithstanding the substantial program of works already identified nationally, there is capacity to take on additional major projects in Melbourne.
- The industry has grown significantly in the last decade in response to the demand for project delivery.
- There are some resource limitations, such as design capability, and governments should structure their project delivery schedules so that the industry can access these key resources in a managed, sequential fashion.
- The appetite for assembling the funds required to deliver major projects under public private partnership models remains very robust.

10.6.1 Background

In recent years, some observers have suggested that the number of very large infrastructure projects throughout Australia has stretched the capacity of the local construction industry. The Study Team consulted widely with a range of key parties to explore this view and to gain an understanding of the status of current projects and the resource implications for future major works in Melbourne.

There is clearly a high level of pride within the industry about the way it has developed over the last decade. Projects that would have been significant a decade ago with values of around $200 million have been replaced with projects worth more than $2 billion, and the industry had been able to gear up to the level of performance required to deliver these larger scale projects. The industry is confident that this escalation in capability can continue, despite the large number of projects being considered by state governments around the country.

The Study Team notes that when the EastLink Project was being developed, concerns were expressed about the ability of the private sector to undertake a project of such scale within the proposed four year construction period. However, three years after works commenced (the sod-turning was in late March 2005), the bulk of construction on this massive project has been completed and there is now a high level of expectation that the new freeway will be operating months ahead of the originally scheduled date.

Three examples illustrate the approach the private sector can take to respond to the demands of meeting the resource requirements for large projects in a busy delivery environment:

Pre-cast concrete elements

The EastLink Project required a huge number of pre-cast elements, including around 1,600 large beams for nearly 90 new bridges. Around 30,000 pre-cast items were needed to meet the overall project requirements, which would have put intolerable strains on the capacity of established pre-cast suppliers in Melbourne.

Thiess John Holland, the EastLink design and construction contractor, converted a disused steel fabrication yard at Morwell to a new pre-casting facility and, in a matter of a few months, had developed the largest pre-cast yard in the country. While such an undertaking required key personnel with appropriate industry skills, most of the workforce at the yard was engaged locally and trained to adapt previous skills to those required for a pre-casting operation. This initiative ensured that the pre-cast concrete requirements for the project were delivered on time and to a high standard, with minimal impact on the capacity of the existing industry to meet demand for other projects.

Tunnelling

At the time of bidding for EastLink, an extensive tunnelling program was underway in Sydney and projects were under development in Brisbane. Concerns were expressed that it would be difficult to assemble the appropriate tunnelling staff in Melbourne and that this would severely impact on the capacity of Thiess John Holland to deliver the EastLink tunnels within the project timeframe. As with the pre-cast yard, key people were brought to the project with tunnelling experience, but most tunnellers were engaged locally and had little or no tunnelling experience. Through careful selection and training, a new workforce of tunnellers was developed. In a relatively short time, this workforce was matching the performance of their experienced colleagues interstate.

Equipment

Access to key items of equipment is a significant challenge for construction companies engaged in major infrastructure projects. With so many bridges requiring beam lifts, access to mobile cranes could have proved frustrating if contractors had relied solely on the availability of those cranes already serving Melbourne. Thiess John Holland sourced and imported a 500 tonne capacity mobile crane, which was able to meet the project's crane requirements, limiting reliance on the availability of existing cranes.

10.6.2 Major works

Construction industry representatives readily acknowledge the scale and range of major works being undertaken in Australia and expressed their enthusiasm for this healthy state of affairs to the Study Team. Projects drawing on the resources of the industry extend beyond road and rail projects in Melbourne, Sydney and Brisbane and include:

- Victoria's planned desalination plant at Wonthaggi (as well as an expansion in desalination capability interstate)
- Other major water projects, which are being developed at a rate three to four times higher than usual
- Tasmania's new pulp mill, a project worth in excess of $2 billion
- Projects emerging in New Zealand where a $3 billion three year infrastructure program has been announced
- The Olympic Dam project in South Australia, a $5 billion to $8 billion project that will also require the construction of a new town and airport
- Several major projects underway or in prospect in Queensland, including major rail works and the new $1.5 billion Springfield Dam
- The release of plans for a $12 billion expansion of the Sydney rail network and plans for significant extensions to the city's metropolitan freeway network
- A high number of works in the Middle East and South East Asia – for example, Leighton International is heavily committed with such works and recently moved its headquarters from Kuala Lumpur to Dubai in response to the pipeline of work occurring in the Middle East, drawing in local partners and expertise
- Melbourne's EastLink Project and the M1 upgrade, which have a combined construction cost of around $3.5 billion.

The resources boom, most evident in Western Australia, is also having an impact on the construction resources available to projects in the eastern states.

Overall, the picture is one of intense activity and the clear expectation is that this activity will continue to escalate in the future.

Study Team Findings

Governments can assist industry to make more efficient use of its resources and produce better quality, more competitive bids by providing clarity concerning the intended pipeline of future projects, in terms of the nature and timing of projects. This would also allow different jurisdictions to work together to co-ordinate bid timing, avoiding having multiple projects at critical stages before the market at the same time.

10.6.3 Resource implications

People

There are implications for human resources from such a high level of project and construction activity. All contractors struggle to find the full range of people necessary to deliver a major project and many are adopting new approaches to develop the required skills within their companies. These approaches include recruiting overseas, which has been successful in growing the workforce but comes at a cost in terms of salaries and conditions. Generally, the major companies structure themselves as national companies with a high level of mobility expected for key people. Companies feel they are getting smarter in their engagement, training and development of graduates, with more emphasis being placed on retaining staff within the company. Companies are also using overseas exchange arrangements to assist with skills development.

Although the industry feels that, with sufficiently attractive salaries, the necessary resources can be assembled, it acknowledges that some key tasks present specific skill challenges. For example, having access to the necessary design teams, especially during the bidding process, is of critical importance. A consistent message emerging from the Study Team's consultations with the construction industry was that the bidding phase of projects needs to be nationally coordinated to ensure that companies are able to access these design skills.

While large companies assemble 'A Teams' to develop their bids for major projects, there is a six month period when overlapping of bid submissions can cause some serious difficulties. The challenge is for Australian governments to recognise this particular constraint within the industry and coordinate the timing of projects coming to market to ensure that the industry can provide high quality responses.

Overall, the industry believes that it now has extensive experience in major infrastructure projects, but there needs to be a continuity of projects to develop and retain staff to meet ongoing project demands. In particular, it is important to retain field employees in order to develop future site supervisors.

Equipment

The industry considers that the availability of equipment is an issue of sufficient advance notice, rather than one of overall availability. Specialist items of equipment such as tunnel boring machines take around 18 months to build and deliver after confirmation of a contract. In addition, it is necessary to fully specify the requirements of a machine and undertake the particular design requirements for the geology of a particular project. For such critical items of plant, the earlier the project details and geotechnical investigations are completed, the better positioned is the industry to deliver the equipment in a timely fashion.

However, even for routine items of equipment such as bulldozers, graders and the like, there is now a significant delivery time, with 12 months and more becoming usual. Again, this is not a limitation to the capacity of the industry to deliver, but one of the programming matters that has to be considered in structuring the resources for a project. In general, the industry did not believe that there would be any constraints on construction equipment that would unduly influence the delivery of the EWLNA recommended projects.

Materials

Materials also require adequate lead time. For example, locally produced products (such as quarry materials) can be sourced with greater confidence than bitumen, which is supplied from overseas. Steel is becoming increasingly difficult to source on a competitive basis, especially for the higher performance materials, and the huge demand for steel and concrete products in the developing economies of China and India is having some local impact. However, as with equipment, the industry indicated that access to the necessary materials would not restrict project delivery.

Industrial relations

A strong plea was made by the industry to the Study Team to ensure that the industrial relations framework now in place in Victoria is maintained. The industry noted that the positive shift in the Victorian industrial relations climate in recent years had influenced the capacity to deliver projects in a timely and cost effective way, and that Victoria had moved from one of the ‘worst’ industrial relations environments to be equal with the best in Australia.

10.6.4 International construction companies

A number of overseas based construction companies have contacted the Victorian Government expressing strong interest in participating in future large scale construction projects.

Historically, Australia has been very well served by large and capable local construction firms, with ever growing and more complex projects being successfully delivered. The Australian companies consulted by the Study Team are fiercely proud of the way in which they have responded to the demands for major project delivery and were strongly of the view that their project management expertise was equal to the best in the world. There was little support – unsurprisingly – for the notion that international companies were needed to support the growing major project pipeline and a high level of confidence that the local industry had the capacity to meet current and future challenges. However, the industry did acknowledge that there were areas of specialist expertise that were in short supply in Australia and, as noted earlier, local firms have sought to gain expertise by sending employees overseas to gain experience.

Australian companies also felt that their local knowledge gave them an ‘edge’ over international players, but that even if this was not the case, they had confidence that local firms could compete successfully with overseas competitors.

On the other hand, there are some major European companies that have expressed interest in undertaking works in Australia and in establishing an ongoing presence here. The strong pipeline of projects is seen as a good long-term opportunity by these companies, and tendering options are being actively examined. Recent indicators of this interest include:

- Bouygues has established a local office in Sydney and is competing on major infrastructure projects around Australia. The company was recently awarded the Hale Street Bridge contract in Brisbane, in conjunction with local partners.
- Laing O’Rourke, through their acquisition of Barclay Mowlem, now has an Australian presence.
- The Spanish contractor Grupo ACS submitted an expression of interest for the Airport Link / Northern Busway Project in Queensland.

New entrants to the market can bring fresh competition, ideas and experience, access to a broader experience pool and the financial status of some of the world's largest construction companies. However, it will not be easy for new entrants to establish successful businesses in Australia. Familiarity with local conditions, business procedures and requirements will take time to develop, as will assembling bid teams of the calibre required to successfully compete with experienced local teams. This local knowledge advantage is recognised and is likely to result in overseas participants partnering with a local firm, at least initially. Given that large Australian construction companies such as Leighton Holdings are now undertaking significant business in other countries – and are likely to continue to do so – it is reasonable to expect that overseas companies may seek to do the same in Australia.

There is clearly some frustration that major international companies with long track records of project delivery overseas are still viewed as newcomers in Australia and are seen as higher risk without a history of successful local projects. Some people expressed the view to the Study Team that this attitude needs to change if new players are to be introduced to the Australian market.

Some aspects of Australian project delivery arrangements are seen as a problem to overseas companies. One example is traffic risk, where international companies hold the view that if a government has developed and supported a particular project as a necessary element of the city's infrastructure, it is strange for the risk of future traffic volumes (and hence revenue) to be allocated solely to the private sector party.

When the size of the looming infrastructure construction task for both the public and private sector is considered, it is apparent that there could be room for new entrants in the domestic heavy construction market.

Study Team Findings

In implementing the projects recommended by the EWLNA, procurement processes should be structured – and communicated – globally to ensure that all suitably qualified construction companies (domestic or international) have an opportunity to participate.

10.6.5 Delivering the EWLNA projects

Although there is a high demand for construction resources, the industry expressed confidence about its capacity to respond to major new projects in Melbourne. The location of a project in inner Melbourne would be a major factor in attracting key staff, with the industry noting that there is a clear preference by project personnel to be based in major cities when opportunities arise. Locating a project in the centre of a major Australian city for several years duration would be a very considerable advantage.

The industry indicated its preference for a pipeline of projects within the $3 billion to $5 billion range, rather than one 'mega-project' that would severely limit the capacity of many companies to participate. At the upper end of this range, partnering between major contractors would be required, but there is now a strong track record in Australia of projects successfully delivered by such partnerships.

Sequencing project delivery

Because the combined size of the EWLNA recommended projects is larger than other transport projects seen in the Australian market, the sequencing and staging of the road and rail portions are likely to be advantageous in terms of funding and capacity in the market.

A staged project has several benefits:

- It provides a known pipeline of projects of a size that the market has capacity and appetite to deliver.
- Having 'sub-projects' will be more attractive to the market, with discussions between the industry and the Study Team suggesting that projects beyond $5 billion would be less manageable for constructors and financiers.
- More frequent, smaller projects represents less of a barrier to entry for new market participants.
- A staged program can also allow the government to better manage any potential call on funds over a period of time, a flexibility that could be significant when considering the state's future credit rating.
- There is precedent in the market for successful projects being delivered in a staged approach – for example, the Brisbane City Council's TransApex initiative involves a program of large scale projects such as North South Bypass Tunnel ($3 billion), Airport Link ($4 billion), Hale Street Link, Northern Link and potentially an East West Link.
- Increased competition for projects. Bid costs associated with projects in excess of $5 billion can exceed $30 million, limiting the number of companies with the capacity or willingness to bid for large scale projects.

There are also some potential advantages to delivering the EWLNA recommended projects as one large project:

- Economies of scale can be generated through a project of this size.
- Delivering the project as a whole could lead to an earlier completion of the project, as there would be an agreed timeline for full delivery. Staging the sub-projects could significantly extend the timeframe to delivery.
- A single project would avoid having multiple owners/operators if a PPP was used, avoiding interface issues.
- Building the full road connection as one project would lead to full connectivity across the network, rather than delaying the benefits to users by staging the process.
- There could be a reduced escalation cost on construction. Given the current upward trend of capital construction, these savings could be substantial.

As already noted, there are limits on the capacity of the private sector to fund road or rail infrastructure projects. In addition, the specific characteristics of particular projects, such as risk allocation, have an impact on the extent of funds that may be available for a particular project. Another factor that influences the amount of finance able to be obtained is the conduct and timing of the bidding process itself.

For very large projects, where bidders are required to obtain commitments for finance as part of their bids, there could be tensions between a general desire to have more than two bidders from a competitive perspective and the ability of the market to provide finance for three or more bids.

This capacity constraint can be compounded where bidding processes for more than one large project in more than one state take place within a twelve month period. A number of market participants advised the Study Team that if there were two or more very large projects being bid at the same time in different states, they may have difficulty in securing the necessary financial commitments to participate in more than one project. Part of the reason for needing to choose between projects is the extent of the costs incurred in preparing project bids. Bid costs for large projects are now tens of millions of dollars per consortium, including significant expenditures on preliminary design and detailed drafting of legal documents. Industry stakeholders consulted by the EWLNA indicated a strong desire for governments to implement processes to reduce the size of bid costs.

These factors are among many to be considered in determining both the optimal size and stages of the EWLNA recommended projects and the timing of bid processes and delivery.

A strong pipeline of projects

The Study Team's view is that the recommended EWLNA projects present an opportunity for the Victorian Government to demonstrate a strong pipeline of projects to the market, maximising the opportunity for competition.[12] This pipeline should be combined with an active market engagement process as the projects develop. Key elements of this process are:

- Ensuring that the project is developed and presented to the market in a manner that is attractive and that includes risk allocations that the market is able to accept (seeking unrealistic risk transfer is likely to inflate cost and lead to suboptimal value for money outcomes).
- Engaging the market in an informed discussion to identify the hurdles to maximising competition. This would involve a range of market sounding and roadshow exercises to contractors, operators, and, where relevant, equity investors and financiers.
- Providing certainty to the market about the expectations of the Victorian Government and consistency of process.
- Presenting to industry a process and documentation with which industry is familiar and that builds upon projects completed to date.
- Adopting competition and probity measures to address the effect of the common ownership of a number of the key construction contractors.
- Developing and delivering a global procurement strategy that appreciates the cost and time required to develop a bid of this nature, while ensuring that Victoria has the best opportunity for gaining a value for money outcome. This may include the use of split bidding, partial reimbursement of bid costs and other strategies to maintain effective competition.

12. This pipeline would be in addition to projects already being considered by the Victorian Government, such as the Frankston Bypass and the duplication of sections of the Western Ring Road.

Government administrative arrangements – special purpose delivery body

The Study Team received strong feedback from the industry that, when delivering very large infrastructure projects, government's own arrangements need to match the calibre of those in the private sector. In most cases, the private sector was highly complimentary of the manner in which the Victorian Government does business in contracting for large scale projects. The need for high calibre government teams applies irrespective of the form of delivery being used: PPP, a more traditional D&C arrangement or an alliance style of contracting.

Procuring projects of this scale and complexity requires a high calibre government team with the skills and experience to match those of the private sector. The government structure must enable such personnel to be recruited and retained. This includes the capacity to offer appropriate and competitive remuneration and employment conditions.

Having considered these comments and looking at recent market practice in Australia, the Study Team considers that there are compelling reasons why projects of this nature should be delivered by a special purpose government body, charged with the specific responsibility and powers to implement the project.

There are a number of benefits in establishing a separate legal entity to manage large scale projects, including:

- By taking a strategic, whole-of-corridor approach, a separate entity could exploit any synergies between the different project packages.
- A separate entity has a single focus on its objectives. While the entity would have a multi-modal task (rail and road), it would have a single focus on delivering the overall project. Achieving such a focus is more difficult in departmental models of delivery because of the huge range of competing demands within departments.
- The fact that the separate entity has a single focus enables it to adopt a commercial culture with greater flexibility and speed in decision-making – attributes that are highly valued by consortia investing billions of dollars.
- Having one entity undertaking multiple procurements allows 'corporate knowledge' to be retained and efficient processes developed and refined.
- A separate entity may also have more flexibility in attracting and retaining staff. This is likely to be particularly important in respect of a complex multi-modal project such as that proposed by the EWLNA.
- A separate entity also has the advantage that the state has less direct exposure to legal and commercial risks.

The Study Team believes that these benefits clearly favour the establishment of a separate entity to deliver the projects recommended by the EWLNA. Such an entity could take a number of different forms, as set out in Table 27.

If a corridor based approach was adopted (as recommended by the EWLNA Study Team), a single delivery body would be appropriate. Alternatively, the road and rail projects could be delivered through separate bodies. This option is not recommended by the Study Team.

While each of the models listed in Table 27 have advantages and disadvantages, the Study Team considers that a statutory authority is likely to be most suitable for delivering the projects.

Implementing this model would require the enactment of special purpose legislation to establish a statutory authority with all necessary powers and functions. The legislation would need to deal with a number of issues, including:

- the transfer of assets and liabilities (if any);
- the establishment of the statutory authority as a body corporate with its own seal (that can then sue and be sued in its own name);
- whether the entity is intended to represent the Crown and therefore enjoy the privileges and immunities of the Crown;
- the functions and powers of the statutory authority;
- any powers or functions of the Minister or a Chief Executive in relation to the statutory authority;
- the funding of the statutory authority;
- the account keeping and reporting requirements imposed on the statutory authority; and
- any transitional arrangements, including contractual arrangements and transfer of staff.

The special purpose legislation could also deal with governance and accountability issues. For example, the legislation could declare the new agency to be a statutory body for the purposes of the *Audit Act 1994 (Vic)* and *Financial Management Act 1994 (Vic)*.

Table 27 – Single entity models for delivering large scale infrastructure projects

Type of Entity	Examples
Statutory office within a department	Director of Public Transport
Statutory corporation (an entity created under its own legislation)	VicRoads, Melbourne City Link Authority and SEITA (Southern and Eastern Integrated Transport Authority)
State Body established under the *State Owned Enterprises Act 1992 (Vic)*	Transport Ticketing Authority (TTA)
State Business Corporation established under the *State Owned Enterprises Act 1992 (Vic)*	Vicforests was established as a State Body and then immediately became a State Business Corporation. In NSW, the Transport Infrastructure Development Corporation (TIDC) is established under the *Transport Administration Act,* which then establishes the entity to be a State Owned Corporation under the *Statement Owned Corporations Act 1989* (NSW).
Corporation under the *Corporations Act* **where all the shares are held by, or on behalf of, the Crown in right of Victoria**	Victorian Major Events Company Limited. This is the preferred model in Queensland, where the State has recently established a range of corporations to deliver projects, including: Queensland Water Infrastructure Pty Ltd (responsible for delivering a number of water projects); Southern Regional Water Pipeline Company Pty Ltd (established to build and operate a number of pipelines to distribute water); Queensland Motorways Limited (operates toll roads); and City North Infrastructure Pty Limited (established to deliver the Airport Link and Northern Busway Projects).
Combination of different types of entities	VicTrack. In Victoria, VicTrack has a number of wholly owned subsidiaries that are incorporated under the Corporations Act. These subsidiaries have been established to own various items of rollingstock (passenger trains and trams) that are leased to public transport operators.

Other issues

Melbourne CityLink

The Study Team is aware of the provisions of the Melbourne CityLink concession deed concerning changes to the Melbourne transport network. While the state is not restricted in managing the transport network, there are provisions known as Material Adverse Effects, where in some circumstances CityLink might be compensated for the consequences of certain network changes. Conversely, there are provisions known as Compensable Enhancements where the state can share in the benefits of changes that result in increased traffic on CityLink.

The Study Team has sought to identify the best transport solutions in response to its terms of reference; it has not constrained or altered its thinking as a result of the contractual arrangements between the state and CityLink.

Public transport re-franchising

The current metropolitan rail franchise arrangements with Connex expire on 30 November 2009. From that date, following a comprehensive tender and selection process, the Victorian Government will enter into a new franchise agreement with an operator for a minimum of eight years.

Should the EWLNA recommendation for a new east-west rail tunnel be adopted, construction will take place during this new franchise period.

Study Team Findings

Because the combined size of the EWLNA recommended projects is larger than other transport projects in the Australian market, sequencing and staging the rail and road portions is likely to be most advantageous in terms of funding and capacity in the market.

The Study Team's view is that staging the projects presents an opportunity for Victoria to demonstrate a strong pipeline of projects to the market, maximising the opportunity for competition. This pipeline should be combined with an active market engagement process as the projects develop.

A single statutory authority is likely to be most suitable arrangement for delivering the projects.

appendices

appendix a

List of submissions and consultations

Submissions

In March 2006, interested persons and groups were invited to make a submission to the EWLNA. The following submissions were received and are available at the EWLNA website.

1. Western Transport Alliance 2/01/2007
2. Paul Mees
3. Elwin Davies
4. Ron Brons 10/03/2007
5. Rueben van Bemmel
6. Ron Brons 16/03/2007
7. Bruce Light
8. Andrew Trotter
9. Eriks Velins
10. Ron Brons 22/03/2007
11. Ron Brons 24/03/2007
12. Paul Anglin
13. Ron Brons 31/03/2007
14. Carlo Carli MP and Christopher Anderson
15. Craig Scott
16. Ron Brons 12/04/2007
17. Simon Conisbee
18. Philip Worssam
19. Stan Chang
20. Kelvin Thomson MP
21. Committee for Melbourne
22. Kaye Oddie
23. Carlton Residents Association
24. Ron Brons 2/05/2007
25. Lindsay Tanner MP
26. Bruce Light 3/05/2007
27. Ramesh Mackenzie
28. People for Ecologically Sustainable Transport
29. Ron Brons 7/05/2007
30. Peter Stafford
31. Diana Neville
32. Ron Brons 9/05/2007
33. Ron Brons 11/05/2007
34. Rod Oaten
35. Maribyrnong Bicycle Users Group
36. Satellic Traffic Management
37. Michael Ryan
38. Jon Stanger
39. Nick Pastalatzis
40. Frank Burden
41. Lynette Cremona
42. City of Greater Geelong
43. Citizens for a Liveable Melbourne
44. Hugh Rundle
45. Victorian Employers' Chamber of Commerce and Industry (VECCI)
46. Malcolm Pryor
47. Ron Brons 28/05/2007
48. Laurie P
49. City of Hobsons Bay
50. ABN AMRO Australia
51. Australian Greens – Victoria
52. TTF Australia (Tourism and Transport Forum)
53. David Lyons
54. City of Darebin
55. Greg Hosking
56. Institute of Logistics & Supply Chain Management
57. Nillumbik Shire Council
58. Paul Prentice
59. City of Melbourne
60. Moreland City Council
61. Janet Taylor
62. Habitat Trust 30/05/2007
63. Mark Schier
64. Habitat Trust 31/05/2007
65. Yarra Climate Action Now!
66. Geoff Peverell
67. Balance Research
68. The 3068 Group

69. Eastern Transport Coalition
70. Jenny Mikakos MP
71. Lowen Clarke
72. Collingwood and Abbotsford Residents Association
73. Municipal Association of Victoria
74. Greater Dandenong City Council
75. Institute of Public Works Engineering Australia, Victoria Division
76. Engineers Australia, Victoria Division
77. Ron Brons 5/06/2007
78. Town and Country Planning Association
79. Daniel Csikos
80. Habitat Trust 6/06/2007
81. Institute for Sensible Transport
82. Western Transport Alliance 31/05/2007
83. Macquarie Bank
84. South Eastern Integrated Transport Group
85. City of Whittlesea
86. North and West Melbourne Association Inc
87. Maribyrnong Truck Action Group
88. Habitat Trust 13/06/2007
89. Ross Thomson
90. Metropolitan Transport Forum
91. Australian Workers' Union
92. Maribyrnong City Council
93. Brimbank City Council
94. Bicycle Victoria
95. Moonee Valley City Council
96. ConnectEast
97. Metlink
98. Mary Wooldridge MP
99. Victorian Freight and Logistics Council
100. Wyndham City Council
101. Royal Park Protection Group
102. Committee for Werribee
103. Thiess
104. Leighton Contactors
105. Nick Wakeling MP
106. City of Boroondara
107. Chris Lewis
108. Jarryd Rasti
109. Infrastructure Partnerships Australia
110. Victorian Council of Social Service
111. Committee for Geelong
112. Bruce Mildenhall
113. Bus Association Victoria
114. Public Transport Users Association
115. Cardinia Shire
116. Rod Watson
117. David Droogleever
118. Commissioner for Environmental Sustainability
119. Peter Brohier
120. RACV
121. Victorian Transport Association
122. City of Yarra
123. Andre Haermeyer MP and George Seitz MP
124. Eastern Sector Councils
125. Manningham City Council
126. Transurban
127. Adem Somyurek MP
128. Jackie Fristacky and Brian Buckley
129. Avalon Airport Australia
130. John Welsh

Several late submissions were received. These were not placed on the EWLNA website, but were considered by the Study Team.

131. Yarra Bend Trust
132. Shaun McGilton
133. John Wallace
134. Gippsland Local Government Network
135. Robert Pelly
136. Institute of Transportation Engineers, Australia and New Zealand Section Inc
137. Dr John Love
138. Mr A Mack

Consultations

The Study Team also met and consulted with a range of individuals and organisations. These consultations took a variety of forms, including presentations by and to Sir Rod Eddington and/or the Study Team, small group discussions, community forums, public meetings and visits to groups, companies and sites of interest. Organisations consulted by the Team are listed below.

AbiGroup

ABN Amro

Asciano

AusTrack

Australian Air Express

Australian Constructors Association

Australian Industry Group

Babcock and Brown

Baulderstone Hornibrook

Bicycle Victoria

Bouyges

C40 Cities Climate Leadership Group (Clinton Climate Initiative)

ConnectEast

Commissioner for Environmental Sustainability

Committee for Werribee

Committee for Geelong

Committee for Melbourne

CRT Group

Department for Transport (UK)

Grupo ACS

Grupo Ferrovial

Infrastructure Partnerships Australia

Institute of Logistics and Supply Chain Management

International Project Finance Association

John Holland Group

Leighton Conractors

Leighton Holdings

Linfox

Macquarie Bank

Maribyrnong Truck Action Group

Metlink

Metropolitan Transport Forum

Municipal Association of Victoria

Murray Goulburn Cooperative

NSW Office of the Coordinator General

Plenary Group

Port of Geelong

Port of Melbourne Corporation

Qantas Air Freight

RACV

Salta

Southern and Eastern Integrated Transport Authority (SEITA)

Theiss John Holland JV

Toll Holdings

Tourism and Transport Forum

Toyota Australia

Transfield Services

Transport Infrastructure Development Corporation (NSW)

Transport for London

Transurban

Treasury Corporation of Victoria

University of Melbourne

VECCI

VicRoads

Victorian Freight and Logistics Council

Victorian Funds Management Corporation

Victorian Transport Association

VicUrban

Western Transport Alliance

West Gate Freeway Alliance

This list does not include consultations with and presentations to internal units within Victorian Government departments and Members of Parliament.

Local government

Banyule City Council

Boroondara City Council

Brimbank City Council

Darebin City Council

Greater Dandenong City Council

Hobsons Bay City Council

Manningham City Council

Maribyrnong City Council

Maroondah City Council

Melbourne City Council

Melton Shire Council

Moreland City Council

Nillimbik Shire Council

South Gippsland Shire Council

Wyndham City Council

Yarra City Council

appendix b

Issues raised by submissions and consultations

The Study Group received 130 submissions from individuals, local councils and business and community organisations. Sir Rod Eddington and members of the Study Group also met with a range of key stakeholders. Individuals and groups making submissions to the EWLNA canvassed a wide range of issues and expressed different views on the study's terms of reference.

Support for a major new east-west road link

A number of submissions strongly supported the construction of a major new east-west road link, seeing such a link as filling a critical gap in Melbourne's road network. While proposing a range of options, these submissions argued that the growing demand for travel across the city and to the north of the CBD cannot be met by the existing road network and that a new east-west link is essential to managing and supporting Melbourne's population and industry growth over the next 30 years.

These submissions argued that the benefits of a new link would be substantial, including:

- improved amenity in Melbourne's inner north and inner west by removing traffic from these suburbs;
- relieving congestion in the inner city and on northern Melbourne arterial routes;
- meeting the growing transport demands of people and businesses in Melbourne's rapidly growing western suburbs;
- improved travel times for road-based public transport and better public transport access to the Parkville university/hospital precinct; and
- reduced reliance on the Monash – CityLink – West Gate corridor as the city's only major east-west road link.

Most of these submissions expressed the view that, even with a significant increase in rail freight and public transport patronage, the majority of freight and passenger traffic will travel by road for the foreseeable future. However, many submissions argued that any new road link should be part of a long term integrated transport plan that includes significant public transport improvements.

Generally, supporters of a new road link believe that it should be in the form of a tunnel and provide a major northern bypass of Melbourne's CBD with a further link to the Tullamarine Freeway, Western Ring Road and/or the Western Highway. A small number of submissions supported an upgraded link across the Yarra River, such as another deck on the West Gate Bridge or a new tunnel under the Yarra. Different views were expressed about the viability of the private sector fully funding these options.

Opposition to a major new east-west road link

A number of submissions expressed strong opposition to any new road-based east-west link. Generally, these submissions argued that there is no substantial demand for travel across Melbourne; that constructing an east-west link will not relieve congestion in inner Melbourne; and that Victoria should be investing in public transport and traffic management solutions rather than in new roads.

A strong focus of these submissions was giving priority to reducing the reliance on motor vehicle transport in Melbourne and increasing the speed, frequency and reliability of public transport services.

These submissions argued that any major road link will:

- lead to increased road travel (than would otherwise occur);
- have adverse effects on the health and amenity of residents of Melbourne's inner north;
- encourage urban sprawl and reduce the city's capacity to contain growth within defined boundaries and around public transport nodes; and
- increase Melbourne's already heavy dependency on cars at the expense of other, more sustainable transport modes.

Support for new transport options in the inner west

A number of submissions viewed the study as also offering an opportunity to ameliorate the impact of heavy trucks moving through residential areas in Melbourne's inner west. Several submissions urged the study to consider options to improve truck access to the Port of Melbourne and bypass residential areas in Melbourne's inner west with the aim of improving residential amenity in suburbs such as Footscray, Yarraville and Seddon, opening up new investment opportunities in the Footscray Transit City area and supporting the expansion of activities at the Port of Melbourne.

Public transport options

Most submissions to the study pointed to the growing pressure on Melbourne's public transport network and noted that public transport patronage is likely to increase significantly over the coming decade. A range of public transport infrastructure and non-infrastructure options were proposed by submissions supportive of and opposed to a major new east-west link, including:

- major public transport upgrades to Doncaster (including extending rail services and improving bus services);
- extending rail services to Caroline Springs;
- the duplication and electrification of the Sunshine to Melton line;
- a major new underground rail link centred around Parkville;
- resolving the problems caused by the rail bottleneck at North Melbourne;
- upgrading train stations (including more Park & Ride facilities);
- increasing rail capacity on congested routes through signalling and operational improvements; and
- more flexible and convenient bus services and priority lanes for buses.

Freight issues

A significant number of submissions urged the study to recommend that a much greater effort be directed towards increasing the share of freight carried by rail. In particular, submissions supported:

- more efficient rail links to and from the Port of Melbourne;
- greater investment and commitment to developing intermodal freight hubs (within Melbourne and across regional Victoria);
- a mix of incentives and disincentives to shift freight in the direction of rail;
- initiatives to facilitate development of the Port of Hastings; and
- the development of a comprehensive Victorian Freight Strategy.

Submissions from people and organisations in the inner west and inner north were especially concerned about the impact of freight traffic on residential amenity.

Congestion

Many submissions discussed the economic, social and environmental costs of congestion, while noting that it is not possible to eliminate congestion altogether. Submissions from industry groups expressed the strong view that ‘doing nothing’ was not an option in relation to congestion, with the problem likely to get worse and lead to higher costs for business. However, submissions from some community and environmental groups argued that congestion should be viewed in a more positive light: as a sign of economic success and an effective disincentive to car use.

A significant number of submissions strongly favoured non-infrastructure options as a solution to congestion. These submissions urged the study to consider options such as:

- congestion pricing, including central city cordon pricing or congestion levies;
- Electronic Road Pricing, such as time-of-day pricing, to achieve traffic objectives;
- High Occupancy Vehicle lanes and other demand management mechanisms to ration road space more efficiently between different modes of transport;
- a greater investment in and use of intelligent transport systems (ITS) to manage travel demand and traffic flow;
- the removal of taxation and other financial incentives that favour car use; and
- public awareness campaigns about the environmental and other impacts of travel decisions.

Urban growth and planning

A number of submissions argued that transport planning in Melbourne should be much more closely aligned with urban development objectives and land use decisions. These submissions argued that any options considered by the study should take into account the need to curtail urban sprawl, increase population density in the city’s inner suburbs and facilitate growth and high density housing around public transport nodes.

A number of submissions noted that growth in Melbourne’s west was likely to be far stronger than current projections and that any options recommended by the study should take into account the future mobility needs of this rapidly growing area.

Sustainability

There was a strong focus on environmental issues across the range of submissions. Many submissions argued that the 'peak oil' scenario will occur within the timeframe covered by the study. These submissions urged the study to give careful consideration to the impact of continually rising petrol prices over the next decade on Melbourne's transport patterns. Some submissions argued that this scenario will place significant negative pressure on road-based transport, leading to reduced motor vehicle traffic on the city's roads and an increasing demand for public transport. However, other submissions argued that, with road transport becoming more carbon efficient, levels of car use are likely to remain relatively stable over the next 30 years.

Many submissions also urged the study to recognise that the fastest growth of greenhouse gas (GHG) emissions is occurring in the transport sector and to give serious consideration to the climate change implications of any options. These – and other – submissions argued that the study should look towards options that reduce travel by the largest emitter of GHG in the transport sector: the single occupancy passenger vehicle. Other submissions argued that road transport was becoming more carbon efficient and that this trend will pick up pace over the next decade, leading to a significant reduction in the contribution motor vehicles make to GHG.

Social equity and healthy transport options

Several submissions argued that greater effort should be directed towards improving cycling and walking options for short trips (less than five kilometres), including:

- improving pedestrian and cycling connections with train stations;
- completing the Principle Bike Network; and
- upgrading cycling links in Melbourne's inner west and between the inner west and the CBD.

A relatively small number of submissions urged the study to consider the social costs and equity implications of any recommendations and to ensure that any proposed options actively tackle transport disadvantage.

appendix c

Doncaster corridor options

As noted in Chapter 7, the EWLNA Study Team reviewed a range of public transport options for the Doncaster/ Manningham corridor. In order of cost and carrying capacity, these options are:

- Heavy rail
- Light rail
- DART with additional service enhancements).

It should be noted that any heavy or light rail option to the Manningham corridor would require a reassessment of freeway bus services.

Heavy rail

A heavy rail link to Doncaster – an idea that was first put forward in the 1920s and again in the late 1960s – continues to be discussed, although it has been rejected by successive state governments over the last 40 years.

The Study Team examined the option of heavy rail in the Doncaster corridor, including alternative routes and different ways of connecting the line to the existing rail system at the city end.

The Doncaster end

The route would provide a service linking Doncaster Shoppingtown with Victoria Park station, then continuing to Flinders Street/Parliament along the existing Clifton Hill Group rail line.

Frequencies would be four services per hour, three new stations would be provided, and Victoria Park and the new stations would be Premium Stations. The route would follow a direct underground path from the Doncaster (Westfield) Shoppingtown (due to the grade differential of Doncaster Hill to the Eastern Freeway) from the west to Bulleen Road/Eastern Freeway. The alignment would gradually descend from a tunnel as it approaches the Bulleen Road overpass and continue along the existing median strip within the Eastern Freeway. Between that point and Victoria Park station, the freeway median would be used.

The total length of the link would be approx 12.6 km including 5 km of tunnel.

Options at the City end

Alternatives were considered for linking a heavy rail service from Doncaster to the existing rail network.

To the CBD changing trains at a major Victoria Park interchange station

While it is possible to provide a major modal interchange at Victoria Park onto the Clifton Hill group which serves the Epping and Hurstbridge lines it was not considered viable by the Study Team due to:

- The need to transfer from the Doncaster trains (as they would terminate at Victoria Park) to the Clifton Hill Rail Group trains would inconvenience passengers travelling to the CBD, making it less likely that the Doncaster rail service would be used.
- Fully loaded trains on the Clifton Hill Rail Group may not have spare capacity for a major influx of interchanging passengers at Victoria Park, requiring an increase in service levels on the Clifton Hill group that would only be fully utilised between Victoria Park and the CBD (despite the substantial additional infrastructure required between Clifton Hill and the CBD to create this option).

To the CBD via the Clifton Hill rail line

Connecting a new Doncaster rail line directly to the existing Clifton Hill Rail Group is currently technically feasible, as this line has some spare capacity (subject to changes and infrastructure works such as the Clifton Hill-Westgarth duplication). While the best option for making this connection is via the Clifton Hill rail line, additional capacity would be required in the future at this connection point, requiring new tracks above, adjacent or below the existing tracks between Clifton Hill and the CBD.[1]

Building tracks above would significantly increase noise and visual intrusion for nearby residents in Collingwood, East Richmond and Jolimont. Constructing new tracks adjacent to the existing tracks would require acquisition of around 100 to 200 properties and may also require some parkland in Collingwood and Jolimont. Tunnelling below the existing tracks would be very expensive, but would avoid most surface impacts.

It is likely that these expansion works between Clifton Hill and the CBD will be needed in the longer term, regardless of whether a Doncaster rail link is built (although a Doncaster link would bring the need for such work forward). Accordingly, these works have not been included in the options analysis for Doncaster.

Indicative costs

For the purposes of comparison to other public transport options within the corridor, the heavy rail option connecting the Doncaster line to the CBD via the Clifton Hill line has been adopted. The estimated costs of this option are around $1.7 billion - $2 billion.

Light rail

In considering light rail options, the Study Team examined extensions to existing routes, as well as a new light rail service along the Eastern Freeway.

Tram network extensions

Two possible extensions of the tram network to Doncaster Hill were suggested by submissions to the EWLNA:

- Extending Route 109 north along Tram Road
- Extending Route 48 along Doncaster Road.

While a Route 109 extension would provide a tram service from Box Hill station to Doncaster Hill, the route would not be viable for tram travel to the central city, as the travel time would be around 70 minutes (roughly double the current time taken by bus route 307). The extension would be likely to attract only a very small number of additional CBD-destined patrons.

In addition, National Bus operates several bus routes along this alignment, with around fourteen buses travelling from Doncaster Hill and Box Hill between 7am and 8am each weekday. While growth on the route would come from patrons destined for Doncaster Shoppingtown, most of these passengers would simply be transferring from existing bus routes in the area (particularly Route 207).

The extension of Route 48 to Doncaster Hill would require around 4 km of dual tram tracks along Doncaster Road, the first 1.6 km shared with traffic and the remainder in a new median to be constructed by converting the two central traffic lanes. Steep grades along this section appear likely to exceed the maximum design grade for trams and would also exceed grade limitations for DDA compliant stops. This issue would require further consideration to determine if it could be overcome.

While the extension of Route 48 would connect Doncaster Hill to the tram network, the very long travel time (around 60 minutes in off-peak periods) means that this is highly unlikely to attract significant CBD-bound patronage. This option does not materially improve travel to the CBD and offers virtually no benefit for commuters in the Doncaster/Manningham region.

The Study Team does not consider Route 109 or 48 extensions to offer sufficient travel benefits to be a priority for public transport investment.

1. See SKM Maunsell et al (2008a)

Light rail via the Eastern Freeway

A number of submissions suggested providing a new light rail service running along the Eastern Freeway to Doncaster Road and then to Doncaster Hill. The key issues for such a service include:

- Fleet requirements
- Connections to existing tram services in inner Melbourne
- Getting the service into and out of the Eastern Freeway median at each end of the route
- How far to extend the route into Doncaster
- Requirements for depot(s) and power supply.

Fleet requirements

As a minimum, modern low-floor light rail vehicles compatible with the existing Melbourne tram system (such as the current Combino or Citadis trams) would be required to allow the route to run into the CBD. However, these trams have an effective operating maximum speed of around 70 to 80 km/h.

Since extensive unconstrained running in the Eastern Freeway median is available, vehicles with a higher operating speed could be considered to minimise travel time. However, it is not clear that appropriate vehicles would be compatible with the existing system (for example, they may require larger wheel flanges to increase stability). If these vehicles were not compatible, a separate route into the CBD may be required (such as via Rathdowne Street-Exhibition Street or Hoddle Street-Albert Street-Lonsdale Street). Alternatively, passengers could be required to interchange to existing services, negating the benefits of the faster freeway travel time.

Given the difficulties and uncertainty around non-compliant vehicles, it is assumed that optimised but compliant vehicles would be used with a running speed up to 80 km/h along the freeway.

Melbourne connection

At the Melbourne end of the route, two options exist for connecting the route to the tram network.

- Nicholson Street could provide a segregated route into the CBD via Bourke Street.
- A connection could be provided at Melbourne University in Swanston Street, connecting with one or more of several routes from the south that terminate at Melbourne University. An extension would run east along Johnston Street to Victoria Park station, connecting to the Eastern Freeway service.

  The Melbourne University option has merit as it would:

  – directly service Melbourne University as well as the CBD;

  – make better use of spare capacity on trams running between Melbourne University and the CBD rail stations; and

  – allow through running to destinations along St Kilda Road without interchange.

Eastern freeway connection – western end

Leaving the Eastern Freeway at the western end would be difficult irrespective of any decision to build an east-west road link. With a tunnel road link, it will almost certainly be necessary to elevate the tram within the Eastern Freeway median due to the need for additional road space to provide a tunnel portal. Without a tunnel, the limited road space under Hoddle Street would require considerable works, including land acquisition and retaining walls to provide space for a tram.

Two routes are possible: via Alexandra Parade or swinging south via an overpass and via Victoria Park Station and then west via Johnson Street, possibly using a ‘Strasbourg style’ treatment (that provides tram priority, but retains a measure of car access and parking for abutting development).

If a road tunnel option at the western end of the Eastern Freeway is adopted, the ‘Strasbourg style’ option becomes viable due to the emergence of opportunities to reallocate road space.

The option via Victoria Park and Johnston Street would:

- provide an interchange opportunity for commuters on the Clifton Hill Rail Group at Victoria Park station (especially for people travelling to Melbourne University);
- better serve employment and retail activity along Johnston Street;
- preferably require reallocation of road space in Johnston Street to give trams priority; and
- provide an opportunity (from reallocated road space in Johnston Street) to create a major east-west bicycle link from Melbourne University to Victoria Park Station and then along Turner Street, linking into the Capital City Trail along the Yarra River.

The Study Team considers that the Melbourne University/ Johnston Street option offers the best east-west light rail option.

Eastern Freeway connection – eastern end

The light rail could be constructed within the Eastern Freeway median until Bulleen Road (with some challenges), but at that point the freeway median disappears. Two basic options appear available to address this problem:

- continuing along the Eastern Freeway and then up Doncaster Road; or
- running via Thompson Road and Manningham Road.

To provide space for the tram to continue along the Eastern Freeway median, the freeway would need to be widened, which appears to be mostly possible within the existing reservation, but would also be costly. Alternatively, the light rail line could cross to the north side of the freeway and run along the north side to meet Doncaster Road. While the reservation appears to be mostly adequate, significant earthworks and retaining structure would be required.

From the freeway, the route would turn east past the Doncaster Park & Ride towards Doncaster Hill. As Doncaster Road is six lanes through this section, the tram could be located within a widened median formed by converting a traffic lane in each direction.

A route via Thompson and Manningham Roads may be feasible, but this would mainly serve lower-density residential development and access to Doncaster Hill is more circuitous. Taking a lane from Manningham Road may also be more difficult than from Doncaster Road, as a high-capacity alternative is not available.

Doncaster terminus

Any light rail should extend at least to Doncaster Hill to support its high-density residential development and major commercial and retail activities.

Indicative costs

To estimate the costs of a light rail service, the Study Team has adopted the following project scope:

- A light rail system that is compatible with the existing Melbourne tram network
- A route that:
  - extends an existing route (that terminates at Melbourne University), along Elgin Street-Johnston Street to Victoria Park station, before passing over the Eastern Freeway to run along the freeway median; or alternatively
  - accesses the CBD via Alexandra Parade and Nicholson Street.
- Runs along the Eastern freeway in the median to Bulleen Road, crosses to the north side of the freeway (accessing a new Park & Ride site near Bulleen Road), and runs alongside the freeway to Doncaster Road. Turning within a widened median along Doncaster Road to Blackburn Road, accessing key activity centres and new Park & Ride sites.
- Stop spacing within Doncaster is longer than normal and tram priority is provided at traffic signals.

The estimated cost of this option is $600 million - $710 million. In addition to these indicative costs, additional Park & Ride facilities would cost a further $12 million to $15 million each (for 400 space multi-storey car parks). The purchase of 15 additional trams would cost approximately $75 million.

DART with further service enhancements

While the MOTC DART upgrade will provide substantially increased bus services along the corridor from 2009, a further step-up in service is possible and desirable. Implementing a range of Bus Rapid Transit (BRT) measures will deliver this step-up by providing dedicated road space and priority to buses, greater frequency of services and the visibility and permanency usually associated with fixed rail options. This step-up will leverage further enhancements from the planned DART upgrade.

Scope

A successful rapid bus system along the Doncaster/ Manningham corridor would require:

- Bus-only road space in the form of bus lanes and/or signal priority
- Tram- like service levels and hours of operation (7 day operation to midnight, 15 minute or better peak and daytime service);
- High quality 'super-stops' with fully accessible platforms and real time travel information
- Higher-capacity, low carbon, state-of-the-art buses
- Additional parking in the form of Park & Ride stations and possible replacements for kerb-side parking substituted for bus lanes.

The DART enhancements involve full-length bus-only lanes on a dedicated route with signal priority between the Eastern Freeway and the CBD to minimise the interference from traffic congestion, supported by similar treatments – at least during peak periods – in Doncaster.

The preferred route to the CBD would remain the existing route along Hoddle Street/Victoria Parade. Additionally, the option of running some services along Johnston Street or Alexandra Parade and then along Rathdowne, Lygon or Nicholson Streets should be considered. If a road tunnel option at the western end of the Eastern Freeway is adopted, this option becomes possible due to road space reallocation opportunities.

The enhanced DART service would also include a major interchange facility at Victoria Park, giving passengers a choice to travel directly into the central city or to Carlton/Melbourne University and Parkville, or further west. This option would:

- provide an interchange opportunity for commuters on the Clifton Hill Rail Group at Victoria Park station, especially for Melbourne University/ Carlton, Parkville travellers and further west;
- Provide a direct link to Parkville underground railway station, giving direct rail connections to the west and south-east;
- better serve employment and retail activity along Johnston Street/ Alexandra Parade;
- if the road tunnel proceeds, preferably require reallocation of road space to give buses priority; and
- provide the opportunity (from reallocated road space) to create a major east-west bicycle link from Melbourne University to Victoria Park Station and then along Turner Street, linking into the Capital City Trail along the Yarra River.

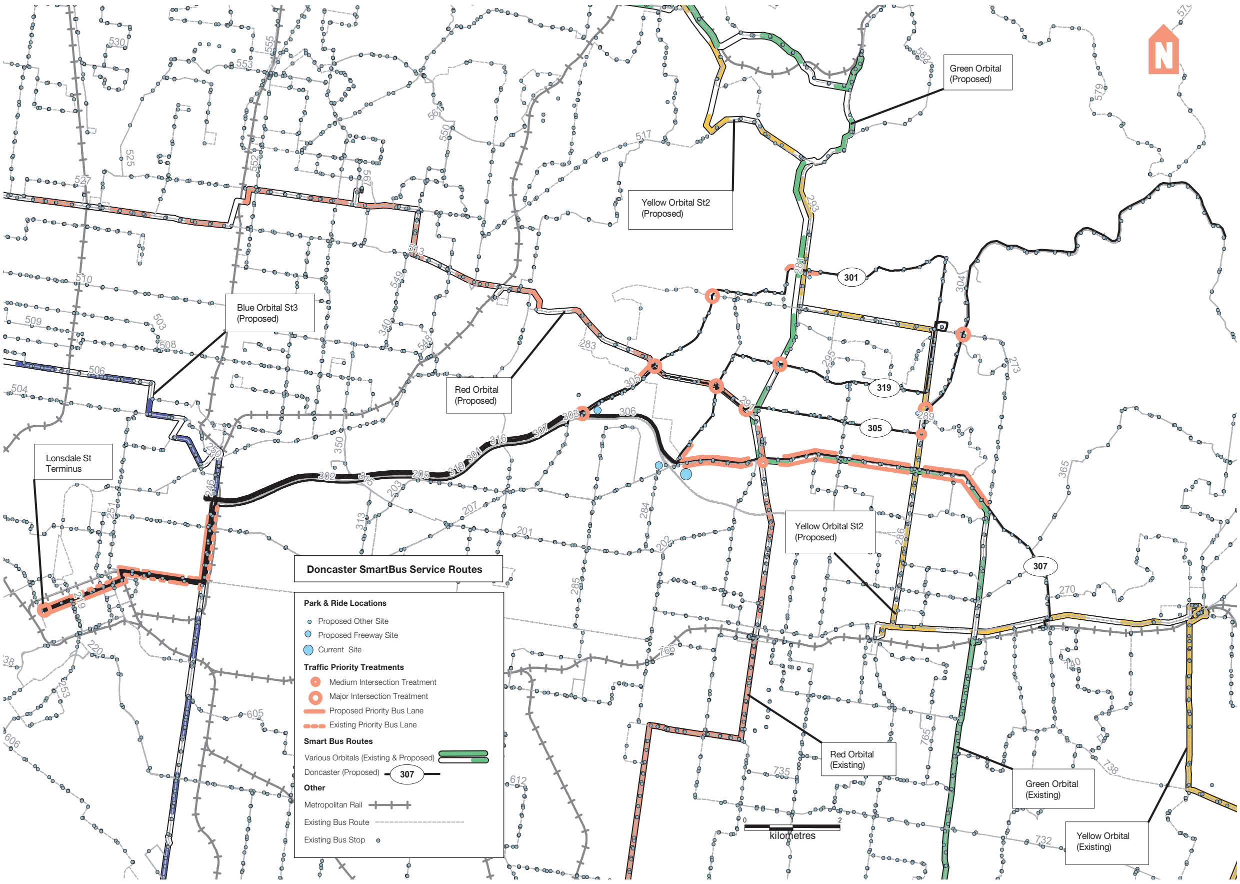
Modelling suggests that an alternative bus route into the central city (one that complements the existing Hoddle Street/Victoria Parade route) connecting Victoria Park Station with Melbourne University with a dedicated bus way would be a popular alternative to travelling through the CBD, with significant numbers of patrons switching between options at this interchange.

The interchange at Victoria Park could complement an urban redevelopment of the area.

Indicative costs

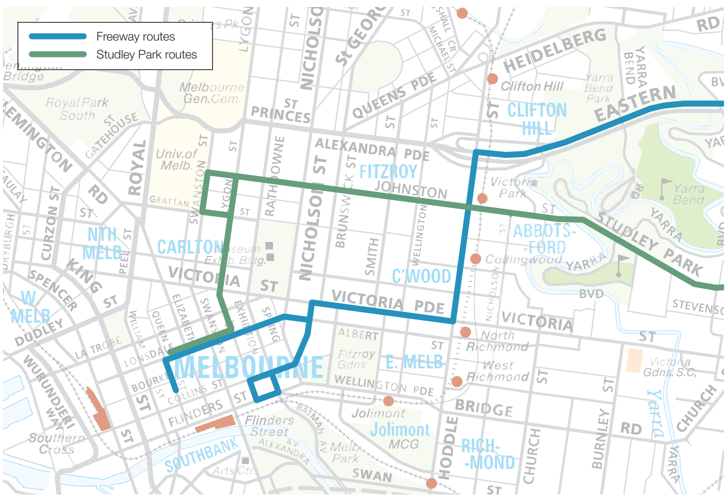
The estimated capital costs of the enhanced DART option are around $250 million - $300 million (this includes the $80 million already estimated for the planned DART upgrade). These costs indicate that this option would be a highly cost-effective means of delivering much better public transport services – and substantially higher levels of public transport patronage – to the Doncaster area.

Figure 113 – Possible enhanced DART service area – Doncaster/Manningham corridor



Source: EWLNA (Public Transport Division, DOI)

Figure 114 – Bus services in the Doncaster corridor – links to the central city



Source: Public Transport Division (DOI)

Comparing the options

Some supporters of a fixed rail link to Doncaster assume that if a rail service were provided, patronage will automatically follow. The Study Team does not share this view and the available evidence and traffic modelling does not support such a view.

Heavy rail

Patronage

Some submissions to the EWLNA argued that a train along the Doncaster corridor would carry more than 3,000 seated passengers per hour (or the equivalent of around 2,600 cars or one and a half lanes of heavy traffic, based on typical occupancies). While this is an accurate reflection of a rail line's capacity, the evidence strongly indicates that such capacity would not be taken up and that the vast majority of potential train users from the region are already using the public transport system. Even if these numbers of people did use the train during the morning peak, a heavy rail line is a costly way of meeting a demand that can be met more effectively by bus services – which have the capacity to carry just as many passengers per hour[2], can run at more regular intervals than a heavy rail service and can be readily increased or decreased as demand dictates.

In addition, as noted earlier, a substantial proportion of the traffic on the last section of the Eastern Freeway comes from east of the Doncaster/Manningham catchment, particularly Springvale Road and beyond. Only a small amount of traffic (8 per cent) enters the freeway at Doncaster Road, with a further 12 per cent entering at Thompsons Road. In addition, a significant proportion of Eastern Freeway traffic entering from the north and further east already have access to rail lines. This means that any shift to public transport by Manningham/Doncaster residents, will not significantly reduce traffic build-up at the city end of the freeway.

Journey times

Travel time between Doncaster Hill and Melbourne Central along the proposed heavy rail line would vary from around 25 to 30 minutes, depending upon the number of stations and the route taken to access the central city.

Light rail via Eastern Freeway

Patronage

While a small number of additional CBD-destined patrons would be attracted to the route, some growth would come from patrons destined for Doncaster Shoppingtown. Most of these passengers would be captured from the existing bus routes in the area, including planned SmartBus services.

While a light rail would offer a higher level of access to the CBD compared with existing bus services, this is almost solely due to offering higher levels of priority – something that which could also be achieved by bus services at a much lower cost. The catchment and access issues regarding patronage on the heavy rail line also apply to the freeway-aligned light rail option.

Journey times

Running time would be about 35 to 40 minutes to the CBD, slower than the DART option.

DART with service enhancements

Patronage

An enhanced DART bus service would have the greatest capacity to respond to changes in patronage coming from any reduced road use. The flexibility of a priority road based public transport option, and the local nature of bus services has the potential to service a greater catchment area than a fixed rail option.

Journey times

Bus travel along the Eastern Freeway is already as fast, or faster, than car travel (due to the emergency lane doubling as a bus-only lane) and only minor improvements in peak inbound travel time are possible. Improvements on the Eastern Freeway must concentrate on providing priority for safer and faster bus travel.

Time penalties exist mainly on Hoddle Street and Victoria Parade, where bus priority measures are affected by issues of compliance, enforcement and local parking.

With the right measures in place, the DART service could cut the travel time between Doncaster Hill and Melbourne Central to around 25 to 35 minutes – approaching the travel time that could be achieved by a dedicated rail line but at a considerably lower cost.

2. See for example: Federal Transit Authority and United States Department of Transportation, (August 2004), *Characteristics of Bus Rapid Transit for Decision Making,* pp. 3-76

appendix d

Policy context

The East West Link Needs Assessment carefully considered Commonwealth, Victorian and Local Government policies with an impact on the development and implementation of transport improvements in Melbourne's east-west corridor.

Whole-of-government strategies and objectives

Several Commonwealth and Victorian government policies set high-level whole-of-government objectives that are relevant to transport planning in Melbourne. These policies include:

Victorian Government

- *Growing Victoria Together (2002 and 2005)* is the Victorian Government's ten-year vision for making Victoria a stronger, more caring and innovative State. Growing Victoria Together (GVT) includes a commitment to balancing social, economic and environmental considerations in making budget and policy decisions (the 'triple bottom line' concept). One of GVT's goals is 'growing and linking all of Victoria', including building faster, better and more accessible transport links. GVT sets two transport targets that are relevant to the EWLNA:
  - The proportion of freight transported to ports by rail will increase from 10 per cent to 30 per cent by 2010
  - Travel in Melbourne taken on public transport will increase from 9 per cent to 20 per cent by the year 2020.

  The Victorian Government has specifically requested Sir Rod Eddington to consider the contribution of improved east-west transport links to meeting these targets.[3]
- *A Fairer Victoria (2005)* outlines a range of actions to address disadvantage across Victoria, improve access to vital services and reduce barriers to opportunity. The update of A Fairer Victoria (released in 2007) notes that "an efficient and affordable public transport system is an important way of delivering fairness and equity to all Victorians" and includes commitments to increasing transport options for disadvantaged groups.
- *Victoria – Leading the Way (2004)* is a major economic statement that aims to position Victoria as a competitive force in the global marketplace. The statement focuses on increasing the competitiveness and export performance of Victorian businesses, including new investment in infrastructure for moving goods to market. Key actions include improving access to the Port of Melbourne and transforming the Port of Melbourne and Dynon rail precincts into a single intermodal terminal of world class standard.
- *Environmental objectives.* The Victorian Government has set whole-of-government environmental objectives through several strategies and initiatives. These include the Victorian Greenhouse Strategy (2002), which aims to reduce Victoria's greenhouse gas emissions across a range of sectors (including transport), and the Our Environment – Our Future Sustainability Action Statement (2006), which identifies priority actions aimed at securing a sustainable future for the state. Our Environment – Our Future identifies the development of efficient and sustainable transport systems as a key objective and includes actions to provide more transport choice, invest in alternative fuels and more fuel-efficient vehicles, and trial hybrid buses in Melbourne.

Commonwealth Government

- *Environmental objectives.* The Commonwealth Government sets broad environmental objectives through a number of national strategies, including the National Strategy for Ecologically Sustainable Development (1992) and the National Greenhouse Strategy (1998). Compliance with these strategies requires transport planners to address issues such as integrated land use and transport planning, travel demand and traffic management, improved vehicle fuel efficiency and fuel technologies, and greater use of public transport, walking and cycling.
- Under the Integrated National Strategy for Lowering Emissions from Urban Traffic (2000), developed by the Australian Transport Council, all Australian governments have agreed to work towards achieving six key outcomes designed to reduce greenhouse gas emissions from passenger transport in urban areas.

3. See EWLNA Study Scope, page XX

Transport system strategies and objectives

The Commonwealth and Victorian governments have also used a range of strategies and policies to set broad objectives for the transport system. Key strategies include:

Victorian Government

- *Linking Melbourne: Metropolitan Transport Plan (2004).* Linking Melbourne identifies four major transport challenges facing Melbourne (improving safety, managing congestion, managing metropolitan growth and supporting economic growth) and sets out a comprehensive plan to address these challenges. The Plan maintains a triple bottom line approach and aims to ensure that improvements to the Principal Public Transport Network (PPTN) deliver integration between modes, with a focus on improving overall mobility and access, rather than on providing individual train, tram or bus services.
- *Meeting Our Transport Challenges (2006)*. The Victorian Government is investing more than $10 billion through *Meeting Our Transport Challenges* (MOTC) to ensure that Victoria's transport system keeps pace with future travel demand. MOTC aims to deliver significant community benefits, including improving transport connections between communities to give Victorians better access to jobs and services; creating a safer and more secure transport system; cutting congestion; growing the whole state; and enhancing Victoria's liveability.
- *Melbourne 2030: Planning for Sustainable Growth (2002)* is the Government's long-term plan for managing Melbourne's growth in ways that are economically, socially and environmentally sustainable. Melbourne 2030 focuses development in areas that can be well-serviced by road and public transport infrastructure. The plan identifies 'better transport links' as a key direction, including improving the existing public transport network, better managing the road system, giving more priority to cycling and walking and promoting the use of sustainable personal transport options.
- *arrive alive!* is the Victorian Government's strategy to reduce deaths and injuries on Victoria's roads. The strategy identifies and addresses a number of road safety issues, including road design, speeding, drink driving, fatigue and vehicle safety.
- *Accessible Public Transport in Victoria – Action Plan 2006-2012* (2006) provides a framework for achieving accessible public transport in Victoria for people with disabilities. It covers mainstream public transport for which the Victorian Government has direct responsibility and aims to ensure that access is provided in line with the requirements of the Federal Disability Discrimination Act 1992.

Commonwealth Government

- *AusLink.* AusLink sets out the Commonwealth Government's approach to planning and funding transport projects of national significance. AusLink aims to promote national and regional economic growth, development and connectivity by building an integrated National Network of significant road and rail infrastructure links. AusLink also aims to generate greater cooperation in transport planning and funding between Commonwealth, State and Territory governments.

  Future AusLink funding will be determined by a series of 'corridor strategies', to be developed jointly by the Commonwealth and State/Territory governments. Corridor strategies identify priority needs along major freight and travel routes and are designed to assist governments and the private sector to make the best investment decisions along these routes over the next 20 to 25 years.
- *Transport Policy Framework– A New Beginning:* this recently released document from the National Transport Commission acknowledges that the 'massive forecast increase' in passenger and freight growth requires a new national policy framework to ensure that Australia's road, rail, air and sea transport systems are planned and operated as an integrated network. The document also aims to develop the framework though cooperation between all levels of government. The document nominates Melbourne's east-west corridor as a possible priority national infrastructure project for consideration by Infrastructure Australia.
- *National Road Safety Strategy 2001-2010*. Coordinated by the Australian Transport Council (which comprises all Commonwealth, State and Territory Ministers with transport responsibilities), the strategy establishes a national framework for reducing deaths and injuries on Australia's roads. All Australian governments have agreed to pursue the strategy's eight objectives, which include improving the safety of roads, improving equity among road users and encouraging alternatives to motor vehicle use.
- *Australian National Cycling Strategy 2005-2010*. The strategy aims to coordinate the activities of all Australian governments to encourage cycling and improve safety for cyclists. The strategy's priorities include creating infrastructure and facilities that support increased cycling, enabling and encouraging safe cycling, and providing leadership and developing partnerships to support and promote cycling in Australia.

Strategies and objectives specific to the east-west corridor

The EWLNA has also taken into account more specific transport objectives that relate directly to Melbourne's east-west corridor, including:

Victorian Government

- *Meeting Our Transport Challenges (2006)*. MOTC identifies the Monash-West Gate corridor as one of Victoria's most important road connections and notes that the corridor is experiencing congestion during peak periods, is vulnerable to short term interruptions and is rapidly approaching capacity. MOTC includes a $1 billion improvement package for the corridor to relieve congestion, reduce accidents and improve capacity and travel times. MOTC also includes a commitment to explore and assess options for the development of another east-west link.
- *Transit cities and growth areas.* Alongside Melbourne 2030, the Government is developing a number of Transit Cities as locations for new activities and development, centred around railway stations. Two Transit Cities – Sydenham and Footscray – lie within the EWLNA Study Area. the Government has also appointed a Growth Areas Authority to oversee planning and development in Melbourne's five growth areas. Growth in three of these areas (Melton-Caroline Springs, Whittlesea and Wyndham) is highly likely to significantly affect demand in the east-west corridor.
- *Outer Western Suburbs Transport Strategy (2001)*. Developed by the Department of Infrastructure, this strategy provides a plan for transport improvements within Melbourne's western region. The strategy's objectives include enhancements to public transport (especially in relation to commuter traffic from the west to the CBD) and improved road links (especially those providing for inter-regional travel, more efficient freight links and better connections to activity centres).
- *Draft transport strategies:* The Government has released several draft strategies that are relevant to the EWLNA, including: Draft Northern Central City Corridor Strategy (2003), North East Integrated Transport Study – Draft Strategy Report (2006) and Melbourne 2030 – Planning for Sustainable Growth – Implementation Plan No 6 – Integrated Transport (2002). While these strategies have no formal status, they provide an indication of the Government's views on particular issues.
- *Port of Melbourne strategies:* A number of strategies are in place to manage and support growth in trade through the port of Melbourne. The Victorian Ports Strategic Framework (2004) identifies strategies to assist Victoria's commercial trading ports to manage international trends in shipping and logistics, strong growth in trade and social and environmental risks. The Framework recognises that continuous improvements in road, rail and intermodal connections are needed to sustain the competitiveness and efficiency of the Port of Melbourne.

  The Port of Melbourne Development Plan (Consultation Draft, 2006) sets out Port of Melbourne Corporation's 30-year plan for the Port of Melbourne, including plans to increase the percentage of freight movements by rail.

  Melbourne Port@L (Consultation Draft, 2006) is a comprehensive scheme to ensure that the Port of Melbourne manages growth in container trade over the next 30 years. Melbourne Port@L aims to fully integrate the Port with landside transport infrastructure to deliver an efficient and sustainable intermodal freight system. The draft strategy notes the need to decentralise non-core container handling activities, progressively implement an efficient metropolitan rail freight system and balance freight infrastructure and operating requirements with community, social and environmental goals. The strategy specifically notes the need to manage amenity impacts, particularly truck traffic impacts, in the inner west and states that this aspect will be considered by the EWLNA.

Commonwealth Government

- *Melbourne Urban Corridor Strategy*. Developed as part of the national AusLink program, the Melbourne Urban Corridor Strategy covers designated urban road links and key segments of the five interstate and inter-regional corridors that traverse Melbourne's growth areas. The strategy identifies a number of short-term priorities with particular relevance to the EWLNA, including:

  – Improving east-west traffic flows in the inner city

  – Improving connectivity at the city end of the Eastern corridor

  – Improving capacity and accessibility of public transport services

  – Improving road and rail links to Port of Melbourne

  – Reducing community impacts of freight transport through Melbourne's Inner West

  – Enhancing the capacity of the Monash-West Gate freeway.

Local Government

- *Local council transport strategies.* Many Melbourne councils have developed transport strategies that identify the key issues affecting their municipalities. Local councils that have developed – or are developing – strategies relevant to the EWLNA include Boroondara, Brimbank, Darebin, Hobsons Bay, Manningham, Maribyrnong, Moonee Valley, Moreland and Wyndham.
- *Moving People and Freight: the City of Melbourne's Transport Strategy (2006 – 2020)*. Moving People and Freight outlines a strategy for transport within Melbourne over the next two decades and identifies short-term actions that can be taken over the next five years in three areas: getting to the city, getting around the city, and freight and commercial travel. The strategy also identifies the importance of removing barriers to freight movement in an east-west direction; the need for stronger linkages between the western suburbs, the Port of Melbourne, CityLink and the eastern suburbs; and the need to plan for the construction of new rail tunnels to increase the capacity of the City Loop and to serve a wider central city area.
- *Inner Melbourne Action Plan (IMAP)*. A collaboration between the Cities of Melbourne, Port Phillip, Yarra and Stonnington and VicUrban (Docklands), IMAP identifies a series of actions that can be taken over the next five to 10 years to improve the liveability of Melbourne's inner region. These actions include: linking and improving transport routes; minimising traffic congestion and increasing public transport use; and developing the inner city's distinctive activity centres.

appendix e

Induced travel – a complex story

The term 'induced travel' is often used in debates about whether investments in major urban transport projects are 'good' or 'bad' for the community. The term is over-arching, in the sense that it attempts to describe in two words the complex travel outcomes of changed accessibility within a city (usually resulting from a major road infrastructure project). Unfortunately the term means many things to many people, is rarely defined with any clarity, and – consequently – does little to inform debate.

A number of submissions to the EWLNA referred to 'induced travel' or 'induced demand' in advancing the argument that 'Melbourne cannot build its way out of congestion' by creating more road space – because any increase in road capacity will be filled up with additional traffic.

Many factors combine to influence travel patterns in a complex transport network, including growth in population, demographic changes to the workforce (and to the driving population), changes in economic activity, changes in business practices, changes in the cost of travel and cars, and changes in land-use. It is difficult to attribute longer-term change or growth in travel patterns to a single factor.

Generally, the majority of trips on a new road facility were already being made prior to the increase in road space delivered by the new facility. These trips are often referred to as 'redistributed travel' or 'diverted traffic': people switch from other routes to the new road because they will derive a benefit in terms of reduced travel time or costs.

The possible impacts of the provision of new road infrastructure on travel behaviour are:

- Time of day shift – where people change the time of their trip to a previously congested time of day. *Time of day shift does not result in a change to the total number or length of journeys undertaken on the road network.*
- Route shift – where people change the route of their journey to the new road. *Route shift does not result in changes to the total number of journeys on the network, but may result in minor changes to the length of journeys.*
- Transport mode shift – where people change their mode of trip and travel on the new road. *Transport mode shift will result in a change to the total number and length of journeys undertaken on the road network.*
- Change in destination choice – where people change their destination location to an alternative, but preferred, destination. *Change of destination will not result in changes to the total number of journeys on the network, but may result in changes to the length of journeys.*
- Newly generated trips –
  a) where people decide to undertake a trip that may not have been considered worthwhile before the provision of the new road.
  b) where changes to land use patterns and increased economic activity result in additional trips in areas accessed by the new road.

Newly generated trips will result in a change to the total number and length of journeys undertaken on the road network.

While some of these responses represent new trips, the majority of the observed increase in traffic comes from trips that were already being made prior to the change in road network capacity. The net effect of these changes is that the amount of traffic using the new or improved road will be largely offset by reductions in traffic on other parts of the road network. The re-routing of traffic, and people changing their time of travel, will have a minimal impact on the total vehicle-kilometres of travel undertaken across the road network.

Numerous studies have been undertaken on induced traffic. One of the most widely referenced studies is the UK Standing Advisory Committee on Trunk Road Assessment (SACTRA) study of 1994. This study found that the elasticity of traffic demand in relation to roadway expansion is between 0 and 1 per cent.[4]

Most travel behaviour changes occur soon after the opening of a new or improved road. However, in the longer term population growth, land development and social and economic changes also occur. As noted in Chapter 1, improved accessibility influences residential and commercial decisions, which may have a significant impact on travel demand and patterns. The travel associated with these factors is often mistakenly identified as 'induced travel', when it is really the consequence of changing patterns of residential, business and jobs growth.

There are a number of ways to 'lock in' the benefits of providing a more efficient link in a road network and mitigating the less positive aspects of travel behaviour changes, such as allocating 'freed-up' road space to other uses, such as bicycles, public transport or high occupancy vehicles.

4. SACTRA: UK Standing Advisory Committee on Trunk Road Assessment (1994), *Trunk Roads and the Generation of Traffic and Government Response*, Department of Environment, Transport and the Regions, London

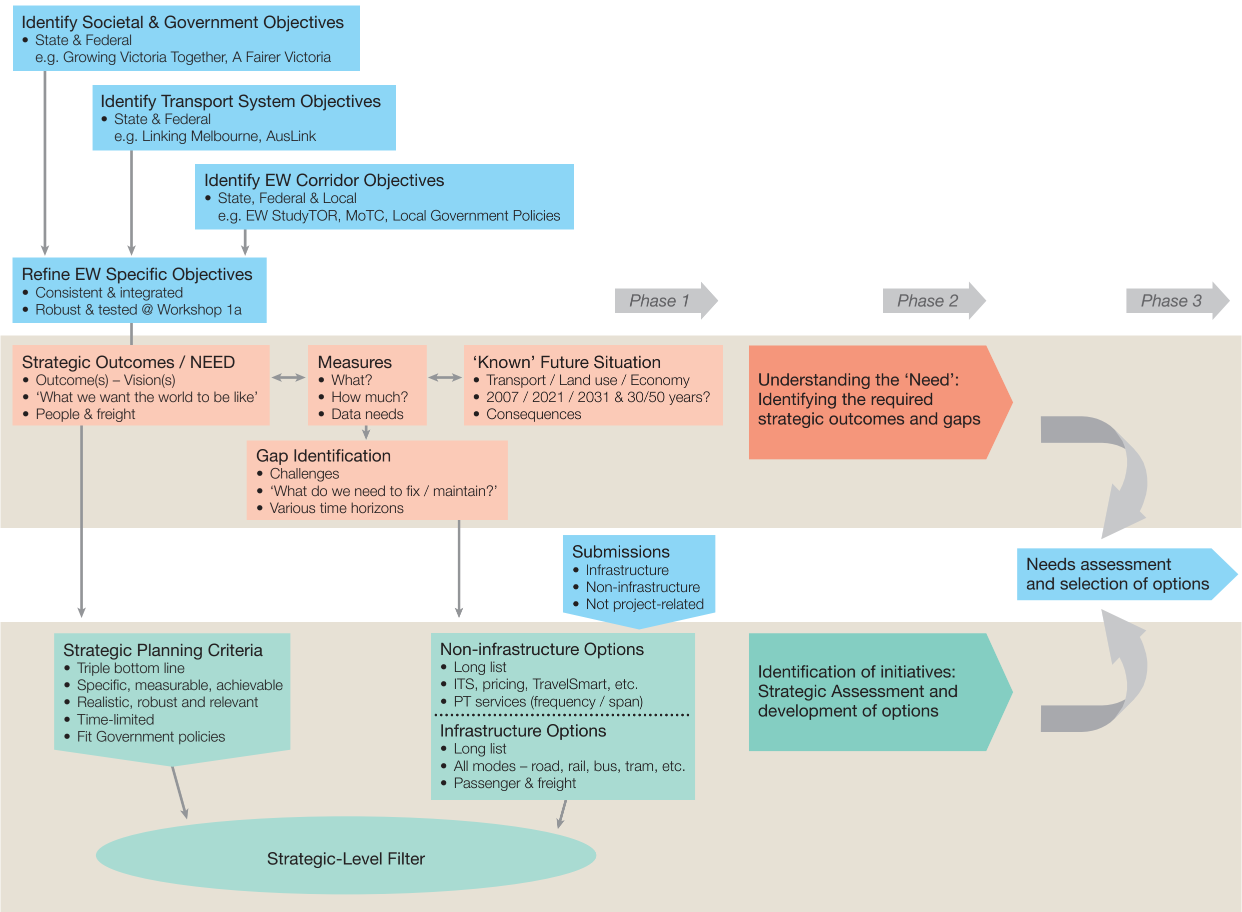
appendix f

EWLNA process

The overall process

The overarching assessment and analysis process adopted by the Study Team is based on the *National Guidelines for Transport System Management in Australia*[5].

Figure 115 – Outline of overarching EWLNA process



Source: EWLNA

5. Australian Transport Council (2006), *National Guidelines for Transport System Management in Australia*, Commonwealth of Australia, Canberra

Canvassing the options

The Study Team conducted its investigation in three phases, based on the three step process outlined by the National Guidelines for Transport System Management in Australia: Strategic Merit Test, Rapid Appraisal and Detailed Appraisal.

Phase 1 – Develop objectives, assessment criteria and initial options

Phase 1 examined the current situation in the Study Area, explored existing and future drivers of transport demand and identified gaps and problems in meeting demand along the east-west corridor. Phase 1 drew together nearly 100 potential options sourced from public submissions and work undertaken by the Study Team and specialist consultants.

Phase 1 used the National Guidelines Strategic Merit Test to review these options and identify those with little chance of meeting the identified strategic requirements or the EWLNA Terms of Reference.

The Strategic Merit Test is largely a qualitative assessment of 'strategic fit', testing how well an option would play a part in achieving transport system objectives or need; whether there are any obvious 'fatal flaws' or key risks; and how an option is broadly likely to measure up under a Triple Bottom Line (TBL) assessment.

The Study Team used this process to 'park' less suitable options, rather than to select a preferred option. The remaining options were further developed to a level of detail that allowed more quantitative assessment to be undertaken. From this process, nine main options were taken through to Phase 2.

Phase 2 – Initial option assessment

Phase 2 involved a Rapid Appraisal of the nine main options brought forward from Phase 1. Rapid Appraisal is intended to be a cost effective way of gauging whether an initiative is likely to pass a detailed appraisal. The methodology used for rapid appraisal is similar to a detailed appraisal; however the estimates and detail for a rapid appraisal are less precise.

During Phase 2, options were developed to a level of detail allowing a quantification of as many benefits and costs as possible to establish whether the option was worth developing further. As part of this exercise, options were developed to engineering feasibility stage, giving consideration to physical and geometrical constraints and construction requirements. Preliminary modelling was also undertaken to ascertain the impacts of each option. The appraisal incorporated an indicative assessment of the main benefits and costs, as well as establishing a 'confidence level' to identify areas where information may not be as robust as required for a detailed appraisal.

Phase 3 – Final option assessment

Following the Rapid Appraisal, Phase 3 further developed options and subjected them to a Detailed Appraisal. The framework used for this appraisal was the same as those used for the Strategic Merit Test; however, further development of the options meant that more detailed analysis was possible using transport model outputs, high level costing information and further detailed analysis of the impacts of the options.

Options for financing, delivery and governance were explored during this phase. Phase 3 also reviewed options that had been rejected in Phase 1 in the light of the more detailed knowledge gained by the EWLNA about the selected options.

Transport modelling

To assist in the understanding of transport demands, the EWLNA Study Team engaged the firm of Veitch Lister Consulting (VLC) to provide transport modelling services.

The Study Team believes that it is important to correct the widespread misconception that transport models provide a view of the future that can be uncritically accepted as 'fact'. As models become more sophisticated – especially micro-simulation models – and outputs are presented more and more attractively and stylishly, viewers can be forgiven for thinking that they are watching a virtual representation of the transport network as it will be operating 20 or more years into the future.

Transport planners would find it very reassuring if the transport behaviour in a big city such as Melbourne could be replicated so realistically by a model. With such a tool, changes to the network could be tested with confidence and the future could be predicted with such accuracy that transport investments would be unerringly well targeted. Unfortunately, the reality is that such models do not (and fundamentally cannot) exist.

Nevertheless, transport models are available that provide reasonably good correlation with the transport network as it currently operates (particularly for the arterial corridors), as well as an insight into the way people may access Melbourne's road and rail systems in the future. However, it is important to treat the information provided from these models with judgement and balance, with the information being considered alongside a range of other assessments to inform recommendations about future transport investments.

To predict future travel behaviour, transport models use data previously provided by the community and captured by surveys such as the Victorian Activity and Travel Survey (VATS). They also rely upon estimates about the future characteristics of Melbourne: how many people will live in the city, where they will live, where jobs will be located, what the level of economic activity will be, and so on. These factors are difficult to predict with precision, especially the further into the future planners try to look. This means that, by their nature, transport models are heavily influenced – and limited – by past behaviour.

The last VATS (which are a series of 'snapshots' of travel behaviour by a group of respondents on particular days) were undertaken between 1994 and 2002. A new survey (the Victorian Integrated Survey of Travel and Activity – VISTA) was commenced in 2007, but the collation and analysis of the results of this survey are not yet available to update transport models. Because travel behaviour is not static, VISTA is expected to reveal changes in travel behaviour since VATS. Some of these changes are evident (such as the substantial increase in rail patronage), can reasonably be expected to continue into the future and can be incorporated into current models; others may be less obvious.

Demographic and employment data is also constantly changing. For example, the growth of jobs in central Melbourne is significantly higher than predicted only a few years ago. Melbourne's population is presently growing strongly and is expected to increase by at least one million over the next 25 to 30 years. Recent analysis undertaken by the Victorian Government suggests that Melbourne's growth is running ahead of these projections. Models allocate trips on the transport network based on statistics such as these that try to reflect the likely future state of the city; however, the reality may be quite different. To test the impact of 'different' futures on transport demand in Melbourne, high growth, low growth and carbon constrained scenarios have been considered as part of the EWLNA.

Overlaying these many variables is the sheer complexity of the transport network, which covers all modes of transport for moving people and goods, and which is constantly undergoing change as roads, trams, buses or trains are added or altered. It is worth noting that the impact of such changes can alter the dynamics of land use in a way that is well outside the parameters of the transport modelling used to support the change in the first place. For example, traffic on the Western Ring Road dramatically exceeded modelled predictions, because the improved accessibility it offered triggered a rapid acceleration of land development in the western region of Melbourne.

Accordingly, information provided from the models should be treated with careful judgement, particularly modelling for future volumes on *specific* roads or rail lines. Broader outputs such as screenline information (which describes future demand for travel across a cordon intersecting a number of roads and rail lines) can be used with greater confidence. In other words, the broader the interpretation of model outputs, the more likely it is to provide a reasonable guide to the future. Particular conclusions should not be drawn without considering broader trends and evidence.

In summary, transport modelling should be seen as a tool to assist strategic transport planning by providing a guide to how further pressures on the network will develop and how options to respond to these pressures might perform.

Veitch Lister modelling work

The firm of Veitch Lister Consulting (VLC) was engaged to provide transport modelling services. VLC utilises a multi-modal model (the Zenith model) that encompasses the wider Melbourne metropolitan area, along with major provincial centres, and includes both the road and public transport networks. This model has been used extensively for analyses of major public and private transport infrastructure projects in Melbourne, and is regarded as a state-of-the-art model for transport planning purposes in Melbourne.

The key background reports that describe VLC's modelling are:[6]

- Background Modelling Assumptions for the East-West Link Needs Assessment Study
- Zenith Model Establishment and Validation Report.

The Zenith model was calibrated for the EWLNA Study Area and adjusted to provide a 'reference' network that included all committed and expected projects that will be undertaken over the assessment period. For example, as a result of *Meeting Our Transport Challenges,* there will be numerous changes to the form and operation of the transport network, with one of the most obvious and relevant being the upgrade to the Monash-City Link-West Gate corridor. Other changes will also impact on the study area. (such as the expenditure of around $6 billion on public transport enhancements over the next ten years). These changes were included to test how well the modified network would cope with the predicted travel demands, whether further action is required and whether proposed actions were well targeted.

The model was also tested to ensure that recent work by the Department of Infrastructure on road freight distribution was appropriately reflected in the model outputs.

6. These papers are available from the EWLNA website

Key characteristics of the Zenith model

A detailed overview of the Zenith model can be found in the background reports listed above; however, an extract from the reports provides a useful summary:

"The Zenith travel forecasting model simulates people's travel behaviour based on observed travel behaviour. The model incorporates the following components in generating travel matrices:-

- a trip production model (a model of how often households of various types decide to make trips for various purposes);
- a trip attraction model (which produces a measure of how attractive a destination will be in satisfying travel desires);
- a trip distribution model (which uses the outputs of the trip production and attraction models to produce estimates of zone-to-zone travel for each travel market segment);
- a mode choice model (which estimates whether people will choose to travel by car, transit or non-motorised modes);
- a vehicle occupancy model (which converts person trips made by car into vehicle trips); and
- a time period model (which allocates trips to parts of the day)."

The model calculates travel between 2519 zones across Victoria, providing forecasts for transport of people and goods using all transport modes.

A summary of modelling results is available at the EWLNA website.

Reference modelling with MITM

The alternative model for transport planning purposes is the Melbourne Integrated Transport Model (MITM). The Department of Infrastructure maintains and is developing this model for a range of transport infrastructure analyses and the Study Team sought some 'parallel' model runs with this model to provide a comparative view about the transport characteristics of the study area.

The outputs from MITM confirm the substantial growth expected in rail and road traffic in the Study Area. As with Zenith, MITM provides travel estimates for 2031: while the quantum and distribution of the predicted growth differs from Zenith in the parallel runs, both models show that the demand for rail and road access will significantly outstrip the capacity of the 'reference' network and that infrastructure intervention is required.

Future scenarios

The Study Team developed a number of future scenarios to test the sensitivity and robustness of options being considered as part of the EWLNA.

The scenarios represented the future transport task for Melbourne under different conditions and aimed to ensure that the Study Team considered a reasonable range of different outcomes, having regard to relevant forces and variables. While consideration was given to the risk generated by more extreme scenarios, the Study Team focused on more likely outcomes.

It is important to note that the scenarios have no purpose other than to test the performance of various options under widely different conditions – and to indicate how these options support (or affect) existing government policies, strategies and programs.

A series of workshops conducted by the Study Team suggested the following scenarios. The scenarios are described at 2031, which is the test year adopted for all EWLNA transport modelling.

- **The Reference Case**

  The Reference Case was used for the major part of the development and assessment of the options being considered by the Study Team. The Reference Case is a well-developed and understood scenario as it is based on extensive detailed land use, employment and economic forecasts developed by Victorian Government agencies.

  However, the Reference Case is not necessarily the most likely outcome for Melbourne and Victoria. For example, if high levels of population growth continue to 2031, the High Population Growth Scenario is more likely.

  The Reference Case assumes Melbourne's population will reach 4.54 million by 2031.

- **Carbon Constrained Scenario**

  The Carbon Constrained Scenario tests the implications of a world where the free availability of carbon-based fuels is constrained by high prices and/or limited supply. This could mean high market prices for carbon-based raw materials (especially oil and gas) due to supply limitations (such as 'peak oil') or it could mean the imposition of high end carbon pricing.

  The scenario assumes the same population growth as the Reference Case and marginally lower economic growth. The scenario assumes there will be an orderly increase in carbon prices and that the economy can adjust to this increase while maintaining economic growth. From a transport perspective, such an orderly progression could be encouraged by early government action designed to reduce the impact of carbon constraints on individuals and the economy – such as introducing road pricing, offering incentives for the development of alternative fuels, providing more public transport and educating people about travel choices. Recent studies – and the recognition of the need for action at the state, federal and international levels – suggest that an orderly approach is feasible and becoming more likely.

  The headline assumption behind this scenario is a doubling in the cost of road transport relative to other household expenditure items. The scenario also assumes a 25 per cent reduction in the cost of public transport and increased urban density.

- **High Population Growth Scenario**

  The High Population Growth Scenario was developed to provide an upper limit of demand for transport. This scenario enabled an assessment to be made about whether the proposed options can cater for travel demands in a high population growth situation.

  The scenario assumes higher employment and population growth, based on the headline assumption of Melbourne's population reaching around 5 million people by 2031.

  While higher population growth may increase the need for some additional transport infrastructure in fringe areas, any impact within the Study Area will be negligible, so the Reference Case Transport network assumptions are also used.

- **Low Population Growth Scenario**

  This scenario was developed to provide a lower boundary of demand. The scenario provided a view about whether the recommended options would be needed even in a low population growth environment or if improvements to the transport network could be deferred under a low-growth scenario.

  The headline assumption behind this scenario is a Melbourne population of around 4.3 million people by 2031. The Reference Case Transport network is assumed.

While it is almost certain that the future will not match precisely any of the scenarios outlined above, the range of possibilities covered by the scenarios provided the Study Team with a tool for measuring the robustness of options under different circumstances.

appendix 9

Specialist consultant teams

The EWLNA Study Team commissioned seven specialist teams to provide expert advice to Sir Rod Eddington. The teams provided an overview of the current situation in relation to a range of issues, impacts and indicators within the study area, generated options to meet future transport needs in Melbourne's east-west corridor, formulated criteria to assess these options and tested the projected impact of options.

Environment and heritage

Sinclair Knight Merz – Maunsell

SKM – Maunsell identified and evaluated the physical and natural environmental and heritage constraints and opportunities for the east-west transport options. Issues identified and investigated by SKM – Maunsell included: environmental sustainability and GHG emissions, air quality, noise, flora and fauna, cultural heritage, hydrology, water quality and aquatic ecology, land contamination and hydrogeological issues.

Transport and the economy

Meyrick and Associates - Econsearch - Steer Davies Gleave

This team examined the importance of transport to Melbourne's economy, including the relationship between freight and the economy, the impact on transport of the shift to a services economy, and the implications and likely costs of failing to improve transport connections.

Meyrick also quantified the economic benefits of various transport initiatives considered by the study.

Transport planning and costing

Sinclair Knight Merz – Maunsell – Evans and Peck

This specialist team provided analysis of current and future transport demand and supply issues in the EWLNA Study Area, and identified future drivers of travel demand and mode share. The team tested proposed options against likely future scenarios, and provided cost estimates for their implementation.

Demographics, social and land use

SGS Economics and Planning

SGS assessed the demographic, social and land use impacts associated with options for an additional east-west link. Issues investigated by SGS covered Melbourne's geography and its impact on the city's transport network, urban growth and development, the demographic and community profile of the study area and transport accessibility and disadvantage.

Commercial and financial

Ernst & Young

Ernst & Young provided advice about commercial and financial issues relevant to the EWLNA, including potential revenue sources and financing options, possible delivery models and general market issues.

Transport modelling

Veitch Lister Consulting

This specialist team was responsible for developing, applying and documenting the results of transport models to test options and scenarios explored by the EWLNA. Veitch Lister also provided expert advice to the Study Team and other specialist consultants about current and future travel demands, patterns and costs across all transport modes.

Legal

Clayton Utz

Clayton Utz assisted the Study Team to identify and assess legal issues arising from the various options under consideration, including providing advice about structuring and governance arrangements, relevant overseas developments within infrastructure markets and the implications of legal and regulatory impediments and opportunities.

acronyms + referenecs

acronyms and abbreviations

AAA	Australian Automobile Association
ABS	Australian Bureau of Statistics
ADR	Australian Design Rules
ARTC	Australian Rail Track Corporation
ATC	Australian Transport Council
BCR	Benefit Cost Ratio
BITRE	Bureau of Infrastructure Transport and Regional Economics
CBD	Central Business District
CGI	Coordinator General of Infrastructure (Victoria)
CLUE	Census of Land Use and Employment (City of Melbourne)
CO / CO_2 / CO_2e	Carbon monoxide / Carbon dioxide / Carbon dioxide equivalent
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
D&C	Design and Construct
DART	Doncaster Area Rapid Transport
DDA	Disability Discrimination Act
DIIRD	Department of Innovation, Industry and Regional Development (Victoria)
DOI	Department of Infrastructure (Victoria)
DSE	Department of Sustainability and Environment (Victoria)
DTF	Department of Treasury and Finance (Victoria)
DTRS	Department of Transport and Regional Services (Commonwealth)
EES	Environmental Effects Statement
EPAV	Environmental Protection Authority Victoria
ESC	Essential Services Commission
EU	European Union
EWLNA	East West Link Needs Assessment
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GSP	Gross State Product
GVT	Growing Victoria Together

HOT	High Occupancy Toll
ICT	Information and Communication Technology
IEA	International Energy Agency
IMAP	Inner Melbourne Action Plan
IMT	Intermodal Terminal
IPCC	Intergovernmental Panel on Climate Change
JtW	Journey to Work
LATM	Local Area Traffic Management
LCV	Light Commercial Vehicle
LGA	Local Government Area
M1	Monash-CityLink-West Gate Freeway Corridor
MCC	Melbourne City Council
MITM	Melbourne Integrated Transport Model
MMBW	Melbourne Metropolitan Board of Works
MOTC	Meeting Our Transport Challenges
MTAG	Maribyrnong Truck Action Group
NCCC	Northern Central City Corridor Study
NO_x	Nitrous oxide
NSBT	North South Bypass Tunnel
O_3	Ozone
OCC	Office of Climate Change
PBS	Performance Based Standards
PCB	Polychlorinated Bipheryl
POMC	Port of Melbourne Corporation
PPP	Public Private Partnerships
PPTN	Principal Public Transport Network
PT	Public Transport
PTD	Public Transport Division, Department of Infrastructure (Victoria)
R&D	Research and Development
SEIFA	Socio-Economic Indexes for Areas

SEITA	Southern and Eastern Integrated Transport Authority
SLA	Statistical Local Area
TBL	Triple Bottom Line
TDL	Transport, Distribution and Logistics
TOD	Transit (or Transport) Oriented Development
TOT	Truck Only Toll
TBM	Tunnel Boring Machine
UK	United Kingdom
US	United States
VATS	Victorian Activity and Travel Survey
VCEC	Victorian Competition and Efficiency Commission
VFLC	Victorian Freight and Logistics Council
VIF	Victoria In Future
VISTA	Victorian Integrated Survey of Travel and Activity
VKT	Vehicle Kilometres Travelled
VOC	Volatile Organic Compounds
VTA	Victorian Transport Association
WRR	Western Ring Road
WTA	Western Transport Alliance

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What other cities are doing

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- The c40 Cities Group: www.c40cities.org/bestpractices/transport
- The Victorian Transport Policy Institute's Transport Demand Management Encyclopedia: www.vtpi.org/tdm/tdm59.htm
- London's Crossrail project: http://www.crossrail.co.uk/
- Kuala Lumpur's SMART project: www.smarttunnel.com.my
- Associated Research Centers for the Urban Underground Space: www.acuus.qc.ca
- Better Air for Berlin: http://www.berlin.de/sen/umwelt/luftqualitaet/de/luftreinhalteplan/download/Umweltzone_Broschuere_en.pdf
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Folio of Modelling Outputs

These papers are available for viewing at the EWLNA website: www.doi.vic.gov.au/eastwest

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