SGS Economics & Planning | Independent insight.

ECONOMIC, SOCIAL AND ENVIRONMENTAL PROFILE: WESTERN METRO REGION

APRIL 2019

PREPARED FOR:
INFRASTRUCTURE VICTORIA

SGS Economics and Planning Pty Ltd
ACN 007 437 729
www.sgsep.com.au
Offices in Canberra, Hobart, Melbourne, Sydney

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

Abbreviation	Description
AAGR	Average annual growth rate
ABS	Australian Bureau of Statistics
ACSC	Ambulatory Care Sensitive Conditions
AEDC	Australian Early Development Census
ANZSCO	Australian and New Zealand Standard Classification of Occupations
ANZSIC	Australian and New Zealand Standard Industrial Classification
ARI	Annual Recurrence Interval
ASR	Age Standardised Rate
ATP	Altona Treatment Plant
BMO	Bushfire Management Overlay
CBD	Central Business District
CMA	Catchment Management Authority
DBSCAN	Density-based spatial clustering of applications with noise
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
DHHS	Department of Health and Human Services
DOTE	Dropping off the Edge (Jesuit Social Services Report)
DPH	Dwellings per hectare
EJD	Effective Jobs Density
EPA	Environment Protection Authority Victoria
ESE	Economic, Social and Environmental
FER	Functional Economic Region
GP	General Practitioner (Medical doctor)
GRP	Gross Regional Product
GVA	Gross Value Added
HA	Hectare
HACC	Home and Community Care Services
HEX	SGS 30-hectare grid model
IT	Information Technology
IV	Infrastructure Victoria
LGA	Local Government Area
LQ	Location Quotient
MAC	Metropolitan Activity Centre
MVCC	Moonee Valley City Council
NEIC	National Economic and Innovation Cluster
NIEIR	National Institute of Economic and industry Research
POW	Place of Work
PSP	Precinct Structure Plan
PTV	Public Transport Victoria
PUR	Place of Usual Residence
SA	Statistical Area
SEIFA	Social and Economic Index for Areas
SSIP	State Significant Industrial Precinct
UGB	Urban Growth Boundary
VIF	Victoria in Future Report
VLUIS	Victorian Land Use Information System
VPA	Victorian Planning Authority
WHO	World Health Organisation
WTP	Water Treatment Plant

EXECUTIVE SUMMARY

Context

Infrastructure Victoria (IV) is building its understanding of the regional and local trends that influence metropolitan Melbourne's regions. This will:

- inform the 2020 update of the 30-year infrastructure strategy, including IV's ability to spatially target infrastructure investment
- build on the analysis of regional Victoria completed earlier in 2018.

This **Western Metro Region Economic, Social and Environmental** (ESE) report is one of six for each region of Melbourne, supported by an Inter-regional ESE report and a Functional Economic Region (FER) Report that looks beyond administrative boundaries to analyse how Melbourne, as a whole, functions as an economic region.

REPORT PACKAGE

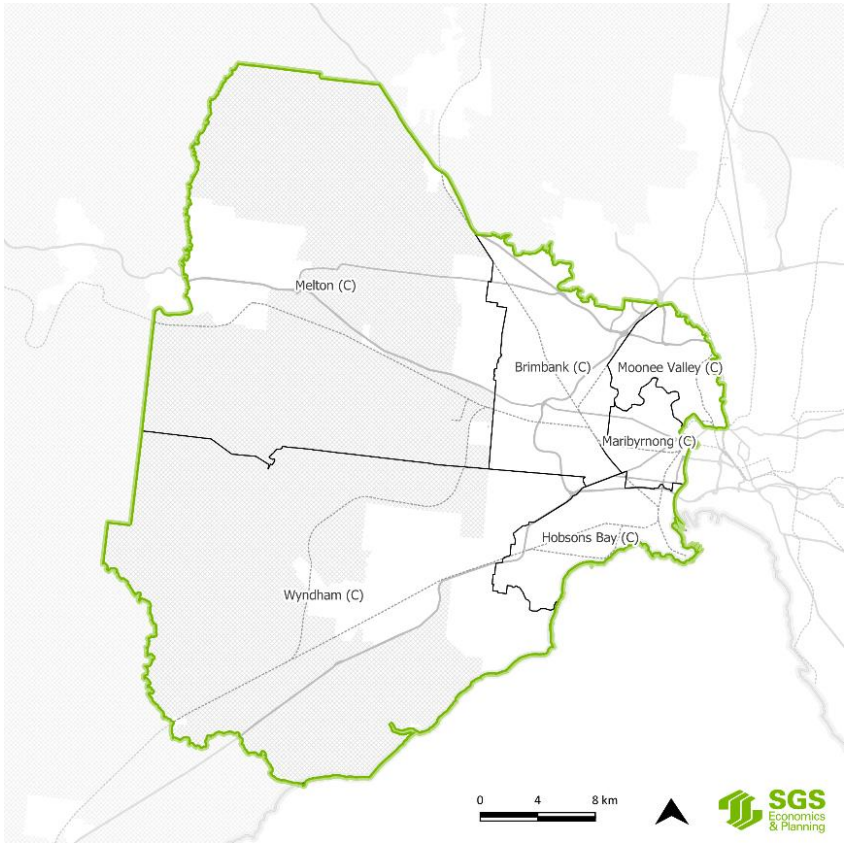
This ESE report looks at overarching drivers of change and how they affect the Western Metro Region. It measures performance against a range of indicators at varying geographic scales and identifies key characteristics, trends, challenges and opportunities within and across the region. It does not investigate nor provide recommendations on investments or solutions to address these matters.

Western Metro Region

The Western Metro Region comprises six local government areas (LGAs): Maribyrnong, Moonee Valley, Hobsons Bay, Brimbank, Melton and Wyndham (see context map below).

The region extends from the inner suburbs of Footscray and Williamstown, to some of the city's newest communities in the Werribee and Melton LGAs.

WESTERN METRO REGION CONTEXT MAP



Western Metro Region Summary

HEADLINE STATISTICS

	Number	%
Population	**876,000**	**100%**
0-14	182,000	21%
15-39	340,000	39%
40-64	258,000	29%
65+	96,000	11%
Jobs	**304,000**	**100%**
Knowledge	47,000	15%
HealthEdu	63,000	20%
Population	110,000	36%
Industrial	85,000	28%
Land (ha)	**132,000**	**100%**
Residential	25,000	19%
Employment	7,000	5%
Park/Rural	60,000	46%
Other	40,000	30%

Attributes

- The Western Metro Region has a **large blue-collar workforce**. The Western State Significant Industrial Precinct (SSIP) between Laverton, Altona and Sunshine has the greatest capacity to support expansion of industrial uses across metropolitan Melbourne. Transport, postal and warehousing are the **strongest industry sectors** in the region, with the Western Metro Region having a significantly larger proportion of these sectors than other regions. Construction is especially dominant in the growth LGAs of Wyndham and Melton. Retail trade is also highly represented, focused around key centres in Werribee, Melton, Sunshine, Footscray, Essendon, Moonee Ponds, Altona and Williamstown. Some inner ex-industrial areas have transitioned to other uses (including residential), while other key industrial areas (especially in Hobsons Bay LGA, Maribyrnong LGA and around the Port of Melbourne) in the inner parts of the Western Metro Region continue to represent a large share of industrial activity (especially the petrochemical plants).
- Housing development across the Western Metro Region is characterised by **established inner metropolitan suburbs** and pressure for infill development (especially in the Moonee Valley, Maribyrnong and Hobsons Bay LGAs, and parts of Brimbank LGA), as well as **greenfield growth areas** at varying stages of development in parts of the Wyndham and Melton LGAs – around Melton, Caroline Springs, Point Cook, Williams Landing, Truganina, Toolern and Plumpton.
- Future population growth will be directed along the **Western Growth Corridors**, where large greenfield and brownfield precincts are identified for future development. Largely infill growth will occur in the inner LGAs (Moonee Valley, Maribyrnong and parts of Hobsons Bay).
- Reflecting the high amenity of inner areas, **median house prices** increased significantly between 2011 and 2017. The largest increase occurred in the Moonee Valley, Maribyrnong and Hobsons Bay LGAs, where the median house price is now between $800,000 to $1,000,000 for a detached house. The median unit/apartment price increased to almost $600,000 in Hobsons Bay LGA over the same period.
- The region's **transport network** supports the movement of goods between regional areas (Geelong and the west coast, Ballarat and Bendigo) and connects the west to Melbourne and Essendon airports.
- The region's **visual landscape character** is defined by the Western Volcanic Plain, which rises in the north to the Victorian Uplands at the foothills of the Macedon Ranges. Towards the east, the Kororoit Creek, Werribee River, Maribyrnong River and Port Phillip Bay allow residents to engage with significant biodiversity and landscape values – including at Altona Beach, the Kororoit Creek Trail, Williamstown Beach and Williamstown Foreshore. Other significant biodiversity areas in the region include the expansive Western Grasslands and Cherry Lake Reserve. In green wedge areas, agricultural activities include highly fertile areas such as the Keilor market gardens (on the border of the Northern Metro Region), as well as vegetable production in the City of Wyndham.
- **Key tourist destinations** include Werribee Zoo, Historic Williamstown, Werribee Mansion, Werribee Township Regional Park, Scienceworks, Nelson Place Tourist Precinct, Seaworks, The Substation, and Altona and Williamstown Beaches.

Strengths

- A growing, diverse and skilled population
- Relatively affordable and diverse housing in Middle Melbourne areas
- Growing cultural diversity and skilled migrants, particularly in the Wyndham, Maribyrnong and Brimbank LGAs
- Recent employment growth largely driven by population-serving industry sectors
- Increasingly diverse economy in inner areas and capacity (due to transitioning uses) to support high-skill, creative, knowledge-intensive sectors
- Proximity to Geelong, Ballarat and peri-urban towns
- Major industrial areas at Laverton, Altona North and Truganina allow for industrial and manufacturing activities that cannot occur elsewhere in Melbourne
- Basalt quarries provide raw materials for housing development and major infrastructure projects
- Land available for urban development particularly in the New Growth Areas and some infill opportunities in inner LGAs
- Access to a range of open space in residential areas

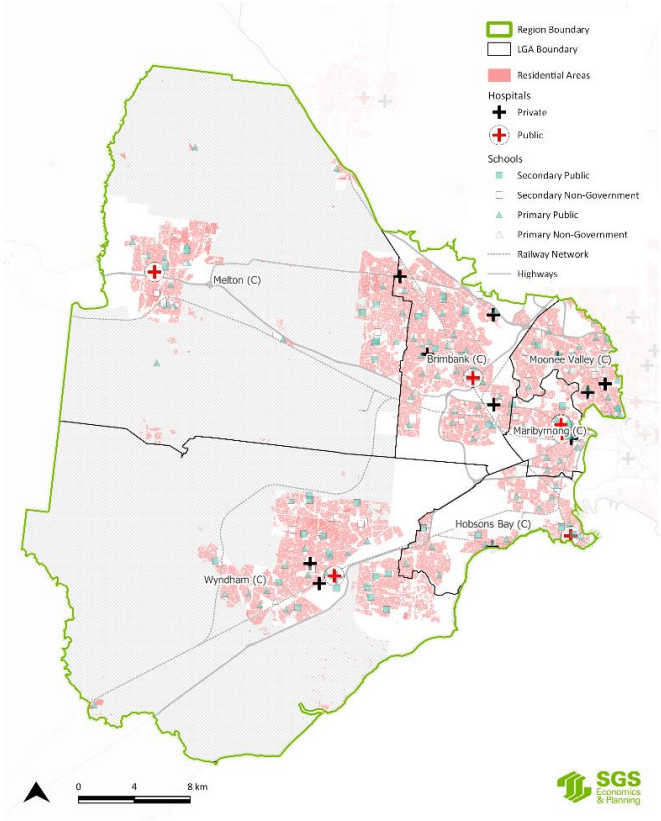
Challenges

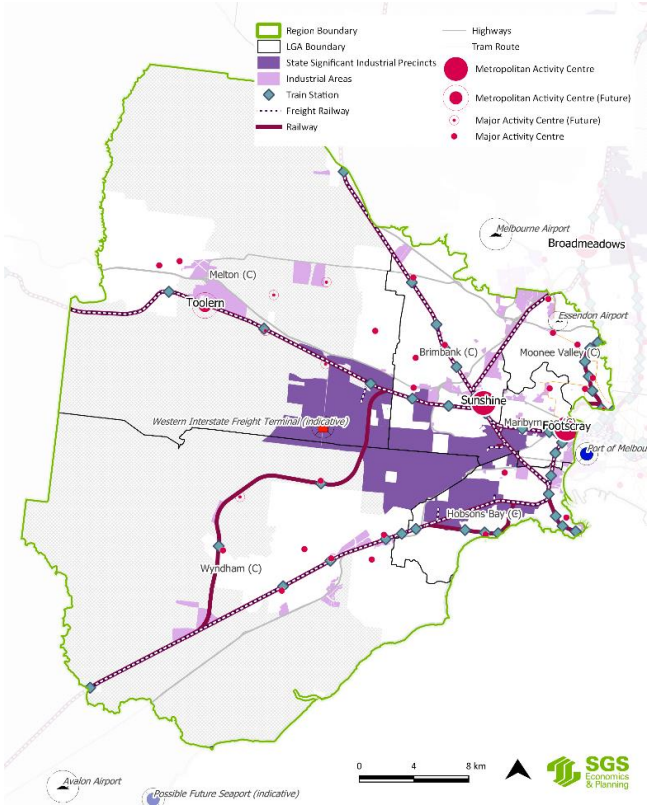
- Vulnerable workforce due to concentrations of lower employment skills in some part of Middle and Outer Melbourne such as St Albans, Braybrook and Melton
- Higher than average (and increasing) housing stress in some LGAs and suburbs, particularly inner areas
- Limited choice in and access to employment and services, particularly in high skill areas, for people in Wyndham and Melton LGAs
- Hazards associated with climate change such as fire, sea level rise, flood and heat vulnerability, particularly in highly urbanised parts of the region
- Maintaining and improving the health of key rivers, wetlands and the bay
- Growth in Melton and Wyndham LGAs contributing to on-road congestion along key transport and freight routes (Princes Highway, Western Highway and Western Ring Road)
- Overcrowded public transport in inner areas
- Few multi-modal transport options in some older growth areas (Caroline Springs, Point Cook, Altona Meadows and parts of Melton town centre)

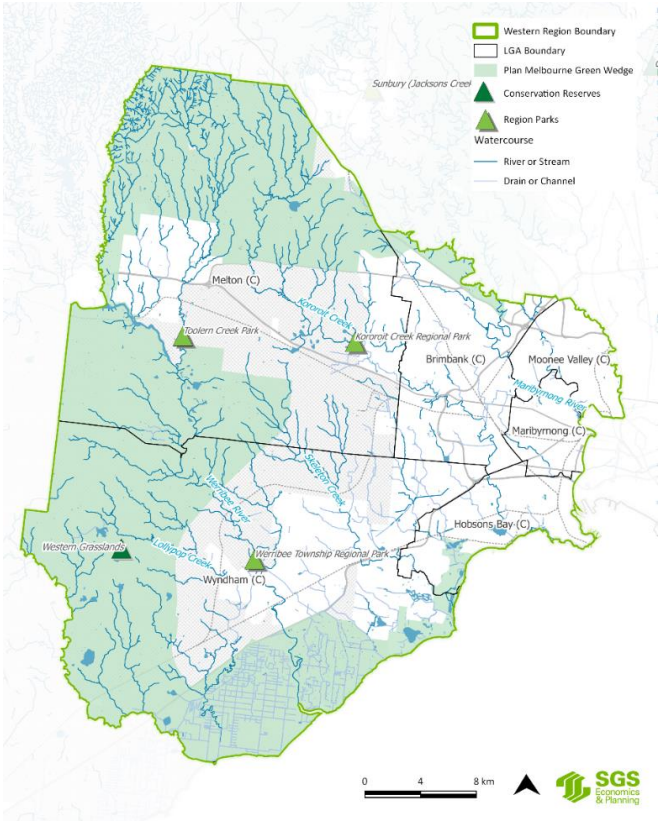
Insights

- Significant population growth has the potential to generate demand for more major centres in the future.
- The concentration of a major industrial precinct promotes more economic agglomeration.
- The density and networking of centres in inner areas allows for better connectivity and alignment of infrastructure and services to respond to changing needs based on demographic shifts.
- The region has land for future urban development; however, access to employment and other services is limited.
- The diverse range of open space may need to be enhanced as the region grows and community needs change.
- Tree canopy cover is below the metropolitan average, which creates a challenge when addressing urban heat island effect.

URBAN, ECONOMIC AND ENVIRONMENTAL STRUCTURE







Western Metro Region Economic, Social and Environmental Profile summary

Indicator	Likely impact of drivers of change	Description
ECONOMIC		
Economic performance	Favourable	The Wyndham, Melton and Brimbank LGAs experienced the highest levels of employment growth over the last five years. Employment growth was largely driven by population-serving industry sectors. The Brimbank, Hobsons Bay and Wyndham LGAs have the highest international exports for the Western Metro Region. International exports from the City of Maribyrnong gradually decreased between 1997 and 2017, reflecting land use changes in the LGA away from manufacturing and industry. Meanwhile, business formation figures from 2009 to 2017 show the health and education sector growth rate was greater than 40 per cent across all LGAs. In the Melton and Wyndham LGAs, the health and education sector grew by 136.4 per cent and 191.9 per cent respectively. The measure for sector growth includes education income from international students. Business formation in the knowledge-intensive sector grew from 2009 to 2017 in the Western Metro Region, indicating a shift from an industrial-based economy to an information-based economy. The Maribyrnong and Moonee Valley LGAs and parts of the City of Hobsons Bay have relatively high levels of effective job density (EJD), which is a likely influence of public and private transport connections to Inner Melbourne job clusters. Access to jobs for people living in outer parts of Melton and Wyndham LGAs is low compared to metropolitan Melbourne. The City of Wyndham's growth in capital investment is likely due to the construction boom associated with growth area development since 2014. The region has natural and built form tourism assets and hosts major events such as festivals at Werribee Mansion and Werribee Zoo, the Melbourne Show and the Spring Racing Carnival.
Economic wellbeing	Favourable	Household income was lower in the Melton and Brimbank LGAs than other parts of the region, where the proportion of people with certificate-level and on-the-job training is higher than other parts of the region, despite these locations being the most productive in terms of gross regional product (GRP). The City of Moonee Valley had the largest growth in total household income. Between 2011 and 2016, the Hobsons Bay and Maribyrnong LGAs had a slight decrease in household income; -4 and -1.3 per cent respectively. These LGAs experienced smaller increases in GRP over 2006-2017 than other parts of the region. The unemployment rate increased in all LGAs is consistent with Victorian trends. Wyndham and Brimbank LGAs experienced the largest increase in the unemployment rate despite strong regional economic performance. This may be due to accessibility challenges rather than a lack of available jobs (as illustrated in the EJD indicators). While inner areas are better connected to frequent train services, the coverage of the bus network indicates a relatively even spread of services across the Western Metro Region. However, some locations are serviced by fewer than two bus services

Indicator	Likely impact of drivers of change	Description
		per hour (on average), reducing the usability of the network. New Growth Areas such as Tarneit in the City of Wyndham are connected to the Regional Rail Link; however, services are less frequent than along the metro line.
Employment and skills	Favourable	Wyndham, Melton, and Brimbank LGAs have a higher share of the population employed in jobs requiring a Certificate II or III and on-the-job training in 2016 (detail on skill levels is included in section 4.4: Employment and Skills). Moonee Valley and Maribyrnong LGAs have a higher proportion of the population employed with a bachelor's degree or higher (Skill level 1) than the Victorian average. The share of change in Skill level 1 among the population increased the most (between 50 and 80 per cent) in the Hobsons Bay, Moonee Valley and Maribyrnong LGAs, while in the Wyndham and Melton LGAs a greater share of change occurred in Skill level 4 and 5 jobs (more than 50 per cent). Transport, postal and warehousing is the most highly concentrated industry in the region, twice that of the metropolitan Melbourne average (concentration refers to the relative number of jobs in this location compared to metropolitan Melbourne). The number of jobs in the construction, education and training, manufacturing, public administration and safety, retail trade, wholesale trade, and other service sectors are more spatially concentrated in the Western Metro Region than elsewhere. Proportionally, compared to metropolitan Melbourne, the share of jobs in knowledge-intensive sectors, in particular arts and recreation, IT, finance and insurance and professional services, is smaller in the Western Metro Region. Despite recent growth in the number of knowledge-intensive jobs.
SOCIAL		
Population demographics	Favourable	The region's population grew faster than the metropolitan average, with growth concentrated in New Growth Areas in Melton and Wyndham LGAs. Population forecasts to 2051 show a continued increase in residents in those areas. These LGAs have the smallest number of people aged 65 and over and the largest number of teenagers and young adults (15-39) and children (0-14) in the region. The age dependency ratio (that is, the dependence of older people on those in the workforce) increased in every LGA in the region between 2011 and 2016 except the City of Maribyrnong. Although Melton and Wyndham LGAs have a lower proportion of older adults than other parts of the region, they have a higher proportion of children aged 14 or younger. The change in age dependency ratio over time in LGAs with a larger population younger than 14 years reflects other LGAs that have a greater proportion of people older than working age. Internal migration – that is, people moving into the Western Metro Region from elsewhere in Australia, including other metropolitan regions – has contributed to population growth in the region. Each LGA had net overseas migration, although fewer people arrived between 2012 and 2016 than in the years prior, in line with national trends.

Indicator	Likely impact of drivers of change	Description
		Wyndham, Maribyrnong and Hobsons Bay LGAs have a more diverse cultural profile than other LGAs in the Western Metro Region and elsewhere in Victoria. The proportion of residents born in Australia is similar to or greater than the State average in Melton, Moonee Valley and Brimbank LGAs.
Housing diversity	-	Separate houses are the most common dwelling type, yet the number of townhouses and terraces increased in each LGA between 2011 and 2016. Maribyrnong and Moonee Valley LGAs have more dwellings classified as townhouse/terrace and apartments than metropolitan Melbourne and other parts of the region. In the City of Hobsons Bay, there are more townhouses, but fewer apartments than the metropolitan Melbourne average. Apartments as a proportion of all dwellings reduced in Brimbank, Wyndham and Melton LGAs from 2011 to 2016 due to the construction of separate houses in New Growth Areas.
Housing stress	Adverse	The proportion of low income households under mortgage or rental stress increased from 2011 to 2016 across the region, except in the City of Hobsons Bay, which experienced an increase in mortgage stress only. Households in Maribyrnong, Moonee Valley and Hobsons Bay LGAs experienced lower levels of mortgage stress than the metropolitan Melbourne and Victorian averages. Households in rental or mortgage stress are those which are low income (falling in the bottom 40th percentile of the housing income distribution in Victoria) and spend at least 30 per cent of their household income on rent or mortgage payments.
Disadvantage	Adverse	In Melton, Wyndham, and Maribyrnong LGAs and large parts of the City of Brimbank, there are areas of concentrated disadvantage; which presents a barrier to participation for many residents in the Western Metro Region. Suburbs that are connected and located closer to Melbourne CBD generally have lower levels of disadvantage, although pockets of disadvantage still exist.
Youth engagement	Adverse	Melton and Wyndham LGAs have lower than average levels of people aged 20 to 24 who have a Year 12 qualification or higher in comparison to the state and metropolitan Melbourne averages, despite an increase in the incidence of 20 to 24 year-olds obtaining a Year 12 or higher qualification in both LGAs. The Moonee Valley and Maribyrnong LGAs have the largest proportion of students enrolled in a university course after completing Year 12 in the region, followed by the City of Brimbank. Each LGA saw an increase in youth engagement from 2011 to 2016. Youth participation in full-time work fell over the same period. This may be due to larger numbers of Year 12 school-leavers enrolling in some form of further education (university, certificates/diplomas, apprenticeships/internships) in 2017 than in the past. Wyndham and Melton LGAs have a higher than average proportion of 15 to 19 year-olds employed full-time compared to the Victorian average.

Indicator	Likely impact of drivers of change	Description
Population health	Adverse	The ability to easily access community services in the Western Metro Region is lower than the Victorian average. Brimbank and Maribyrnong LGAs have the lowest levels of access, while the Moonee Valley and Wyndham LGAs have the highest. All LGAs have smaller numbers of mental health clients than the Victorian average but larger than the metropolitan average, with the exception of the City of Wyndham. The City of Melton saw the largest increase in the number of mental health clients between 2011 and 2015. The number of GPs per 1,000 people is lower in all Western Metro Region LGAs than the Victorian average, except in the City of Maribyrnong, where it is equivalent. The regional prevalence of Type 2 diabetes is high compared with the Victorian average, especially in the City of Melton, as well as the Moonee Valley, Maribyrnong and Hobsons Bay LGAs. Rates in the Wyndham and Brimbank LGAs are lower than the Victorian average. The Moonee Valley and Wyndham LGAs are the only municipalities where female life expectancy is higher than the Victorian and metropolitan Melbourne averages. For males, life expectancy is lower than the metropolitan average in all Western Metro Region LGAs.
Early childhood outcomes	Adverse	Child protection substantiations (that is, children receiving child protection services) are higher than the Victorian and metropolitan averages in Brimbank and Melton LGAs. In the Maribyrnong and Moonee Valley LGAs, the proportion is below the state and metropolitan Melbourne averages. The percentage of low birth weight babies is consistent with Victorian averages, although slightly higher in the Brimbank, Melton and Wyndham LGAs. The proportion of children fully immunised at age two is consistent across the region and with Victorian averages.
Crime	Adverse	Brimbank and Maribyrnong LGAs had the highest offence rates in the region compared to the rest of Western Metro Region, metropolitan Melbourne and Victoria in 2018. Wyndham, Moonee Valley, Melton, and Hobsons Bay LGAs have lower offence rates compared to metropolitan Melbourne and Victoria.
Wellbeing	Adverse	Most LGAs in the Western Metro Region had lower scores of subjective wellbeing in 2015 compared to Victoria, except for the City of Moonee Valley. The City of Brimbank had the lowest score when measuring people's sense of safety walking alone after dark, which may correlate with the higher than average offence rate in this LGA compared to Victoria and metropolitan Melbourne. Despite an increase in volunteering rates between 2011 and 2016, the Western Metro Region generally has lower rates than Victorian and metropolitan Melbourne averages, except in the City of Moonee Valley.

Indicator	Likely impact of drivers of change	Description
ENVIRONMENTAL		
Environmental assets	Adverse	The City of Wyndham has the largest total area of open space in the region. The City of Melton, a similar size to Wyndham LGA, has a much lower total area of open space. Of the inner LGAs, total open space is most extensive in the cities of Brimbank and Hobsons Bay. Open space assets in each LGA are at least 50 per cent green space. The remaining open space is predominately mixed open space. Conservation reserves are the most common type of open space in the region. Land use is varied in the cities of Melton and Wyndham, with high proportions of agricultural and residential land. Much of the agricultural land is zoned as green wedge. The cities of Brimbank, Hobsons Bay, Moonee Valley and Maribyrnong are primarily residential. There are large areas of land attributed to industrial planning types in Brimbank, Hobsons Bay and Maribyrnong LGAs. In New Growth Areas, land is transitioning from primary production to residential. Land used for primary production and residential purposes is stable in rural areas. Areas designated as conservation reserves have increased since 2006.
Environmental condition	Adverse	Tree canopy cover is below the metropolitan average in the Western Metro Region. Wyndham and Melton LGAs have the lowest coverage in the metropolitan area. A low proportion of reaches (the section of river between a beginning and ending point) in the Western Metro Region are in good/excellent condition. The proportion of reaches in the Werribee River Basin in good/excellent condition is higher than the metropolitan average. Both the Maribyrnong and Moorabool basins have a lower proportion of reaches in good/excellent condition. The proportion of reaches in good/excellent condition is declining. Port Phillip Bay is regarded as healthy although there are some examples of poor health in waters close to the region. For example, there are signs of stress in seagrass and a swim advisory warning was issued at Werribee South Beach in 2017. Safe daily levels of pollution were exceeded in Brooklyn and Footscray. Safe annual levels of pollution have been exceeded in Footscray once. Pollution is close to exceeding safe levels.
Environmental risks and hazards	Adverse	The City of Wyndham is the LGA most at risk of flooding, primarily on residential land use. The City of Hobsons Bay is at most risk of sea level rise and storm surge along with a large area of Wyndham LGA due to their coastal location. The City of Melton is the only LGA at risk of bushfire in both conservation areas and agricultural land. All LGAs have urban heat islands. The outer areas of Wyndham and Melton LGAs are most affected, while Ramsar wetlands in Werribee and Altona Meadows contribute to cooler urban temperatures. Melton and Hobsons Bay LGAs have populations

Indicator	Likely impact of drivers of change	Description
		that are vulnerable to heat. Areas within Brimbank, Moonee Valley, Maribyrnong and Hobsons Bay LGAs have concentrations of EPA priority sites and contaminated groundwater, likely linked to historical and current locations of industrial activity.
Environmental flows	Adverse	Most populated areas in the region have access to a diverse range of open space types. People living in Wyndham, Maribyrnong and Moonee Valley LGAs visit green space more frequently than residents in Hobsons Bay, Brimbank and Melton LGAs. City West Water and Western Water consider multiple scenarios when forecasting supply and demand of water. In the worst-case scenario, augmentations to the system will be needed to service the region in the next 15 to 20 years. The inner LGAs have had few small-scale solar installations since 2001 compared to outer LGAs, where they are more common. The region has four open landfills. The total volume of kerbside garbage is largest in Wyndham and Brimbank LGAs. The quantity of kerbside garbage collected in the region has increased since 2002.

1. INTRODUCTION

To support the update of Infrastructure Victoria's 30-year Infrastructure Strategy, this report overviews the economic, social and environmental characteristics of the Western Metro Region.

1.1 Project purpose

This project will help Infrastructure Victoria:

Prepare for the 2020 Strategy update and provide a rich economic, social and environmental evidence-base at a regional level within Metropolitan Melbourne. This will assist IV to understand relative regional strengths and challenges across the metropolitan area and (combined with the existing work done by others) across the state.

This report is one of six regional economic, social and environmental (ESE) profiles (see Figure 1) that will "identify the ESE strengths and challenges of Melbourne's regions on a geographical basis."

As well as the six regional profiles, the project also includes:

- a whole of metropolitan Functional Economic Region (FER) profile, highlighting the strengths and challenges of metropolitan Melbourne's economy as a network
- a metropolitan inter-regional summary report that provides regional indicators against IV's 10 objectives to identify relative strengths and challenges within the metropolitan area.

FIGURE 1: REPORT PACKAGE

1.2 Report structure and approach

The report covers ESE domains, which reflect Infrastructure Victoria's 10 objectives:

1. Prepare for population change (Social)
2. Foster healthy, safe and inclusive communities (Social)
3. Reduce disadvantage (Social)
4. Enable workforce participation (Economic)
5. Lift productivity (Economic)
6. Drive Victoria's changing globally integrated economy (Economic)
7. Promote sustainable production and consumption (Environmental)
8. Protect and enhance natural environments (Environmental)
9. Advance climate change mitigation and adaption (Environmental)
10. Build resilience to shocks (Environmental, Social and Economic).

The report is structured as follows:

- Chapter 2: The various geographies used for the project
- Chapter 3: The major drivers of change that affect Australian cities and regions, and that will impact Melbourne's and the Western Metro Region's growth and development
- Chapters 4 to 6: Economic, social and environmental indicators for the Western Metro Region.

1.3 Western Metro Region

The Western Metro Region comprises six local government areas (LGAs): Maribyrnong, Moonee Valley, Hobsons Bay, Brimbank, Melton and Wyndham.

The region extends from the inner suburbs of Footscray and Williamstown to some of the city's newest communities in Werribee and Melton (Figure 3). It has a total area of 133,023 hectares, while the combined metropolitan regions have a total area of 890,087 hectares.

The Western Metro Region includes substantial coastal areas, culturally diverse and established suburbs, and some of Melbourne's newest and fastest growing outer suburbs (Figure 3). For more information regarding the region's post-European settlement development history, refer to Section 5.1.

The region's suburbs provide a variety of housing, employment and lifestyle opportunities ranging from dense inner suburban suburbs to coastal and rural areas. The established inner and middle suburbs include Williamstown, Footscray, Moonee Ponds, Essendon and Sunshine, and growth area communities stretching from Toolern in the region's north to Point Cook on Port Phillip Bay.

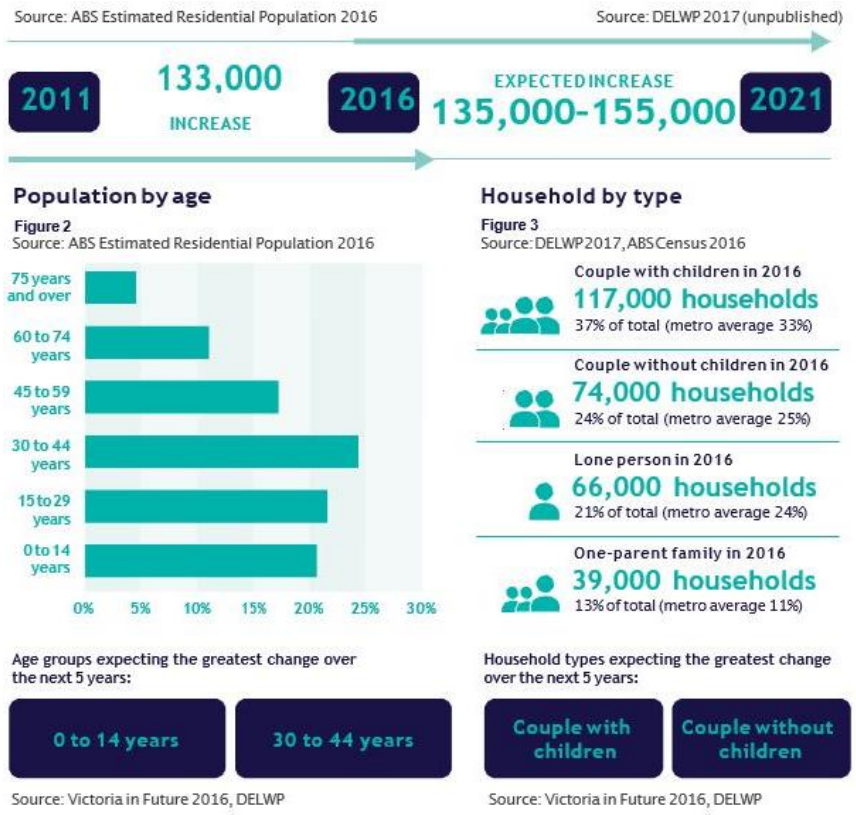
The region has a population of more than 879,520 (approximately 19 per cent of metropolitan Melbourne's total). The region's population is projected to grow at 15 per cent to 2021 which is higher than all regions except the Inner Metro Region and the metropolitan Melbourne average annual growth rate of 12 per cent. The population of each LGA in 2016 was:

- City of Brimbank: 205,745
- City of Hobsons Bay: 93,719
- City of Maribyrnong: 87,355
- City of Melton: 141,912
- City of Moonee Valley: 123,027
- City of Wyndham: 227,761.

Based on land allocated for future growth in Wyndham and Melton LGAs, population growth is likely to be directed into outer suburban areas including Melton, Toolern, Tarneit, Wyndham Vale, Werribee and Point Cook. Inner areas such as Footscray and Sunshine are expected to undergo intensification and renewal due to their connection to public transport and relative proximity to Melbourne CBD, resulting in increased population and economic development.

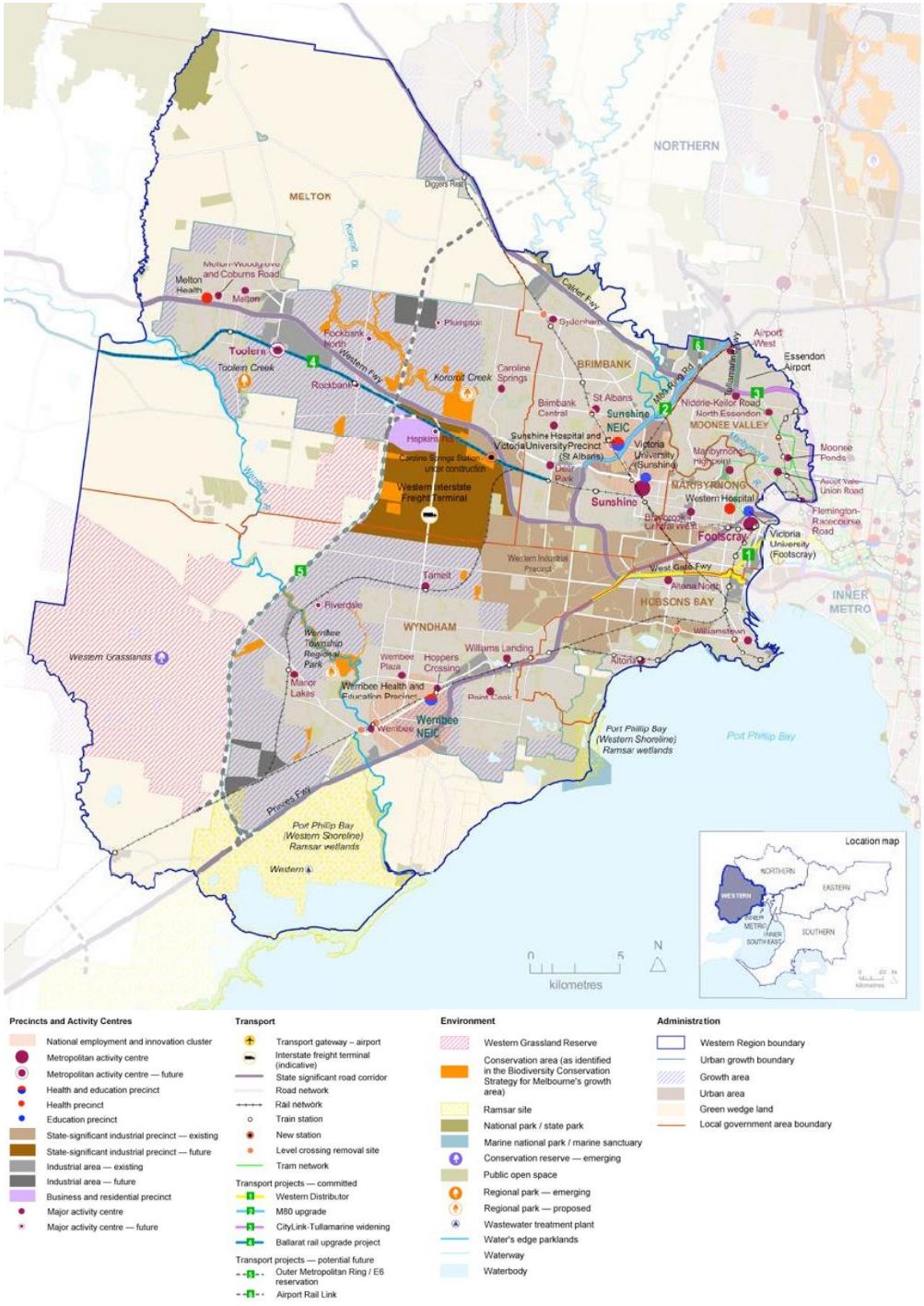
The Western Metro Region has a large and diverse workforce. In 2016 it had approximately 304,247 jobs, which represented approximately 10 per cent of all jobs in metropolitan Melbourne (total: 3,032,148 jobs).

FIGURE 2: POPULATION OVERVIEW (2016)



Source: Five Year Plan for Jobs, Services and Infrastructure 2017-2021 (Initial Investment Report), State Government of Victoria (2017).

FIGURE 3: WESTERN METRO REGION CONTEXT MAP



Source: *Plan Melbourne* - State Government of Victoria (2017)

2. GEOGRAPHIES AND CATEGORIES

A range of reporting geographies are used to help understand how the Western Metro Region functions.

Urban areas contain a mix of residential, economic, industrial, recreation, education, health and other spaces. The distribution of activity within these spaces, and the way people move within and between them, contributes to demand for various types of infrastructure.

While standard local government and Australian Bureau of Statistics (ABS)-defined areas are useful, consideration of different types of areas and the activities they accommodate can provide a more nuanced understanding of an area.

2.1 Key reporting geographies

Analysis against a range of geographies, as presented in Table 1, use definitions based on SGS's knowledge of urban development patterns.

The analysis has primarily been based around LGAs (due to data limitations) and location typologies.

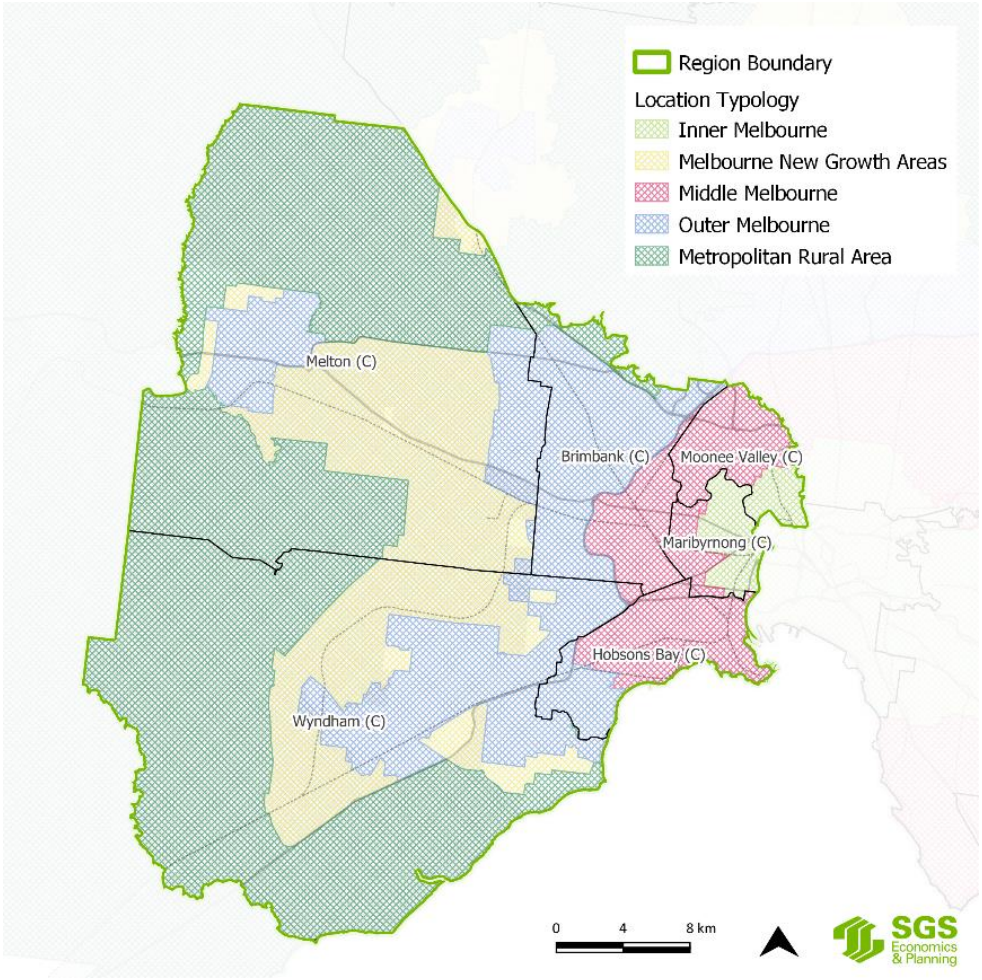
Different economic regions are used in the FER report.

TABLE 1: SUMMARY OF REPORTING GEOGRAPHIES

Region	Approach to defining
Planning subregions	*Plan Melbourne* regions: groups of LGAs
Location typology (Figure 4)	▪ Inner: combination of tram network coverage, and 8km from CBD (e.g. does not include full extent of 86 tram to Bundoora, and extends further west where there is a limited tram network) ▪ Middle: areas within the Western Ring Road, and other areas between Outer and Inner ▪ Outer: established outer suburbs within the urban growth boundary (UGB) ▪ Melbourne New Growth Areas: areas covered by precinct structure plans (PSPs) ▪ Metropolitan Rural Areas: non-PSP areas within metropolitan Melbourne
Current planning areas	Defined planning and other geographies, including activity centres, national economic and innovation cluster (NEIC) boundaries, State significant industrial precincts (SSIPs) as per *Plan Melbourne*
Economic locations	Key employment clusters with a minimum of 5,000 jobs within a 1km radius. Includes areas designated for employment in *Plan Melbourne* including those with limited employment which are future planned centres along with significant clusters that are not in *Plan Melbourne*. Where there is overlap with the *Plan Melbourne* locations, the boundaries are not identical. The analysis to identify economic locations draws on: ▪ existing employment land - based on ABS Mesh Block Land Use Categories: Commercial, Hospital/Medical, Industrial ▪ job density for 2016 by four broad industry classifications ▪ clustering analysis based on DBSCAN algorithm
Standard ABS geographies	▪ LGAs: local government areas (Figure 4) ▪ SA2: areas that represent a community that interacts socially and economically (generally 3,000-25,000 people) ▪ SA3: areas with similar regional characteristics, administrative boundaries or labour markets (generally 30,000-130,000 people) ▪ SA4: Used for output of labour force survey data, reflect labour markets within each State/Territory (generally 100,000+ people, sometimes 300,000-500,000 people in metropolitan areas)
SGS HEX Grid	▪ 30ha grid

Source: SGS Economics and Planning, 2018

FIGURE 4: WESTERN METRO REGION: LGA AND LOCATION TYPOLOGIES



Source: SGS Economics and Planning, 2018

2.2 Economic categories

The 19 ANZSIC (1 digit) industry classifications have been aggregated into four broad industry classifications in this report.

In line with previous discussion it should be noted that creative industries are classified as knowledge-intensive under these classifications. The tourism industry straddles a number of standard industry classifications. The contribution of tourism is often indirect, generating output and creating jobs in sectors such as retail trade, arts and recreation services, accommodation and food services in particular.

TABLE 2 BROAD INDUSTRY CLASSIFICATIONS

Classification	ANZSIC 2006 1 digit industry
Knowledge-intensive	▪ Information media and telecommunications ▪ Financial and insurance services ▪ Rental, hiring and real estate services ▪ Professional, scientific and technical services ▪ Administrative and support services ▪ Public administration and safety
Health and education	▪ Education ▪ Health care and social assistance
Population-serving	▪ Retail trade ▪ Accommodation and food services ▪ Arts and recreation services ▪ Construction ▪ Other services
Industrial	▪ Agriculture, forestry and fishing ▪ Mining ▪ Manufacturing ▪ Electricity, gas, water and waste services ▪ Wholesale trade ▪ Transport, postal and warehousing

3. DRIVERS OF CHANGE

3.1 Overview

Global megatrends are shifting the way people live and work, with implications for business and life in metropolitan Melbourne and in the Western Metro Region.

Three key drivers of change have been identified.

- **Economic structural change:** The economy is continuing to shift towards creative (digital and innovation-led businesses) and services-led sectors. These sectors are consolidating in and around the CBD and major economic nodes. Technology is influencing the way people work, changing all types of jobs. As land use transition (particularly in post-industrial inner areas) occurs across metropolitan Melbourne, the type of employment opportunities will shift and grow around the CBD. This provides a major opportunity for the inner parts of the Western Metro Region. It also presents a real challenge for more traditional industry areas and the dispersed urban areas of the region. The Western Metro Region is vulnerable due to its focus on traditional industries - typically those that are low-tech, less research intensive and generally low skill. Rapid growth and change could enable the region's economy to better adapt and become more resilient to change.
- **Rapid urbanisation**: Australian population growth continues to be concentrated in existing major urban centres, particularly in Melbourne and Sydney. This sustained level of high population growth has resulted in rapid urban expansion and infill development, especially in the inner parts of the Western Metro Region. Areas such as Footscray, and many parts of Hobsons Bay and Moonee Valley LGAs face the challenge of this infill change, while New Growth Areas in Wyndham and Melton LGAs pose other challenges. New greenfield and infill renewal development make the Western Metro Region the fastest growing in metropolitan Melbourne; this scale of growth and change is a defining feature of the region.
- **Impacts of climate changes:** The impacts of climate change are being felt across the city in a range of ways. As rapid urbanisation continues, the effects of urban heat islands, decreasing tree canopy cover and scarce water resources will be felt by many residents and natural areas. Access to resources such as water, land and energy will affect how and where businesses and people locate and operate.

3.2 Structural economic change

Growth in new jobs

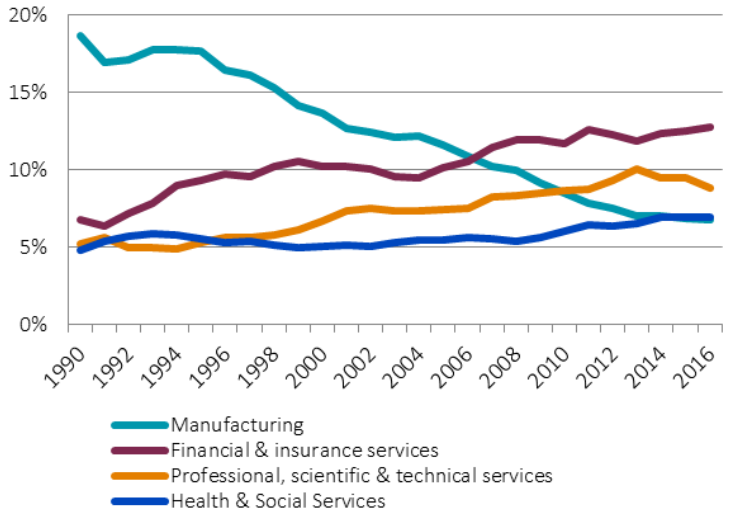
Melbourne's economy, like that of many other cities, has undergone significant change over the past few decades. Previously dominated by manufacturing and industrial activities, it has transformed into an economy more reliant on knowledge-intensive activities and services. This structural change is illustrated in Figure 5. These professional services include a range of business functions involving finance, design, engineering, architecture, IT, marketing, law, accounting, universities and research and development institutions.

Despite this, manufacturing and other primary industries will remain and must be highly innovative to prosper. This will demand, directly or indirectly, professional services. Likewise, population-serving sectors like retail, health and hospitality will require access to analytical and creative services if they are to boost productivity and continue to innovate.

Knowledge-intensive activities require access to diverse skills and client bases to specialise and build resilience. They also need to attract and retain highly skilled/specialised labour. For these reasons they typically locate (or agglomerate) in highly accessible, high amenity and diverse environments.

The massing and clustering of professional services improves businesses' ability to innovate, boosting their productivity and, in turn, that of their customers. Agglomeration benefits are one of the main attractions for the growing professional services industries to locate in central city areas and near major institutional and economic nodes.

FIGURE 5: SHARE OF MELBOURNE'S GDP, SELECTED INDUSTRIES



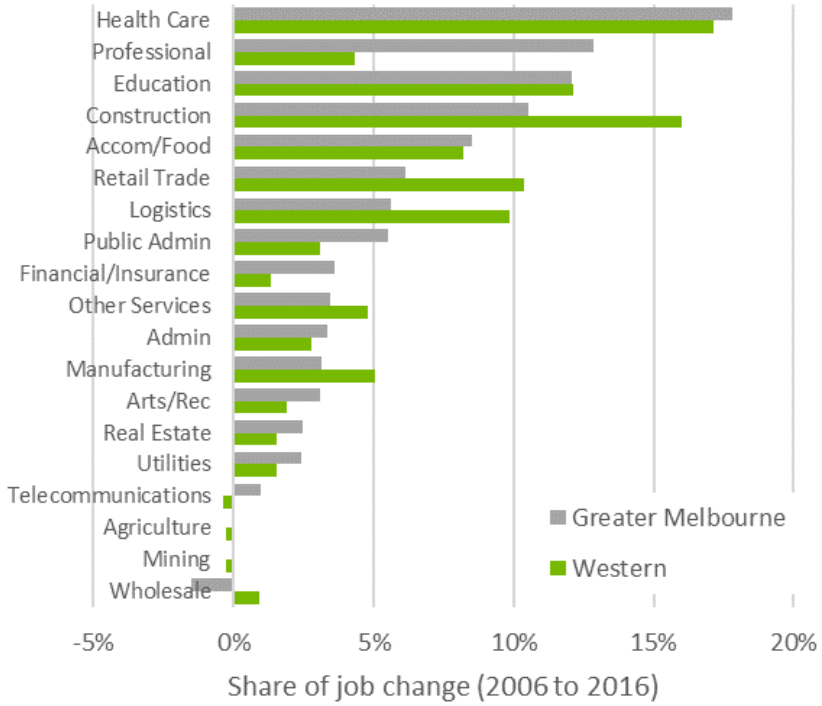
Source: SGS Economics and Planning

The Western Metro Region had 305,000 jobs in 2016 and added 136,000 jobs over the last two decades. This represents 16 per cent of Melbourne's job growth over that period, and job growth in this region is significantly higher than other metropolitan regions (refer to Chapter 4 for further information). In particular, health and education and knowledge-intensive sectors are growing (supporting population growth), while the industrial and population-serving industries remain strong (refer to Section 4.4).

Figure 6 (overleaf) presents the share of jobs growth over the last decade by industry for the Western Metro Region and metropolitan Melbourne. This further illustrates the structural change occurring in the region's economy, where many of the top industries are services-based (for example, health care, professional, education, retail, accommodation and food, and public administration).

The Western Metro Region's industry profile is broadly consistent with this trend. The construction and retail sectors have expanded in response to population growth, while the logistics, wholesale and manufacturing sectors are larger, supported by protection of SSIPs and the connectivity between areas like Tarneit and Melbourne Airport. Professional and financial services are notably smaller than the metropolitan average, highlighting that the Western Metro Region is yet to fully capture an equal market share of the knowledge services-led economy compared to other parts of metropolitan Melbourne (see Figure 6).

FIGURE 6: SHARE OF REGION'S EMPLOYMENT GROWTH (2006 -2016)

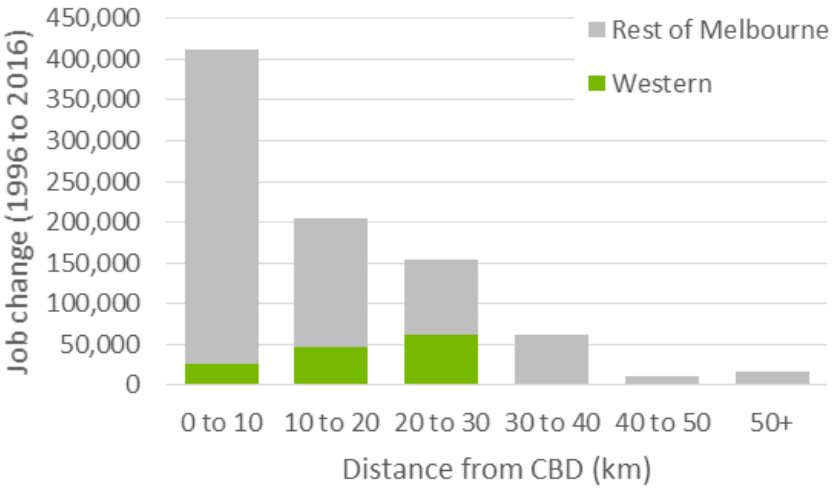


Source: SGS Economics and Planning, derived from NIEIR (2018)

The changing industry structure has a direct spatial implication for Melbourne and the Western Metro Region. Figure 7 provides a high-level overview, presenting the change in jobs (1996 to 2016) by distance to the CBD. Employment location is investigated in Section 4.2.

Figure 7 illustrates that employment growth in the Western Metro Region has been geographically diverse, reflecting the locations of industrial and population-serving employment sectors. Despite this diversity, the region has not captured a substantial share of the inner-city jobs growth, which is largely linked to knowledge services.

FIGURE 7: EMPLOYMENT GROWTH BY DISTANCE TO CBD



Source: SGS Economics and Planning, derived from NIEIR (2018)

Automation and the changing nature of work

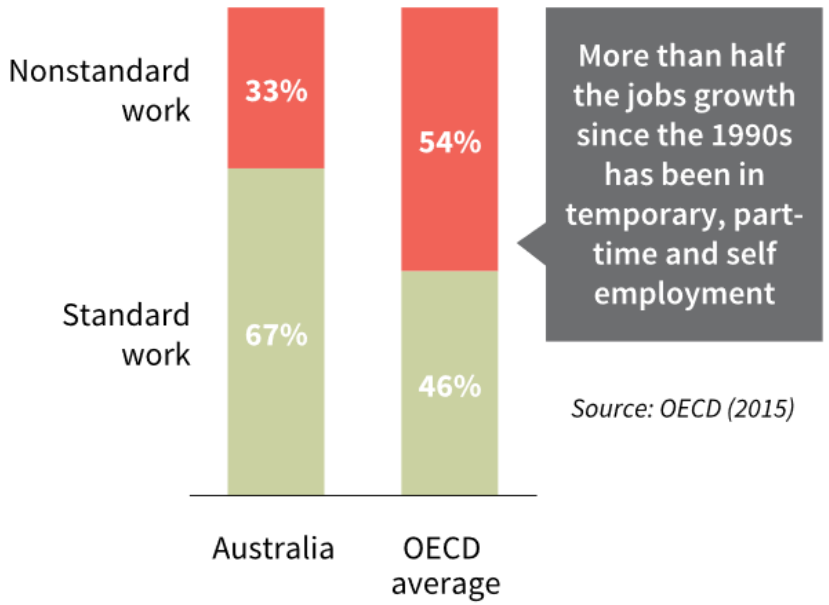
Technology is changing all types of jobs and how people work. Automation is an ongoing process with continual technological development that will impact all sectors of the economy.

Jobs that will be difficult to automate include those that require human thinking, creativity and problem solving and high levels of skills training, as well as those that require human touch and highly developed vocational skills. The next wave of jobs likely to be automated are not necessarily lower-skilled manufacturing, but routine white-collar jobs such as call centre workers, legal clerks, accountants and retail workers.

Task-biased technical change is the leading framework for analysing the impact of technology on work.[1] It is used to measure the intensity of *abstract*, *routine* and *manual* tasks across different occupations. While abstract and manual tasks are hard to automate, routine tasks can be easily broken down and codified into a computer program because they follow precise, well-understood procedures. These trends cannot be neatly aligned to the structural shifts in the industry composition of metropolitan Melbourne's economy. These issues are further investigated in the FER Report.

There has been a gradual increase in non-standard or alternative working arrangements (see Figure 8) such as self-employment, temporary agency work, seasonal work, independent contracting, fixed term contracts and on call work *(Independent Inquiry into Insecure Work*, 2012). Increasingly people are also piecing their incomes together from a portfolio of activities, including platforms like Air Tasker, Freelancer, Uber, WeWork, Deliveroo and Airbnb.[2]

FIGURE 8: PERCENTAGE OF JOBS GROWTH IN NON-STANDARD AND STANDARD WORK, 1990-2015



Source: FYA, 2015.

For the Western Metro Region, this will impact the population working in blue-collar industries, where new skills and education or training may be required to adapt in this rapidly changing and innovative new economy. There will continue to be opportunities for hands-on sectors including construction trades, health care services and education.

[1] TBTC first proposed by Autor, et al. (2003) and further by Goos and Manning (2007), Autor, Katz and Kearney (2006, 2008), and Acemoglu and Autor (2011).

[2] McKinsey and Company (2016), Independent Work: Choice, necessity, and the gig economy. Accessed 23 October from: https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Employment%20and%20Growth/Independent%20work%20Choice%20necessity%20and%20the%20gig%20economy/Independent-Work-Choice-necessity-and-the-gig-economy-Executive-Summary.ashx

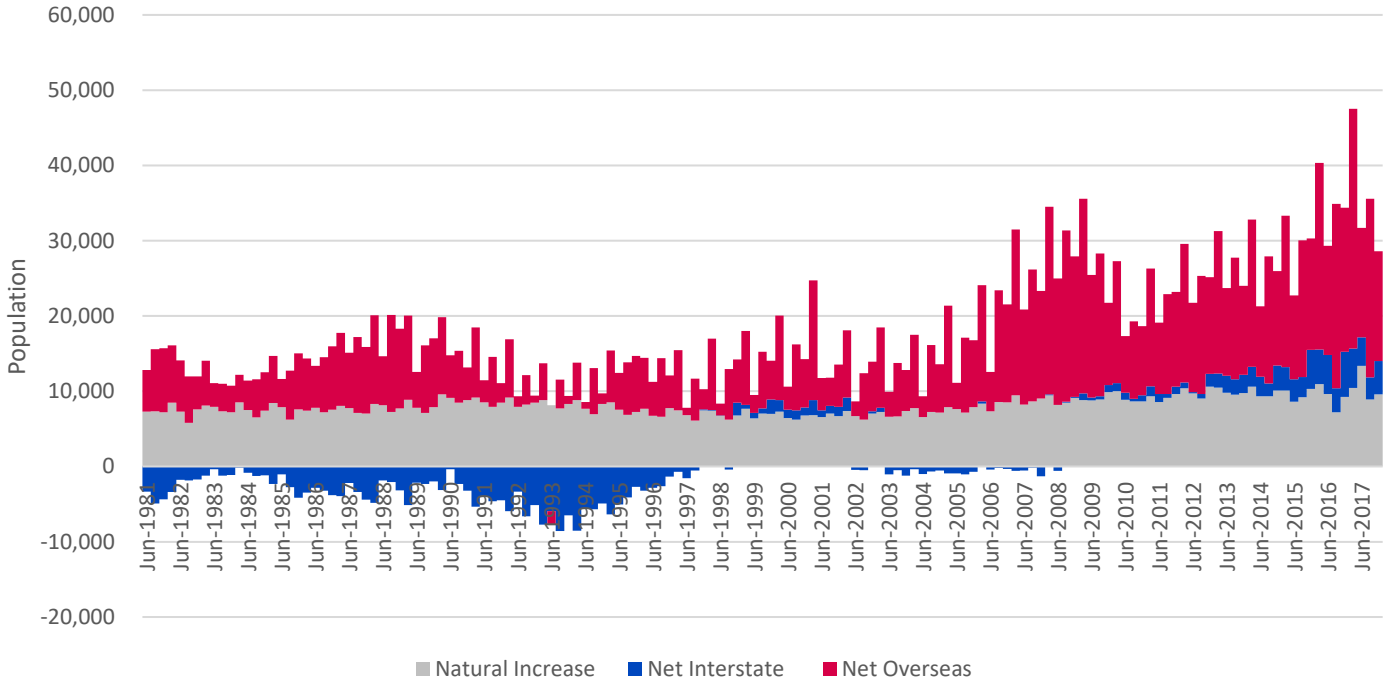
3.3 Rapid urbanisation and demographic shifts

People are choosing to live in urban environments to access jobs and a higher standard of living. Australia is one of the most urbanised countries in the world and population growth is expected to continue in the capital cities (PWC, 2015).

In terms of population growth, Melbourne has been the fastest growing capital city in Australia since 2012. Factors driving the population boom include strong economic growth, a high standard of living, high amenity lifestyle and good infrastructure.

Figure 9 presents the components of population growth for Victoria over the last three decades. While natural increases in population have remained stable, both net overseas and net interstate migration have increased. In the 1980s and 1990s, Victoria experienced a net outflow of interstate migrants, largely to Queensland and Western Australia. This trend has since reversed, largely driven by strong economic opportunities in Melbourne and Sydney. Over this period, there has also been a rise in overseas migration driven by the above factors and increases in national intake levels.

FIGURE 9 COMPONENTS OF POPULATION GROWTH, VICTORIA



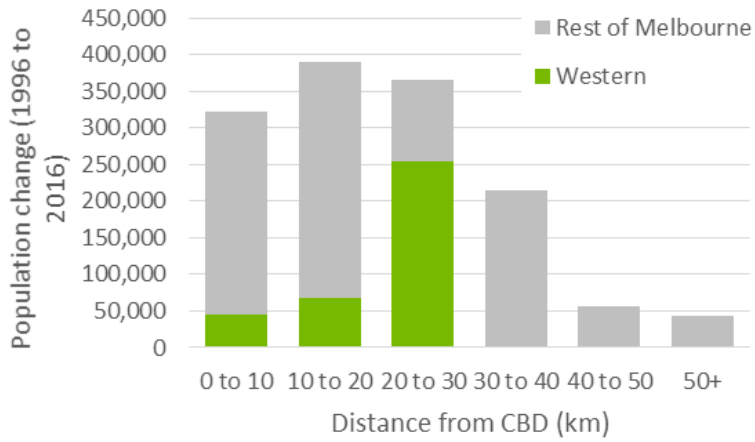
Source: ABS Regional Population Growth (Cat. 3218.0)

Population growth has been accommodated in urban growth areas around the fringe of metropolitan Melbourne, as well as the renewal of established parts of the city. Figure 10 shows a more dispersed pattern of residential settlement than employment growth (seen in Figure 7 earlier).

The Western Metro Region was home to 880,000 people in 2016 and added 367,000 people over the last two decades. This represents 26 per cent of Melbourne's population growth over that period.

For the Western Metro Region, much of the population growth has been accommodated in new suburbs on the fringe of the urban area (within 20 to 30 kilometres of Melbourne CBD. Growth beyond this distance has been limited, due historically to the extent of the UGB. Demand for growth closer to the city also highlights the relative proximity and connectivity of many parts of the Western Metro Region to Melbourne's Inner City compared to other parts of the region that are not as well connected. However, this trend has started to change with the Regional Rail Link and growth planned and under construction along its corridor.

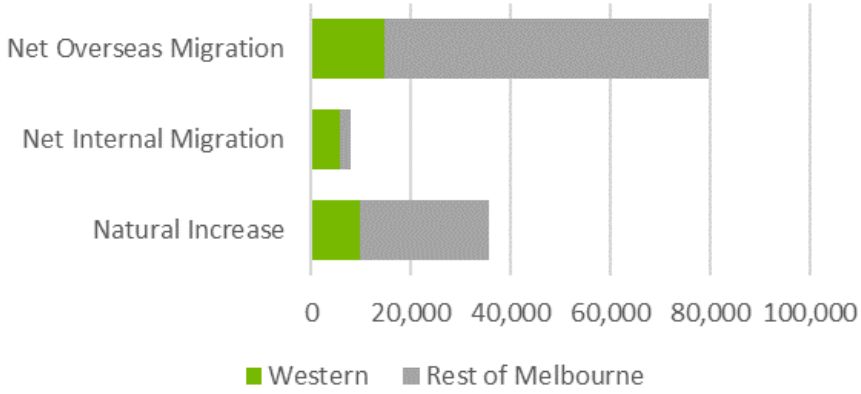
FIGURE 10 POPULATION GROWTH BY DISTANCE TO CBD (1996-2016)



Source: SGS based on ABS Census, 2016.

Population growth has implications for the demographic profile of a region. Figure 11 presents the components of population growth for metropolitan Melbourne and the Western Metro Region in 2017. It illustrates the impact that net overseas migration has on demographic change. The Western Metro Region had 18 per cent of metropolitan Melbourne's overseas migration and 28 per cent of the natural increase. Historically, the Western Metro Region has attracted a significant number of overseas migrants, resulting in a diverse multicultural population (further detailed in Section 5.2).

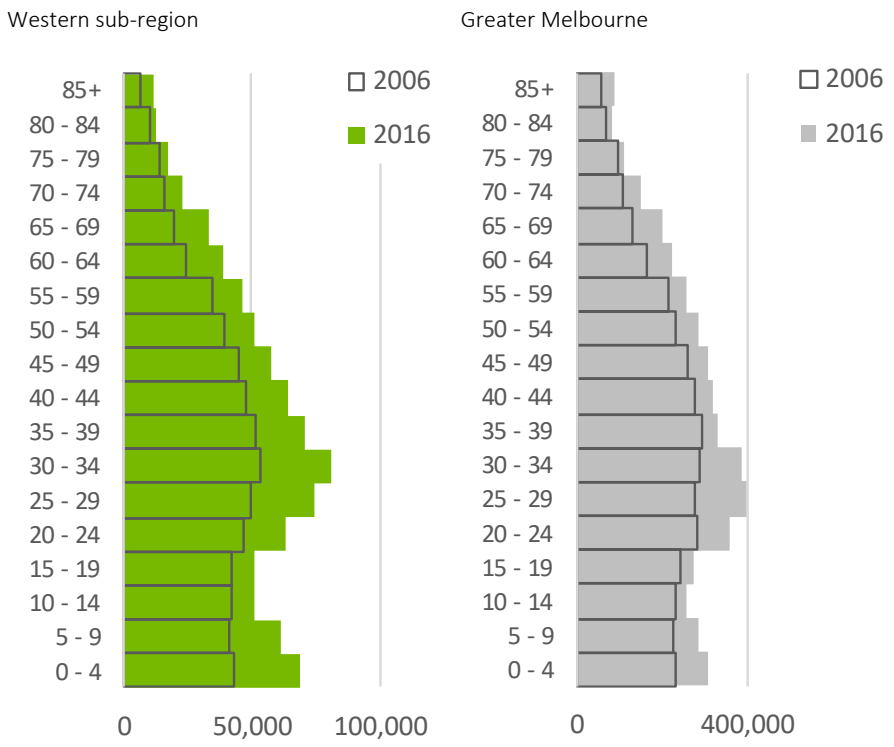
FIGURE 11 COMPONENTS OF POPULATION GROWTH (2017)



Source: ABS Regional Population Growth (Cat. 3218.0)

Figure 12 presents a population pyramid for the Western Metro Region and metropolitan Melbourne between 2006 and 2016. Strong growth has occurred across all age groups in Western Metro Region. However, there are larger increases for young adults and young children, which correlates with the number of new detached houses developed over the same period, predominantly in new greenfield suburbs (further detailed in Section 4.3).

FIGURE 12 POPULATION AGE STRUCTURE (2006 AND 2016)



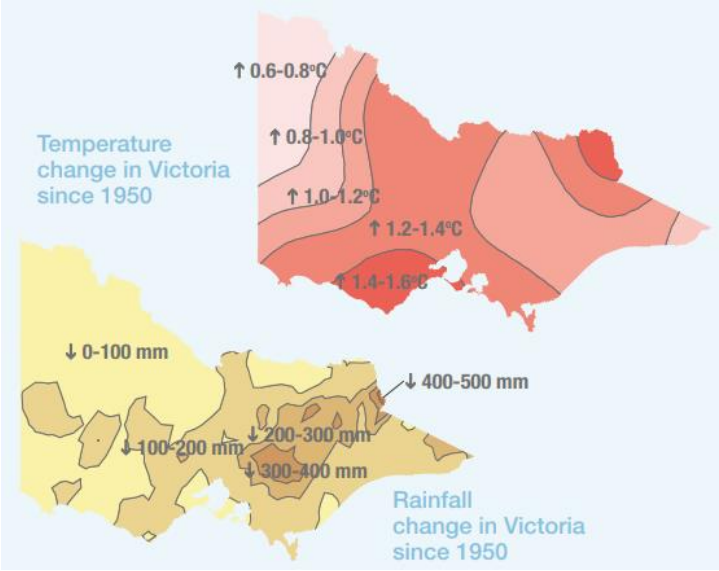
Source: SGS based on ABS, 2016

3.4 Climate change

Climate change has resulted from decades of unsustainable human activity. Its effects are largely attributed to emissions from the use of non-renewable energy sources. As most people now live in urban centres, cities and urban activities are the greatest contributors to climate change.

Consequently, global climates are becoming increasingly volatile and extreme, and the impacts of climate change are felt in all areas. Climate change in Australia manifests as rises in temperature and increased incidences and intensity of extreme weather events. In other instances, it manifests as higher incidences of nuisance flooding or unpredictable bushfire behaviour. For Victoria this includes heatwaves, fires, droughts, storms and floods. Historical temperature and rainfall changes, as illustrated in Figure 13, show the influence of climate change in Victoria.

FIGURE 13: TEMPERATURE AND RAINFALL CHANGE (1950-2015)



Source: Climate Ready Victoria 2015

This has consequences for the natural environment, including a decrease in species diversity and abundance, vegetation structure and genetic loss. Climate change also has implications for the safety and livelihoods of communities. This includes risks for infrastructure as well as primary production, tourism, health and the community (Climate Ready Victoria, 2015).

Key risks to infrastructure from climate change include increasing sea levels, fire weather, flooding, hot days, heat waves and storm surges. These result in damage to infrastructure, maintenance costs and disruptions to services (Climate Ready Victoria 2015).

Extreme temperatures increase the likelihood of damage or loss of energy infrastructure, which could limit supply of energy or further exacerbate capacity issues during peak times. Heatwaves may also result in degradation of structures, buckled train tracks or overheated water purification plants.

Droughts may result in faster degradation of bridges, roads and tunnels from changing groundwater levels, shifting building foundations or cracking of underground pipes. Increasing water insecurity may have implications for the integrity of ecological systems and biodiversity, economic production and consumption, and the health and wellbeing of communities.

Infrastructure near the coast may be impacted by sea level rises and coastal erosion, causing corrosion of pipes through salt water intrusion, roads being washed away, ports flooded and degraded, or flooding of exchange stations, sub-stations, manholes and underground pits (Commissioner of Environmental Sustainability Victoria, 2013).

For the Western Metro Region, this will mean:

- increased risks due to extreme heat and the region's vegetation profile
- vulnerable communities, particularly in areas with limited vegetation and relief from heat
- risks to coastal areas.

4. ECONOMIC

ECONOMIC INDICATORS

The Infrastructure Victoria economic indicators that underpin this section are:

- Employment location
- Economic location
- GRP
- GVA by industry
- Exports
- Business formation
- Effective job density
- Capital investment
- Labour productivity
- Participation rate
- Unemployment
- Change in working age population
- Household income
- Public transport
- Travel origins and destinations
- Freight and road networks
- Freight and business trips
- Households with vehicles
- Access to internet
- Skill levels
- Employment concentration of industries
- Location quotient

REGIONAL OVERVIEW

The economic profile of the Western Metro Region is characterised by:

- inner metropolitan established residential areas with mixed-use activity centres and diverse employment options
- outer areas focused on industry with some health or education clusters
- traditional core agriculture areas within the metropolitan green wedge land and associated rural activities.

ECONOMIC STRENGTHS

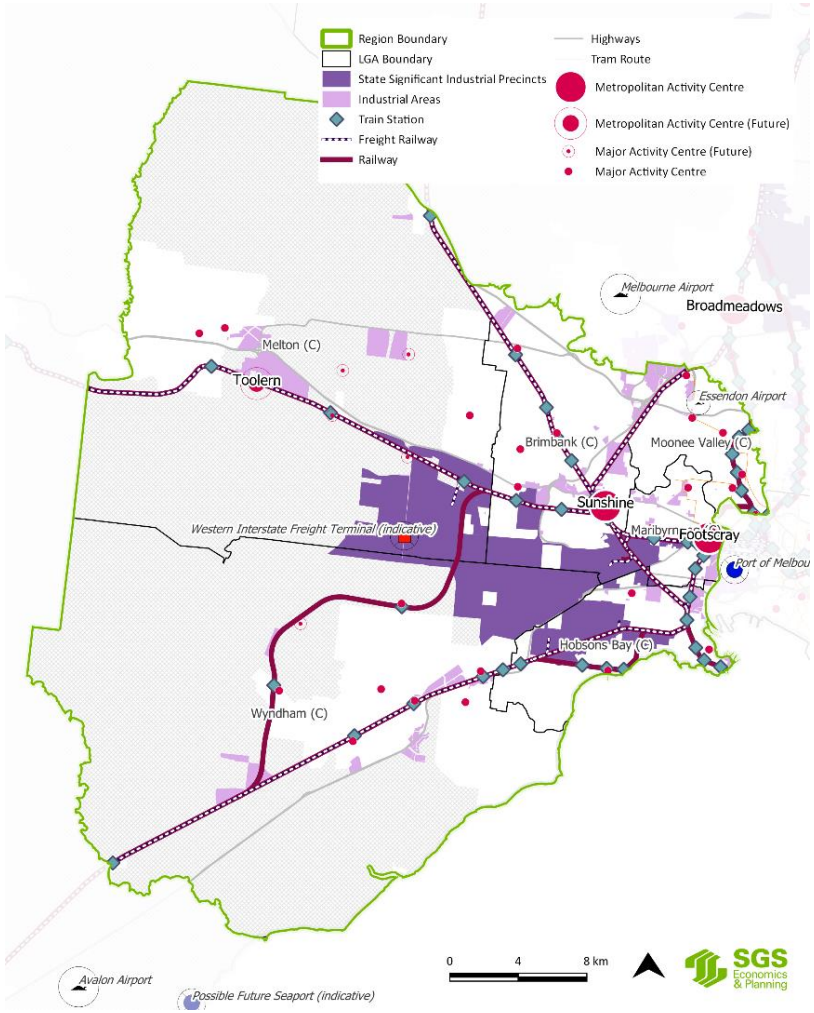
- Inner parts of the region have an increasingly diverse economy and capacity (for example, in transitioning post-industrial areas) to support higher-order, creative, knowledge-intensive sectors
- Conditions can be created for more diverse economies in established activity centres in other parts of the region, leveraging strategic assets like tertiary institutions and hospitals (for example, Werribee and the Werribee NEIC)
- Proximity to Geelong and Ballarat.
- Major industrial areas allow for industrial and manufacturing activities that cannot occur elsewhere due to emissions and amenity impacts, requirement for industrially-zoned land and port connections.

ECONOMIC CHALLENGES

- Limited access to diverse employment choices and fewer services, particularly for those in outer area.
- Vulnerable workforce due to lower skill levels in some parts of the region, particularly Brimbank and Melton LGAs.
- Amenity issues and pockets of disadvantage.

4.1 Overview and key economic features

FIGURE 14: KEY ECONOMIC FEATURES – WESTERN METRO REGION



Source: SGS Economics and Planning, 2018

The Western Metro Region plays a critical role in both Melbourne's and the wider state and national economy. The Western State Significant Industrial Precinct (SSIP) is the largest and most active industrial area in Melbourne and has capacity for additional growth in the coming decades.

The region links to major transport hubs and freight routes, including Melbourne, Essendon and Avalon airports and the Port of Melbourne and potential future Bay West seaport. Major road networks include the Princes and West Gate freeways, which connect the metropolitan Melbourne region to the western side of Victoria, and the Western Freeway, which stretches towards the Melton and Rockbank in the north west. The M80 Ring Road provides cross-town connectivity to the north of the city, and the Calder Freeway links the north west of Victoria to Melbourne. The West Gate Tunnel project, due to open in 2022, will provide a second river crossing with access to the Port of Melbourne and the CBD. A proposed Outer Metropolitan Ring Road would cut through the middle of the region connecting Werribee with Wallan.

The rail network in Western Metro Region features:

- metro passenger services to Werribee, Williamstown and Sunbury (plus sections of the Craigieburn Line)
- regional passenger services to Bendigo, Ballarat and Geelong and beyond, via Regional Rail Link
- interstate passenger and freight lines between Adelaide/Perth and Melbourne (via Ararat and Geelong) and between Brisbane/Sydney (via Sunshine and Albury) and Melbourne.

The Western Metro Region will be home to the proposed Western Interstate Freight Terminal (WIFT). *Plan Melbourne* identifies Sunshine and Footscray as Metropolitan Activity Centres (MACs) and Toolern as a future MAC. MACs are higher-order centres intended to provide a diverse range of jobs, activities and housing.

Sunshine and the hospital precinct east of Werribee are identified as future NEICs as they are local and regional destinations which will become nationally significant as they increasingly attract workers, students and visitors from across Australia and overseas.

Diverse activities in the NEICs will be focused and expanded in the fields of international education, research, health, medical technology, pharmaceuticals, science, business services, high-tech manufacturing and information technology. These industries are the future of the Victorian economy and are expected to offer more jobs close to where people live. Planning for these precincts will be undertaken in partnerships between local and State government, including, in some cases, agencies such as the Victorian Planning Authority (VPA).

4.2 Economic performance

Table 3, along with Figure 15 and Figure 16, present current and recent change in employment.

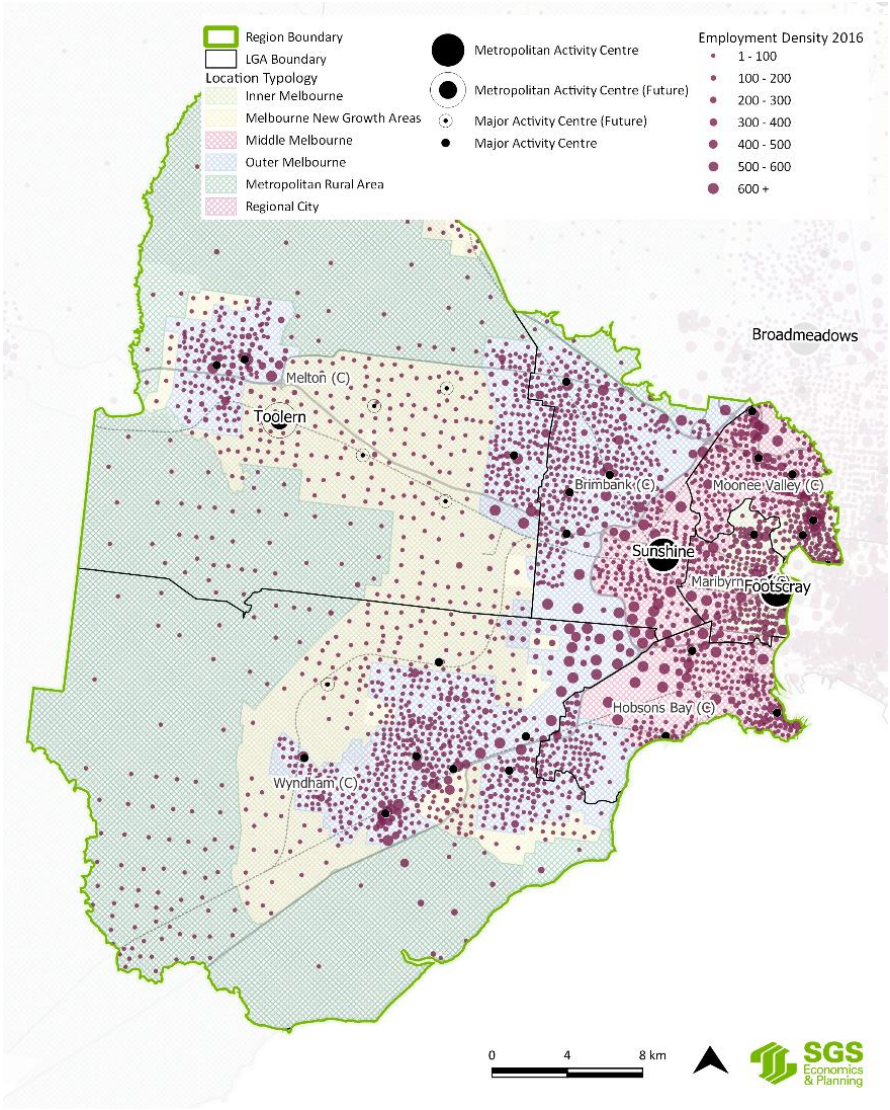
- The Outer Melbourne Area absorbed the largest proportion of regional growth in employment (56.4 per cent) between 1996 and 2016, concentrated in the Melton, Wyndham and Brimbank LGAs and around major activity centres, including Melton (town), Werribee, Brimbank (town), and along major transport corridors such as the Princes Highway (Figure 15).
- Wyndham and Brimbank LGAs had the largest proportion of growth by LGA, accounting for 32 per cent and 27 per cent of the increase in employment respectively.
- This is likely due to the region's growing construction industry. This correlates with the increase in population, mostly driven by overseas migration between 1996 and 2016, which in turn created demand for housing.
- While employment figures increased overall between 1996 and 2016 (Table 3), the market share of some industries decreased, particularly in Inner Melbourne, where post-industrial land is used by other industry sectors or for residential use (see section 4.4 for further information).
- Melbourne's New Growth Areas grew at a faster rate (7.7%) than other location typologies, reflecting population-driven demand for retail and other services (Table 3). This proportion is larger due to a smaller base rate in 1996.
- Figure 15 shows that employment density in the Western Metro Region appears to be more concentrated in the east, with the City of Melton having a cluster in the western part of the region along with higher densities along the Princess Freeway corridor.
- Figure 16 presents employment growth across the Western Metro Region from 2011 to 2016. Employment growth was relatively even but more extensive in Outer Melbourne, reflecting the patterns of population growth. For more detail on industry share by sectors, refer to section 4.4.
- Figure 17 shows employment by industry classification for 2016. The tourism sector straddles a number of standard industry classifications. The contribution of tourism is often indirect, generating output and creating jobs in sectors such as retail trade, arts and recreation services, accommodation and food services in particular." Rural activity (agriculture, forestry and fishing) is covered by the industrial classification.

TABLE 3: EMPLOYMENT BY LGA AND LOCATION TYPOLOGY (1996-2016)

	1996	2016	1996-16		
			Change	% regional	AAGR
LGA					
Brimbank	41,296	78,254	36,958	27.1%	3.2%
Hobsons Bay	31,615	42,036	10,421	7.7%	1.4%
Maribyrnong	31,243	42,477	11,233	8.2%	1.5%
Melton	9,200	28,155	18,955	13.9%	5.8%
Moonee Valley	26,375	41,563	15,188	11.2%	2.3%
Wyndham	27,840	71,292	43,452	31.9%	4.8%
Western Metro Region	**167,569**	**303,777**	**136,208**	**100.0%**	**3.0%**
Location Typology					
Inner Melbourne	36,211	49,726	13,515	9.9%	1.6%
Middle Melbourne	68,782	103,229	34,447	25.3%	2.1%
Outer Melbourne	58,216	134,863	76,647	56.4%	4.3%
Melbourne New Growth Areas	2,437	12,946	10,509	7.7%	8.7%
Metropolitan Rural Areas	2,590	3,483	892	0.7%	1.5%
Western Metro Region	**168,237**	**304,247**	**136,011**	**100.0%**	**3.0%**
Victoria	**2,045,773**	**3,032,148**	**986,375**	**-**	**2.0%**

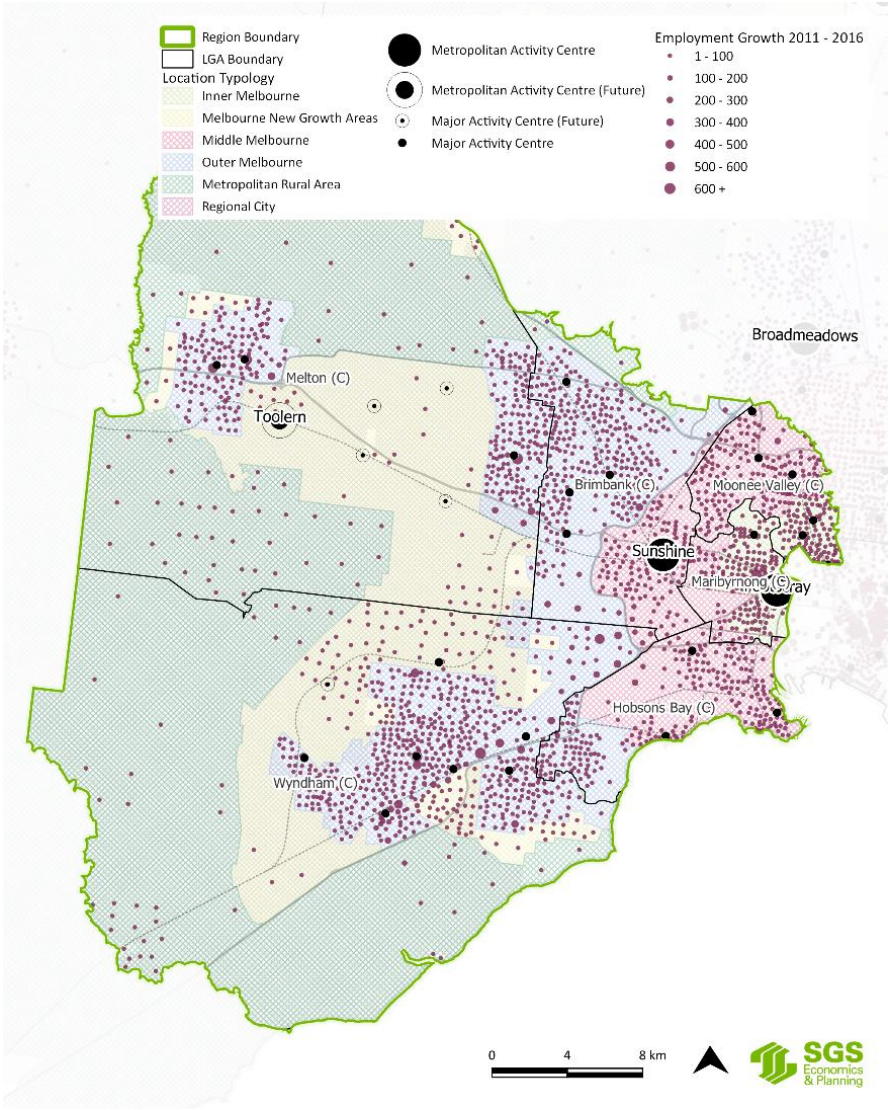
Source: SGS Economics and Planning, 2018

FIGURE 15: EMPLOYMENT DENSITY (2016)



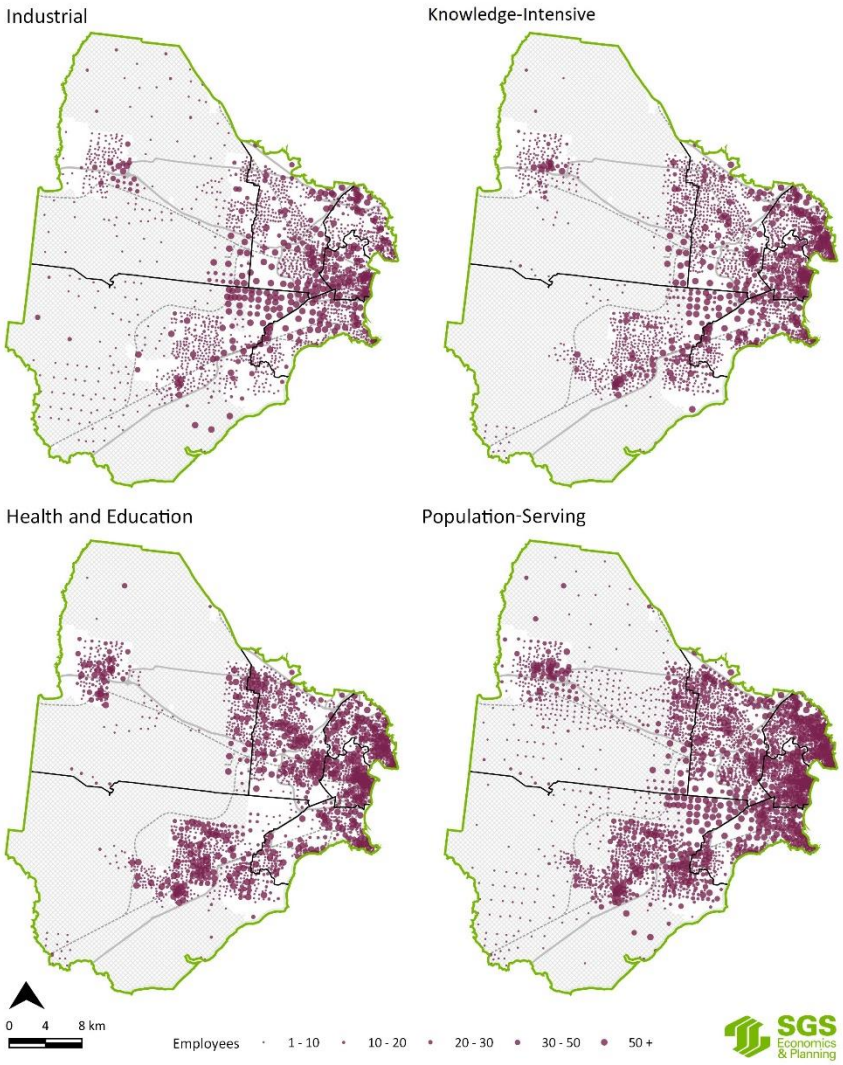
Source: Small Area Land Use Projections 2017

FIGURE 16: EMPLOYMENT GROWTH (2011-2016)



Source: SGS Economics and Planning, 2018

FIGURE 17: EMPLOYMENT BY INDUSTRY CLASSIFICATION (2016)



Source: SGS Economics and Planning 2018

Economic locations

Economic locations are areas with a dense cluster of economic and employment activity with a minimum of 5,000 jobs within a one-kilometre radius (see Table 1 for further information).

Each economic location has a unique economic profile that reflects the attributes and endowments of their catchment area's workforce, legacy and level of development maturity. The locations capture many places of State significance identified in *Plan Melbourne*, including NEICs, SSIPs and MACs. While they overlap with the *Plan Melbourne* locations, the boundaries are not identical. They also capture clusters not identified in *Plan Melbourne*.

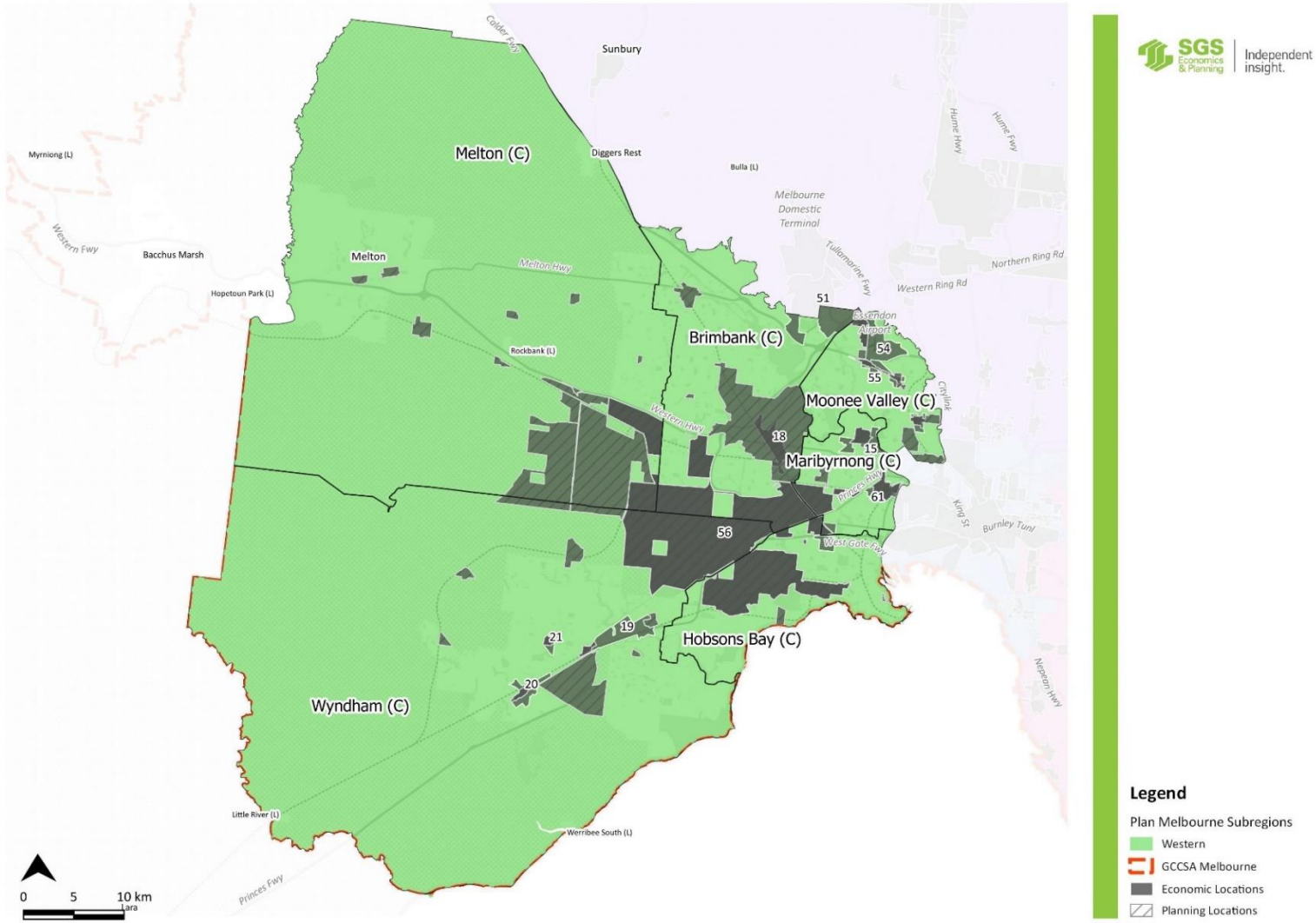
Figure 18 shows where economic locations overlap with *Plan Melbourne* locations.

The economic locations driving production and employment in the Western Metro Region are shown in Figure 18. Table 4 lists the number of jobs and industry breakdowns for each economic location.

The West Melbourne Industrial Precinct (cluster ID 56) is the most productive location in the region. It has the greatest number of jobs (75,096), 64 per cent of which are in the industrial sector. Footscray (number 58) has the second highest number of jobs (9,292) with health and education representing 34 per cent of jobs. Airport West (number 54) has 8,777 jobs, with 48 per cent of these in the population-serving sector. Moonee Ponds, Maribyrnong-Highpoint, Sunshine and Hoppers Crossing also employ more than 6,000 people, with population-serving and knowledge-intensive sectors representing the largest share.

In the Western Metro Region, most economic locations are also identified in *Plan Melbourne*. The West Melbourne Industrial Precinct is generally aligned with the Western State Significant Industrial Precinct. In Hoppers Crossing and Footscray, the cluster of economic activity extends beyond the *Plan Melbourne* boundaries, while in Sunshine and Truganina-Tarneit employment is yet to expand into the precinct identified. The light industrial and homemaker centre along Old Geelong Road in Hoppers Crossing (cluster ID 19), and logistics hubs clustered around Essendon Airport (cluster IDs 51, 54 and 55) are not identified in *Plan Melbourne*.

FIGURE 18: ECONOMIC LOCATIONS



Source: SGS Economics and Planning, 2018

TABLE 4: ECONOMIC LOCATIONS BY INDUSTRY (2018)

Cluster id	Economic locations	LGA	Knowledge-intensive	Industrial	Population-serving	Health and education	Total jobs
2	Moonee Ponds	Moonee Valley	54%	3%	31%	13%	6,338
15	Maribyrnong-Highpoint	Maribyrnong	12%	9%	71%	9%	6,983
18	Sunshine	Brimbank	31%	19%	30%	20%	6,887
19	Hoppers Crossing	Wyndham	7%	26%	63%	4%	6,981
20	Werribee	Wyndham	41%	5%	32%	22%	5,035
21	Werribee Plaza	Wyndham	10%	3%	72%	15%	3,273
51	Tullamarine Business Precinct	Hume	13%	63%	23%	1%	1,021
54	Airport West	Moonee Valley	16%	32%	48%	3%	8,777
55	Niddrie-Keilor Road	Moonee Valley	24%	8%	44%	24%	4,485
56	Western Industrial Precinct	Wyndham	9%	63%	26%	2%	75,096
61	Footscray	Maribyrnong	24%	14%	26%	37%	9,292

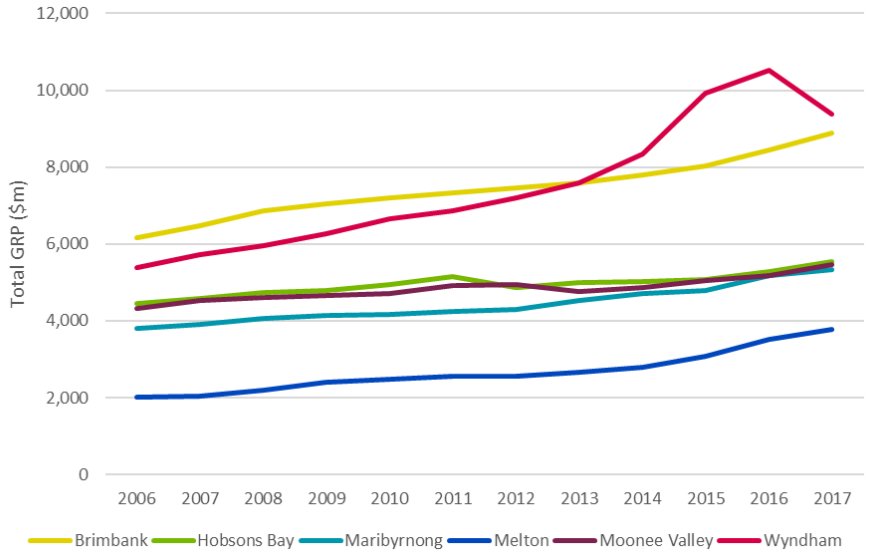
Source: SGS Economics and Planning, 2018

Gross regional product (GRP)

Gross regional product (GRP) measures the total quantity of economic production (goods and services in dollar terms) within a region. The GRP of a metropolitan area measures the size of economic output, but not necessarily its value added or productivity. These are discussed separately in this chapter; this section discusses GRP measured at place of work by LGA (Figure 19).

- From 2006 to 2012, the City of Brimbank reported the highest GRP for the region off the back of employment clusters in Sunshine, Brimbank, St Albans and the corridor towards Tullamarine supporting airport-related activities. Local productivity was supported by the LGA's proximity to surrounding industrial pockets.
- Between 2014 and 2016, the City of Wyndham had the highest GRP per annum in the Western Metro Region.
- The City of Melton had the lowest level of GRP due to its higher proportion of residential areas compared to employment land and a higher proportion of residents working outside the municipality. Melton(town) has an employment cluster of population-serving and civic jobs and is the administrative hub for the municipality.

FIGURE 19: TOTAL GRP (2006-2017)



Source: NIEIR 2018

Gross value added (GVA) by industry

Gross value added (GVA) represents the total value added for all goods and services produced within a region. It differs to GRP in the same way that sales revenue and profits differ. A region may have a high level of output (GRP) but low value added (GVA), meaning more resources were used in the production process.

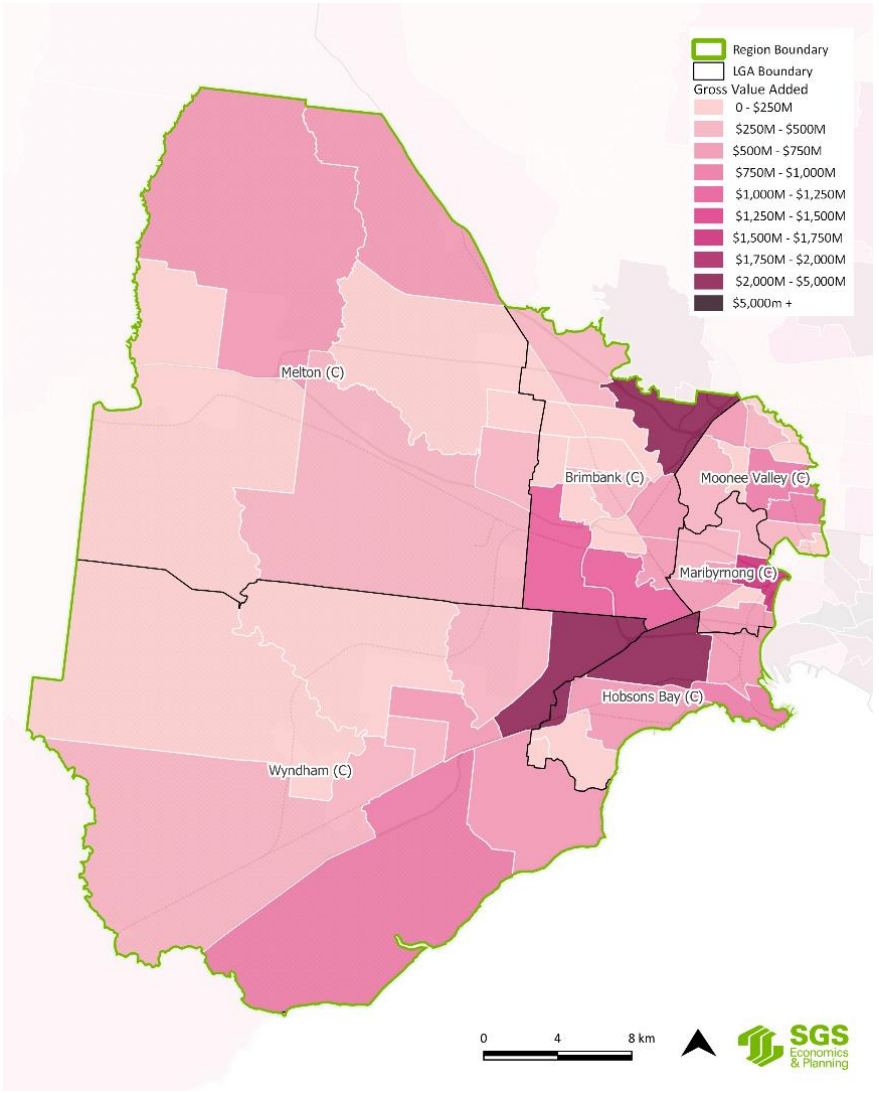
Of the four industrial classifications, GVA is highest in the following locations in the Western Metro Region:

- **Health and education**: Footscray, St Albans (Victoria University) and the Werribee region
- **Industrial**: Sunshine, Altona/Altona North to Williams Landing and Braybrook corridor, Keilor and Airport West to Tullamarine
- **Population-serving**: Airport West to Tullamarine, Hoppers Crossing to Altona North corridor
- **Knowledge-intensive**: Keilor and Airport West to Tullamarine, Williams Landing to Altona North corridor, Werribee region, Footscray, Moonee Ponds to North Essendon, Sunshine (to a lesser extent).

Figure 20 illustrates the total GVA across the Western Metro Region.

- High levels of GVA clustered around Sunshine, Footscray and Werribee.
- Tullamarine/Airport West and Keilor also have high levels of GVA linked to freight, logistics and manufacturing activities linked to the airport.

FIGURE 20: TOTAL GVA (2016)



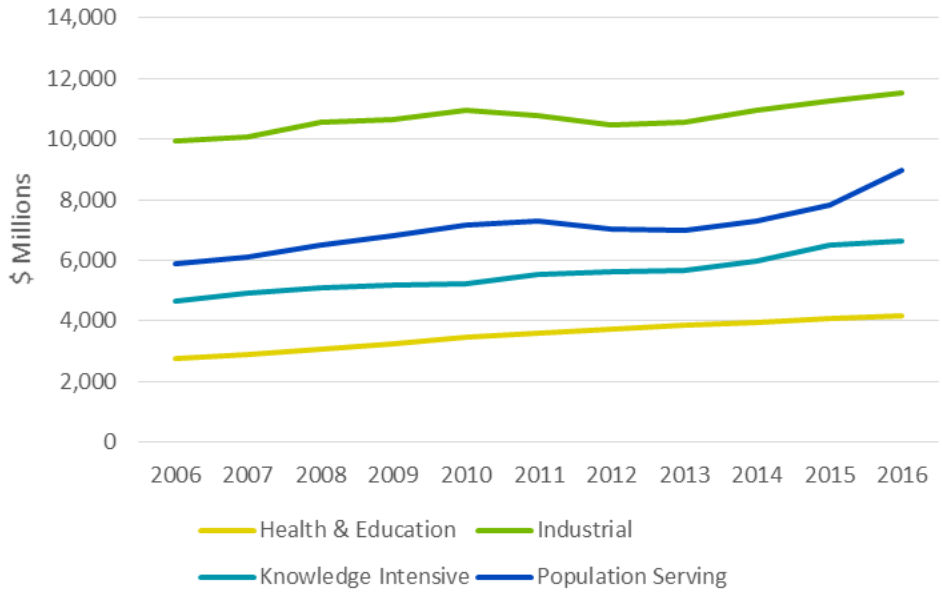
Source: SGS Economics and Planning, derived from various ABS datasets

Figure 21 presents the breakdown of historic GVA by the four broad industry classifications.

- Over the period 2006 to 2016, the largest increase in GVA occurred in the population-serving sector, likely in response to the scale of population growth.
- Over the same period, the GVA for industrial, knowledge-intensive and health and education sectors also increased; the smallest increase occurred in health and education.

See section 2.2 for a description of industry classifications.

FIGURE 21: GVA BREAKDOWN BY INDUSTRY CLASSIFICATION (2006-2016)



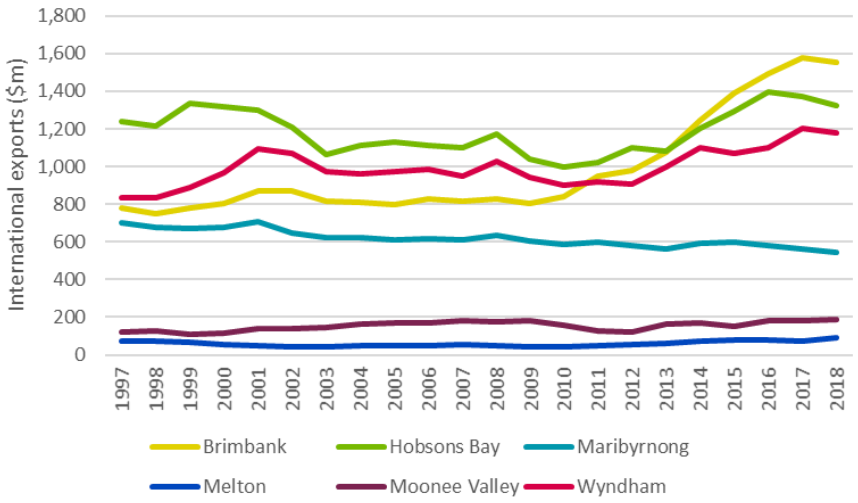
Source: NIEIR 2018

Exports

Exports are goods transferred between regions and are essential to a country's economy. High international exports contribute a region's economic and employment growth. The largest export industries for the Western Metro Region are manufacturing, and transport, postal and warehousing.

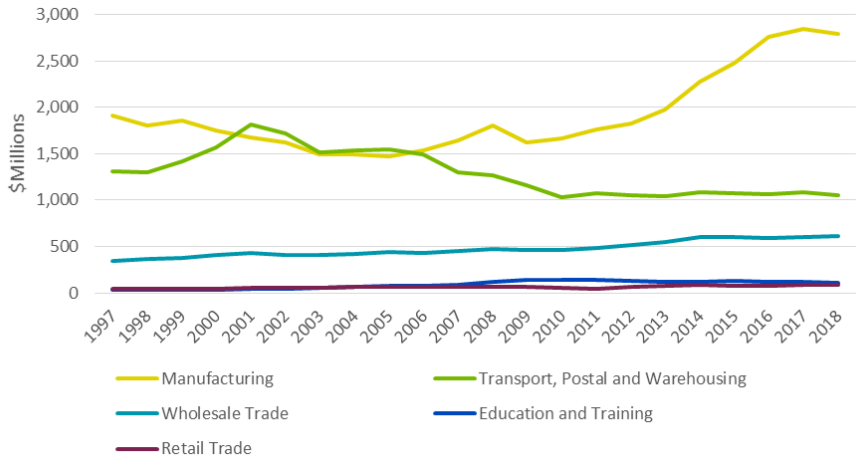
- From 1997 to 2018 Brimbank, Hobsons Bay and Wyndham LGAs had the highest value of international exports in the Western Metro Region.
- These LGAs saw a positive trend in international exports from 2012 to 2016.
- The City of Maribyrnong had a decrease in international exports, likely because of a drop in its manufacturing industry.
- Melton and Moonee Valley LGAs had lower value international exports overall, with annual values consistently below $200 million. This indicates that international exports may not make up a large share of local economic activity, particularly compared to the overall GDP for the City of Moonee Valley (see Figure 19).
- The highest value industry for international exports in the Western Metro Region (Figure 23) is manufacturing, followed by transport, postal and warehousing.
- The size of the education and training industry in the Western Metro Region, while growing, is not a high-value international export (see Figure 54 and Figure 55 for further information about industry share).

FIGURE 22: INTERNATIONAL EXPORTS (1997-2018)



Source: NIEIR 2018

FIGURE 23: INTERNATIONAL EXPORTS BY INDUSTRY (1997-2018)



Source: NIEIR 2018

Business formation

Business formation is the registration and de-registration of businesses by different industries. The growth of business in the Western Metro Region is broken down into the four industry classifications for comparison.

- Table 5 shows the growth rate by industry classification from 2009 to 2017, where health and education increased by 136.4 per cent and 191.1 per cent in the Melton and Wyndham LGAs respectively.
- Despite the high growth rates above, Table 6 shows that the overall size of the health and education sector (by business formation) in the Shire of Melton is smaller and in the City of Wyndham significantly larger than other parts of the region.
- The City of Wyndham growth and size of the health and education industry reflects the scale of population change in New Growth Areas, which has driven sector growth since 2009.
- Business formation in the growing health and education sector may reflect the growth in international students across metropolitan Melbourne.
- Business formation in the knowledge-intensive sector increased at a greater rate in each of the Western Metro Region LGAs compared to Victoria overall (Table 5), due to the shift from an industrial-based economy to a knowledge-based economy.

TABLE 5: BUSINESS FORMATION (GROWTH RATE) BY INDUSTRY (2009-2017)

LGA	Health and education	Industrial	Knowledge-intensive	Population-serving
Brimbank	83.4%	11.8%	33.4%	18.3%
Hobsons Bay	48.1%	3.8%	27.4%	23.8%
Maribyrnong	65.2%	8.4%	33.4%	28.9%
Melton	136.4%	38.9%	54.8%	34.1%
Moonee Valley	43.7%	-4.3%	29.6%	9.6%
Wyndham	191.9%	86.8%	87.8%	46.9%
Victoria	**42.2%**	**1.2%**	**24.3%**	**15.2%**

Source: ABS Counts of Australian Businesses, including Entries and Exits 2009 and 2017

TABLE 6: BUSINESS FORMATION (COUNT) BY INDUSTRY (2009-2017)

LGA	Health and education	Industrial	Knowledge-intensive	Population-serving
2009				
Brimbank	386	3,897	2,979	4,354
Hobsons Bay	352	1,629	2,259	2,219
Maribyrnong	356	1,284	1,885	1,834
Melton	195	1,391	1,234	2,420
Moonee Valley	693	1,536	3,644	3,336
Wyndham	353	2,113	2,302	3,016
Victoria	28,721	127,325	176,887	165,058
2017				
Brimbank	708	4,356	3,974	5,149
Hobsons Bay	522	1,692	2,879	2,747
Maribyrnong	588	1,392	2,514	2,364
Melton	461	1,932	1,910	3,246
Moonee Valley	996	1,470	4,723	3,657
Wyndham	1,029	3,946	4,322	4,430
Victoria	40,841	128,831	219,863	190,207

Source: ABS Counts of Australian Businesses, including Entries and Exits 2009 and 2017

Effective job density (EJD)

Effective job density (EJD) measures a location's concentration of jobs based on their accessibility, which is closely linked to the transport networks and infrastructure.

EJD informs how accessible a region is, how employment is distributed, and whether residents enjoy a range of employment opportunities. It also measures how connected a person is to the benefits of the region, as people who live in areas where they can access a higher proportion of a region's jobs have a greater chance of matching their skills and aspirations to available jobs.

An area with fewer jobs can also have high EJD by locating close to another area with high EJD.

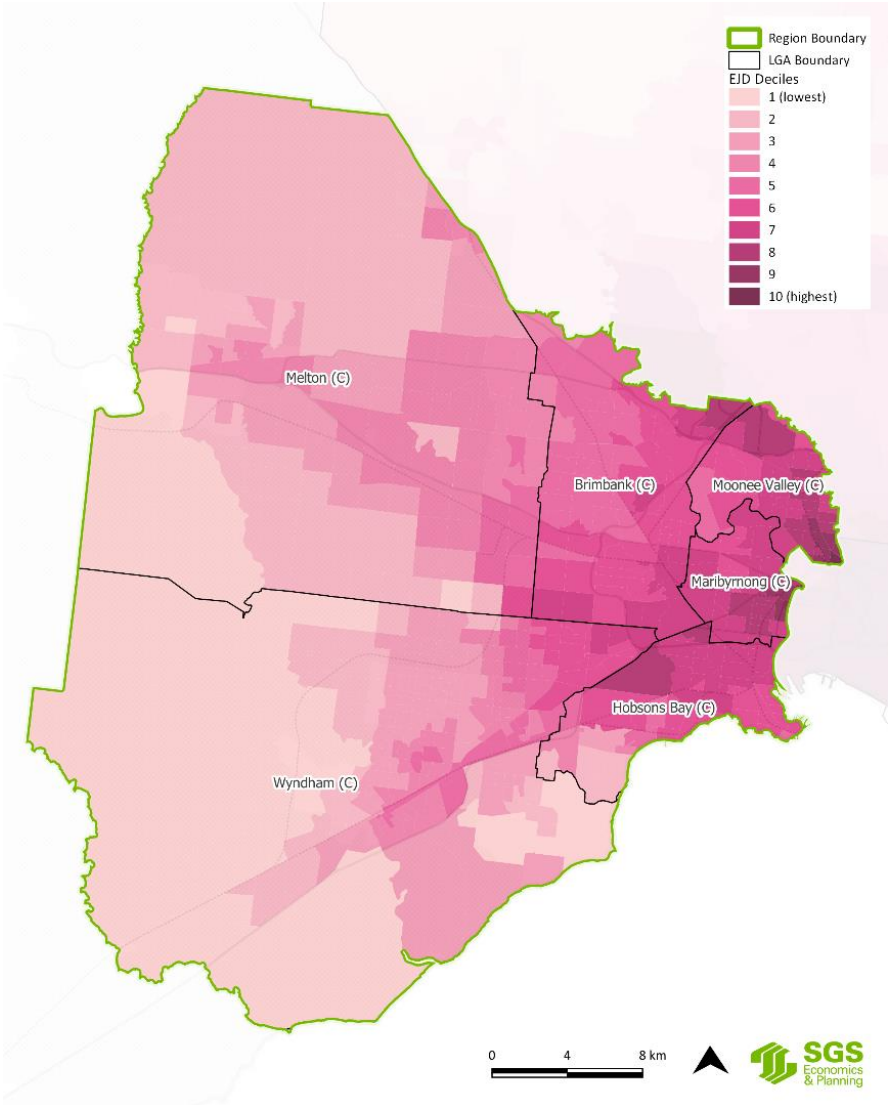
A better match of skills to job can increase skill development and job satisfaction. Figure 24 and Figure 25 (overleaf) use a scale (lowest to highest) that applies to all locations across metropolitan Melbourne.

- Maribyrnong, Moonee Valley and parts of Hobsons Bay LGAs have a high EJD compared to other parts of the region. Jobs are particularly accessible and concentrated in activity centres along the Craigieburn and Werribee train lines, which also connect these areas to the Melbourne CBD (Figure 24).
- The City of Brimbank has medium-to-high EJD, likely due to the Sunbury and Sunshine metro train lines that connect these centres and Melbourne CBD (a key factor influencing high EJD).
- The eastern parts of the Melton and Wyndham LGAs have medium EJD while the outer parts have lower EJD due to poorer transport connectivity and their distance from Melbourne CBD.

Figure 25 shows the EJD for each of the four broad industry classifications.

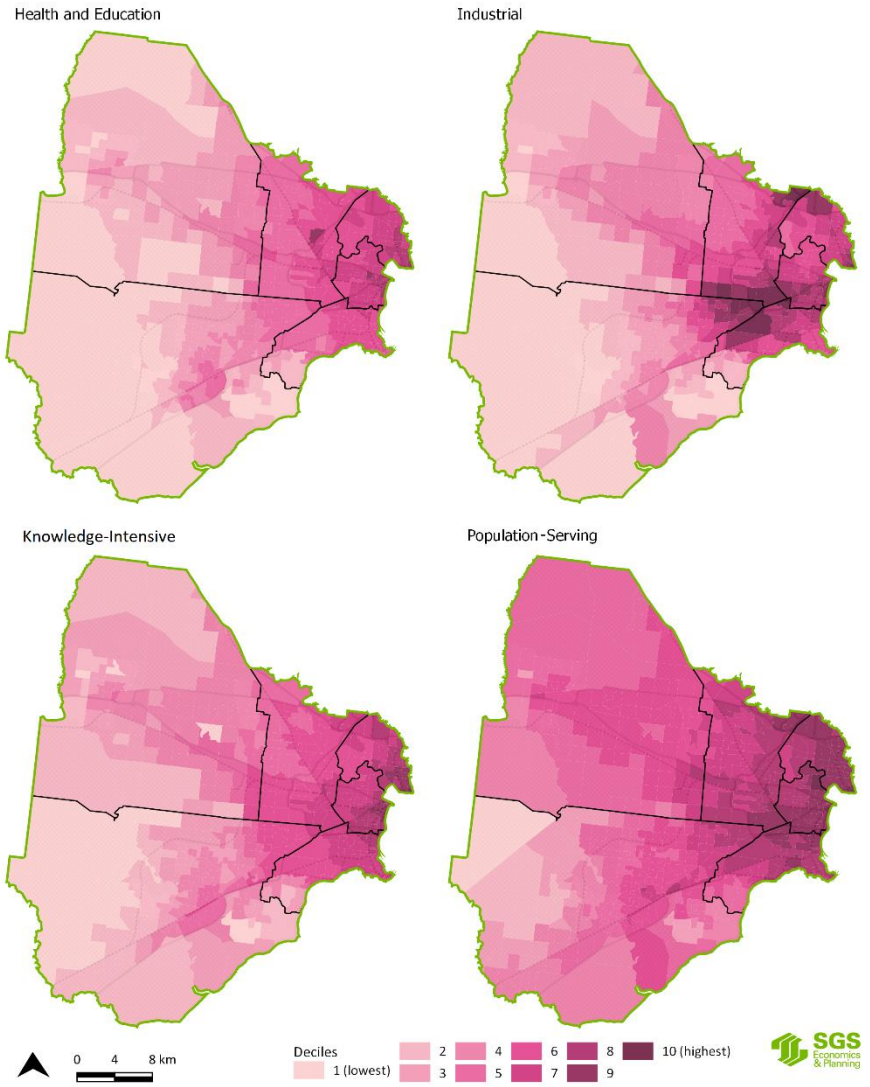
- Due to its relationship to places where people live and work, the population-serving sector is most evenly distributed across the region and accessible in most locations. EJD for this sector is greater than 6,000 across the region.
- EJD for the industrial sector broadly reflects the location of industrial precincts including Derrimut, Laverton North, Altona North and Sunshine West.
- Towards the mid-west of the City of Melton, the EJD of the industrial sector is clustered along the Western Freeway, a principal corridor in the Victorian freight network.

FIGURE 24: EFFECTIVE JOB DENSITY (2018)



Source: SGS Economics and Planning, 2018.

FIGURE 25: EFFECTIVE JOB DENSITY BY CLASSIFICATION (2018)



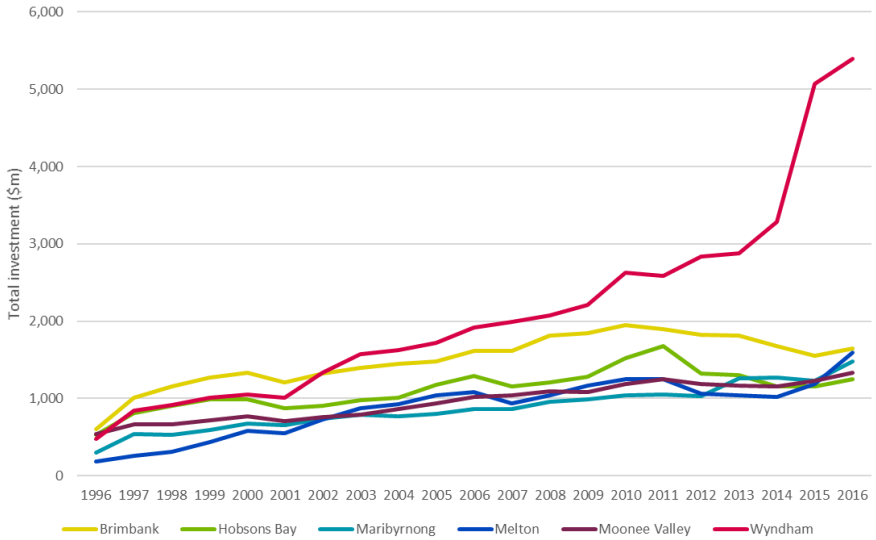
Source: SGS Economics and Planning, 2018.

Capital investment

Capital investment refers to funds invested in enterprise. High levels of investment indicate a growing economy.

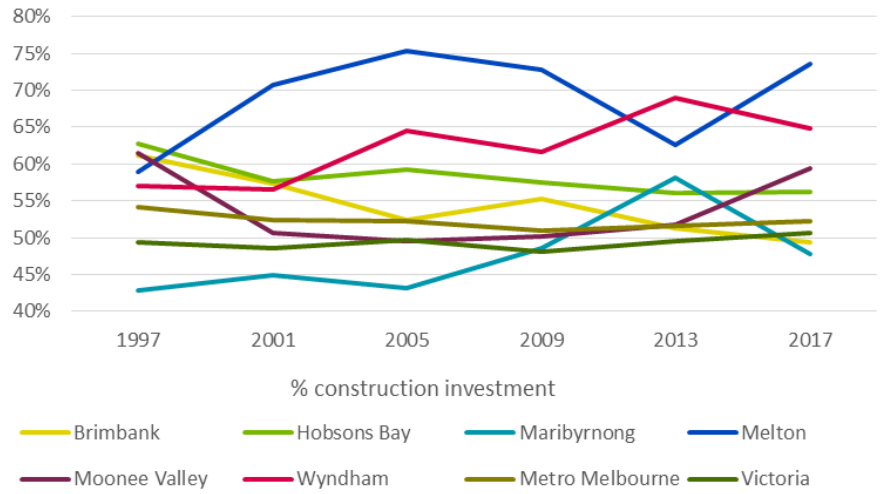
- The City of Wyndham experienced significant growth in capital investment, likely due to the flow-on investment in infrastructure and services associated with the maturing New Growth Areas from 2014 to 2016 (Figure 26).
- Figure 27 shows that investment in construction decreased in the City of Wyndham since 2013 or 2014, perhaps indicating a slowing of the development rate in New Growth Areas. Despite this, this investment is high compared to other LGAs in the region.
- Hobsons Bay, Melton, Maribyrnong and Moonee Valley LGAs, while experiencing modest growth, saw increase in capital investment since 2015. This is likely associated with urban renewal projects in those areas. See, for example, Section 5.3, Figure 69 and Figure 72, where new development is occurring at higher densities and likely to attract infrastructure investment via mechanisms such as development contributions.
- Figure 27 and Figure 28 illustrate the breakdown of capital investment by LGA and proportional changes from 1996 to 2017.

FIGURE 26: TOTAL INVESTMENT (1996-2016)



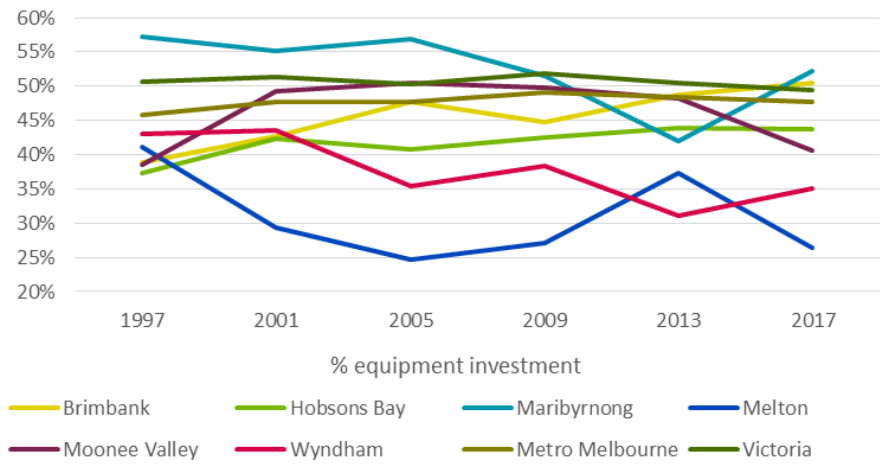
Source: NIEIR 2018

FIGURE 27: CONSTRUCTION INVESTMENT (1996-2017)



Source: NIEIR 2018

FIGURE 28: EQUIPMENT INVESTMENT (1996-2017)



Source: NIEIR 2018

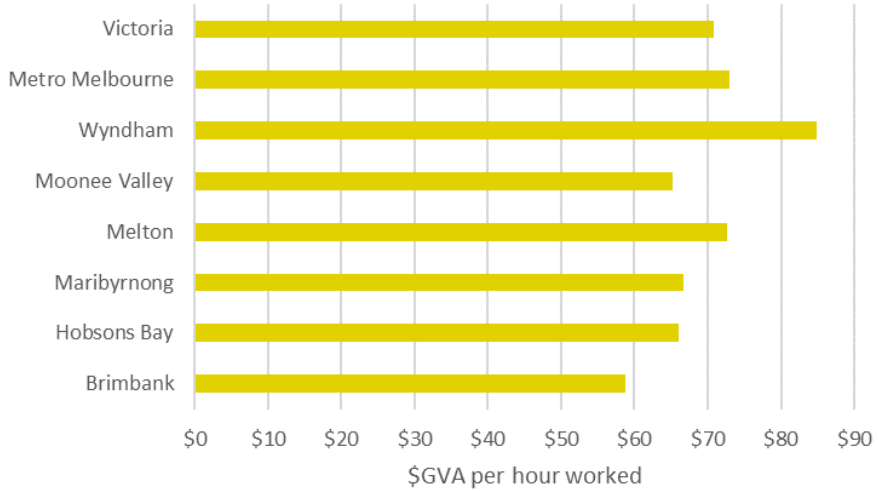
Labour productivity

Labour productivity is a measure of efficiency of labour, expressed as the GVA generated per hour worked. Variations in labour productivity can be due to worker skills, quality of capital, infrastructure available and adoption of technology.

Understanding a location's productivity informs how efficient and effective its workers are at producing goods and services.

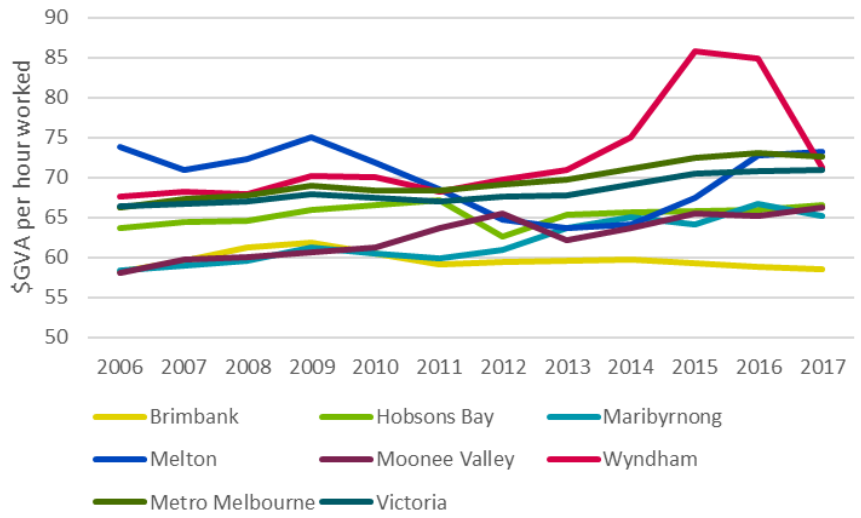
- The relatively higher labour productivity in the Melton and Wyndham LGAs shown in Figure 29 are likely due to the wider scale of industrial activities and employment precincts in these areas.
- The proportion of residential development in New Growth Areas is higher than in other parts of the region, contributing to a higher overall GVA per hours worked.
- The City of Brimbank's labour productivity has been historically lower than other LGAs (Figure 30). This somewhat corresponds to the City's lower labour participation rates (on average) illustrated in Figure 32, and also correlates to its on-average lower skill levels, as discussed in Section 4.4.

FIGURE 29: LABOUR PRODUCTIVITY BY LGA (2016)



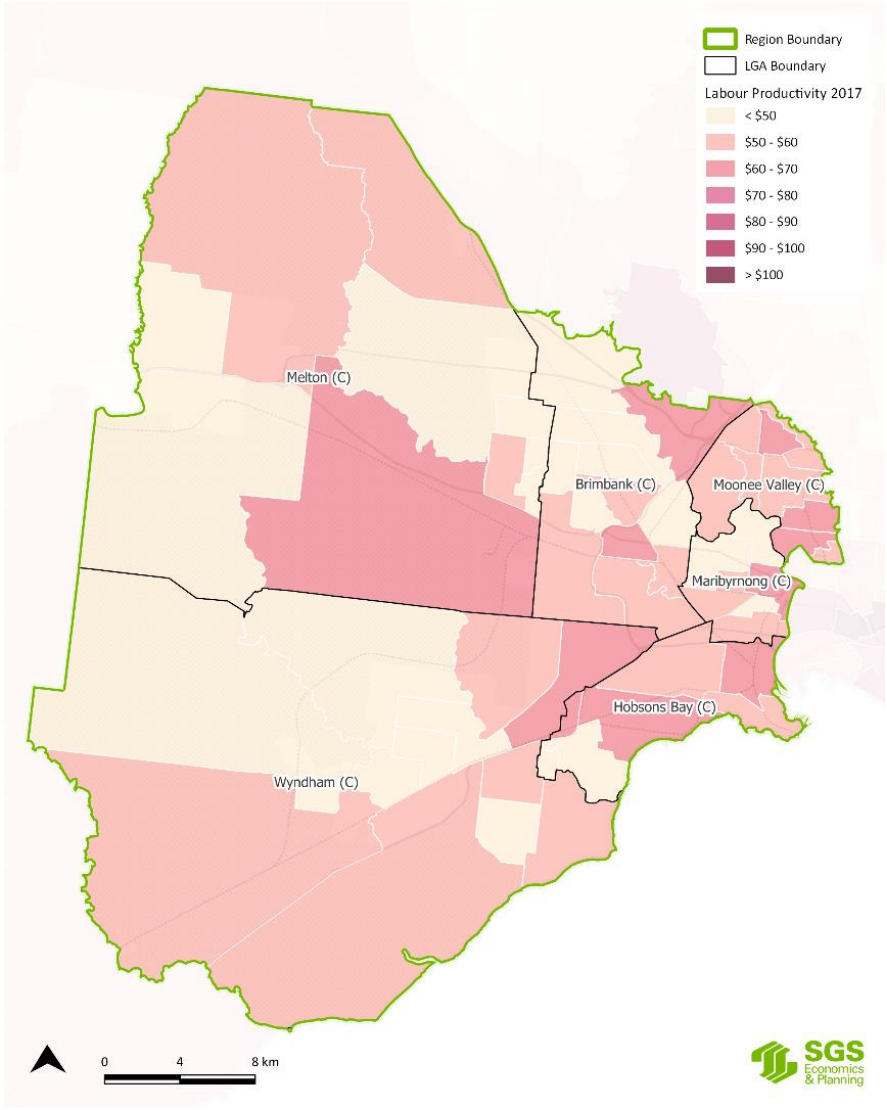
Source: ABS Census 2016

FIGURE 30: LABOUR PRODUCTIVITY (2006-2017)



Source: NIEIR 2018

FIGURE 31: LABOUR PRODUCTIVITY



Source: ABS Census 2016

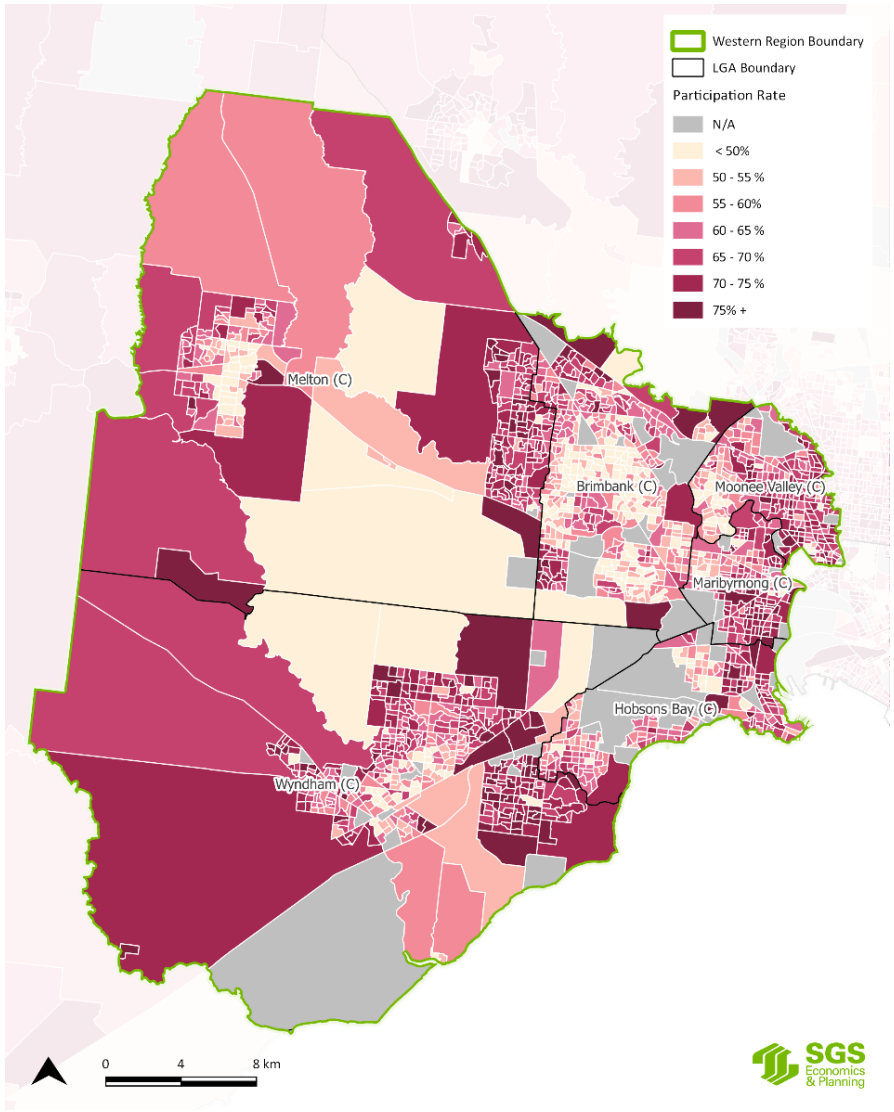
Participation rate

The participation rate is a measure of the portion of the population active in the labour force. It refers to the number of people who are either employed, underemployed or actively looking for work as a percentage of the population aged over 15.

The participation rate informs the region's labour utilisation and dependency, and the strength of the local economy.

- The participation rate (Figure 32) is notably lower in St Albans to Cairnlea, in the City of Brimbank, than in other parts of the region.
- The City of Brimbank's population aged 65 and over had the largest growth over the period 2011 to 2016 (Figure 36). The size of this group may explain why there are extensive areas with lower participation rates in this LGA (Figure 32).
- Areas with a participation rate over 70 per cent are clustered in the Werribee NEIC, Western Industrial Precinct, areas of the Brimbank LGA close to Melbourne Airport, Melton, Sunshine, Newport and Footscray.

FIGURE 32: PARTICIPATION RATE BY SA1 (2016)



Source: ABS Census 2016

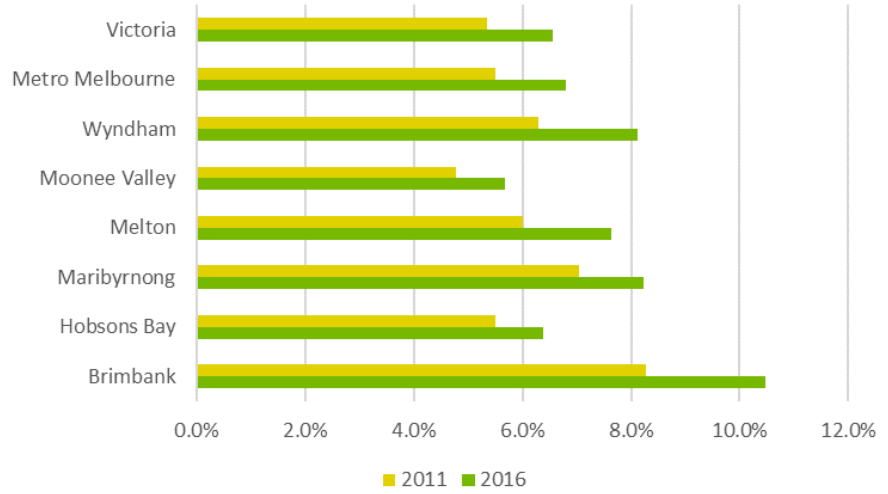
Unemployment

The unemployment rate is a measure of the people in the labour force actively looking for work. In the Western Metro Region, employment and skills levels have been gradually increasing in line with the metropolitan Melbourne and Victorian trends (see Figure 6 and Figure 50).

Figure 33 shows the change in the unemployment rate from 2011 to 2016, while Figure 34 shows the spatial distribution of unemployment rates in 2016. As noted earlier, some locations in the region have high EJD (see Figure 24), yet unemployment rates are also higher than the metropolitan Melbourne and Victorian averages (for example, the City of Brimbank). This suggests that while jobs are available, they may be less physically accessible.

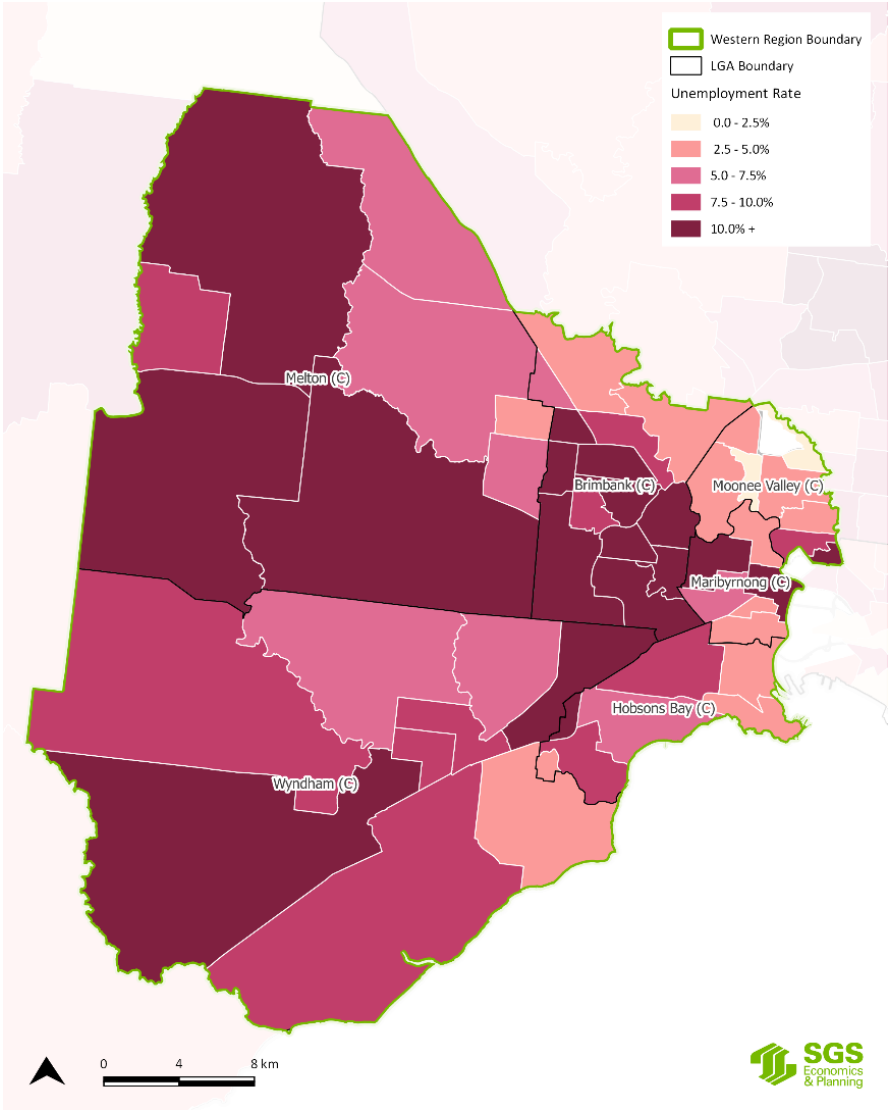
- The unemployment rate increased in all municipalities across the Western Metro Region between 2011 and 2016, consistent with broader trends across Victoria.
- The most significant increases occurred in the Wyndham and Brimbank LGAs.
- The City of Brimbank had the highest unemployment rate, consistent with lower participation rates (Figure 32) from 2011 to 2016; this figure may also relate to poorer connections to jobs than other locations (see Figure 41).
- Hobsons Bay and Moonee Valley LGAs had lower unemployment rates, which may relate to residents' proximity and relative ease of access to employment opportunities (see Figure 24) and higher education attainment levels (Figure 50).

FIGURE 33: UNEMPLOYMENT RATE BY LGA (2011-2016)



Source: ABS Census 2011 and 2016.

FIGURE 34: UNEMPLOYMENT RATE (2016)



Source: Australian Government, Department of Jobs and Small Business 2018

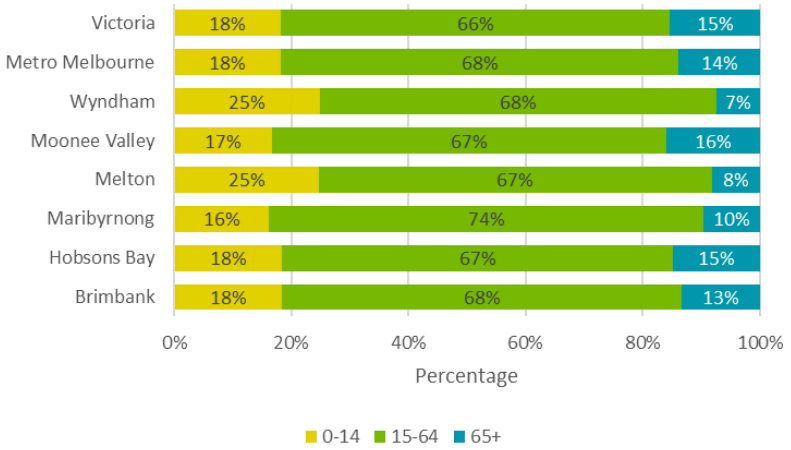
Change in working age population

Working age population is defined as the population aged between 15 and 64. The proportion of the working age population in an area provides an insight into its labour force composition.

Figure 35 shows the working age population (2016) across the region, compared to Victoria and metropolitan Melbourne. Figure 36 shows the structural change to the working age population over the period 2011 to 2016.

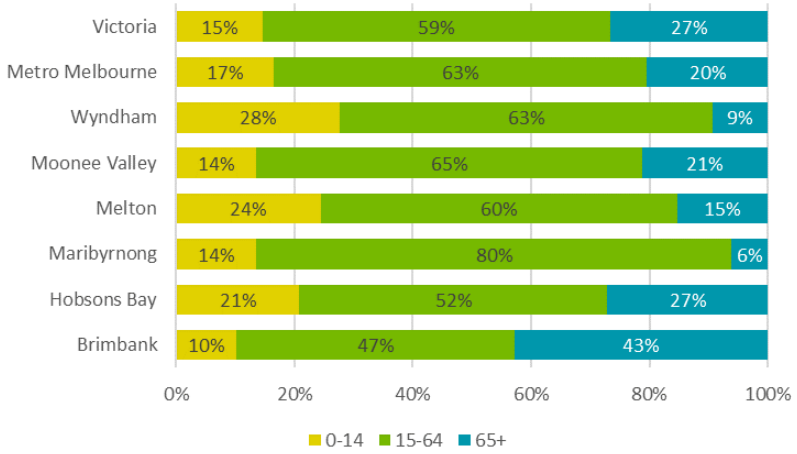
- Figure 36 shows that the City of Maribyrnong experienced the highest share of population growth (80 per cent) in the age group 15-64, reflecting the significant share of growth that occurred in the younger adult age groups (see Figure 62).
- The share of growth in the group aged over 65 largely accounted for 43 per cent of the population growth in the City of Brimbank, which is significantly higher than other LGAs. The City may experience a decreasing labour participation rate in the future if this trend continues.
- Note that the working age range (15-64 years) has some limitations. While there are still a greater number of older Australians who are not in the labour force, as people are living longer and working longer, a growing number of people work past 65 years of age.

FIGURE 35: WORKING AGE POPULATION (2016)



Source: ABS Census 2016, SGS Economics and Planning, 2018

FIGURE 36: SHARE OF POPULATION CHANGE BY AGE (2011-2016)



Source: ABS Census 2011 and 2016, SGS Economics and Planning, 2018

4.3 Economic wellbeing of residents

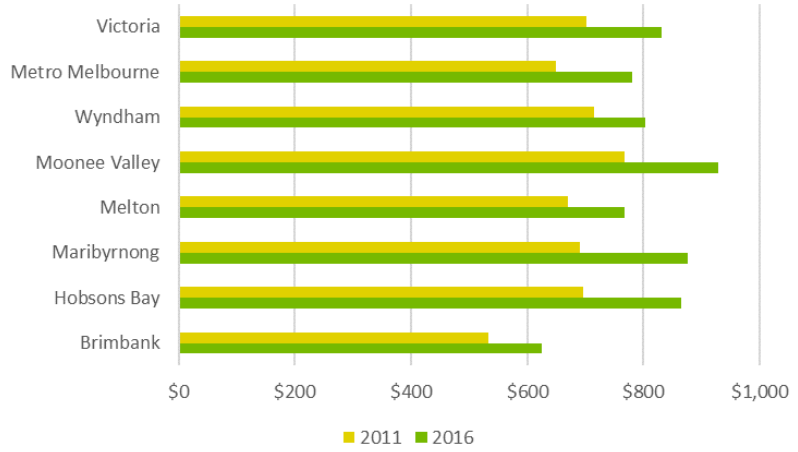
Household income

Figure 37 and Figure 38 show the change in equivalised[3] total weekly household income by LGA in the Western Metro Region between 2011 and 2016.

- The equivalised total weekly income in the Western Metro Region increased in every LGA between 2011 and 2016, aligning with the broader trends in metropolitan Melbourne and Victoria.
- This is likely to be due to proximity to Inner Melbourne and the growth of higher skill level jobs.
- As shown in Figure 37, household income was significantly lower in the City of Brimbank than elsewhere in the Western Metro Region. This correlates with the higher percentages of residents employed in jobs with lower skill levels in the City of Brimbank (Figure 50).
- The cities of Maribyrnong and Hobsons Bay experienced the greatest growth in total household income from 2011 to 2016.
- Households in Hobsons Bay, Maribyrnong, and Moonee Valley had higher household incomes compared to metropolitan Melbourne and Victoria.

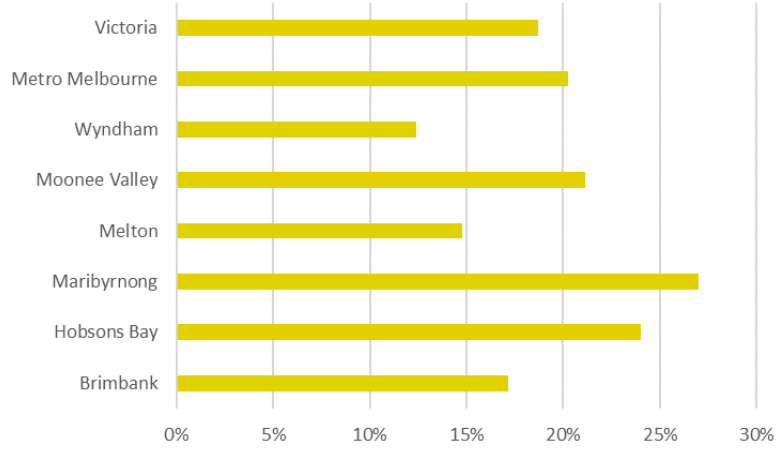
[3] Equivalised total household income is household income adjusted to facilitate comparison of income levels between households of differing size and composition, reflecting that a larger household would normally need more income than a smaller household to achieve the same standard of living.

FIGURE 37: MEDIAN TOTAL WEEKLY HOUSEHOLD INCOME (EQUIVALISED) (2011-2016)



Source: ABS Census 2011 and 2016

FIGURE 38: CHANGE MEDIAN TOTAL WEEKLY HOUSEHOLD INCOME (EQUIVALISED) (2011-2016)



Source: ABS Census 2011 and 2016

Public transport

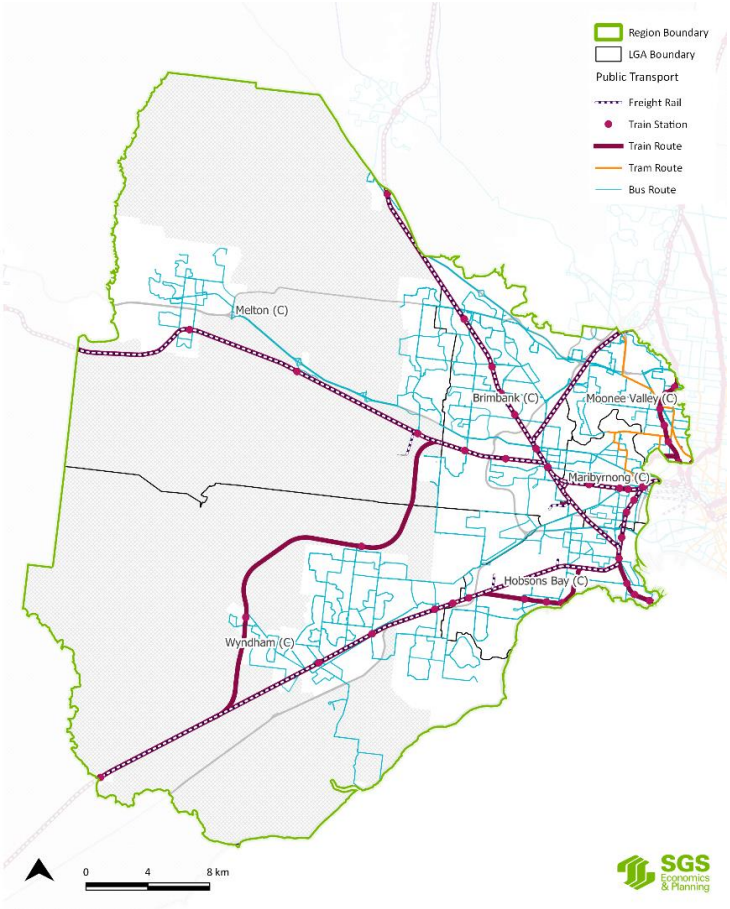
Access to public transport influences the access people in an area have to services and facilities.

Figure 39 illustrates the Western Metro Region's public transport network. Figure 40 illustrates the number of average hourly services per stop across LGAs, compared to metropolitan Melbourne and Victoria.

Figure 41 illustrates public transport service frequency and the level of flexible access transport services provided.

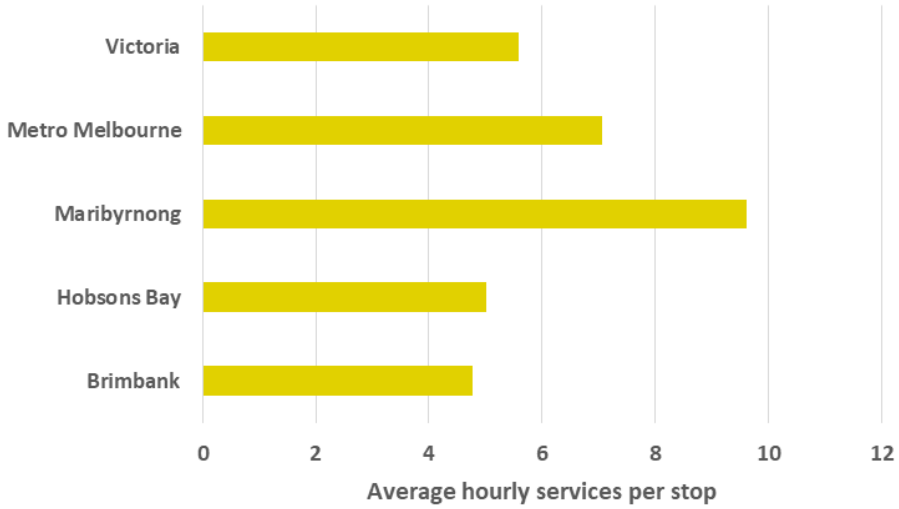
- The Werribee, Sunbury, Craigieburn, and Williamstown train lines service the Western Metro Region.
- Regional train services provide access to the city and the regions from Wyndham Vale and Tarneit on the Regional Rail Link from Geelong and Melton, Rockbank and Caroline Springs on the Ballarat line. Both regional lines service the stations at Deer Park and Ardeer. Hubs at Sunshine and Footscray provide connections between regional and metro services.
- Tram services in the Western Metro Region are comparatively less expansive and only service inner metro areas in Moonee Valley and Maribyrnong LGAs.
- While the inner areas are more connected by trains, the coverage of the bus network indicates a relatively even spread of services, except for the major industrial area in the south west corridor. Only one SmartBus service operates in the Western Metro Region (Route 903) from Altona to Mordialloc.
- The City of Melton has the lowest frequency of public transport services.
- Moonee Valley, Maribyrnong, and Brimbank LGAs have the highest frequency of public transport services in the Western Metro Region (Figure 40).
- Despite the relatively even spread of transport routes across the inner areas and high (10+ services an hour) service frequency along some routes, other routes have very low frequency of services, creating pockets where public transport connectivity is low despite proximity to the Melbourne CBD; see Figure 41 over the page.

FIGURE 39: PUBLIC TRANSPORT ROUTES (2017)



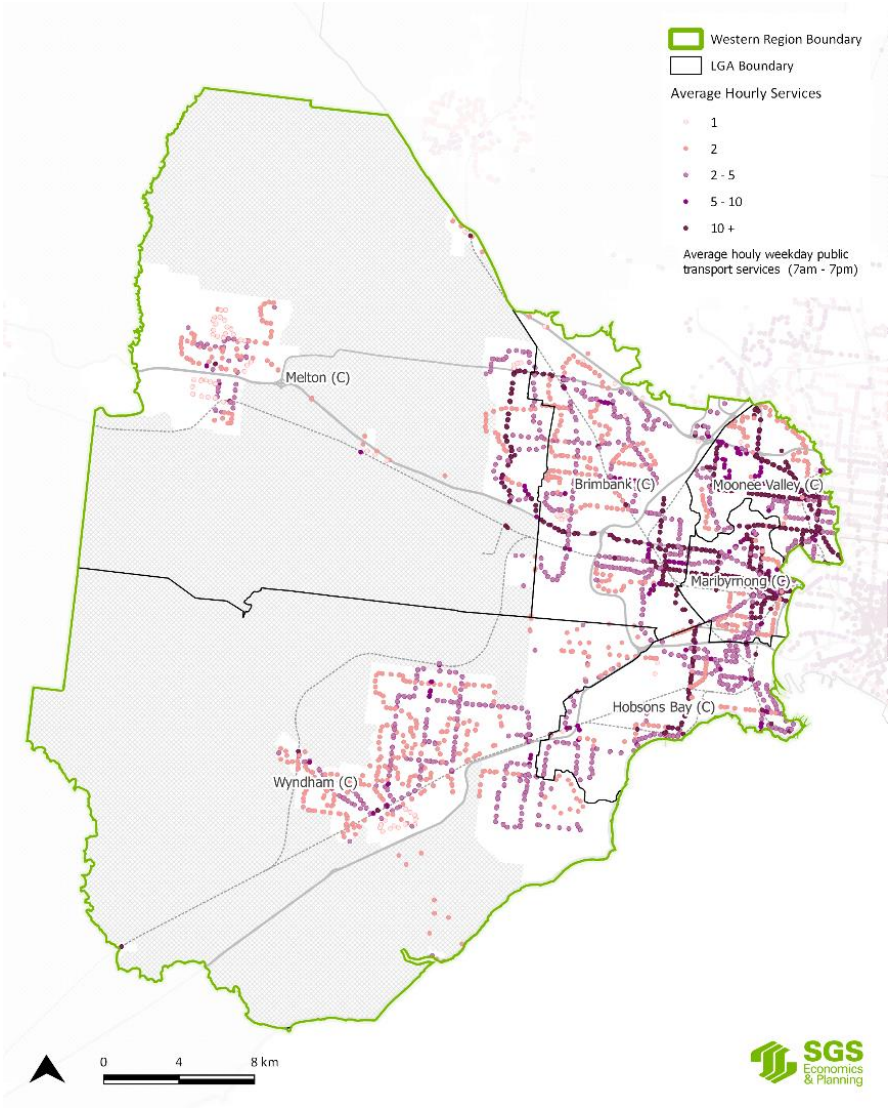
Source: Public Transport Victoria, 2017

FIGURE 40: AVERAGE HOURLY SERVICES PER STOP (2017)



Source: Public Transport Victoria 2017

FIGURE 41: PUBLIC TRANSPORT SERVICE LEVELS (2017)



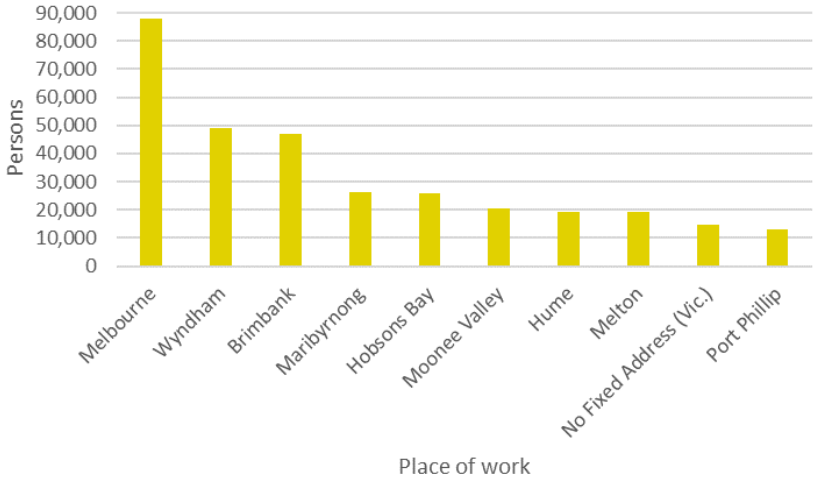
Source: Public Transport Victoria, 2017

Travel origins and destinations

Travel origins and destinations refer to the journey to work. Figure 42 illustrates the 10 most common work destinations for residents in the Western Metro Region and Figure 43 the 10 most common place of residence of people working in the Western Metro Region.

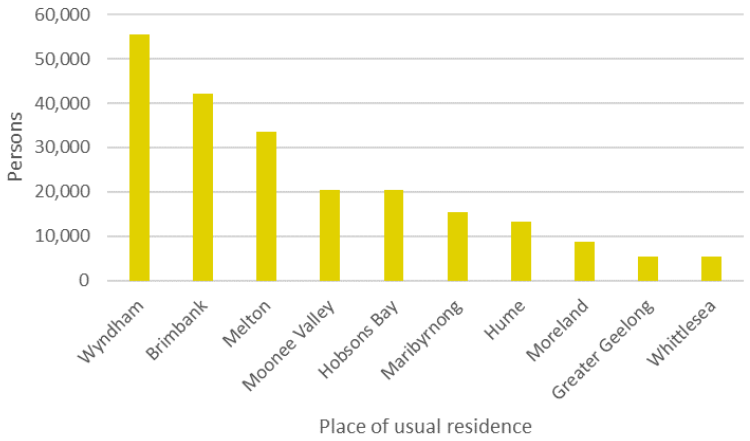
- The City of Melbourne is by far the most common work destination for residents in the Western Metro Region, as seen in Figure 42. Beyond this, common work destinations are mostly within the Western Metro Region.
- The Wyndham and Brimbank LGAs are the most common origins for jobs in the Western Metro Region, partly due to their relatively larger populations. Relatively few workers employed within the Western Metro Region commute from outside the region.

FIGURE 42: TOP 10 WORK DESTINATION (PLACE OF WORK) BY LGA (2016)



Source: ABS Census 2016

FIGURE 43: TOP 10 WORKER ORIGINS BY LGA (2016)

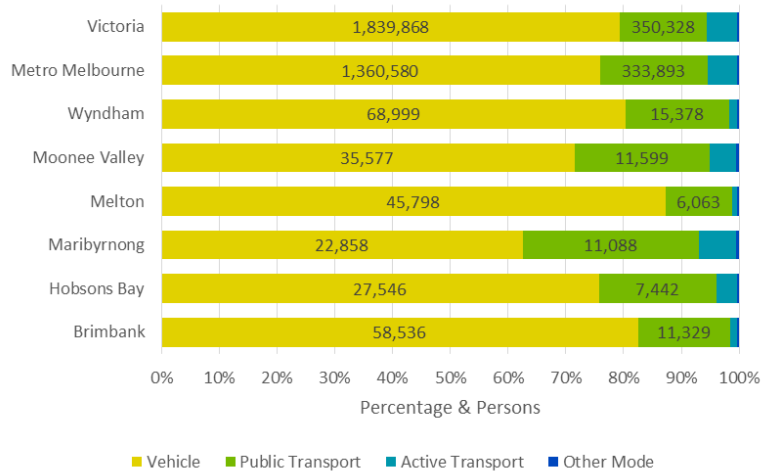


Source: ABS Census 2016

Figure 44 illustrates the shares of different modes of journey to work in each LGA.

- The City of Maribyrnong had the lowest share of residents driving their own cars to work, followed by Moonee Valley and Hobsons Bay LGAs. All three were lower than the Metro Melbourne and Victorian averages.
- The Shire of Melton had the highest proportion of residents travelling to work by car, reflecting the distance to the CBD and lower levels of public transport access.
- Active transport was higher in more established areas closer to the CBD in Maribyrnong, Moonee Valley and Hobsons Bay LGAs.

FIGURE 44: MODES OF JOURNEY TO WORK (2016)



Source: ABS Census 2016

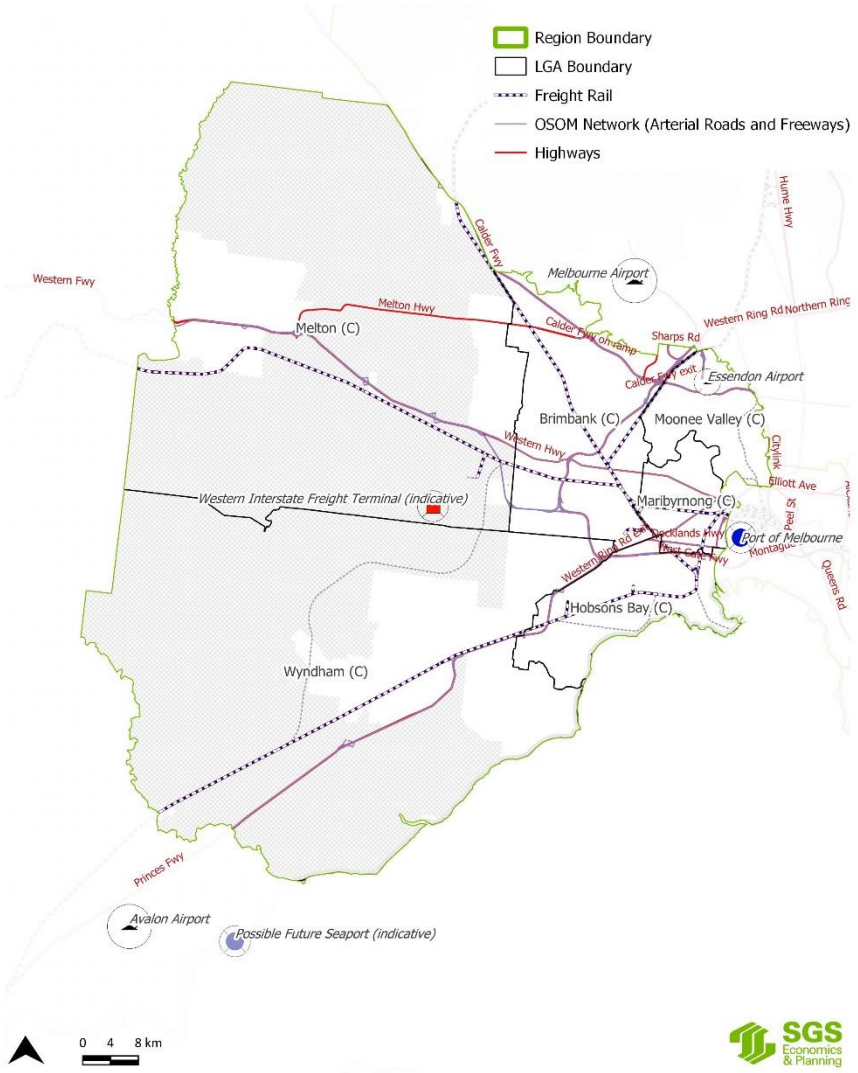
Freight and road networks

The rail and road network of arterial roads and freeways supports the local, regional, interstate and overseas movement of goods.

Figure 45 shows the freight and road network in the Western Metro Region.

- The Western Metro Region lacks a higher order arterial road grid (especially in the western part of the region) to support more intensive development.
- Existing intermodal hubs in the region are Altona (Qube Logistics), Spotswood (Sadliers) and Laverton (SCT Logistics).
- The region connects to the Port of Melbourne via the Princes Highway. Significant freight traffic carrying interstate goods moves through the inner parts of the Western Metro Region, causing congestion on the few major roads in the network.
- The proposed WIFT would be located at Truganina and link to the proposed Outer Metropolitan Ring Transport Corridor (OMR/E6).
- The WIFT will move freight more efficiently by providing modern terminal facilities closer to the warehouse precincts in the Western Metro Region, reducing the length and time of truck trips. It will also reduce freight traffic through the inner areas of the region by removing the need for trains and trucks to bring interstate freight into the Dynon precinct within the Inner Metro Region.

FIGURE 45: FREIGHT AND ROAD NETWORKS



Source: SGS Economics and Planning 2018

Freight and business trips

Table 7 illustrates the origins and destinations of freight and business trips by LGA.

- Wyndham and Brimbank LGAs had the highest number of freight and business trips in 2015. This is likely to be due to the larger scale of industrial activities in these areas.
- The City of Moonee Valley reported the lowest number of freight and business trips due to its smaller number of industrial precincts and employment centres.

TABLE 7: ORIGINS AND DESTINATIONS OF TRIPS BY TYPE AND LGA (2015)

	Freight		Business	
LGA	2015 Origin	2015 Destination	2015 Origin	2015 Destination
Brimbank	15,761	10,057	15,851	9,054
Hobsons Bay	6,668	5,870	6,576	7,383
Maribyrnong	9,361	4,624	9,366	4,836
Melton	6,361	7,344	6,451	10,128
Moonee Valley	1,856	8,239	1,751	6,974
Wyndham	21,379	10,618	21,518	12,081

Source: MABM (KMPG) 2018

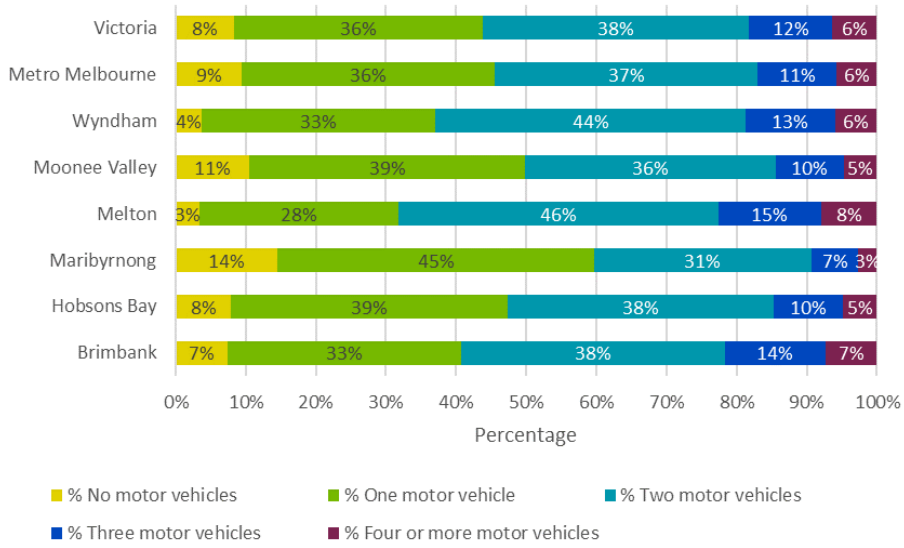
Households with vehicles

Households with vehicles is a measure that correlates with the number of transport modes available in an area; households in areas with fewer transport options tend to own more motor vehicles.

Figure 46 shows the number of motor vehicles owned by households across the LGAs in the Western Metro Region in 2016. Figure 47 (overleaf) shows the share of change in households owning different numbers of motor vehicles between 2011 and 2016, while Figure 48 shows the proportion of the population who travel to work in a private vehicle.

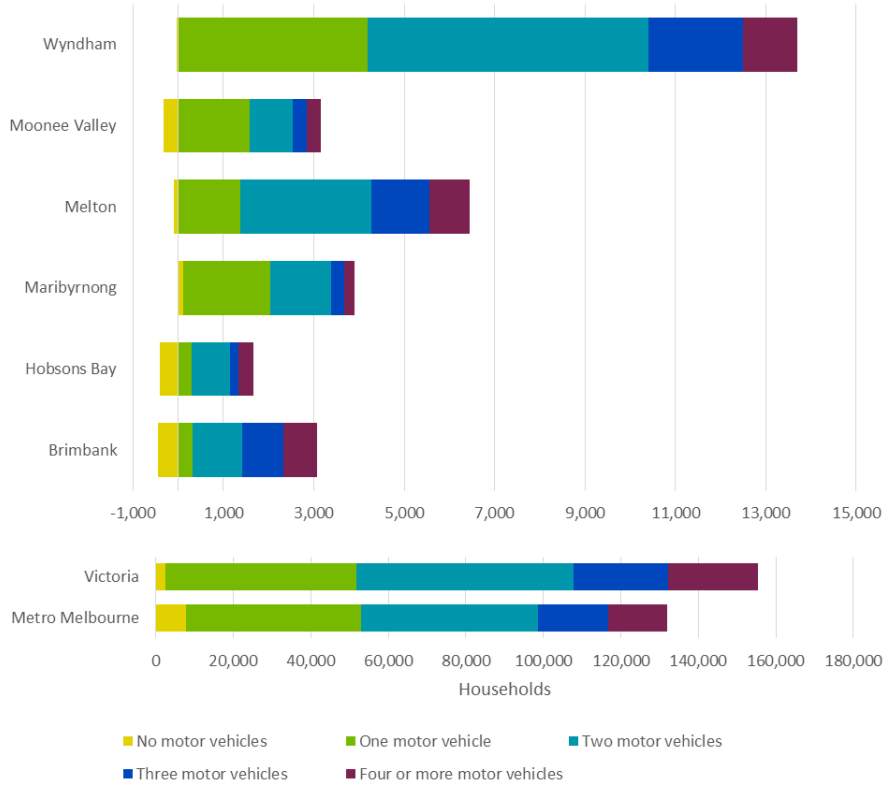
- Households in the Western Metro Region generally own between one to two motor vehicles (Figure 46).
- Households with two motor vehicles have contributed to the largest share of change in ownership of vehicles in the Western Metro Region, excluding the Moonee Valley and Maribyrnong LGAs (Figure 47). This is likely to be due to the extensive coverage of public transport networks in these two LGAs.
- Melton and Wyndham LGAs have the highest proportion of households owning private vehicles. The two LGAs also have a lower number of total hourly public transport services (Figure 40).
- From 2011 to 2016, Moonee Valley, Hobsons Bay and Brimbank LGAs saw a reduction in the share of households without a motor vehicle (Figure 47).
- Journey to work by private vehicle is most common in Wyndham and Melton LGAs and the northern parts of Brimbank LGA, while Moonee Valley, Maribyrnong and Hobsons Bay have a lower proportion of people travelling to work by private vehicle (Figure 48).
- In established places like Point Cook and New Growth Areas like Tarneit of the City of Wyndham, proximity to a train line (including new Regional Rail Link stations) means areas that may otherwise have been more car-reliant have lower proportions of people who journey to work by private vehicle when compared to other parts of Melton and Wyndham LGAs with similar established areas (for example, Caroline Springs) and New Growth Areas (for example, Melton South).

FIGURE 46: NUMBER OF VEHICLES OWNED BY HOUSEHOLDS (2016)



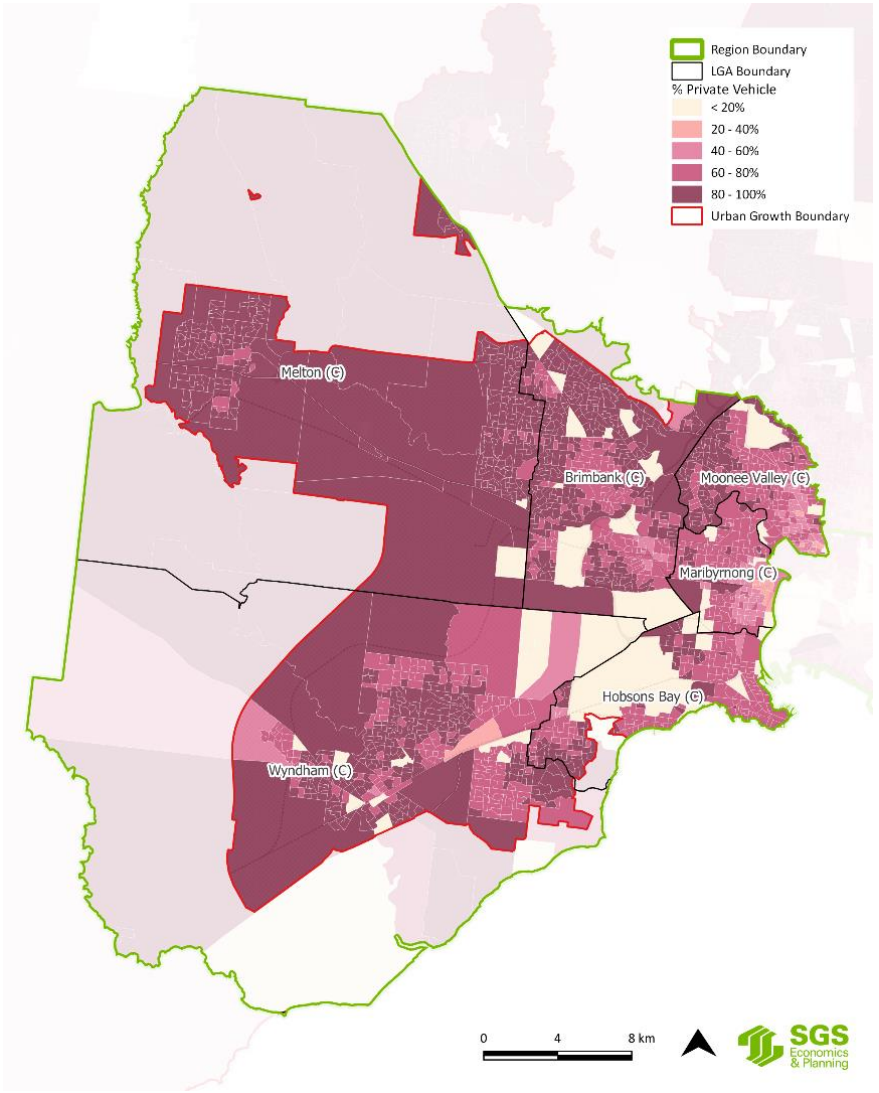
Source: ABS Census 2016

FIGURE 47: CHANGE IN HOUSEHOLDS WITH MOTOR VEHICLES (2011-2016)



Source: ABS Census 2011 and 2016

FIGURE 48: JOURNEY TO WORK BY PRIVATE VEHICLES (2016)



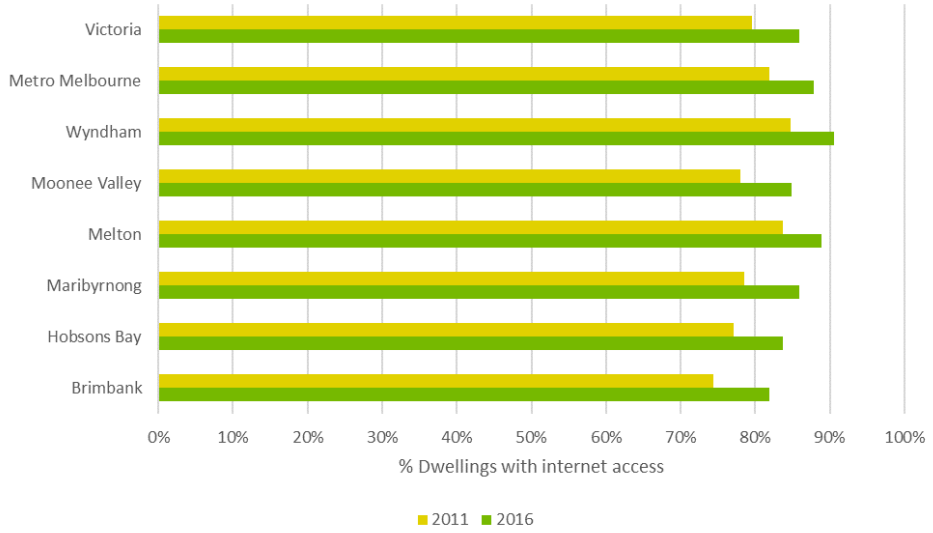
Source: ABS Census 2016

Access to internet

Access to internet refers to the level of access to and engagement with digital media and communication of households, as well as the level of access of households to online services, including health and education.

- Figure 49 shows minor differences between metropolitan Melbourne and the LGAs across the Western Metro Region, with dwellings in Brimbank having a lower level of access than Victoria or metropolitan Melbourne.

FIGURE 49: DWELLINGS WITH INTERNET ACCESS (2011-2016)



Source: ABS Census 2011 and 2016

4.4 Employment and skills

Skill levels

The Australian and New Zealand Standard Classification of Occupations (ANZSCO) classifies employment skill levels into 5 categories, with Skill Level 1 being the highest, and Skill Level 5 being the lowest (Table 8).

TABLE 8: SKILL LEVEL DESCRIPTIONS

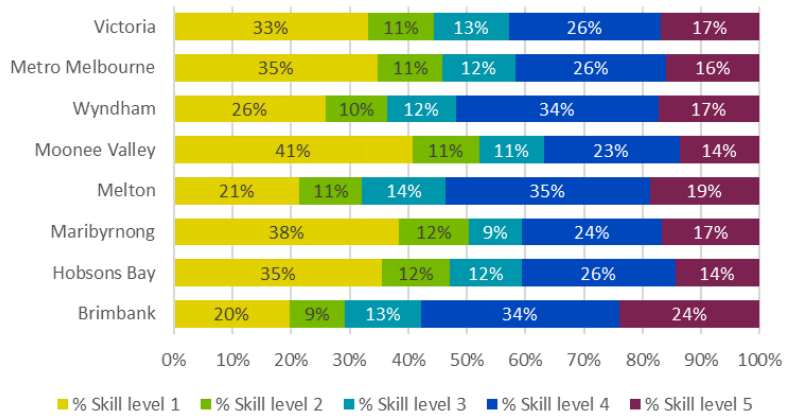
Skill Level	Skill Level Description
Skill Level 1	Occupations at Skill Level 1 have a level of skill commensurate with a bachelor's degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification.
Skill Level 2	Occupations at Skill Level 2 have a level of skill commensurate with either an Associate Degree, Advanced Diploma or Diploma. At least three years of relevant experience may substitute for the formal qualifications listed above.
Skill Level 3	Occupations at Skill Level 3 have a level of skill commensurate with a Certificate IV or Certificate III including at least two years of on-the-job training. At least three years of relevant experience may substitute for the formal qualifications listed above.
Skill Level 4	Occupations at Skill Level 4 have a level of skill commensurate with Certificate II or III. At least one year of relevant experience may substitute for the formal qualifications listed above.
Skill Level 5	Occupations at Skill Level 5 have a level of skill commensurate with Certificate I or compulsory secondary education. In some instances, no formal qualification or on-the-job training may be required.

Source: ANZSCO

Figure 50 shows skill levels in 2016 as a percentage of the total working population. Figure 51 shows the percentage change in skill level between 2011 and 2016.

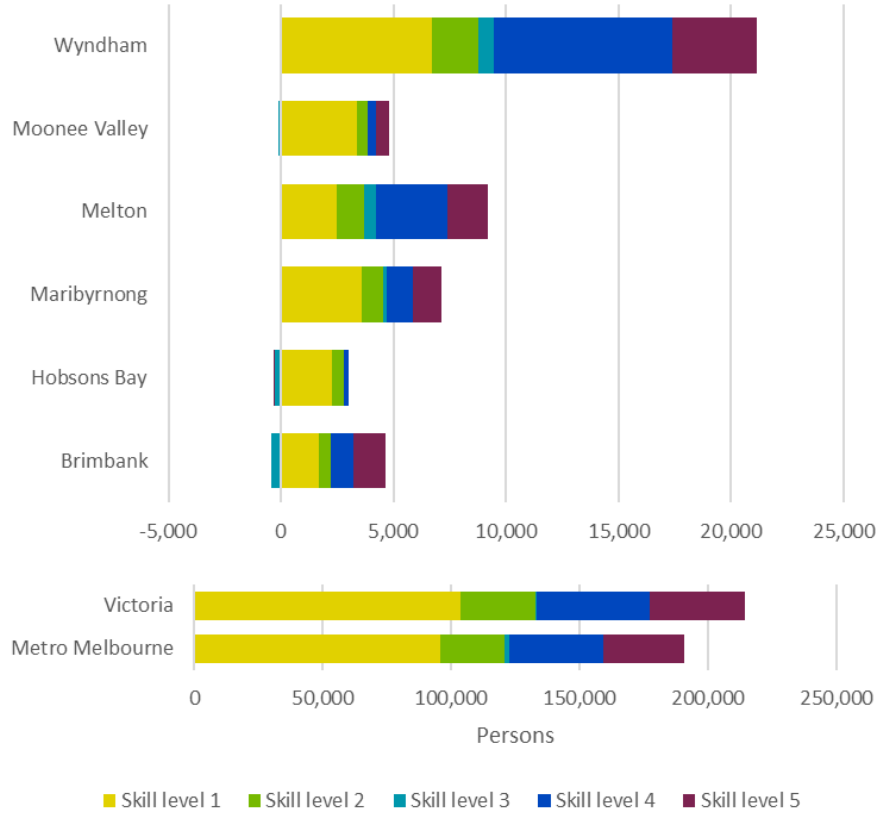
- Wyndham, Melton and Brimbank LGAs have a higher share of population employed in Skill Level 4 jobs than in other parts of the region (Figure 50). This may mean residents in these areas are more vulnerable to the changing economy and automation of manual work.
- Wyndham and Melton LGAs also have more than 20 per cent of people with Skill Level 1 jobs, indicating a greater diversity of skill levels among the population than other parts of the region.
- Figure 51 shows that growth in Skill Level 1 jobs has occurred in every LGA in the Western Metro Region, metropolitan Melbourne and Victoria. This can be partly explained by the Australian immigration policy, which is increasingly focused on skilled migration.
- The City of Moonee Valley in particular has a higher proportion of Skill Level 1 than the metropolitan Melbourne and Victorian averages, as does the City of Maribyrnong.
- A noticeable growth in Skill Level 1 and 5 jobs is evident in Maribyrnong, Melton and Wyndham LGAs.
- The City of Brimbank had the lowest proportion of residents in Skill Level 1 and Skill Level 2 jobs and the highest share of residents in Skill Level 5 jobs.

FIGURE 50: SKILL LEVELS AS PERCENTAGE OF TOTAL WORKING POPULATION (PLACE OF USUAL RESIDENCE) (2016)



Source: ABS Census 2016

FIGURE 51: SHARE OF CHANGE IN SKILL LEVELS (PLACE OF USUAL RESIDENCE) (2011-2016)



Source: ABS Census 2011 and 2016

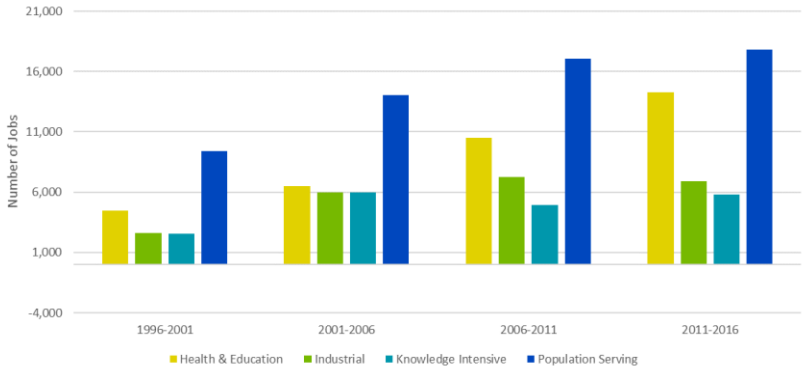
Employment concentration of industries 2016

Figure 52 shows the historic change in the number of jobs by the four industry classifications.

Figure 53 illustrates the changes in the share of each classification in the Western Metro Region between 1996 and 2016.

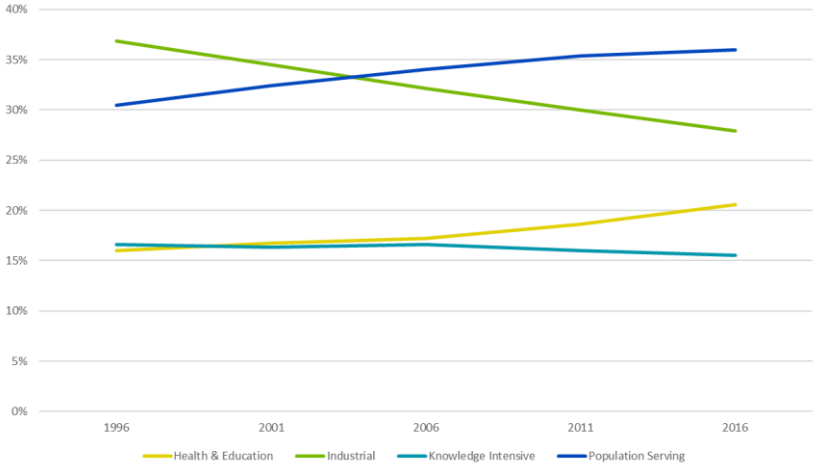
- The number of jobs increased in all four industry groups between 1996 and 2016.
- Job growth was strongest in health and education and population serving industries. The growing population in the Western Metro Region generated more demand for education, which subsequently led to more supply (as evident in job growth) and in population-serving services (Figure 52).
- As with most parts of Melbourne, the share of jobs in the industrial sectors decreased significantly in the Western Metro Region between 1996 and 2016 (Figure 53).

FIGURE 52: CHANGE IN NUMBER OF JOBS BY INDUSTRY CLASSIFICATION (1996-2016)



Source: SGS Economics and Planning, 2018.

FIGURE 53: SHARE OF EMPLOYMENT BY INDUSTRY (1996-2016)



Source: SGS Economics and Planning, 2018.

Location quotient

Location quotient (LQ) is used to measure the relative concentration of industries in an area compared to a benchmark region. In this report, metropolitan Melbourne is the benchmark against which the Western Metro Region is compared.

An LQ of less than 1 means an industry is underrepresented in the Western Metro Region compared to metropolitan Melbourne. An LQ greater than 1 means that the Western Metro Region has a higher concentration of that industry compared to metropolitan Melbourne. LQs in the Western Metro Region are broken down into 19 industries, presented in Figure 54.

Figure 55 presents the LQ for the broad industry classifications within the Western Metro Region.

- The region is underrepresented in the knowledge-intensive sector, particularly in arts and recreation services; information, media and telecommunications; finance and insurance services; and professional services.
- There has been a decline in the LQ of the knowledge-intensive sector, indicating the region may be falling further behind. However, there was an overall increase in the number of businesses that formed between 2009 and 2017 (see Table 5 and Table 6).
- In the health and education sector, the LQ approached 1 in 2016 (an increase from 2011). This growth is reflected in the region's business formation trend (Table 5 and Table 6), where the health and education sector had the largest proportional increase from 2009 to 2017.

FIGURE 54: LOCATION QUOTIENT BY INDUSTRY (2011-2016)

Source: SGS Economics and Planning, 2018

FIGURE 55: WESTERN METRO REGION LOCATION QUOTIENT BY SECTOR (2011-2016)

Source: SGS Economics and Planning, 2018.

5. SOCIAL

SOCIAL INDICATORS

The Infrastructure Victoria social indicators that underpin this section are:

- Recent population growth
- Population by age group over time
- Age dependency
- Migration
- Cultural mix
- Housing price
- Housing typology
- SEIFA – Index of Relative Disadvantage
- DOTE index
- Education levels
- Engagement with work or study
- Hospital inpatient separations
- Access to Community Care Services
- Mental health and drug use
- Home and Community Care Services
- Ambulatory Care Sensitive Conditions
- Access to general practitioners
- Type 2 diabetes
- Life expectancy at birth
- Birth weight
- Immunisation
- Child protection substantiations
- Development vulnerability
- Crime
- Wellbeing

REGIONAL OVERVIEW

The Western Metro Region's social profile is characterised by:

- new migrant communities
- varying social-economic conditions across different municipalities
- fragmented urban areas with rapid greenfield and infill growth.

SOCIAL STRENGTHS

- A growing, diverse and skilled population
- Relatively affordable housing middle and outer parts of the region
- Growing cultural diversity due to increased origins of overseas migrants

SOCIAL CHALLENGES

- Providing access to a choice of jobs
- Vulnerable workforce due to lower employment skills in some parts of the region
- Higher than average (and increasing) housing stress in some municipalities and suburbs.

5.1 Overview and key features

The Wurundjeri and Wathaurong people of the Kulin nation are the Traditional Owners of the lands that now make up the Western Metro Region of Melbourne.

After European settlers arrived, Melbourne's development spread east of the CBD first, where the topography is undulating and the soil more fertile. Early colonial development was slower in the Western Metro Region, as the western grasslands were less suitable for farming than the lusher terrain to the east. The region's flatter lands were initially developed for industrial uses, with residential and commercial development in more recent decades.

Source: Department of Environment, Land, Water and Planning, 2018.

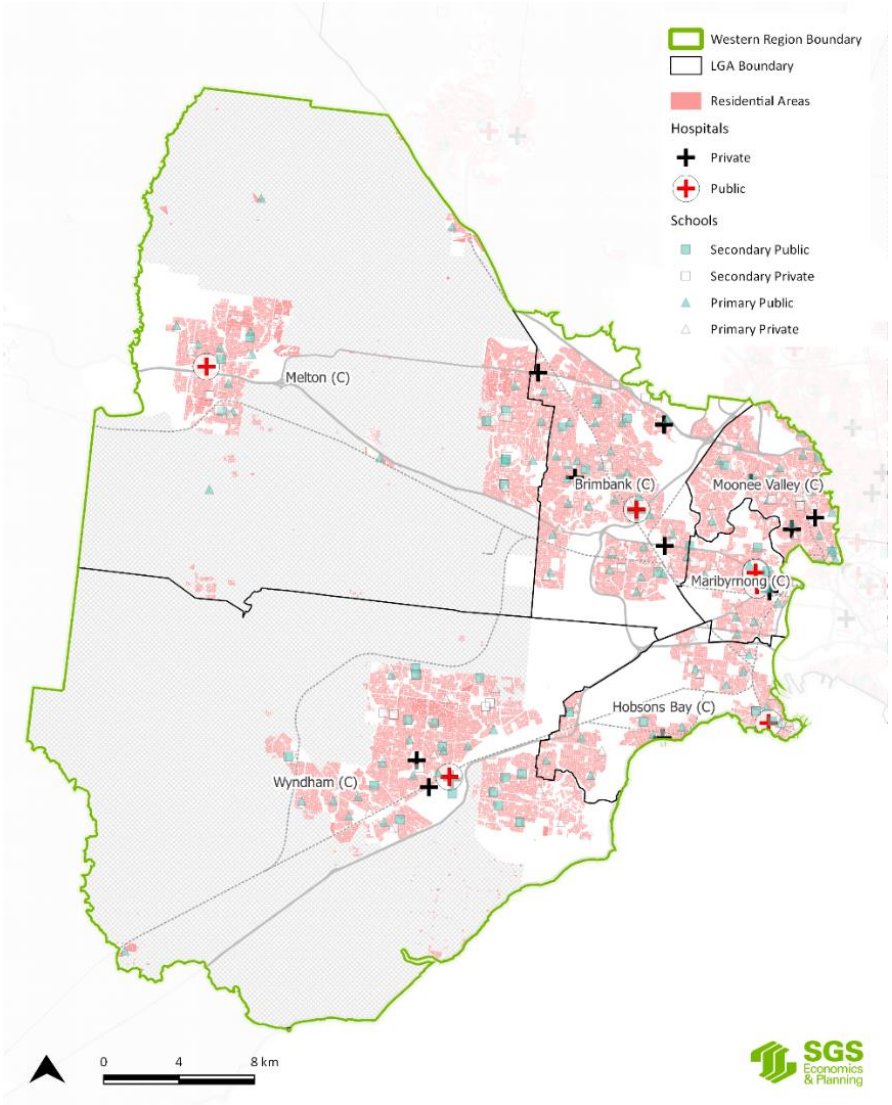
From 1888, when the inner west became host to Australia's first ammunition plant, the Western Metro Region was at the forefront of Australia's munition production, and would be the nation's key domestic ammunition supplier during World War One.

The 1950s brought an influx of Italians, Greeks and Eastern Europeans. By 1966, over a third of Footscray's population was born overseas. From 1975, the Western Metro Region received a new wave of migration from South East Asia. In the 2011 Census, more than 20 per cent of people living in Sunshine and Braybrook were born in Vietnam.

The region is broadly characterised by:

- an inner area that is being transformed due to its proximity to the inner-city economy
- a middle region of major industrial areas and two corridors of residential growth, with urban development contiguous in the north west, yet separated by industrial activity in the south west, which includes growth areas as well as older established areas undergoing change
- outer areas that are also growing and changing.

FIGURE 56: URBAN STRUCTURE



Source: Source: SGS Economics and Planning, 2018

5.2 Population demographics

Recent population growth

Table 9 shows the region's current population and the increase between 2011 and 2016.

- Wyndham and Brimbank LGAs had the highest populations in 2016.
- The City of Brimbank experienced the lowest average annual growth rate of all Western Metro Region LGAs between 2011 and 2016.
- Hobsons Bay and Maribyrnong LGAs had the smallest populations in 2016. The City of Maribyrnong experienced strong growth at 3.1 per cent per annum; the City of Hobsons Bay's population growth rate was half this.
- The City of Wyndham experienced the greatest change in population between 2011 and 2016, accommodating 45.4 per cent of the total growth of the region, followed by the City of Melton, which had 21.9 per cent of regional growth. This reflects residential development in the New Growth Areas in both LGAs.
- In terms of location typologies, the region's Outer Melbourne areas experienced the highest *amount* of growth; New Growth Areas had the highest *growth rate* (33.5 per cent) with continued growth planned for these locations in the future.

Figure 57 and Figure 58, overleaf, show existing and projected population density.

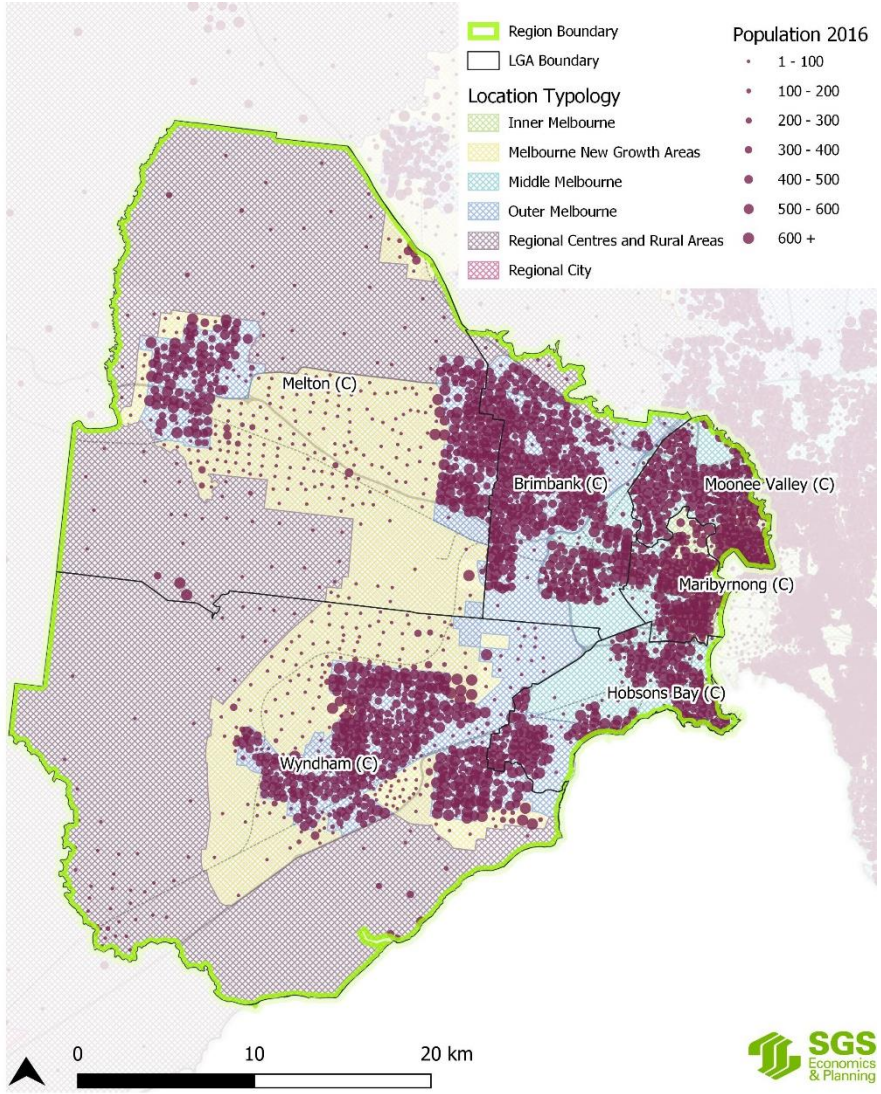
TABLE 9: POPULATION (2011-2016)

	2011	2016	2011-16		
			AAGR	Change	% Regional
LGAs					
Brimbank	191,496	205,745	1.4%	14,249	10.6%
Hobsons Bay	87,076	93,719	1.5%	6,643	5.0%
Maribyrnong	75,154	87,355	3.1%	12,201	9.1%
Melton	112,614	141,912	4.7%	29,299	21.9%
Moonee Valley	112,251	123,027	1.9%	10,777	8.0%
Wyndham	167,018	227,761	6.4%	60,743	45.4%
Western Metro Region	745,608	879,520	3.4%	133,912	100.0%
Location Typology					
Inner Melbourne	100,437	114,212	2.6%	13,776	10.3%
Middle Melbourne	190,056	209,189	1.9%	19,132	14.3%
Outer Melbourne	442,163	514,847	3.1%	72,684	54.3%
Melbourne New Growth Areas	8,071	34,196	33.5%	26,125	19.5%
Metropolitan Rural Areas	4,831	7,018	7.8%	2,187	1.6%
Western Metro Region	745,559	879,462	3.6%	133,904	100.0%
Metro Melbourne	**4,108,837**	**4,653,078**	**2.5%**	**544,241**	
Victoria	**5,537,817**	**6,179,249**	**2.2%**	**641,432**	

Source: SGS Economics and Planning, 2018

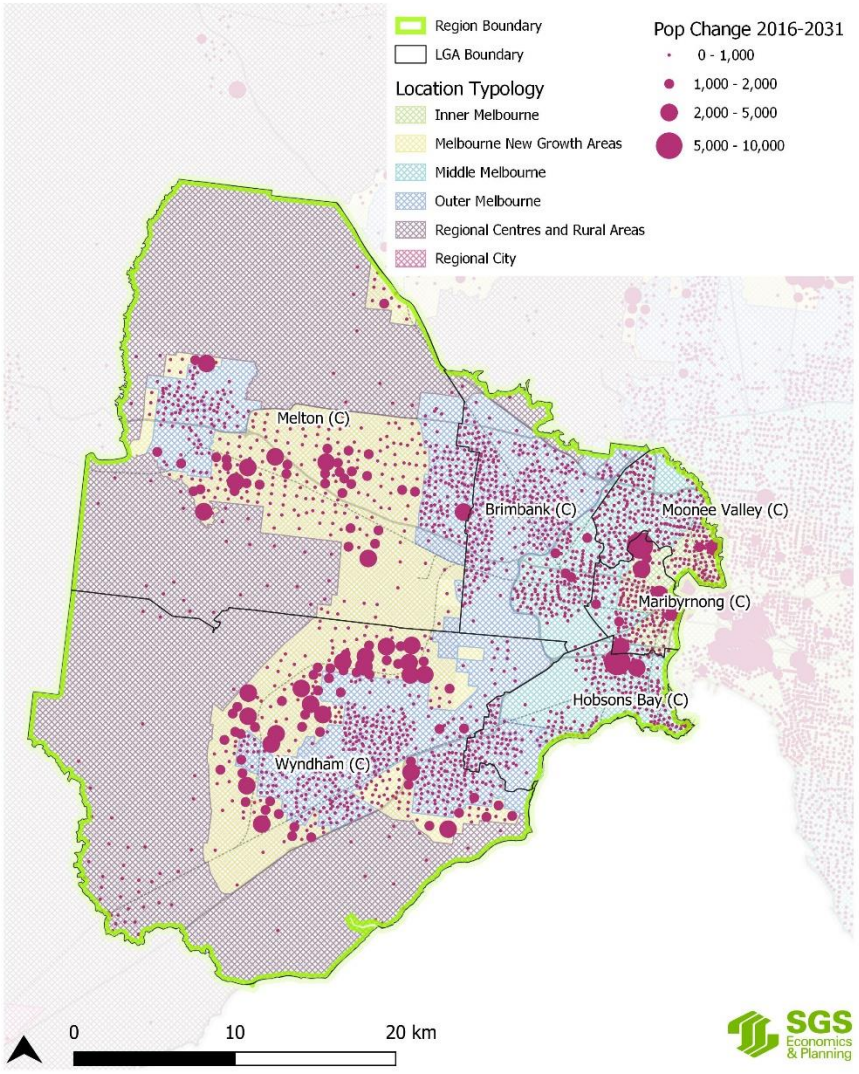
Note: The difference between the region totals of location typology and LGAs reflect different data grouping techniques to group small area data into target geographies.

FIGURE 57: POPULATION DENSITY (2016)



SGS Economics and Planning, based on Victoria in Future 2016 and SALUP17, TfV

FIGURE 58: PROJECTED POPULATION CHANGE (2011-2031)



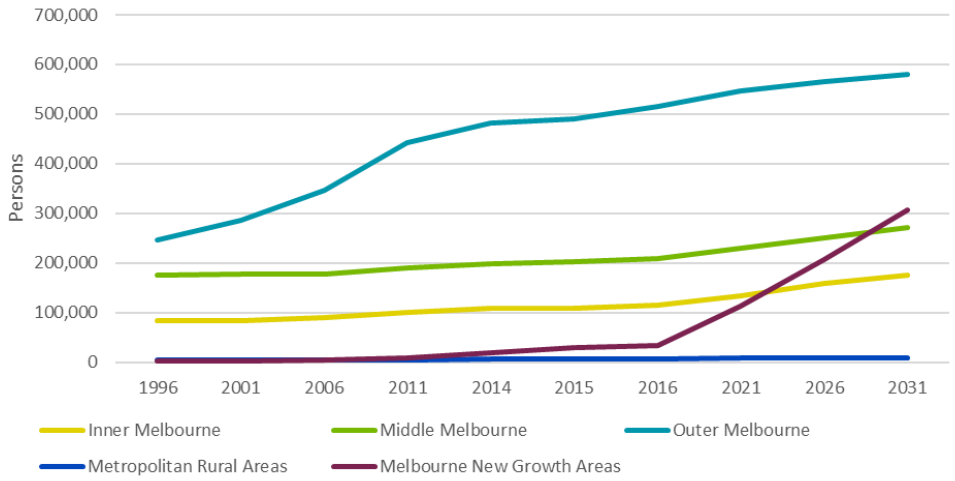
SGS Economics and Planning, based on Victoria in Future 2016 and SALUP17, TfV

Forecast population growth

Figure 59 presents recent and forecast population growth by location typology.

- Population forecasts towards 2031 show a rapid increase in population in the Western Metro Region's New Growth Areas.
- The Inner, Middle and Outer Melbourne areas of the Western Metro Region will also experience increasing but relatively sustained growth into the future.
- The population outside the Urban Growth Boundary (Metropolitan Rural Areas) will remain relatively stable to 2031.

FIGURE 59: FORECAST POPULATION CHANGE (1996-2031)



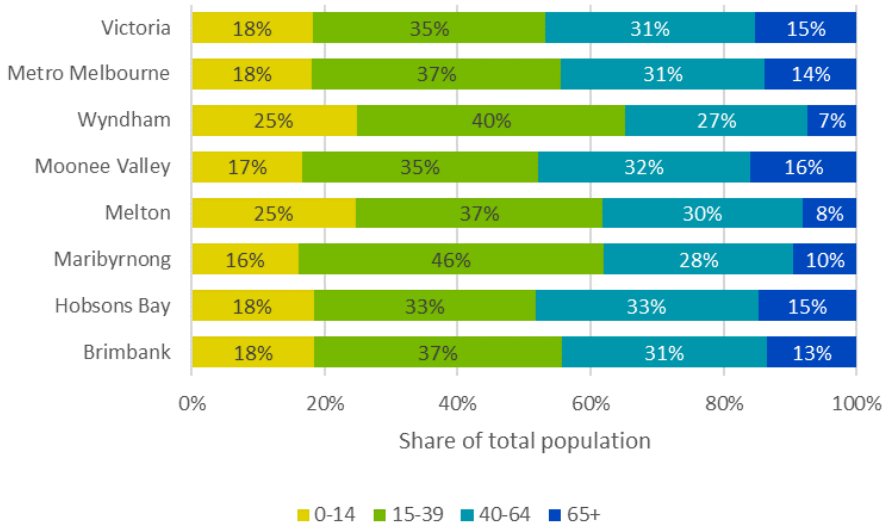
Source: SGS Economics and Planning, based on Victoria in Future 2018 and ABS (cat. 3218.0)

Population by age groups over time

Figure 60 shows:

- Moonee Valley and Hobsons Bay LGAs have the largest proportion of people of retirement age and the lowest proportion of children.
- Conversely, the New Growth Area LGAs of Melton and Wyndham have the lowest proportion of retirees and largest proportion of young adults and children.
- The City of Maribyrnong has the largest proportion of young adults.

FIGURE 60: PROPORTION OF POPULATION BY AGE GROUP (2016)

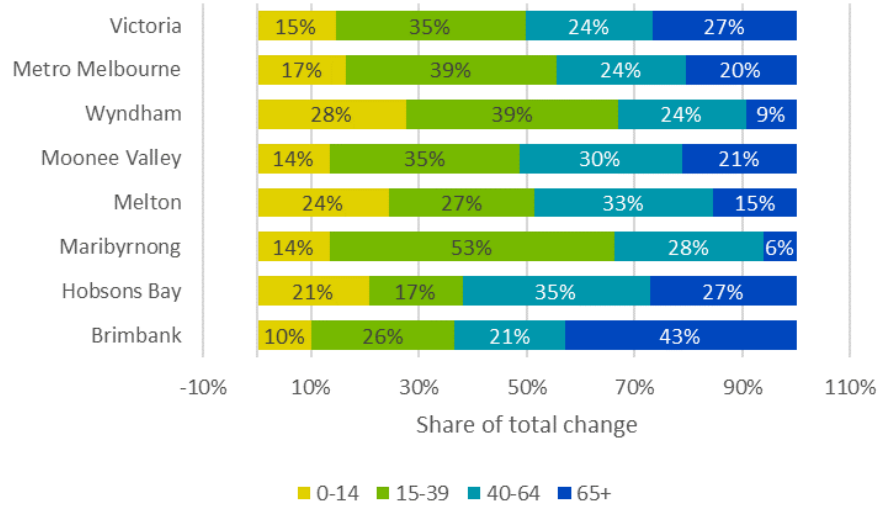


Source: ABS Census 2011 and 2016

The change in population by age group between 2011 and 2016 (Figure 61) shows:

- Population in each age group in the Western Metro Region increased between 2011 and 2016. High growth in the proportion of older people is representative of broader national demographic trends.
- The retirement age group (65+) increased by the greatest proportion in the City of Brimbank although by absolute numbers this is still the smallest age group (Table 10).
- The city of Maribyrnong had the greatest increase in the share of 15-39 age group accounting for 53 per cent of total change.
- The overall share of population change in people aged 65+ was lower in the Maribyrnong (six per cent) and Wyndham (nine per cent) LGAs, consistent with their overall population profile.

FIGURE 61: SHARE OF POPULATION CHANGE BY AGE (2011-2016)



Source: ABS Census 2011 and 2016

Table 10 shows the average annual population growth rate by age group (2006 to 2016), and absolute number of people in each age group (2016).

- The largest age group in all LGAs, the Western Metro Region as a whole and Victoria is people aged 15-39.
- Wyndham, Brimbank and Melton LGAs also had large numbers of residents aged 0-14 years.
- Wyndham and Brimbank LGAs had large numbers of working age residents with a large number of residents aged 15-39 years and aged 40-64 years.
- The age group with the largest proportional change over 2006 to 2016 was the 65+ age group (although based on smaller absolute numbers).

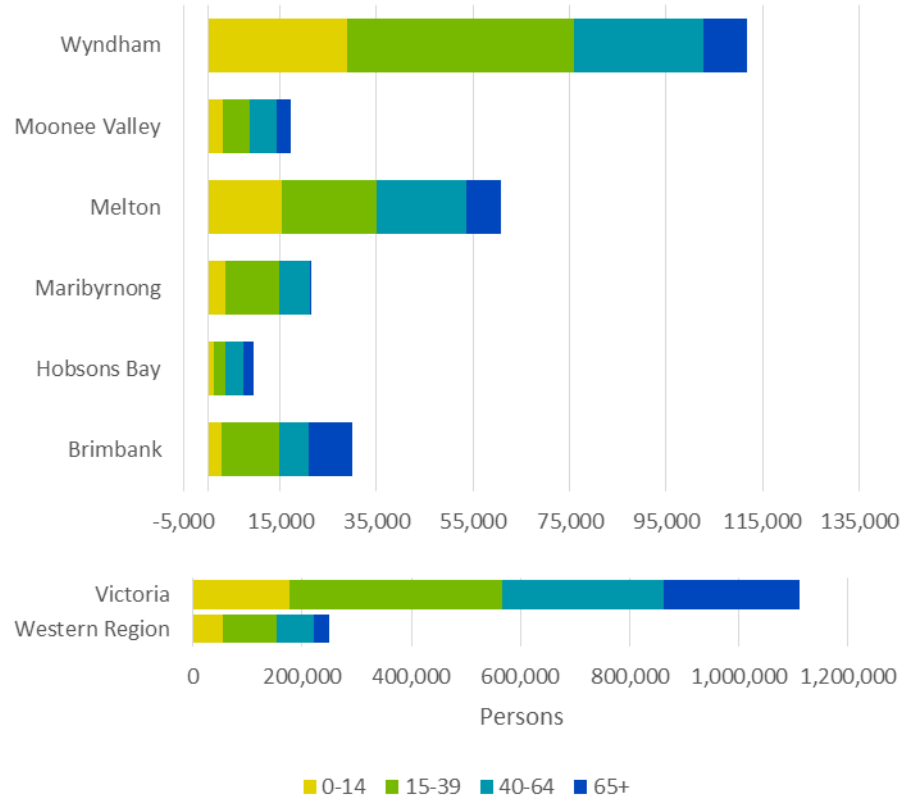
TABLE 10: AVERAGE ANNUAL POPULATION GROWTH RATE BY AGE GROUPS OVER TIME (2006-2016)

	2016				AAGR 2006-2016			
LGA	0-14	15-39	40-64	65+	0-14	15-39	40-64	65+
Brimbank	38,025	77,518	61,812	26,835	0.8%	1.7%	1.1%	4.1%
Hobsons Bay	17,368	31,983	30,651	13,443	0.8%	0.8%	1.3%	1.8%
Maribyrnong	14,032	40,260	24,343	8,307	3.0%	3.4%	3.0%	0.3%
Melton	34,972	53,318	41,529	11,601	6.0%	4.7%	6.2%	10.0%
Moonee Valley	20,793	44,459	38,461	19,158	1.6%	1.4%	1.5%	1.6%
Wyndham	56,374	92,738	61,127	16,769	7.5%	7.3%	6.0%	8.0%
Western Metro Region	**181,564**	**340,276**	**257,923**	**96,113**	**3.7%**	**3.5%**	**3.1%**	**3.9%**
Victoria	**1,140,064**	**2,200,757**	**1,903,876**	**928,475**	**1.7%**	**2.0%**	**1.7%**	**3.2%**

Source: ABS ERP 2006, 2016

Figure 62 shows population growth by age group in the Western Metro Region (2006 to 2016) by LGA compared to Victoria. The City of Wyndham had the largest growth in overall population.

FIGURE 62: POPULATION GROWTH BY AGE GROUP (2006-2016)



Source: ABS ERP 2006 and 2016

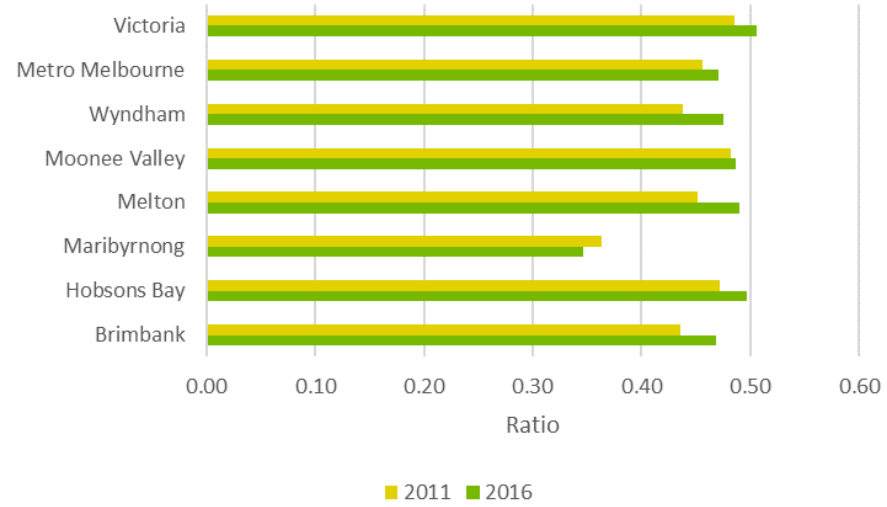
Age dependency ratio

Age dependency is the ratio between the population not in the labour force (typically the age groups 0-14 and 65+) and the population in the labour force (age group 15-64). A lower dependency ratio means there is less reliance on each working age person.

The age dependency ratio (Figure 63) helps to understand a location's economic potential as well as its welfare and service needs.

- The age dependency ratio increased in every LGA from 2011 to 2016, except for the City of Maribyrnong.
- The City of Maribyrnong's decreasing age dependency ratio reflects the increase in the number of younger adults who are active in the labour force.

FIGURE 63: AGE DEPENDENCY RATIO (2011-2016)



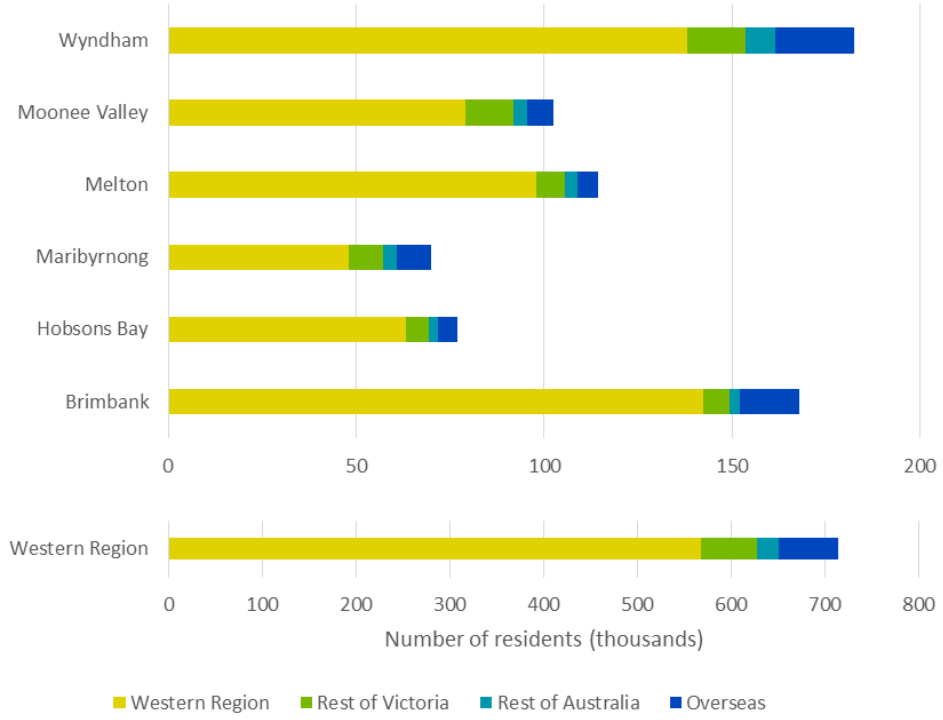
Source: ABS Census 2011 and 2016

Population migration flow

Figure 64 shows the place of origin of residents who moved to the Western Metro Region between 2011 and 2016.

- This is broadly consistent with trends across metropolitan Melbourne, as people tend to move further out within similar geographies as house prices increase (for example).
- The Wyndham and Moonee Valley LGAs have the highest number of residents who have moved from elsewhere within the State or from overseas.

FIGURE 64: REGION OF ORIGIN FOR RESIDENTS BY LGA (2016)



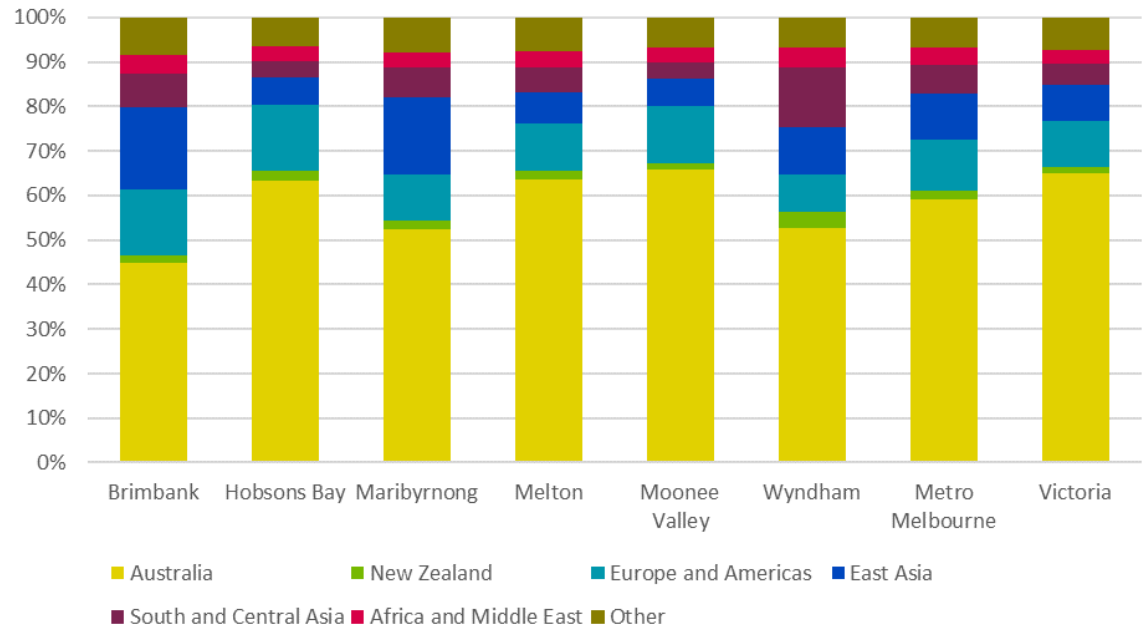
Source: ABS Census 2016

Cultural mix

Cultural mix is measured by the place of birth of the population, as presented in Figure 65. Figure 66(overleaf) provides a further breakdown of place of birth.

- The populations are particularly multicultural in the Brimbank, Wyndham, and Maribyrnong LGAs.
- The City of Brimbank has the highest overseas born population in 2016, while the Hobsons Bay, Melton and Moonee Valley LGAs reported the lowest.
- Residents born in South East Asia are more concentrated in the Maribyrnong and middle part of Brimbank LGAs (Figure 66).
- Southern and Eastern Europe-born residents are proportionally higher in the City of Melton, mid-northern part of the City of Brimbank, and the Point Cook area in the City of Wyndham (Figure 66).

FIGURE 65: PLACE OF BIRTH AS A PERCENTAGE OF TOTAL POPULATION (2016)



Source: ABS Census 2016

FIGURE 66 : PLACE OF BIRTH (2016)

Source: ABS 2016 Census

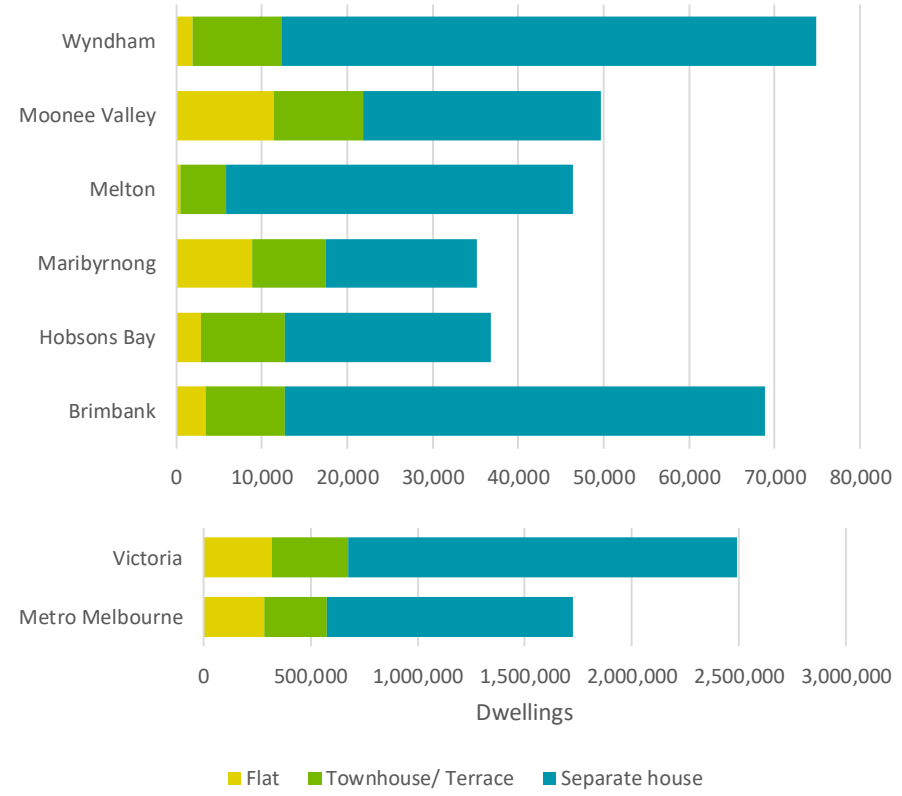
5.3 Housing diversity

Dwelling typology and activity

A greater diversity of housing in a location provides greater choice to households. It is influenced by changes in the property market, land available for residential development, and housing policy and regulations.

Wynham followed by Brimbank had the most actual dwellings of all LGAs in the Western Metro Region in 2016 (Figure 67). Separate houses are the most common type across all LGAs in the region, metropolitan Melbourne and Victoria. Townhouse and terrace houses were more common than flats in all LGAs except Wyndham which has slightly more flats than townhouse and terrace houses.

FIGURE 67: DWELLING TYPE BY LGA (2016)



Source: ABS 2016

Site density is one measure of housing diversity. It is derived from DELWP's Housing Development Data and is different to a gross or net density measure. It is based on the land (or lot) associated with each newly constructed dwelling only and does not include surrounding open space, roads, footpaths or other land required to support that residential use. While site density can provide some indication of the types of dwellings in an area, different dwelling types have overlapping site density ranges – for example a detached house on a small lot could have a higher site density than a development of large townhouses.

Site density is grouped in three broad ranges:

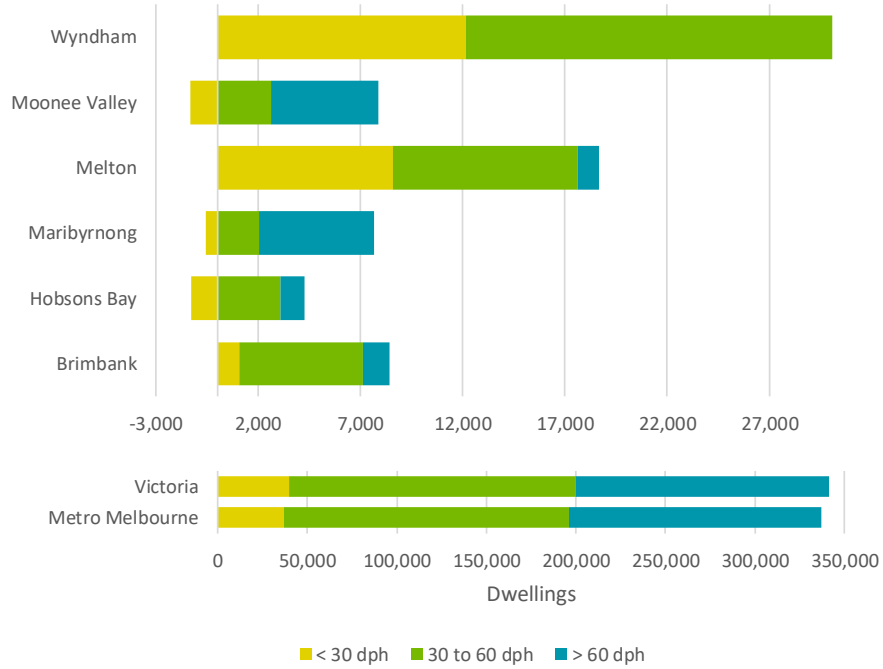
- High site density - greater than 60 dwellings per hectare (DPH)
- Medium site density - between 30 and 60 dwellings per hectare
- Low site density - less than 30 dwellings per hectare

Figure 68 shows the net change in site density between 2005 and 2015. A negative number indicates there were fewer dwellings at a certain site density range in 2015 compared to 2005, possibly because a dwelling has been demolished or a site was subdivided or redeveloped to a higher density. For example, if one lower density dwelling is replaced by four higher density townhouses this would be measured as a reduction in lower site density and an increase in higher site density.

In the Western Metro Region:

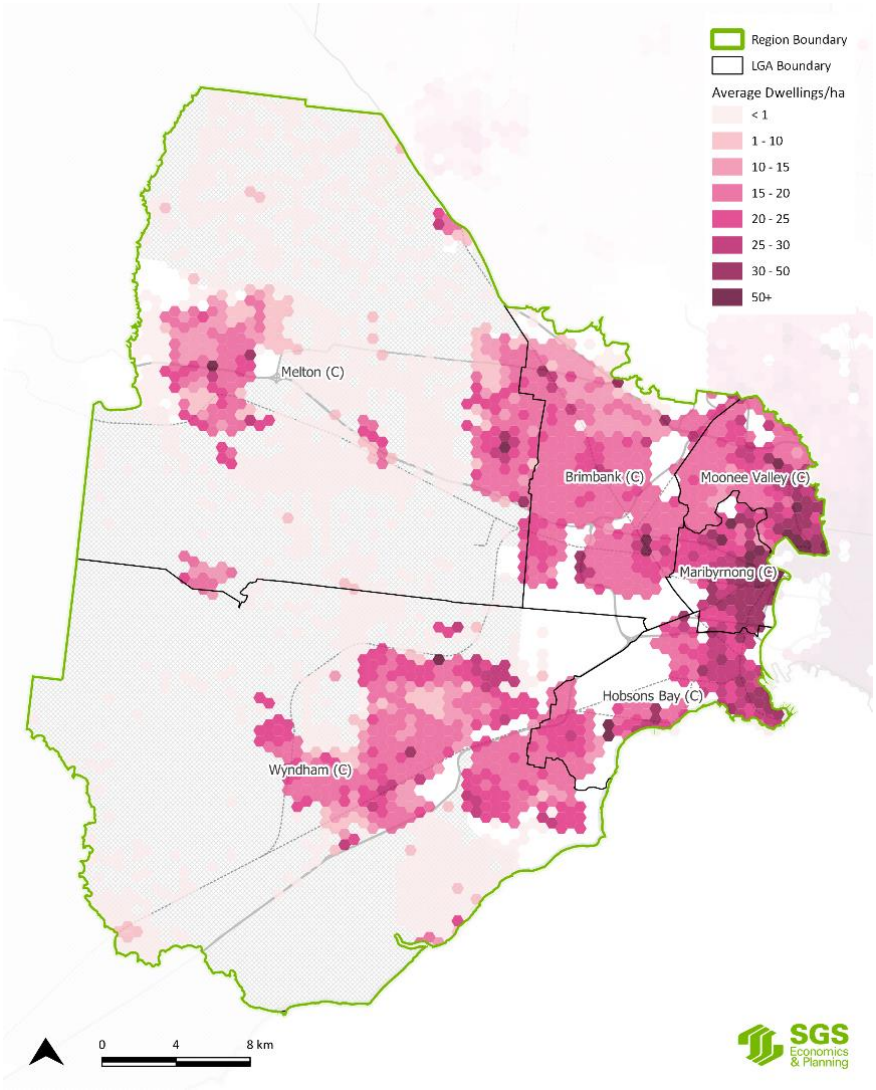
- The LGAs that had most dwellings constructed at a site density greater than 60 dwellings per hectare were Moonee Valley and Maribyrnong (Figure 69 and Figure 71).
- In the New Growth Areas within the Melton and Wyndham LGAs, dwelling density from 2005 to 2015 occurred at site densities less than 30 DPH or 30 to 60 DPH.

FIGURE 68: CHANGE IN DWELLINGS BY SITE DENSITY (2005-2015)



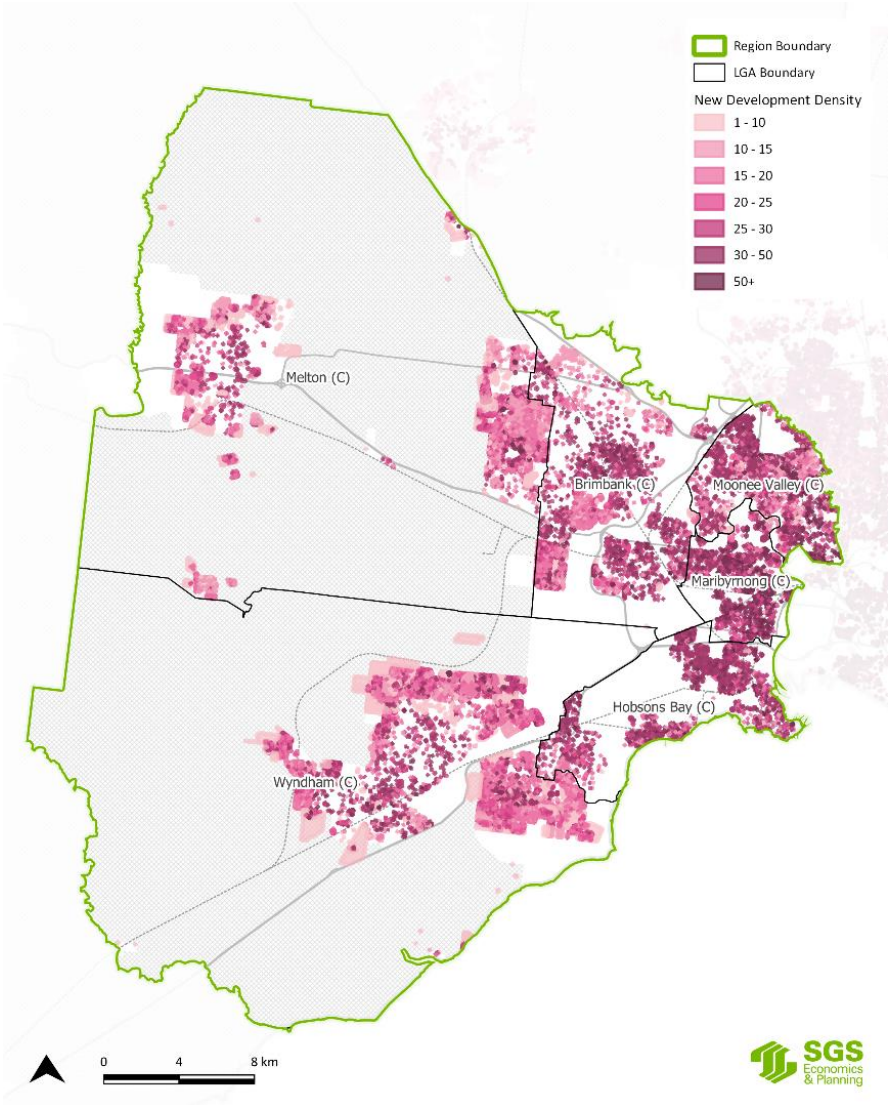
Source: DELWP Housing Development Data 2006 and 2016

FIGURE 69: AVERAGE DWELLINGS PER HECTARE (2016)



Source: DELWP Housing Development Data 2016

FIGURE 70: DEVELOPMENT DENSITY OF NEW PROJECTS (2005-2016)

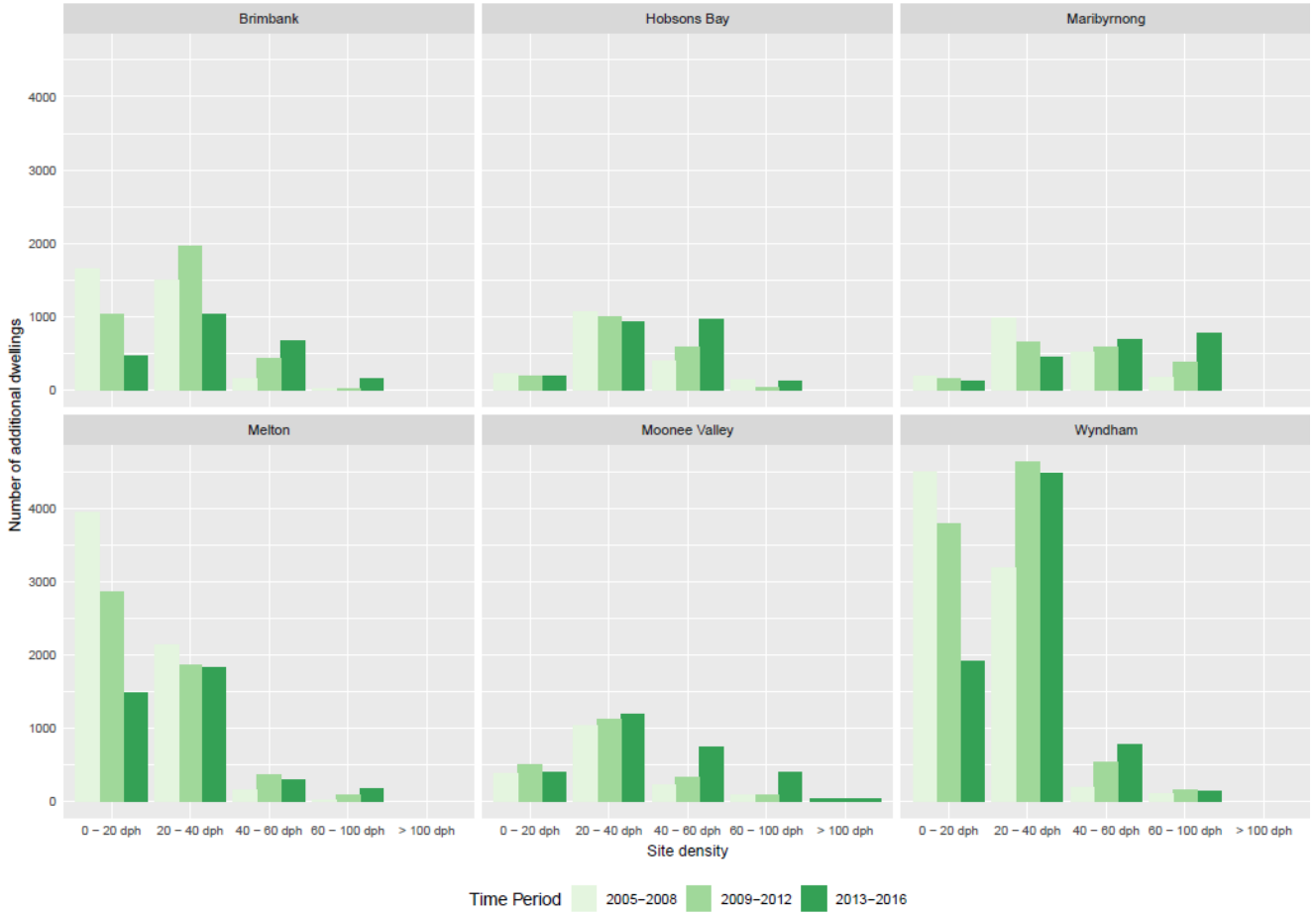


Source: DELWP Housing Development Data 2006 and 2016

Figure 71 shows the site densities for new dwellings in each LGA between 2005 and 2008; 2009 and 2012; and 2013 and 2016.

- In Melton, Wyndham and Brimbank LGAs, dwellings are generally constructed at lower densities, reflecting new development density (Figure 71). Figure 70 shows the average density of dwellings across the region. Site density in the City of Wyndham has mainly been between 20 and 40 DPH in each of the timeframes.
- In the Maribyrnong, Moonee Valley and Hobsons Bay LGAs, there is a greater diversity of dwelling densities.

FIGURE 71: DENSITY PROFILE OF NEW DWELLINGS (2005-2016)



Source: DELWP Housing Development Data 2006 and 2016

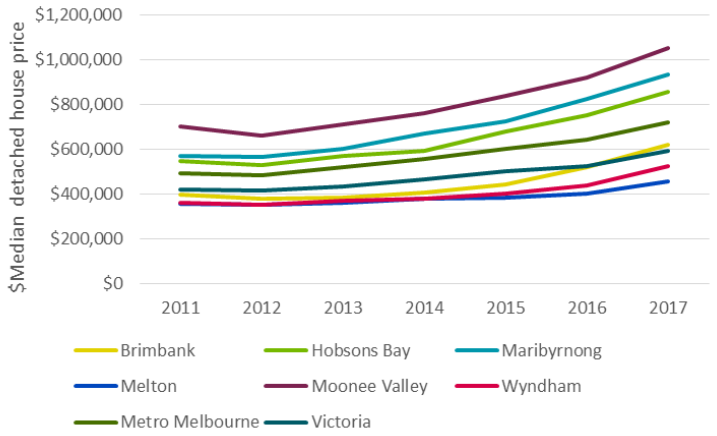
5.4 Housing prices and stress

Housing price

Figure 72 and Figure 73 show recent house price trends.

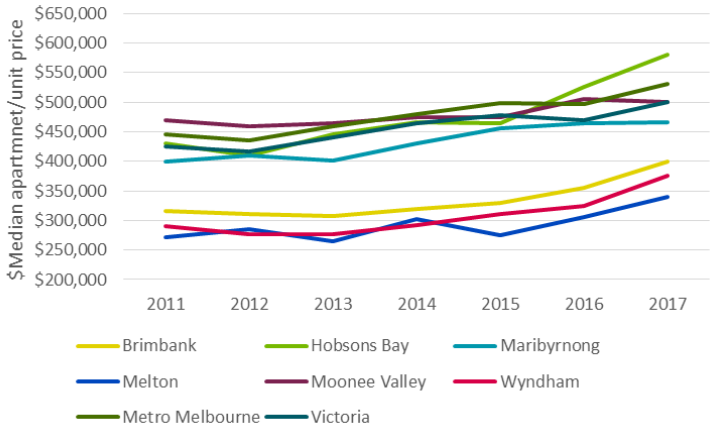
- The median prices for detached houses in the Western Metro Region increased between 2011 and 2017, while the median prices for apartments and units were more stable during that period.
- Maribyrnong, Moonee Valley and Hobsons Bay LGAs' median detached house prices have remained higher than the metropolitan Melbourne and Victorian averages since 2011.
- The Hobsons Bay, Moonee Valley, and Maribyrnong LGAs had the highest median house and apartment prices between 2011 and 2017, possibly as they include more established suburbs closer to Melbourne CBD with good transport connections.

FIGURE 72: MEDIAN DETACHED HOUSE PRICE (2011-2017)



Source: DELWP, 2017

FIGURE 73: MEDIAN APARTMENT/UNIT PRICE (2011-2017)



Source: DELWP, 2017

Housing stress

Housing stress measures the balance between household income and housing expenditure. It can present as either rental stress or mortgage stress.

Households in rental stress are those which:

- are low income, defined as falling within the bottom 40th percentile of the household income distribution of Victoria
- spend at least 30 per cent of their household income on rent.

Households in mortgage stress are those which:

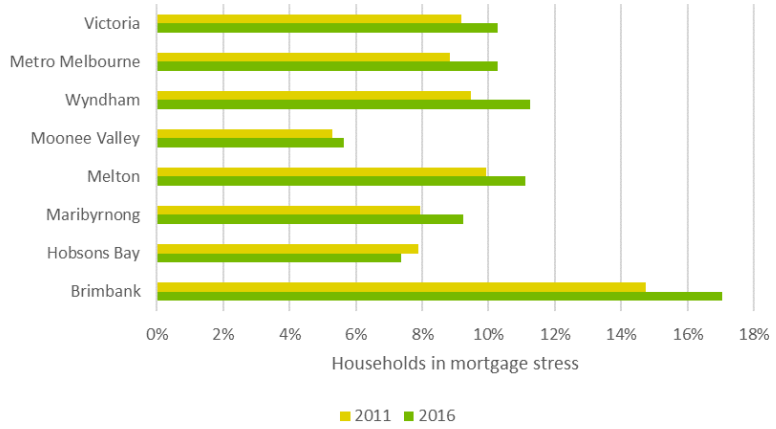
- are low income, defined as falling within the bottom 40th percentile of the household income distribution of Victoria
- spend at least 30 per cent of their household income on mortgage payments.

Figure 74 and Figure 75 present mortgage and housing stress by LGA.

- Maribyrnong, Moonee Valley and Hobsons Bay LGAs experience lower levels of mortgage stress than metropolitan Melbourne and Victoria. As shown in Figure 81, these LGAs have a higher level of socio-economic advantage than other locations within the region.
- The City of Brimbank has the highest proportion of households under mortgage stress compared to other municipalities in the Western Metro Region (Figure 77, overpage).
- The City of Brimbank also has areas where more than 40 per cent of households are under rental stress (Figure 78).
- Mortgage stress in the City of Wyndham increased between 2011 and 2016.
- There is a greater proportion of households under rental stress than mortgage stress in the Western Metro Region, metropolitan Melbourne and Victoria.
- There was an increase in the proportion of households experiencing rental stress between 2011 and 2016 in all LGAs except the City of Wyndham.

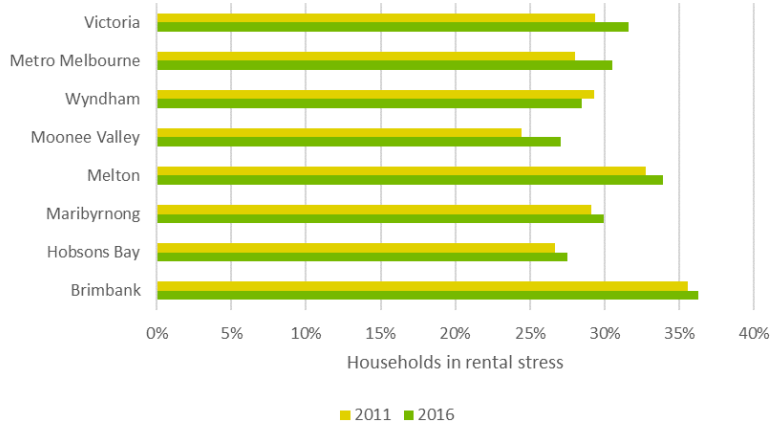
Figure 77 and Figure 78 illustrate the distribution of households with mortgage stress and rental stress in the Western Mero Region.

FIGURE 74: LOW INCOME HOUSEHOLDS IN MORTGAGE STRESS (PERCENTAGE OF TOTAL HOUSEHOLDS WITH MORTGAGE) (2011-2016)



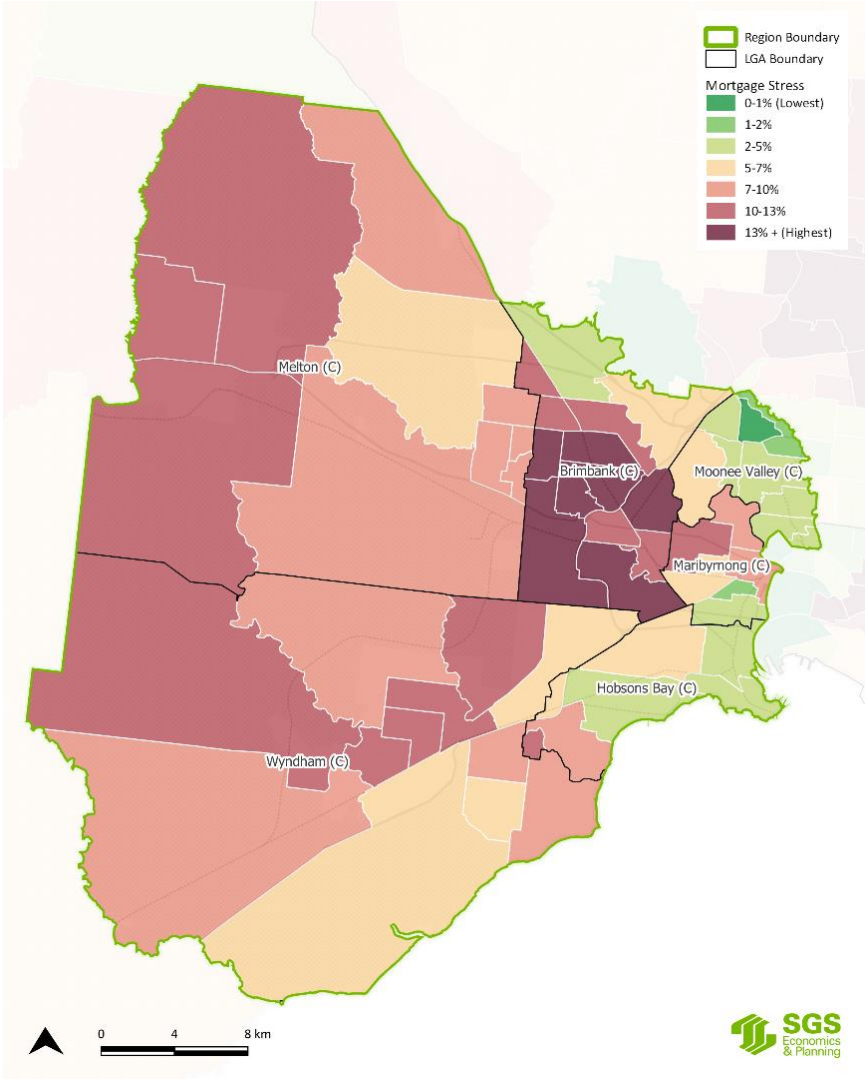
Source: ABS Census 2011 and 2016

FIGURE 75: LOW INCOME HOUSEHOLDS IN RENTAL STRESS (PERCENTAGE OF TOTAL HOUSEHOLDS RENTING) (2011-2016)



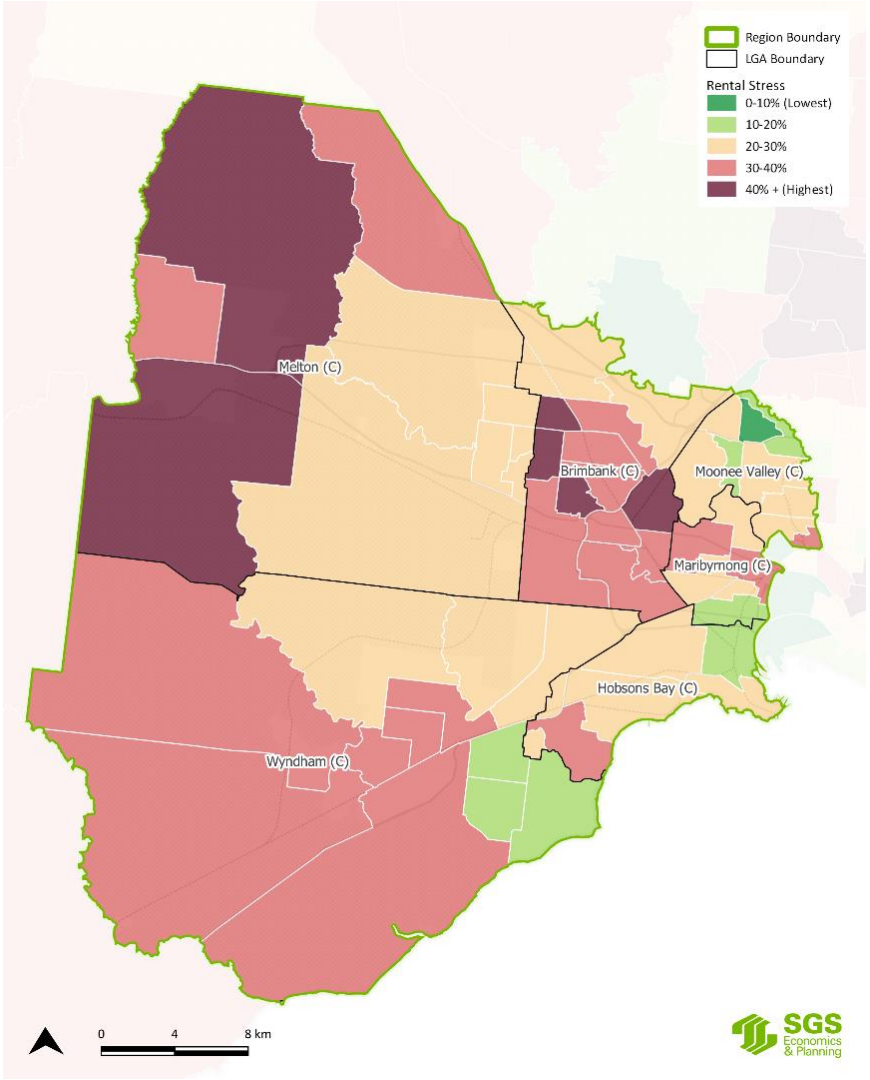
Source: ABS Census 2011 and 2016

FIGURE 76: HOUSEHOLDS IN MORTGAGE STRESS (PERCENTAGE OF TOTAL HOUSEHOLDS WITH MORTGAGE) (2016)



Source: ABS Census 2016

FIGURE 77: HOUSEHOLDS IN RENTAL STRESS (PERCENTAGE OF TOTAL HOUSEHOLDS RENTING (2016)



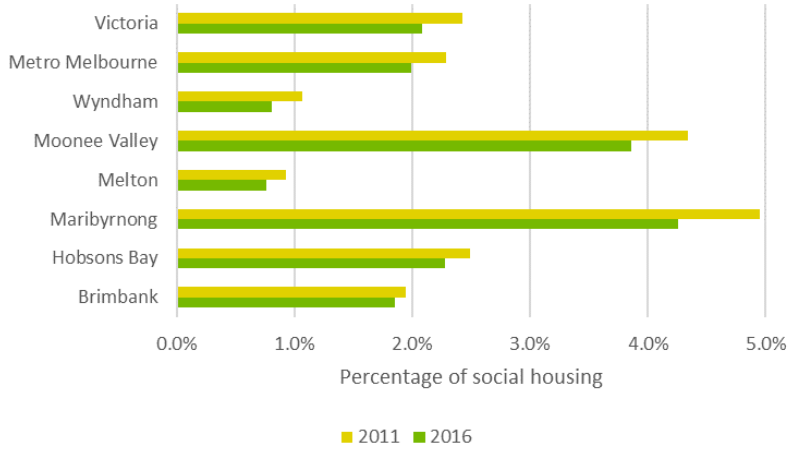
Source: ABS Census 2016

Figure 78 show recent trends in social housing (as a proportion of total dwellings) and Figure 79 shows homelessness (as a proportion of the total population[4].

- The proportion of social housing is highest in Maribyrnong and Moonee Valley LGAs.
- New Growth Area LGAs (Wyndham and Melton) have smaller proportions of social housing supply compared to metropolitan Melbourne and Victoria, possibly as housing development in the New Growth Areas tends to be private construction in large greenfield subdivisions.
- The proportion of social housing and the homeless population decreased in the City of Maribyrnong 2011 to 2016, although these proportions are comparatively higher than other locations in the Western Metro Region, metropolitan Melbourne and Victoria.

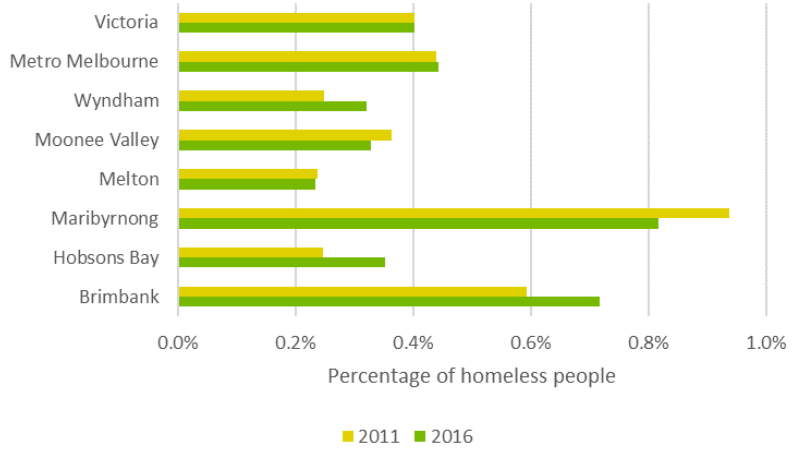
The proportion of the population which is homeless increased in Wyndham, Hobsons Bay and Brimbank LGAs from 2011 to 2016.

FIGURE 78 SOCIAL HOUSING (PERCENTAGE OF TOTAL DWELLINGS) (2011 AND 2016)



Source: ABS Census 2011 and 2016

FIGURE 79: HOMELESS PEOPLE (PERCENTAGE OF TOTAL POPULATION) (2011 AND 2016)



Source: ABS Census 2011 and 2016

[4] Homelessness is defined as living in an inadequate dwelling, having no tenure, when initial tenure is short and not extendable, or tenure does not allow people to have control of, and access to, space for social relations. ABS 2012

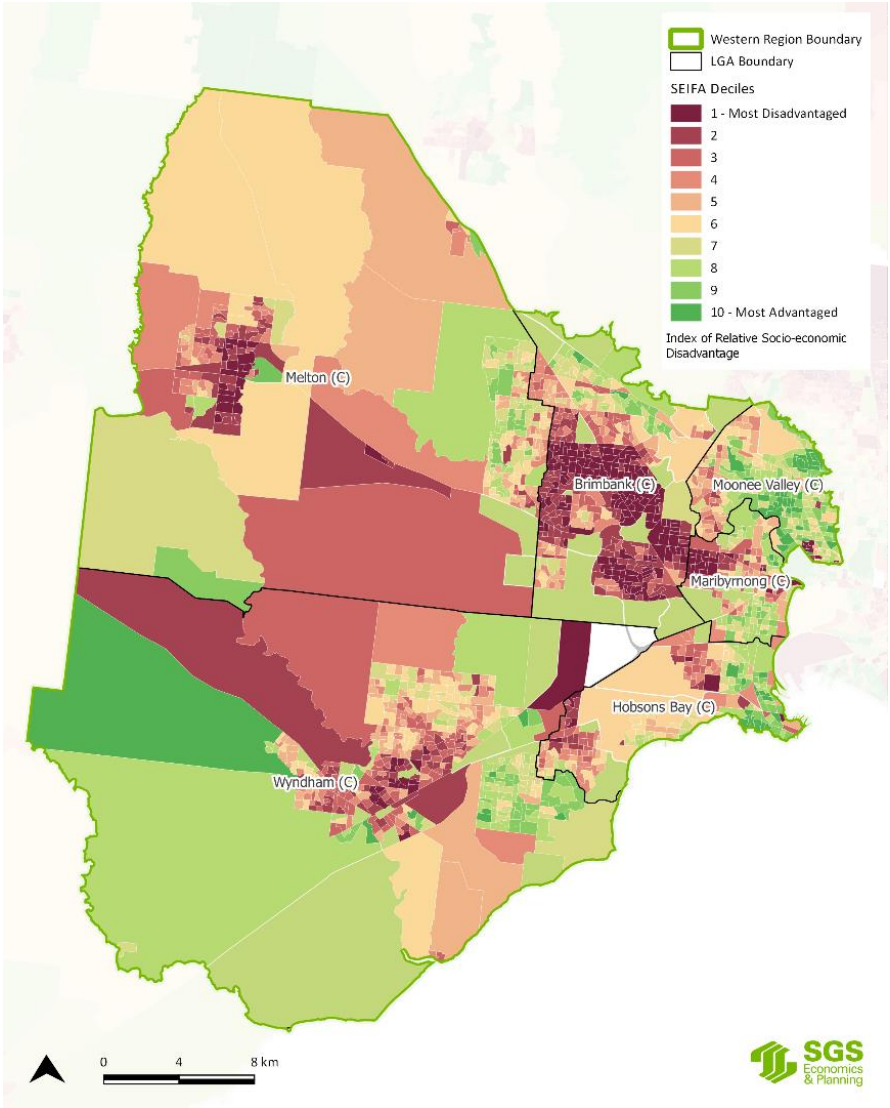
5.5 Disadvantage

SEIFA - Index of Relative Socio-Economic Disadvantage

Figure 80 shows the SEIFA Index of Relative Socio-Economic Disadvantage across the Western Metro Region. It illustrates the rate of advantage and disadvantage relative to the national average, and considers occupation, education, housing, health status, English language proficiency, marital status, health and disability status, household composition, internet access and household income.

- The Western Metro Region's areas of concentrated disadvantage cluster in the Melton, Wyndham, and Maribyrnong LGAs, and in part of the City of Brimbank.
- The City of Moonee Valley shows some variation with some locations (Moonee Ponds, Essendon and Essendon West) most advantaged and other areas most disadvantaged (Keilor, parts of Flemington).
- The pattern of disadvantage focuses on areas experiencing, or whose populations are most affected by, broader structural economic changes (Melton, Hoppers Crossing, Laverton, Sunshine, Brimbank, Maidstone, Tarneit, Werribee, Wyndham Vale and Rockbank).

FIGURE 80: SEIFA INDEX OF RELATIVE SOCIO-ECONOMIC DISADVANTAGE (2016)



Source: ABS Census 2016

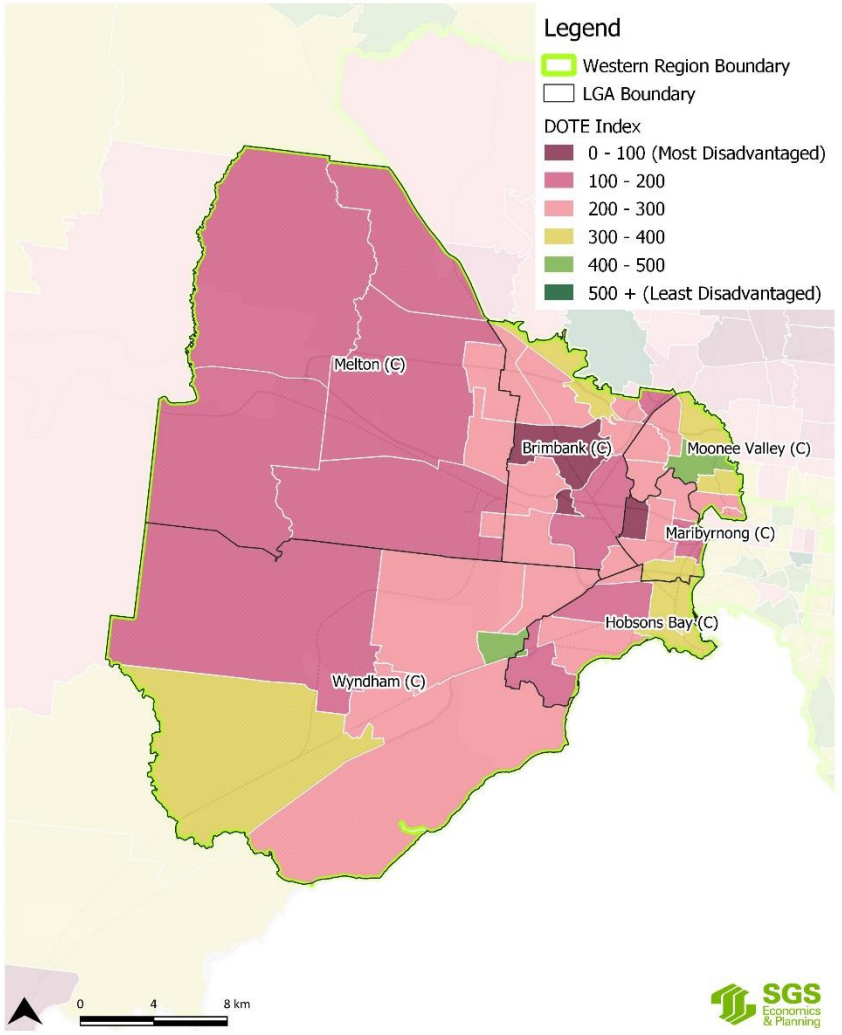
DOTE index

Jesuit Social Services and Catholic Social Services Australia have developed the Dropping Off the Edge (DOTE) Index to measure disadvantage levels (Figure 82).

The indicators utilised in the DOTE Index overlap with some (income, educational attainment, job type and employment status) used in SEIFA. The DOTE Index differs in its utilisation of indicators that measure specific aspects of disadvantage rather than variables that reflect disadvantage. In addition to several SEIFA variables, the DOTE Index also includes indicators relating to child maltreatment, prison admissions, criminal court convictions, domestic/family violence and psychiatric hospital admissions.[5]

- The DOTE Index Average Rank shows that the eastern side of the Western Metro Region appears to be the least disadvantaged.
- The south-west of the Western Metro Region, from the City of Wyndham down towards the City of Greater Geelong, also seems to be less disadvantaged due to higher skill levels and income in Wyndham Vale.
- The City of Brimbank and Maribyrnong each have pockets of residents who rank as most disadvantaged in the Western Metro Region.
- Brimbank and Melton LGAs have less diversity in disadvantage with all areas showing as highly disadvantaged. This corresponds with lower employment, lower skill levels and higher housing stress in these areas.

FIGURE 81: AVERAGE RANK, DOTE INDEX (2015)



Source: Jesuit Social Services and Catholic Social Services Australia 2015 (note that 2015 data is latest available)

[5] Catholic Social Services Australia (2015), Dropping Off the Edge: Persistent Communal Disadvantage in Australia, pp.10. Accessed 6 September 2018 from: http://k46cs13u1432b9asz49wnhcx-wpengine.netdna-ssl.com/wp-content/uploads/0001_dote_2015.pdf

5.6 Youth engagement with work or study

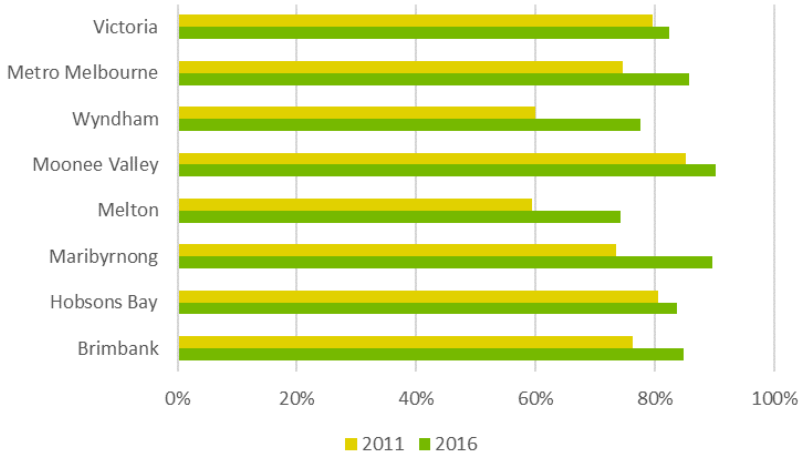
Education levels

Education levels correlate to skill level, especially for people in the younger working age groups. The On Track survey by the Department of Education shows the study or work plans of high school completers six months after they finish high school.

Figure 82 presents the proportion of residents aged between 20 and 24 who have a minimum of a Year 12 qualification (referred to as school qualified youth for the remainder of this section). For those who completed Year 12 in 2017, Figure 83 presents the distribution of destinations (for example, study or work)

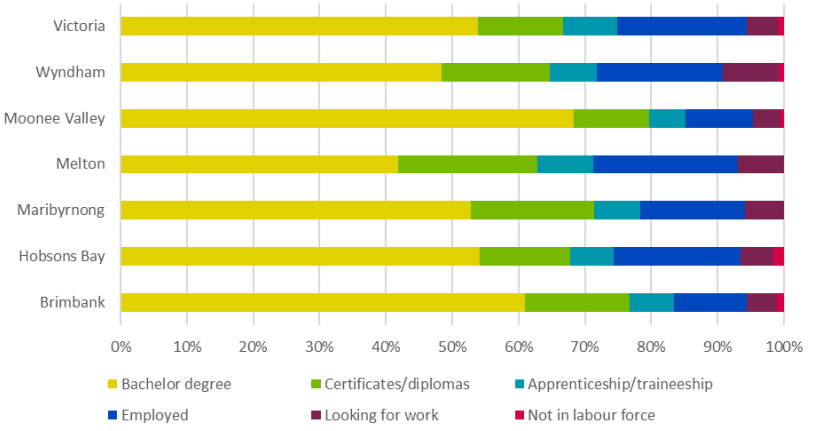
- Figure 83 illustrates that Melton and Wyndham LGAs have lower than average levels of people aged 20-24 with Year 12 or a higher qualification compared to metropolitan Melbourne.
- The significant increase in people aged 20-24 with Year 12 or higher education in Wyndham, Melton, and Maribyrnong LGAs could be explained by the Australian immigration policy, which focuses highly on skilled migration and gives preference to immigrants with higher level education qualifications.
- The 2017 On Track survey shows that most Year 12 completers in the Western Metro Region have proceeded to tertiary education.
- The City of Moonee Valley has the highest proportion of students attending university upon high school completion, possibly due to the City's higher socio-economic conditions.
- The City of Brimbank has the second highest tertiary education attainment rate, despite 34% of its labour force being employed in jobs with lower skill requirements. This could contribute to the uplift of the City's future employment skill levels.

FIGURE 82: PERCENTAGE OF PEOPLE AGED 20 TO 24 WITH YEAR 12 OR HIGHER QUALIFICATION (2011-2016)



Source: ABS Census 2011 and 2016

FIGURE 83: DESTINATIONS OF YEAR 12 OR EQUIVALENT COMPLETERS (2017)



Source: On Track, Department of Education, 2017

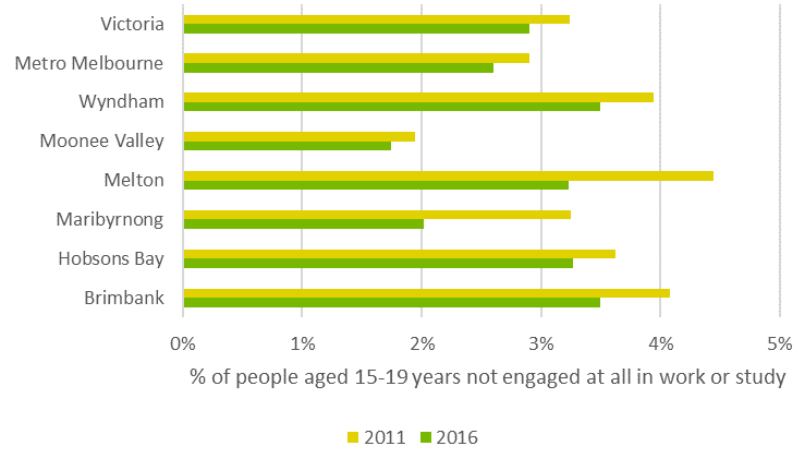
Engagement with work or study

Youth engagement in work or study can signify an area's level of education resources and the level of skills required to be employed in local job markets.

Youth disengagement (Figure 85) with work or study can stem from taking time off from studies, travel, illness and disability, or family commitment. The youth disengagement rate can also inform investments in education and professional training services.

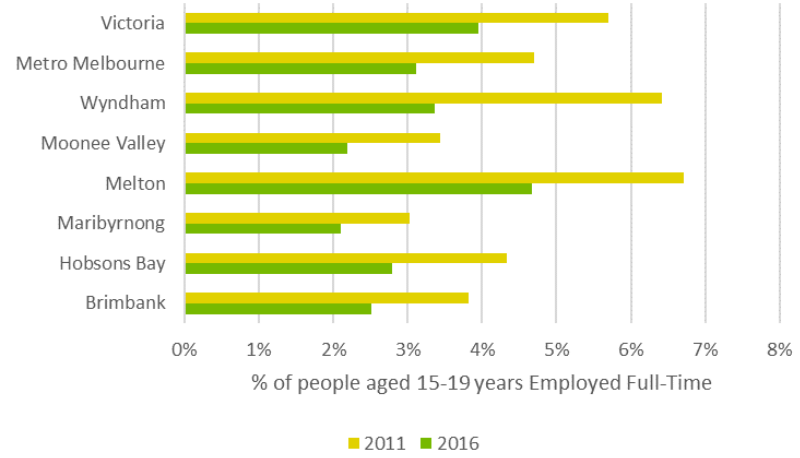
- Youth engagement increased in every LGA in the Western Metro Region over the period 2011 to 2016 (Figure 84).
- Youth participation in full-time work decreased in each LGA from 2011 to 2016, which corresponds to an increase in the proportion of people enrolled in tertiary education .
- Figure 85 shows that the proportion of the City of Melton's 15 to 19-year-olds in full-time work is higher than the metropolitan Melbourne and Victorian averages. These young people may not be sufficiently skilled for future higher skilled jobs.

FIGURE 84: YOUTH DISENGAGEMENT (2011-2016)



Source: ABS Census 2011 and 2016

FIGURE 85: YOUTH LABOUR PARTICIPATION (2011-2016)



Source: ABS Census 2011 and 2016

5.7 Population health

Hospital inpatient separations

Inpatient separations are a measure of the number of instances in which a patient leaves a hospital because of death, discharge, sign-out against medical advice, or transfer (Figure 86). It is a common measure of the utilisation rate of hospital services.

- Wyndham and Maribyrnong LGAs have the lowest rate of inpatient separations, while the Hobsons Bay and Moonee LGAs the highest.
- On average, inpatient separations across Victoria and metropolitan Melbourne are increasing; however, the pattern of change within the Western Metro Region is more varied. The temporal variations are small across all suburbs.

FIGURE 86: INPATIENT SEPARATIONS PER 1,000 POPULATION (2011-2015)

Source: DHHS Local Government Area Statistical Profiles, 2011 and 2015 (note that 2015 data is latest available)

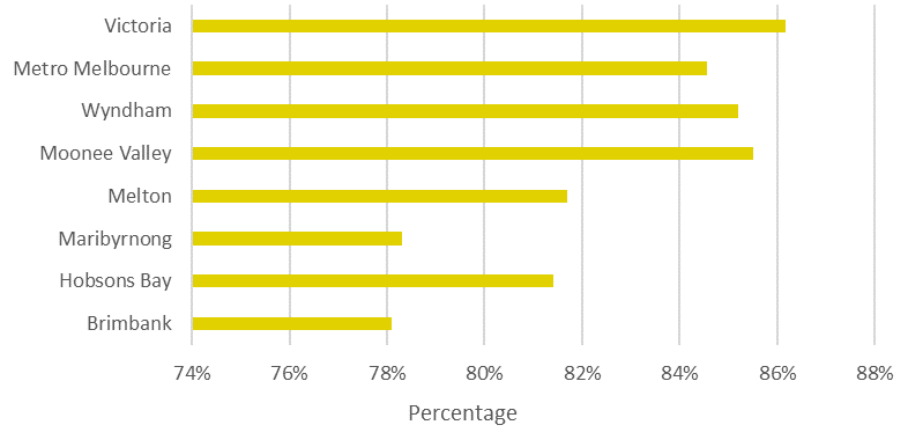
Access to community and health care services

Community health services are provided to the community alongside general health practitioners and are privately funded services that support primary health services in Victoria.

The scope of community health services can include human services such as drug and alcohol rehabilitation, post-acute care and disability care. The level of access to community and health care services indicates a region's social advantages and disadvantages.

- Residents within the Western Metro Region are less able to easily access community services compared to Victoria overall.
- People living in Brimbank and Maribyrnong LGAs have the lowest level of access in the region, while the cities of Moonee Valley and Wyndham have the highest.

FIGURE 87: PERCENTAGE OF PEOPLE WHO COULD DEFINITELY ACCESS COMMUNITY SERVICES AND RESOURCES BY LGA (2015)



Source: DHHS Local Government Area Statistical Profiles, 2015 (note that 2015 data is latest available)

Mental health and drug and alcohol use

Drug and alcohol use and/or poor mental health can lead to adverse health and wellbeing outcomes.

There are limitations to this data. A shortage of services may hide the extent of true demand and the dataset only includes public patients. More affluent areas are likely to have mental health and drug and alcohol patients seeking private care; conversely, the availability of more services may mean higher demand.

- All LGAs across the Western Metro Region have lower numbers of mental health clients than the Victorian average. However, most LGAs have higher numbers than the metropolitan average, excluding the City of Wyndham.
- The City of Melton has seen the greatest increase in the number of mental health clients between 2011 and 2015.
- The City of Brimbank experienced an increase in the number of drug and alcohol clients with more clients per 1,000 people than Victoria and metropolitan Melbourne in 2015.

FIGURE 88: REGISTERED MENTAL HEALTH CLIENTS PER 1,000 PEOPLE BY LGA (2011-2015)

Source: DHHS Local Government Area Statistical Profiles 2011 and 2015 (note that 2015 data is latest available)

FIGURE 89: DRUGS AND ALCOHOL CLIENTS PER 1,000 PEOPLE (2011-2015)

Source: DHHS Local Government Area Statistical Profiles 2011 and 2015 (note that 2015 data is latest available)

Home and Community Care Services (HACC)[6]

Home and Community Care (HACC) services (Table 11) provide outreach services to allow people aged 65 and over and people with a disability to live in their communities for longer. Services may include centre-based day respite, transport, basic in-home services and social support.

The HACC 'target population' indicates the number of people eligible to receive services from a HACC program funded by the Victorian or Australian Government and usually delivered by local government. To determine service levels, a needs assistance measure examines the proportion of 'older and frail people with moderate, severe or profound disabilities'. The size and location of the target population in Victoria is estimated from responses to Census questions on 'need for assistance' with self-care, mobility or communication, counted at an LGA geography.[7]

The rate per 1,000 indicates a relative need of service provision and is used to compare the relative extent of HACC provision in each LGA compared to the population. Because of multiple occasions of service, a given LGA may show more people receiving a HACC service in a year than the count of individuals in the HACC target population.[8]

- In the Western Metro Region, the City of Moonee Valley has the largest number of HACC clients, followed by the City of Maribyrnong, while the City of Brimbank has the lowest.
- The number of HACC clients appears to be somewhat inconsistent with the proportion of people aged over 65 in each LGA, with low numbers in the City of Brimbank occurring despite its relatively large retiree population.

TABLE 11: HACC CLIENTS (2015)

	HACC clients aged 65+/ 1,000 head
Brimbank	391.9
Hobsons Bay	538.5
Maribyrnong	547.9
Melton	539.8
Moonee Valley	554.3
Wyndham	536.1
Metro Melbourne	*688.5*
Victoria	*973.3*

Source: DHHS Local Government Area Statistical Profiles, 2015 (note that 2015 data is latest available)

[6] On 1 July 2016 funding and management of HACC services for older people were replaced by Commonwealth Home Support Programme (CHSP) and by HACC Program for Younger People (HACC PYP). The use of former HACC data will therefore not set a future benchmark to measure progress.
[7] The target population is adjusted by removing those living in residential aged care or DVA card holders.
[8] Department of Health and Human Services, *Data item definitions: 2015 local government area profiles*, 'Home and Community Care (HACC) clients', November 2015.

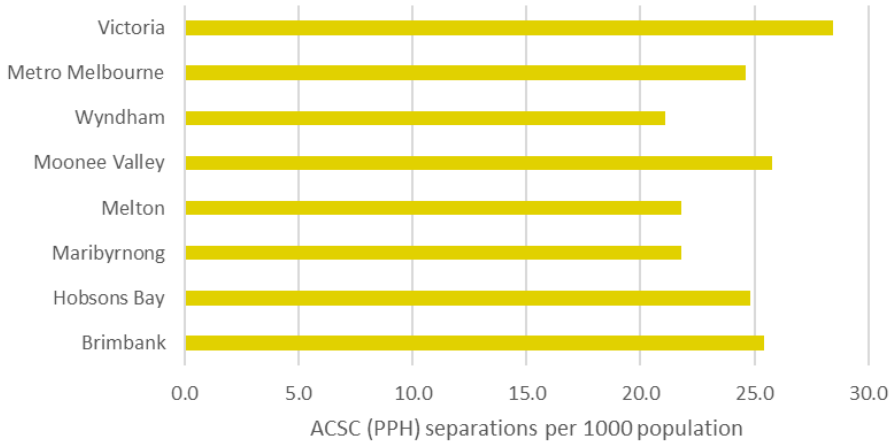
Ambulatory Care Sensitive Conditions

Ambulatory Care Sensitive Conditions (ACSC) describe conditions for which hospitalisation could be avoided through public health interventions and early disease management, usually delivered in an ambulatory setting such as primary care.

High rates of hospital admissions for ACSCs may provide indirect evidence of problems with patient access to primary healthcare, inadequate skills and resources, or disconnection with specialist services.[9]

- Moonee Valley, Brimbank and Hobsons Bay LGAs have slightly higher numbers of ACSC clients per 1,000 head of population.

FIGURE 90: ACSC (PPH) SEPARATIONS FOR ALL CONDITIONS PER 1,000 POPULATION (2015)



Source: DHHS Local Government Area Statistical Profiles, 2015 (note that 2015 data is latest available)

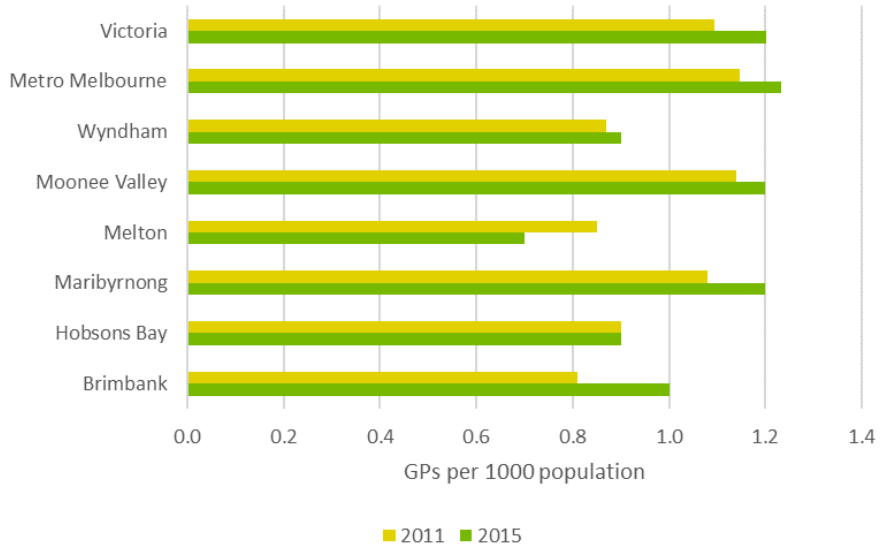
[9] Source: Victorian Admitted Episode Dataset (VAED), Department of Health and Human Services; Estimated Resident Population (ERP, Australian Bureau of Statistics (ABS).

Access to general practitioners (GPs)

Access to general practitioners (GPs) contributes to a region's community services and resident wellbeing (Figure 91). It also helps describe an area's level of healthcare resources.

- The number of GPs per 1,000 people is lower in all LGAs compared to metropolitan Melbourne and Victoria, except in the City of Maribyrnong where it is equivalent to the Victorian measure.
- The relative numbers of GPs per 1,000 people increased in Brimbank, Melton, Moonee Valley, Maribyrnong and Wyndham LGAs between 2011 and 2015, while the City of Melton experienced a decrease and Hobsons Bay LGA remained the same.

FIGURE 91: NUMBER OF GENERAL PRACTITIONERS PER 1,000 PEOPLE BY LGA (2011-2015)



Source: DHHS Local Government Area Profiles, 2015 (note that 2015 data is latest available)

Type 2 diabetes

People with diabetes are at greater risk of chronic health conditions and its occurrence is closely linked with the prevalence of obesity. The number of diabetes cases in the population indicates a higher risk of chronic health conditions, including cardiovascular disease, blindness, amputation, kidney disease and depression.

People from the most socioeconomically disadvantaged areas are more likely to have Type 2 diabetes. Males in the lowest socioeconomic group were almost twice as likely to report Type 2 diabetes as those in the highest socioeconomic group. For females, the rate in the lowest socioeconomic group is 2.5 times that in the highest socioeconomic group.[10].

The number of new cases of diabetes helps to predict future needs for health services and to evaluate the effectiveness of prevention programs.

- The region's prevalence of Type 2 diabetes is high compared to the metropolitan and Victorian average, particularly in the City of Melton.
- The Wyndham and Brimbank LGAs both had lower rates of Type 2 diabetes than the Victorian average in 2015.
- The prevalence of diabetes in the City of Melton correlates to the area being one of the most significantly disadvantaged in the region.
- While the City of Moonee Valley is one of the most advantaged LGAs, it has a high – and growing - rate of Type 2 diabetes.
- The City of Hobsons Bay also saw growth in the prevalence of Type 2 diabetes between 2011 and 2015, while the City of Brimbank saw a decrease.

FIGURE 92: INCIDENCE OF TYPE 2 DIABETES BY LGA (2011-2015)

Source: DHHS Local Government Area Profiles 2011 and 2015 (note that 2015 data is latest available)

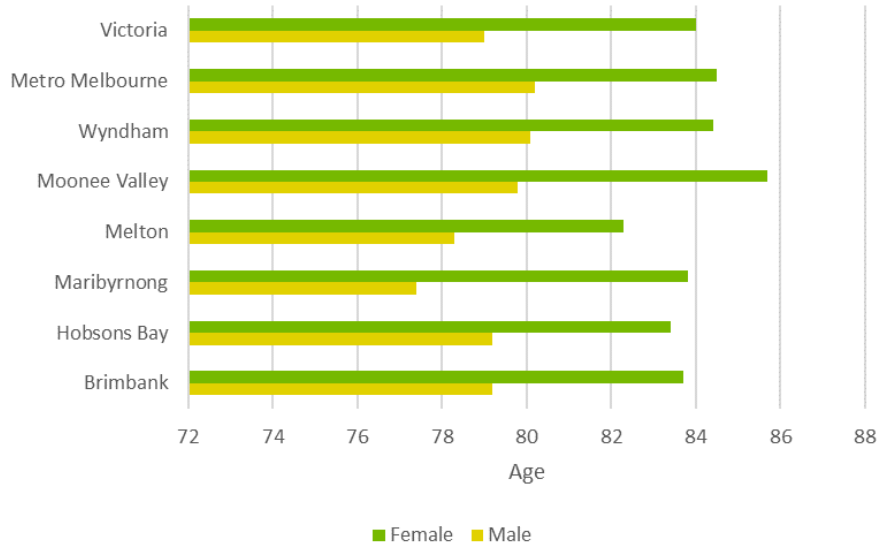
[10] AIHW 2002

Life expectancy at birth

Life expectancy at birth is an indicator of living standards, lifestyle and education factors, as well as access to quality health services.

- Life expectancy for females is significantly higher than for males.
- Life expectancy for males is lower than the metropolitan average for all LGAs, and it is also lower than the Victorian average in Maribyrnong and Melton LGAs.
- For females, life expectancy is lower in all LGAs compared to metropolitan Melbourne and Victoria, except the City of Moonee Valley.

FIGURE 93: LIFE EXPECTANCY AT BIRTH (2015)



Source: DHHS Local Government Area Statistical Profiles, 2015 (note that 2015 data is latest available)

5.8 Early childhood outcomes

The importance of the early years of childhood development is clear, with early life experiences affecting lifelong health and wellbeing in several ways.

Birth weight and immunisation

Birth weight is the bodyweight of a newborn at birth. It can be affected by the mother's health during pregnancy, pharmaceutical consumption or lifestyle (Table 12). Birth weight has also been theorised to correlate to obesity and diabetes.

The Australian Childhood Immunisation Register (ACIR) provides information about vaccine coverage at 12 months, 24 months and six years of age. The immunisation rate is measured as children who have received all the standard immunisations appropriate to their age.

- Incidence of low birth weight appears slightly higher in the Brimbank, Melton and Wyndham LGAs.
- Low birth weight appears to be linked to areas with higher rates of socio-economic disadvantage.
- Rates of immunisation are also relatively consistent across the region, with the number of children immunised decreasing, largely consistently, between one and two years of age across the region.

TABLE 12: LOW BIRTH WEIGHT AND IMMUNISATION RATE BY LGA (2015)

	% low birth weight babies 2012-14	% children fully immunised at 12 months 2015	% children fully immunised at 24 months 2015
Brimbank	7.2%	90%	88%
Hobsons Bay	5.2%	93%	91%
Maribyrnong	6.8%	91%	90%
Melton	6.8%	92%	90%
Moonee Valley	5.8%	92%	89%
Wyndham	6.6%	91%	89%
Metropolitan Melbourne	*6.3%*	*92%*	*89%*
Victoria	*6.3%*	*92%*	*89%*

Source: Social Health Atlases, 2015 (note that 2015 data is latest available)

Child protection substantiations

Child protection substantiations refer to children who receive child protection services, including those subject to an investigation of notification, on a care and protection order, and/or in out-of-home care (Table 13).

- There is a regional variation in the number of child protection substantiations, with Brimbank and Melton LGAs having the highest number per 1,000 head of population – higher than the metropolitan and state average.
- The City of Moonee Valley is the only LGA to have a child protection rate lower than the metropolitan Melbourne average.

TABLE 13: CHILDREN PROTECTION SUBSTANTIATIONS (2015)

	Child protection substantiations/1,000
Brimbank	16
Hobsons Bay	9
Maribyrnong	10
Melton	17
Moonee Valley	5
Wyndham	12
Metro Melbourne	9
Victoria	12

Source: Social Health Atlases, 2015 (note that 2015 data is latest available)

Developmental vulnerability

The Australian Early Development Centre (AEDC) identifies five domains of early childhood development, measured at the commencement of primary school:

- physical health and wellbeing
- social competence
- emotional maturity
- language and cognitive skills (school-based)
- communication skills and general knowledge.

Patterns of childhood vulnerability according to the AEDC domains largely follow that of the rate of child protections.

- The City of Brimbank had the highest percentage of children experiencing vulnerability across several AEDC domains, while Maribyrnong and Moonee Valley LGAs had lower rates.

TABLE 14: PERCENTAGE OF DEVELOPMENTALLY VULNERABLE CHILDREN (2015)

	% Children developmentally vulnerable in two or more domains	% Children developmentally vulnerable in emotional domain
Brimbank	18%	10%
Hobsons Bay	10%	7%
Maribyrnong	7%	6%
Melton	10%	8%
Moonee Valley	8%	7%
Wyndham	13%	9%
Metro Melbourne	*9.5%*	*7.6%*
Victoria	*9.9%*	*8%*

Source: Social Health Atlases, 2015 (note that 2015 data is latest available)

5.9 Crime

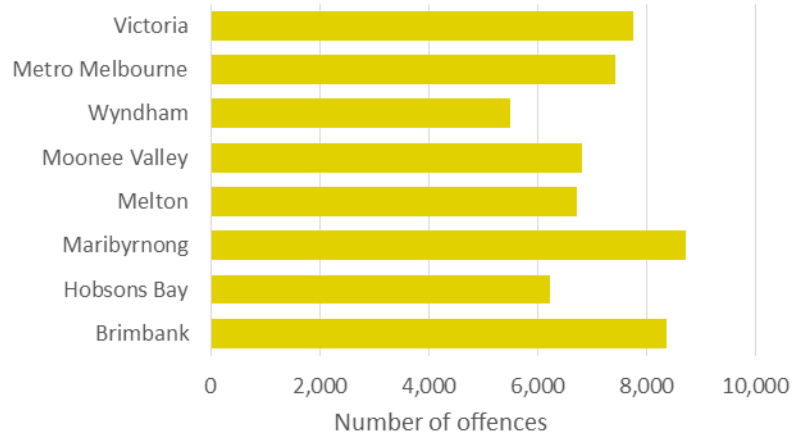
The rate of crime in an area may correlate with its level of socio-economic disadvantage, where a higher crime rate can be associated with higher socio-economic disadvantage and vice versa. Understanding an area's crime rate allows policymakers to allocate policing resources or evaluate other measures that might help to reduce crime rates.

There is a discrepancy between publicly-perceived crime rates and recorded crime statistics. Crime rate incorporates myriad offence types, which could mean varying growth trends between different offences. For instance, the increasing rate of a certain offence can co-exist with an overall dropping crime rate.

The Crime and Statistics Agency provides data on crime statistics. Offence rates are often measured with offence counts per 100,000 head of population during a given period.

- The Brimbank and Maribyrnong LGAs had the highest offence rates compared to the rest of Western Metro Region, metropolitan Melbourne and Victoria in 2018.

FIGURE 94: OFFENCE RATE PER 100,000 POPULATION (2018)



Source: Crime Statistics Agency, 2018

5.10 Wellbeing

The Self-reported Personal Wellbeing Index or Subjective Wellbeing Index is published in the VicHealth Indicators Survey (Table 15). It measures not only illness but also people's mental health and their perceptions about their lives.

According to the Victorian Health Promotion Foundation, higher scores on the Subjective Welling Index indicate better mental and physical health, higher productivity and stress-coping abilities, as well as higher engagement with social and humanitarian activities.

'Sense of safety walking alone after dark' is an indicator published by Social Health Atlases to understand how people feel about their community during night time (Table 16).

Note both datasets have limitations as they are subjective measurements based on self-reporting.

- People in most LGAs in the Western Metro Region reported lower scores on the Subjective Wellbeing Index compared to Victoria. An exception is the City of Moonee Valley, possibly due to the City's higher average income.
- Table 16 shows that the City of Brimbank reported a notably lower Sense of safety walking alone after dark rate (age-standardised rate is an adjusted rate to allow comparison of crude rates between different population sub-groups). This aligns with the City's relatively higher offence rate.

TABLE 15: SUBJECTIVE WELLBEING INDEX (2015)

LGA	Subjective wellbeing index
Brimbank	74.1
Hobsons Bay	76.6
Maribyrnong	75.1
Melton	74.2
Moonee Valley	77.8
Wyndham	76.8
Victoria	**77.3**

Source: VicHealth Indicators Survey, 2015 (note that 2015 data is latest available)

TABLE 16: SENSE OF SAFETY WALKING ALONE AFTER DARK (2018)

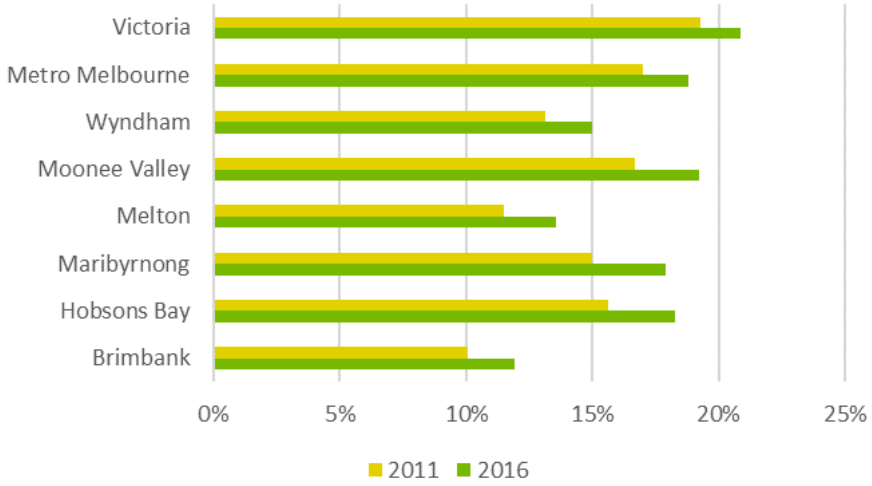
LGA	ASR per 100 (age standardised rate)
Brimbank	36.3
Hobsons Bay	47.4
Maribyrnong	43.8
Melton	41.7
Moonee Valley	55.4
Wyndham	42.3
Metro Melbourne	**51.9**
Victoria	**53.0**

Source: Social Health Atlases, 2018

Volunteering rate reflects an area's level of participation in volunteer work (Figure 96). It is calculated based on the number of people who volunteer among the total population.

- Despite increasing volunteering rates between 2011 and 2016, the Western Metro Region generally has lower volunteer rates compared to Victoria and metropolitan Melbourne, except the City of Moonee Valley.

FIGURE 95: PERCENTAGE OF POPULATION VOLUNTEERING (2011-2016)



Source: ABS Census 2011 and 2016

6. ENVIRONMENTAL

ENVIRONMENTAL INDICATORS

The Infrastructure Victoria environmental indicators that underpin this section are:

- Open space, including green space
- Land
- Water assets
- Canopy cover
- Stream condition
- Coastal and bay health
- Air quality
- Flood risk
- Sea level rise
- Bush fire
- Urban heat island effect and heat risk
- Contaminated groundwater and other sites
- Access and use of green space
- Visitation to parks
- Water security
- Renewable energy
- Extractives industry
- Waste

REGIONAL OVERVIEW

The Western Metro Region's environmental profile is characterised by:

- a diverse stock of environmental assets including conservation areas, parks, Ramsar wetlands, rivers and coasts
- a large amount of agricultural land – especially in the middle to outer areas of the region – exhibiting characteristics similar to regional areas
- a number of landfill sites that are currently open
- Natural Temperate Grasslands, an endangered ecological community.

ENVIRONMENTAL STRENGTHS

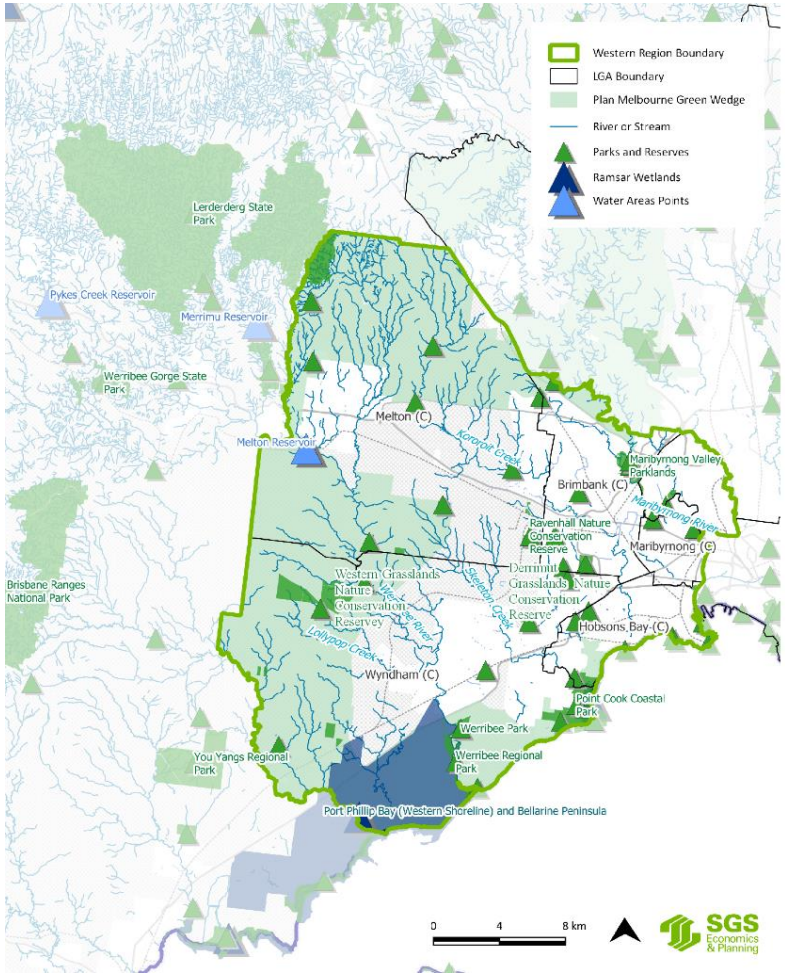
- Land available for urban development
- A large proportion of residents within the UGB (excluding New Growth Areas) have access to at least one type of open space
- Access to a range of national parks outside of Melbourne.

ENVIRONMENTAL CHALLENGES

- Limiting risk and impacts of hazards associated with climate change such as fire hazard (Brisbane Ranges), sea level rise (coastal areas of the City of Hobsons Bay), flood (City of Wyndham) and heat vulnerability
- Maintaining and/or improving asset condition including tree canopy cover, waterway health, and atmosphere pollution
- Managing the impact of economic activity on the environment, including contaminated sites, waste water and physical waste
- Managing dependent relationships with the environment to ensure human health and other objectives such as water and climate security.

6.1 Overview and key environmental features

FIGURE 96: KEY ENVIRONMENTAL FEATURES WESTERN METRO REGION



Source: Department of Environment, Land, Water and Planning, 2018a *Map does not cover full portfolio of key environmental assets

The Western Metro Region has a rich natural environment with an extensive coastline and inland waterways in Werribee and Maribyrnong. The region is home to the Western and Derrimut Grassland Reserves and wetlands of international significance under the Ramsar Convention. As well as providing public amenity, these areas protect the regions biodiversity. The Growling Grass Frog inhabits a section of the Western Growth Corridor along the lower Werribee River.

The Western Metro Region sits on the Victorian Volcanic Plain. Prior to European settlement, the region featured extensive grassland plains and coastal saltmarshes. Development occurred slowly relative to other areas of Melbourne, partly because the western grasslands were less suitable for farming than the lusher terrain to the east.

Figure 96 shows key environmental terrestrial assets in and outside the Western Metro Region. The region's key parks and reserves, including endangered native grasslands ecosystems, are:

- the Western Grasslands Nature Conservation Reserve
- the Derrimut Grassland Nature Conservation Reserve
- the Ravenhall Nature Conservation Reserve.

Outside the region, residents can access:

- Lerderderg State Park
- Brisbane Ranges National Park
- You Yangs Regional Park
- Werribee Gorges State Park.

In addition to these landmarks, substantial tracts of land in the region are zoned as green wedge. Generally, these non-urban areas that lie outside the UGB perform important environmental functions and may contain endangered ecosystems.

The region is also home to a range of water assets, including:

- Maribyrnong and Werribee rivers
- Melton Reservoir
- Port Phillip Bay and Bellarine Peninsula wetlands, which are listed as Ramsar sites.

6.2 Environmental assets

The stock of environmental assets in the Western Metro Region underpins its capacity to provide ecosystem services that are critical for environmental and human health. See Figure 100 for more information on ecosystem services.

Open space and green space

The Western Metro Region includes 31,351 hectares of land defined as open space,[11] of which approximately 65 per cent can be classified as green space (Victorian Planning Authority, 2017c)..[12] Of the regions in metropolitan Melbourne, it has the third largest share (24 per cent) of open space.

The VPA open space dataset defines open space in 12 categories under a typology of green, mixed or built open space (see Figure 98 for the groupings of categories into the typology)..[13]

Figure 97 and Figure 98 show the different types of open space in the region in 2017. Accessibility to open space is discussed in section 6.5.

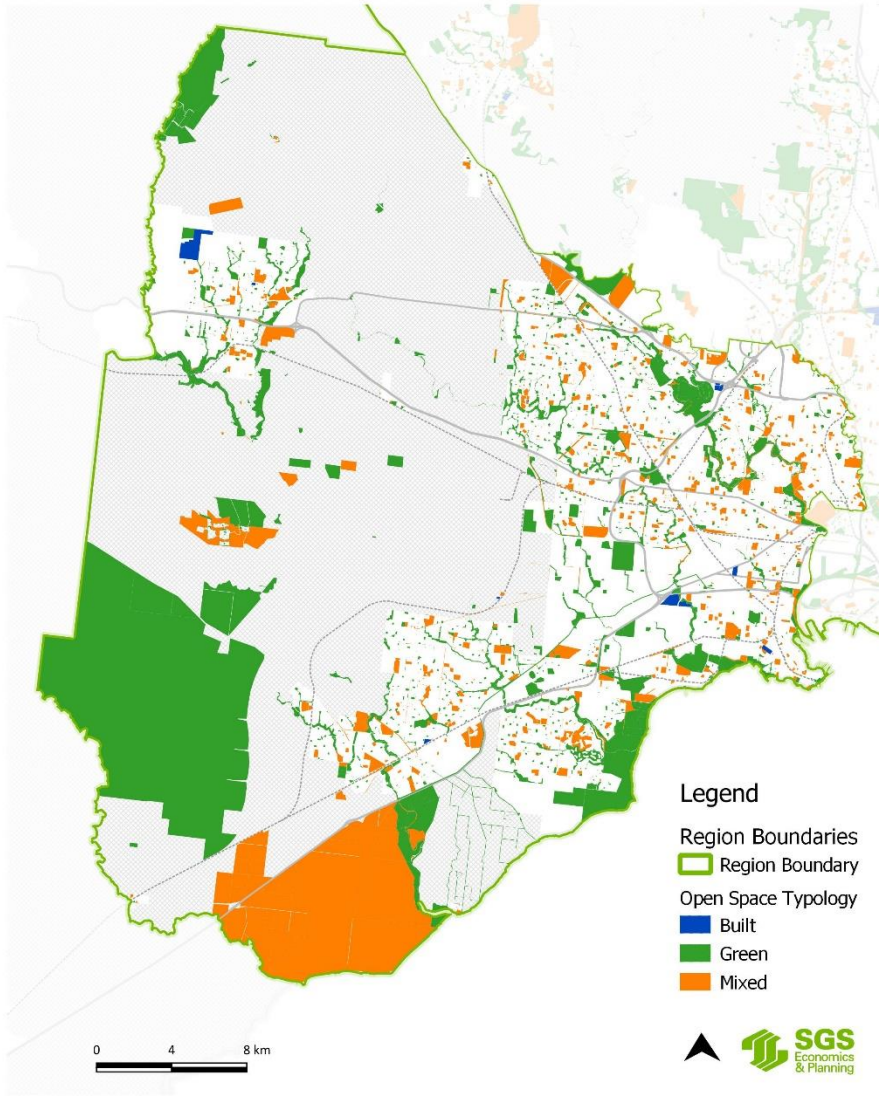
- There is a diverse range of green, mixed and built open space near Inner Melbourne.
- Conservation reserves and natural and semi-natural reserves are the largest green space classes.
- The region includes mixed assets in the form of services and utilities reserves, and sports fields and organised recreation areas.
- In the large areas where there is no open space, this generally corresponds to areas that have low population and are used for industrial and agricultural purposes.
- Wyndham, Hobsons Bay and Brimbank LGAs are among the top-10 metropolitan LGAs with respect to the percentage of open space relative to total land area.
- Maribyrnong and Melton LGAs are among the 10 lowest metropolitan LGAs with respect to the percentage of open space relative to total land area.

[11] Open space is any piece of land that provides some natural or cultural benefit. GWZ land that is primarily used for agriculture is not considered as open space because of the potential disamenity arising from agricultural activity.

[12] The interpretation of green space in this report relates to a vegetated variant of open space. Urban vegetation in the form of house gardens/yards and agriculture was not considered to be open space.

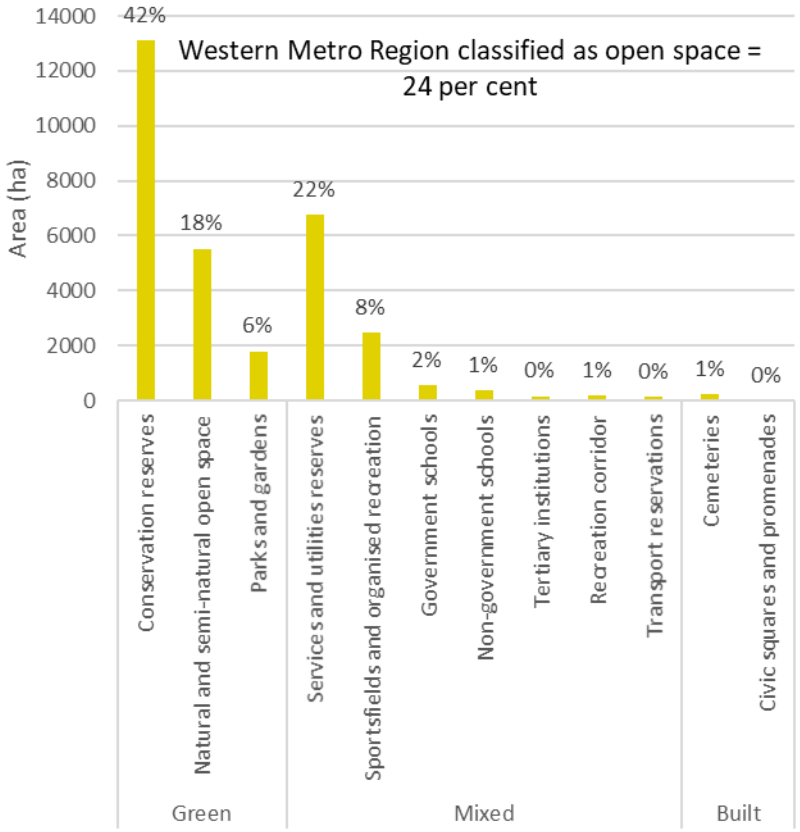
[13] Green space refers to areas that are predominately natural and contain little built infrastructure, mixed space refers to areas that have been altered from their natural state for economic purposes but still contain areas of green space, and built space refers to areas that contain predominately built infrastructure.

FIGURE 97: OPEN SPACE CATEGORIES (2017)



Source: Victorian Planning Authority, 2017c

FIGURE 98: EXISTING OPEN SPACE TYPES (2017)



Source: Victorian Planning Authority, 2017c *Share of total green space in the region is provided on top of the green space type bars. This graph does not consider proposed open space.

Table 17 and Figure 99 illustrate the VPA open space data by LGA. Table 17 shows the area, in hectares, of open space in each LGA, while Figure 99 shows the share of open space in each LGA that can be attributed to green, mixed and built open space. It is evident that:

- Green open space is the dominant category in most LGAs.
- Mixed open space is important in the cities of Moonee Valley and Maribyrnong, where total open space is low.
- City of Wyndham has a large amount of open space compared to the other LGAs.

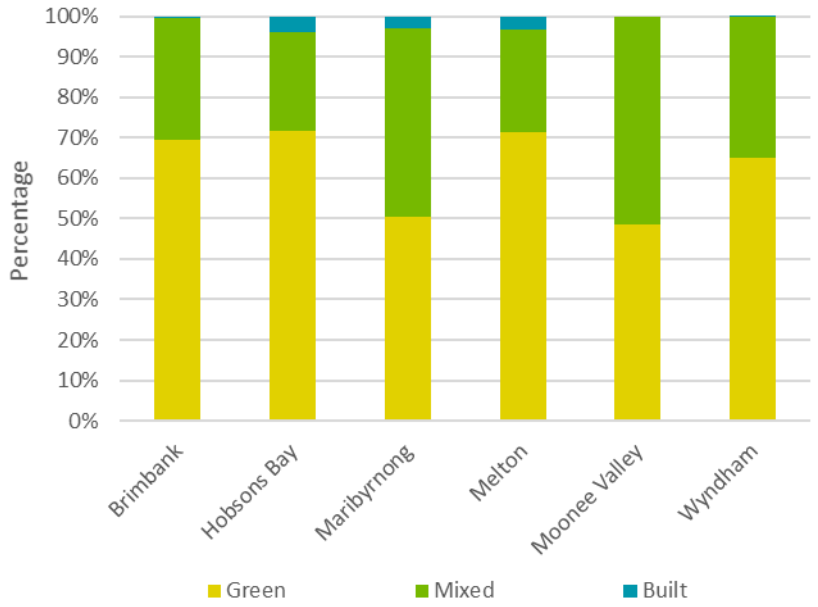
Land use planning and urban design processes will determine future open space in areas that are being developed. Assessment of trends over time should highlight the extent to which the share of open space is changing in the context of residential development.

TABLE 17: OPEN SPACE TYPE (HA) BY LGA (2017)

LGA	Green	Mixed	Built	Total
Brimbank	1,883	818	13	2,714
Hobsons Bay	1,180	405	62	1,647
Maribyrnong	231	214	13	458
Melton	2,878	1,030	129	4,037
Moonee Valley	362	384	0	746
Wyndham	14,050	7,599	7	21,656

Source: Victorian Planning Authority, 2017c *This table does not consider proposed open space.

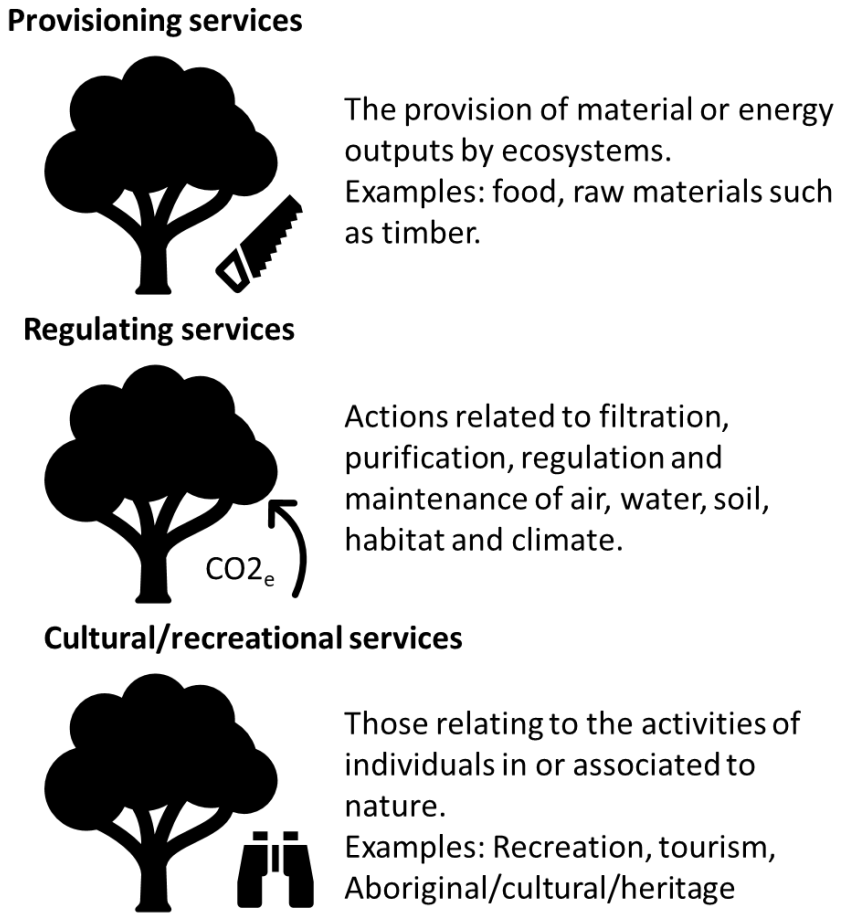
FIGURE 99: OPEN SPACE TYPE (%) BY LGA (2017)



Source: Victorian Planning Authority, 2017c *This graph does not consider proposed open space.

The provision of ecosystem services, as defined in Figure 100, varies by environmental asset type and depends on the extent (size) and condition of the asset.

FIGURE 100: ECOSYSTEM SERVICE CLASSIFICATION



Source: IDEEA Group

For example, green open space is likely to provide a range of ecosystem services including provisioning services, regulating services (such as mitigation of urban heat island effects) and cultural/recreation services, while mixed open space is likely to be concentrated on cultural/recreation services that have positive effects on health and wellbeing. Built open space is even more likely to be concentrated on cultural/recreation services.

The ability of environmental assets to provide ecosystem services can be affected by barriers such as accessibility, human activity and degradation. Additional benefits can be realised if assets are managed to be made more accessible.

Demand for ecosystem services will continue to rise with population growth. Land is fixed in supply, meaning that under-utilised assets (which can include government and non-government school ovals outside of school hours, as well as other government and some private land) are a source of supply to meet this demand.

Figure 101 illustrates the share of open space assets in the region that are either private, restricted public land or public[14] and spatial distribution of public, restricted public, and private land is shown in Figure 102.

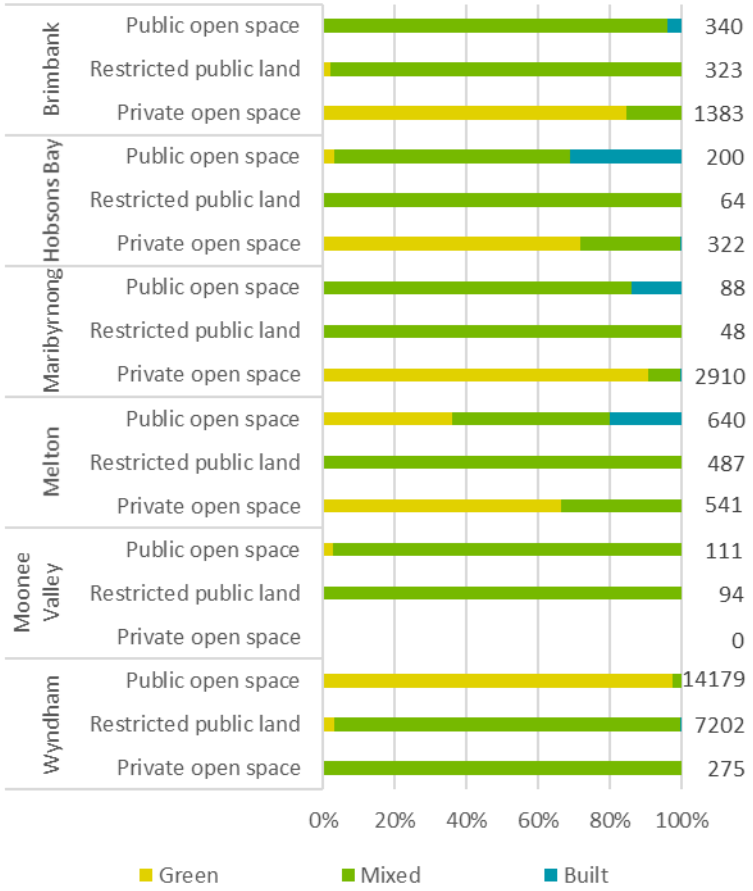
Key points include:

- A large share of green space in Wyndham LGA is public while green space in other LGAs is predominately private.
- Built and mixed space is spread across public, private or restricted ownership.

Figure 103 and Figure 104 respectively indicate the location of private and restricted open space in the region. It is evident that government and non-government schools are both accessible to populated areas.

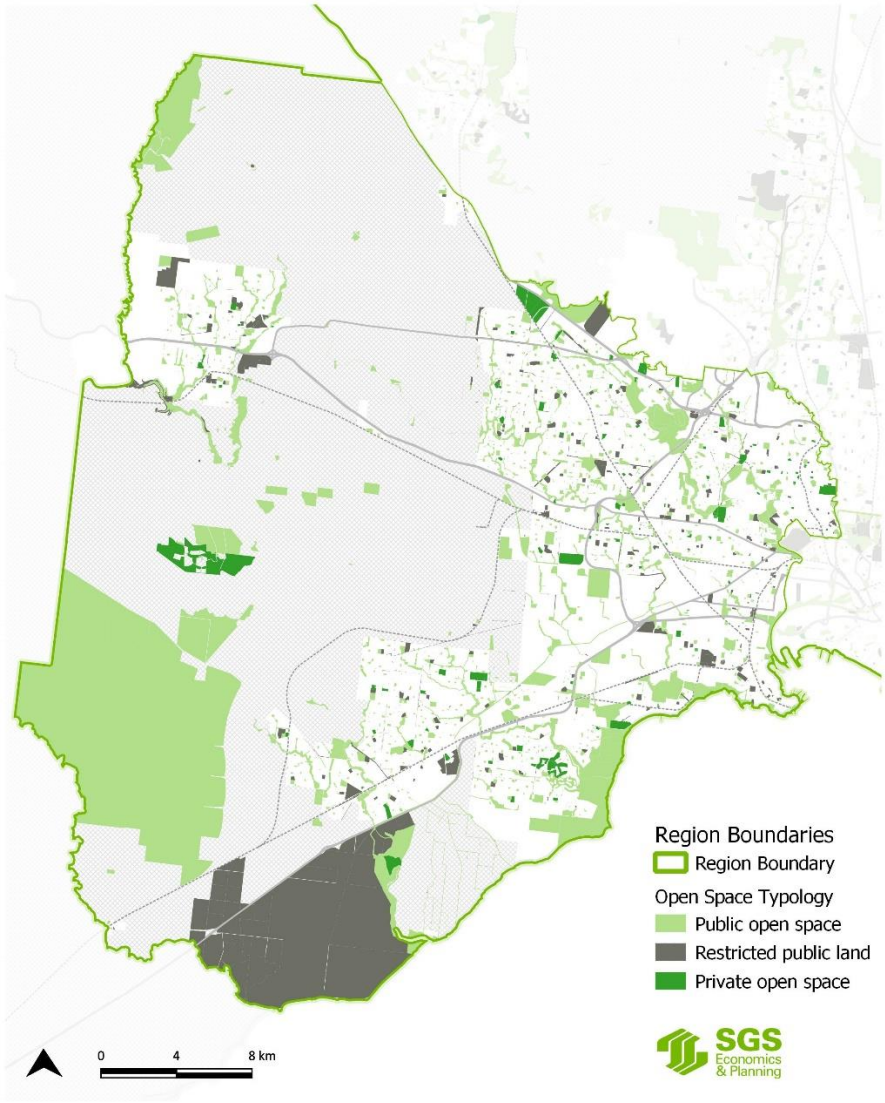
[14] Private open space does not include residential gardens – it includes private schools, private sports fields, golf courses and race courses, private conservation and private outdoor shopping plazas/malls.

FIGURE 101: OPEN SPACE TYPE BY OWNERSHIP AND LGA (2017)



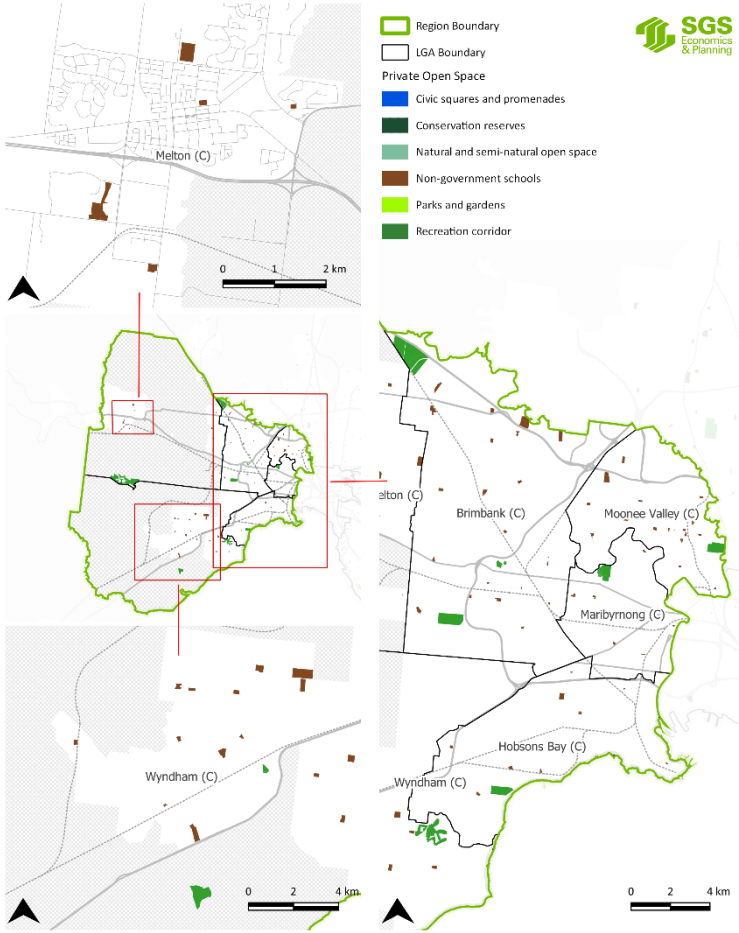
Source: Victorian Planning Authority, 2017c *Numbers to the right of bars are hectares

FIGURE 102: OPEN SPACE BY OWNERSHIP (2017)



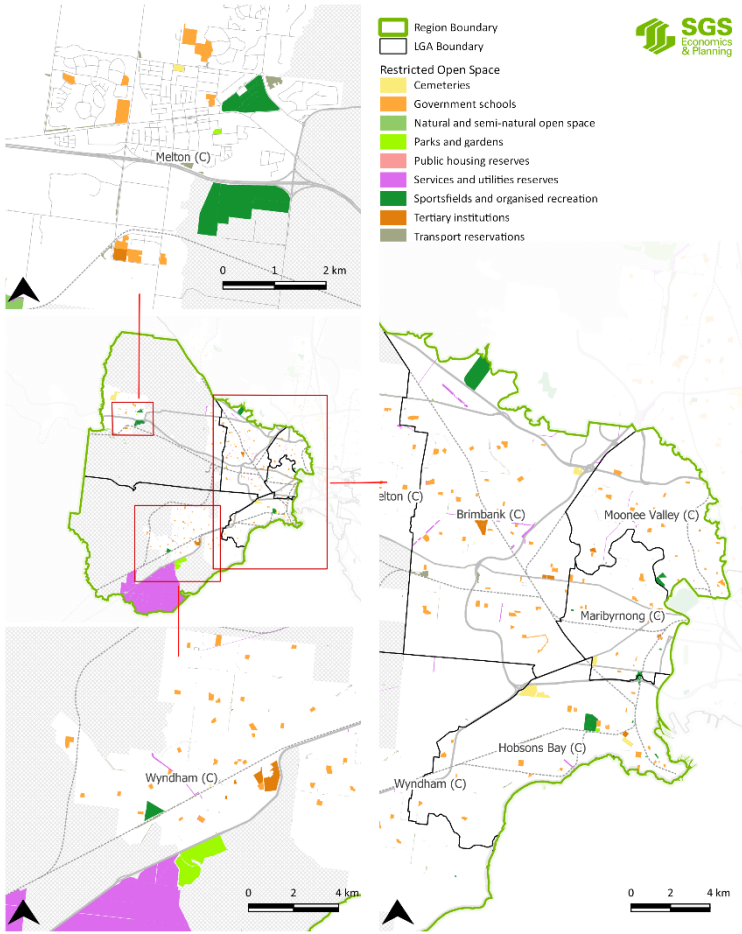
Source: Victorian Planning Authority, 2017c

FIGURE 103: LOCATIONS OF PRIVATE OPEN SPACE BY TYPE (2017)



Source: Victorian Planning Authority, 2017c

FIGURE 104: LOCATIONS OF RESTRICTED OPEN SPACE BY TYPE (2017)



Source: Victorian Planning Authority, 2017c

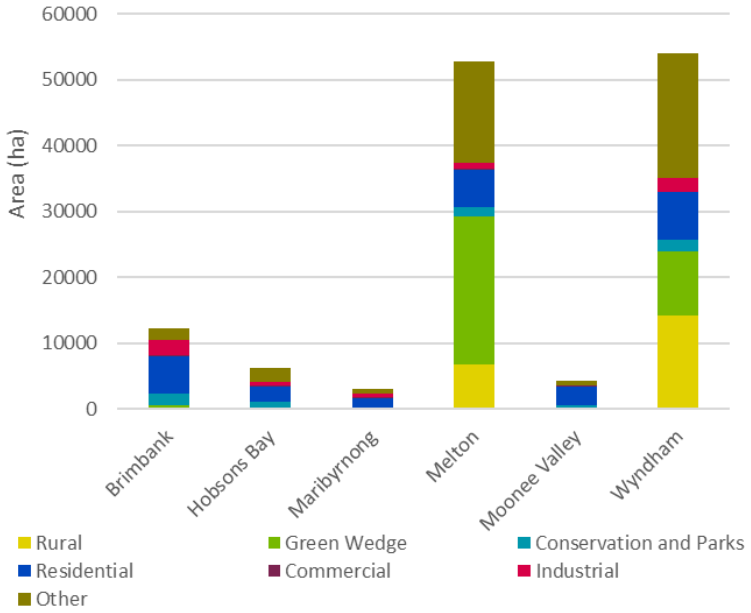
Land use

Land use is characterised using zoning data rather than Victorian Land Use Information System (VLUIS) data as the VLUIS data does not have spatial specificity for inner metropolitan areas. However, zoning data does have limitations, as it represents preferred land use rather than actual land use and is not as specific in rural areas.

Figure 105, Table 18 and Figure 106 show zoning distribution in the Western Metro Region:

- There is a large percentage of residential land in the inner LGAs.
- More than 10 per cent of land is industrial in the cities of Brimbank, Hobsons Bay and Maribyrnong.
- A large percentage of land in the outer LGAs is either green wedge, rural, residential or other.
- large areas of Green Wedge Zone (GWZ) suggest that rural areas of the Western Metro Region are aligned with the rural areas described in the regional profiles.

FIGURE 105: PLANNING ZONES BY LGA (2016)



Source: Department of Environment, Land, Water and Planning, 2018b

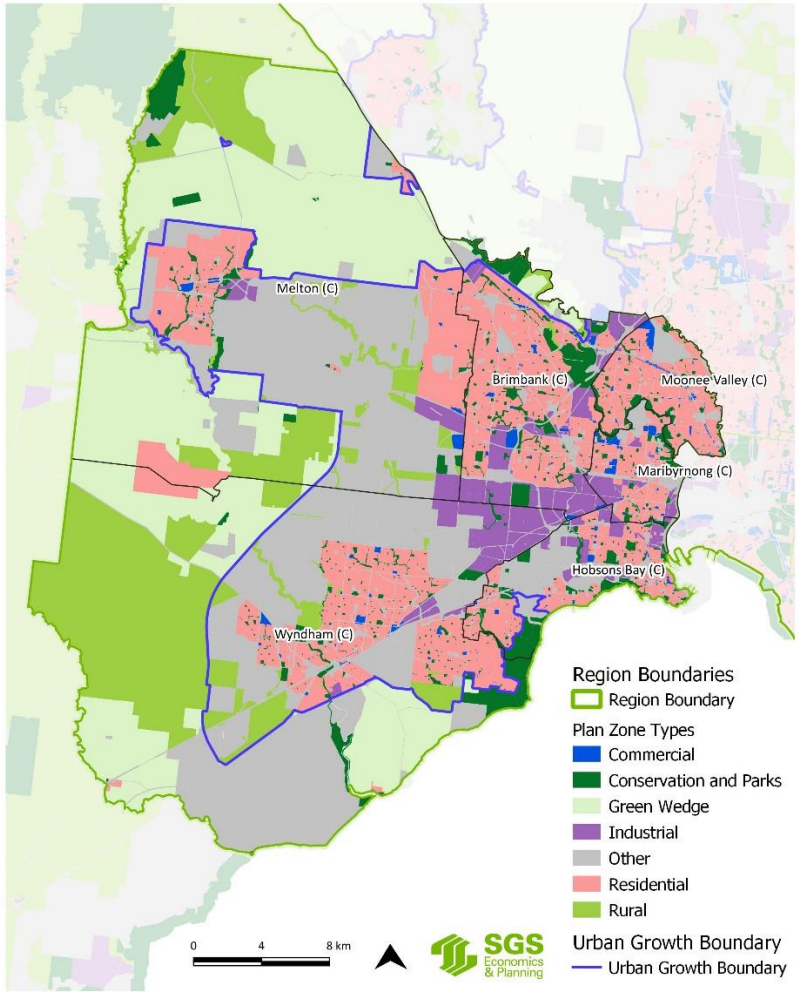
*Other includes both special purpose zones and public land zones (excluding parks and conservation). Examples of special purpose zones are activity centre zones and capital city zones. Examples of public land are education zones and health and community zones.

TABLE 18: SHARE OF TOTAL AREA BY DIFFERENT PLANNING ZONE TYPES (2016)

	Brimbank	Hobsons Bay	Maribyrnong	Melton	Moonee Valley	Wyndham
Commercial	2%	1%	6%	0%	4%	0%
Conservation and Parks	14%	17%	9%	3%	12%	3%
Green Wedge	3%	0%	0%	43%	0%	18%
Industrial	18%	11%	14%	2%	0%	4%
Other*	15%	34%	25%	29%	17%	35%
Residential	46%	38%	47%	11%	67%	13%
Rural	2%	0%	0%	13%	0%	26%
Total	100%	100%	100%	100%	100%	100%

Source: Department of Environment, Land, Water and Planning, 2018b*Other includes both special purpose zones and public land zones (excluding parks and conservation). Examples of special purpose zones are activity centre zones and capital city zones. Examples of public land are education zones and health and community zones.

FIGURE 106: PLANNING ZONES (2016)



Source: Department of Environment, Land, Water and Planning, 2018b *Other includes both special purpose zones and public land zones (excluding parks and conservation). Examples of special purpose zones are activity centre zones and capital city zones. Examples of public land are education zones and health and community zones.

High rates of population growth and urbanisation are occurring in the Western Metro Region; of its 133,023 hectares, 91,155 hectares are within the UGB, of which 26,524 hectares are also in the New Growth Areas (Victorian Planning Authority, 2017a).The remaining 41,849 hectares form rural metropolitan Melbourne.

Figure 107 shows the distribution of VLUIS land use types across the UGB, New Growth Areas and Metropolitan Rural Areas.[15] The VLUIS dataset provides greater insight into the types of conservation areas in the region. Table 19 presents this information numerically and overlays the open space data with the VLUIS data to better describe sensitive areas not recorded in the inner areas of Melbourne using the VLUIS data.

Table 19 and Figure 107 show that:

- The share of land used for primary production and conservation purposes is higher in rural areas compared to urban areas.
- There is a large percentage of land classified as primary production in New Growth Areas and rural areas.
- Land in the GWZ (as Figure 107) – such as that in the northern areas of Brimbank LGA and western areas of Wyndham LGA sometimes corresponds to the other categories in the VLUIS data meaning it may not have an environmental function.
- Large areas of primary production suggest the rural areas of the Western Metro Region align with rural areas described in regional profiles.

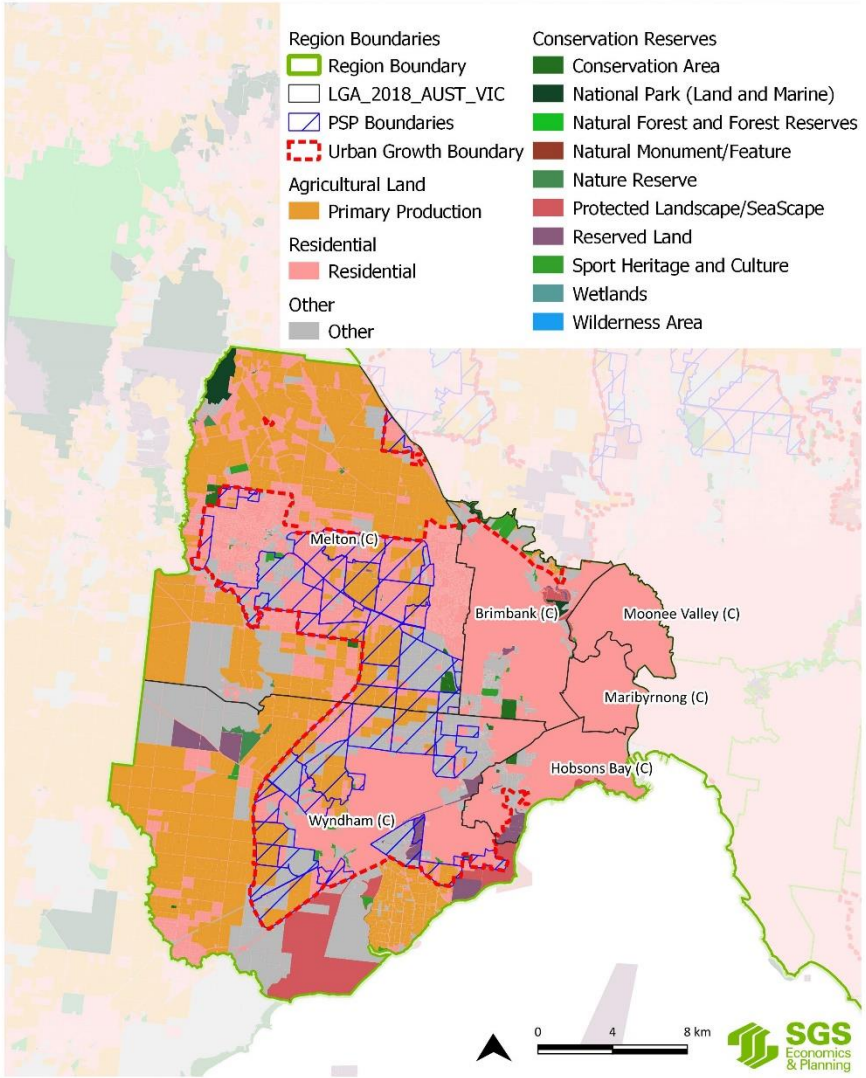
15 Conservation reserves and primary production can be defined as sensitive land use types as their functions can be impacted by encroaching residential zones.

TABLE 19: LAND USE SHARES (2016)

VLUIS types	inside UGB (excl New Growth Areas)	New Growth Areas	Rural
Residential	74%	37%	14%
Primary Production	0%	28%	39%
Conservation Reserves	3%	2%	11%
Open Space	15%	2%	26%
Other	8%	30%	10%
Total	100%	100%	100%

Source: Agriculture Victoria, 2018

FIGURE 107: LAND USE (2016)

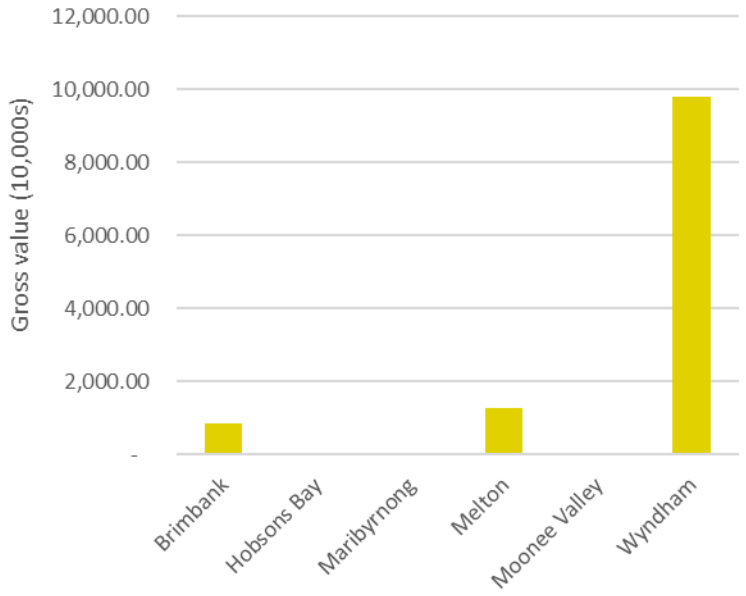


Source: Agriculture Victoria, 2018. Note that the Other class refers to all other classifications under VLUIS

Figure 108 shows the value of agricultural production in 2015-16. It is evident that Wyndham LGA generates the highest gross value followed by Melton LGA. Despite both LGAs having large areas of agricultural land, Wyndham LGA produces far more value than Melton LGA.

Table 20 shows the share of value contributed by different agricultural products for each LGA. Wyndham LGA's large share of vegetables is higher than the metropolitan and Victorian average. A higher percentage of the Shire of Melton's value is produced by the slaughtered livestock category compared to the metropolitan and Victorian average.

FIGURE 108: VALUE OF AGRICULTURAL PRODUCTS BY LGA ($10,000) (2015-2016)



Source: ABS, Value of Agricultural Commodities Produced, 2016-2017

TABLE 20: SHARE OF TOTAL VALUE, BY AGRICULTURAL COMMODITY AND LGA (2016-17)

	Brimbank	Hobsons Bay	Maribyrnong	Melton	Moonee Valley	Wyndham	Metro	Victoria
Broadacre crops	82%	0%	0%	5%	0%	1%	1%	9%
Fruit and nuts (excluding grapes)	0%	0%	0%	0%	0%	0%	10%	10%
Hay	1%	0%	0%	0%	0%	1%	3%	4%
Livestock products	2%	0%	0%	5%	0%	7%	9%	29%
Livestock slaughtered and other disposals	13%	0%	0%	70%	0%	16%	26%	37%
Nurseries, cut flowers or cultivated turf	0%	0%	0%	6%	0%	3%	19%	4%
Vegetables for human consumption	2%	0%	100%	13%	0%	73%	32%	8%
Total	100%	0%	100%	100%	0%	100%	100%	100%

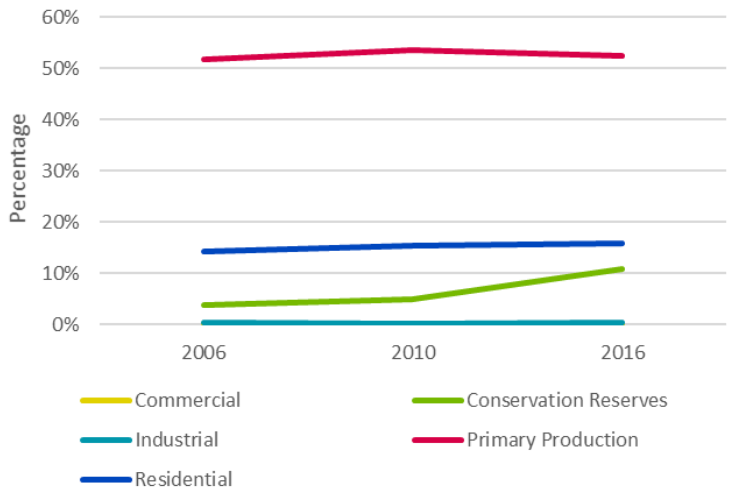
Source: ABS, Value of Agricultural Commodities Produced, 2016-2017

The rate at which land use is changing over time can better describe the reality of urban population growth and any related pressure on land use on the fringes of the UGB and New Growth Areas.

Figure 109 shows the trend in several VLUIS classes over time for rural areas. These are estimates only and should be interpreted with caution. The data suggests that primary production is relatively stable:

- Residential land is increasing slowly.
- Conservation reserves are increasing.
- Commercial and industrial land is low.

FIGURE 109: LAND USE, RURAL AREAS (2006-2016)

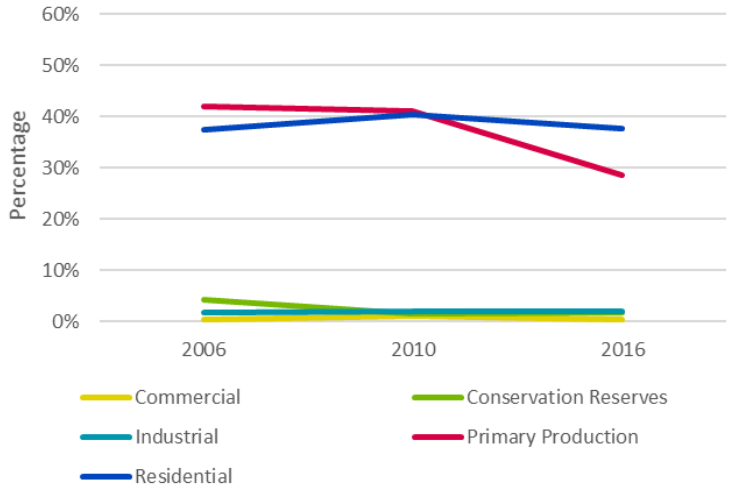


Source: Agriculture Victoria, 2018

Figure 110 shows the trend in several VLUIS classes inside New Growth Areas; again, these estimates should be interpreted with caution. The data suggests that primary production decreased sharply between 2010 and 2016:

- Residential land has remained stable since the beginning of 2006.
- Conservation reserves have declined slightly since the beginning of 2006.
- Commercial and industrial land has remained at a small share.

FIGURE 110: LAND USE, NEW GROWTH AREAS (2006-2016)



Source: Agriculture Victoria, 2018

Water and wetlands

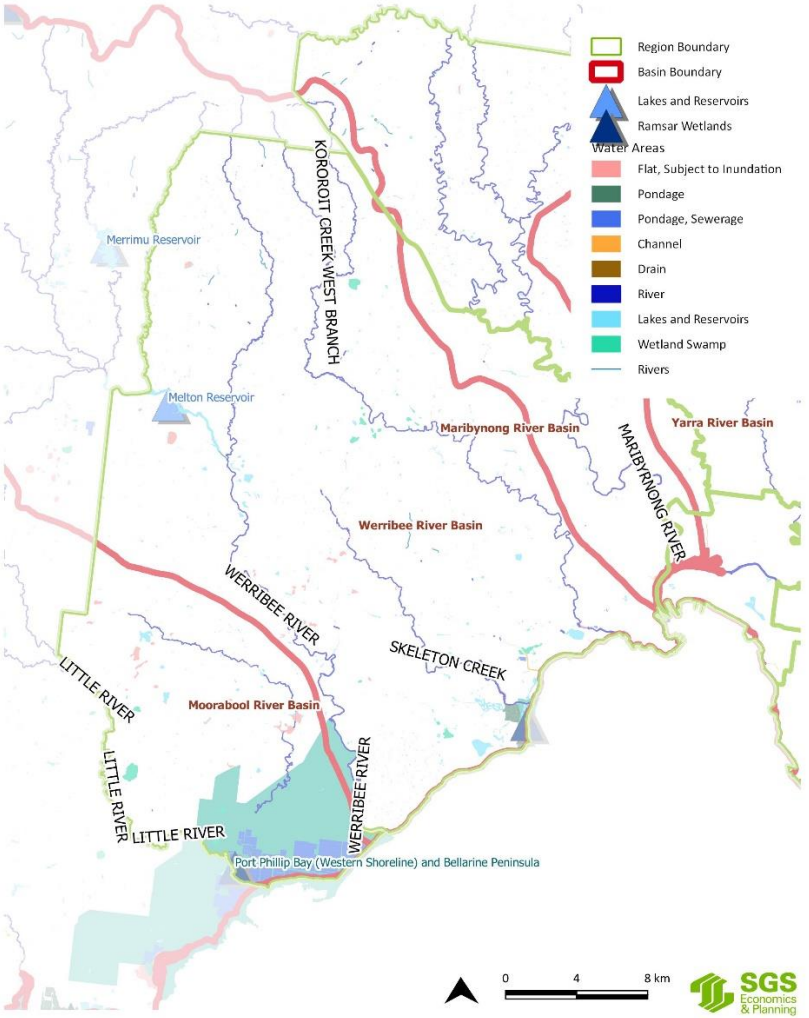
Water assets include lakes/reservoirs, rivers, wetlands and marine areas. They contribute to Melbourne's economy and provide amenity and recreation benefits.

The key assets shown in Figure 111 include three main river systems: the Maribyrnong River, Werribee River and Little River (the river is not shown on the map as it runs on part of the western boundary), as well as Kororoit Creek and Skeleton Creek.

There are two sites of Ramsar wetlands on parts of the western shoreline of Port Phillip Bay, one located towards the south west of the shoreline, and a smaller site closer to the City of Hobson Bay.

The Jawbone Marine Sanctuary is a significant marine asset and there are popular beaches at Williamstown and Altona. Boating clubs located in Hobsons Bay support the marine and local economies.

FIGURE 111: WATER AND WETLANDS (2016)



Source: Department of Environment, Land, Water and Planning, 2018c; Department of the Environment, 2015

6.3 Environmental condition

The capacity of environmental assets to provide environment-related benefits is related to asset condition. All else being equal, environmental assets with a higher condition relative to other assets have the capacity to provide a higher quantity of ecosystem services.

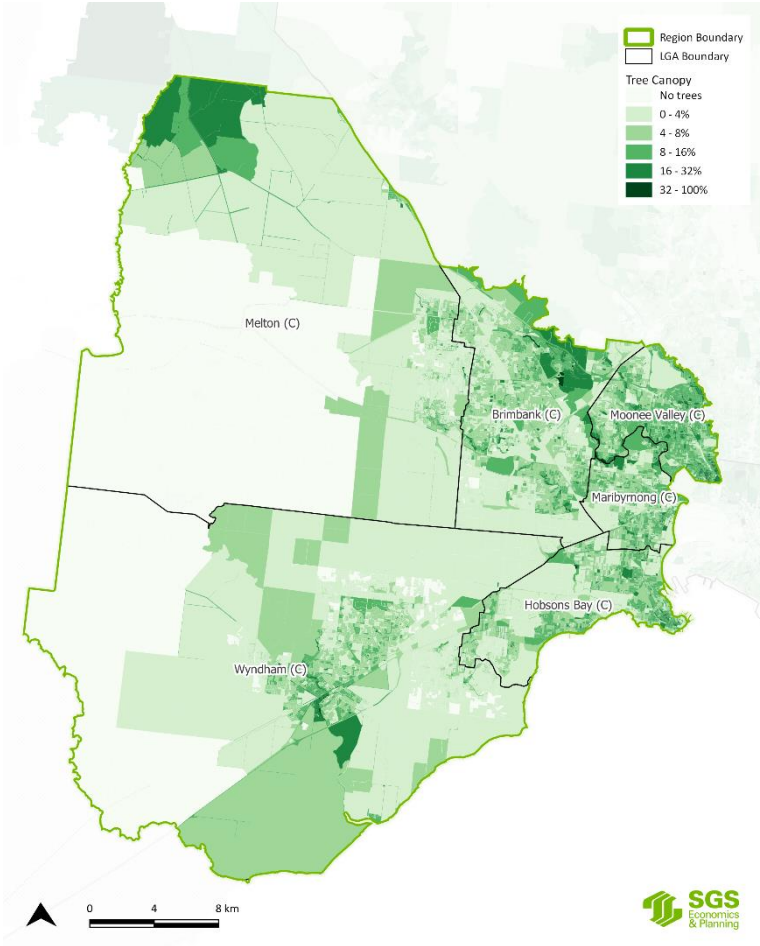
Canopy cover

Canopy cover is a proxy for the condition of terrestrial ecosystems that is related to connectivity, shade, mature ecosystems and higher biodiversity. Canopy cover affects the capacity of the ecosystem to provide regulating services (for example, urban heat island mitigation) and cultural services (for example, recreation).

Figure 112 shows the areas of the Western Metro Region that include measurements of canopy cover:

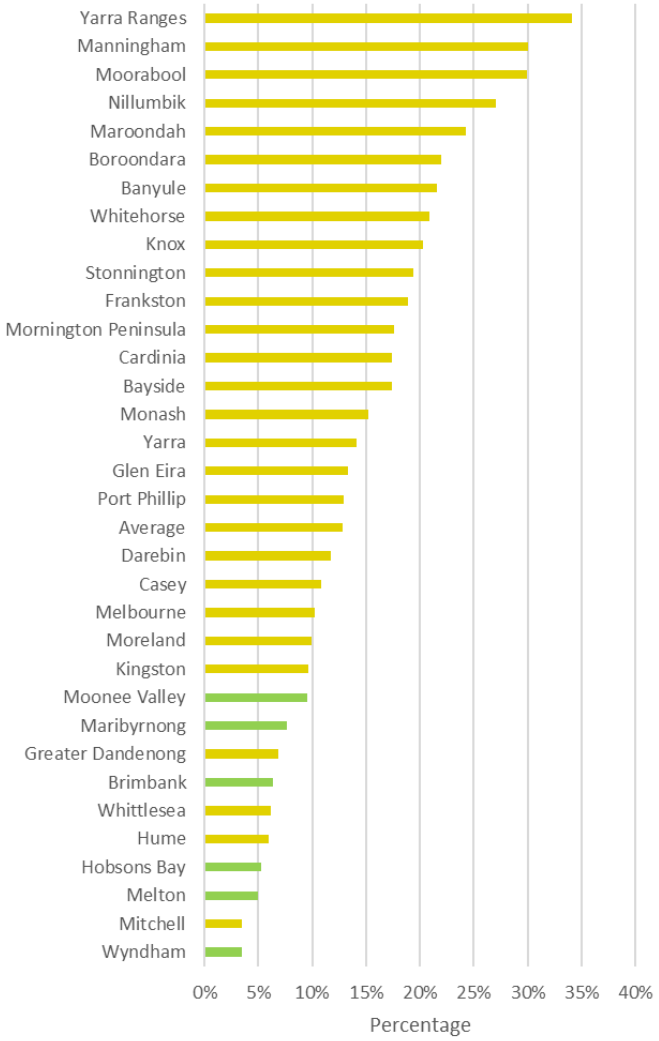
- In large areas of the cities of Melton and Wyndham there is no measurement.
- The large areas with low canopy cover is consistent with information that grasslands are the major ecological community in the region. Further, it reflects agricultural land use and historic industrial land use.
- Tree canopy cover is low compared to other LGAs in metropolitan Melbourne. All six LGAs in the region are ranked in the bottom 10 when it comes to tree canopy cover.

FIGURE 112: TREE CANOPY COVER (2014)



Source: Clean Air and Urban Landscapes Hub, 2018

FIGURE 113: TREE CANOPY COVER BY LGA (%), ALL METRO LGAS (2014)

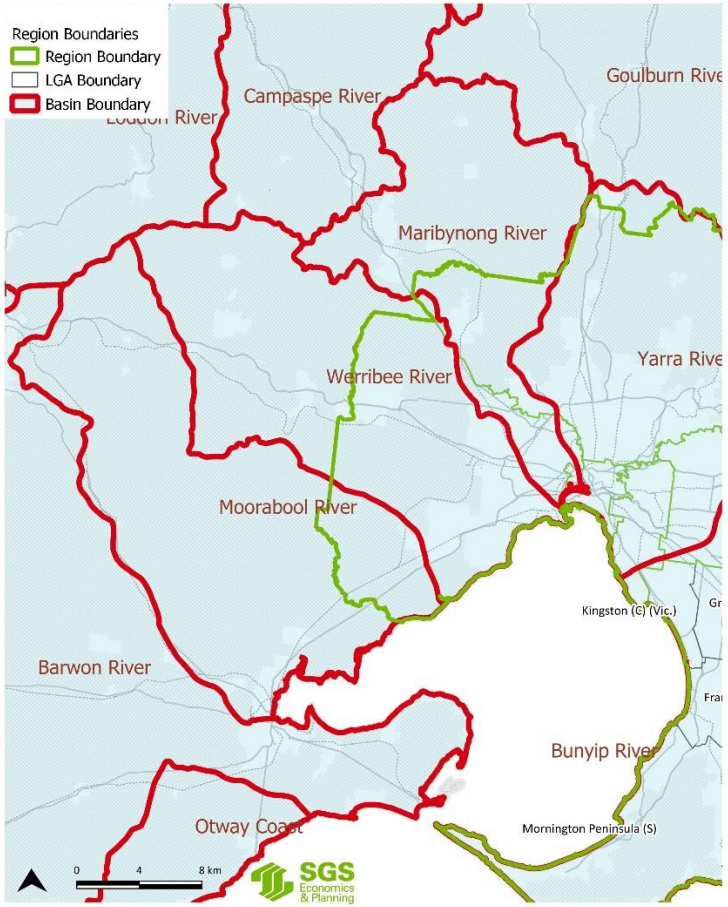


Source: Clean Air and Urban Landscapes Hub, 2018

Stream condition

There are three distinct basins in the Western Metro Region (the Yarra River Basin will be considered in the Northern Metro Region and the Eastern Metro Region reports). Figure 113 describes the extent of the basins.

FIGURE 114: KEY BASINS (2016)



Source: Department of Economic Development, Jobs, Transport and Resources, 2015

The condition of key reaches in each basin is measured using the Index of Stream Condition. The composite measure considers scores of hydrology, physical form, streamside zone, water quality and aquatic life. Data exists for 1999, 2004 and 2010.

The number and percentage of reaches where the Index of Stream Condition for the Maribyrnong and Werribee basins is in good or excellent condition (Table 21 and Figure 114 respectively). It is evident that:

- good/excellent stream condition is relatively rare in the Werribee and Maribyrnong rivers – most observations are in the range of very poor to moderate
- there are no reaches in the Moorabool River basin in good or excellent condition
- the Werribee River reaches are in better condition than the metropolitan average
- there is a declining trend in the percentage of reaches classified as good/excellent condition.

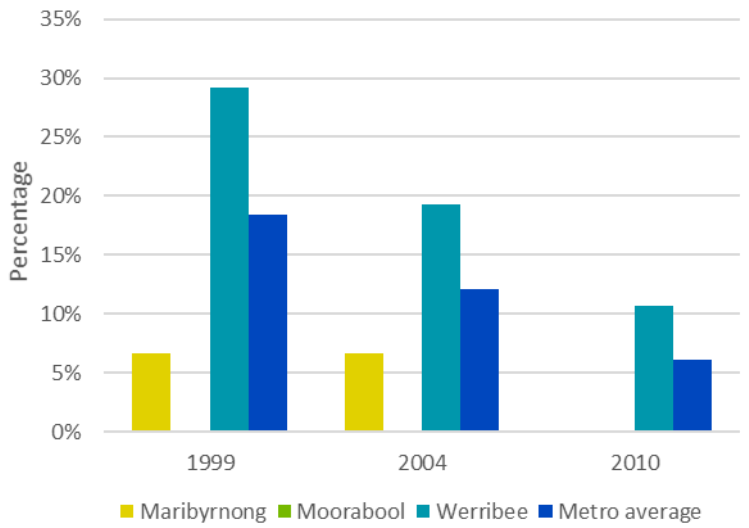
The significant urban development earmarked in the Werribee catchment is a challenge. The lower reaches of the Maribyrnong River have been exposed to industrial activity.

TABLE 21: NUMBER OF REACHES IN GOOD/EXCELLENT CONDITION (1999-2010)

Year	Maribyrnong	Moorabool	Werribee	Metro average
1999	1.00	0.00	7.00	3.82
2004	1.00	0.00	5.00	3.50
2010	0.00	0.00	3.00	2.01

Source: Department of Environment, Land, Water and Planning, 2014 *Reaches with an environmental condition greater than 70% are deemed to be in excellent condition, while reaches with an environmental condition between 51-70% are deemed to be in good condition.

FIGURE 115: PERCENTAGE OF REACHES IN GOOD/EXCELLENT CONDITION (1999-2010)



Source: Department of Environment, Land, Water and Planning, 2014 *Reaches with an environmental condition greater than 70% are deemed to be in excellent condition, while reaches with an environmental condition between 51-70% are deemed to be in good condition.

Coastal and bay health

Bay health can be affected by upstream pollution, which is often elevated during periods of heavy rain. Estuarine and bay systems such as Port Phillip Bay, Western Port and the Gippsland Lakes are subject to reduced water quality, which usually occurs after extreme weather events when high pollutant levels are discharged from rivers and drains. In the past, this has resulted in algal blooms, high turbidity, fish kills and elevated bacteria levels.

The Port Phillip Bay and Western Port generally demonstrate healthy systems. Several indicators were used to assess the Bay, as outlined in the State of the Bays 2016 report (Commissioner for Environmental Sustainability Victoria, 2016). For example:

- nitrogen cycle
- water quality
- intertidal habitat
- seagrass
- reef habitat and dependent species
- fish
- marine dependent birds.

There have been some signs of poor bay quality in the north-west of Port Phillip Bay, as outlined in the State of the Bays 2016 report. For example:

- Signs of stress in reefs and seagrass could be associated with nutrient inputs (most likely from the Western Treatment Plant, the Werribee River and the Yarra/ Maribyrnong rivers) and poor light conditions.
- Reductions in denitrification efficiency in Hobsons Bay for a maximum of a month at a time are likely to create acute short-term impacts (for example, algal blooms, beach closures), particularly if the projected nitrogen load increase is not mitigated. Large storm events can reduce denitrification efficiency.[16]
- High levels of phytoplankton (9.9 million cells/L) at the Hobsons Bay site in December 2009 coincided with the break of the Millennium drought and a 46 mm rainfall event on 22 November 2009. Port Phillip Bay can experience periods of enhanced plankton activity with significant catchment discharges to the Bay (predominantly in the north), and relatively slow flushing rates. Some of the plankton types in the Bay can harm aquatic life and even human health (Commissioner for Environmental Sustainability Victoria, 2016).

Of Williamstown, Altona and Werribee South beaches, Werribee South Beach had a swim advisory warning issued and it was after this period. The advisory occurred on 15 February 2017 (EPA Victoria, n.d.). However, most (94–97%) of the 36 beaches monitored in the Bay met the EPA's objectives for swimming 2014 – 2016 (Commissioner for Environmental Sustainability Victoria, 2016).

[16] The denitrification efficiency process generally maintains the nutrients in Port Phillip Bay at an optimal level for biodiversity. Denitrification efficiency lower than 60% in Port Phillip Bay (40% for Hobsons Bay) indicates the denitrification process is disrupted.

Air quality

The atmosphere is integral to human health. By burning a range of materials in the production process, economic activity can impact the condition of the atmosphere. Numerous variables can be used to measure air quality, including:

- particulate matter 2.5 (PM2.5) – small particles that can be breathed deep into the lungs
- particulate matter 10 (PM10) – larger particles that can irritate the eyes and throat, and affect symptoms for those with existing heart and/or lung conditions
- carbon monoxide (CO) – a colourless gas found in smoke that displaces oxygen in the blood
- nitrogen dioxide (NO2) and sulphur dioxide (SO2) – gases that can affect the throat and lungs.

Safe thresholds vary across the variables and by the length of exposure (that is, daily thresholds and yearly thresholds).The World Health Organisation air quality guidelines suggest an annual mean of 20ug/m3 and a daily mean of 50 ug/m3 as long and short-term thresholds for PM10. The notes below Figure 116 and Figure 116 provide information on other thresholds. Annual levels of pollution are presented graphically in this section, while daily levels are discussed in the text.

From 2003 to 2014, the EPA monitored air quality across several locations in the Western Metro Region, including:

- Altona North
- Brooklyn
- Footscray
- Point Cook.

Depending on the location, data is only available for some of the variables. As a result, the data presented in this report is not comprehensive; care should be taken when interpreting the data. Air quality is measured at a point location and there may be variation in air quality across the geography.

Since the beginning of 2003, daily thresholds for PM10 have been exceeded at Brooklyn and Footscray. The number of days exceeded has steadily increased at Brooklyn since PM10 began being measured in 2010, and as of 2014 was at 21 days, while the number of days has been less frequent since it reached a high of 14 days in 2009. PM2.5 has also been exceeded daily in Footscray.

Trends in pollution relative to annual safe thresholds at each of the locations are shown in Figure 116. Note that the level of the variable relative to safe thresholds is shown on the y-axis. A value less than 1 means that flows are less than the safe threshold, a value of 1 means that flows are equal to the safe threshold, and a value greater than 1 means that flows have exceeded the safe threshold.

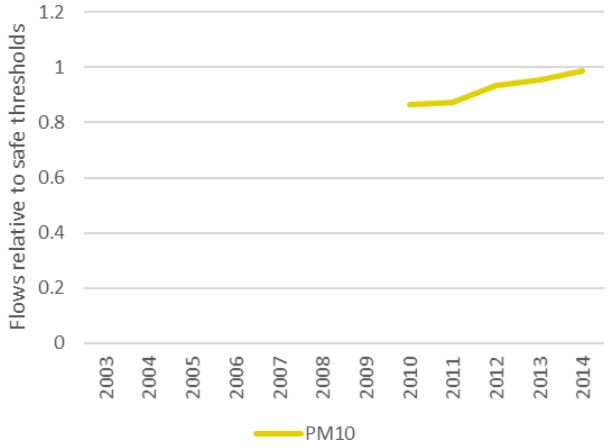
Levels of air quality at each site have been relatively low compared to safe long-term thresholds. The exception is for PM10 (Footscray and Brooklyn) and PM2.5 (Footscray), which is relatively high. Air quality in the region is similar to the metropolitan average (Figure 116d); however, PM10 levels are high in Brooklyn.

FIGURE 116: LONG TERM AIR QUALITY THRESHOLD, Altona North (2003-2014)

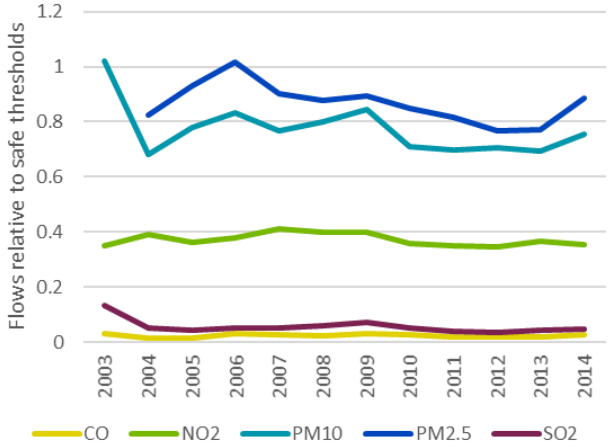
Source: EPA Victoria, 2014, safe threshold is exceeded if PM2.5>8, PM10>25, O>9, NO2>30, SO2>20

FIGURE 117: LONG TERM AIR QUALITY THRESHOLD CONT. (2003-2014)

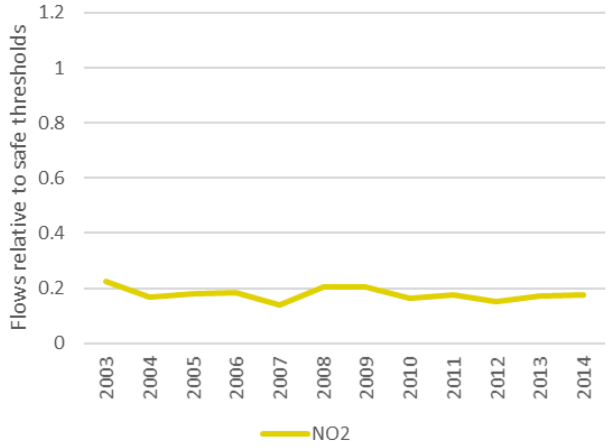
a) Brooklyn



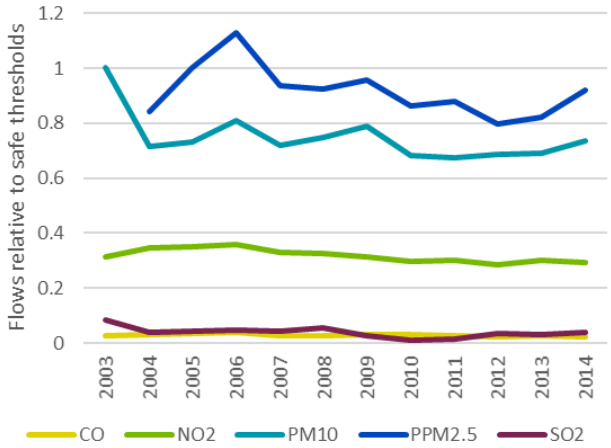
b) Footscray



c) Point Cook



d) Metropolitan average



Source: EPA Victoria, 2014, safe threshold is exceeded if PM2.5>8, PM10>25, O>9, NO2>30, SO2>20

6.4 Environmental risks and hazards

Economic, social and environmental benefits are at risk of adverse impacts associated with changing environmental conditions.

The Western Metro Region has been hit by a flood or storm most years since 2009 (Commonwealth of Australia, 2018). With climate change occurring, it is likely that this trend will continue, and the frequency of such events might rise.

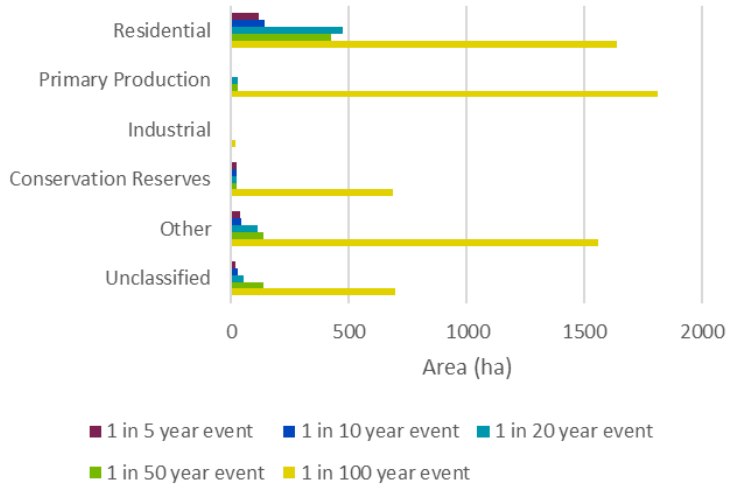
Flood

With a changing climate, areas are at increased risk of flooding because of more extreme weather events. Figure 118, Figure 119 and Figure 120 show the projected flood extent for several different probabilistic events. For example, a five-year Average Recurrence Interval (ARI) refers to a one in five-year event, a 10-year ARI refers to a 1 in 10-year event, and so on. The figures show:

- A relatively small area is expected to be affected by a 1 in 5-year event.
- As the flood event becomes less likely (and more severe) the area affected increases.
- In the event of a 1 in 100-year flood event, relatively even amounts of land are at risk for different land types in the event of high probability floods. Residential land types have a relatively high area of land modelled to be impacted, which will reduce the land available for development.
- Compared to other metropolitan regions, the Western Metro Region is one of the most affected by flood.
- ARIs are based on historical events; this means there is an increasing chance of such events occurring associated with climate change.

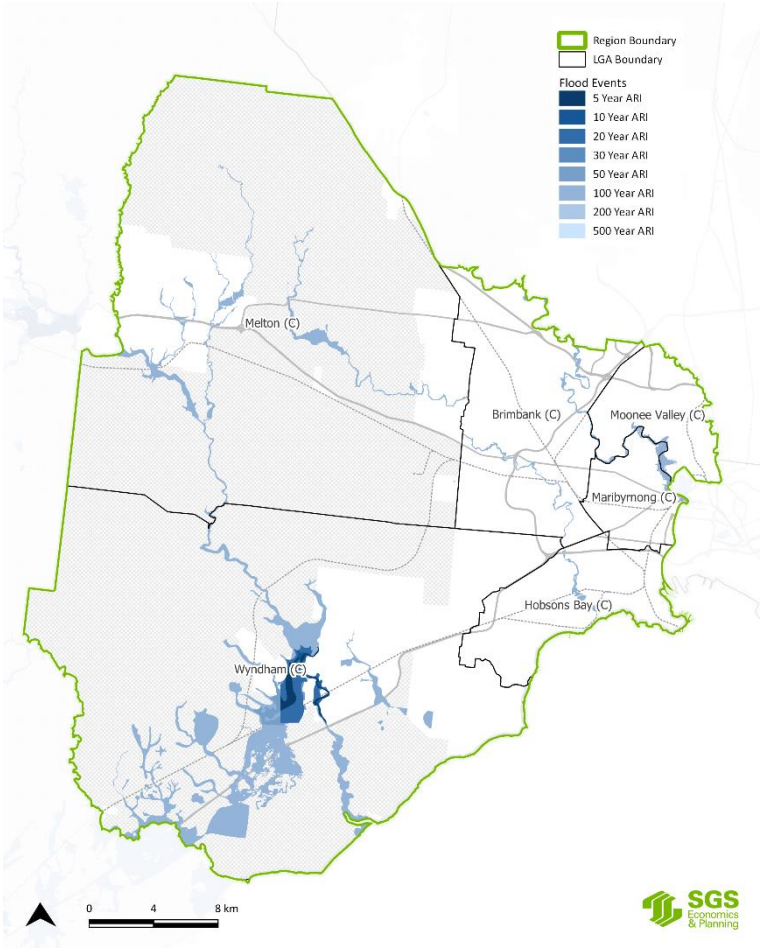
Building applications for properties likely to be affected by flooding are referred to Melbourne Water, which sets conditions on proposed development.

FIGURE 118: LAND AT RISK OF FLOOD (HA), MODELLED BY LAND USE TYPE (2009)



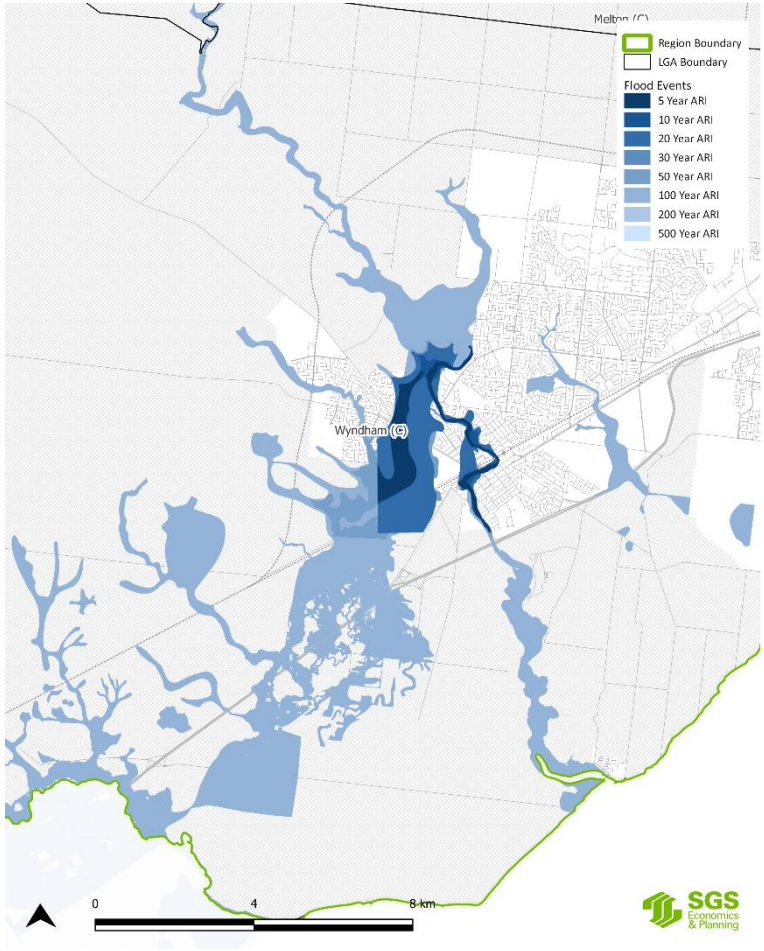
Source: Department of Environment, Land, Water and Planning, 2018d *VLUIS data has been used as hazards are primarily in the outer areas of the region (where the VLUIS data better describes land use). Other includes extractive industries, community services, sport, heritage and culture, and infrastructure and utilities. Unclassified is land not requiring an active assessment or record for rate, tax or levy purposes. Data used is considered to the latest public dataset available. Nuisance and localised flooding may extend beyond what is shown by the data.

FIGURE 119: MODELLED FLOOD EXTENT (2009)



Source: Department of Environment, Land, Water and Planning, 2018d. Data used is considered to the latest public dataset available. Nuisance and localised flooding may extend beyond what is shown by the data.

FIGURE 120: MODELLED FLOOD EXTENT, ZOOM (2009)

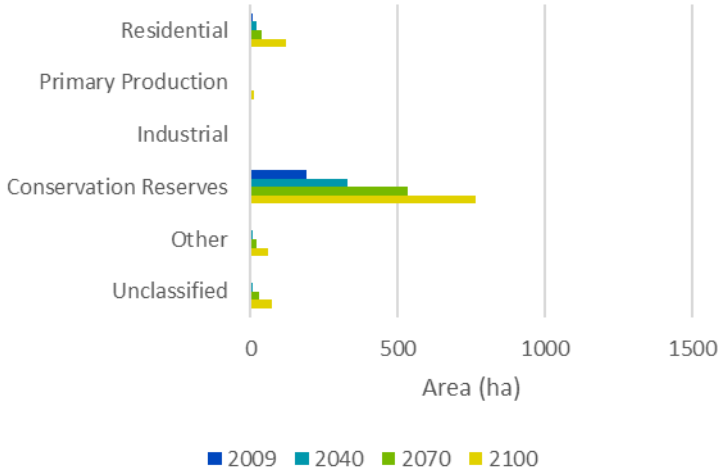


Source: Department of Environment, Land, Water and Planning, 2018d. Data used is considered to the latest public dataset available. Nuisance and localised flooding may extend beyond what is shown by the data.

Sea level rise

Sea level rise is another consequence of global warming. Sea level rise has the potential to impact coastal areas in the Western Metro Region. This impact is also more threatening when considering storm surges. Storm surges are 1 in 100-year events and add to the underlying projection of area inundated by sea level rise.

FIGURE 121: PROJECTED AREAS INUNDATED, SEA LEVEL RISE (2009-2100)

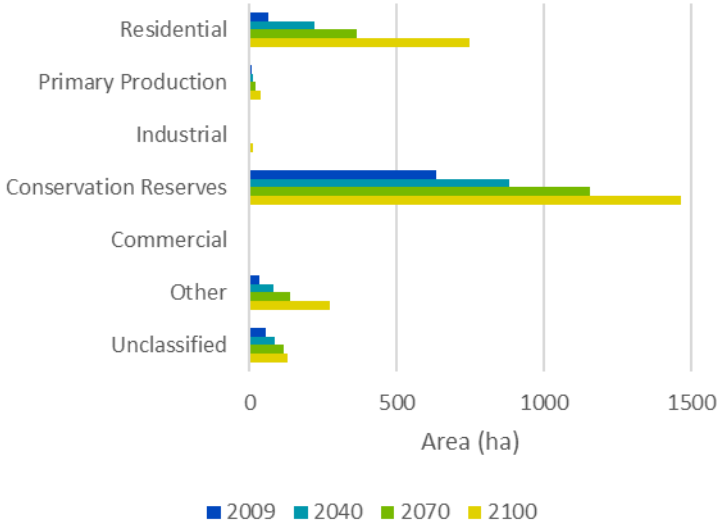


Source: Department of Environment, Land, Water and Planning, 2018e *VLUIS data has been used as hazards are primarily in the outer areas of the region (where the VLUIS data better describes land use). Data used is considered to the latest public dataset available. Nuisance and localised sea level rise may extend beyond what is shown by the data.

Figure 121, Figure 122, Figure 123 and Figure 124 show that:

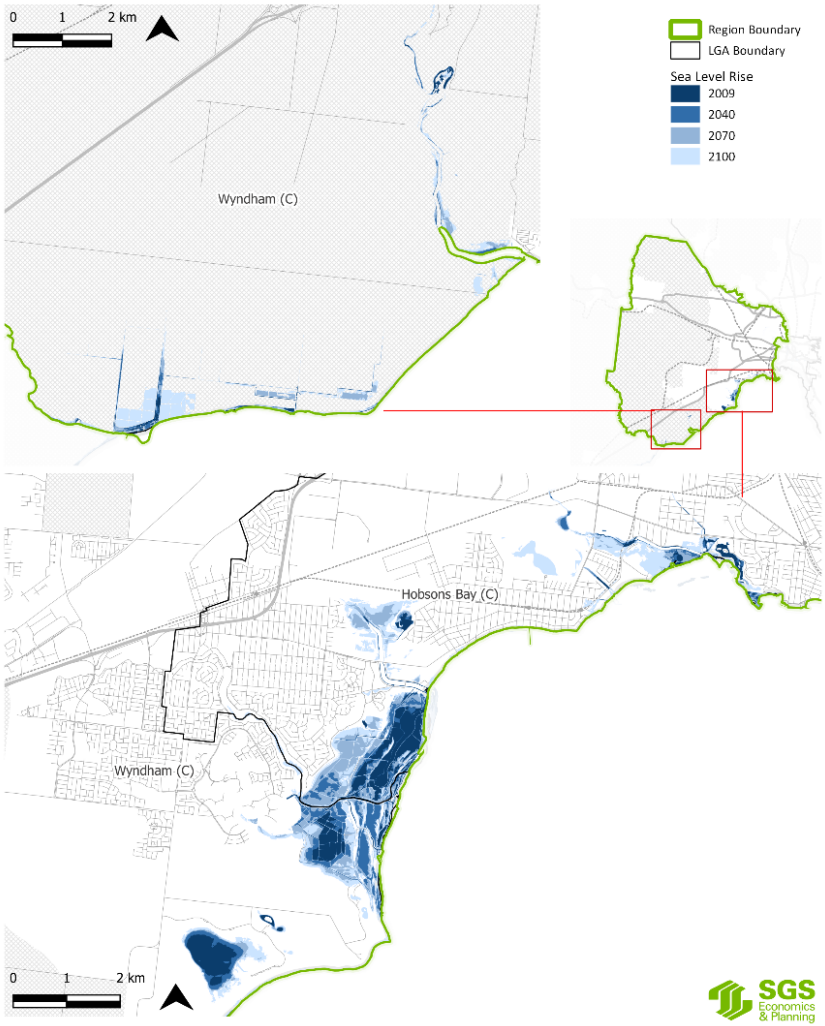
- there is a considerable amount of residential and conservation areas that may be affected by sea level rise
- there is a much larger area of land at risk of storm surge
- the Ramsar wetlands and the petrochemical industry areas are at risk of sea level rise and sea level rise with storm surge. Residential areas in the City of Hobsons Bay are also at risk

FIGURE 122: PROJECTED AREAS INUNDATED, SEA LEVEL RISE WITH STORM SURGE (2009-2100)



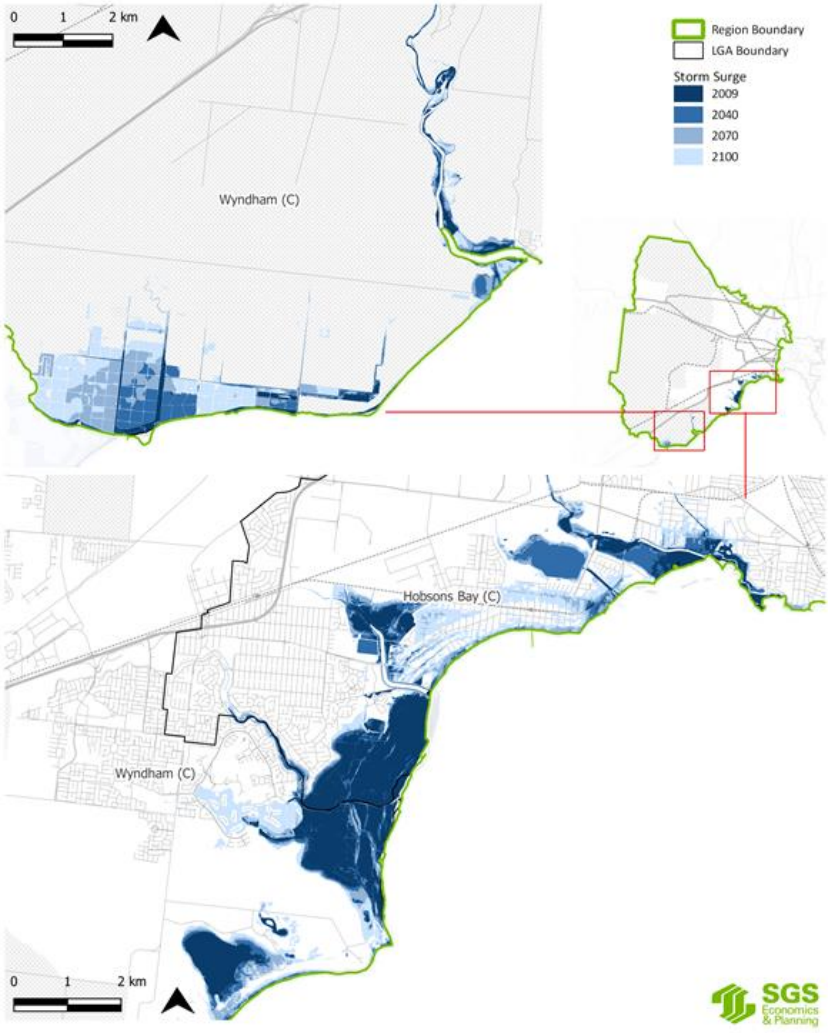
Source: Department of Environment, Land, Water and Planning, 2018e *VLUIS data has been used as hazards are primarily in the outer areas of the region (where the VLUIS data better describes land use). Data used is considered to the latest public dataset available. Nuisance and localised sea level rise may extend beyond what is shown by the data.

FIGURE 123: AREA AFFECTED BY PROJECTED SEA LEVEL RISE (2009-2100)



Source: Department of Environment, Land, Water and Planning, 2018e. Data used is considered to the latest public dataset available. Nuisance and localised sea level rise may extend beyond what is shown by the data.

FIGURE 124: AREA AFFECTED BY PROJECTED STORM SURGE (2009-2100)



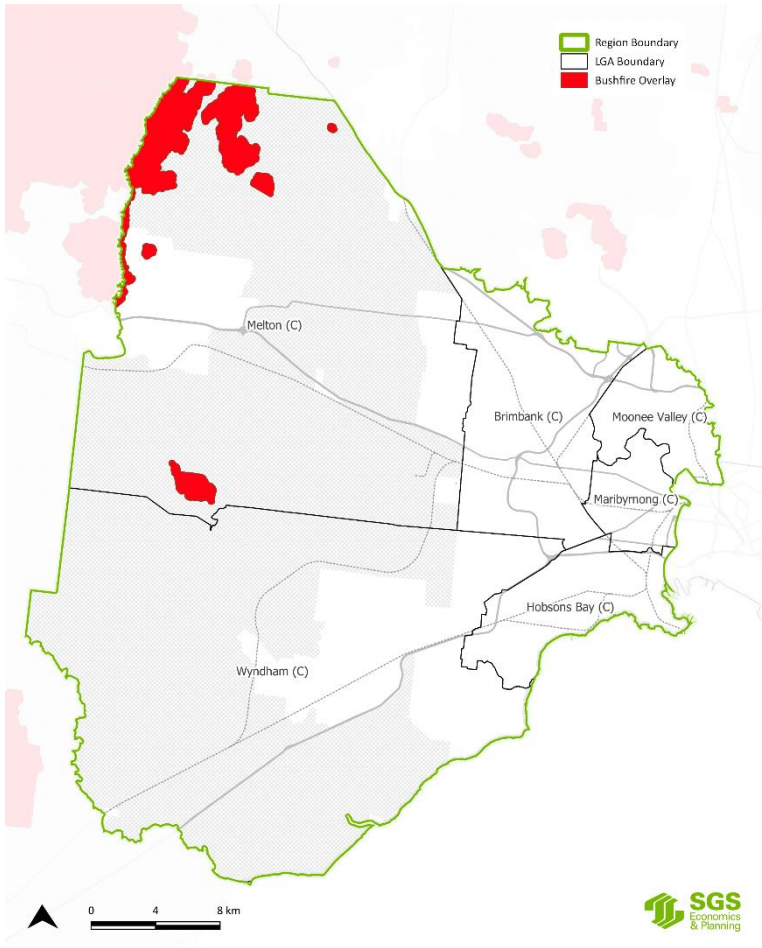
Source: Department of Environment, Land, Water and Planning, 2018e. Data used is considered to the latest public dataset available. Nuisance and localised sea level rise may extend beyond what is shown by the data.

Bushfire

Bushfire risk is extremely relevant for Melbourne. There are greater risks for areas of particular classes of vegetation that burn more easily. The Bushfire Management Overlay is a planning control applied to land with the potential to be affected by extreme bushfires. It does not specify which areas are at more risk, although it is expected that highlighted areas will be at more risk as climate change occurs.

Figure 125 shows the area at risk of bushfire in the Western Metro Region. Areas at risk of bushfire include areas of agriculture and the Brisbane Ranges National Park, both in the north west of the region.

FIGURE 125: BUSH FIRE RISK OVERLAY (2016)



Source: Department of Environment, Land, Water and Planning, 2018b

Urban heat island effect and heat risk

People and animals will experience rising average temperatures and more extreme heat because of global warming. As infrastructure is built and natural environments removed, heat is absorbed and land temperatures rise.

The urban heat island effect (UHI) – a measure of the deviation of urban temperature relative to a non-urban baseline (Sun et al., 2018) – is one example of changing conditions. Urban heat islands can affect the longevity of infrastructure, energy demand, health and water quality. Figure 126 shows the distribution of UHI in the Western Metro Region in 2014. It illustrates:

- a relatively even distribution
- a low effect in the Ramsar wetlands and the Brisbane Ranges National Park, given water helps to cool the landscape
- high effects in the cities of Wyndham and Melton.

Work by Sun et al. (2018) correlates vegetation (including tree canopy data) to UHI. They find that tree cover structure is a useful predictor of variation in UHI. Grass and shrub vegetation are poor predictors of UHI.

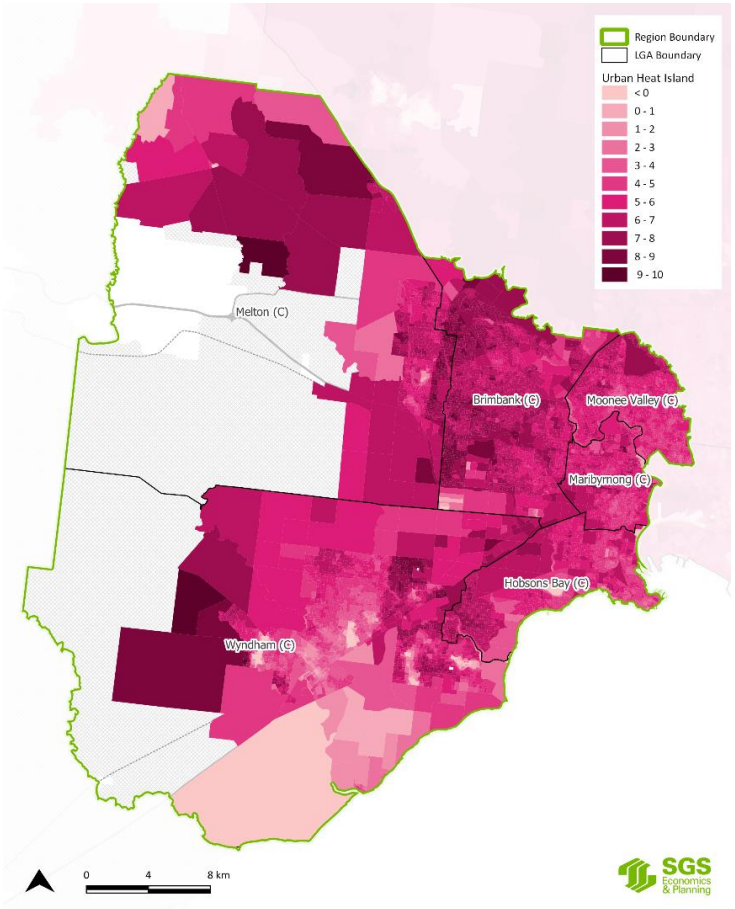
Heat Vulnerability Index (HVI) describes the impacts of heat increases, such as that posed by UHI. The HVI consists of three input layers: heat exposure, sensitivity to heat and adaptive capability (Sun et al., 2018). Figure 127 shows the spatial variation of the HVI in the Western Metro Region.

- The region is quite varied when it comes to heat vulnerability. All Melbourne regions show a variation in vulnerability that ranges from low to high depending on the location.
- The HVI does not always overlap with high UHI areas because other components of the HVI such as sensitivity to heat and adaptive capability can offset urban heat islands and heat exposure.

Separate to work completed by Sun et al. (2018), Loughlan et al. (2013) describe areas that are vulnerable and how this is related to ambulance callouts on hot days. Loughlan used several environmental, health and demographic variables to develop the vulnerability index for heat stress by postcode.

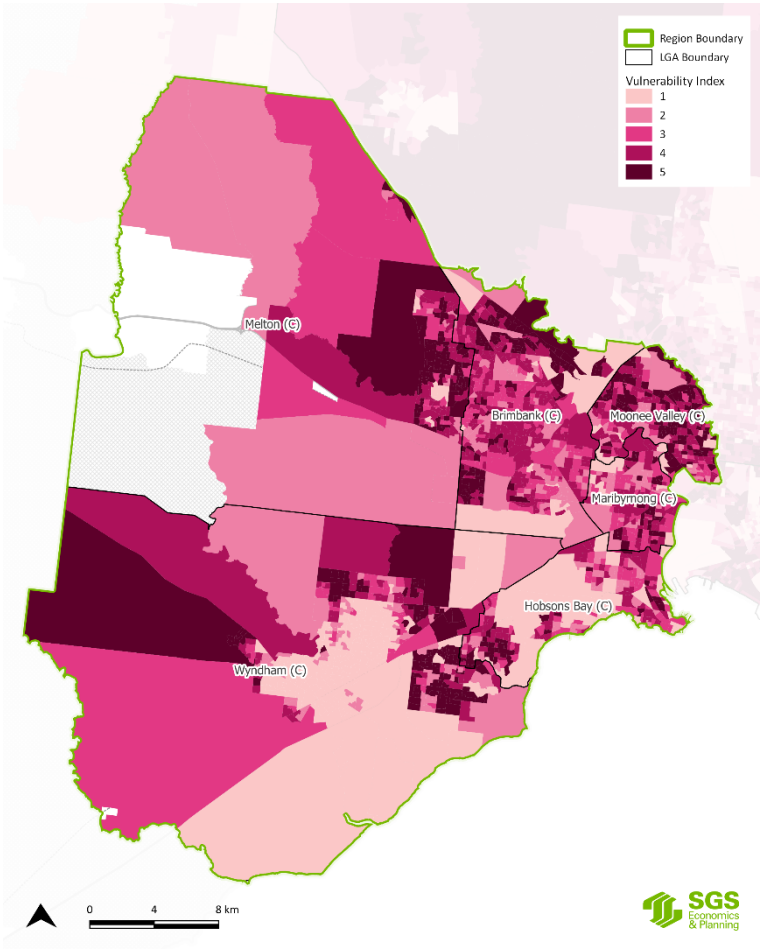
Analysis showed that heat vulnerability correlates with ambulance call outs on extreme heat days. It also shows that ambulance callouts are high in some coastal locations, which could be related to visitor numbers during hot periods.

FIGURE 126: URBAN HEAT ISLAND EFFECT (2014)



Source: Sun et al., 2018* Mean UHI in degrees Celsius shown in legend. Missing data for eastern areas of the region

FIGURE 127: HEAT VULNERABILITY INDEX (2014)



Source: Sun et al., 2018. Missing data for eastern areas of the region

Contaminated ground water and other sites

The EPA has an ongoing program of monitoring sites for contamination and other risks, particularly focusing on the potential impacts on health. At the time of writing there were 80 sites listed on the EPA priority register in the region.[17] Key reasons for being on the register include:

- former and current industrial sites that require management and/or clean up
- former landfill sites that require clean up
- current service station that requires ongoing management
- illegal dumping that requires clean up.

The data shown in Figure 128 and Figure 129 only provide a snapshot of contamination in the Western Metro Region. The available data does not include all sites known or likely to be contaminated.

Collection of EPA priority site data over time could show areas that are more likely to be contaminated and the time taken to manage them to reasonable levels.

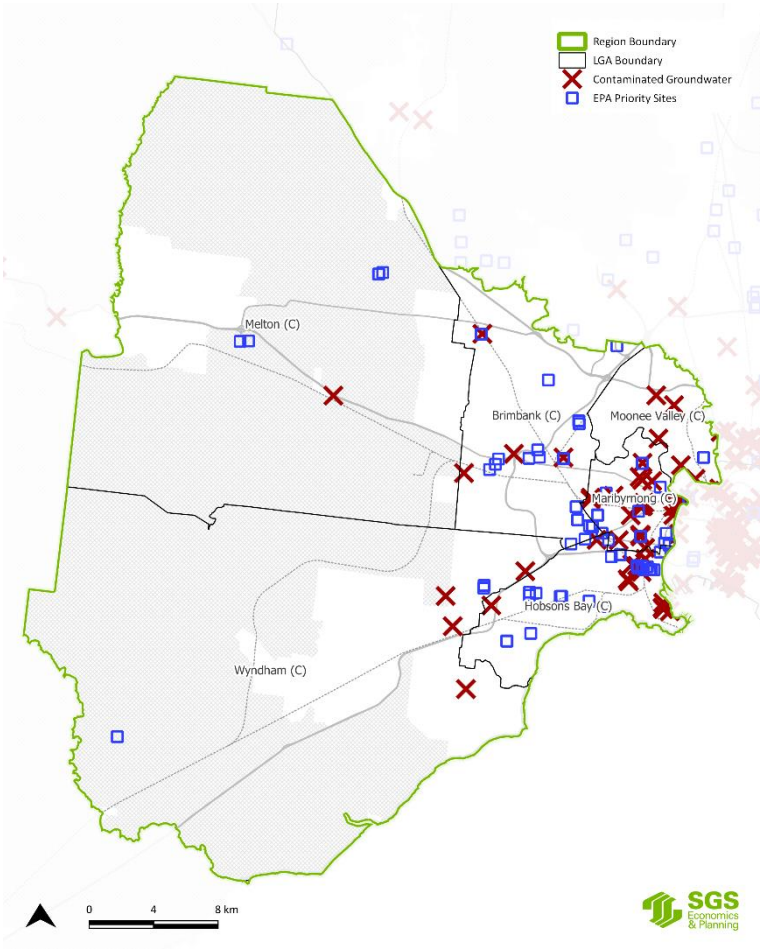
Concentration of contaminated groundwater sites (Figure 127 and Figure 128) can inform how economic activity is associated with the health of the environment.[18] Together, the spatial data shows that contaminated sites:

- are in the inner/urban areas of the region
- are likely to be where industry has previously operated.

Soil and groundwater contamination need to be addressed and remediated to acceptable levels before land can be changed to more sensitive uses, such as residential from industrial.

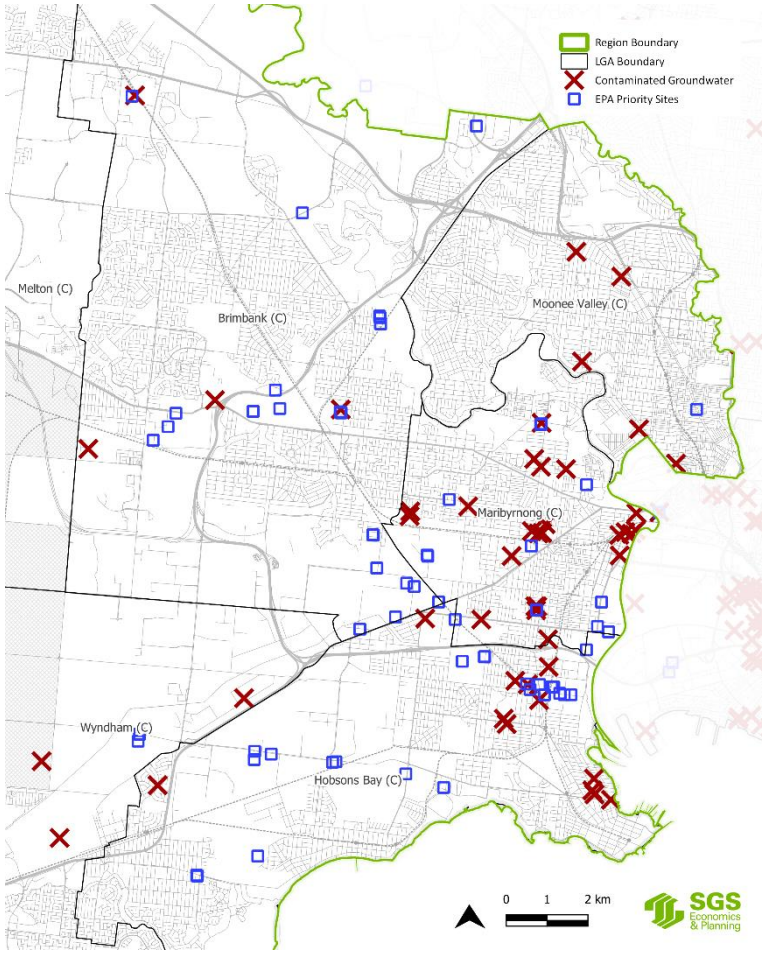
[17] http://www.vvg.org.au/
[18] Groundwater quality restricted use zones data used

FIGURE 128 EPA PRIORITY SITES AND CONTAMINATED GROUNDWATER SITES (2018)



Source: EPA Victoria, 2018a, 2018c

FIGURE 129 EPA PRIORITY SITES AND CONTAMINATED GROUNDWATER SITES, ZOOM, (2018)



Source: EPA Victoria, 2018a, 2018c

6.5 Environmental flows

From an economic perspective, much activity relies on natural capital along with human and physical capital to produce goods and services. For example, materials such as coal, timber and gas are essential in generating energy for almost any economic activity. Other basic needs such as food, water and shelter, all rely on the environment.

Further, the environment provides a host of other services, not recognised as being a part of the economy, that affect human wellbeing. This includes:

- provisioning services – likely to be covered as an input into economic activity
- regulating services – including carbon sequestration and flood regulation
- recreational and cultural services – including spiritual experiences and a sense of belonging.

Such services are often difficult to measure. They are sometimes not incorporated into decision-making and when they are, they may not be represented accurately.

Economic activity also generates residuals (such as waste, wastewater, air pollution, greenhouse gas emissions) and the environment is typically a sink for these flows. For example, effluent/wastewater is typically discharged into other water bodies, and carbon flows to the atmosphere. The environment can play an active or passive role in processing these residuals. Water waste is processed by the next ecosystem, while solid waste can consume space. The management of residuals and areas tasked with dealing with them can affect the condition of environmental assets and their capacity to provide services from which humans benefit.

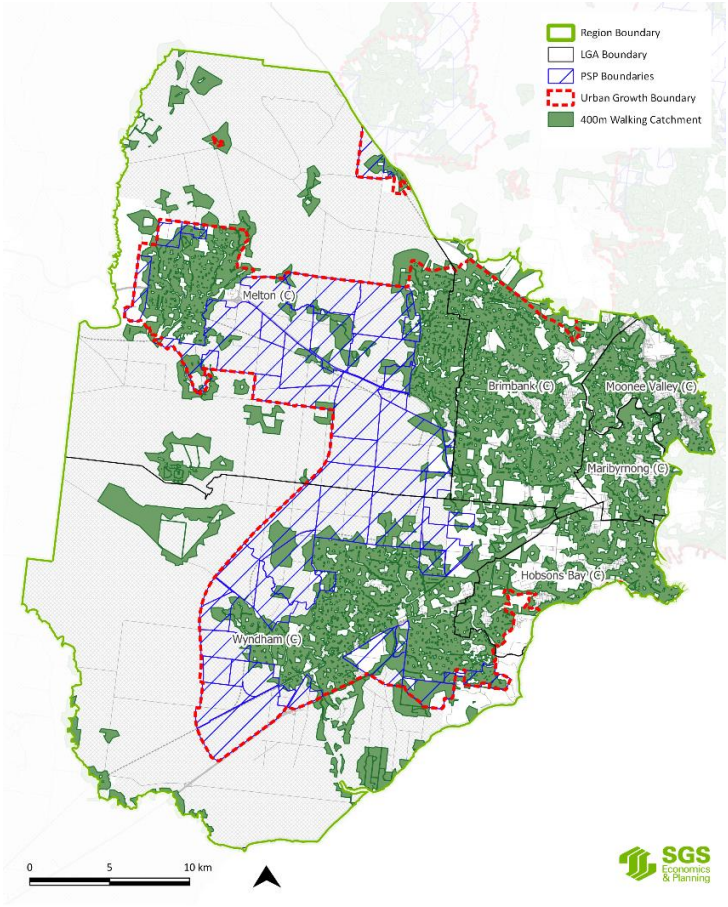
Access/use of green space

Green space and parks contribute to health, liveability and biodiversity outcomes. Figure 130 shows areas within the Western Metro Region within 400 metres from the nearest public open space (this is a subset of the data presented in Figure 97). It is evident that:

- a large share of inner areas have access to open space
- there are large gaps in accessibility in the New Growth Areas; however, planned open space is not represented in the data set.

Care should be taken when interpreting the results. The data is mainly relevant for urban areas, where there are higher populations and walking paths to access open space.

FIGURE 130: 400 METRE WALKING CATCHMENTS (2017)



Source: Victorian Planning Authority, 2017b

The diversity of open space can provide the population with greater choice and benefits. Table 22 shows the percentage of households with access to six different open space types, with private open space removed from the classes described earlier in the report as it is already inaccessible. Approximately 38 per cent of the Western Metro Region had one type of green space accessible within 400 metres.[19]

- there are considerable differences in accessibility across locations inside the UGB, the New Growth Areas and rural areas
- almost all areas in the UGB have access to at least one type of open space
- the region has middle range access compared to other metro regions
- access to open space is low in the New Growth Areas, which may reflect that the data does not consider planned areas of open space. Delivering these areas will bring the benefits of open space to the growing population.

Figure 130 (overleaf) further shows how the diversity of accessibility to the six types of open space varies across the Western Metro Region. Access is relatively diverse in each LGA, with some variation.

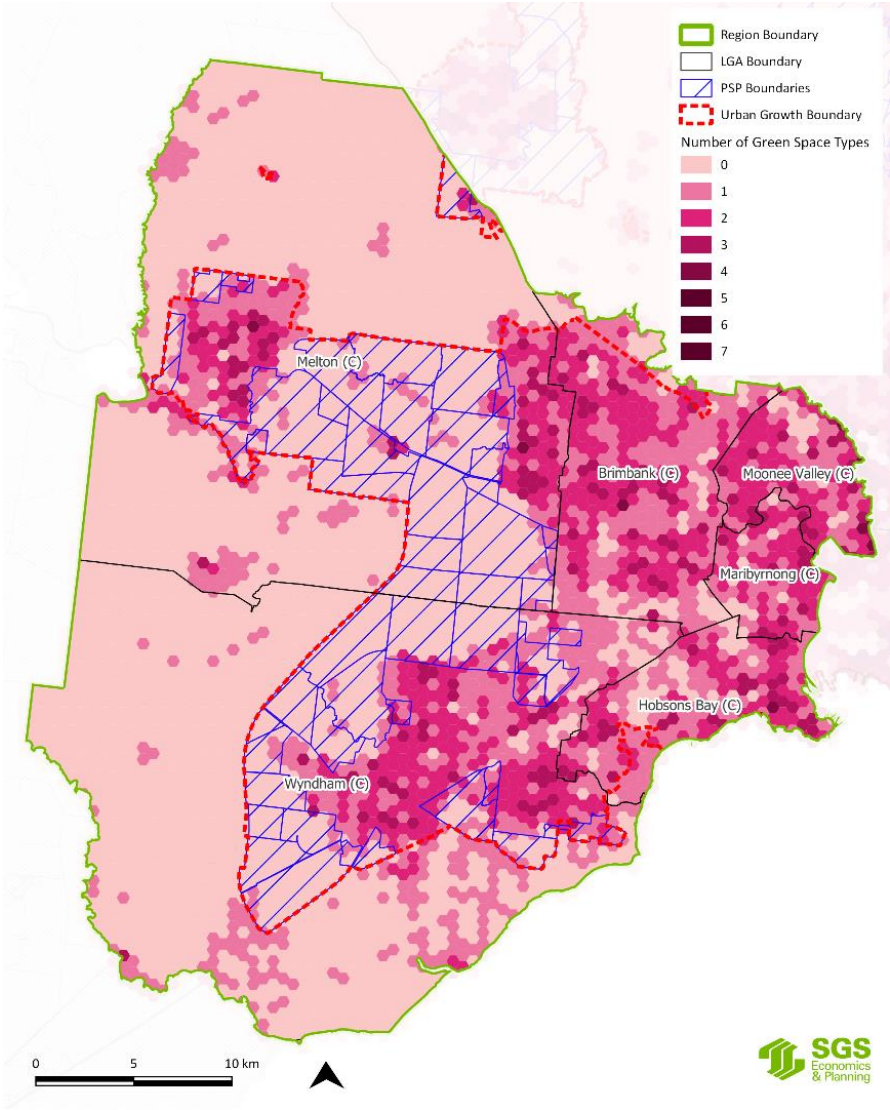
[19] The SGS Hex Pixel uses a small-scale hexagonal grid to represent spatial data. Hex centroids refer to the centre point of each SGS Hex Pixel. Distance has been measured from hex centroid to each of different types of VPA open space (not restricted to the west)

TABLE 22 PERCENTAGE OF REGION WITH GREEN SPACE WITHIN 400M BY GREEN SPACE TYPE (2017)

Open space Typology	Rural	New Growth Areas	UGB (excl. New Growth Areas)	All
Public and Built	0%	0%	0%	0%
Public and Green	9%	21%	81%	33%
Public and Mixed	0%	2%	22%	7%
Restricted and Built	0%	0%	1%	0%
Restricted and Green	1%	1%	1%	1%
Restricted and Mixed	2%	10%	44%	17%
Total with access to at least 1 category	12%	26%	89%	38%
No access to any category	88%	74%	11%	62%
Total	100%	100%	100%	100%

Source: Victorian Planning Authority, 2017c Note: open space definitions are the same as those used in figure 99. Note that sum of each open space typology does not equate to the row named total with access to at least 1 category field. This is because one hex could have access to two of the open space types. Therefore, it does not equal the sum of its parts. Also note: the data used to measure New Growth Areas represents 119 precincts of declared growth areas – see https://data-planvic.opendata.arcgis.com/datasets/psp-boundaries

FIGURE 131: NUMBER OF DIFFERENT GREEN SPACE TYPES ACCESSIBLE WITHIN 400M (2017)



Source: Victorian Planning Authority, 2017c

Visitation to parks

Accessibility can help to alleviate barriers associated with public health benefits. Accessibility does not, however, mean that public benefits will be achieved. For instance, human behaviour and time are other barriers to public health benefits.

Figure 132 shows the percentage of the population in each LGA that visits green space at least one time a week.

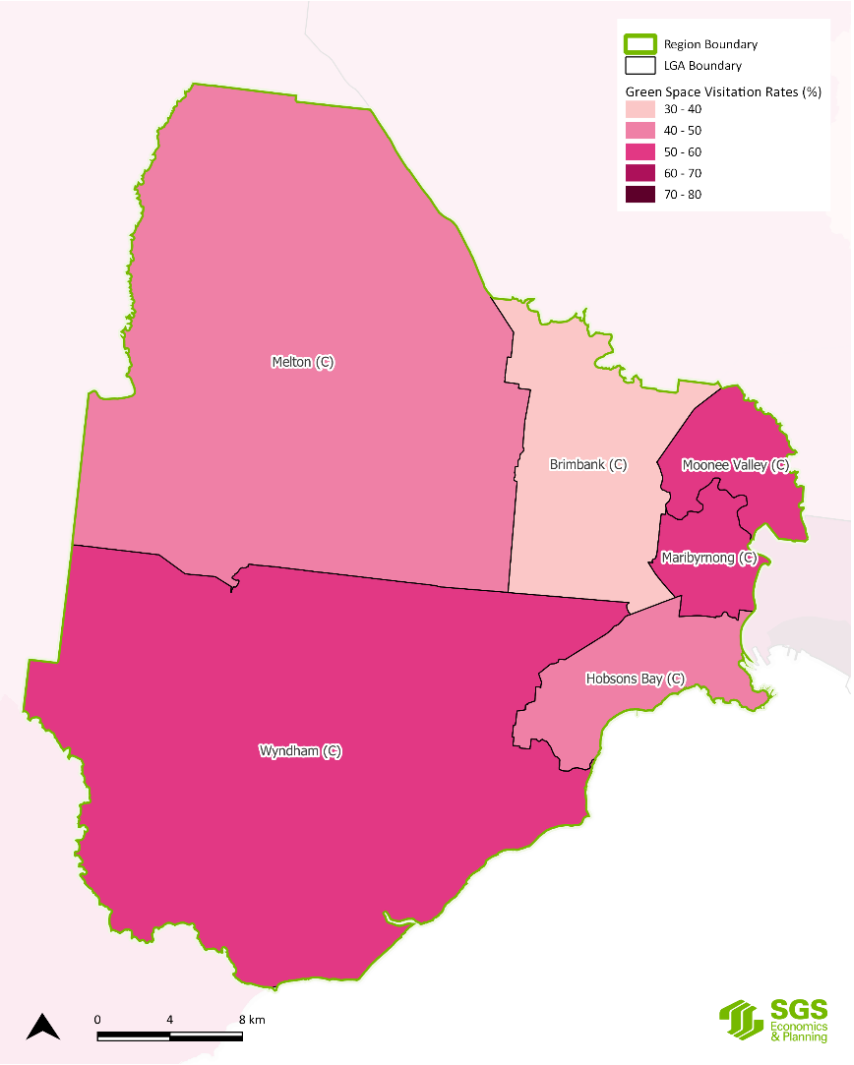
- A relatively low percentage of residents in the Brimbank and Melton LGAs visit green space at least once a week.
- A relatively high percentage of residents in inner areas of the cities of Maribyrnong and Moonee Valley visit green space at least once a week.

Concurrent analysis of accessibility and visitation mapping shows that despite having similar accessibility, a lower percentage of residents in the City of Brimbank visit green space at least once a week when compared to the cities of Moonee Valley and Maribyrnong. This may be due to the quality and attributes of parks and perceptions of safety; further research is required.

Several Parks Victoria parks in and just outside the Western Metro Region boundary receive many visitors annually:

- Werribee Park is the sixth most visited destination in Victoria (400,000 per year), and Point Cook Coastal Park is ninth most visited (275,000 per year)
- the You Yangs are a popular destination just outside the region, with annual visitors estimated to be the same as Werribee Park. Further research is required to understand the users of these parks and where they originate from to inform future visitation patterns.
- This data does not give a full description of visitation of the Western Metro Region as it is only for Parks Victoria data.

FIGURE 132: % OF RESIDENTS VISITING GREEN SPACE (1+ TIMES A WEEK) (2011)

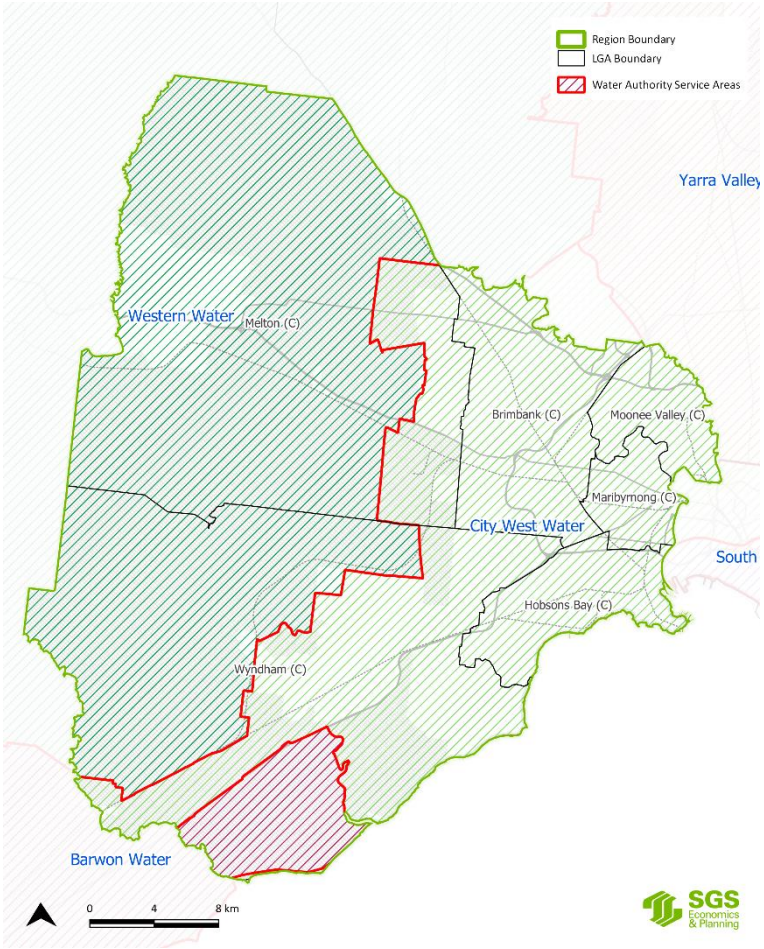


Source: Victorian Health Promotion Foundation 2011-2014, n.d.

Water security

Urban water supply across the Western Metro Region is managed by City West Water, Western Water and Melbourne Water (see Figure 133).

FIGURE 133: URBAN RETAIL AND REGIONAL WATER AUTHORITY SERVICE AREAS (2016)



Source: Bureau of Meteorology, 2015

Most City West Water customers receive water from secondary off-stream reservoirs in Melbourne's west and north at Greenvale and Preston. The water supplied to City West Water customers from Greenvale Reservoir comes from the forested catchments of the Yarra and Thomson rivers via Silvan Reservoir. Preston Reservoir receives a mix of water from both forested catchments via Silvan Reservoir and Sugarloaf Reservoir. In times of critical need, water owned by City West Water stored in northern Victoria may also be accessed via the North-South Pipeline.

Western Water has access to a diversified water supply, including water harvested from local catchments, groundwater, recycled water and water from the Melbourne supply system. Two reservoirs are the key source of supply – Rosslynne and Merrimu reservoirs. The water supply system is also connected to the Melbourne Water Grid to enable water to be supplied from the Yarra-Thompson System throughout the region (Western Water, 2017).

Businesses such as agricultural producers rely on water as an input into their value-add process. These businesses are at risk of extreme weather conditions such as drought and flood. This characteristic again shows how some of the LGAs in the region share characteristics with regional Victoria.

There are multiple scenarios that City West Water considers when forecasting demand and supply of water. The high demand, low supply scenario results in a shortfall by 2027–28; medium demand and medium supply results in a shortfall by 2044; and low demand, high supply scenario results in a shortfall by 2065. Factors affecting these scenarios include population growth, climate change and efficiency.

Western Water forecasts that demand will be equal to or greater than yield as early as 2023. When demand is greater than yield, water security and storage levels decline. Following this, Western Water estimates that new water supplies will be required between 2032 and 2040. This timing considers the volume of water stored in local reservoirs and the Greater Yarra-Thomson System. By the time new water supplies are required it is expected that an annual volume of around 7,000 million litres of new water will be required.

As more growth is accommodated in the Western Metro Region, City West Water will progressively extend its system. Among planned upgrades is the extension to the Greek Hill system that will incorporate a water supply tank, pump station and pipe-works. Another extension of the water supply system will be in the east and west of the region to service future growth.

Future large-scale investments in water supply infrastructure are likely to occur in the west of Melbourne to sustainably and cost-effectively service the growth in the suburbs of Melton, Bacchus Marsh and Sunbury. This includes extending bulk water, sewer and recycled water grids.

Urban and industrial water supply and sewerage is serviced by City West Water and Western Water. Bulk water harvesting and agricultural irrigation districts are operated by Southern Rural Water.

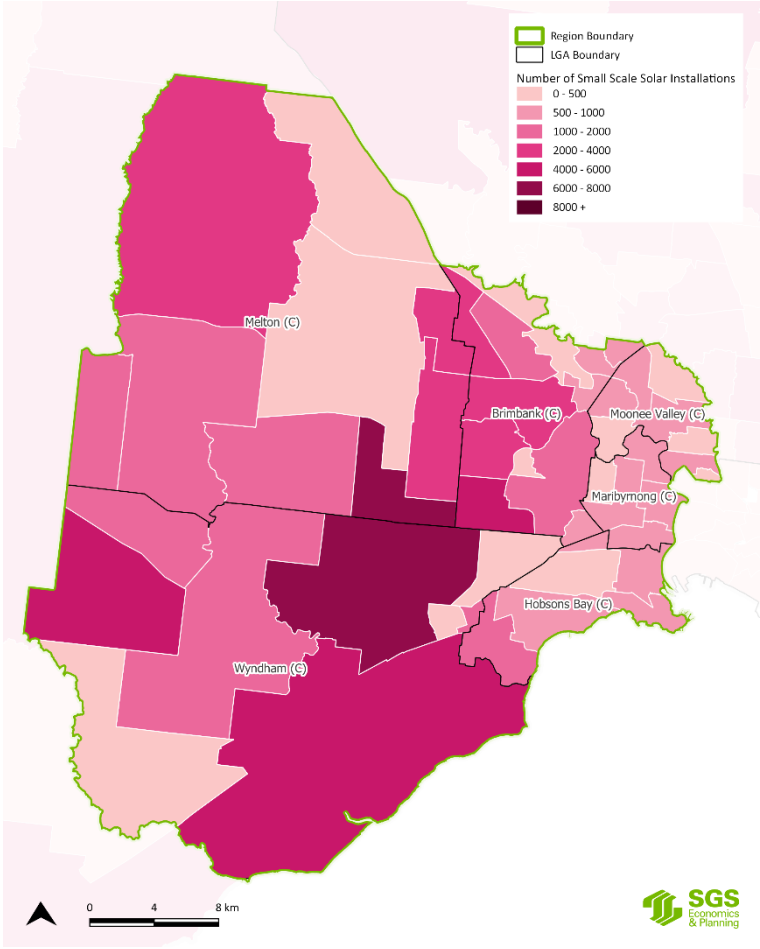
Renewable energy

Renewables are an important current and future resource as traditional resources such as coal are depleted and the impacts of climate change increase. Figure 134 shows the number of small-scale solar installations from 2001 to 2016. The Western Metro Region's middle and outer areas have large quantities of installations compared to inner areas.

Extractives industry

While spatial data for the extractives industry is available for metropolitan Melbourne, it does not identify quarries that actively produce materials and the quantities produced. This analysis is therefore not included in this report.

FIGURE 134: SMALL SCALE SOLAR INSTALLATIONS (2001-2016)



Source: Clean Energy Regulator, 2018

Waste

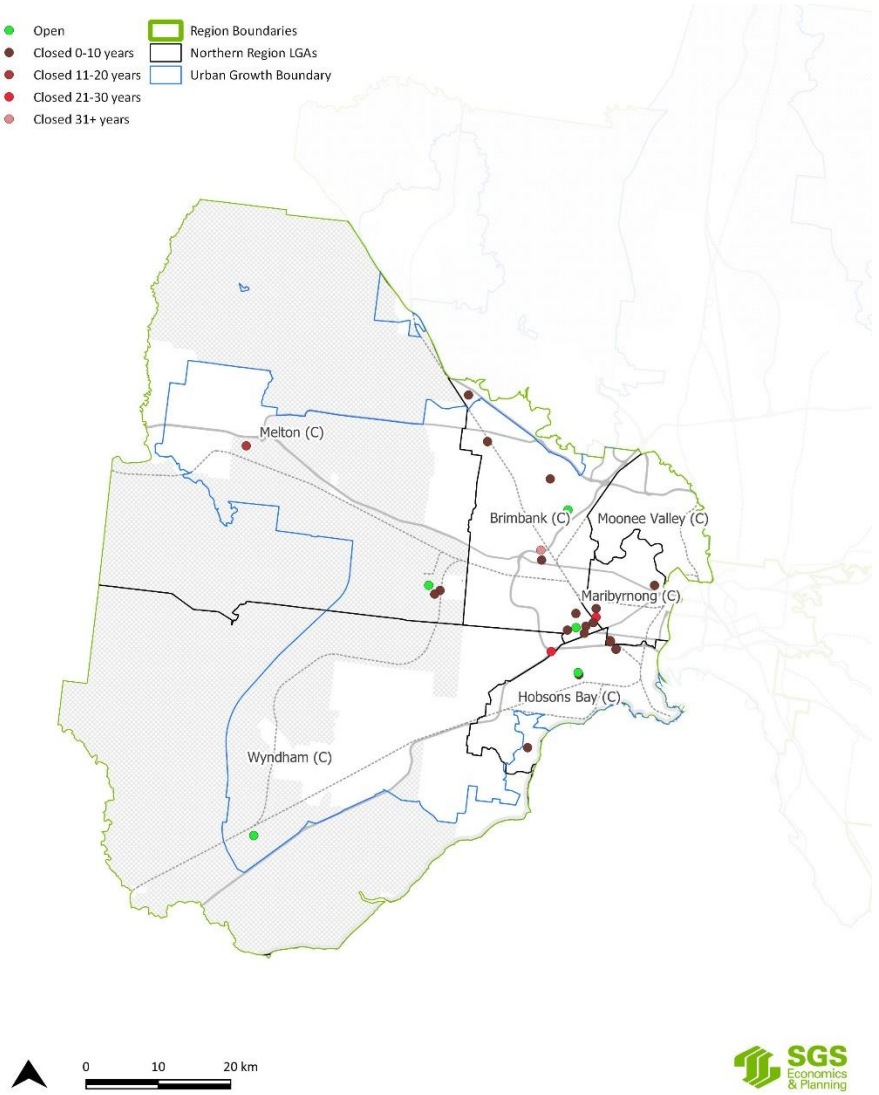
Multiple waste management locations across the Western Metro Region require continued management. Waste sites can emit odours for residents and can contribute to the contamination of water supplies if not managed properly. Figure 135 and Figure 136 indicate that:

- five landfill sites are open
- many landfill sites are within the UGB.

Kerbside garbage is one indication of the quantity of flows from the economy to the environment and the requirement on the environment to process waste. Figure 137 and Figure 138 shows that from 2002 to 2017:

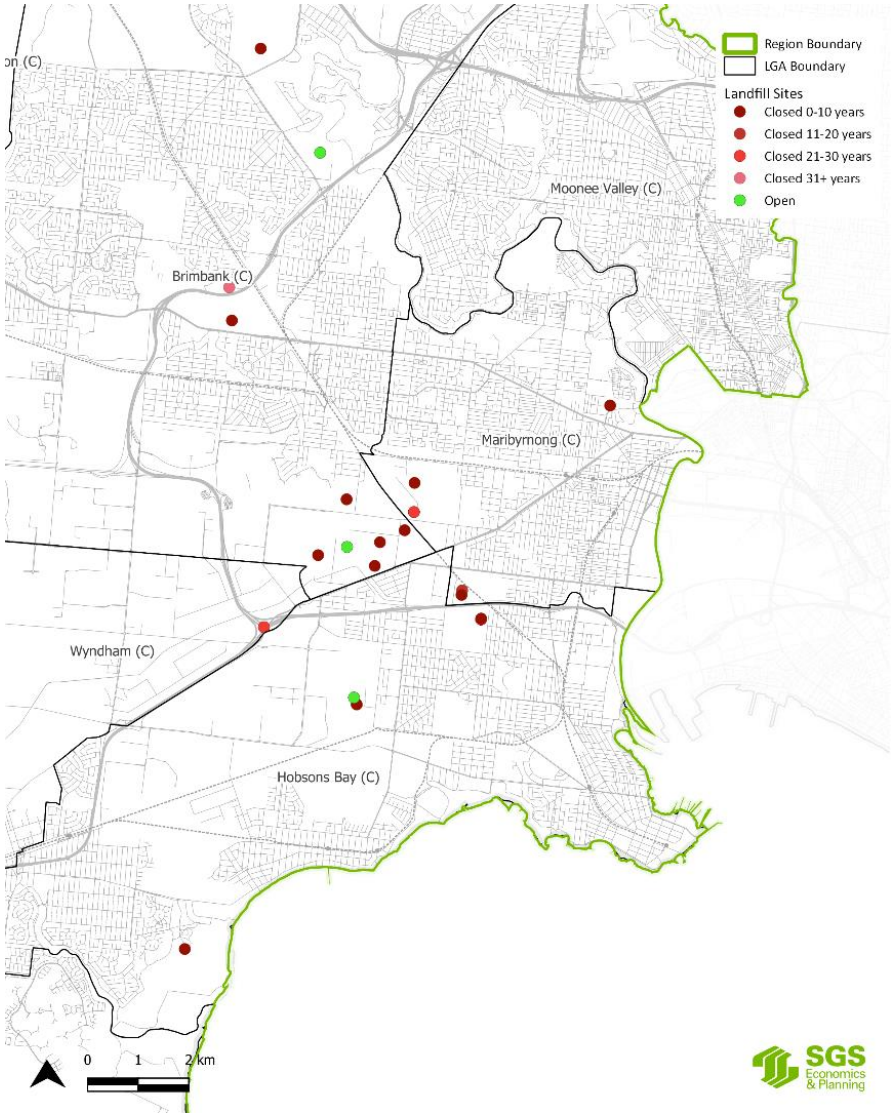
- waste in the region increased in the back end of the period, although the trend was relatively flat
- the cities of Brimbank and Moonee Valley were the largest aggregate contributors to waste in the region
- all LGAs contribute a similar amount of kerbside garbage per capita, with the City of Brimbank the largest contributor and the City of Moonee Valley the lowest contributor in 2017.

FIGURE 135: LANDFILL SITES (2018)



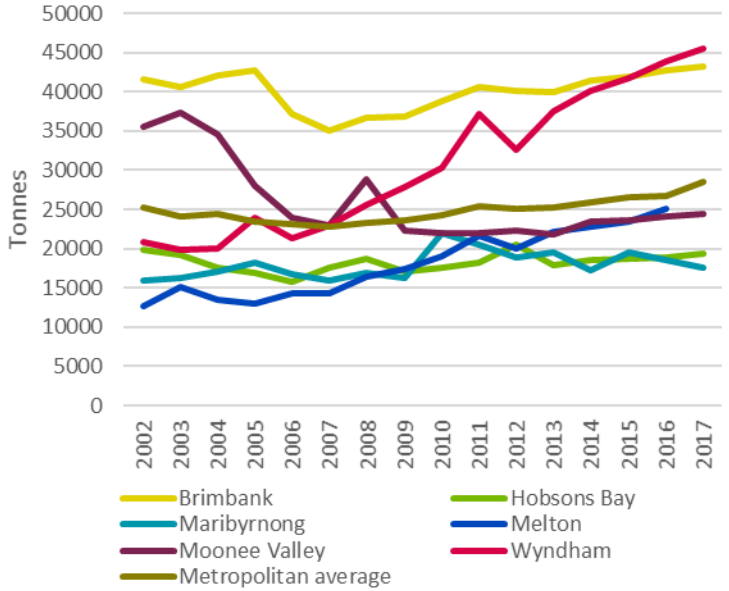
Source: EPA Victoria, 2018b

FIGURE 136: LANDFILL SITES, ZOOM, (2018)



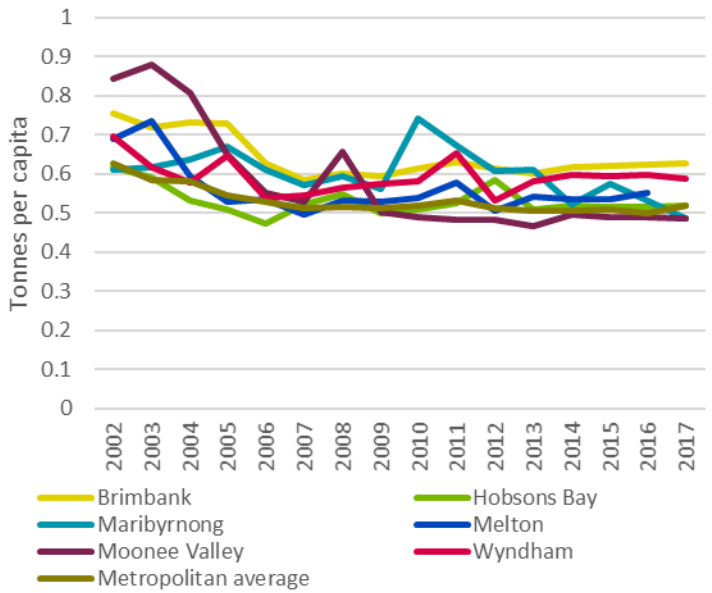
Source: EPA Victoria, 2018b

FIGURE 137: KERBSIDE GARBAGE (2002-2017)



Source: Sustainability Victoria *Note that Melton data for 2017 is not shown due to an error with the raw data

FIGURE 138: KERBSIDE GARBAGE PER CAPITA (2002-2017)



Source: Sustainability Victoria *Note that Melton data for 2017 is not shown due to an error with the raw data

Wastewater

Discharge of wastewater from treatment plants contributes to the region's environmental footprint. The condition of assets such as the Port Phillip Bay is affected by the flow of wastewater.

Of the 94,000 ML of wastewater generated in City West Water's catchment in 2015-2016, 94 per cent was transferred to Melbourne Water for treatment at its Western Treatment Plant. The remaining six per cent was received and treated at the Altona Treatment Plant, which is owned and operated by City West Water.

Melbourne Water's Western Treatment Plant is in the same area as the Ramsar wetlands site in Werribee LGA (see the Southern Metro Region report for a discussion on the Eastern Treatment Plant). Recycled water is treated to class A standard, while that discharged to the Bay is of class C standard. City West Water contributes approximately half the sewage volume going to the Western Treatment Plant. The Western Treatment Plant treated approximately 190GL of sewage in 2017 and delivered 30 GL of recycled water to customers.

Western Water has seven recycled water plants (including locations in Melton, Gisborne and Sunbury) that collect and treat sewerage. As with water demand, it is expected that population growth will influence the level of wastewater and sewerage.

Approximately 9,000 ML of water is recycled by the water recycle plants per year. By 2065, 30,000GL of recycled water is forecast to be generated within the region per year.

7. REFERENCES

Australian Institute of Health and Welfare (AIHW) 2002. Diabetes: Australian facts 2002. AIHW Cat. No. CVD 20 (Diabetes Series No.3). Canberra: AIHW

Agriculture Victoria. (2018). Victorian Land Use Information System (VLUIS). Retrieved August 15, 2018, from http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/vluis

Bureau of Meteorology. (2015). Physical information. Retrieved from http://www.bom.gov.au/water/nwa/2015/melbourne/contextual/physicalinformation.shtml

Clean Air and Urban Landscapes Hub. (2018). *Urban Vegetation Cover Analysis, Melbourne western Region, (Unpublished Interim Report)*. Melbourne.

Clean Energy Regulator. (2018). Postcode data for small scale installations (SGU-Solar). Retrieved from http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations#Postcode-data-files

Commissioner for Environmental Sustainability Victoria. (2016). *State of the bays*. Retrieved from https://www.ces.vic.gov.au/sites/default/files/reports/State of the Bays Report 2016.pdf

Commonwealth of Australia. (2018). Australian Disasters. Retrieved from https://www.disasterassist.gov.au/Pages/australian-disasters.aspx

Department of Economic Development, Jobs, Transport and Resources. (2015). Earth Resources - Geovic. Retrieved from http://er-info.dpi.vic.gov.au/sd_weave/anonymous.html

Department of Environment, Land, Water and Planning. (2014). Index of Stream Condition. Retrieved from http://ics.water.vic.gov.au/ics/

Department of Environment, Land, Water and Planning. (2018a). Public Land Management Generalised. Retrieved from https://www.data.vic.gov.au/data/dataset/public-land-management-plm25-generalised

Department of Environment, Land, Water and Planning. (2018b). Vicmap-planning. Retrieved from https://www.data.vic.gov.au/data/dataset/vicmap-planning

Department of Environment, Land, Water and Planning. (2018c). Vicmap Hydro. Retrieved from https://www.data.vic.gov.au/data/dataset/vicmap-hydro-1-25-000

Department of Environment, Land, Water and Planning. (2018d). Victoria Flood Database. Retrieved from https://www.data.vic.gov.au/data/dataset/victoria-flood-database

Department of Environment, Land, Water and Planning. (2018e). Victorian Coastal Inundation. Retrieved from https://www.data.vic.gov.au/data/dataset/victorian-coastal-inundation

Department of the Environment. (2015). Ramsar Wetlands of Australia.

EPA Victoria. (n.d.). Beach Summer Highlights Report. Retrieved from https://yarraandbay.vic.gov.au/beach-report/2016-17-summer-highlights-report

EPA Victoria. (2014). Air Watch. Retrieved from https://www.data.vic.gov.au/data/dataset/epa-air-watch-all-sites-air-quality-hourly-averages-yearly

EPA Victoria. (2018a). Groundwater quality (restricted use zones). Retrieved from https://www.data.vic.gov.au/data/dataset/epa-victoria-groundwater-quality-restricted-use-zones-gqruz

EPA Victoria. (2018b). Landfill register. Retrieved from https://www.epa.vic.gov.au/your-environment/waste/landfills/victorian-landfill-register

EPA Victoria. (2018c). Priority sites register. Retrieved from https://www.epa.vic.gov.au/your-environment/land-and-groundwater/priority-sites-register

Loughnan, M. E., Tapper, N. J., Phan, T., Lynch, K., & Mcinnes, J. A. (2013). *A spatial vulnerability analysis of urban populations during extreme heat events in Australian capital cities*. Gold Coast. Retrieved from

https://www.nccarf.edu.au/business/sites/www.nccarf.edu.au.business/files/attached_files_publications/Loughnan-ExtremeHeatEventsinAustralianCapitalCities-HighRes.pdf

Sun, C., Hurley, J., Amati, M., Arundel, J., Saunders, A., Boruff, B., & Caccetta, P. (2018). *Interim report: Urban Vegetation Cover Analysis, Melbourne eastern Region, Version 2.* Melbourne, Australia.

Victorian Health Promotion Foundation 2011-2014. (n.d.). LGA visit to green space (once per week). Retrieved from https://data.aurin.org.au/dataset/vic-govt-vichealth-vichealth-green-space-safety-visit-to-green-space-more-than-once-perwk-lga

Victorian Planning Authority. (2017a). Precinct Structure Plan Boundaries. Retrieved from https://data-planvic.opendata.arcgis.com/datasets/psp-boundaries

Victorian Planning Authority. (2017b). Public Open Space - 400m Walkable Catchments.

Victorian Planning Authority. (2017c). VPA Open Space. Retrieved from https://data-planvic.opendata.arcgis.com/datasets/da1c06e3ab6948fcb56de4bb3c722449_0

Western Water. (2017). *Urban Water Strategy*. Retrieved from http://www.westernwater.com.au/files/assets/public/documents/reference-documents/urban-water-strategy.pdf

SGS Economics & Planning

Contact us

CANBERRA
Level 2, 28-36 Ainslie Avenue
Canberra ACT 2601
+61 2 6257 4525
sgsact@sgsep.com.au

HOBART
PO Box 123
Franklin TAS 7113
+61 421 372 940
sgstas@sgsep.com.au

MELBOURNE
Level 14, 222 Exhibition Street
Melbourne VIC 3000
+61 3 8616 0331
sgsvic@sgsep.com.au

SYDNEY
209/50 Holt Street
Surry Hills NSW 2010
+61 2 8307 0121
sgsnsw@sgsep.com.au