East West Link Needs Study

Demographic, Social and Land Use Analysis

PHASE 1: Background Research FINAL REPORT

Department of Infrastructure



This Report has been prepared for:



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1 Introduction

1.1 **Project Background**

The Victorian Government's vision for the State, *Growing Victoria Together*, emphasises the need for ongoing investment in public transport and roads, while protecting the environment for future generations. Over the last ten years, there have been two major east-west road developments in Melbourne, which are:

- The linking of the Monash and West Gate Freeways; and,
- 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% of Melbourne's total freeway congestion. At the same time, it is expected that container traffic through the Port of Melbourne will increase significantly by 2035 with the majority of the traffic being imports. The Monash-CityLink-West Gate Improvement Package will enhance capacity over the next four to five years, however it is estimated that full capacity will be reached within 2 decades.

More broadly, the CityLink and Western Ring Road projects have had a powerful metropolitan reshaping effect. Improved accessibility to key portals such as Hume Highway, the airport and Melbourne's docks, as well as to the skill pools in central and eastern Melbourne spurred growth in the north and west, leading potentially to an historic repositioning of the west as a key contributor to Victoria's economy. However the ongoing transport requirements of the emergent growth region need to be better understood.

The creation of the Melbourne Underground Rail Loop which commenced in 1971 is the latest significant development of the Melbourne train network. The construction of the loop as we know it today was completed in 1985 with the opening of Flagstaff Station. In 2007 the government announced the development of a new program, the 'Rail Network Capacity Program'. Ultimately the aim of this program is to extend the capacity of the current network through the duplication of tracks, the development of new stations-particularly within the growth areas of the outer suburbs and signaling upgrades to improve efficiency. However there have been no significant developments under this Program.

In this context, the long term transport requirements of an additional east-west corridor need to be assessed and options developed to meet future demand.

1.2 Project Brief

The Department of Infrastructure (DoI) commissioned SGS Economics and Planning Pty Ltd in May 2007 to carry out a Demographic, Social and Land Use Impacts Study to assess the need for and impact of developing a new East West Link, which would run across the inner northern parts of the city. This is one of six streams of technical investigations which will inform a Study Team led by Sir Rod Eddington, established to make recommendations to the Victorian Government. The other technical streams focus on the following issues:

• Economic Analysis;





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- Transport Planning and Costing;
- Environment and Heritage Impact Analysis;
- Commercial and Financial Analysis; and,
- Transport Modelling.

SGS's brief is to assess the demographic, social and land use impacts associated with a range of transport network and infrastructure proposals arising from options for a possible additional east-west transport link.

1.3 Study Approach

Our overall approach for carrying out this work is summarised in Figure 1 below and follows the iterative process set down in the brief. This working paper relates to Phase 1 of the study (highlighted below). It provides an overview of the demographic, social and land use issues within the area and the relevance of these to possible transport improvements. This is based on a review of a wide range of socio-economic data, a review of relevant strategy documents and other literature together with site visits.







1.4 Study Area

The study area, which will be the focus of this work is illustrated in Figure 2 below. This is based on over 39 Statistical Local Area's (SLA's) across the Metropolitan Melbourne area. This has been defined to encompass those SLA's which are likely to experience the greatest impacts from east-west link improvements namely those within the Central area, the North East and to a lesser extent the South West areas. The central oval indicates the area which was first proposed by Dol as being of strategic interest. It will be important in our analysis.









1.5 Report Structure

The remainder of this report is set out under the following headings:

- Section 2: Historical Context provides an overview of the chronology and key events which have shaped the physical and social development of the study area.
- Section 3: Landscape and Urban Development Perspective provides an overview of the landscape determinants of Melbourne's urban development and how Melbourne has developed as a reaction to landscape constraints. A brief overview of Melbourne's current planning policy drivers is also given.
- Section 4: Accessibility and Urban Adjustment complements the discussion in Section 3 by introducing quantitative evidence regarding the nexus between accessibility changes and the locational choices of households and businesses. This demonstrates how major transport investments can reshape the pattern of settlement at the metropolitan level.
- Section 5: Demographic and Community Profile provides an assessment of the demographic profile of the population within the study area and the resulting implications for a new East-West link. This section also provides an inventory of community facilities within the study area and considers the implications of this.
- Section 6: Industrial and Commercial Profile provides an assessment of the industrial and economic structure of the study area and its relationship with the rest of Melbourne and Victorian economies. The implications for a new East West link are also considered.
- Section 7: Conclusions assesses the implications of the foregoing research with respect to the need for, and impacts of, a new East West Link. It identifies the social, demographic and land use criteria relevant to the economic appraisal of various potential options for a new East West Link. These criteria are intended to complement the productivity/transport/environmental considerations being developed by other consultants for the purpose of the social cost-benefit analysis planned for later stages in the project cycle.





2 Historical Context

An historical perspective is useful in understanding how the study area may change in the future. Figure 3 below provides a timeline of the key events shaping the study area and this is followed by a description of these events.

1837 —	— Land Sales Began
1850's —	— Gold Rush
1878 —	— Hobson's Bay and Victorian Railways Open
1885 —	— Opening of the first Tramway
1929 —	- The Great Depression
1939 —	- Second World War
1960s —	Rising Car Ownership/Freeway Development
1962 —	 First stage of the South Eastern (Monash) Freeway Opens
19705	'Backlash' against Freeway Development
1990s	Shift towards the 'Global Economy'
2000	CityLink (the first privately owned/operated electric toll road) Opens

Figure 3 A Timeline: Key Events shaping the Study Area





From the time official land sales begun in Melbourne (1837) until the 1880's Melbourne's growth was largely influenced by small industries that focused on goods for the local consumer market. During this time industries were clustered in and around central Melbourne. The discovery of gold in the 1850s followed by silver and lead in the late 1880's boosted the economic fortune of Melbourne. This generated an injection of British capital into the region and with it a rapidly growing population. By the end of the 1880's Melbourne had begun to grow as a centre of finance and communication. Increasing demand for office space in the central business district led to an increase in rent, forcing warehouses and factories into the inner suburbs of Collingwood, Fitzroy and Richmond. As these areas became largely built-up residents were pushed farther out to establish the new working class suburbs of Footscray, Brunswick and Northcote.

During this time, the rise of suburbanisation was also evident as many middle class people chose to move from 'bustling' inner Melbourne to the more 'tranquil' suburbs. Fuelling suburbanisation further was the rapid development of the suburban railway system that more than doubled in length during the 1880's. Railway-led growth was evident particularly around Hawksburn, Toorak and Armadale stations which became surrounded by houses for the affluent. The popularity of Melbourne's south-eastern suburbs for suburban growth was evident through the continued housing sprawl (see Section 3) in the mid-late 1880's, while the western fringe was viewed as a low-socio-economic area. In Davison's words, "Melbourne's south-eastern residential sprawl indicated the low value home-seekers put on the landscape of the city's western fringe, a flat volcanic plain scored only by a deep crescent of the Saltwater (Maribyrnong) River" (Davison, 1978, pg. 50). This area was viewed as desirable for new factory sites that sought cheap flat land with river access.

The depression of the 1890s halted suburban development in its tracks, particularly in the working class suburbs of Collingwood and Fitzroy. These were among a number of suburbs with the greatest unemployment rate and social distress. Public transport services were cut threatening the "life support link" between the middle class and their inner city jobs. It wasn't until the late 1890's that the process of suburban growth cautiously resumed. However politicians were reluctant to embark on any bold schemes of suburban improvement.

The Great Depression struck in 1929 followed by the Second World War in 1939, preventing further suburban growth. During the war years (1939-1945) Melbourne's public transport system was heavily utilised. Although the desire for car travel was increasing, the cost of buying and running a car remained out of most people's reach. It wasn't until the 1950's when Melbourne experienced its second boom as it responded to a new phase of modern capitalism that this began to change. Car ownership soared and public transport usage plummeted. Figure 4 below illustrates this trend in public transport usage and shows that the number of trips per head of the population fell from around 370 in 1950 to less than 100 by 1980. This has been happening at a time when car ownership has been increasing.







Figure 4 Public Transport Trips per Capita in Melbourne 1950-2006

Sources: DOI; Department of Infrastructure (2007) & ABS; Australian Bureau of Statistics (2006). **Figure 1: Public transport trips per capita in Melbourne, 1950 – 2006.**

The car had brought a new sense of time and space to the city. It further reinforced the suburban sprawl that occurred in the pre war period. It reshaped the suburbs, pushing their perimeter further out and filling in the gaps between development along the rail and tram lines. This transformed the regular oscillation of travel from city to suburb into a more complex web of movements.

By the 1960's rising car ownership began to cause regular and severe traffic congestion on the roads. The need for road infrastructure was evident and the desire for the 'freeway' (as had been developed in the United States) was high. It was during this decade that Melbourne's freeway development began to take place. In designing a new road system for Melbourne, the Metropolitan Transport Committee (MTC) proposed roads along ridges and creek valleys radiating from the Yarra (as they were seen as the lines of least resistance) that had originally been highlighted for railway development in the late nineteenth century. According to the MTC, using these reservations would minimise both the financial and social costs of land acquisition. At this time, the assumption that the parklands and valleys were unoccupied and free to be used for roads only seemed questionable to a minority of people. The MTC also sought to implement a ring-road, originally proposed in the 1954 Melbourne Metropolitan Planning Scheme. This encircled the inner city allowing for the effective distribution of traffic to the arterial roads. The inner city ring-road ran mainly through residential and industrial property. The inner northern residential areas were perceived as rundown and substandard. The engineers of the time anticipated that building the inner city freeways might proceed in tandem with 'slum' clearance.

Yet by the early 1970's community views had changed dramatically. The cost-benefit ratio of building inner city freeways was perceived as unfavourable and there was an enormous backlash from newly gentrifying inner city neighbourhoods, where residents saw the freeways as a major threat to quality of life on environmental, social and economic terms. In

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1972 there was an element of success for the residents against freeway development as enormous cuts were made to the road building programme that had been proposed only three years earlier. However, debate soon rose again in 1973 when the government resolved to proceed with the principal eastern route, known as the F19 freeway, linking Doncaster and Templestowe with the inner city. Residents of Collingwood and Fitzroy who would be largely affected by the project initiated major campaigns. Their fight against the freeways soon snowballed into an anti-freeway movement that lasted well into the 1990's and was further driven by the environmental movement that rapidly gathered momentum during this time.

In the 1990's there was a distinct shift from the post-war Keynesian model of development towards a more decentralised service economy driven by new information technologies that embraced a global economy. A significant symbol of this was Liberal leader Jeffrey Kennett's decision to change the motto on the number plates of the State's cars from 'Victoria-The Garden State' to 'Victoria-*On the Move*'. The need to be 'on the move' was highlighted by the past decade of paralysis in transport policy and the evidence of congestion on Melbourne's city roads that was growing worse. Part of the solution to this congestion was CityLink, a privately constructed, owned and operated toll road that would provide a link between the South-Eastern Arterial and Tullamarine and Westgate freeways. While there was a political backlash against CityLink its development (supported by a strong governmental campaign) went ahead and was completed in 2000.

Today, CityLink is heavily utilised and the construction of a new toll road, EastLink (Mitcham-Frankston road), is well underway to ease traffic congestion and improve connectivity between areas in the south-east of Melbourne.





3 Landscape and Urban Development Assessment

3.1 Introduction

Melbourne is a divided city: East & West! It is distinctly and visibly so: across many physical, economic and social criteria.

The fairness and desirability of this has been a consistent topic of discussion within the broad planning community since the initiation of planning in Victoria though the 1954 strategy compiled by the Melbourne and Metropolitan Board of Works (MMBW). It probably was similarly so for many decades before that.

Successive strategic plans for Melbourne have inferred, if not actually proclaimed, that such an acute divide was undesirable and have commonly included means for redressing perceived imbalances.

Any study of an East West link should address this issue of the appropriateness and desirability of the Melbourne divide in a more logical and overt way than has hitherto occurred. An initial appeal of and possible need for better East West connection relates to the prospect of blunting some of the extremes in inequity across Melbourne.

This section considers this concept in further detail under the following headings:

- Landscape determinants of Melbourne's urban development;
- Melbourne's urban development as a reaction to landscape constraints; and,
- Melbourne's current strategic plan: Melbourne 2030.

3.2 Landscape Determinants of Melbourne's Urban Development

The natural landscape characteristics of the Melbourne Metropolitan region have been major determinants of the city's development pattern.

Melbourne's system of geomorphologic regions is defined in MMBW (1971, pp.18-19) as:

- 1 *Flat basalt plains: west & north.* This region is dissected by the river valleys of the Maribyrnong and the Plenty Rivers. It undulates towards the far north in foothills enclosed by the Great Dividing Range and towards the north-east in the Plenty River valley.
- 2 Steeply broken Silurian hills: north-east. This region includes the Kinglake and Eltham areas.
- 3 *Yarra Valley strongly undulating.* This region extends from Port Phillip Bay to the Dandenong Ranges and the arc of hills between Lysterfield and Upper Beaconsfield.
- 4 *Broad flat coastal plain: south-east.* This region extends eastward from Port Phillip Bay with extensive alluvial deposits at Carrum and Koo-wee-rup.
- 5 Mornington Peninsula's higher, undulating topography.





3.2.1 Port Phillip Sunkland

Source: Joyce (1992)

The Great Divide runs east-west across Victoria north of Metropolitan Melbourne, separating the Metropolitan Region from the remainder of the State.

Metropolitan Melbourne itself has been developed in what is referred to as the Port Phillip Sunkland. This consists of Port Philip Bay and the flat lands along its foreshore stretching through most of the western suburbs and across to the south-eastern suburbs past Carrum. The land rises gently but consistently to the north-east until it reaches an elevation of about 200 metres where the Dandenong ranges rise more steeply.

 Tullamerine Alirpot
 Etham

 Werribee
 10 km

 20 km
 Dandenang

 20 km
 Dandenang

 * Rosebud
 * Rosebud

Figure 5 Melbourne's Natural Setting

Source: Dept of Human Resources, based on VicMap

Port Phillip Sunkland is so called because it was lowered by faulting to form the flat to gentlyundulating plain of the Port Phillip Bay region. This left an arc of high areas around Melbourne: the Dandenong Ranges, the Kinglake Plateau and the Brisbane Ranges to the east, north and west.





3.2.2 Melbourne's Bioregions & Rainfall

The most attractive land for agriculture and settlement in early Melbourne lay east and southeast of central city area that includes geomorphologic regions 2, 3 and 4 cited before.

Melbourne is also divided east and west in its bioregions. The east-west divide corresponds generally with the alignment of the Yarra River.

The plains of the northern and western suburbs were overlain by lava flows and form the Victorian Volcanic Plain. These areas have been extensively quarried as major sources of building and road material, known as bluestone. This is not very suitable land for agriculture as it has a very thin layer of topsoil and persistent craggy outcrops of basalt. Even native trees have difficulty growing on it. An exception is a small parcel of land in South Werribee along the coast which has very fertile soil and is used for market gardening to supply the Metropolitan Melbourne market.

On the other hand, the eastern suburbs are part of the extensive fertile Gippsland Plain. They were very suitable for agriculture. However, the same rolling hills and fertile soils that made them appealing for agriculture also rendered them appealing for residential uses.

Another factor in the appeal of the east region of Melbourne for agriculture was the natural rainfall pattern across the Port Phillip Region. In this there are also two distinct sides: east and west. The east has 750mm average rainfall compared to an average 500mm in the west.

3.2.3 Melbourne's Natural Drainage System

The topography and rainfall pattern influenced Victoria's and Melbourne's natural drainage system that in turn determined future development patterns. Figure 6 shows the drainage pattern for metropolitan Melbourne.

The Goulburn and Campaspe rivers flow north of the Divide towards the Murray Basin. The rivers south of the Divide flow into Port Phillip Bay and Bass Strait.

Stream erosion of the uplifted areas has formed deep valleys including Werribee Gorge and Lerderderg Gorge with the sediments being deposited in the sunkland. The erosion and sedimentation are visible as the sands and gravels of Royal Park, and the brown coal of the Bacchus Marsh-Altona area.







Figure 6 Metropolitan Melbourne River System

Source: Joyce (1992)

The Yarra River, that dominates most of Metropolitan Melbourne, rises in the higher country to the east, and runs westward, passing through a wide, alluviated valley at Yarra Glen and Yering, then plunging through a gorge, crossing another wide alluviated valley around Heidelberg and finally passing through the city and across the Yarra Delta into the head of Port Phillip Bay.

The eastern margin of Port Philip Bay is marked by the sandy ridges of the Brighton coastal plain with sandy beaches formed between low rocky headlands. Elsewhere there are cliffs and shore platforms such as the internationally famous fossil sites of Beaumaris.

There are relatively few rivers and streams in the volcanic plains north and west of Melbourne. The Maribyrnong River is Melbourne's second largest river and the largest in the west. The Werribee River is the only other substantial river in the west. It has formed a broad, delta-like alluvial plain edged with salt marshes at the mouth.

River valleys acted as barriers in the early days of European settlement and with a limited number of crossings this encouraged development of agriculture along the alignments of river valleys. This radial pattern of rural development eventually became a radial pattern of urban development in which recreation uses along the valley floors supported the residential and industrial uses that occupied the higher ground.





3.2.4 Melbourne's Wetlands

In the original Melbourne 'place for a village' there were wetlands along most of the foreshore of Port Phillip Bay. For example, much of what is now the highly desirable residential suburbs of South Melbourne, Albert Park and Port Melbourne was a swamp, so called at the time.

The superficial solution to bringing swamps into productive use was to drain the land into the rivers, creeks and the Bay and develop it for housing. This was particularly prevalent along the eastern foreshore of Port Phillip Bay.

Now with more enlightened attitudes to environmental issues these wetlands are being respected as valuable assets of nature. Belatedly the remnants of the wetlands have been saved and are being restored. These wetlands are of international significance and are subject to international treaties (Ramsar Agreement) as resting places for migrating water birds (see more details later).

Wetlands in the west region were under less pressure for residential development. The west had less appeal as a residential area and the wetlands were expensive to drain and develop so they were largely ignored for housing development. However many were used as municipal rubbish tips for domestic garbage on top of which playing fields were built for recreation purposes. Some of these areas were used for dangerous occupations and industries such as munitions storage, armed services camps, airfields and military rifle ranges.

Currently, the western suburbs wetlands are being developed as nature conservation and recreation areas that have helped change the appeal of the region for residential developments nearby them.

3.3 Melbourne's Urban Development as a Reaction to Landscape Constraints

Urban development is generally a market type of process in which both the private and public sectors react to a bundle of opportunities for and constraints to development to create an acceptable outcome. As discussed previously, the natural landscape is a primary driver in this process.

People sought to find 'good' or 'better' places to live within the city and thereby determined the physical characteristics and social stratification of Metropolitan Melbourne.

As discussed previously, this process created greater growth pressure on the more appealing eastern suburbs than on the western suburbs. This, as shown in Figure 7, has resulted in a pattern in which Melbourne's development extends much further to the east than to the west. The centroid of Melbourne's residential population is in the vicinity of Glen Iris and has been consistently shifting eastwards until recently when it has halted and it is expected to move further west as 2030 approaches (DSE Melbourne Atlas 2006, p.1.5)

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Figure 7 Melbourne's Growth 1851-2004

3.3.1 River Valleys as Recreation and Utility Services Facilities

Generally land along rivers and creeks was not passed over to private ownership with direct access to the river. Rather the river banks remained in public ownership and were generally used for passive recreation.

With increased population and urban development many of the creeks were subsequently used for active recreation. Some creeks were even put in a pipe and the valley filled in to serve as active recreation sports fields that needed flat surfaces, such as football and cricket pitches. These open spaces also served as storm water retarding basins to cope with periodic flooding of the rivers and creeks. There are numerous examples of this type of development across the eastern suburbs. For example, Kew, Camberwell, Burwood, Blackburn & Mt Waverley and the City of Melbourne all have networks of open space that follow the alignment of former open creeks.

Subsequently, it became necessary to provide additional utility services to the burgeoning population. This linear recreation open space system along the river alignments were appealing because they were already in public ownership and could be used for infrastructure development at least cost. The result is that most of Melbourne's rivers and creek valleys accommodate the infrastructure of utilities such as electricity, telephone, drainage, freeways, and the like.

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Source: DSE 2006



This is now recognised as an unsophisticated solution ecologically and there is discussion as to the desirability of reopening some of the piped creeks, especially those in the parklands of the City of Melbourne.

3.3.2 Melbourne's Western Regions

In general terms, areas south and east of the Yarra were historically the preferred areas for living, whilst areas to the West and North West of the Yarra River were generally seen as the disadvantaged areas. There are of course exceptions to this generality. These include:

- The corridor of residential development in the North East along the banks of the River Yarra through the suburbs of Ivanhoe and Heidelberg and into Eltham;
- The corridor of residential development in the North West through Moonee Ponds & Essendon, between the Maribyrnong River and Moonee Ponds Creek.

A recently emerging exception is the corridor of residential development along the western foreshore of Port Phillip Bay from Newport to Werribee South that is developing behind the new linear parklands that is the Bay West Trail.

As discussed, the western suburbs were traditionally the location for industrial and service uses, especially heavy and noxious industries (the region around and west of Footscray). For example, the Maribyrnong River had factories along its banks and the river served as a waste disposal conduit.

Melbourne's original sewerage treatment plant was located on and immediately behind the South Werribee waterfront. Until recently it was known as the Werribee Sewage Farm, now the Western Treatment Plant. The treatment process produced an obnoxious odour, particularly in summer, and it reached as far as the Princes Highway on its northern boundary, and beyond. It became the butt of jokes and made the western suburbs, particularly the Werribee Municipality, an undesirable residential address.

This was an era when wetlands were equated with wastelands: that needed considerable work on them to put them to gainful uses. The common solution was to drain and fill them for residential, industrial or active recreation (sportsfields) purposes.

The extensive wetlands along the western foreshore of Port Phillip Bay were often used as tips for domestic rubbish. The wetlands around the Newport power station were filled with ash and coke from the coal-fired electricity power station. Although some of it was officially left as open space, there was not much work done on it as parklands. The lack of amenity parks gave the western suburbs an industrial image that further stunted residential growth. The west became the residential address of those who could not afford to buy into the more appealing eastern suburbs.

The very names of suburbs in the west conjures up perceptions of specialist heavy industry (many of these perceptions may in fact be incorrect)

- Altona: petrol refineries and storage
- Albion: munitions manufacturing and storage
- Sunshine: manufacturing of heavy farm machinery
- Ardeer: chemical products manufacturing





- Brooklyn, Tottenham, Braybrook: transport and freight depots
- Newport & Spotswood: oil storage & electricity generation
- Yarraville & Seddon: petro-chemical industries & storage

This approach to using the West as a waste dump has persisted until quite recent times. It may even still persist. For example, as recently as the mid 1990's there were attempts to locate a toxic waste dump in the vicinity of Werribee/ Hoppers Crossing.

3.3.3 Characteristic Regions Across the Study Area

Taking into account the topographic and historic factors shaping Melbourne' development, SGS has identified 11 characteristic regions across the study area. These are distinct in physical, land use or social terms. They are illustrated in Figure 8 below followed by a brief description of each in turn.





Figure 8 Melbourne's Characteristic Regions





Inner City. These are the suburbs around the Central Business District of the City of Melbourne and adjacent municipalities. They are generally mixed use areas but currently they are under pressure for residential redevelopment. This is due to young professionals making lifestyle decisions to live in the inner city and to students, especially international students, seeking close access to the many education institutions in the inner city.

South and South Eastern Bayside Suburbs. These are suburbs that extend along the northern foreshore of Port Phillip Bay from Port Melbourne to Elwood. It extends further along the South Eastern Bayside but that is outside the study area. These were once very mixed use and low income areas but increasingly they are becoming the preferred address of middle and higher income groups.

Intermediate Eastern Suburbs. These are probably the most established suburbs of Melbourne. They are and always were the preferred residential address of the middle and higher income groups and property prices therein remain very stable. This is largely because of the accessibility to the large number of private schools that are located in the area.

Outer Eastern Suburbs. These are newer suburbs that extend from Box Hill to Ringwood. Originally, they had appeal as prime agricultural land and have a significant pioneering history. However, since the 2nd World War they have been one of Melbourne's major growth corridors of residential communities

North Eastern Suburbs. This is another corridor of residential communities that correspond generally with the rising ground that extends from Ivanhoe towards the North East along the Yarra Valley.

Northern Suburbs. This is an area immediately North of the Central City that extends from Royal Park to the northern outskirts of Melbourne and from Moonee Ponds Creek in the West to the Yarra River in the East. Traditionally it has been a mixed use area (residential and industrial) that had appeal to a succession of migrant groups to Australia but with the deindustrialisation of the inner city it is increasingly being turned over to residential uses. Increasingly it is appealing to professional and higher income groups.

Moonee Ponds Creek Residential Suburbs. This is a small pocket of high quality and high cost residential development on both sides of the Moonee Ponds Creek Valley. It is wedged in between the Northern Suburbs and the Western Industrial Suburbs. Some private secondary schools are located in the area and they add to the appeal of the region for middle and higher income groups.

Western Industrial Suburbs. This is an area that was once the heartland of Melbourne's industrial growth, especially the heavy, dangerous or noxious industries. Industrial uses are systematically being decanted and some of the larger sites vacated by industry are being redeveloped as planned residential communities. VicUrban has been instrumental in the rejuvenation of the region.

Willamstown Residential Suburb. Williamstown was the original European settlement in the region but the early colonialists moved on up the Yarra River to where they settled Melbourne because there was a more abundant supply of fresh water there. It is a small pocket sized residential suburb that was, and still is, relatively isolated from Melbourne. Its appeal increased with the development of Westgate Bridge that replaced a ferry across the





Yarra River. Currently it is a strongly middle income suburb with increasingly expensive waterfront homes.

Western Bayside Suburbs. This region comprises a series of linear wetlands along the water front, as discussed previously. Currently, the Western component accommodates the Western Treatment Plant, Werribee South horticulture farms and Point Cook RAAF base. Until recent times the region was relatively undeveloped for residential uses. However, the eastern component is increasingly being developed for residential purposes; for example, Altona Meadows and Sanctuary Lakes. Furthermore, there is to be a new planned residential community built at Werribee South focusing on a marina (it will be the only one on the foreshore West of Williamstown to date).

Outer Western Suburbs. This region is one of Melbourne's major growth areas. The Wyndham Municipality is reputed to be the fastest developing municipality in Metropolitan Melbourne. There are several planned communities already developed and occupied in the region and others are under construction or are being planned. Again, VicUrban has been active in the development of the region.

3.3.4 Cumulative Causation Effect

The cumulative causation model is specifically devised to explain the relationship between the creation of basic jobs and flow-on urban growth. However, the underlying logic of cumulative causation is that any initial injection of investment/ development gives an area an advantage that leads to subsequent development potential and then actual development. For example, essential infrastructure such as improved road or rail links to service existing populations in an area makes the area appealing to citizens and developers who subsequently invest and develop there.

The result of this is that across Metropolitan Melbourne some areas are distinctly:

- dominated by residential, industrial or any other urban use.
- endowed with open space (others are poorly served).
- have/ have not good schools, public and private
- have/ have not adequate public & private facilities.

Clearly until recently preference and the investment energy has been with the eastern suburbs. The problem in Melbourne was how to attract people, who had a choice to live in the east by virtue of their economic circumstances, to live in the west.

To overcome perceived inequities and imbalanced patterns of urban development there needed to be devised one, or preferably more, circuit breakers (in the cumulative causation cycle).

There appears to have been two main circuit breakers to date:

- upgrading of accessibility of the western suburbs to the CBD and to the superior assets of the inner eastern suburbs. This is manifested, for example, in the development of West Gate Bridge, CityLink and the Western Ring Road.
- development of new parklands in the west that compare more favourably with those in the east. This is manifested, for example, in industry being relocated from







the banks of the Maribyrnong River, with these areas being developed as part of a linear open space system adjacent to residential uses.

In the 1990s as Melbourne's population expanded, and the East and South Eastern suburbs spread further from the Inner City, so the west became more appealing for other than industrial development because of the advantages of better accessibility to the CBD and inner suburbs services and job opportunities. This and the concerns of Government about the inequities of space in a society that prided itself in equality of opportunity, embodied in the 'fair go' cliché led to increased emphasis on policies and programs for the development and redevelopment of the western suburbs.

One possible advantage of increasing east to west linkages (and vice versa) across Metropolitan Melbourne is that better connectivity results in improved access for all citizens to what is on offer Metropolitan wide. The alternative lack of access can result in people effectively being trapped within a local area and that can be a major problem if it happens to be disadvantaged.

3.3.5 Public Investment in Parklands and Housing

Two public authorities have been to the fore in the recent regeneration of the West: VicUrban, and Parks Victoria.

VicUrban (including under its previous name of Urban Land Corporation) was established to provide improved residential opportunities for the lower end of the housing market whilst implementing the government's policies for more contemporary principles in housing and mixed use development. This was to be at least self funding in competition with the private sector, but with the added responsibility of 'showing the way' to the private sector by testing innovations in the market. This included such innovations as: smaller lots, solar orientation, green streets, water sensitive urban design, and integrated land uses within planned communities.

Over the last two decades it obtained several substantial tracts of land in the western suburbs that had been vacated by industrial and government occupants (some of it military land and allied manufacturers). Development of this land for quality but relatively inexpensive housing at a profit allowed VicUrban to establish that the West could be turned into a desirable residential address in its own right. Many of these innovations successfully tested by VicUrban have been adopted by the private sector and are now distinctly mainstream.

The other authority is Parks Victoria that is responsible for planning, development and management of most of Victoria's parklands. Melbourne has always prided itself in its parkland: the City's forefathers laid out Melbourne with generous amounts of public open space around the CBD. An exception is the west end of the CBD that was given over to railway and port uses, largely because it was swamp land and perceived to be of little value for other development.

However, since this early surge of parkland development there were very few major parks developed in Melbourne until the 1970s. Even then most of the new parkland established was to service new residential development in the east and south east that was increasingly

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further from the inner city parkland. For example, both the Dandenong Valley Parklands and the Yarra Valley Parklands were established in the mid 1970s.

However, in the late 1970s Parks Victoria also undertook the task of planning and developing large new parks in the western suburbs. These were to be accessible to established residential areas that hitherto had very limited access to other than their local municipal parks.

Point Cook Coastal Park was established in 1978 to preserve the setting of the historic homestead of the Chirnside family, early pioneers in Victoria. It was expanded in the early 1990s when the Cheetham Wetlands were added by the State Government purchase of land that had been used to harvest salt from Port Phillip Bay. The Woodlands Historic Park, a 700 ha park in the shadow of Tullamarine Airport, was established in 1980. Again the purpose was not only to provide public open space for the western suburbs but also to preserve the setting of the Woodlands homestead, home of another pioneering family in Victoria.

The provision for future open space is well established within Melbourne's current metropolitan strategy. This is particularly so with the elaborate provision for green wedges that stretch from the designated growth boundary in towards the core of the metropolitan area as illustrated in Figure 9. In this the West fares very well for green wedges. Green wedges are designated areas of land that cannot be developed for urban use; they can be used for such open space activities as agriculture, forestry, recreation and the like.



Figure 9 Parks Victoria Open Space & Melbourne's Green Wedges 2006

Source: Parks Victoria and DSE





3.3.6 Parklands & Wetlands: Marketable Residential Features.

The Convention on Wetlands (1971) is an intergovernmental treaty to which the Federal Government of Australia is a party. It provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It came into force in 1975 and thereafter the Australia Federal Government retained an interest in the future of Melbourne's natural wetlands including those that have been neglected or even decimated and should be restored.

The enactment and implementation of the 'Ramsar Agreement' (Convention on Wetlands) has had a major impact on the recent upsurge in the conservation and development of parkland in Melbourne, especially in the western suburbs.

The Edithvale-Seaford Wetlands have been named wetlands of international significance under the Ramsar Convention. However, it is merely a 260 hectare remnant of the once 4000 hectare Carrum Swamp that measured approximately 15 kilometres from north to south, and averaged about 5 kilometres across from east to west. Most of it was drained in the 1860s and in the late 1970s part of it was developed as Patterson Lakes.

Whilst there are wetlands, such as Edithvale-Seaford, in the eastern side of the Bay that benefited from protection as wetlands under Ramsar principles, those in the western suburbs benefited most. Virtually the whole western foreshore from the West Gate Bridge is to become a linear park (the Bay West Trail). Much of it has wetlands as features. For example, the Cheetham Wetlands, once a saltworks, was set aside as a wetlands park in the mid-1990s and is now a Ramsar designated site of international significance. The Bay West Trail is to be linked into a new linear park along the Werribee River, partly on land appropriated from Melbourne Water's Western Treatment Plant.

Melbourne Water has also a program of wetlands development for rivers, streams and swamp land under its authority. As illustrated in Figure 10 below, many of these wetlands are in the western suburbs.







Figure 10 Melbourne Water Wetlands

Increasingly the new parklands and wetlands in the western suburbs are recognised as assets that can be exploited in the development of residential communities capable of attracting higher income people to live in the western suburbs.

Many of VicUrban's residential estates, discussed previously, have wetlands components that contribute to their appeal and marketability. This pioneering work by VicUrban has resulted in development of a variety of private sector residential projects catering for the middle and higher income groups. Many of these have an emphasis on lifestyle and water sensitive urban design that has contributed to the greening of the west. An example is Sanctuary Lakes with its lakes and wetlands, its golf course designed by Greg Norman, and its recreation centre.





3.4 Melbourne's Current Strategic Plan: Melbourne 2030

Melbourne 2030 has as a central feature a proposal for Melbourne outward growth to be constrained within a designated urban growth boundary.

3.4.1 Growth Boundary & Green Wedges

All subsequent urban development is to be contained inside this boundary with subsequent growth to be accommodated by increasing the intensity of development within the boundary and by redeveloping established areas at higher densities.



Figure 11 Melbourne 2030: Growth Boundary and Green Wedges

Source: DSE (2002) Melbourne 2030

The principle of green wedges (open space) located between corridors of urban development along the major radial transport routes (road and rail) was established in 1967 by the MMBW. It became a feature of all subsequent strategy plans for Melbourne.

The MMBW 1967 strategy plan document had as one of its alternative strategy plans proposals to redirect growth from the East and South East corridors (Melbourne's favoured side) to the West and North West (see Figure 12). This intention was included in the option that was subsequently adopted and much work was done on planning for new towns at Sunbury and Melton. However, the intention of redirecting Melbourne's growth was never translated into a firm program of implementation, and the public investment necessary to implement such a radical proposal was never forthcoming.







Figure 12 Metropolitan Growth Corridors Proposed in 1967

Source: MMBW 1967

3.4.2 Hierarchy of Activity Centres

Melbourne 2030 also has a proposal for a hierarchy of activity centres that are to accommodate retail uses (amongst other major travel generating activity such as commercial business services). The highest order in the hierarchy: the most significant travel generating centres in Metropolitan Melbourne outside of the CBD, is that of Principal Activity Centre. These designated Principal Activity Centres are specified in Figure 8: Melbourne Characteristic Regions, presented before.

The Melbourne Atlas (DSE 2006, Figure 5, p.1.5) identifies that of Melbourne's population 40% is located in the West and 60% is located in the East (corresponding generally with the alignment of the Yarra River). However when one analyses the location of the major shopping destinations across Metropolitan Melbourne it is evident that it is also a divided city in shopping opportunities: a great majority of corporate shopping centres are located in the East.

The corporate shopping centres (drive-in hard top corporately owned shopping centres such as Chadstone) are the major retail performers and travel generators across Metropolitan Melbourne. The only shopping centre in the West that is of any substantial size is

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Maribyrnong Highpoint; whereas in the East there are: Chadstone, Southlands, Doncaster, Box Hill, and Eastland (Ringwood) that are all of major size and are major performers. For example, Chadstone has generally the highest (or near thereto) gross \$ turnover and \$ turnover per square metre of any shopping centre in Australia. Northlands and Greensborough are on the west side of the East West divide but are positioned to service trade areas that are located in the east side of the metropolis.





4 Accessibility and Urban Adjustment

It is a long held tenet of economic geography that firms will, over time, adjust their locations to take advantage of improved accessibility. Moving operations to areas of superior accessibility reduces transactions costs in dealing with suppliers and distributors, as well as improving access to much needed workforce skills.

Whilst all firms may prefer locations offering an accessibility advantage, capacity to pay for this will vary. Those enterprises operating in higher value added markets, where access to a wide pool of skills is critical, will generally outbid more land or capital intensive firms for the most accessible sites. In this sense, the urban land market can be conceptualised as a series of overlapping demand curves of differing elasticities related to the premium placed on an accessibility advantage. While any given area may contain the full mix of land uses, these nested demand curves generally give rise to concentric rings of decreasing land use intensity as one moves away from the point of greatest accessibility (see Figure 13 below). In modern cities which are affected by congestion and other transport system uncertainties, there is generally a range of 'nodal' points in the urban area's accessibility contours, giving rise to a series of sub-ordinate concentric rings of land use, reflecting the pattern of sub-regional centres.



Figure 13 Demand for Different Land Use as a Function of Accessibility

Source: SGS Economics and Planning





These same dynamics apply to households. They will adjust location to maximise opportunities for employment, education, recreation and other services. However, there is significant evidence in the literature that these choices will be made within a more constrained canvas, reflecting family ties and historic neighbourhood affiliations. Many household moves are made 'within corridor' rather than 'across town'. However, when moves are made within this context, relative accessibility is a key consideration.

4.1 The Accessibility Model

As noted above, accessibility is a significant factor in the locational decisions of firms and households. Changes in accessibility can significantly alter growth patterns and thus the economic geography of the metropolis. In other words, a lift in a suburb's accessibility vis a vis other suburbs will improve its capacity to attract and retain jobs and households. In order to estimate the sensitivity/ elasticity of jobs and households to changes in accessibility in metropolitan Melbourne a multiple regression analysis was undertaken.

The following pages describe the process and report the results of this regression analysis.

4.1.1 Estimating Relative Accessibility

Relative accessibility instead of absolute accessibility index is used in the regression analysis. This is because information about 'absolute' accessibility does not on its own provide sufficient information to firms and households when making locational decisions. What matters is whether a candidate location is more or less accessible as compared to other locales/ Statistical Local Areas (SLAs). Hence, a relative accessibility index was calculated for each SLA in Melbourne. The SLA with the highest absolute accessibility index (namely Melbourne (C) – Inner) was given a rating of 1, and other SLAs were given a rating based on how well they faired as compared to the SLA with rating one, rating one being absolute centrality and rating zero being absolute remoteness.

In estimating **Absolute Accessibility** for 1996, 2001 and 2006 by SLA:

- The unloaded network / free flow travel time matrix from each Travel Zone to all the other Travel Zones in metropolitan Melbourne for 1996, 2001 and 2006 was obtained from the transport modellers (namely Veitch Lister Consulting (VLC)). VLC also provided the matrix of the total number of origin and destination trips by Travel Zone.
- In estimating the travel time matrix by SLA, SGS estimated the weighted average travel times from all Travel Zones in the origin SLA to all other Travel Zones in the destination SLA. The travel times were weighted with the trip matrices.
- The following table shows an example of how the **absolute accessibility** index of an SLA is calculated in a hypothetical situation where there are only 5 SLAs in the metropolitan area. The accessibility of a SLA is the sum of the inverse of the travel time weighted with the total destination trips. The total destination trips to each SLA is used as a proxy for that SLA's 'attractiveness' / 'importance' in the economic geography of metropolitan Melbourne.





	Travel time (TT) from SLA	Total Destination	Absolute Accessibility of SLA 1 to SLA 1 - 5
	1 to SLA 1 - 5	Trips by SLA	Trips)
SLA 1	1	100	100
SLA 2	5	1000	200
SLA 3	5	2	0.4
SLA 4	50	1000	20
SLA 5	50	2	0.04
Absolute Accessibility Index of	320.44		

Table 1 Calculating Absolute Accessibility Index

Unloaded versus the Loaded Network Travel Time to Measure Accessibility

In modelling the land use shifts sparked by changes in accessibility contours, there are several reasons why the accessibility of each SLA should be measured using travel times based on an unloaded/ free-flow network as opposed to a loaded or congestion affected network:

- 1. Provided the rank order of areas in terms of relative accessibility is roughly the same under the unloaded and loaded networks, it does not matter that under the loaded network, the absolute differences between the various areas is greater than under the unloaded network. What matters is that there is a difference and that this is consistent between the two scenarios. In other words the capacity to explain past shifts in employment shares due to accessibility changes is the same whether one uses indices derived from an unloaded network, indices derived from a loaded network or a simple rank order index, so long as the accessibility order is the same. The r-squared of the estimated regression may differ, but not the amount of variation in employment share explained by accessibility changes.
- 2. If the accessibility explanatory variable is expressed in terms of indices based on a loaded system, one would need to estimate these indices for the year 2011 when the infrastructure under examination comes on stream. This is more complicated than providing indices for an unloaded system because one would need to assess the congestion situation likely to prevail at that time.
- 3. Physical proximity to high quality road infrastructure is most likely to be interpreted in the market as a 'genuine promise of permanent superior accessibility', even if the road facilities in question are prone to congestion. This is so because congestion can be managed away by implementing appropriate policies, but the physical provision of infrastructure can't just be switched on and off.
- 4. Further to the foregoing point, many firms transact traffic related business during inter-peak period. On this basis, travel times on a relatively free flowing network will be the key driver of locational choice.

Based on the above approach, the following figure shows the change in relative accessibility between 1996 and 2001. This shows that the relative accessibility of North East, North West and Western suburbs improved significantly over the five years to 2001, principally due to the Western Ring Road and the CityLink.







Figure 14 Change in Relative Accessibility, %, 1996-01

Similar the figure below shows the change in relative accessibility between 2001 and 2006. This shows that the relative accessibility of North East suburbs improved significantly during this period, principally due to the Hume bypass.







Figure 15 Change in Relative Accessibility, %, 2001-06

Figure 16 below shows the percentage change in the absolute accessibility value for each SLA between 2001 - 2006.






Figure 16 Change in Absolute Accessibility, %, 2001-2006

Figure 17 below shows the Absolute Accessibility Value for 2006 for each SLA across Metropolitan Melbourne. The figure shows that there are three bands of accessibility within the Metropolitan area. As expected Inner Melbourne is by far the most accessible area of Melbourne. The majority of the remaining urban area is in the next band of accessibility and finally the outer urban areas are least accessible.







Figure 17 Absolute Accessibility Value, 2006





4.1.2 Regression Specification

Based on the above estimated relative accessibility indices, SGS synthesised multiple linear regression to estimate the sensitivity of jobs and households in metropolitan Melbourne. Separate regressions for each of the 17 ANZSIC 1 digit industries and households were conducted.

The dependent variable for employment is the employment in each industry and SLA (sourced from ABS Census Journey to Work (JTW) data for 1996 and 2001). The independent variables were:

- households in each SLA in 1996 & 2001; and
- relative accessibility of each SLA in 1996 & 2001.

Similarly, the dependent variable for households is households in each SLA (sourced from ABS Census, 1996 and 2001. The independent variables are:

- total employment in each SLA in 1996 & 2001; and
- relative accessibility of each SLA in 1996 & 2001¹.

Since there are two dimensions to the data – the cross-section (i.e. SLAs) and time series (2001 & 2006) – a panel data regression using SLA specific fixed effects (or constants), onestep weighting matrix generalised least squares was applied to the equations. By using fixed effects, one can take into account the "individuality" of each SLA by allowing the constant to vary across SLAs.

The cross-section, time series nature of the data means that there is bound to be a degree of heteroscedasticty and autocorrelation. One-step weighting matrix generalised least squares is the most feasible and reliable estimator when the residuals are both cross-section heteroscedastic and contemporaneously correlated.

4.1.3 Regression Results

The following table provides the summary results of the regression analysis. The coefficients indicate the magnitude of the effect that each of the independent variables have on the dependent variable. The t-statistics indicate whether the coefficients estimated are statistically significant. The signs of all the coefficients for each of the regression equations are as expected, the examination of the t-statistics suggests that all the variables are statistically significant at 85% level of confidence and all the regression equations have relatively high adjusted r-squared, indicating that to a large extent the variation in the distribution of employment and housing can be explained by variations in accessibility.

¹ It is evident from the above specification of the regression model that households and employment in each SLA are directly correlated. However, in order to keep the analysis relatively simple, the interrelationship between households and employment was set aside in this analysis. The aim of the analysis conducted here is to derive consistent estimates of the effects of relative accessibility and how the changes in relative accessibility due to a major road infrastructure and other factors in metropolitan Melbourne will impact on the distribution of households and employment. Each topic, household distribution and employment distribution, was treated as an entirely separate exercise.





	Dependent	Variable
Independent Variable	Coefficient	T-Statistics
Agriculture, For	estry and Fishing	
Relative Accessibility	-133.877	-2.945
Households	-0.001	-2.155
Adjusted R-Squared	0.856	
Mi	ning	
Relative Accessibility	657.408	22.629
Households	-0.007	-27.636
Adjusted R-Squared	0.788	
Manuf	acturing	
Relative Accessibility	11,121.740	167.675
Households	0.103	45.432
Adjusted R-Squared	0.971	
Electricity, Gas	and Water Supply	
Relative Accessibility	987.991	30.414
Households	-0.008	-29.914
Adjusted R-Squared	0.884	
Const	ruction	
Relative Accessibility	2,192.353	18.183
Households	0.016	9.187
Adjusted R-Squared	0.974	
Wholes	ale Trade	
Relative Accessibility	6,579.014	17.044
Households	-0.006	-1.222
Adjusted R-Squared	0.787	
Retai	l Trade	
Relative Accessibility	9,570.861	24.587
Households	0.055	82.751
Adjusted R-Squared	0.959	
Accommodation, C	afes and Restaurants	
Relative Accessibility	14,116.840	8.221
Households	0.097	109.587
Adjusted R-Squared	0.900	
Transport	and Storage	
Relative Accessibility	4,509.116	9.913
Households	0.034	276.615
Adjusted R-Squared	0.899	
Communica	tion Services	
Relative Accessibility	-4,610.176	-7.108
Households	0.028	37.521
Adjusted R-Squared	0.799	
Finance ar	d Insurance	
Relative Accessibility	22,349.960	19.005
Households	0.219	21.411
Adjusted R-Squared	0.774	

Table 2 Regression Estimates, Employment by Industry and Households





	Dependent	Variable
Independent Variable	Coefficient	T-Statistics
Property and Bus	iness Services	
Relative Accessibility	27,477.650	22.837
Households	0.208	14.834
Adjusted R-Squared	0.908	
Government Administ	ration and Defence	
Relative Accessibility	10,940.970	9.024
Households	-0.105	-7.183
Adjusted R-Squared	0.770	
Educa	tion	
Relative Accessibility	26,265.010	15.947
Households	0.090	36.292
Adjusted R-Squared	0.899	
Health and Comm	unity Services	
Relative Accessibility	11,112.410	56.792
Households	0.034	18.812
Adjusted R-Squared	0.937	
Cultural and Recre	ational Services	
Relative Accessibility	4,729.788	27.129
Households	0.034	32.984
Adjusted R-Squared	0.756	
Personal and O	ther Services	
Relative Accessibility	4,590.718	2.780
Households	0.021	8.488
Adjusted R-Squared	0.998	
Households (Total O	cupied Dwellings)	
Relative Accessibility	217,772.200	14.797
Total Employment	0.230	29.516
Adjusted R-Squared	0.900	

It should be noted that the relative accessibility is an index, the value of which ranges from 0 (extreme isolation, a theoretical concept) to 1 (absolute centrality). The regression coefficients therefore provide an indication of the impact that the relative accessibility will have on employment if that SLA's accessibility improved from extreme isolation to absolute centrality. Thus, if a SLA's relative accessibility improves from 0 to 1, employment in Property and Business Services in that SLA for example will increase by around 27,400.

Similarly, improvement of a theoretical SLA's relative accessibility from 0 (extreme isolation) to 1 (absolute centrality) would lead to that SLA attracting 9,570 retail trade jobs

The coefficients for all other industries and households can be interpreted similarly.





4.2 Conclusion

The above analysis statistically confirms that the accessibility is a key factor in the SLA's capacity to attract and retain jobs and households. Other things equal, this suggests that any improvement in the accessibility rating of a SLA relative to other SLAs in the metropolitan area will lead to significant urban adjustment whereby the SLA is able to permanently attract and retain significantly higher number of jobs and households compared to the scenario where the accessibility rating is unchanged.

This has significant implication for any proposed East West Link. The urban adjustment impact of any East West Link should therefore be examined and assessed against economic, social and environmental objectives.





5 Demographic and Community Profile

This section provides a background analysis of the socio-economic environment in the potential catchment area for the proposed East-West Link. The analysis of the social and demographic characteristics of the study area is intended to assist in the identification of indicators to determine the need and the potential options for a new East West link.

The analysis includes a demographic overview as well as a review of current residential trends. The Study area has been analysed on the basis of ABS Census's Statistical Local Area boundaries. The profiling analysis has been undertaken through the review of 2006 ABS census data pertaining to:

- Population Density;
- Age Profile;
- Household Structure;
- Ethnic Composition;
- Skill Profile;
- Household Income;
- SEIFA Advantage/Disadvantage Index (based on 2001 Census)²; and
- Housing Type and Tenure.

Median house prices data derived from the Valuer-General's Guide to Property Values 2006 was also analysed for the relevant SLAs within the study area.

 $^{^2}$ At the time of undertaking this report, SEIFA Advantage/ Disadvantage index based on 2006 Census was not available from the ABS.





5.1 Population Density

Using the 2006 ABS Census data, it is estimated that the combined total resident population of the relevant SLAs in the Study area is 1,907,865. This indicates that over 50% of Metropolitan Melbourne's population reside in the identified catchment of the proposed East West Link.

For the purpose of comparison, the population density (the number of persons per hectare) within each SLA is mapped and compared in the figure below. The analysis shows that the SLAs with high population densities are within inner-city locations including Melbourne (C) - Inner, Port Phillip (C) - St Kilda, Stonnington (C) – Prahran and Yarra (C) - Richmond. The high density pattern also encompasses the inner-north suburbs and inner- to middle- eastern corridors of Melbourne.

Population densities are far higher in central municipalities and established inner north and eastern suburbs than the more recently developed western suburbs and outer metropolitan fringes that are considered the 'growth' areas of Melbourne. Land use, historic and topography issues help explain the lower population density pattern in these municipalities. As discussed in Section 3, the western suburbs are known regions for industrial land use and development and until recently have been less desirable as residential neighbourhoods.



Figure 18 Population Density, 2006

Source: ABS Population and Housing Census (2006)





5.2 Age Profile

The age profile of the population in 2006 is shown in Table 3 below. For comparison purposes, the SLAs have been grouped by region and the population grouped into 10-year age cohorts with the exception of the highest group (over 70), which is open-ended. The age group sharing the greatest proportion of the population for each of the SLA is highlighted in the table.

SLAs in Inner Melbourne have the greatest proportion of the 20-29 young working age brackets in the study area. The Eastern Middle suburbs have a slight variation in age profile but with the slight over-representation of people aged 40-49 years. Northern middle, western and outer fringe suburbs on the other hand are over-represented by people in the 30-39 age cohort. The age structure of the study area however is generally aligned with the wider Metropolitan Melbourne.

Region	SLA	0-9	10-19	20-29	30-39	40-49	50-59	60-69	over 70
	Melbourne (C) - Inner	2.8%	9.8%	46.9%	15.3%	7.7%	8.5%	5.0%	4.1%
n	Melbourne (C) - Remainder	5.7%	11.9%	37.4%	16.2%	9.3%	8.3%	5.2%	6.0%
	Melbourne (C) - S'bank-D'lands	3.5%	8.6%	45.2%	21.9%	8.6%	6.9%	3.0%	2.3%
	Port Phillip (C) - St Kilda	6.9%	5.5%	24.3%	26.2%	13.6%	9.7%	6.1%	7.7%
	Port Phillip (C) - West	8.3%	7.4%	18.7%	21.4%	13.8%	12.6%	8.9%	8.9%
	Stonnington (C) - Prahran	6.3%	7.3%	23.7%	20.5%	11.6%	11.1%	9.0%	10.5%
	Yarra (C) - North	8.1%	7.0%	25.4%	21.8%	13.7%	10.5%	6.2%	7.4%
	Yarra (C) - Richmond	7.9%	6.5%	26.4%	22.9%	12.3%	9.6%	7.1%	7.3%
5	Glen Eira (C) - Caulfield	10.5%	11.0%	16.0%	15.6%	14.7%	12.7%	7.4%	12.1%
Sth	Stonnington (C) - Malvern	11.4%	11.5%	17.0%	14.1%	14.3%	12.7%	8.3%	10.8%
	Boroondara (C) - Camberwell N.	10.9%	15.3%	11.3%	10.8%	15.8%	14.2%	8.1%	13.8%
	Boroondara (C) - Camberwell S.	12.4%	14.1%	12.5%	12.9%	16.2%	13.7%	7.7%	10.6%
lle	Boroondara (C) - Hawthorn	9.4%	10.7%	23.5%	16.2%	12.6%	11.7%	6.9%	8.9%
lide	Boroondara (C) - Kew	10.5%	12.5%	15.2%	13.6%	15.4%	13.6%	7.9%	11.3%
2	Manningham (C) - East	13.5%	18.5%	10.0%	11.4%	17.8%	15.2%	9.0%	4.6%
iter	Manningham (C) - West	9.9%	12.3%	12.8%	13.4%	14.3%	14.1%	12.3%	10.8%
Eas	Whitehorse (C) - Box Hill	11.2%	11.8%	15.4%	14.9%	14.4%	11.4%	7.6%	13.5%
	Whitehorse (C) - Nunawading E.	11.3%	11.4%	13.6%	14.5%	13.8%	14.0%	10.7%	10.5%
	Whitehorse (C) - Nunawading W.	11.7%	10.7%	12.0%	15.4%	13.6%	11.7%	10.4%	14.6%
	Banyule (C) - Heidelberg	11.4%	12.1%	14.0%	14.3%	14.5%	12.6%	8.4%	12.8%
	Banyule (C) - North	11.2%	13.2%	14.4%	14.1%	14.5%	14.5%	9.2%	8.9%
ž	Darebin (C) - Northcote	10.5%	8.1%	17.6%	21.1%	14.9%	10.1%	7.5%	10.2%
E	Darebin (C) - Preston	11.3%	11.0%	15.9%	16.1%	13.2%	10.6%	8.9%	13.1%
Ę	Moreland (C) - Brunswick	8.5%	8.1%	25.1%	19.1%	13.2%	9.5%	7.5%	9.0%
Ñ	Moreland (C) - Coburg	12.4%	10.7%	14.4%	17.9%	13.8%	9.9%	7.8%	13.0%
	Moreland (C) - North	12.3%	11.5%	13.2%	15.0%	13.5%	9.4%	9.6%	15.5%
	Brimbank (C) - Keilor	14.2%	15.4%	13.9%	15.7%	15.8%	12.8%	6.7%	5.5%
	Brimbank (C) - Sunshine	12.7%	12.8%	16.2%	15.4%	13.5%	12.9%	8.3%	8.2%
E	Hobsons Bay (C) - Altona	12.8%	12.7%	13.5%	15.9%	14.9%	11.8%	8.9%	9.5%
este	Hobsons Bay (C) - Williamstown	13.6%	10.8%	11.9%	17.3%	17.4%	11.9%	6.7%	10.5%
Š	Maribyrnong (C)	11.6%	9.8%	17.3%	19.2%	15.0%	10.0%	6.7%	10.5%
	Moonee Valley (C) - Essendon	11.8%	11.5%	15.8%	16.9%	15.5%	11.2%	6.7%	10.7%
	Moonee Valley (C) - West	9.9%	11.4%	13.3%	15.0%	13.2%	13.3%	12.3%	11.6%
8	Maroondah (C) - Ringwood	11.5%	11.7%	13.9%	15.2%	13.2%	13.2%	9.4%	12.0%
i.	Melton (S) - East	19.4%	13.1%	18.0%	22.7%	14.4%	8.2%	3.0%	1.3%
E P	Nillumbik (S) - South	13.5%	16.6%	10.9%	13.0%	17.5%	15.9%	7.5%	5.1%
rar	Nillumbik (S) - South-West	14.8%	18.3%	11.9%	14.8%	18.8%	13.1%	5.1%	3.2%
ute	Wyndham (C) - North	15.3%	15.9%	15.1%	16.5%	15.7%	11.2%	5.6%	4.8%
ō	Wyndham (C) - South	15.7%	11.0%	17.8%	22.2%	17.6%	9.6%	3.6%	2.6%
	Study Area Total	11.3%	11.7%	16.8%	16.5%	14.3%	11.8%	7.9%	9.7%
	Melbourne SD	12.3%	12.9%	15.1%	15.8%	14.7%	12.2%	8.0%	9.1%

Table 3 Age Structure, 2006

Source: ABS Population and Housing Census (2006)





5.3 Household Structure

Household structure for the study area is shown in Table 4 below. For comparison purposes, the SLAs have been grouped by region. The analysis indicates that Family Household dominates the study area with the exception of Melbourne-Inner and Port Philip-St Kilda. The proportion of lone person households is also ranked highly in the study area.

Region	SLA	Family Household	Lone Person Household	Group Household
	Melbourne (C) - Inner	36.8%	42.1%	21.1%
	Melbourne (C) - Remainder	43.5%	39.1%	17.3%
Inner	Melbourne (C) - S'bank-D'lands	50.2%	32.3%	17.5%
	Port Phillip (C) - St Kilda	42.2%	45.2%	12.6%
	Port Phillip (C) - West	56.7%	34.4%	8.8%
	Stonnington (C) - Prahran	48.3%	40.2%	11.5%
	Yarra (C) - North	52.7%	32.1%	15.1%
	Yarra (C) - Richmond	52.2%	32.9%	14.8%
ırı	Glen Eira (C) - Caulfield	61.2%	32.8%	6.0%
St	Stonnington (C) - Malvern	65.4%	27.8%	6.7%
	Boroondara (C) - Camberwell N.	75.7%	22.0%	2.2%
	Boroondara (C) - Camberwell S.	73.8%	22.6%	3.5%
dle	Boroondara (C) - Hawthorn	56.5%	31.9%	11.6%
Vid	Boroondara (C) - Kew	69.2%	24.4%	6.3%
2 -	Manningham (C) - East	89.2%	9.5%	1.3%
Easter	Manningham (C) - West	80.3%	17.9%	1.8%
	Whitehorse (C) - Box Hill	67.2%	27.0%	5.8%
	Whitehorse (C) - Nunawading E.	74.3%	23.0%	2.7%
	Whitehorse (C) - Nunawading W.	71.8%	24.9%	3.3%
0	Banyule (C) - Heidelberg	70.1%	26.1%	3.9%
Adle	Banyule (C) - North	76.8%	20.7%	2.5%
Mide	Darebin (C) - Northcote	59.6%	31.9%	8.5%
Ľ	Darebin (C) - Preston	67.8%	26.9%	5.3%
thern	Moreland (C) - Brunswick	54.7%	31.8%	13.5%
Ñ	Moreland (C) - Coburg	69.7%	25.6%	4.8%
	Moreland (C) - North	70.5%	26.7%	2.8%
	Brimbank (C) - Keilor	83.7%	14.5%	1.8%
	Brimbank (C) - Sunshine	76.8%	20.2%	3.0%
ern	Hobsons Bay (C) - Altona	73.0%	23.9%	3.1%
est	Hobsons Bay (C) - Williamstown	67.8%	28.4%	3.8%
Š	Maribyrnong (C)	62.9%	29.7%	7.5%
	Moonee Valley (C) - Essendon	62.4%	31.6%	6.0%
	Moonee Valley (C) - West	77.5%	20.1%	2.4%
8	Maroondah (C) - Ringwood	69.2%	27.7%	3.1%
ri.	Melton (S) - East	86.7%	11.7%	1.6%
E P	Nillumbik (S) - South	84.3%	14.4%	1.3%
rar	Nillumbik (S) - South-West	89.1%	9.9%	1.0%
ute	Wyndham (C) - North	79.8%	17.8%	2.4%
õ	Wyndham (C) - South	88.0%	9.9%	2.1%
	Study Area Total	67.4%	26.5%	6.0%
	Melbourne SD	71.8%	23.8%	4.5%

Table 4Household Structure 2006

Source: ABS Population and Housing Census (2006)







Ethnic Composition

Ethnic composition in terms of place of birth for residents in the study area is shown in the table below. For comparison purpose, the population data has been grouped by Birthplace Region, and further split into Australia born and Overseas born (by region) categories. The analysis indicates that in general the majority of the populace in the study area is Australian born, with the exception of Melbourne-Inner where around 70% of the population is overseas born. On the other hand, Melbourne-Southbank Docklands and Brimbank – Sunshine have almost equal representation of overseas born population.

Furthermore, the analysis highlights that among the overseas born, the southern and eastern Europe groups dominate the study area followed by people born in North-West Europe. The ethnic composition of Melbourne-Inner shows greater concentration of people born in South-East and North-East Asia.

Region	SLA	Australia	Oceania and Antarctica (exl. Australia)	North- West Europe	Southern and Eastern Europe	North Africa and the Middle East	South-East Asia	North-East Asia	Southern and Central Asia	Americas	Sub- Saharan Africa	Other	Total Born Overseas
	Melbourne (C) - Inner	30%	4%	5%	2%	2%	28%	21%	4%	2%	1%	0.1%	70%
	Melbourne (C) - Remainder	56%	3%	6%	3%	1%	14%	10%	2%	2%	2%	0.1%	44%
	Melbourne (C) - S'bank-D'lands	47%	4%	8%	3%	2%	19%	11%	3%	2%	1%	0.0%	53%
er	Port Phillip (C) - St Kilda	68%	4%	10%	7%	1%	2%	2%	2%	2%	1%	0.4%	32%
Inne	Port Phillip (C) - West	70%	3%	8%	8%	1%	4%	2%	1%	2%	1%	0.1%	30%
	Stonnington (C) - Prahran	67%	3%	8%	8%	1%	4%	3%	2%	2%	1%	0.2%	33%
	Yarra (C) - North	70%	3%	7%	6%	1%	5%	3%	1%	2%	1%	0.1%	30%
	Yarra (C) - Richmond	66%	3%	6%	6%	1%	11%	3%	1%	1%	1%	0.1%	34%
E	Glen Eira (C) - Caulfield	62%	2%	6%	11%	2%	3%	4%	4%	1%	3%	0.8%	38%
Sth	Stonnington (C) - Malvern	73%	2%	6%	5%	1%	4%	4%	3%	1%	1%	0.0%	27%
	Boroondara (C) - Camberwell N.	69%	2%	5%	5%	1%	5%	8%	2%	1%	1%	0.1%	31%
	Boroondara (C) - Camberwell S.	77%	2%	6%	4%	1%	3%	3%	2%	1%	1%	0.0%	23%
lle	Boroondara (C) - Hawthorn	71%	2%	6%	4%	1%	5%	5%	5%	1%	1%	0.0%	29%
lide	Boroondara (C) - Kew	73%	2%	6%	6%	1%	4%	5%	2%	1%	1%	0.1%	27%
2	Manningham (C) - East	82%	1%	8%	3%	1%	1%	1%	1%	1%	1%	0.0%	18%
ter	Manningham (C) - West	61%	1%	5%	11%	3%	6%	9%	2%	1%	2%	0.1%	39%
Eas	Whitehorse (C) - Box Hill	67%	2%	5%	4%	1%	6%	10%	3%	1%	1%	0.1%	33%
	Whitehorse (C) - Nunawading E.	71%	2%	7%	5%	1%	5%	4%	2%	1%	1%	0.0%	29%
	Whitehorse (C) - Nunawading W.	70%	2%	6%	6%	1%	6%	5%	3%	1%	1%	0.1%	30%
	Banyule (C) - Heidelberg	76%	1%	5%	7%	1%	2%	3%	2%	1%	1%	0.0%	24%
dle	Banyule (C) - North	83%	1%	6%	5%	1%	1%	1%	1%	1%	1%	0.1%	17%
Νiq	Darebin (C) - Northcote	69%	2%	5%	13%	2%	2%	2%	3%	1%	1%	0.0%	31%
E	Darebin (C) - Preston	63%	1%	3%	17%	3%	4%	4%	3%	1%	1%	0.1%	37%
the	Moreland (C) - Brunswick	65%	2%	4%	12%	3%	4%	3%	4%	1%	1%	0.0%	35%
Por	Moreland (C) - Coburg	68%	1%	3%	15%	5%	2%	2%	2%	1%	1%	0.0%	32%
-	Moreland (C) - North	63%	2%	3%	16%	8%	2%	1%	4%	1%	0%	0.1%	37%
	Brimbank (C) - Keilor	58%	1%	3%	19%	3%	9%	1%	3%	1%	1%	0.1%	42%
	Brimbank (C) - Sunshine	48%	2%	3%	18%	3%	19%	1%	3%	2%	1%	0.1%	52%
E.	Hobsons Bay (C) - Altona	64%	3%	6%	13%	3%	6%	1%	2%	1%	1%	0.0%	36%
este	Hobsons Bay (C) - Williamstown	77%	2%	8%	7%	2%	2%	1%	1%	1%	1%	0.0%	23%
Ň	Maribyrnong (C)	57%	2%	4%	9%	2%	14%	4%	5%	1%	2%	0.1%	43%
	Moonee Valley (C) - Essendon	73%	1%	4%	8%	1%	4%	2%	2%	1%	2%	0.1%	27%
	Moonee Valley (C) - West	68%	1%	4%	17%	2%	4%	1%	1%	1%	0%	0.1%	32%
ge	Maroondah (C) - Ringwood	78%	2%	9%	3%	1%	2%	1%	2%	1%	1%	0.0%	22%
ü	Melton (S) - East	67%	2%	3%	10%	2%	7%	1%	4%	2%	1%	0.1%	33%
ц Б	Nillumbik (S) - South	84%	1%	8%	3%	0%	1%	0%	1%	1%	1%	0.0%	16%
ran	Nillumbik (S) - South-West	85%	1%	6%	4%	1%	1%	0%	1%	0%	1%	0.0%	15%
Iter	Wyndham (C) - North	72%	3%	6%	7%	1%	5%	1%	3%	1%	1%	0.1%	28%
õ	Wyndham (C) - South	68%	3%	7%	7%	1%	6%	2%	3%	1%	2%	0.0%	32%
	Study Area Total	67%	2%	5%	9%	2%	6%	4%	2%	1%	1%	0.1%	33%
	Melbourne SD	69%	2%	6%	8%	2%	5%	3%	3%	1%	1%	0.1%	31%

Table 5Ethnicity by Place of Birth 2006

Source: ABS Population and Housing Census (2006)





5.4 Skills Profile

Figure 19 shows educational attainment for the relevant SLAs in the study area. This provides an insight to the skills composition of the study area.

The figure indicates the proportion of the population in the SLAs that is highly educated and skilled. It relates to the proportion of population who have attained post-school education at the level of Postgraduate Degree, Graduate Diploma and Graduate Certificate, Bachelor Degree and Advance Diploma and Diploma in 2006.

Given the relatively high proportion of professional industries generally found in the CBD, inner-city and eastern municipalities, a subsequently high proportion of skilled residents is observable in and around these employment-generating areas. Proximity to education institutions, access to quality housing, public transport and basic services and facilities (such as health services, recreation, retail centres etc) are other key factors that contribute to the settlement pattern of the highly-skilled and educated population.

Comparatively, there is a significantly lower proportion of skilled individuals within the western suburbs. Outer metropolitan areas of Melton-East and Wyndham-South have faired better than their western counterparts due to recent investment in housing. This has contributed to the somewhat improved socio-economic conditions in these two areas, though the East West division discussed in Section 3 is still very much in evidence.



Figure 19 Education Attainment, 2006

Source: ABS Population and Housing Census (2006)





5.5 Household Income

Average weekly household income for the selected SLAs in 2006 is analysed and mapped in Figure 20 below.

The analysis shows that the uppermost household income brackets are in the range of 1,500-1,750 and 1,750-2,000. Manningham –East fell within the highest income range, while Boroondara - Camberwell South and Boroondara – Kew, Wyndham South and Nillumbik South recorded the highest weekly household income for the 1,500-1,750 income bracket.

Overall the eastern suburbs on average retain a higher proportion of high income households.

It is observable that there is a high proportion of SLAs falling within the \$1,250-\$1,500 income bracket. This is indicative of a population with a high proportion of middle income households evenly distributed across the study area rather than being concentrated in one specific region.

The analysis again indicates that outer western suburbs of Melton-East and Wyndham-South are in a better position than the other outer fringes and western suburbs. This is a reflection of significant new homebuyers with mortgages who by their very nature are required to have stable employment and reasonable household income. 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 socio-economic shift, as evidenced by the continuing under-representation of higher skill groups (Figure 19).







Figure 20 Weekly Household Income Profile, 2006

Source: ABS Population and Housing Census (2006)





5.6 SEIFA Advantage/Disadvantage Index³

For the purpose of comparison, the Index for Advantage\Disadvantage derived from SEIFA 2001 for each of the SLA is mapped and compared in Figure 21. These indices have been developed to measure the level of social and economic well-being of a region and to contrast the spatial distribution of two population groups – the affluent and disadvantaged.⁴ Lower values indicate areas of disadvantage and high values indicate the areas of advantage.

The result of the mapping exercise indicates that there is a noticeable East-West divide in the study area in relation to the well-being of the communities. A great proportion of the municipalities in the western territories of the study area are comparatively less well-off than their eastern counterparts. This also reflects the discussion in Section 3.



Figure 21 Index for Advantage \Disadvantage 2001

Source: ABS SEIFA (2001)



³ At the time of undertaking this report, SEIFA Advantage/ Disadvantage index based on 2006 Census was not available from the ABS.

⁴ SEIFA 2001 Product Brief



5.6.1 Accessibility and Socio-Economic Disadvantage

We have also examined the relationship between accessibility and levels of socio-economic disadvantage (as estimated by SEIFA). The following figure illustrates this relationship and highlights that there is a direct relationship between SEIFA and accessibility, especially in the outer suburban areas which not only are accessibility deprived, but are also disadvantaged in socio-economic terms.

Figure 22 Absolute Accessibility and Socio-Economic Advantage/ Disadvantage, Melbourne, 2001







Within the study area, the figure below shows that the suburbs of Airport West, Moreland, and Coburg are accessibility deprived as well as socio-economic disadvantaged.

Figure 23 Absolute Accessibility and Socio-Economic Advantage/ Disadvantage, Study Area, 2001







5.7 Dwelling Type

Table 6 compares the dwelling structure by type (occupied private dwelling) of the study area. The dwelling type accounting for the greatest proportion of the population for each of the SLA is highlighted in the table.

Not surprisingly there is a significant proportion of flats and apartments in and around the CBD; specifically in Melbourne –Inner and Melbourne-Southbank & Dockland. For inner-city SLAs, the housing market is more diverse. This applies to inner suburbs such as Malvern, Caulfield, Hawthorn, Brunswick and Essendon. As the distance from the CBD increases, separate Houses become the dominant dwelling type.

Dwelling type is an indicator of the role and function that the area plays in the housing market. A high concentration of semi-detached houses, flats and apartments are likely to attract more young adults and smaller households. Couple or single parent families with children however, are more likely to prefer larger, detached or separate dwellings.





		Senarate house	Semi-detached,	Flat, unit, or	Other
Region	SLA	Separate nouse	townhouse	apartment	Other
<u> </u>	Melbourne (C) - Inner	0.1%	0.9%	97.9%	1.1%
Inner	Melbourne (C) - Remainder	6.4%	28.1%	64.9%	0.6%
	Melbourne (C) - S'bank-D'lands	0.1%	0.8%	99.0%	0.2%
	Port Phillip (C) - St Kilda	15.3%	13.0%	71.4%	0.3%
	Port Phillip (C) - West	14.0%	40.8%	44.7%	0.5%
	Stonnington (C) - Prahran	25.8%	17.3%	56.6%	0.3%
	Yarra (C) - North	15.4%	49.6%	33.3%	1.7%
c	Yarra (C) - Richmond	27.3%	31.9%	40.2%	0.7%
r L	Glen Eira (C) - Caulfield	47.6%	16.9%	35.1%	0.4%
Sth	Stonnington (C) - Malvern	56.0%	16.1%	27.3%	0.6%
	Boroondara (C) - Camberwell N.	74.4%	15.4%	9.6%	0.6%
	Boroondara (C) - Camberwell S.	74.3%	12.3%	13.0%	0.4%
lle	Boroondara (C) - Hawthorn	39.0%	16.0%	44.4%	0.6%
lido	Boroondara (C) - Kew	61.7%	17.1%	20.9%	0.3%
2 2	Manningham (C) - East	98.8%	0.6%	0.2%	0.3%
Easterr	Manningham (C) - West	82.7%	11.2%	6.0%	0.1%
	Whitehorse (C) - Box Hill	67.8%	17.3%	14.8%	0.1%
	Whitehorse (C) - Nunawading E.	82.5%	13.0%	4.4%	0.1%
	Whitehorse (C) - Nunawading W.	81.0%	10.1%	8.7%	0.2%
Middle	Banyule (C) - Heidelberg	75.5%	12.5%	11.8%	0.2%
	Banyule (C) - North	86.5%	9.1%	4.3%	0.1%
	Darebin (C) - Northcote	59.5%	13.2%	26.6%	0.6%
2	Darebin (C) - Preston	70.5%	14.0%	15.1%	0.4%
the	Moreland (C) - Brunswick	46.7%	21.1%	31.2%	0.9%
No.	Moreland (C) - Coburg	78.9%	10.7%	9.8%	0.6%
_	Moreland (C) - North	78.7%	8.9%	12.2%	0.3%
	Brimbank (C) - Keilor	82.3%	12.7%	4.9%	0.1%
	Brimbank (C) - Sunshine	83.5%	7.6%	8.7%	0.3%
srn	Hobsons Bay (C) - Altona	82.6%	8.6%	8.4%	0.4%
este	Hobsons Bay (C) - Williamstown	67.6%	18.2%	13.0%	1.2%
Š	Maribyrnong (C)	66.9%	13.1%	19.5%	0.6%
	Moonee Valley (C) - Essendon	55.2%	16.4%	27.9%	0.4%
	Moonee Valley (C) - West	86.5%	8.8%	4.4%	0.2%
e e	Maroondah (C) - Ringwood	78.3%	12.1%	9.5%	0.1%
ring	Melton (S) - East	92.4%	6.5%	1.0%	0.0%
Ч	Nillumbik (S) - South	91.0%	6.2%	2.7%	0.1%
r an	Nillumbik (S) - South-West	96.7%	1.2%	1.9%	0.3%
uter	Wyndham (C) - North	88.1%	5.7%	6.0%	0.2%
õ	Wyndham (C) - South	90.7%	7.8%	0.2%	1.3%
	Study Area Total	63.3%	14.6%	21.7%	0.4%
	Melbourne SD	73.1%	11.3%	15.1%	0.5%

Table 6Dwelling Type, 2006

Source: ABS Population and Housing Census (2006)

5.8 Median House Price

The analysis of Median House Price is derived from the *A Guide to Property Value 2006* (DSE).





Again the comparisons across the study area suggest that there is a continuing East-West division. The 'affluent' suburbs notably the inner-city municipalities and suburbs along the east and south-eastern corridor, have attracted higher house prices. Further, the median price of houses also displays a geographical pattern dependent on proximity to the CBD. This is more prevalent along the eastern corridor.

It should be noted that there is a significant potential for home price increase in the inner- to middle- western suburbs such as Maribyrnong, Wyndham and parts of Hobson Bay as they are at strategic locations. They capture homebuyers who are drawn to the area due to its proximity to the city, reasonable transport links and (currently) lower house prices. Recent investment in master-planned residential communities in middle- to outer-fringe areas such as Caroline Springs in Melton and Sanctuary Lakes in Point Cook will have an impact on the median house price and socio-economic characteristics of the region.



Figure 24 Median House Price, 2006

Source: DSE, 2007





5.9 Community Infrastructure

A review of the spatial distribution of community infrastructure across the study area has been undertaken. The best available data for this task was Melways GIS. The following infrastructure items are included in this analysis:

- Secondary Colleges (inclusive of State, Catholic and Private);
- Hospitals;
- Major Sporting Venues;
- Universities; and
- TAFEs;

Figures 25 to 28 show the spatial distribution of these facilities in the study area. These infrastructure items generally require a regional population/household catchment to justify their provision.

The spatial distribution of these facilities is reasonably aligned with the demographic and socio-economic profile of the study area. Those regions which have a limited provision of infrastructure tend to be lower density (and lower income) areas. The distribution of these facilities generally supports the argument that there is an emerging east-west divide across the study area.



Figure 25 Spatial Distribution of Secondary Colleges in the Study Area 2005







Figure 26 Spatial Distribution of Hospitals in the Study Area 2005





















5.10 Conclusion– Baseline Information

The review of demographic characteristics of the study area indicates an apparent East-West division in terms of trends in settlement patterns, density, household characteristics and education background. It is concluded that the eastern territories of the study area can be defined as established 'affluent' parts of Melbourne while the western and outer fringe territories are areas with a lower socio-economic profile.

The inner and eastern parts of Melbourne which traditionally offer good access to public and private services, transport links, employments opportunities and housing have attracted a more diverse and affluent population. The population of the study area is also characterised by a diverse number of ethnicities.

In the past, the western and outer suburbs have fallen behind other parts of Melbourne. The development in the West has been hindered by poor infrastructure provision and lower levels of private investment. It is noticeable that the western suburbs of Wyndham and Melton have faired better in the overall findings of the baseline analysis. This is largely attributed to recent development and investment in master-planned residential communities in the region. Such development has improved the socio-economic conditions of these suburbs to some extent.





6 Industrial and Commercial Profile

This section provides an overview of the industrial and commercial profile for the study area and where relevant compares indicators for this area with the whole of metropolitan Melbourne and Victoria. As with demographic and community profile, the analysis has been undertaken at the SLA level based on 2006 Census data. The remainder of this section is set out under the following headings:

- Employment areas;
- Current Industry Composition;
- Growth Sectors;
- Levels of Specialisation;
- Occupational Profile;
- Workers place of Residence; and
- Economic Contribution of the study area.

6.1 Employment Areas

According to the 2006 Census, the SLAs with the highest concentrations of jobs are Melbourne – Inner, with 153,391 jobs or 15.6% of the total and the Melbourne – Remainder area with 106,153 jobs or 10.8% of the total. The spatial distribution is illustrated in Figure 29 below and shows that there is a concentration of jobs within the central area. Other SLA's which also have a high proportion of jobs include Port Phillip West (4.9%), Yarra North (3.3%), Wyndham North (3.3%) Maribyrnong (2.9%) and Darebin – Preston (2.9%).

The true reflection of employment by SLA can be shown by investigating employment per household (refer to Figure 30). This provides a better guide to job provision relative to the number of households in each SLA.

From this it can be seen that, apart from the growth areas of Wyndham South and Melton East, the majority of SLA's within the western region have fewer jobs than those in the east.







Figure 29 Total Employment by SLA, 2006

Source: Census 2006





Source: Census 2006



6.2 Current Industry Composition

The following table illustrates the industry profile of the employed residents within the study area compared to Metropolitan Melbourne. There are around 934 282 people employed within the study area or 60% of the total employed in the Metropolitan Melbourne area as a whole.

Within the study area, the property and business services sector offers the highest proportion of jobs (16.8%) followed by retail trade (13.6%), manufacturing (9.6%) and health and community services (11.4%). Together, these account for over half of the total employment in the study area. Similarly, the Melbourne Metropolitan area has a high concentration of employment within these industries, however retail trade (14.9%) and manufacturing (14.3%) are the highest followed by property and business services (13.3%) and health and community services (10.7%).





In duction .	Study	/ Area	Melbourne SD		
industry	Employees	% of Total	Employees	% of Total	
Agriculture, Forestry and Fishing	1,913	0.2	8,721	0.6	
Mining	1,660	0.2	2,409	0.2	
Manufacturing	88,926	9.6	218,680	14.3	
Electricity, Gas and Water Supply	5,580	0.6	8,727	0.6	
Construction	40,795	4.4	82,482	5.4	
Wholesale Trade	44,762	4.8	94,840	6.2	
Retail Trade	126,070	13.7	227,797	14.9	
Accommodation, Cafes and Restaurants	43,613	4.7	63,830	4.2	
Transport and Storage	36,805	4.0	66,313	4.3	
Communication Services	22,720	2.5	30,770	2.0	
Finance and Insurance	67,771	7.3	78,977	5.2	
Property and Business Services	154,828	16.8	202,568	13.3	
Government Administration and Defence	46,589	5.0	62,855	4.1	
Education	71,644	7.8	120,344	7.9	
Health and Community Services	105,361	11.4	164,141	10.7	
Cultural and Recreational Services	30,812	3.3	41,587	2.7	
Personal and Other Services	33,535	3.6	52,164	3.4	
Total Employment	923,384	100	1,527,205	100	

Table 7Industrial Structure for Study Area compared to Melbourne

Source: Census 2006

Figures 31 to 34 below provide further insights to the industrial composition of the study area. They show the distribution of employment across the study area in 2006. For the purpose of the analysis, the ANZSIC 1 digit Industrial Classifications have been grouped into 5 categories or "Super Groups", which are shown in the following table.





Industry Jobs	Service Jobs	Professional Jobs	Other Jobs	Retail Jobs
Manufacturing	Education	Finance and Insurance	Agriculture, Forestry and Fishing	Retail Trade
Construction	Health and Community Services	Property and Business Services	Mining	Accommodation, Cafes and Restaurants
Wholesale Trade	Cultural and Recreational Services	Government Administration and Defence	Electricity, Gas and Water Supply	
Transport and Storage	Personal and Other Services		Communication Services	

Table 8 Super Groups by ANZSIC 1 Digit Industrial Classifications

The key points from this analysis are as follows:

- There is a high concentration of employment in all industries within the central area. The Melbourne Inner, Remainder and Southbank Docklands SLA has a high proportion of employment in Professional Jobs (14.9%), followed by Service Jobs (6.7%) in comparison to the study area on a whole.
- For the Industrial Sector, there is a significant concentration of jobs within the west of the study area (as well as Inner Melbourne); and
- Employment in the retail and service sectors is more widely dispersed across the east and west.







Figure 31 Industrial Jobs: Total Employment by SLA, 2006

Source: Census 2001 and SGS

Figure 32 Professional Jobs: Total Employment by SLA, 2006



Source: Census 2001 and SGS









Source: Census 2006 and SGS





Source: Census 2006 and SGS





6.3 Growth Sectors

We have examined the employment within industries by Statistical Local Areas (SLA's) between 2001 and 2006. This has been carried out using the super groups identified above (in Table 8). The results are shown in Table 9 below. The key points from this table are:

- Overall employment within the industrial sector has decreased by 3.2% across the study area between 2001 and 2006. This is evident for 26 out of 39 SLA's. In particular SLA's located in the Northern Middle and Western regions have experienced a significant decline in employment. This suggests that the Western suburbs which already are relatively disadvantaged from a socio-economic perspective (see Section 5.6) and have significant concentration of industrial jobs are likely to be at a higher risk of being marginalised.
- The majority of SLA's have experienced an increase in employment in the **professional** industries. Significantly, the development of the Melbourne Southland-Docklands SLA has seen an increase in professional industries by 102.3%, this is expected due to the low starting base at pre-development phase.
- Employment in **service** industry jobs have increased at a comparable rate for both the study area (12.5%) and the Metropolitan Melbourne (13.9%) area. All SLA's experienced an increase in service industry jobs except for Moonee Valley Essendon (-9.2%) and Nillumbik South (-3.9%).
- Employment in **retail** industries within the study area and the Metropolitan Melbourne area has increased by only 4.8% and 5.3% respectively. While this is the case, the majority of SLA's experienced an increase in employment.
- **Other** services experienced a decrease in employment within both the study area (-3.6%) and the Melbourne Metropolitan area (-5.7%). This was most evident within Inner Melbourne with 6 of the 8 SLA's experiencing a significant decrease in employment.





Region	SLA	Industry	Professional	Service	Retail	Other
	Melbourne (C) - Inner	7.1	6.3	3.5	2.6	-4.6
ner	Melbourne (C) - Remainder	-7.1	-4.2	17.1	-1.2	-19.0
	Melbourne (C) - S'bank-D'lands	-5.7	102.3	25.4	3.5	48.5
Sthrn Inner	Port Phillip (C) - St Kilda	-5.5	12.3	2.7	-4.3	-12.8
	Port Phillip (C) - West	-1.5	12.4	1.1	4.3	-37.6
	Stonnington (C) - Prahran	-23.4	-3.5	3.3	0.9	-29.8
	Yarra (C) - North	-20.7	19.5	7.8	-0.2	-30.0
	Yarra (C) - Richmond	-17.2	30.6	13.5	18.8	42.8
ırn	Glen Eira (C) - Caulfield	-8.2	-1.1	6.2	-8.7	42.0
Sth	Stonnington (C) - Malvern	2.3	6.2	12.5	24.3	-1.8
S	Boroondara (C) - Camberwell N.	-4.0	9.9	6.9	-0.4	79.0
Middle	Boroondara (C) - Camberwell S.	13.5	1.6	14.6	-5.9	-9.3
	Boroondara (C) - Hawthorn	-11.2	19.6	3.6	17.4	-0.2
Aid	Boroondara (C) - Kew	-16.9	15.3	3.5	-5.6	78.4
2 2	Manningham (C) - East	12.3	-6.9	14.4	14.3	-18.4
Eastern	Manningham (C) - West	-2.6	-3.5	15.0	1.2	-3.7
	Whitehorse (C) - Box Hill	-14.7	13.9	18.5	-6.2	17.0
	Whitehorse (C) - Nunawading E.	-3.2	7.6	5.4	-20.6	-5.0
	Whitehorse (C) - Nunawading W.	-2.4	2.6	16.2	4.1	67.1
0	Banyule (C) - Heidelberg	-11.7	3.3	21.4	1.8	-20.5
	Banyule (C) - North	2.7	8.8	19.5	0.2	-0.9
Μi	Darebin (C) - Northcote	-12.6	14.0	18.9	3.4	-7.8
u.	Darebin (C) - Preston	-8.7	18.9	10.6	2.5	1.5
th	Moreland (C) - Brunswick	-22.6	0.0	15.1	-1.8	-14.7
Norther	Moreland (C) - Coburg	-29.1	5.8	1.6	-9.2	8.8
	Moreland (C) - North	46.3	31.8	28.2	25.9	-22.4
	Brimbank (C) - Keilor	18.0	35.0	21.7	29.4	16.0
Western Northern Middle	Brimbank (C) - Sunshine	19.4	34.1	13.2	-4.5	55.2
ern	Hobsons Bay (C) - Altona	13.0	32.8	13.2	-3.2	1.0
est	Hobsons Bay (C) - Williamstown	-20.1	26.0	9.4	7.1	6.1
≥	Maribyrnong (C)	-23.6	7.6	16.9	11.2	-35.5
	Moonee Valley (C) - Essendon	-7.3	14.7	-9.2	12.7	-2.6
	Moonee Valley (C) - West	-11.6	23.6	6.2	-1.7	-34.1
8	Maroondah (C) - Ringwood	-10.3	12.6	16.3	9.9	-13.8
rin	Melton (S) - East	183.6	187.2	250.7	583.1	39.5
1 pc	Nillumbik (S) - South	-8.1	-6.1	-3.9	0.6	13.9
rar	Nillumbik (S) - South-West	12.7	26.5	19.9	28.3	7.0
ute	Wyndham (C) - North	41.0	29.9	21.2	29.7	4.4
ō	Wyndham (C) - South	47.5	80.9	141.3	90.6	0.3
	Study Area Total	-3.2	11.3	12.5	4.8	-3.6
	Melbourne SD	1.6	11.9	13.9	5.3	-5.7

Table 9Growth in Employment (%), 2001-2006

Source: Census 2006 and SGS





6.4 Levels of Specialisation

Table 10 overleaf shows the industry representation index for the study area as a whole and individual SLA within the study area. By comparing the proportion of jobs in each industry type in the study area to the proportion of jobs in that industry in metropolitan Melbourne, an industry representation index is derived. A ratio above 1.0 indicates an over-representation of people employed in that sector while a ratio of less than 1.0 indicates an under-representation of people employed in the sector.

The key points from this analysis are as follows:

- The study area has a slight over-representation of people employed within **service** industries (1.1). Those SLA's which are over-represented in terms of this type of employment are fairly evenly distributed except for the Western region where only 2 out of 7 SLA's are over-represented in terms of this employment.
- The area also has an over-representation of people employed in **professional** industries (1.3). This is particularly the case in the Inner and Eastern Middle regions.
- The study area has a consistent representation of people employed in **retail** jobs (1.0) compared to metropolitan Melbourne. Just over half (22) of the SLA's have an over-representation of people employed in retail jobs while 17 SLA's are under-represented.
- The study area has an under-representation of people employed within **industrial** jobs (0.8) when compared to metropolitan Melbourne as a whole. However, there is a clear over-representation of people employed in industrial jobs within the Western region. Regions particularly under-represented in terms of industrial employment include the Eastern Middle, Southern and Inner regions.





Region	SLA	Industry	Professional	Service	Retail	Other
	Melbourne (C) - Inner	0.3	2.7	0.3	0.7	2.6
Melbourne Melbourne Melbourne Port Phillip Port Phillip	Melbourne (C) - Remainder	0.7	1.2	1.5	0.5	0.9
	Melbourne (C) - S'bank-D'lands	0.5	1.9	1.1	0.6	1.4
sthrn Inner	Port Phillip (C) - St Kilda	0.5	1.6	1.0	1.1	0.7
	Port Phillip (C) - West	0.9	1.8	0.7	0.6	1.2
	Stonnington (C) - Prahran	0.5	1.1	1.1	1.6	0.6
	Yarra (C) - North	0.9	0.9	1.4	0.9	0.3
	Yarra (C) - Richmond	0.6	1.4	0.9	1.2	1.5
ırn	Glen Eira (C) - Caulfield	0.5	0.9	1.8	1.0	0.3
Sth	Stonnington (C) - Malvern	0.4	0.8	1.3	1.8	0.3
	Boroondara (C) - Camberwell N.	0.5	1.2	1.4	1.1	0.9
Eastern Middle	Boroondara (C) - Camberwell S.	0.6	1.2	1.3	1.2	0.4
	Boroondara (C) - Hawthorn	0.5	1.4	1.0	1.4	0.7
	Boroondara (C) - Kew	0.4	1.2	1.9	0.7	0.3
	Manningham (C) - East	0.9	0.7	1.3	1.1	1.0
	Manningham (C) - West	0.6	0.8	1.3	1.7	0.4
	Whitehorse (C) - Box Hill	0.5	1.1	1.6	0.7	1.5
	Whitehorse (C) - Nunawading E.	1.1	0.8	1.0	1.0	1.4
	Whitehorse (C) - Nunawading W.	0.9	0.8	1.1	1.3	0.6
	Banyule (C) - Heidelberg	0.7	0.7	1.9	0.7	0.3
Idle	Banyule (C) - North	0.6	0.6	1.3	1.8	0.3
Mic	Darebin (C) - Northcote	1.1	0.6	1.3	1.1	0.4
5	Darebin (C) - Preston	1.1	0.6	1.2	1.2	0.8
the	Moreland (C) - Brunswick	1.3	0.6	1.0	1.2	0.2
Nor	Moreland (C) - Coburg	1.1	0.7	1.2	1.0	0.2
	Moreland (C) - North	0.9	0.6	1.5	1.1	0.2
	Brimbank (C) - Keilor	1.4	0.5	0.9	1.1	0.5
	Brimbank (C) - Sunshine	1.5	0.5	0.9	0.8	1.3
srn	Hobsons Bay (C) - Altona	2.0	0.5	0.5	0.8	0.3
este	Hobsons Bay (C) - Williamstown	1.3	0.8	0.9	0.9	0.6
Š	Maribyrnong (C)	1.1	0.5	1.2	1.3	0.3
	Moonee Valley (C) - Essendon	0.5	1.3	1.2	1.3	0.5
	Moonee Valley (C) - West	1.0	0.6	0.9	1.7	0.3
ge	Maroondah (C) - Ringwood	0.7	0.6	1.3	1.6	0.2
rin	Melton (S) - East	1.3	0.5	1.3	0.8	0.5
E PC	Nillumbik (S) - South	0.8	0.7	1.3	1.3	0.5
r ar	Nillumbik (S) - South-West	0.7	0.8	1.4	1.2	1.0
ute	Wyndham (C) - North	1.5	0.6	0.7	1.0	0.5
ō	Wyndham (C) - South	0.9	0.6	0.9	1.0	4.6
	Study Area Total	0.8	1.3	1.1	1.0	1.0
	Melbourne SD	1	1	1	1	1

Table 10 Industry Representation Index, 2006

Source: Census 2006 and SGS




6.5 Key Sectors

We have undertaken further analysis to identify the key sectors for the study area and the results are shown in Table 11, Table 12 and Table 13 below (spread across three tables). We have used employment data based on ANZSIC classification at a 3 digit level to identify those sectors which have grown rapidly between 2001 and 2006 (those sectors which have grown by 10% or more) and those which are growing slowly (that is increased by less than 10%) or declining. We have then used the industry representation index as described in Section 6.4 above, to identify those sectors which have an under (LQ<1) or overrepresentation (LQ>1) of employment in these sectors when compared to Melbourne as a whole.

The results can be read as follows:

- **Table 11 Left Quadrant** strategic industries to focus on in the future. These are industries that are growing rapidly and in which the study area has a comparative advantage compared to Melbourne as a whole.
- **Table 11 Right Quadrant** potentially strategic industries for the future. These are industries that are growing rapidly but the study area does not have a specialisation or over representation of employment in these industries compared to Melbourne as a whole. These may become key sectors in the future.
- **Table 12 Left Quadrant** these can be considered 'sunset industries' because employment in these sectors has been declining. However, the study area does have an over-representation of employment in these sectors compared to Melbourne as a whole.
- **Table 12 Right Quadrant** these are non-strategic industries. Employment in these industries is declining and the study area is under-represented in terms of employment in these sectors compared to Melbourne as a whole.

The results show that key sectors for future focus within the study area are spread across a number of industries but included specific sectors within each as follows:

- Services to Agriculture; Hunting and Trapping, undefined
- Oil and Gas Extraction
- Mining, nec
- Beverage and Malt Manufacturing
- Publishing
- Recorded Media Manufacturing and Publishing
- o Electricity Supply
- Textile, Clothing and Footwear Wholesaling
- Clothing and Soft Good Retailing
- Accommodation, Cafes and Restaurants, undefined
- Pubs, Taverns and Bars
- Rail Transport
- Services to Road Transport

- Services to Water Transport
- Communication Services, undefined
- Finance, undefined
- Services to Finance and Investment
- Services to Insurance
- Property Operators and Developers
- Non-Financial Asset Investors
- Other Business Services
- Government Administration, undefined
- Government Administration
- Defence
- o Education, undefined
- Post School Education





- Hospitals and Nursing Homes
- Other Health Services
- Community Services, undefined
- Community Care Services
- o Museums

- \circ $\,$ Services to the Arts $\,$
- $\circ \quad \text{Sport and Recreation, undefined}$
- o Interest Groups
- Public Order and Safety Services

A large number of sectors within the manufacturing industry have been identified as underrepresented within the study area and either growing slowly or declining. While these could be considered to be less important for the future (that is those within the right quadrant of Table 12), as noted above (see Section 6.3) this declining trend in the Western suburbs is likely to put them at a higher risk of being marginalised.





	Location Quotient > 1	Location Quotient < 1			
Industries	A00 Agriculture, Forestry and Fishing	A00 Agriculture, Forestry and Fishing			
that are	020 Services to Agriculture; Hunting and Trapping, undefined	016 Other Crop Growing			
Growing	B00 Mining	B00 Mining			
Rapidly	120 Oil and Gas Extraction	141 Construction Material Mining			
	142 Mining, nec	152 Other Mining Services			
	C00 Manufacturing	C00 Manufacturing			
	218 Beverage and Malt Manufacturing	211 Meat and Meat Product Manufacturing			
	242 Publishing	212 Dairy Product Manufacturing			
	243 Recorded Media Manufacturing and Publishing	213 Fruit and Vegetable Processing			
	D00 Electricity, Gas and Water Supply	263 Cement, Lime, Plaster and Concrete Product Manufacturing			
	361 Electricity Supply	275 Sheet Metal Product Manufacturing			
	F00 Wholesale Trade	D00 Electricity, Gas and Water Supply			
	472 Textile, Clothing and Footwear Wholesaling	362 Gas Supply			
	G00 Retail Trade	370 Water Supply, Sewerage and Drainage Services			
	522 Clothing and Soft Good Retailing	D00 Electricity, Gas and Water Supply, undefined			
	H00 Accommodation, Cafes and Restaurants	E00 Construction			
	570 Accommodation, Cafes and Restaurants, undefined	411 Building Construction			
	572 Pubs, Taverns and Bars	412 Non-Building Construction			
	IOO Transport and Storage	422 Building Structure Services			
	620 Rail Transport	F00 Wholesale Trade			
	661 Services to Road Transport	470 Personal and Household Good Wholesaling, undefined			
	662 Services to Water Transport	F00 Wholesale Trade, undefined			
	J00 Communication Services	G00 Retail Trade			
	710 Communication Services, undefined	520 Personal and Household Good Retailing, undefined			
	K00 Finance and Insurance	G00 Retail Trade, undefined			
	730 Finance, undefined	100 Transport and Storage			
	751 Services to Finance and Investment	611 Road Freight Transport			
	752 Services to Insurance	650 Other Transport			
	K00 Finance and Insurance, undefined	670 Storage			
	LOO Property and Business Services	L00 Property and Business Services			
	771 Property Operators and Developers	774 Machinery and Equipment Hiring and Leasing			
	773 Non-Financial Asset Investors	N00 Education			
	786 Other Business Services	842 School Education			
	M00 Government Administration and Defence	O00 Health and Community Services			
	810 Government Administration, undefined	871 Child Care Services			
	811 Government Administration	P00 Cultural and Recreational Services			
	820 Defence	931 Sport			
	N00 Education	Q00 Personal and Other Services			
	840 Education, undefined	961 Religious Organisations			
	843 Post School Education				
	O00 Health and Community Services				
	861 Hospitals and Nursing Homes				
	863 Other Health Services				
	870 Community Services, undefined				
	872 Community Care Services				
	P00 Cultural and Recreational Services				
	922 Museums				
	925 Services to the Arts				
	930 Sport and Recreation, undefined				
	Quu Personal and Other Services				
	962 Interest Groups				
	963 Public Order and Safety Services				

Key Sectors (Growing Rapidly), 2006 Table 11





	Location Quotient > 1		Location Quotient < 1
Industries	B00 Mining		A00 Agriculture, Forestry and Fishing
that are	110 Coal Mining		010 Agriculture, undefined
Growing	131 Metal Ore Mining		011 Horticulture and Fruit Growing
Slowly or	151 Exploration		012 Grain, Sheep and Beef Cattle Farming
Declining	B00 Mining, undefined		013 Dairy Cattle Farming
	C00 Manufacturing		014 Poultry Farming
	214 Oil and Fat Manufacturing		015 Other Livestock Farming
	224 Clothing Manufacturing		021 Services to Agriculture
	225 Footwear Manufacturing		022 Hunting and Trapping
	251 Petroleum Refining		030 Forestry and Logging
	253 Basic Chemical Manufacturing		040 Commercial Fishing, undefined
	G00 Retail Trade		041 Marine Fishing
	521 Department Stores		042 Aquaculture
	H00 Accommodation. Cafes and Restaurants		A00 Agriculture. Forestry and Fishing, undefined
	571 Accommodation		B00 Mining
	573 Cafes and Restaurants		140 Other Mining, undefined
	100 Transport and Storage		150 Services to Mining, undefined
	630 Water Transport		C00 Manufacturing
	664 Other Services to Transport		210 Food, Beverage and Tobacco Manufacturing, undefined
	J00 Communication Services		215 Flour Mill and Cereal Food Manufacturing
	712 Telecommunication Services		216 Bakery Product Manufacturing
	K00 Finance and Insurance		217 Other Food Manufacturing
	731 Central Bank	_	219 Tobacco Product Manufacturing
	732 Deposit Taking Financiers		220 Textile Clothing Footwear and Leather Manufacturing undefine
	733 Other Financiers	_	220 Textile, electring, rootwear and Leather Manafacturing, and emit
	734 Einancial Asset Investors		222 Textile Product Manufacturing
	740 Insurance undefined	_	222 Featine Produce Manadaceding
	740 Institute, underlined		226 Leather and Leather Product Manufacturing
	742 Other Insurance		230 Wood and Paper Product Manufacturing undefined
	750 Services to Finance and Insurance undefined	_	231 Log Sawmilling and Timber Dressing
	ION Property and Business Services		232 Other Wood Product Manufacturing
	770 Property Services undefined	_	233 Paper and Paper Product Manufacturing
	772 Real Estate Agents		240 Printing Publishing and Recorded Media undefined
	780 Business Services undefined		241 Printing and Services to Printing
	781 Scientific Research	_	250 Petroleum Coal Chemical and Associated Product Manufacturin
	782 Technical Services		252 Petroleum and Coal Product Manufacturing, nec
	782 Computer Services		252 Other Chemical Product Manufacturing
	784 Legal and Accounting Services		255 Rubber Product Manufacturing
	785 Marketing and Business Management Services		256 Plastic Product Manufacturing
	100 Property and Business Services undefined	_	260 Non-Metallic Mineral Product Manufacturing undefined
	M00 Government Administration and Defence		261 Glass and Glass Product Manufacturing
	812 Justice		262 Ceramic Product Manufacturing
	813 Foreign Government Representation	_	264 Non-Metallic Mineral Product Manufacturing nec
	M00 Government Administration and Defence undefined		270 Metal Product Manufacturing undefined
	844 Other Education	-	270 Metal Froduct Manufacturing, underlined
	On Health and Community Services		272 Basic Non-Ferrous Metal Manufacturing
	860 Health Services undefined		273 Non-Ferrous Basic Metal Product Manufacturing
	862 Medical and Dental Services		274 Structural Metal Product Manufacturing
		-	276 Fabricated Metal Product Manufacturing
			280 Machinery and Equipment Manufacturing undefined
			281 Motor Vehicle and Part Manufacturing
			201 Word Venicle did Part Wandiduuning
		1	202 Other Hansport equipment Manufacturing

Table 12 Key Sectors (Growing Slowly/Declining), 2006





Table 13	Key Sectors	(Growing	Slowly/I	Declining),	2006 -	Continued
		(

	Location Quotient > 1	Location Quotient < 1		
ta da 11	DOD Cultural and Descentional Complete	COO Manufacturing		
Industries	POU Cultural and Recreational Services	COU Manufacturing		
that are Growing	910 Motion Picture, Radio and Television Services, underined	283 Photographic and Scientific Equipment Manufacturing		
Slowly or	912 Radio and Television Services	285 Electrical Equipment and Appliance Manufacturing		
Declining	920 Libraries Museums and the Arts undefined	286 Industrial Machinery and Equipment Manufacturing		
Deciming	921 Libraries	290 Other Manufacturing, undefined		
	923 Parks and Gardens	291 Prefabricated Building Manufacturing		
	924 Arts	292 Furniture Manufacturing		
	932 Gambling Services	294 Other Manufacturing		
	P00 Cultural and Recreational Services, undefined	C00 Manufacturing, undefined		
	Q00 Personal and Other Services	D00 Electricity, Gas and Water Supply		
	950 Personal Services, undefined	360 Electricity and Gas Supply, undefined		
	970 Private Households Employing Staff	E00 Construction		
	Q00 Personal and Other Services, undefined	410 General Construction, undefined		
		420 Construction Trade Services, undefined		
		421 Site Preparation Services		
		423 Installation Trade Services		
		424 Building Completion Services		
		425 Other Construction Services		
		E00 Construction, undefined		
		F00 Wholesale Trade		
		450 Basic Material Wholesaling, undefined		
		451 Farm Produce Wholesaling		
		452 Mineral, Metal and Chemical Wholesaling		
		453 Builders Supplies Wholesaling		
		460 Machinery and Motor Vehicle Wholesaling, undefined		
		461 Machinery and Equipment Wholesaling		
		462 Motor Vehicle Wholesaling		
		471 Food, Drink and Tobacco Wholesaling		
		473 Household Good Wholesaling		
		479 Other Wholesaling		
		G00 Retail Trade		
		510 Food Retailing, undefined		
		511 Supermarket and Grocery Stores		
		512 Specialised Food Retailing		
		523 Furniture, Houseware and Appliance Retaining		
		524 Recreational Good Retaining		
		525 Other Personal and Household Good Retaining		
		520 Motor Vehicle Retailing and Services undefined		
		531 Motor Vehicle Retailing		
		532 Motor Vehicle Services		
		H00 Accommodation. Cafes and Restaurants		
		574 Clubs (Hospitality)		
		100 Transport and Storage		
		610 Road Transport, undefined		
		612 Road Passenger Transport		
		640 Air and Space Transport		
		660 Services to Transport, undefined		
		663 Services to Air Transport		
		100 Transport and Storage, undefined		
		J00 Communication Services		
		711 Postal and Courier Services		
		N00 Education		
		841 Preschool Education		
		O00 Health and Community Services		
		864 Veterinary Services		
		O00 Health and Community Services, undefined		
		P00 Cultural and Recreational Services		
		933 Other Recreation Services		
		Q00 Personal and Other Services		
		951 Personal and Household Goods Hiring		
		952 Other Personal Services		
		960 Other Services, undefined		





6.6 Occupational profile

The occupational profile of the study area compared to the whole of Melbourne is illustrated in Table 14 below. The study area shows a similar occupational profile to the Melbourne Metropolitan area with a higher proportion of people employed in professional occupations (28.2%), followed by clerical and administrative workers (18.5%) and managers (13.7%).

Table 14Occupational Structure for Study Area compared to Melbourne SD,2006

	Study Area		Melbourne SD	
	Employees	% of Total	Employees	% of Total
Managers	126,023	13.7	202,920	13.3
Professionals	259,523	28.2	366,448	24.1
Technicians and Trades Workers	95,622	10.4	186,733	12.3
Community and Personal Service Workers	76,481	8.3	124,308	8.2
Clerical and Administrative Workers	170,198	18.5	260,709	17.1
Sales Workers	92,217	10.0	161,422	10.6
Machinery Operators And Drivers	41,974	4.6	96,662	6.4
Labourers	57,412	6.2	122,651	8.1
Total	919,450	100	1,521,853	100

Source: Census 2006

For the purpose of the remainder of this analysis, the occupations have been grouped into three categories as follows⁵:

- **Symbolic Analysts** that is, Managers and Administrators together with professional workers
- In-person Service Workers that is Associate Professionals, Advanced Clerical and Service Workers, Intermediate Clerical, Sales and Service Workers and Intermediate Production and Transport Workers
- **Routine Production Workers** that is Elementary Clerical, Sales and Service Workers, Labourers and Related workers and Tradespersons and Related workers

Figures 35 to 37 below provide a greater insight into the geographical spread of occupations employed within each SLA across the study area. The key points from these maps are:

⁵ We have used the definition for various Reich's categories as given in Scott B, et al. (1999), Community opportunity and vulnerability in Australia's cities and towns : characteristics, patterns and implications, Brisbane : University of Queensland Press for the Australian Housing and Urban Research Institute.





- There is a definite concentration of **Symbolic Analysts** employed within the central area with 16.1% employed within Melbourne Inner and 10.8% employed within Melbourne Remainder.
- There is also a concentration of **In-Person Service** workers within Melbourne Inner (16.6%) and Melbourne Remainder (9.4%) spreading out to Port Phillip West, Yarra North and Maribyrnong.
- There is a more dispersed spread of **Routine Production** workers but with higher concentration in the Western suburbs. Specifically, Brimbank –Sunshine, Maribyrnong and Darebin –Preston recorded significant number of routine production workers.



Figure 35 Symbolic Analysts

Source: Census 2006 and SGS







Figure 36 In-Person Service Workers



Source: Census 2006 and SGS







Source: Census 2006 and SGS

6.7 Workers Place of Residence

Figure 38 below shows where people working within the study area reside. The highest proportions reside in Manningham West (2.7%), Kingston North (2.6%) and Casey –Berwick (2.5%). There are also concentrations of workers within the west, south east and north east of the study area.







Figure 38 Workers Place of Residence

Source: Census 2006 and SGS





6.8 Economic Contribution of the Study Area

Table 15 below shows the overall value of economic output for the study area and its contribution to the metropolitan Melbourne and Victorian economies. This shows that within the sectors outlined below, the study area contributes \$89,378 million to Victorian Gross State Product (GSP). This equates to 63% of the total for Melbourne and nearly half of the Victorian GSP.

Property and Business Services accounts for the highest contribution to GDP (22%) followed by Finance and Insurance (15.5%) (principally due to the significant concentration of these sectors in Melbourne-Inner), and Manufacturing (10.3%).

	Study Area	Contribution to Wider Area		
	Contribution	Melbourne SD	Victoria	
	(\$m)	(%)	(%)	
Agric., forestry & fishing	\$205.2	22.2	3.3	
Mining	\$1,158.0	69.7	33.3	
Manufacturing	\$9,198.6	41.1	32.4	
Elec., gas, & water supply	\$2,376.0	64.7	39.7	
Construction	\$4,900.8	50.0	36.7	
Wholesale trade	\$4,902.3	47.8	40.1	
Retail trade	\$5,122.7	56.0	41.4	
Accomm., cafes & restaurants	\$1,793.3	69.1	50.0	
Transport & storage	\$3,896.4	56.2	45.8	
Communication services	\$4,452.1	74.7	64.5	
Finance & insurance	\$13,848.1	86.8	78.0	
Property & business services	\$19,458.5	77.3	67.9	
Govt admin. & defence	\$2,689.0	75.0	55.0	
Education	\$4,764.2	60.2	45.2	
Health & community services	\$6,735.3	64.9	47.5	
Cultural & recreation services	\$2,100.5	75.0	62.1	
Personal & other services	\$1,777.6	65.0	49.7	
Total	\$89,378.6	63.0	48.6	

Table 15Economic Output (GDP) and Contribution to Wider Areas, 2006

Source: SGS





6.9 Summary of Key Points

The key points from this analysis and implications for an East-West Link are summarised below:

Industrial Structure

Professional Industries

- Property and Business Services is a key sector for the study area accounting for the highest proportion of overall employment;
- We have looked at Professional Industries (incorporating property and business services⁶) and our analysis shows that there is a significant over-representation of these types of jobs within the central area and Melbourne Inner SLA in particular (compared to metropolitan Melbourne). Employment in Professional Industries is also increasing at a higher rate compared to other sectors. As such, it is a key sector for the study area.

Industry

- Manufacturing accounts for a lower level of employment within the study area compared to Metropolitan Melbourne
- We have looked at industrial employment⁷ and this sector has experienced a decline in employment (between 2001 and 2006). Furthermore, employment in this sector declined for more than half of the SLA's. The study area has an under-representation of people employed within industrial jobs when compared to metropolitan Melbourne as a whole. However, this sector is of significance to the west of the study area, which has an over-representation of people employed in this sector.

Retail Industries

- There is a lower proportion of people within the study area employed within Retail Trade but a higher proportion employed within Accommodation, Cafes and Restaurants;
- Furthermore, the Retail Industry is the highest employer (as a percentage of all industries within the Metropolitan Melbourne area), while Property and Business Services is the highest within the study area.

Service Industries

- Higher proportion of people are employed in the study area within Health and Community Services, Cultural and Recreational Services and Personal and Other Services.
- Employment in service industry jobs have increased at similar rate for both the study area and the Metropolitan Melbourne area. However, the study area has a significant over-representation in employment within this sector compared to the Metropolitan Melbourne.



⁶ Together with Finance and Insurance and Government Administration and Defence

⁷ Incorporating Manufacturing, Construction, Retail Trade and Transport and Storage



Other Industries

- Overall, across both the study area and the Melbourne Metropolitan area "Other Industries" has experienced a decrease in employment (between 2001 and 2006).
- The study area shows an equal representation in employment within this sector when compared to Metropolitan Melbourne. SLA's which experience a significant over representation in employment include Wyndham South and Melbourne Inner.

Occupational Profile

- The study area has a similar occupation profile to the Metropolitan Melbourne area. However, a higher proportion of people are employed as professionals within the study area and slightly lower proportions employed in lower level occupations.
- We have examined the geographical spread of Symbolic Analysts⁸ and In Person Service workers⁹ and they have a major concentration within the central areas of Melbourne
- Routine Production workers¹⁰ generally speaking are more widely dispersed across the study area but with higher concentration in the Western suburbs.

Workers Place of Residence

- Few people who work in the study area live within the Melbourne Inner and Melbourne Remainder SLA's where the majority of jobs are located.
- The highest proportions reside in Manningham West (2.7%), Kingston North (2.6%) and Casey –Berwick (2.5%).
- There are also concentrations of workers within the west, south east and north east of the study area.

Economic Contribution of the Study Area

- The study area makes a significant contribution to Victorian GSP (\$89,378 across 17 ANZSIC Industries).
- This equates to 63% of the total for Melbourne and nearly half of the Victorian GSP.
- Property and Business Services accounts for the highest contribution to GDP (22%), followed by Finance and Insurance (15.5%) and Manufacturing (10.3%).

⁸ Incorporating Managers and Administrators together with Professional workers

⁹ Incorporating Associate Professionals, Advanced Clerical and Service Workers, Intermediate Clerical, Sales and Service Workers and Intermediate Production and Transport Workers

 $^{^{\}rm 10}$ That is Elementary Clerical, Sales and Service Workers, Labourers and Related workers and Tradespersons and Related workers



7 Conclusions

7.1 Need for an East West Link

The research reported in this working paper points to a profound and continuing east west divide in metropolitan Melbourne's economic and social structure. While, recent initiatives including the completion of the Western Ring Road and its connection to CityLink have begun to 'rebalance' Melbourne in line with planning aspirations expressed since the 1950's, outcomes in the northern and western suburbs remain strikingly different to those in the east and south, especially with respect to skills and educational attainment. As these are the vital factors in sustainable prosperity, both at the household and regional level, there is a prima facie case for accelerated infrastructure investment to further advance social and economic development in the west.

Especially with the completion of EastLink, the south eastern metropolitan sub-region will have a well defined radial structure potentially focussed on a revitalised Dandenong. In some contrast, the west is characterised by its strong corridor structure. As discussed earlier, the south western corridor enjoys a number of advantages in terms of attracting a more diverse population and establishing a more robust employment base. These relate to the proximity to the Bay, the gentrification of Williamstown and surrounding areas, the chain of wetland environmental resources through the area and the relative accessibility to the Surf Coast. The second corridor, oriented towards Melbourne, has fewer such advantages. Indeed, parts of this corridor display both poor relative accessibility and high socio-economic vulnerability.

Strategies to break down the east west divide must address accessibility and connectivity for this 'greater Melton corridor'.

These issues can be viewed more broadly, in terms of the spatial and economic structure required for metropolitan Melbourne to be globally competitive.

Bearing in mind the established findings in the literature regarding the costs of different urban forms, and the emergent conclusions regarding urban form and the propensity for innovation, what would be the 'ideal' spatial structure for a post industrial city like Melbourne? (SGS, 2007)

At the highest level of resolution, we believe that the literature points clearly to a metropolitan regional structure characterised by strong sub-regional 'CBD's' to ensure that the whole region is keyed to the knowledge economy, not just the urban core (Figure 39). Melbourne 2030 is broadly consistent with this prescription for a poly-nucleated, compact urban form.







Figure 39 Regional Metropolitan Structure



Elaborating this broad settlement pattern in terms of other messages from the literature, further desirable elements for the spatial structure of the competitive metropolis include:

- The need to link the sub-regional CBD's with quality public transport to ensure that the whole metropolis enjoys maximum accessibility to the regional skills pool;
- The need to optimise road space usage, including through pricing or similar devices to, again, improve access to skills for all points in the Melbourne regional geography, facilitate physical productions flows and contain the exposure of regional businesses to carbon pricing; and
- The need to develop 'employment zones' as opposed to traditional manufacturing, warehousing and commercial typologies which fail to appreciate the unbundling of value chains and the blurring of production and service functions in the economy (Figure 40)







Figure 40 Elements of Competitive Regional Structure

Contemplating this issue of an ideal urban structure from a *district* or *sub-regional* perspective, other messages are apparent from the literature:

- The need for a strong CBD as an international shopfront for the regional economy and the host for high level cultural and civic institutions and facilities demanded by mobile knowledge workers;
- Strong 'place quality' in suburban activity centres, recognising the growing importance of the public domain street life and urban character in the attraction and retention of knowledge workers;
- A diverse housing mix configured so as to energise activity centres and to facilitate home based and micro businesses; and
- Strong connectivity to the airport¹¹.

Given our brief, SGS has considered the question of 'need' for an East West Link primarily from the perspective of restructuring the pattern of urban settlement in Melbourne to overcome socio-economic division in the metropolis and deliver a more competitive regional



 $^{^{11}}$ Availability of high capacity broadband could be added to this list, though this is not, strictly speaking an 'urban structure' issue.



economy. This is a different approach from analysing current and predicted travel demands, and seeking to cater for these cost-effectively.

Based on the work carried out to date, SGS has identified one potential option for consideration in subsequent stages of the project. We are proposing the 'Bell Street Light Rail' concept, a concept which has originated from these 'urban structure' perspectives and which can also be justified on the grounds of existing planning policy, namely *Melbourne 2030*. This, calls for designated activity centres (especially the 'Principal' and 'Major' Activity centres) to be connected by public transport:

'This network (of activity centres) will comprise a range of centres of varying sizes and function that are linked with a strategic public transport network.'

Amongst the 'main issues that affect activity centres' is:

'Poor integration with public transport.' Some specialised employment clusters such as tertiary institutions, hospitals, and office parks have been established in relative isolation, as have some major shopping and entertainment clusters. This reduces the potential for integrating transport facilities and encouraging people to travel to them by means other than car'

A key objective of the future development of activity centres is (amongst others):

'supporting the development of the Principal Public Transport Network (PPTN)' (Implementation Plan 4: Activity Centres 2002, p.5)

Taking these policy perspectives into account, the 'Bell Street Light Rail' concept is shown in Figure 41 below.







Figure 41 Box Hill to Sydenham Light Rail

This concept reflects a two way spatial relationship; it would better service Melbourne's retail, employment & other strategic destinations with public transport, while stimulating the restructuring of Melbourne's activity centre network to facilitate public transport. In this context it is important to consider that fixed rail public transport is likely to have more powerful galvanising effect on urban development than other transit forms which may have operational advantages (eg 'Smart Buses')

The Bell Street light rail concept envisages a 'transit boulevard' using existing commodious rights of way, including the Calder Freeway, Tullamarine Freeway, Bell St, Manningham Rd, Williamsons Rd and Station St.

The termini for this light rail corridor would include:

- Deakin Univ/ Greenwood Office Pk (East); and
- Sydenham & Tullamarine Airport (West)

The route would interconnect with 6 radial rail corridors. A key benefit will be to facilitate shorter distance East West movements by public transport, as opposed to conveying public transport riders from the far eastern extremity of the corridor to the western most point. Nevertheless, the envisaged interweaving of the light rail and radial heavy rail corridors is expected to lead to better integration of labour markets across the west, north and east of Melbourne.





It is emphasised that the concept and term of 'transit boulevard' is introduced purposely to reflect the need to create a multi-mode transport corridor and this is not achievable by merely building a light rail track along an existing highway. Rather it requires development of an elegant 'multiway boulevard' (Jabobs, A et al. 2002, p.2) to be accompanied by purposeful restructuring of land uses along its length. How this can best be accomplished is a task of a subsequent stage in the project.

7.2 Assessing the Impacts of an East West Link

Based on the research reported in this working paper, SGS has considered how the demographic, social and land use impacts of any proposed East West link might be considered as part of a conventional social cost benefit analysis. The chart overleaf provides a preliminary view of relevant impacts and how they might be measured.

It should be noted that this is not intended as a comprehensive account of the impacts any East West Link. Many of the factors to be considered within the cost benefit analysis (namely travel and environmental impacts) fall within the briefs of other Study Team consultants.





Table 16 Impacts Matrix

Category of effect	Sub-category	Potential benefit (disbenefit) of the E-W Link vis a vis the Base Case	Indicators	\$ valuation
Demographic & Social	Residential amenity	Net improvement in dwelling amenity , especially in terms of dwellings exposed to freight traffic nuisance	Change in number of dwellings fronting onto roads with truck traffic exceeding a given number of vehicle movements per day	Apply a standard dwelling price discount for freight traffic exposed housing, as ascertained through a survey of real estate agents in each relevant neighbourhood
		Net reduction in the incidence of neighbourhood severance	Change in the count of neighbourhoods affected by severance	As above, but only for dwellings located on the severance routes.
	Community access to services and employment	Net improvement in access to shopping centres	Change in the aggregate amount of retail floorspace accessible to the average metropolitan household within a 10 minute car journey.	(1.) Apply the difference in median house price for metropolitan dwellings enjoying above average access to retail floorspace, health facilities, family and community services, education and training, parkland, public transport and jobs, versus metropolitan dwellings featuring below average access to these amenities and opportunities
			Change in the aggregate amount of retail floorspace accessible to the average metropolitan household within a 15 minute public transport journey.	Counted within (1.)
		Net improvement in access to health facilities	Change in the aggregate quantum of health facilities (proxied by health sector employment) accessible to the average metropolitan household within a 10 minute car journey.	Counted within (1.)
			Change in the aggregate quantum of health facilities (proxied by health sector employment) accessible to the average metropolitan household within 15 minute public transport journey.	Counted within (1.)
		Net improvement in access to family and community services	Change in the aggregate quantum of family and community services facilities (proxied by sector employment) accessible to the average metropolitan household within a 10 minute car journey.	Counted within (1.)
			Change in the aggregate quantum of family and community services facilities (proxied by sector employment) accessible to the average metropolitan household within a 15 minute public transport journey	Counted within (1.)
		Net improvement in access to education and training services	Change in the aggregate quantum of education and training services facilities (proxied by sector employment) accessible to the average metropolitan household within a 10 minute car journey.	Counted within (1.)
			Change in the aggregate quantum of education and training services facilities (proxied by sector employment) accessible to the average metropolitan household within a 15 minute public transport journey	Counted within (1.)
		Net improvement in access to parkland	Change in the quantum of parkland accessible to the average metropolitan household within a 15 minute walk	Counted within (1.)
		Net improvement in availability of public transport services	Change in the number of households with access to a given quality standard of public transport service	Counted within (1.)
		Net reduction in transport disadvantage	Change in the number of low income households with access to a given standard of public transport service	Counted within (1.)
			Change in the aggregate number of jobs available within a 20 minute car journey for households located in low SEIFA areas	Counted within (1.)
			Change in the aggregate number of jobs available within a 40 minute public transport journey for households located in low SEIFA areas	Counted within (1-)
	Diversity and polarisation	Net increase in social mix in each metropolitan sub-region	Change in the number of TZ's that have income distributions that are less equal (Gini Coefficient) than that for the metropolitan area as a whole. (Income distribution can be inferred from the locally accessible jobs mix)	Apply regression data relating productivity to Gini coefficient
Landscape and Land Use Impacts	Urban Form - Design & Sustainability	Net change in commercial vitality of activity centres within and outside the E-W corridor	Change in the number of centres with estimated RTD's falling below a specified 'efficiency threshold'	Apply a ratio of land value to RTD and measure the difference between the E-W link and base case scenarios
		Increase in urban consolidation	Net change in the proportion of housing built within infill and brownfield areas, as opposed to greenfield	Apply researched urban consolidation savings per dwelling
	Cultural Landscape	Net improvement in the (energy) sustainability of built form Conservation / enhancement of recognised	Change in level of embedded energy in built form environment & heritage consultants	Apply standard embedded energy rates per sq. m. of floorspace for different housing types
		cultural sites - European Conservation / enhancement of recognised	environment & heritage consultants	
	Open Space &	cultural sites - Indigenous	Change in quantity of available parkland	Apply standard value of parkland per so. m. based on
	Natural Landscape	Improved parkland quality	Change in quantity of parkland meeting given	literature searches Apply Parks Victoria standard valuations of parkland
		Enhancement of valued landscape	Parks Victoria quality standards. Not specified	quality margins
		features	-	



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