

ANALYSING MELBOURNE'S ENTERPRISE PRECINCTS

REPORT

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DELWP



SGS
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insight.



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GLOSSARY

Absorptive capacity is a business's ability to identify, acquire, transform and exploit knowledge that is external to the business. Measures such as R&D expenditure, number of researchers in the business and survey methods are used to measure absorptive capacity.

Agglomeration are external economies of scale and refer to the benefits gained by business and households from concentrating together in particular areas.

ANZSIC is the Australian and New Zealand Standard Industrial Classification.

Blue Collar occupations include trades workers, technicians, machinery and plant operators, road and rail drivers, cleaners and laundry workers, labourers, factory workers, farm workers and food preparation assistants.

CBD stands for Central Business District.

Convergence is about bringing together ideas from separate fields / industries or different technology platforms through bringing people together to work very closely, blurring organisational boundaries.

Effective Job Density (EJD) is a measure often used to represent agglomeration. EJD is a measure of the relative concentration of employment, derived from the density and accessibility (in terms of travel times) of all jobs across a region.

Gross Domestic Product (GDP) is the total market value of goods and services produced in an economy within a given period after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital.

GDP per capita is the ratio of GDP to the resident population for an economy.

GDP per hour worked is a measure of labour productivity. It measures how efficiently labour input is combined with other factors of production and used in the production process.

Gross State Product (GSP) is used to describe the GDP for a state.

Gross value added (GVA) is a term used to describe gross product by industry. Gross value added is the value of output at basic prices minus the value of intermediate consumption at purchasers' prices.

Industry gross value added (IGVA) describes the total value of goods and services produced by an industry, after deducting the cost of goods and services used up in the process of production.

Inner Melbourne suburbs within 15 kilometres of the Hoddle Grid.

Innovation is the implementation of a new or improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. It can be thought of improvements to a firm's Products, Process, Organisation and Marketing.

Innovation ecosystem is business, researchers and government interacting with each other. Three components of the innovation system (networks, innovation activities and framework conditions) collectively function to produce and diffuse innovations that, in aggregate, help to boost productivity within an economy.

Knowledge-based economy encompasses research and development, design, engineering, marketing, advertising and creative industries, as well as more traditional jobs such as lawyers, bankers, financiers, doctors and management consultants.

Labour productivity measures the amount of goods and services produced by one hour of labour.

Multifactor Productivity (MFP) estimates the amount of goods and services by produced by each unit of labour and capital.

Productivity is the efficiency with which firms, organisations, industry, and the economy as a whole, convert inputs (labour, capital, and raw materials) into output. Productivity grows when output grows faster than inputs, which makes the existing inputs more productively efficient. It is measured via Labour productivity, Capital productivity and Multifactor productivity.

Research & Development (R&D) is the systematic investigation or experimentation involving innovation or technical risk, the outcome of which is new knowledge, with or without a specific practical application, or new or improved products, processes, materials, devices or services. R&D activity extends to modifications to existing products/processes. R&D activity ceases and pre-production begins when work is no longer experimental.

White Collar – High Skilled occupations include chief executives, managers, legislators, and professionals across a range of industries, including business, HR and marketing, design, engineering, science and transport, education, health, ICT, legal, social and welfare professionals.

White Collar – Low Skilled occupations include hospitality, retail and service managers, arts and media professionals, health and welfare support workers, protective service workers, sports and personal service workers, office managers and program administrators, clerical workers, receptionists, office support workers, sales representatives and sales agents.

EXECUTIVE SUMMARY

Plan Melbourne identifies that to remain competitive in a changing economy there is a need to boost innovation and productivity, and support growth across all industries. Facilitating the evolution of the economy will be critical to support the creation of new jobs. Planning plays an important role, however facilitating the future growth of Melbourne goes beyond spatial visioning or developing regulations around the location, type and density of development, and must be supported by wider policy levers available to government.

The global and Melbourne economies have been transformed over the past two decades by interactive forces that include the technological revolution, globalisation and reduced trade barriers. Globalisation has blurred national borders and increased competition for talent; free trade has enhanced economic integration and the technological revolution has disrupted all industries. In this new economy, economic growth and development is being driven by a complex structural realignment of business investment, the clustering of enterprises, the transformation of the production process and the adoption of niche marketing approaches. This has resulted in the economy of Melbourne experiencing a broad decline in the relative importance of large scale manufacturing, growth in logistics and a strong shift towards the knowledge economy, including health and education services.

In the past, Melbourne's competitive advantage was found in large scale manufacturing in the outer suburbs, now Inner Melbourne is Victoria's gateway to the global economy. Inner Melbourne is home to an increasing number of knowledge-based jobs. These jobs encompass research and development, design, engineering, marketing, advertising and creative industries, as well as more traditional jobs such as lawyers, financiers, doctors and management consultants.

Many of these activities overlap with production and manufacturing, and could present growth opportunities, particularly as more hybrid roles emerge with technological advancements, such as rapid prototyping. Convergence between these different activities can bring people in separate domains to work very closely together, blurring organisational and industry sector boundaries. This type of change means that the Australian and New Zealand Standard Industrial Classification, as well as traditional land use definitions are less helpful in understanding what firms are actually doing and what their needs may be. Similarly, the labour force is becoming more complex, with around 20 per cent of workers being multiple job holders (individuals with two or more concurrent jobs). These workers may be across different industries or different locations in any given week.

The diversity and complexities of the modern economy mean that a diversity of employment lands is required to support the changing nature and needs of Melbourne's economy. While large scale industrial areas (e.g. Dandenong South) and predominately office precincts (e.g. Hoddle Grid and Docklands) will remain important and dominant employment areas, a diversity of employment precincts is required to cater to different scales and types of economic activity.

The literature regarding these more nuanced types of employment precincts highlights the need for physical and network assets and the importance of firms, places and people. These "enterprise precincts" are located within, or close to the centre of the metropolitan area, often in former industrial areas. Quality of place is increasingly recognised within the literature as an important attractor for talent, particularly for creative workers. This includes amenity, such as the urban environment and places to interact (restaurants and cafes), and is often activated by a mix of uses, both in terms of a diversity of employment types and a complementary mix with residential.

The auditing framework developed by the Brookings Institute research on innovation precincts provided a basis for benchmarking enterprise precincts against each other. Each of the criteria depicted in Figure 1 are interrelated. For example, a quality public realm will contribute to retaining a critical mass, attracting anchor institutions, and depending on the design, may encourage a culture of collaboration.

FIGURE 1: INTERRELATED ENTERPRISE PRECINCT CRITERIA



Source: SGS Economics and Planning, 2018.

In identifying enterprise precincts in Melbourne, not all places have the same economic potential, and a list of precincts capable of delivering higher economic outcomes have been identified using the following criteria.

- **Critical mass:** Does the area under study have a density of assets that collectively begin to attract and retain people, stimulate a range of activities and increase financing? The number of jobs and industry structure has been used as a guide this assessment. For example, Fitzroy Collingwood has a large number of Professional services (and associated industries) jobs. This critical mass provides economic advantages for firms locating there. Whilst the Northland Urban Renewal Precinct (NURP) has a low number of jobs which are spread across a diverse range of industries that have limited levels of interaction.
- **Competitive advantage:** Is the precinct leveraging and aligning its distinctive assets, including historical strengths, to grow firms and jobs in the district, city and region? For example, Cremorne has a strong IT and creative industries presence. Firms in those industries located in Cremorne will gain economic benefits from locating there. West Melbourne does not provide these same types of benefits to firms.
- **Quality of place:** Does the precinct have a strong quality of place and offer quality experiences that accelerate outcomes and increase interactions? This has been assessed based upon factors such as the urban environment and the presence of places to interact (restaurants and cafes) and the level of mix of uses which helps to provide a 'buzz' inside and outside of standard office hours.
- **Diversity and inclusion:** Is the precinct a diverse and inclusive place that provides broad opportunities for residents?
- **Collaboration:** Is the precinct connecting the dots between people, institutions, economic clusters, and place, creating synergies across multiple scales and platforms?

- **Affordability:** Does the precinct provide a diversity of affordable premises for business to locate in? This would include start-ups, small, medium sized business and larger businesses. This has been measured by looking at rents.
- **Infrastructure:** Does the precinct have the necessary utilities, ICT infrastructure and building stock to accommodate critical mass and support connectivity, collaboration and innovation? What is the type and quality of the building stock?
- **Accessibility:** Does the precinct have access to deep pools of labour and other firms? This has been assessed based on the number of jobs and workers accessible by car and public transport during the AM peak. The higher the number of jobs accessible, the greater the connection of the enterprise precinct to the broader economy of Melbourne. The higher the access to workers, the better the connection is to a large labour force. Both the connection to other jobs and workers will enhance the economic performance of the enterprise precinct.
- **Anchor institutions:** Does the precinct have anchor institutions, such as research organisations or large corporates, that are present, relevant and engaged with industry?

A diverse set of 13 inner city enterprise precincts have been selected to understand the implications of each of the criteria listed above. These precincts range from popular inner city mixed-use neighbourhoods with high levels of amenity and vibrancy like Cremorne, Fitzroy-Collingwood and South Melbourne, emerging precincts such as West Melbourne and Fishermans Bend, to more traditional industrial areas like the NURP and Tottenham.

Based on high level quantitative data analysis, qualitative assessment, and SGS's extensive experience in urban economics, an assessment has been made for each enterprise precinct against each criterion. Further detailed assessment of the enterprise precincts would likely result in some refinement of the criterion ratings.

The assessment highlights that some precincts are high performing and have the characteristics to retain and attract more knowledge intensive employment. Swinburne Uni, Fitzroy-Collingwood, South Melbourne, Cremorne, and Gipps St Abbotsford precincts all have the characteristics expected of thriving enterprise precincts. They all have different specialisations which add to the diversity of the economy of inner Melbourne. The literature supports the view that diversity is a hallmark of success for urban economies such as Melbourne. In short, a more diverse economy can deal with economic shocks and is better equipped to take advantage of new opportunities.

Of course, these high performing enterprise precincts could be further enhanced to attract additional employment and further boost innovation. At the same time, these enterprise precincts could be adversely impacted by residential uses crowding out jobs. Footscray, NURP and Tottenham would appear likely to retain their current focus on traditional industrial uses over the short to medium term (5-15 years). Without intervention West Melbourne appears likely to also continue its current development trajectory.

The remaining precincts have some strengths, but there is less certainty around how they will develop over the short to medium term. Precincts like Arden Macaulay and Fishermans Bend NEIC are undergoing significant urban renewal which will change the existing land use and employment dynamics. There are lessons which can be learnt from the high performing precincts to help attract employment and foster innovation in their urban renewal areas.

A certain level of residential that is developed without suitable planning controls to protect employment uses could have the same impact as a much greater level of residential development which is planned more appropriately. To understand the impact of future growth trajectories of higher employment and innovation on the selected enterprise precincts, two scenarios were developed:

- Scenario A: where there is increased residential and the 'crowding out' of employment in the precincts.
- Scenario B: where there is a greater concentration/clustering of employment in the precincts.

Sensitivity tests have been conducted on each of the scenarios to reflect the ‘footloose’ nature of employment in these areas and the global competition for talent and ideas present in the industries that preference such areas. This includes analysis of the net loss of jobs to Victoria due to potential crowding out, and net gain of jobs to Victoria from greater concentration/clustering of employment.

As shown in Figure 2 and Figure 3, a change in the structure and performance of Melbourne’s identified enterprise precincts would have implications for jobs, productivity and overall economic output.

Under a scenario of strengthened enterprise precincts, by 2036 Victoria’s economic output would be \$71.6 million higher per annum. For identified precincts this represents a 15 per cent increase in economic output compared to the base case. To 2036 enterprise precincts would have cumulatively added over \$0.9 billion to the Victorian economy through the attraction of additional jobs to the State and improved productivity within precincts.

Conversely, under a scenario in which employment uses in identified precincts are crowded out and adversely impacted by additional residential development the State economy would be \$114.0 per annum worse off. For these precincts, this represents a 24 per cent loss of GVA compared to the base case. The cumulative impact to the Victorian economy of reduced job creation and economic output would be over \$1 billion by 2036.

TABLE 1: SUMMARY OF ECONOMIC IMPACTS (GVA \$MILLION PER ANNUM)

	2026	2036	2051
Scenario A: Increased residential ‘crowding out’			
Sensitivity A1: Jobs lost to VIC	(\$51.1) ¹	(\$114.0)	(\$234.6)
Percentage Impact relative to Base Case GVA	(15%)	(24%)	(32%)
Sensitivity A2: Lower levels of innovation (No jobs lost)	(\$11.3)	(\$32.8)	(\$81.3)
Percentage Impact relative to Base Case GVA	(3%)	(7%)	(11%)
Scenario B: Increased employment clustering			
Sensitivity B1: Jobs new to VIC	\$52.8	\$71.6	\$105.3
Percentage Impact relative to Base Case GVA	16%	15%	14%
Sensitivity B2: Higher levels of innovation (No jobs gained)	\$13.4	\$22.2	\$38.1
Percentage Impact relative to Base Case GVA	4%	4%	5%

Note: brackets indicate negative values

Source: SGS Economics & Planning, 2018.

These ongoing costs to the economy are in contrast to the immediate land sale benefits of increased residential development in these areas. These benefits would only be reflected in a one-off windfall to the land owner when the land is transferred to residential use. The dis-benefit is a long-term reduction in economic activity and taxation revenue for Victoria. This highlights that thinking about land use in simple ‘highest and best use’ terms can have an adverse and long-term impact on economic outcomes.

Existing land use planning in some of the precincts, for example, Fitzroy-Collingwood, could see some (in relative terms) residential uses co-locate in the enterprise precincts without any adverse impacts, provided the influence of residential development could be controlled and not impact on commercial affordability. This is due to a number of factors:

- The geographical size of the precincts;
- The current commercial feasibilities allowing large scale commercial and residential development; and
- The historical acceptance of a mix of uses in the precinct.

¹ Bracketed values represent a negative value.

Supporting the development of enterprise precincts present opportunities to replicate and enhance the past development of employment lands which have helped produce a diverse economic structure, while still offering key specialisations in which Melbourne has a competitive advantage.

FIGURE 2: SUMMARY OF ECONOMIC IMPACTS (GVA \$MILLION PER ANNUM)



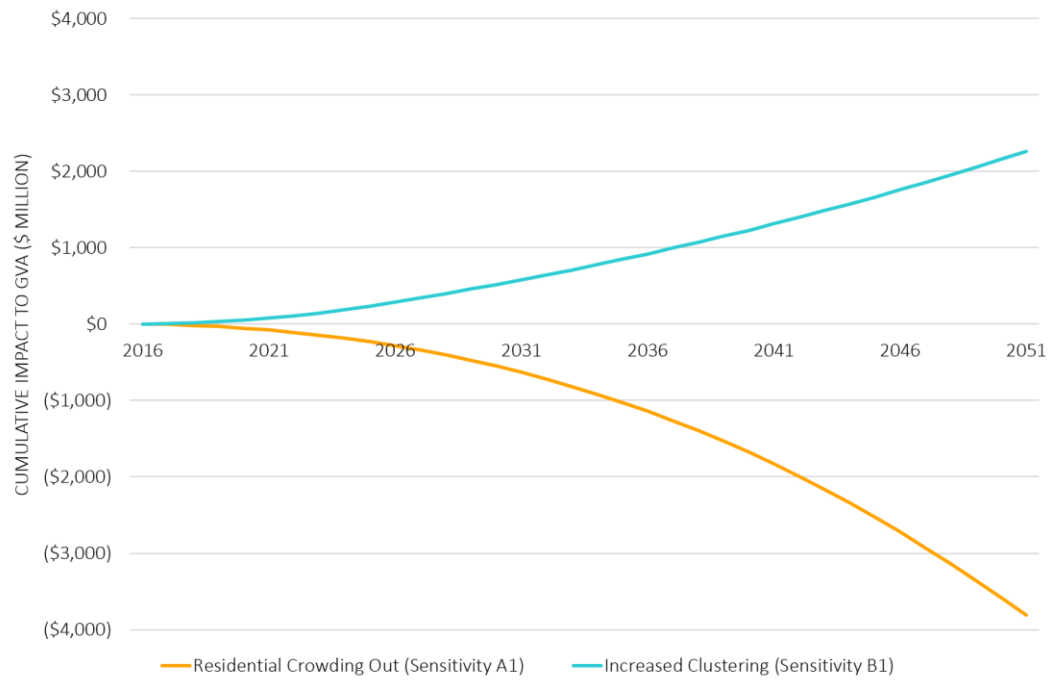
Source: SGS Economics & Planning, 2018.

Note: Percentages on this chart represent the percentage impact relative to the base case

Therefore, Scenario A is the result of residential development adversely impacting the enterprise precinct, most likely because its influence on economic outcomes was unable to be controlled.

Attracting and retaining innovative and productive jobs, particularly those in emerging economic sectors that are highly mobile will be increasingly important to the Victorian economy in an increasingly global economy. Planning and policy making has a significant role to play in providing the enabling environment for innovation and productivity to flourish. Interacting with development feasibility, planning controls and policy can affect all of the criteria that impact on the economic success or otherwise of enterprise precincts. In order for enterprise precincts to realise their potential, supportive land use planning is required to allow for a critical mass of employment in a high amenity environment.

FIGURE 3: CUMULATIVE ECONOMIC IMPACT (GVA \$MILLION)



Source: SGS Economics & Planning, 2018.

1. INTRODUCTION

Productivity isn't everything, but in the long run, it's nearly everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.

Paul Krugman, *The Age of Diminishing Expectations* (1994)

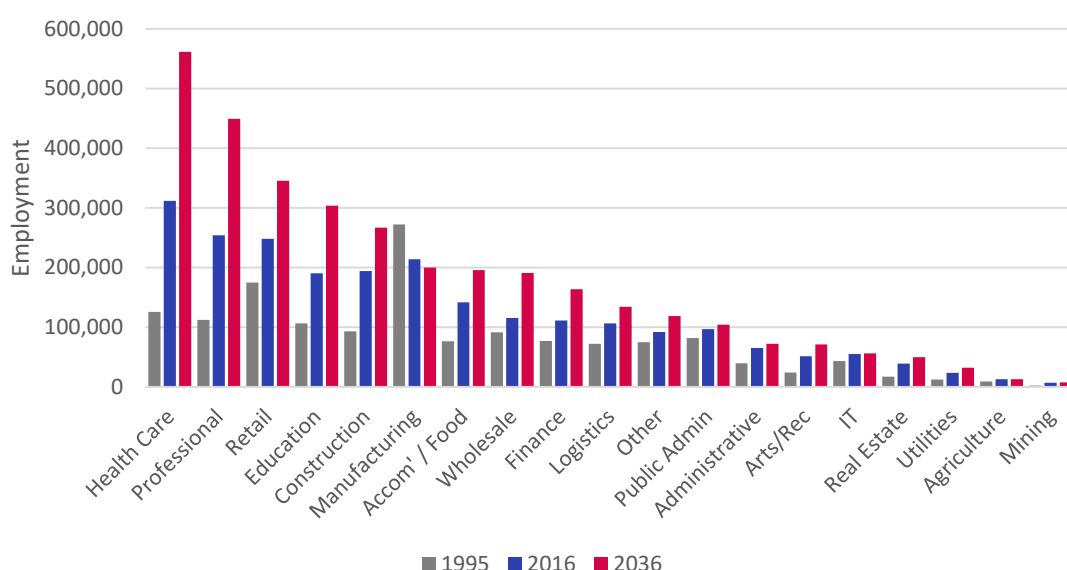
A Changing Economy

The past thirty years have seen a profound restructuring of the Melbourne economy. The metropolis has transformed from an industrial city into a knowledge intensive economy. This structural change has impacted on the composition and location of employment across Metropolitan Melbourne.

There have been many explorations of the new or 'recombinant economy' of the inner city, including those by Hutton (2010) and Moretti (2012). Hutton (2010, p. 279) described the inner city as a 'hybridized structure of cultural production, creative labour and technology' where both 'new' and 'old' economy industries coexist through collaboration, competition and consumption. Often the former industrial areas of the inner city contain remnants of the industrial past alongside new knowledge and creative uses.

Figure 4 below shows the historic and future employment by industry for Metropolitan Melbourne. This highlights the changes that will be occurring across the whole economy over the next two decades.

FIGURE 4: GREATER MELBOURNE EMPLOYMENT, 1995, 2016, 2036



Source: SGS Economics and Planning and ABS

Employment in manufacturing will continue to decline, while employment in Professional and Financial services will increase. A range of population serving industries will also expand, including Health care, Retail and Education. The expected changes in manufacturing show a nuanced picture of a sector transforming rapidly, performing remarkably well in an

increasingly globalised economy. However, this industry will employ fewer people with knowledge-based skills.

Knowledge-based industries encompass research and development (R&D), design, engineering, marketing, advertising and creative industries, as well as more traditional jobs such as lawyers, bankers, financiers, doctors and management consultants (Reich, 2003).

Many of these activities overlap with production and manufacturing, and could present growth opportunities for the sector. This is particularly so as more hybrid roles emerge with technological advancements, allowing for movement up the value chain (e.g. rapid prototyping, 'customise-make-service-sell').

In the past Melbourne's specialisation was in making clothes, cars and other manufactured goods on a large scale. Today, Melbourne's specialisation is in solving bespoke 'problems' and niche manufacturing.

This type of change means that the ANZSIC (Australian and New Zealand Standard Industrial Classification) and traditional land use definitions are less helpful in understanding what firms are actually doing and what their needs may be.

Plan Melbourne identifies that to remain competitive in a changing economy, there is a need to boost innovation and productivity, and support growth across all industries. Facilitating the evolution of the economy will be critical to creating the 1.5 million new jobs that are forecast for Melbourne to 2050. Where these jobs will locate is a clear policy concern for the Department of Environment, Land, Water and Planning (DELWP).

As set out in *Plan Melbourne*, the Central City is a key economic driver for the Melbourne economy. The economic success of the Central City is the result of a range of interrelated factors: significant transport infrastructure, an enabling planning framework, appropriate lot sizes, urban amenity and demand for high rise development. Where these factors align, there will be a highly productive environment which will help to generate investment, jobs growth and attract new firms to Victoria.

The evolution of the 'Central City'

Over the past decade the competitive advantages of Melbourne's Central City have included relatively affordable commercial floorspace and housing, high levels of transport connectivity, high urban amenity, and development certainty for future development. These competitive advantages are the result of external drivers (microeconomic reforms, shifts towards a more knowledge intensive economy), far-sighted government actions, and private sector investment.

The boundary of Melbourne's Central Business District (CBD) is not a fixed line: it has expanded over time in response to structural economic change, infrastructure investments, planning policies and decisions, and evolving property market dynamics. The use of the term 'Central City'² – which encompasses the Hoddle Grid (Melbourne's 'traditional' CBD) and adjacent employment, service, entertainment, leisure and residential precincts – reflects the evolving scale and understanding of Melbourne's urban structure.

Areas adjoining the core Central City precincts present opportunities for urban renewal that could expand the footprint of the Central City, helping to grow the economy. These urban renewal areas typically require interventions (transport improvements, local infrastructure, changes to planning controls, precinct marketing and demonstration projects) by government to spur new, higher intensity land uses.

Over the past thirty years, there have been many examples of land parcels becoming extensions of the existing Central City, with Southbank and Docklands being the two clearest examples. Even within the Hoddle Grid, development has spread from the southern section

² Plan Melbourne defines the Central City as the area within the inner region that contains key capital city functions and civic facilities, as well as several precincts identified for major and strategic change. It is a larger area than the Melbourne CBD.

into the north because of a range of initiatives, the most significant of these being the City Loop. It should be noted that during most of the 1980s and 1990s, due to economic recessions, Victorian government policy was aimed towards generating economic activity by creating opportunities for investment via urban renewal of the Central City.

Areas within the Central City are far from homogenous. Different parts have different specialisations. For example, financial services have concentrated along Collins Street. The development of Docklands and subsequent tram extensions have extended the financial services cluster from Spring Street to the Yarra River. These financial services are very much export oriented, not serving the local population but markets across Australian and the rest of the world.

Parkville is a cluster of biomedical research facilities, private companies, universities and hospitals, with a strong focus on international success, not only serving local markets. While technically across different industries (Health Care, Professional Services, Education), there is a convergence of activities as people in separate domains blur organizational boundaries.

Recent decades have also seen a significant shift in the use of employment land. Melbourne's economy has gradually transformed, with a broad decline in the relative importance of manufacturing, growth in freight and logistics, shifts towards the knowledge economy, and unprecedented demand for health and education services.

Over the past five years residential development has occurred in locations which historically have been solely used for employment. Ongoing strong population growth in inner suburbs also places pressure on employment land for residential conversion. This then places pressure on competition, speculation, crowding-out or under-investment in employment land uses.

Changing market conditions have meant that residential development is challenging office as the primary function of the Central City. Figure 5 shows how residential developments are dominating the skyline of Melbourne's Central City. This competition for land is just as intense in the inner suburbs. While each individual residential development may have its merits, the cumulative impact undermines the economic strength of Inner Melbourne.

The role of government is to understand the future drivers of change, and to align decision making and investment decisions that build on the Central City's competitive advantages. This will unlock and facilitate private sector investment to maximise public benefits.

Critically, in an increasingly competitive global economy, if conditions are not right in a Central City location, it is unlikely that the jobs will simply appear elsewhere in Melbourne. They will be drawn to another central city location in Sydney, or another global city like Singapore or Berlin. This is why it is so important to ensure that conditions are right for Melbourne's Central City.

While development will continue in the Hoddle Grid, Docklands and Southbank, new areas have been identified as extensions to the Central City. These include West Melbourne, Fitzroy/Collingwood, City North, Cremorne, Arden Macaulay and Fishermans Bend, which not only feed into the CBD and its immediate surrounds, but also provide an alternate and more diverse employment offer that is attractive to different sectors of the economy.

Planning and policy making has a significant role to play in determining how economic change will impact on local enterprise precincts by providing the enabling environment for innovation and productivity to flourish. Current land use planning controls are a key determinant of development outcomes, interacting with development economics and feasibility to influence the mix of residential and commercial floorspace proposed for a site.

In order for enterprise precincts to realise their potential, land use planning frameworks that support a critical mass of employment in a high amenity environment may be necessary. While current Mixed Use zoning allows for both residential and commercial development, there are limited tools in the planning system to encourage the provision of sufficient space for employment purposes while controlling the influence of residential development.

FIGURE 5: MELBOURNE RESIDENTIAL AND COMMERCIAL PIPELINE³



Source: AFR and JLL

³ 'Other' is generally student accommodation or hotels

2. BEST PRACTICE & EXPERT REVIEW

There is a significant body of literature on the underlying concepts related to innovation and employment precincts. This section presents an overview of the conceptual framework used to understand innovation and productivity and the relationship with employment (or enterprise/innovation) precincts.

Measuring innovation and its impact on productivity is a complex task. One way to indirectly measure the performance of the innovation system is to review how an economy performs on broad outcome indicators (GDP, GDP per capita, and Multifactor Productivity MFP). However, these factors can be influenced by a range of factors outside of the innovation process (e.g. global economic conditions, commodity cycles).

Some of the indicators are leading indicators – an increase in a lead indicator will see innovation and productivity increase in future years. Business expenditure on R&D is a lead indicator of future innovation and productivity growth. It may also be several years between the innovation, commercialisation and the new product or services generating income.

The changing nature of production (e.g. technology enabled production like 3D printing), use of the internet to access mass markets, or the unbundling of production chains across different countries, mean that standard industry classifications (such as ANZSIC) are less helpful in understanding what tasks firms are performing.

This issue is further complicated by the consolidation and integration of separate technologies. This is often referred to as convergence. Convergence can change operations dramatically, by bringing people in separate domains to work very closely together, blurring organisational boundaries.

This section of the report contextualises the concept of employment / innovation precincts within the well-established bodies of thought and literature concerning the benefits of agglomeration economies or industry clustering, and highlights the success factors for innovation precincts.

2.1 Understanding Innovation

Innovation is the implementation of a new or significantly improved good, service, process, new marketing method; a new workplace organisational or business practices; or improved external relations. Innovation will result in product, process, organisational or marketing improvements for a firm which will increase productivity and profitability.

The resulting efficiency for the individual firm will also help to increase aggregate productivity growth across the economy. The increased productivity will increase the output per hour worked and per unit of capital employed.

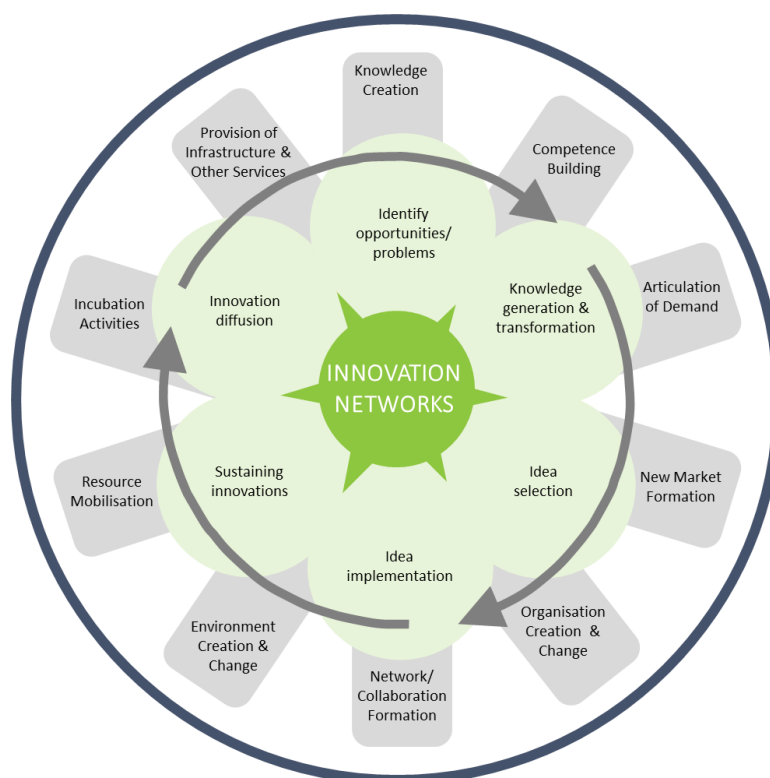
While simple in concept, the transmission of innovation throughout the economy is very complex. The innovation cycle presented in the Australian Innovation System Report describes a conceptual model of the accumulation and communication of knowledge or technologies and other innovations that embody knowledge.

The analogy of a propeller moving through the water is used to describe the conceptual model (Figure 6). The network of people / organisations and the innovation-related activities

they perform are the engine that turns the innovation cycle around (Table 2 presents some of the actors and conditions required for ongoing innovation). As the propeller turns it generates value (stream of bubbles) for the economy and society.

There has been an extensive amount of research undertaken into the topic of innovation and productivity and ways to measure and understanding it. The remainder of this section provides a summary of the literature.

FIGURE 6: CONCEPTUAL MODEL OF AN INNOVATION SYSTEM



Source: SGS Economics and Planning, 2018, based on Australian Innovation Report

TABLE 2: CONDITIONS AND ACTORS IN THE INNOVATION PROCESSES

Actors within the innovation system	Conditions which enable ongoing innovation
Infrastructure (including Institutional, National, Landmark and Global research infrastructure) Utilities & telecommunications	Existing infrastructure
Universities - Medical research institutes - Vocational education & training providers	Match between research & needs
Business angels - Community - Unions - Industry associations	Population, environment, geography & resource base
Venture capitalists - Banking - Investors - Entrepreneurs	Entrepreneurial culture
Specialist Advisors	Skilled migration
Regulatory authorities - Governments	Budgetary & regulatory framework Policies & programs Legal framework & IP regime
Consumers / End users	Workforce & management
Domestic & global supply chains	Economic conditions Patterns of specialisation

Source: SGS Economics and Planning

Innovation ecosystem

The innovation ecosystem is the network of organisations (business, researchers and government) interacting with each other. Three components of the innovation system (networks, innovation activities and framework conditions) collectively function to produce and diffuse innovations that, in aggregate, help to boost productivity within an economy.

The efficiency of an innovation system often hinges upon the quality of framework conditions, namely the capacity to ensure an innovation-friendly environment. Typical indicators include availability of human capital, organisational capability, government policy, financial capital (e.g. venture capital and later-stage private equity) and the ability to protect IP. The interplay of factors combined with firm activities enable innovation to be converted into new products, processes and organisational forms, which in turn enhances productivity growth.

2.2 New Economic Geography

The move towards a knowledge-based economy for many cities around the world has driven enthusiasm for understanding the spatial geography of innovation. Successful modern economies now recognise knowledge as a driver of productivity and economic growth, and there is a renewed emphasis on the role of information, technology and learning in economic performance (OECD, 2016). The transition towards a knowledge-based economy has also seen the resurgence of the inner city, driven by an increasing preference of knowledge workers to live and work centrally, increasingly resulting in gentrification of both housing and employment.

Knowledge-based industries encompass research and development (R&D), design, engineering, marketing, advertising and creative industries as well as more traditional jobs such as lawyers, bankers, financiers, doctors and management consultants (Reich, 2003). When an economy experiences growth in knowledge-based industries, personal services industries (restaurant workers, taxi drivers, security guards and hospital attendants) also experience growth as knowledge job workers are the primary consumers of these services (Reich, 2003). Moretti (2012) contends for every knowledge job, five indirect service jobs are generated.

2.3 Agglomeration Economies

Contemporary understandings of co-location benefits are generally grounded in Marshall's *Principles of Economics* (1890). Often referred to as the forefather of these schools of thought, Marshall (1920) described the conceptual benefits a firm may gain by choosing to locate in a particular place.

There have been a number of recent contributions on cities and economic geography which seek to understand the concepts identified by Marshall and to provide some intelligence on the underlying contributors to a successful urban economy. Much of the literature supports the concept that density and diversity are the hallmarks of success for those urban economies based on knowledge and creative industry jobs.

'Agglomeration economies' is a term used in spatial economics to describe the benefits that flow to firms from locating in areas that have a high density of economic activity. Essentially, this literature suggests there are two distinct effects at work. These are:

- **Urbanisation** economies involve economic interactions between industries and arise from a large number of different industries located in close proximity to each other; and
- **Localisation** economies involve economic interactions within a particular industry and arise from a large number of firms within the same industry cluster in the same location.

The benefits that arise from locating in a denser economic cluster include:

- **Economies of scale and scope:** with a larger customer base firms are able to develop efficiencies through operating at a larger scale. This also enables firms to focus the scope

of their expertise in a particular field, gaining improved efficiencies through specialisation.

- **Deep and diverse pool of clients/employers/employees:** A competitive marketplace presents people and firms with a multitude of potential options. This frees them from reliance on a single (or limited) client or employer base, allowing firms to better align their specific skills, again improving productivity.
- **Technological spillovers:** With multiple firms located together there will be a higher level of technological and knowledge spillovers and transfers, which will help bolster innovation. This transfer occurs both directly, through stronger supply chain linkages and connections between local firms, and indirectly, when skilled labour moves between firms and transfers knowledge, as well as through incidental exchanges.

The importance of face-to-face contact is highlighted in the literature related to locating in dense economic clusters. The spatial clustering of firms and producers encourages frequent and informal face-to-face contact, which can facilitate knowledge spillovers. Though the world is increasingly connected electronically, there also remains a need for face-to-face communications and interactions to occur, and questions remain over the extent to which technology and online connectivity can replace or replicate our need for these more social interactions (Pratt, 2000; Cook et al., 2007).

Agglomeration of activity reduces the transaction costs within the supply chain and intermediate markets as a result of reduced search and comparison costs for buyers and end-users. Agglomeration also supports the creation of a 'critical mass' to allow for specialisation and to deliver shared infrastructure cost-effectively. Critical mass is necessary to begin to attract and retain people, stimulate a range of activities and increase financing (Wagner & Storring 2016). Further to this, agglomeration can generate highly competitive environments, resulting in better, smarter and cost-efficient products and services (McDougall & Witte, 2010).

2.4 Innovation Precincts

A broad range of terms linked with clusters of employment have been adopted within the literature over the years including technology parks or 'technopoles', knowledge parks, and science or innovation precincts. While there may be differences in the types of park or district, they share a common rationale for existence, namely, to leverage the benefits of co-location within particular industries.

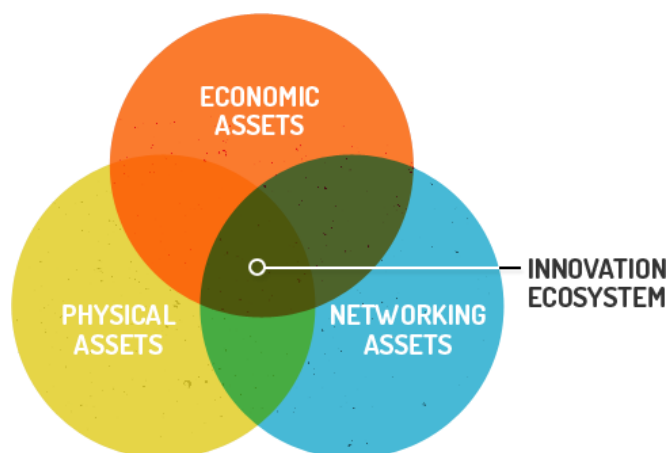
The concept of an innovation district has been promoted by The Brookings Institution (see Katz & Wagner 2014). Innovation precincts are defined by Katz and Wagner (2014) as geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators. Anchor institutions are research universities and research-oriented medical hospitals with a focus on R&D.

Katz and Wagner (2014) suggest that all innovation precincts comprise three types of assets:

- **Economic assets** are the firms, institutions and organisations that drive, cultivate or support an innovation rich environment.
- **Physical assets** are publicly, or privately-owned spaces including streets and other infrastructure, designed and organised to stimulate new and higher levels of connectivity, collaboration and innovation.
- **Networking assets** are the relationships between people, firms and places that facilitate ideas generation and advances in commercialisation.

Central to these is the innovation ecosystem (refer to Figure 7).

FIGURE 7: INNOVATION ECOSYSTEM



Source: Katz and Wagner, 2014

Innovation precincts have also been categorised into three different models by Katz and Wagner (2014):

- **Anchor plus model:** usually in the downtowns and midtowns of central cities. Large scale mixed use development is centred around major anchor institutions and a rich base of related firms, entrepreneurs and spin off companies, involved in the commercialisation of innovation i.e. Kendall Square, Cambridge; Philadelphia University City.
- **Reimagined urban area:** often occur in industrial settings/warehouse precincts undergoing physical and economic transformation. Change is powered in part by transit access, historic building stock, proximity to downtowns in high rent cities, supplemented by advanced research institutions and anchor companies i.e. 22@Barcelona.
- **Urbanised science park:** commonly found in suburban or ex-urban areas. Sprawling areas of innovation are urbanised through an increase in density and an infusion of new activity.

Economic and spatial characteristics

While there is extensive discussion within the literature regarding the elements that comprise innovation precincts, there appears to be a limited understanding of how success can be created and measured.

SGS's work across Australia over the last few years, which has profiled many international case studies, has highlighted that successful innovation precincts have the following characteristics:

- Highly accessible location
- Credible and reputable anchor enterprises/ institutions (that are present, relevant to and engaged with industry)
- Critical mass of related enterprises
- Having the capacity to accommodate more jobs at an affordable price point.
- Vibrant, amenable and walkable physical environment (often through mixed/ dense development)
- Well-connected digital environment
- Open and democratic operating environment (a mindset for collaboration)
- Shared/ collaborative spaces that facilitate collaboration
- Flexible design that promotes scalability and continual evolution, and
- Governance arrangements that nurture the precinct's vision and its long term economic development objectives.

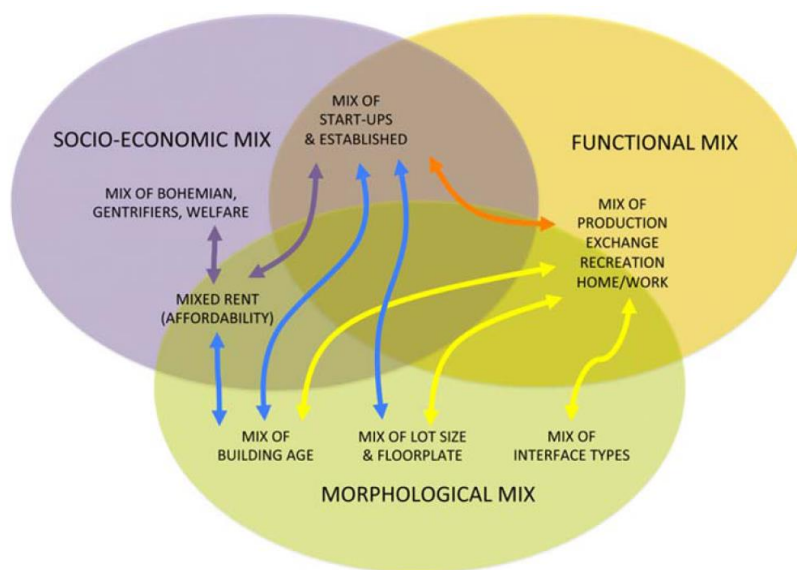
Sometimes these outcomes in certain locations have been more by good luck than carefully and focused planning. Further detail on each of these success factors is in Appendix 6.1.

Quality of place

Florida's (2003) well known work on the Creative Class focuses on creative workers who are seen to share a 'common ethos that values creativity, individuality, difference and merit' (Florida 2003, p.17). These preferences often play out in the sense that the creative class are based to a large degree on their lifestyle interests which go well beyond the standard quality of life amenities.

Furthermore, Florida (2003, p. 22) considers the value given to such places by the creative class as reliant on the mix, as leading creative centres provide a solid mix of high-tech industry, plentiful outdoor amenities, and an older urban centre whose rebirth has been fuelled in part by a combination of creativity and innovative technology, as well as lifestyle amenities. At a more fine grain level, Wood and Dovey (2015) focus on urban morphologies of creative clustering, identifying the need for socio-economic, functional and morphological mixes (refer to Figure 8).

FIGURE 8: MIX OF URBAN MORPHOLOGIES



Source: Wood and Dovey, 2015

Governance and leadership

A common theme across the literature is the emphasis placed on leadership and governance (Katz & Wagner, 2014; Bugliarello, 1996; Cultler, 2009; Groves, 2007; SGS Economics and Planning, 2009). In addition, it is important to have a strategic intent or plan for a hub or district upfront. A vision for growth is important which should include guidance for how an innovation district should grow and develop in the short, medium and long term along economic, physical and social dimensions.

Benchmarking

The discussion within the literature is generally focused on the desired characteristics of these innovation precincts and there is limited discussion of how to measure success. However, Wagner & Storing (2016) have identified an auditing framework including the data which could be used to measure the success of an innovation district. This was developed from a test audit of the Oklahoma City innovation district which drew from 60 plus interviews and a detailed analysis of local data sets.

There does not appear to be a benchmark that these innovation precincts need to meet but rather this framework would allow for the comparison of various innovation precincts, hubs, parks or precincts against each other.

TABLE 3: AUDITING FRAMEWORK FOR INNOVATION PRECINCTS

Success factor	Data used to benchmark	
Critical mass	Site area Jobs numbers Resident numbers	Anchors institution numbers Restaurant/bar numbers R&D spending values
Competitive advantage	R&D spending by category Research publication by category Façade transparency of innovation assets Commercialisation of research outcomes	Cluster location quotient (LQ) Alignment of research spending with cluster LQs Alignment of venture capital spending with cluster LQs Patents achieved
Quality of place	Active public space numbers Density of pedestrian links (walkability)	Pedestrian counts % of people in groups in public spaces
Diversity and inclusion	Resident ethnicity Resident place of birth Resident employment rates	Resident skill levels Resident income levels Resident alignment with local job skills requirements
Culture and collaboration	Rates of project collaboration Rates of serendipitous interactions	Location of interactions

Source: Wagner & Storrington, 2016

2.5 Summary

The literature suggests that within the new knowledge-based economy there is an increasing pull towards the inner city where there is an agglomeration of employment, particularly within knowledge-based industries. The value of human capital has increased and knowledge sharing between firms and workers is seen as a driver of innovation. These concepts are not entirely new and draw on the body of literature relating to agglomeration and industry clustering which has evolved since the late nineteenth century.

Location is particularly important as firms are seen to benefit from locating within dense employment centres due to a range of benefits, including economies of scale and scope, deep and diverse pool of clients/employers/employees, and technological (or knowledge) spillovers. This pull towards the central business district will have implications for establishing an innovation district in a location where there is not a critical mass of activity.

More recent literature has focused on the concept of innovation precincts which are geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators. The innovation ecosystem comprises economic, physical and network assets which highlight the importance of firms, places and people.

Quality of place is increasingly recognised within the literature as an important attraction for talent, particularly for creative workers. This includes amenity such as the urban environment and places to interact (restaurants and cafes) and is often facilitated by a mix of uses.

While there is extensive discussion within the literature as to the elements which comprise a successful innovation district, there appears to be a limited understanding as to how success can be created and measured. The auditing framework developed by Wagner & Storrington (2016) as part of the Brookings Institution research on innovation precincts provides a sound base for benchmarking innovation precincts against each other.

Ultimately there is significant overlap across these success factors or key ingredients for innovation precincts and can be summarised into a framework for innovation precincts. These precinct criteria are described in the following chapter.

3. PRECINCT CRITERIA

This section provides an overview of the criteria used to identity and understand the strengths and weakness of inner Melbourne enterprise precincts.

The auditing framework developed by Wagner & Storrington (2016) as part of the Brookings Institute research on innovation precincts provides a sound base for benchmarking enterprise precincts against each other. An evaluation of a enterprise precinct should question:

- **Critical mass:** Does the area under study have a density of assets that collectively begin to attract and retain people, stimulate a range of activities and increase financing?
- **Competitive advantage:** Is the innovation district leveraging and aligning its distinctive assets, including historical strengths to grow firms and jobs in the district, city and region?
- **Quality of place:** Does the innovation district have a strong quality of place and offer quality experiences that attract other assets, accelerate outcomes, and increase interactions?
- **Diversity and inclusion:** Is the innovation district an economically diverse and inclusive place that provides broad opportunity for city residents?
- **Collaboration:** Is the precinct connecting the dots between people, institutions, economic clusters, and place creating synergies at multiple scales and platforms? Collaboration also relates to developing synergies at multiple business scales and by various platforms.

SGS has expanded this auditing framework to cover affordability, infrastructure, accessibility and anchor institutions:

- **Affordability:** Does the precinct provide a diversity of affordability premises for business to locate in? This would include start-up, small, medium sized business and larger businesses.
- **Infrastructure:** Does the precinct have the necessary utilities, ICT infrastructure and building stock to accommodate critical mass and support connectivity, collaboration and innovation? What is the type and quality of the building stock?
- **Accessibility:** Does the precinct have access to deep pools of labour and other firms?
- **Anchor institutions:** Does the site have anchor institutions such as research organisations or large corporates that are 'present, relevant and engaged with industry' (Katz & Wagner, 2014)?

Ultimately there is significant overlap across the criteria for innovation precincts. Figure 9 and Table 4 describe the criteria used in this report to assess each of the enterprise precincts, based on the literature review, the Brookings Institute research and SGS insight.

Each of the criteria depicted in Figure 9 are interrelated. For example, a quality public realm will contribute to retaining a critical mass, attracting anchor institutions, and depending on the design, may encourage a culture of collaboration.

FIGURE 9: INTERRELATED INNOVATION PRECINCT CRITERIA



Source: SGS Economics and Planning

TABLE 4: PRECINCT CRITERIA

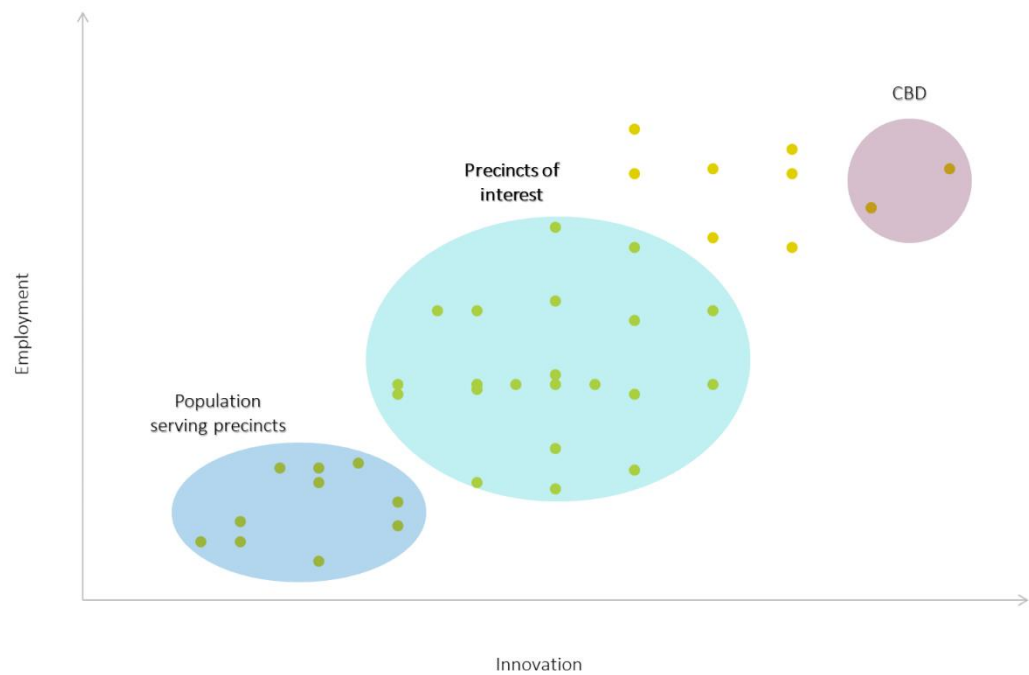
Precinct Criteria	Notes
Critical Mass	Geographic concentration of firms within the same or related industry sectors (level of specialisation)
Competitive Advantage	Key industry or locational strength
Quality of Place and Urban Amenity	Quality urban environment and the presence of places to interact (restaurants and cafes) Required to attract knowledge workers
Accessibility	To labour force and other firms Both the connection to other jobs and workers will enhance the economic performance of the enterprise precinct
Anchor institutions	Research organisations or large corporates which help with critical mass and resourcing and benefit the precinct
Affordability	Does the precinct provide a diversity of affordability premises for business to locate in
Culture of collaboration	The developing networking and interaction particularly between workers at multiple business scales and by various platforms
Infrastructure	Utilities, ICT infrastructure, building stock
Diversity and inclusion	Economically diverse and inclusive place that provides a broad range of employment opportunities

Source: SGS Economics and Planning

Figure 10 presents a conceptual description of the type of precincts which are being investigated in this report. It illustrates that there are some smaller employment clusters with limited levels of innovation that predominately serve their immediate surrounding population (providing local services). For example, Station Street in Fairfield or North Road in Ormond. At the other end of the spectrum are the Hoddle Grid, Southbank and Docklands, which are large scale and performing a distinct CBD function. They are the State's main gateway to the global economy.

The precincts of interest to this report are those that are larger enterprise precincts, connected into the economic mass of the central city and with a degree of innovation and export orientation. Given their characteristics these precincts present opportunities for greater economic output and job creation.

FIGURE 10: CONCEPTUAL PRECINCT TYPOLOGY



Source: SGS Economics and Planning

4. PRECINCT ANALYSIS

This section identifies precincts in Inner Melbourne and assesses them across the various criteria outlined in the previous section.

4.1 Overview

A list of enterprise precincts has been identified using the criteria outlined in the previous chapter. These precincts have been named as ‘enterprise precincts’ because of their capacity to accommodate additional economic activity and provide fertile ground for business creation and growth, particularly in future focused ‘export-oriented’ industries heavy on innovation.

These are shown on the map below and described in Table 5. While all are within a 10-15-kilometre radius of the Hoddle Grid, they represent a diverse range of employment types and built form environments. Diversity in employment / economic activity has often been promoted to achieve the goal of economic growth stability.

FIGURE 11: IDENTIFIED PRECINCT BOUNDARIES



Source: SGS Economics and Planning, 2018.

The literature supports the view that diversity is a hallmark of success for urban economies such as Melbourne. In short, the greater diversity of the economy, the better the economy can deal with economic shocks and take advantage of new opportunities.

A simple example of this was evidenced during the Global Financial Crisis, when Sydney's heavily financial sector dependent economy grew at 1.4 per cent and Melbourne's more diversified economy expanded at 2.4 per cent.

TABLE 5: SELECTED PRECINCTS

Precinct	Description
Brunswick South	West of the rail line between Hope Street and Brunswick Road (excluding Sydney Road Retail Strip), this area is predominantly industrial and surrounded by high price real estate tag.
Cremorne	This former industrial area is fast becoming a popular location for professional services. Local amenity is yet to catch up and remains limited.
Fitzroy/Collingwood	Popular inner city mixed-use neighbourhood and destination with high levels of amenity and a vibrant creative scene.
South Melbourne	Inner city neighbourhood, surrounded by mixes of uses and high levels of amenity destination.
Footscray	Industrial area running along the Maribyrnong River front.
Abbotsford	Mixed use neighbourhood with growing population of young professionals.
Arden	Industrial area in close proximity to growing inner city location North Melbourne and the CBD. Will be impacted by large scale urban renewal.
Macaulay	Industrial area in close proximity to growing inner city location North Melbourne and the CBD. Will be impacted by large scale urban renewal.
NURP (Northland Urban Renewal Precinct)	Industrial area isolated from amenity and services and nearby residential. (industrial area south of Northlands Shopping Centre, excludes the Northland Shopping Centre)
Swinburne Uni	Affluent suburban area with the advantage of access to multiple transport links (three train stations and a tram) and high levels of amenity. Anchored by a university and access to deep pools of labour. This precinct is a spine that goes from Glenferrie Station to Camberwell Station along Burwood Road.
Tottenham	Industrial area isolated from amenity and services and nearby residential.
West Melbourne	Area situated on the edge of the CBD with a mix of existing industrial/manufacturing uses and new medium to high rise residential development.
Fishermans Bend NEIC	Large industrial renewal site of 230 hectares at the doorstep of the CBD. Currently predominantly low density industrial and warehouse uses proposed to be centre for advance manufacturing and design excellence.

Source: SGS Economics and Planning, Pty Ltd.

The businesses located in each of the precincts have been attracted to the location by a range of factors, many of which are captured in the criteria listed in the previous section. It is not the case that these businesses could relocate to another location in Melbourne. Their business operations could be impacted if they were to relocate somewhere that does not have the same characteristics as their current location, potentially leading to a net loss in businesses and jobs from Victoria.

For example, if Realestate.com.au was to relocate from its current Cremorne location to Docklands, it would lose skilled staff, be further away from its supply chain, and lose agglomeration benefits.

The loss or degradation of the employment lands within these precincts would impact on the economy of Inner Melbourne and Victoria.

4.2 Precinct Assessment Against Criteria

Based on the data analysis and qualitative assessment of other aspects (e.g. collaboration and infrastructure), SGS has used its extensive experience in urban spatial economics to make an assessment of each of the enterprise precincts against each criterion. Further detailed assessment of the enterprise precincts would likely result in some refinement of the criterion ratings.

The data and analysis that informs these assessments can be found in the Appendix to this report. A summary of the thinking behind the assessment for each criterion follows:

- **Critical Mass** is based around the number of businesses in the same or closely related industry. The number of jobs and industry structure has been used as a guide. For example, Fitzroy Collingwood has a large number of Professional services and Creative industries jobs. This critical mass provides economic advantages for firms locating there. Whilst the NURP has a low number of jobs which are spread across a diverse range of industries that have limited levels of interaction.
- **Competitive advantage** is based on the key industry or locational strength. It does not require a critical mass of jobs to occur but reflects a niche competitive advantage. That is, does the enterprise precinct provide firms with a clear advantage by locating there. For example, Cremorne has a strong IT and creative industries presence. Firms in those industries located in Cremorne will gain economic benefits from locating there. West Melbourne does not provide these same types of benefits to the firms located there.
- **Quality of place** is assessed upon factors such as the urban environment and the presence of places to interact (restaurants and cafes) and the level of mix of uses which helps to provide a buzz inside and outside of standard office hours.
- **Diversity and inclusion:** Is the enterprise precinct an economically diverse and inclusive place that provides broad opportunity for city residents?
- **Collaboration** relates to the likelihood of a cultural collaboration which promotes networking and interaction, particularly between businesses and workers. This is based around the type of industries, urban form and the existence of any formal networking organisations.
- **Affordability:** Does the precinct provide a diversity of affordable premises for business to locate in? This would include start-ups, small, medium sized business and larger businesses. This has been measured by looking at rents.
- **Infrastructure** focuses on whether the precinct has the necessary utilities, ICT infrastructure and building stock to accommodate a critical mass of jobs, and support connectivity, collaboration and innovation.
- **Accessibility** is based on the number of jobs and workers accessible by car and public transport during the AM peak. The higher the number of jobs accessible, the greater the connection of the enterprise precinct to the broader economy of Melbourne. The higher the access to workers, the better the connection is to a large labour force. Both the connection to other jobs and workers will enhance the economic performance of the enterprise precinct.
- **Anchor institutions:** Does the site have anchor institutions such as research organisations or large corporates.

TABLE 6: ASSESSMENT FOR EACH PRECINCT

	Critical Mass	Competitive Advantage	Quality of Place and Urban Amenity	Accessibility	Anchor institutions	Affordability	Collaboration	Infrastructure
Brunswick South	Medium	Medium	High	Medium	High	Medium	Medium	High
Cremorne	High	High	High	High	Medium	Medium	Medium	Medium
Fitzroy Collingwood	High	High	Medium	High	Medium	Low	Medium	Medium
Gipps St Abbotsford	Low	Low	High	Medium	Low	High	Low	Low
NURP	Low	Low	Low	Low	Low	High	Low	Low
Swinburne Uni	High	Medium	Medium	High	High	Medium	Medium	High
Tottenham	Low	Low	Low	Medium	Low	High	Low	Medium
West Melbourne	Medium	Low	Medium	High	Low	Medium	Medium	Low
Fishermans Bend NEIC	Medium	Low	Low	Medium	Low	Medium	Low	Medium
Arden	Medium	Low	Low	Medium	Low	Medium	Low	Medium
Macaulay	Medium	Low	Medium	Medium	Low	Medium	Low	Medium
Footscray	Low	Low	Medium	Medium	Low	Medium	Low	Medium
South Melbourne	High	Medium	High	High	Medium	Low	Medium	High

Source: ABS Census & SGS Economics and Planning, 2018.

Based on the current conditions in the identified enterprise precincts, the assessment shown above highlights that some precincts are high performing and have the characteristics to retain and attract more knowledge intensive employment. Swinburne Uni, Fitzroy-Collingwood, South Melbourne, Cremorne and Gipps St Abbotsford precincts all have the characteristics expected of thriving enterprise precinct. They all have different specialisations which help add to the diversity of Inner Melbourne's economy. Of course, these high performing precincts could be further enhanced to attract additional employment and further boost innovation. Additionally, given their attractiveness there is also the threat of residential encroachment if not adequately protected through planning controls.

Footscray, NURP and Tottenham would appear likely to retain their current focus on traditional industrial uses over the short to medium term (5-15 years). West Melbourne appears likely to also continue its current trajectory.

The remaining precincts have some strengths, but there is less certainty around how they will develop over the short to medium term. Precincts like Arden, Macaulay and Fishermans Bend NEIC are undergoing significant urban renewal which will change the existing land use and employment dynamics. There are lessons for the urban renewal process which can be learnt from the high performing precincts to help attract employment and foster innovation in these locations.

It is important to understand that not all employment lands have the potential to unlock innovation and productivity growth. Only those which perform well (or have future potential to) on the criteria outlined previously in this report should be considered as suitable to fulfil the role of an enterprise precinct.

5. ECONOMIC MODELLING

5.1 Base Case

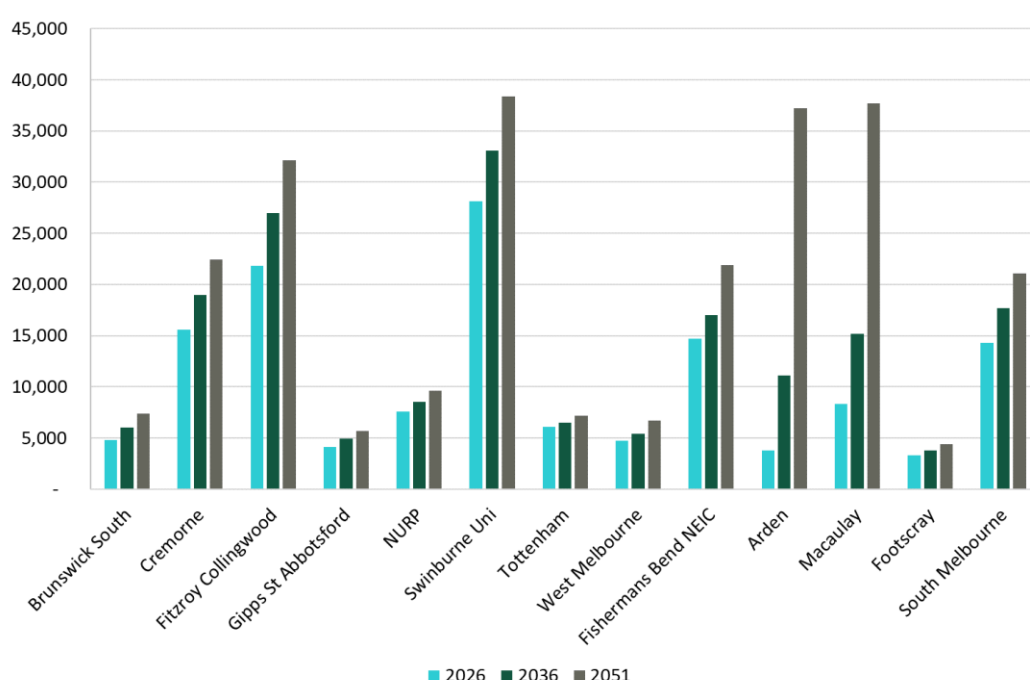
The future gross value added (which is the sum of wages and profits) generated in each precinct has been estimated by multiplying the number of jobs by the average hours worked in the precinct by the average labour productivity. This creates a base case level of gross value added for 2026, 2036 and 2051.

The employment projections are drawn from the Victoria Integrated Transport Model (VITM) land use 2017. The employment projections for each precinct are shown in Figure 12. Most precincts will continue with steady employment growth, with the exception of Arden and Macaulay, which will increase employment significantly leveraging off large scale urban renewal and a new train station.

The average hours worked is based on the ABS Census, and the labour productivity is the 2016 estimate increased by 1.5 per cent (which is in line with the Intergenerational Report's labour productivity growth) to create an estimate for future years.

Table 7 below presents the forecast employment and gross value added for each precinct in 2026, 2036 and 2051.

FIGURE 12: BASE CASE PRECINCT EMPLOYMENT PROJECTIONS



Source: SGS Economics and Planning, 2018.

TABLE 7: BASE CASE PRECINCT EMPLOYMENT AND GROSS VALUE ADDED PROJECTIONS

Precinct	2026		2036		2051	
	Employment	GVA (\$ million)	Employment	GVA (\$ million)	Employment	GVA (\$ million)
Brunswick South	4,800	\$8.8	6,000	\$12.1	7,400	\$16.0
Cremorne	15,600	\$43.6	19,000	\$57.3	22,400	\$72.8
Fitzroy Collingwood	21,800	\$42.4	27,000	\$56.5	32,100	\$72.6
Gipps St Abbotsford	4,100	\$12.1	4,900	\$15.5	5,700	\$19.4
NURP	7,600	\$13.0	8,500	\$15.8	9,600	\$19.2
Swinburne Uni	28,100	\$72.5	33,100	\$92.2	38,400	\$115.1
Tottenham	6,100	\$11.8	6,500	\$13.7	7,200	\$16.2
West Melbourne	4,700	\$12.2	5,400	\$15.2	6,700	\$20.1
Fishermans Bend NEIC	14,700	\$38.1	17,000	\$47.5	21,900	\$66.0
Arden	3,800	\$9.9	11,100	\$31.2	37,200	\$112.4
Macaulay	8,300	\$21.6	15,200	\$42.6	37,700	\$113.7
Footscray	3,300	\$6.5	3,800	\$7.9	4,400	\$9.9
South Melbourne	14,300	\$44.2	17,700	\$59.0	21,100	\$75.5

Source: ABS Census & SGS Economics and Planning, 2018.

5.2 Alternative Scenarios

To understand the impact of future growth trajectories two alternate scenarios were developed to test different economic outcomes. These include:

- **Scenario A:** where there is increased residential 'crowding out' of employment in the precincts.
- **Scenario B:** where there is a greater concentration/clustering of employment in the precincts.

A number of sensitivity tests have been conducted on each of the scenarios:

- There is a net loss of jobs to Victoria due to the crowding out (Sensitivity A1).
- There is a net gain of jobs to Victoria due to the greater concentration/clustering of employment (Sensitivity B1)
- The level of innovation within each precinct decreases (Sensitivity A2).
- The level of innovation within each precinct increases (Sensitivity B2).

Under Scenario A, the sensitivity tests show the impact of lower productivity through decreased innovation and a net loss of jobs from Victoria. Similarly, for Scenario B the sensitivity tests show the impact of higher productivity through increased innovation and a net gain of jobs from Victoria. This helps to present a range of possible outcomes of between '*no jobs loss*' or '*all jobs being lost*'. The ranges provide an indication of the potential economic outcomes as there are many uncertainties.

For example, there is no precise level of residential development which would occur in Scenario A. A certain level of residential that is developed without suitable planning controls to protect employment uses could have the same impact as a much greater level of residential development which is planned more appropriately. Therefore, Scenario A is the

result of residential development adversely impacting the enterprise precinct, most likely because its influence on economic outcomes was unable to be controlled.

5.3 Scenario A Results – Residential ‘Crowding Out’

This section presents the results of the economic modelling in terms of the employment and GVA impact on each of the enterprise precincts under Scenario A (increased residential ‘crowding out’), for both sensitivity tests as outlined above. This scenario assumes that the employment lands in these enterprise precincts are used for residential development with minimal employment uses. This residential development is expected to be transferred from nearby residential growth fronts.

This would reduce the amount of land available for employment, but also place the remaining employment uses in ‘unmanaged’ conflict with new residents (e.g. noise, dust, car parking etc). Under this scenario, the precinct is a less attractive place to do business as there would be difficulties in conducting their business operations. conflict between the employment and residential uses. Land values would also likely be impacted due to increased land speculation of further rezoning and would drive up rents for remaining business.

To generate this scenario, base case employment was reduced by an assumed rate that was based on the relative attractiveness of the precinct to residential development.

As shown in Table 8, a precinct such as Brunswick South could easily be redeveloped for residential, resulting in it having lower employment by 2026 of up to 25 per cent. This residential growth could be expected to be transferred away from development along Sydney Road.

By contrast, NURP and Tottenham are far less attractive for residential development in the short to medium term, so a 5-10 per cent reduction in employment has been assumed. Residential development in these locations would have been transferred from the surrounding residential zoned areas.

TABLE 8: REDUCED EMPLOYMENT AS A RESULT OF RESIDENTIAL CROWDING OUT (SCENARIO A)

Precinct	Reduction from Base Case	2026	2036	2051
Brunswick South	-25%	(3,600)	(3,900)	(4,100)
Cremorne	-15%	(13,300)	(14,300)	(15,700)
Fitzroy Collingwood	-25%	(16,400)	(17,600)	(17,700)
Gipps St Abbotsford	-25%	(3,100)	(3,200)	(3,100)
NURP	-5%	(7,200)	(7,200)	(7,200)
Swinburne Uni	-25%	(21,100)	(21,500)	(21,100)
Tottenham	-10%	(5,500)	(5,500)	(5,400)
West Melbourne	-25%	(3,500)	(3,500)	(3,700)
Fishermans Bend NEIC	-5%	(14,000)	(14,500)	(16,400)
Arden	-5%	(3,600)	(9,400)	(27,900)
Macaulay	-5%	(7,900)	(12,900)	(28,300)
Footscray	-5%	(3,100)	(3,200)	(3,300)
South Melbourne	-5%	(13,600)	(15,000)	(15,800)

Source: SGS Economics & Planning

Note: brackets indicate negative values

The impact of this reduced employment on gross value added is shown in Table 9 under Sensitivity A1, which assumes that all of these jobs are lost from Victoria. This reduces Victoria's GVA by \$51.2 million per annum in 2026, reflecting a 15 per cent reduction in economic performance relative to the base case.

This would also reduce Victoria's taxation revenue by \$1.8 million in 2026 via reduced payroll taxes and stamp duties on conveyances. Commonwealth taxation revenue could be impacted as much as \$12.8 million if all jobs are lost to Australia.

The reduction in Victoria's GVA increases to \$114.0 million per annum in 2036 and up to \$234.6 million per annum in 2051. The impact on Victoria's taxation revenue increases to \$8.4 million in 2051.

Under sensitivity A2, where the jobs are not lost to Victoria, but are instead displaced from the precincts and are able to find another suitable location in Melbourne, there is still an impact on the economy, as the new location will not be as productive as the original precinct. That is, the level of innovation within each precinct decreases as agglomeration economies weaken.

The impact in 2026 would be a reduction in Victoria's GVA of \$11.3 million, \$32.8 million in 2036 and \$81.3 million in 2051.

TABLE 9: ECONOMIC IMPACT (GVA \$MILLION) AS A RESULT OF RESIDENTIAL CROWDING OUT – JOBS LOST TO VICTORIA (SENSITIVITY A1)

Precinct	2026	2036	2051
Brunswick South	(\$2.2)	(\$4.2)	(\$7.1)
Cremorne	(\$6.4)	(\$14.2)	(\$21.8)
Fitzroy Collingwood	(\$10.5)	(\$19.7)	(\$32.5)
Gipps St Abbotsford	(\$2.9)	(\$5.4)	(\$8.9)
NURP	(\$0.7)	(\$2.4)	(\$4.8)
Swinburne Uni	(\$18.1)	(\$32.3)	(\$51.9)
Tottenham	(\$1.2)	(\$2.1)	(\$4.1)
West Melbourne	(\$3.1)	(\$5.3)	(\$9.1)
Fishermans Bend NEIC	(\$1.8)	(\$7.0)	(\$16.6)
Arden	(\$0.5)	(\$4.8)	(\$28.1)
Macaulay	(\$1.0)	(\$6.4)	(\$28.4)
Footscray	(\$0.4)	(\$1.3)	(\$2.5)
South Melbourne	(\$2.2)	(\$9.0)	(\$19.0)
Total	(\$51.1)	(\$114.0)	(\$234.6)

Note: brackets indicate negative figures

Source: SGS Economics & Planning

5.4 Scenario B Results – Increased Employment Clustering

This section presents the results of the economic modelling in terms of the employment and GVA impact on each of the enterprise precincts under Scenario B (increased employment clustering), for both sensitivity tests as outlined above.

To simulate this impact, the base case employment was increased by an assumed rate to reflect the attractiveness of the precinct to additional employment uses. As shown below in Table 10, Cremorne (within its well-developed business and office market) could have higher employment by 2026 (a 25 per cent increase).

Fishermans Bend NEIC has a 25 per cent increase due to the clustering and specialisation in advanced manufacturing building on the surrounding urban development, transport investments and relocation of the University of Melbourne's engineering school.

While most other precincts are assumed to have between a 10 to 15 per cent increase in employment in 2026.

The impact of this increased employment on gross value added is shown in Table 11 below, under Sensitivity B1, which assumes that these additional jobs are new to Victoria. This increases Victoria's GVA by \$52.8 million per annum in 2026 (and State taxation revenue from payroll tax and stamp duty by \$1.9 million per annum). This represents a 16 per cent increase in overall economic output per annum when compared to the base case.

The economic benefit increases to \$71.6 million per annum by 2036 rising to \$105.3 million per annum in 2051. If the jobs are not new to Victoria, but rather just drawn from other locations, there is still an impact on the economy, as the precincts will be more productive than other locations (Sensitivity B2). The positive impact in 2026 would be \$12.5 million, \$20.6 million in 2036 and \$35.3 million in 2051.

TABLE 10: EMPLOYMENT IMPACT AS A RESULT OF INCREASED CLUSTERING (SCENARIO B)

Precinct	Increase from Base Case	2026	2036	2051
Brunswick South	10%	5,300	6,600	8,100
Cremorne	25%	19,500	23,800	28,000
Fitzroy Collingwood	10%	24,000	29,700	35,300
Gipps St Abbotsford	15%	4,700	5,600	6,600
NURP	10%	8,400	9,400	10,600
Swinburne Uni	15%	32,300	38,100	44,200
Tottenham	10%	6,700	7,200	7,900
West Melbourne	10%	5,200	5,900	7,400
Fishermans Bend NEIC	25%	18,400	21,300	27,400
Arden	10%	4,200	12,200	40,900
Macaulay	10%	9,100	16,700	41,500
Footscray	15%	3,800	4,400	5,100
South Melbourne	15%	16,400	20,400	24,300

Source: SGS Economics & Planning

TABLE 11: ECONOMIC IMPACT (GVA \$MILLION) OF INCREASED CLUSTERING – JOBS NEW TO VICTORIA (SENSITIVITY B1)

Precinct	2026	2036	2051
Brunswick South	\$0.9	\$1.2	\$1.5
Cremorne	\$10.9	\$14.5	\$18.2
Fitzroy Collingwood	\$4.3	\$5.7	\$7.2
Gipps St Abbotsford	\$1.8	\$2.2	\$3.1
NURP	\$1.4	\$1.7	\$2.0
Swinburne Uni	\$10.9	\$13.9	\$17.4
Tottenham	\$1.2	\$1.5	\$1.6
West Melbourne	\$1.3	\$1.4	\$2.1
Fishermans Bend NEIC	\$9.6	\$12.0	\$16.6
Arden	\$1.0	\$3.1	\$11.2
Macaulay	\$2.1	\$4.2	\$11.5
Footscray	\$1.0	\$1.3	\$1.6
South Melbourne	\$6.5	\$9.0	\$11.5
Total	\$52.8	\$71.6	\$105.3

Source: SGS Economics & Planning

5.5 Summary Results

Table 11 presents a summary of the economic impacts to GVA from each scenario and sensitivity test outlined in the previous sections. Figure 14 illustrates these impacts, showing the likely range of benefits/dis-benefits under each sensitivity test.

The economic modelling highlights that the loss of employment land to residential uses in the selected precincts (Scenario A) will negatively impact on the Victorian economy in the order of tens of millions of dollars, and over the longer term up to hundreds of millions of dollars.

It also shows that increased concentration and clustering of employment in enterprise precincts will positively impact the economy, adding between \$10 to \$50 million to Victoria's GVA in the short term, and increasing significantly in the longer term.

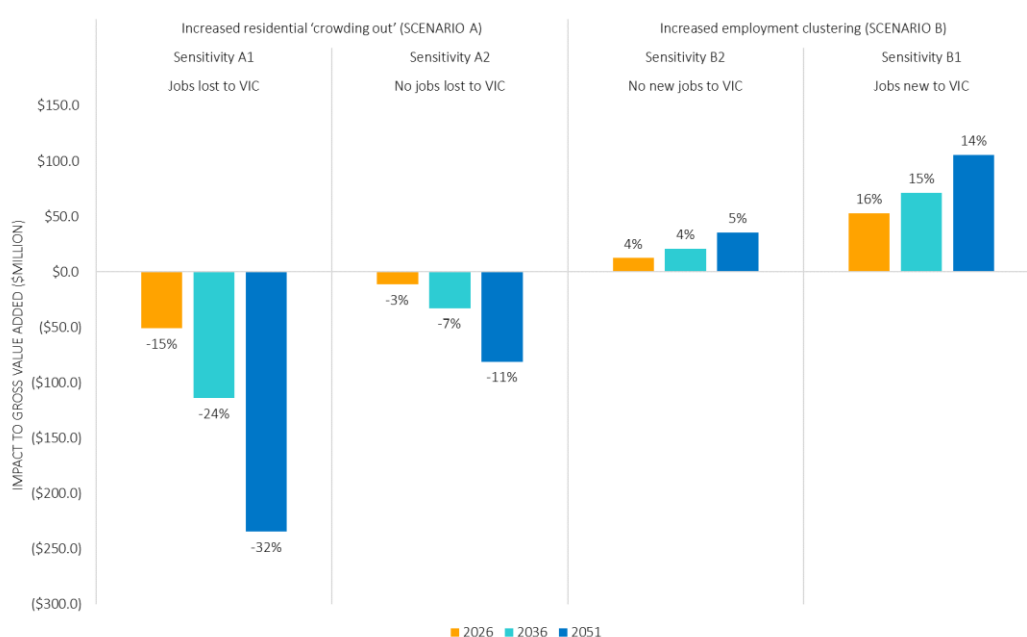
TABLE 12: SUMMARY OF ECONOMIC IMPACTS (GVA \$MILLION PER ANNUM)

	2026	2036	2051
Scenario A: Increased residential 'crowding out'			
Sensitivity A1: Jobs lost to VIC	(\$51.1) ⁴	(\$114.0)	(\$234.6)
Percentage Impact relative to Base Case GVA	(15%)	(24%)	(32%)
Sensitivity A2: Lower levels of innovation (No jobs lost)	(\$11.3)	(\$32.8)	(\$81.3)
Percentage Impact relative to Base Case GVA	(3%)	(7%)	(11%)
Scenario B: Increased employment clustering			
Sensitivity B1: Jobs new to VIC	\$52.8	\$71.6	\$105.3
Percentage Impact relative to Base Case GVA	16%	15%	14%
Sensitivity B2: Higher levels of innovation (No jobs gained)	\$13.4	\$22.2	\$38.1
Percentage Impact relative to Base Case GVA	4%	4%	5%

Source: SGS Economics & Planning

Note: brackets indicate negative values

FIGURE 13: SUMMARY OF ECONOMIC IMPACTS (GVA \$MILLION PER ANNUM)



Source: SGS Economics & Planning

Note: Percentages on this chart represent the percentage impact relative to the base case

⁴ Bracketed values represent a negative value.

5.6 Implications

The economic modelling presented in the previous sections highlights that the loss of employment land to residential uses in the selected precincts will impact Victoria in the order of tens of millions of dollars, and over the longer time horizon, up to hundreds of millions of dollars each year. As shown in Figure 14, by 2036 the cumulative impact on the Victorian economy of increased residential encroachment that adversely impacts on the economic role of enterprise precincts would see a loss of over \$1 billion in GVA (Sensitivity A1).

Conversely, a focus of increased clustering in enterprise precincts could add over \$0.9 billion to the Victorian economy by 2036 through the attraction of additional jobs to the State and improved productivity within the precincts (Sensitivity B1).

FIGURE 14: CUMULATIVE ECONOMIC IMPACT (GVA \$MILLION)



Source: SGS Economics & Planning 2018

The benefits of increased residential development in these areas would only be reflected in a one-off windfall to the land owner when the land is transferred from employment use to residential use. The dis-benefit is a long term reduction economic activity and taxation revenue for Victoria. This highlights that thinking about land use in simple 'highest and best use' terms can adversely impact on economic outcomes.

Existing land use planning in some of the precincts (for example, Fitzroy-Collingwood) could see some (in relative terms) residential uses co-locate in the enterprise precincts without any adverse impacts. This is due to a number of unique factors:

- The geographical size of the precincts;
- The current commercial feasibilities allowing large scale commercial and residential development; and
- The historical acceptance of mixes of uses in the precinct.

There is also an opportunity to boost the concentration of employment in these precincts, which would offer additional agglomeration benefits for business, and provide more employment opportunities on the fringes of Inner Melbourne. This would help to improve job access for residents of middle and outer suburbs as residents do not have to travel into the CBD to access high quality jobs. Even additional employment growth at precincts such as

Arden, Footscray and Swinburne Uni would reduce stress on transport networks that are focused on the Hoddle Grid

They could also encourage corridors of employment into the middle and outer suburbs. For example, strong enterprise precincts at West Melbourne, Arden and Footscray would encourage related and supporting jobs to locate in the inner west of Melbourne. Much in the way that jobs currently locate along St Kilda Road and link jobs in the inner south east with jobs in the CBD.

These enterprise precincts present opportunities to replicate and enhance the development of employment lands which have helped produce a diverse economic structure, while still offering key specialisations in which Melbourne has a competitive advantage.

Attracting and retaining innovative and productive jobs, particularly those in emerging economic sectors that are highly mobile will be increasingly important to the Victorian economy going forward.

Planning and policy making has a significant role to play in determining how economic change will impact on local enterprise precincts by providing the enabling environment for innovation and productivity to flourish. In order for enterprise precincts to realise their potential, land use planning frameworks that support a critical mass of employment in a high amenity environment may be necessary.

6. APPENDICES

6.1 Appendix 1 – Precinct Data Analysis

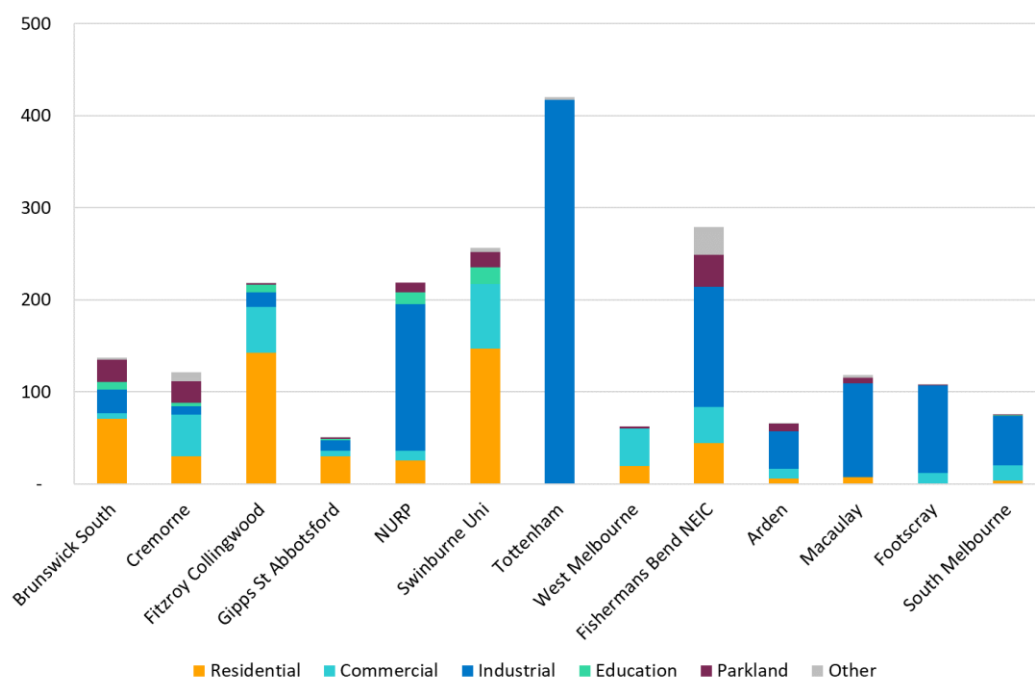
This section presents data for a range of indicators for each enterprise precinct. This analysis informs the ranking of each precinct against the criteria conducted in Section 4.2 of this report.

Land Area

The number of jobs per hectare, an indication of employment density measured using employment land area, varies dramatically across the shortlisted precincts. Swinburne Uni has the largest number of jobs per hectare (300 jobs/ha). Abbotsford, Fitzroy Collingwood and Cremorne have similarly high density of employment, with between 200 to 250 jobs/ha. South Melbourne is another high density precinct, with 180 jobs/ha. The remaining precincts have between 50 to 100 jobs per hectare, with the exception of Tottenham, Footscray and NURP which have below 50 jobs/ha. These areas have more industrial zoned land which uses a greater land area than commercial employment uses.

Figure 15 presents the area for each precinct and the land use (based on the ABS Meshblocks) for different land use types. The precincts range between 100 to 250 hectares on average, with the exception of Tottenham, the largest precinct with over 400 hectares of mostly industrial zoned land.

FIGURE 15: MESHBLOCK AREA AND ZONING FOR EACH OF THE PRECINCTS (HA)



Source: ABS Census & SGS Economics and Planning, 2018.

The more established precincts, including Brunswick South, Fitzroy Collingwood, Swinburne Uni and Abbotsford, have a large proportion of residential zoned land. Developing precincts including Arden-Macaulay and Footscray have a large proportion of industrial zoned land.

Across all the short listed precincts, Swinburne Uni has the largest amount of commercial zoned land, followed by Cremorne and Fitzroy Collingwood. West Melbourne and Fishermans Bend NEIC also have a large amount of commercial zoned land at present.

Number of jobs

Table 13 presents the estimated number of jobs in each enterprise precinct and the employment density (jobs per hectare), based on the amount of commercial, industrial and education land in each precinct.

The Swinburne Uni precinct has the largest number of jobs across all the short listed precincts, with over 26,600 jobs in 2016. It has also experienced strong employment growth in the last five years, at 3.6 per cent per year. South Melbourne has also had strong growth, of 3.8 per cent per year since 2011, with 12,300 jobs in 2016.

Abbotsford, a relatively small precinct, had the strongest jobs growth across the precincts, of 6.1 per cent. It was, however, coming off a low base, and had 4,300 jobs in 2016. Footscray is another small precinct that experienced growth, with 3,000 jobs in 2016, and a growth of 2.1 per cent per year since 2011.

Fitzroy Collingwood is also a large employment cluster, with 16,600 jobs in 2016, and has had steady growth of 1.5 per cent since 2011. Fishermans Bend NEIC had 13,600 jobs and Cremorne had 11,900 jobs in 2016. Both precincts have experienced steady growth over the last five years (0.9 and 1 per cent respectively).

TABLE 13: ENTERPRISE PRECINCT TOTAL JOBS

Precinct	2011	2016	2011-16 AAGR
Brunswick South	3,300	3,600	1.8%
Cremorne	11,300	11,900	1.0%
Fitzroy Collingwood	15,400	16,600	1.5%
Abbotsford	3,200	4,300	6.1%
NURP	6,700	6,700	0.0%
Swinburne Uni	22,300	26,600	3.6%
Tottenham	5,900	5,900	0.0%
West Melbourne	5,000	4,000	-4.4%
Fishermans Bend NEIC	13,000	13,600	0.9%
Arden	3,100	2,700	-2.7%
Macaulay	6,600	6,400	-0.6%
Footscray	2,700	3,000	2.1%
South Melbourne	10,200	12,300	3.8%

Source: ABS Census & SGS Economics and Planning, 2018

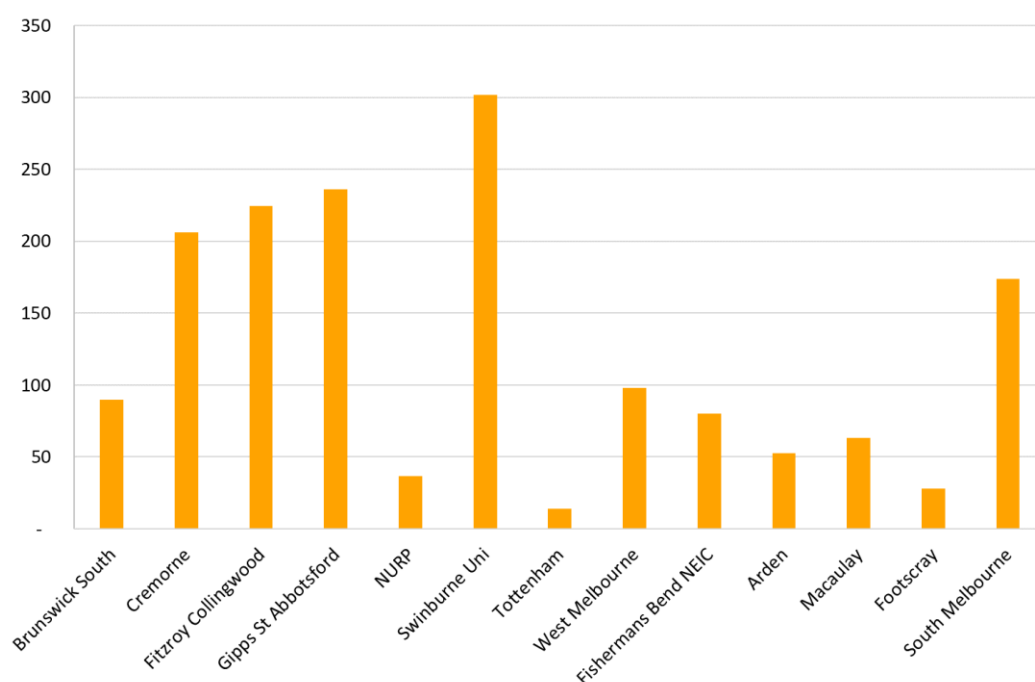
Several precincts have experienced a decline in employment over the last five years, including West Melbourne (4,000 jobs in 2016), Arden (2,700 jobs in 2016) and Macaulay (6,400 jobs in 2016). This is due to these areas undergoing urban renewal, from historically industrial areas to more residential inner city locations.

Brunswick South had 3,600 jobs in 2016, growing by 1.8 per cent in the last five years, and the NURP had 6,700 jobs, and has had no change to employment since 2011. Similarly, Tottenham had 5,900 jobs in 2016, and the same amount in 2011.

As previously identified, the ANZSIC industry classifications which are used to determine the number and type of jobs in each precinct do not capture all of the employment in an area. Informal employment locations such as co-working spaces, shared facilities and workshops are becoming more prevalent, particularly in these CBD-fringe locations. These types of jobs are unlikely to appear in the data.

The number of jobs per hectare, an indication of employment density measured using employment land area, varies dramatically across the shortlisted precincts. Swinburne Uni has the largest number of jobs per hectare (300 jobs/ha). Abbotsford, Fitzroy Collingwood and Cremorne have similarly high density of employment, with between 200 to 250 jobs/ha. South Melbourne was another high density precinct, with 180 jobs/ha.

FIGURE 16: JOBS PER HECTARE – BASED ON EMPLOYMENT LAND AREA



Source: ABS Census & SGS Economics and Planning, 2018

The remaining precincts had between 50 to 100 jobs per hectare, with the exception of Tottenham, Footscray and NURP which had below 50 jobs/ha. These areas have more industrial zoned land which assumes a greater land area than commercial employment uses.

Jobs by Type

Using the occupation of workers, the total number of jobs is broken down into Blue Collar⁵, White Collar (High Skilled)⁶ and White Collar (Low Skill)⁷ for each precinct, as shown in Table 14.

Cremorne has the largest share of high skilled white collar jobs (46.2 per cent) across the shortlisted precincts. Swinburne Uni, South Melbourne, Fishermans Bend NEIC and West Melbourne also have large shares of high skilled white collar jobs, between 40 to 45 per cent of total jobs in 2016.

⁵ Blue Collar occupations include trades workers, technicians, machinery and plant operators, road and rail drivers, cleaners and laundry workers, labourers, factory workers, farm workers and food preparation assistants.

⁶ White Collar – High Skilled occupations include chief executives, managers, legislators, and professionals across a range of industries, including business, HR and marketing, design, engineering, science and transport, education, health, ICT, legal, social and welfare professionals.

⁷ White Collar – Low Skilled occupations include hospitality, retail and service managers, arts and media professionals, health and welfare support workers, protective service workers, sports and personal service workers, office managers and program administrators, clerical workers, receptionists, office support workers, sales representatives and sales agents.

TABLE 14: NUMBER OF JOBS BY BROAD OCCUPATION, 2016

	Blue Collar	Blue Collar (%)	White Collar (High Skilled)	White Collar High Skilled (%)	White Collar (Low Skilled)	White Collar Low Skilled (%)	Total
Brunswick South	1,000	27.8%	1,400	38.9%	1,200	33.3%	3,600
Cremorne	1,400	11.8%	5,500	46.2%	5,000	42.0%	11,900
Fitzroy Collingwood	2,900	17.5%	6,300	38.0%	7,400	44.6%	16,600
Abbotsford	1,100	25.6%	1,400	32.6%	1,800	41.9%	4,300
NURP	2,900	43.3%	1,400	20.9%	2,400	35.8%	6,700
Swinburne Uni	2,200	8.3%	12,000	45.1%	12,400	46.6%	26,600
Tottenham	3,600	61.0%	1,100	18.6%	1,200	20.3%	5,900
West Melbourne	800	20.0%	1,600	40.0%	1,600	40.0%	4,000
Fishermans Bend NEIC	4,200	30.9%	5,900	43.4%	3,500	25.7%	13,600
Arden	1,100	40.7%	900	33.3%	700	25.9%	2,700
Macaulay	2,300	35.9%	2,300	35.9%	1,800	28.1%	6,400
Footscray	1,100	36.7%	1,000	33.3%	900	30.0%	3,000
South Melbourne	2,200	17.9%	5,500	44.7%	4,700	38.2%	12,300

Source: ABS Census & SGS Economics and Planning, 2018.

Swinburne Uni has the largest share of low skilled white collar jobs (46.6 per cent) across the shortlisted precincts. Fitzroy Collingwood also has a large share of low skilled white collar jobs, 44.6 per cent of total in 2016. Abbotsford (41.9 per cent) and Cremorne (42.0 per cent) also have large shares of low skilled white collar jobs.

Tottenham has the largest share of blue collar jobs, with 61.0 per cent of total jobs in blue collar occupations. NURP (43.3 per cent) and Arden (40.7 per cent) also have a large proportion of blue collar jobs.

Fishermans Bend NEIC has a broad mix of blue collar (30.9 per cent), high skilled white collar (43.4 per cent) and low skilled white collar (25.7 per cent) jobs. An even spread of jobs across the three occupation groupings was also evident in Brunswick South, Macaulay and Footscray.

Table 15 presents the four largest industries in each precinct and the number of jobs in each industry in 2016. This analysis provides an indication of the type of industries and degree of specialisation in each precinct, and its ability to achieve a critical mass of economic activity.

Professional, scientific and technical services was the largest employing industry across several of the precincts. These include Cremorne, Fitzroy Collingwood, Swinburne Uni, South Melbourne and West Melbourne. The second largest industry for most of these professional services precincts was retail trade, to support the office workers.

Manufacturing was the largest employing industry for several precincts, including Brunswick South, NURP, Tottenham, Fishermans Bend NEIC, and Footscray. Construction was the largest industry for the precincts of Arden and Macaulay, which are undergoing redevelopment.

Table 16 presents the same data for 2011. There is very little change in term of the largest industries and their relative levels of employment.

TABLE 15: LARGEST INDUSTRY AND NUMBER OF JOBS FOR EACH PRECINCT (2016)

Precinct	Top Industry	Jobs	2nd Industry	Jobs	3rd Industry	Jobs	4th Industry	Jobs
Brunswick South	Manufacturing	710	Education and Training	490	Health Care and Social Assistance	450	Professional, Scientific and Technical Services	320
Cremorne	Professional, Scientific and Technical Services	2370	Retail Trade	2120	Construction	1340	Administrative and Support Services	870
Fitzroy Collingwood	Professional, Scientific and Technical Services	3060	Retail Trade	2130	Accommodation and Food Services	1830	Health Care and Social Assistance	1830
Gipps St Abbotsford	Retail Trade	720	Accommodation and Food Services	510	Professional, Scientific and Technical Services	490	Wholesale Trade	400
NURP	Manufacturing	1590	Retail Trade	1040	Wholesale Trade	970	Construction	880
Swinburne Uni	Professional, Scientific and Technical Services	4430	Retail Trade	3660	Education and Training	3600	Health Care and Social Assistance	2840
Tottenham	Manufacturing	1960	Transport, Postal and Warehousing	1180	Construction	850	Wholesale Trade	490
West Melbourne	Professional, Scientific and Technical Services	800	Transport, Postal and Warehousing	420	Construction	370	Other Services	320
Fishermans Bend NEIC	Manufacturing	5320	Construction	1840	Transport, Postal and Warehousing	1540	Wholesale Trade	1330
Arden	Construction	780	Professional, Scientific and Technical Services	380	Manufacturing	380	Wholesale Trade	210
Macaulay	Construction	1760	Professional, Scientific and Technical Services	1280	Manufacturing	790	Wholesale Trade	600
Footscray	Manufacturing	450	Information Media and Telecommunications	400	Wholesale Trade	330	Other Services	280
South Melbourne	Professional, Scientific and Technical Services	2870	Construction	1680	Retail Trade	1180	Information Media and Telecommunications	990

Source: SGS Economics and Planning, 2018

TABLE 16: LARGEST INDUSTRY AND NUMBER OF JOBS FOR EACH PRECINCT (2011)

Precinct	Top Industry	Jobs	2nd Industry	Jobs	3rd Industry	Jobs	4th Industry	Jobs
Brunswick South	Manufacturing	860	Education and Training	420	Health Care and Social Assistance	340	Wholesale Trade	310
Cremorne	Professional, Scientific and Technical Services	2110	Retail Trade	2020	Construction	1230	Financial and Insurance Services	940
Fitzroy Collingwood	Professional, Scientific and Technical Services	2720	Retail Trade	2030	Health Care and Social Assistance	1580	Accommodation and Food Services	1560
Gipps St Abbotsford	Retail Trade	560	Wholesale Trade	460	Professional, Scientific and Technical Services	380	Transport, Postal and Warehousing	340
NURP	Manufacturing	1850	Retail Trade	990	Wholesale Trade	960	Construction	810
Swinburne Uni	Professional, Scientific and Technical Services	3770	Retail Trade	3340	Education and Training	2500	Financial and Insurance Services	2380
Tottenham	Manufacturing	2240	Transport, Postal and Warehousing	1050	Construction	820	Wholesale Trade	450
West Melbourne	Professional, Scientific and Technical Services	1100	Transport, Postal and Warehousing	680	Construction	570	Wholesale Trade	390
Fishermans Bend NEIC	Manufacturing	4790	Wholesale Trade	1770	Construction	1440	Transport, Postal and Warehousing	1420
Arden	Construction	1040	Manufacturing	560	Professional, Scientific and Technical Services	470	Wholesale Trade	240
Macaulay	Construction	1780	Professional, Scientific and Technical Services	1170	Manufacturing	1020	Wholesale Trade	540
Footscray	Manufacturing	550	Wholesale Trade	320	Information Media and Telecommunications	270	Construction	230
South Melbourne	Professional, Scientific and Technical Services	2300	Construction	1260	Retail Trade	1210	Manufacturing	760

Source: SGS Economics and Planning, 2018

Access to jobs

Based on outputs from the Victorian Integrated Transport Model, the number of jobs accessible within 30 minutes by car and public transport is presented below. The values presented are the average value for the whole precincts rather than just the centre of the precinct.

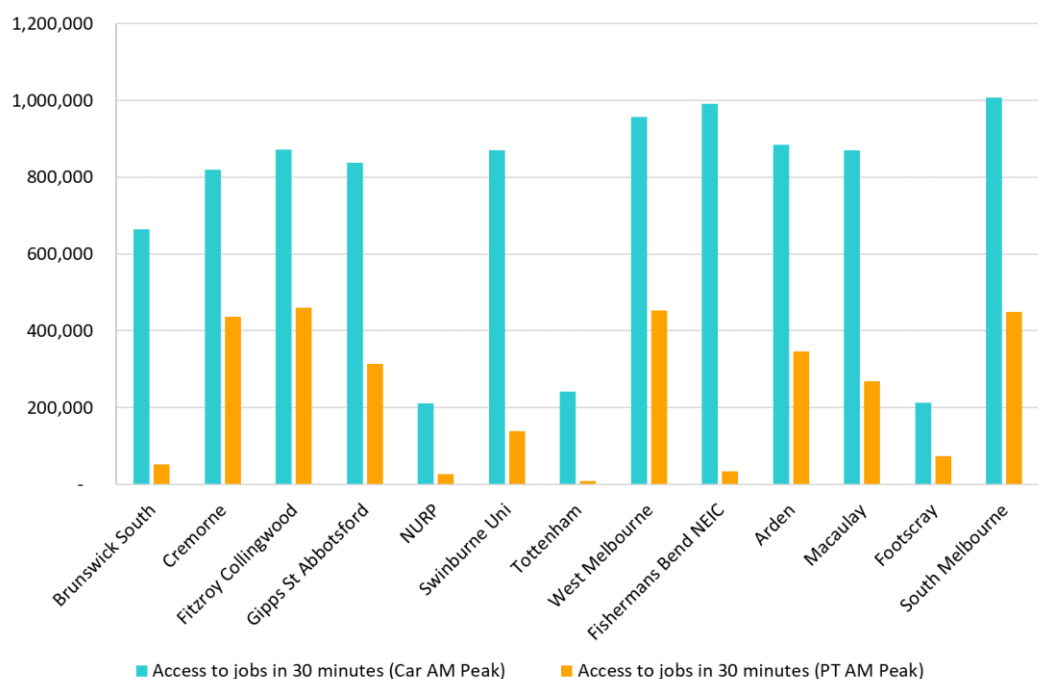
For many of the precincts, almost 1 million jobs can be reached within a 30 minute car journey. This includes precincts close to the CBD: Fishermans Bend NEIC, South Melbourne and West Melbourne.

Other inner precincts including Cremorne, Fitzroy Collingwood, Abbotsford, Swinburne Uni, Arden and Macaulay can reach approximately 800,000 jobs within a 30 minute car journey. Precincts located further away from the CBD can access a smaller number of jobs, including NURP, Tottenham and Footscray (200,000 jobs within 30 mins car ride).

Precincts with good public transport infrastructure which links to the CBD have the greatest access to jobs within 30 minutes by public transport. These include Fitzroy Collingwood, Cremorne, West Melbourne, South Melbourne and Abbotsford (between 300,000 to 450,000 jobs within 30 minutes by public transport).

Swinburne Uni, which has good access to jobs by car, has comparatively lower access to jobs by public transport (below 200,000 jobs within 30 minutes by public transport). Precincts with poor public transport infrastructure and located further from the CBD, such as NURP, Tottenham, Footscray, Fishermans Bend NEIC and Brunswick South, have lower access to jobs within 30 minutes by public transport.

FIGURE 17: AVERAGE ACCESS TO JOBS FOR EACH OF THE PRECINCTS



Source: SGS Economics and Planning, 2018.

Labour force catchment

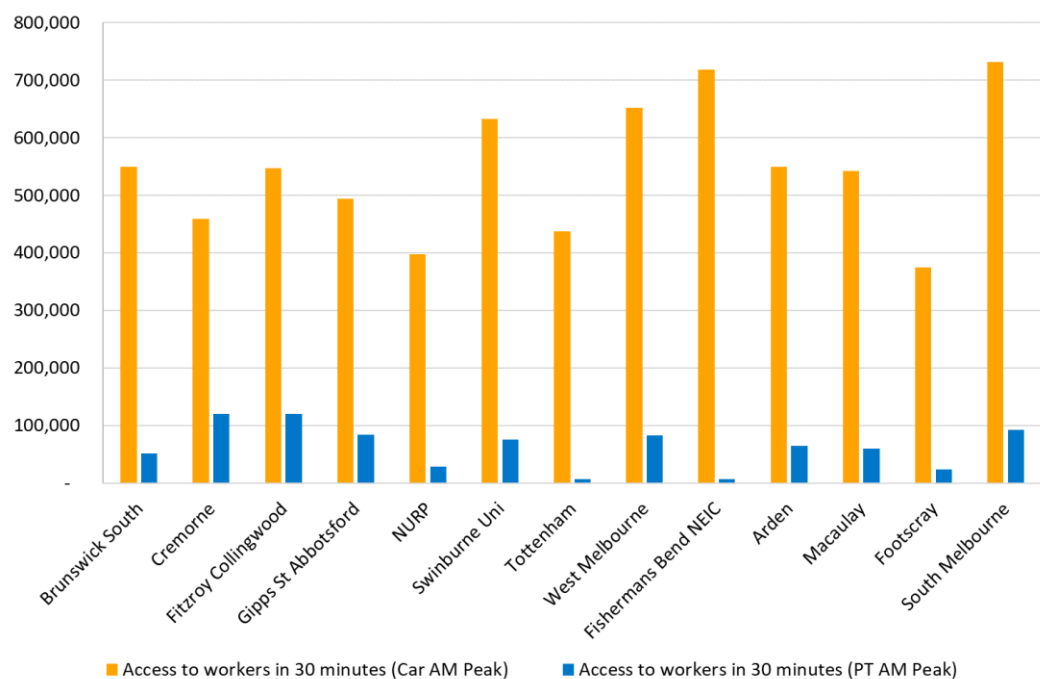
The labour force catchment of each precinct can be assessed through an examination of the number of workers that can be reached from the precinct within 30 minutes by car and public transport.

Based on outputs from the Victorian Integrated Transport Model, the number of workers accessible within 30 minutes by car and public transport have been estimated, as presented below. The values presented are the average value for the whole precincts rather than just the centre of the precinct.

The labour market catchment (by car) ranges between 400,000 to 750,000 workers for each precinct. The South Melbourne and Fishermans Bend NEIC precincts have the largest labour force catchments, with over 700,000 workers accessible within a 30 minute car trip. Swinburne Uni, West Melbourne, Arden, Macaulay, Fitzroy Collingwood, and Brunswick South also have large labour market catchments, between 500,000 to 650,000 workers accessible within a 30 minute car trip.

The labour market catchment by public transport is much smaller than compared to car trips, at approximately 100,000 workers for precincts with good public transport infrastructure such as Cremorne, Fitzroy Collingwood, Abbotsford and South Melbourne. Some precincts had almost no workers accessible within 30 minutes by public transport, such as Tottenham, Fishermans Bend NEIC and Footscray.

FIGURE 18: ACCESS TO WORKERS FOR EACH OF THE PRECINCTS



Source: SGS Economics and Planning, 2018

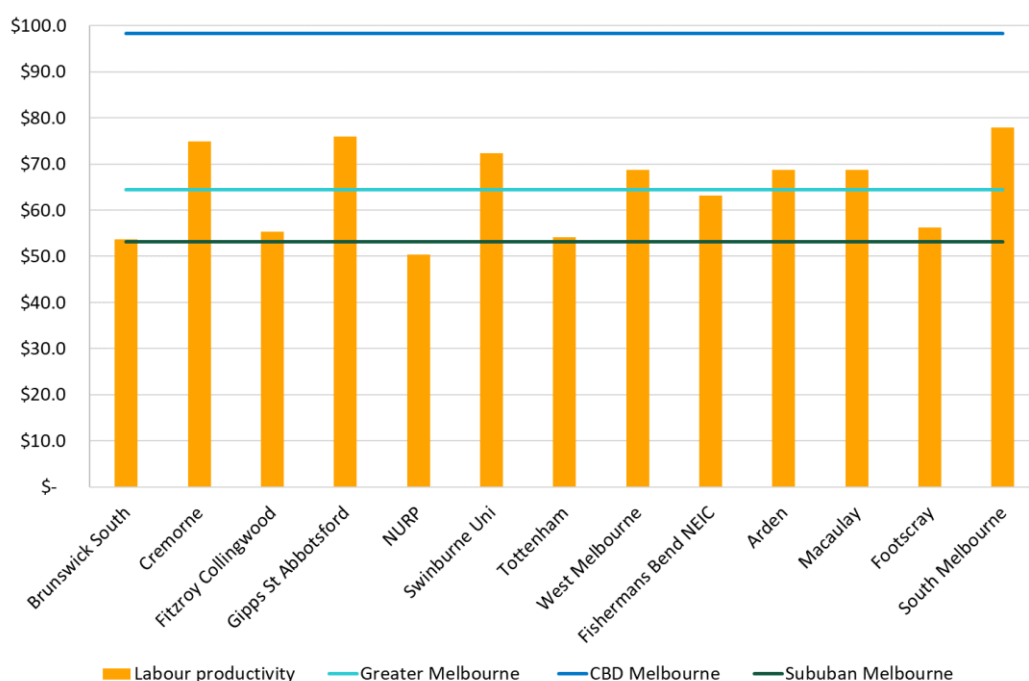
Relative Labour Productivity

Labour productivity is a measure of the income (both profits and wages) produced for each hour worked. Figure 19 presents the labour productivity for each precinct, for the Hoddle Grid (CBD) and the average for suburban (everything outside of Inner Melbourne SA3) Melbourne.

Labour productivity varies across the precincts, highest in South Melbourne (\$80), Abbotsford (\$76), Cremorne (\$76) and Swinburne Uni (\$72). These are areas with a higher proportion of high skilled white collar jobs and a greater share of professional services employment.

The average labour productivity for suburban Melbourne is approximately \$51. Several of the outer precincts had a similar level of labour productivity, including Brunswick South, NURP, Tottenham and Footscray.

FIGURE 19: LABOUR PRODUCTIVITY FOR EACH OF THE PRECINCTS

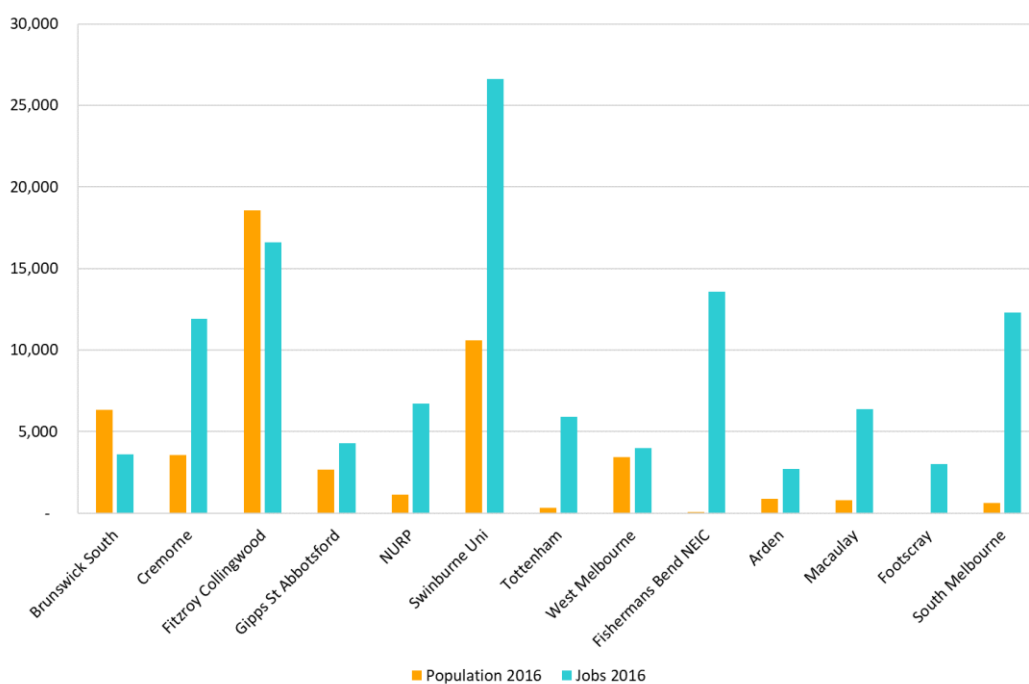


Source: SGS Economics and Planning, 2018

Resident Population

The residential population within each enterprise precinct varies depending on the type of location and level of residential development that has occurred (see Figure 20). Fitzroy Collingwood has the largest population in 2016 of all the precincts, with over 18,000 residents in 2016. This aligns with the large proportion of residential zoned land in this precinct.

FIGURE 20: 2016 POPULATION AND EMPLOYMENT FOR EACH OF THE PRECINCTS



Source: SGS Economics & Planning 2018

Swinburne Uni also has a large resident population, with over 10,000 residents in 2016. Brunswick South, Cremorne, West Melbourne and Abbotsford had small residential populations, of between 3,000 to 6,000 residents in 2016. All other precincts had very little or no resident population in 2016.

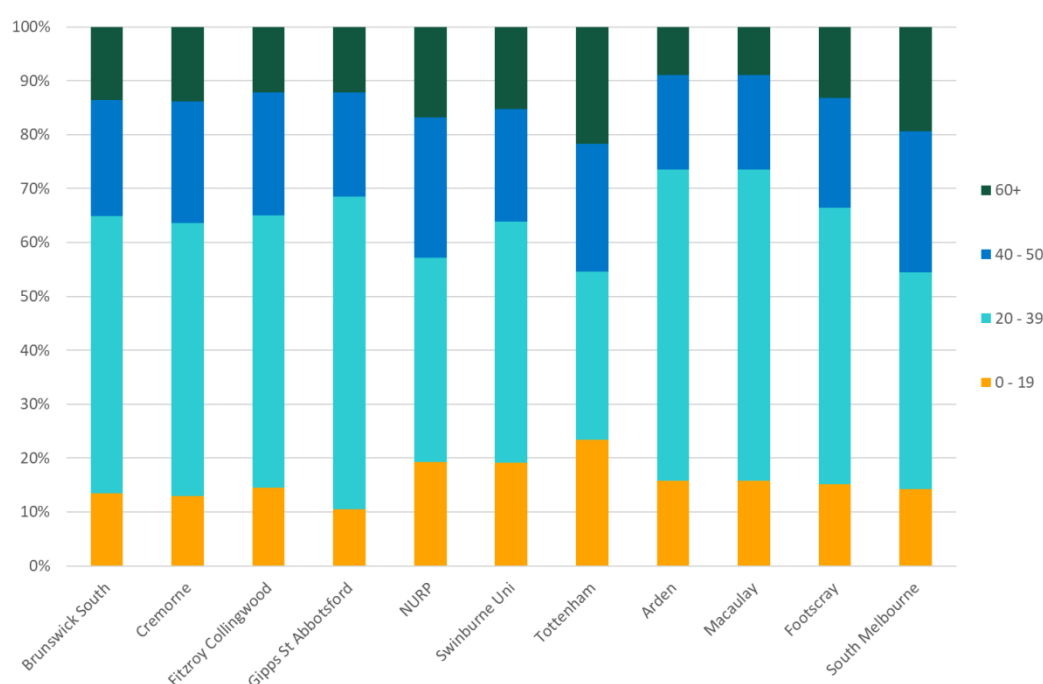
It should be noted that some of these precincts achieve 'mixed use' by having large adjacent residential populations rather than within the precinct per se. As the precincts have been defined based on employment and innovation clusters, the majority of the local resident population is likely to be outside of the precinct boundary.

Figure 21 below shows the age profile of the resident population in each precinct as of the 2016 Census. Precincts with higher proportions of people aged between 20 and 60 will have a larger local working catchment to draw on.

The age profile varies considerably between precincts. Some precincts such as Tottenham and NURP have smaller proportions of people of working age, and consequently higher proportions of those aged under 19 and over 60 years. The precincts of Arden, Macaulay and West Melbourne have the smallest proportion of people aged over 60, at around 9 per cent, while Tottenham and South Melbourne have the highest proportions at 22 per cent and 19 per cent respectively.

The largest proportion of youngers workers between 20 and 39 years are seen in the Gipps St Abbotsford precinct and West Melbourne (58 per cent respectively), while the Tottenham precinct has the lowest proportion at 31 per cent.

FIGURE 21: POPULATION BY AGE FOR EACH OF THE PRECINCTS



Source: ABS Census 2016

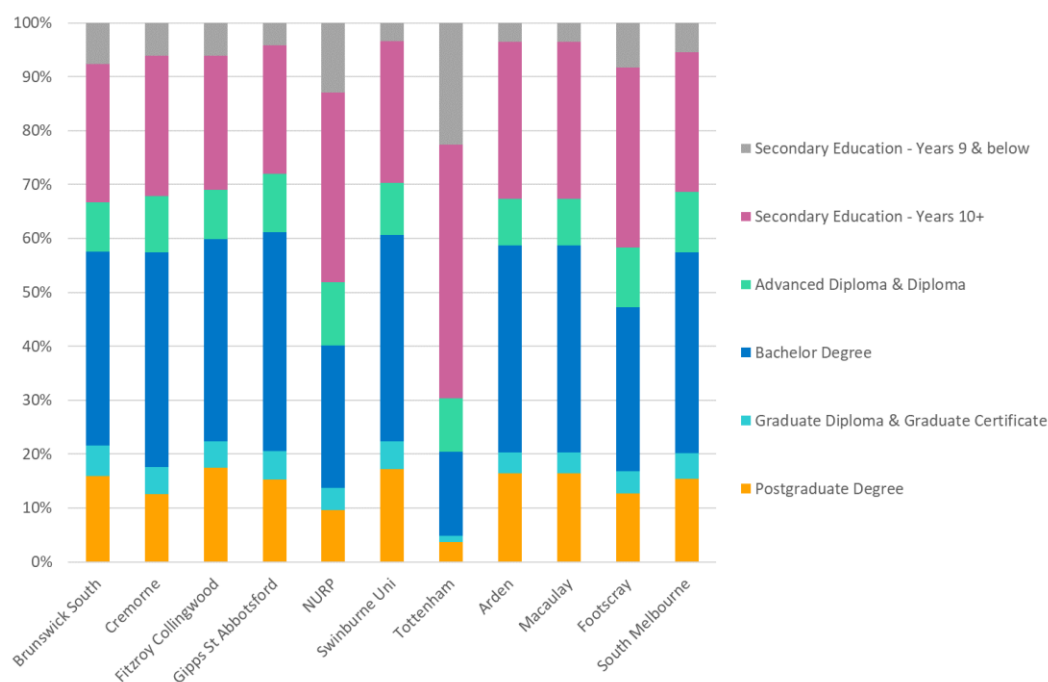
Figure 22 shows the proportion of each precinct's population with educational qualifications at the secondary and tertiary level. The level of educational attainment also varies between precincts, and those with higher proportions of people with tertiary level qualifications will have larger pools of skilled labour to source workers from.

The Gipps St Abbotsford and Swinburne University precincts have the highest proportion of people with bachelor and higher level degrees, at 61 per cent each, followed by Fitzroy Collingwood with 60%. West Melbourne, Arden Macauley and Brunswick South also have high

proportions of people with higher level degrees. Tottenham has the lowest proportion of residents with a tertiary degree, at just 20 per cent of the resident population.

Similarly, Tottenham has the highest proportion of people who attended high school as their highest level of study, making up 70 per cent of residents, followed by the NURP precinct with 48 per cent, and Footscray with 42 per cent.

FIGURE 22: EDUCATION QUALIFICATIONS FOR EACH OF THE PRECINCTS



Source: ABS Census 2016

Note: West Melbourne and Fishermans Bend NEIC precincts have been excluded as there is no resident population in 2016

Type and cost of commercial property

Data on commercial property is difficult to obtain at the precinct level. Table 17 below shows the effective rental growth of commercial properties between 2007 and 2017 by region.

TABLE 17: EFFECTIVE RENTAL GROWTH – 2007-2017 BY REGION

Location	March 2007	March 2017	Growth
City Fringe	\$220	\$344	56%
Inner East	\$232	\$324	40%
CBD	\$269	\$354	32%
South East	\$182	\$227	25%
Outer East	\$184	\$224	22%
North and West	\$179	\$197	10%

Source: Colliers

This suggests that the City Fringe area has seen a higher level of growth in rents than the CBD, at 56 per cent compared to 32 per cent respectively. The lowest level of growth has been in the North and West, at just 10 per cent over the period. In 2017, the CBD and City Fringe have had the highest rents, followed by the Inner East, with the North and West region having the lowest rents. Rents in the South East and Outer East are also relatively low compared to the CBD, Inner East and City Fringe.

Research by Colliers into the features that tenants are seeking in commercial properties includes elements such as high quality foyer spaces, full-height glass windows and as part interior fit-outs, and rooftop gardens and balconies.

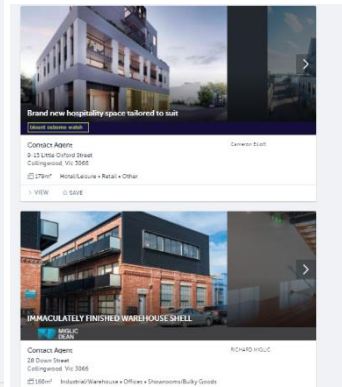
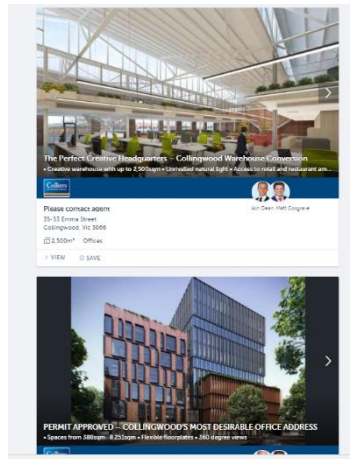
The provision of high quality end of trip facilities (lockers, showers, and so on) and more informal staff creative spaces are also sought after. The volume of space is also important, with large tenants looking for floor plates between 1,600 and 2,500 square metres, desk space and services with a ratio of 1:10, and car parking at a ratio of 1:40.

To help provide some insights into the affordability criteria, current commercial properties for rent from www.realcommercial.com.au have been used to highlight the property type and cost in some of the precincts. These are illustrated in Table 18.

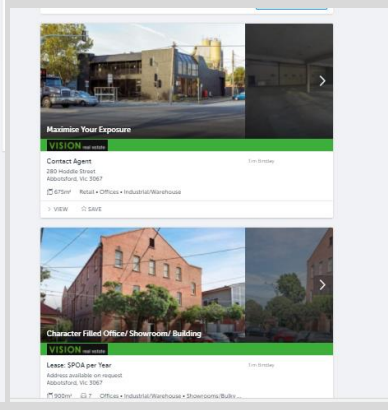
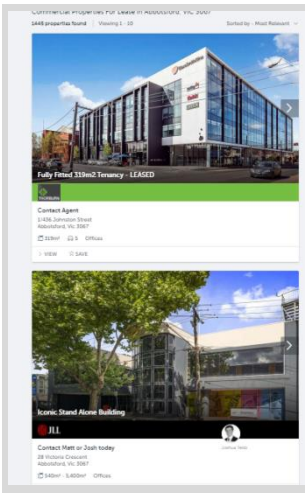
Some precincts such as Cremorne and Gipps Street have a diverse (in terms of size and price points) office market, while Tottenham is very much a ‘tilt slab’ industrial precinct with larger building footprints.

TABLE 18: EXAMPLES OF COMMERCIAL PROPERTY TYPES/RENTS

Precinct	Commercial property types/rents
Brunswick South	
Cremorne	
Fitzroy/Collingwood	



Gipps Street Abbotsford



Tottenham



West Melbourne

jire
Lease: \$800.00 per Month
L1, 504 Spencer
West Melbourne, Vic 3003
139m² Offices
VIEW SAVE

grayjohnson
Contact Agent
270 Rosslyn Street
West Melbourne, Vic 3003
190m² Offices
VIEW SAVE

SUTHERLAND FARRELLY
\$40,000 pa + GST including statutory outgoings
Level 2, 424 William Street
West Melbourne, Vic 3003
185m² Offices

South Melbourne

KELEMEN
Contact Agent
215 Moray Street
South Melbourne, Vic 3205
140m² Offices
VIEW SAVE

Waverley City
Contact Agent
170 York Street
South Melbourne, Vic 3205
301m² 1 Offices • Retail
VIEW SAVE

NEW
\$398,000
26/150 Albert Rd
South Melbourne, Vic 3205
56m² Offices
VIEW SAVE

\$340,000
Stead Street Office, Level 3, 304/53-65 Stead Street
South Melbourne, Vic 3205
52.00m² 2 Offices • Retail • Other
VIEW SAVE

Source: www.realcommercial.com.au

6.2 Appendix 2 – State and Local Planning Policy Review

This section outlines current Victorian Government planning and economic development policy and legislation relevant to inner city knowledge intensive precincts.

The Victorian Government has identified that to remain competitive in a changing global economy there is a need to boost innovation and productivity, and support growth across all industries. Facilitating the evolution of the economy will be critical to support the creation of new jobs. Planning for the future growth of Melbourne goes beyond strategy planning, but requires strengthen industries such as manufacturing and creative industries.

Plan Melbourne

Plan Melbourne sets out a strategy for supporting jobs and growth across Melbourne. Melbourne is intended to be a productive city that attracts investment, supports innovation and creates jobs. It is argued that Melbourne has the opportunity to position itself as one of the world's foremost new knowledge economies, powering the next generation of productivity and economic growth in Australia. To achieve that ambition, Melbourne must 'develop a series of interconnected learning, working and living precincts across the city'.⁸

Priority sectors have been identified that have the potential to attract and deliver significant growth and investment, in Melbourne.⁹ The priority sectors identified include:

- Medical technology and pharmaceuticals
- New energy technologies
- Food and fibre
- Transport technologies
- Defence technologies
- Construction technologies
- International education, and
- Professional services.

Plan Melbourne relevant actions

Action 4 Land-use and infrastructure plans for the national employment and innovation clusters

Outcome 1: Melbourne is a productive city that attracts investment, supports innovation and creates jobs.

Work in partnership with local governments, major institutions, utility providers, land owners and investors to prepare long-term land use and infrastructure plans for national employment and innovation clusters (NEICs). Current work on Sunshine, Monash and La Trobe will be followed by Dandenong, Parkville and Werribee.

For each NEIC these plans will:

- Develop a shared vision and desired outcomes statement
- Define its specialised activities and capacity to expand over time
- Identify constraints on employment and business growth, and the preconditions necessary to facilitate investment
- Define the planning boundary
- Evaluate whether existing planning controls provide effective planning frameworks. See Action 22 regarding Fishermans Bend NEIC.

⁸ Victorian Government 2017, *Plan Melbourne 2017-2050*, Victorian Government: Melbourne, p.20

⁹ Victorian Government 2017, *Plan Melbourne 2017-2050*, Victorian Government: Melbourne, p.20

The lead agency for this action is the Victorian Planning Authority (VPA) with implementation partners DELWP, DEDJTR, and councils.

Action 8 Significant industrial precincts

Outcome 1: Melbourne is a productive city that attracts investment, supports innovation and creates jobs.

Work with local government to strengthen regionally significant industrial precincts in established urban areas for employment generating activities by:

- Ensuring that sufficient land is zoned for employment purposes and that sensitive land uses such as housing are not permitted to be established in them
- Retaining larger industrial precincts for local manufacturing, service industries, warehousing and distribution
- Promoting the renewal of older industrial areas that are no longer well suited to industrial activities for alternative employment activities such as offices, creative industries and other employment-generating activities
- Facilitating improved information and communications technology infrastructure, access and amenity within these areas
- Reviewing planning, building and environmental regulations to ensure that these are not barriers to the affordable conversion of designated industrial areas for alternative employment-generating activities
- Identifying areas no longer required for employment activities.

The lead agency for this action is DELWP with implementation partners VPA, DEDJTR, and councils.

Action 12 Planning for future employment growth

Outcome 1: Melbourne is a productive city that attracts investment, supports innovation and creates jobs.

Assist councils to plan for future employment needs by:

- Addressing how metropolitan regional employment demand forecasts can be translated into floorspace requirement, land-use and zoning frameworks
- Providing direction for assessing the ongoing suitability of established industrial and commercial areas for different types of employment purposes
- Providing direction about when such areas should be retained for employment purposes and when they should be considered for rezoning to mixed-use or residential.

The lead agency for this action is DELWP with implementation partners DEDJTR and VPA.

Advanced Victorian Manufacturing, DEDJTR

*Advancing Victorian Manufacturing*¹⁰ is the State Government's plan for the ongoing development of advanced manufacturing in metropolitan and regional Victoria. It outlines a series of initiatives designed to support local manufacturing businesses, including through:

- Introducing new products and services,
- Implementing process enhancements and adopting advanced business models,
- Encouraging stronger links with global business partners, and
- Entering new export markets and securing global supply chain opportunities.

Among the initiatives offered under the plan are manufacturing vouchers for SMEs to introduce improved locally manufactured products into their business, and co-contributions for businesses to support enhancements to their manufacturing capability, such as in developing business plans, marketing, and improved operating and financial management

¹⁰ See https://www.business.vic.gov.au/_data/assets/pdf_file/0003/1544169/10764-DEJTR-EIT-Advancing-Victorian-Manufacturing-factsheet_Program-Overview-WEB.pdf

systems. Other initiatives include a Global Discovery Exchange, where local business can experience cutting-edge advanced manufacturing processes first hand, and a case management program for medium-sized businesses to assist them in entering new overseas markets and developing global supply chains.

Creative State, Creative Victoria

The passing of the Creative Victoria Act (May 2017) by the Victorian Government has 'signalled a new era for creativity in Victoria' by expressing the government's vision and support for a whole-of-sector approach to Creative Industries' (Creative Victoria, 2017).

The Creative Victoria Act acknowledges the economic value of the creative industries, which currently make up eight per cent of the economy, contribute \$23 billion a year to the state, and provide around 220,000 jobs (Creative Victoria, 2017). The Act is underwritten by the principle that all individuals in Victoria are equally entitled to access opportunities and participate in and contribute to the arts and creative industries in Victoria.

With the legislative framework now in place, Creative Victoria is now pursuing the policy directions set out in Creative State, Victoria's first creative industries strategy (released in 2016).

In addition to acknowledging the sector's importance in terms of job creation and industry innovation, the strategy also promotes the sector's role in the delivery of 'wider community solutions' (Creative Victoria, 2017). Creative State indicates that to do so, creative industries will continue to engage with key sectors such as Education, Health and Human Services, Environment and Justice.



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