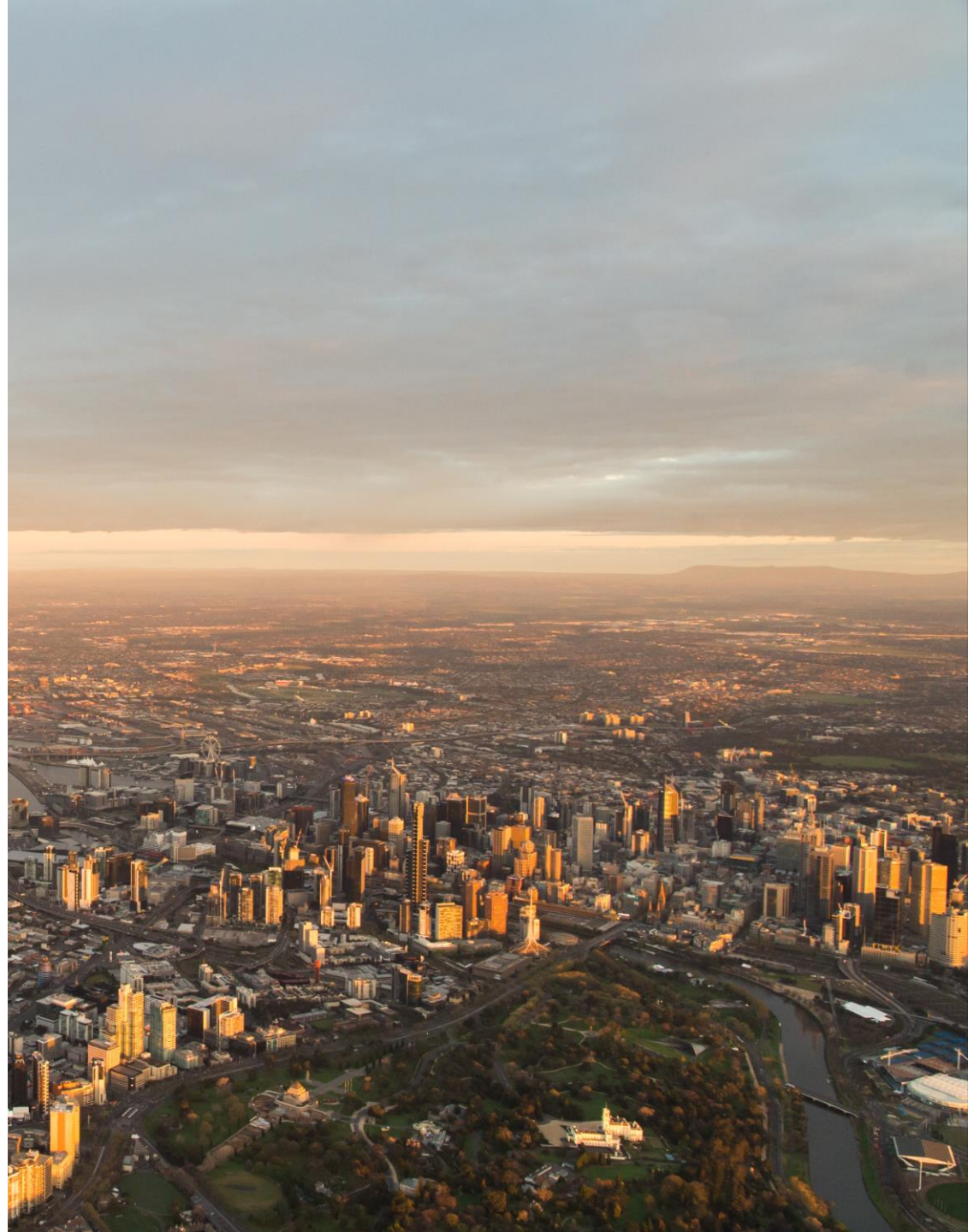# Comprehensive Analysis of the Melbourne Economy

Research Report and Framework (Final) and Areas of Interest (Draft)

## RDA Melbourne

May 2021

Prepared by:

SGS Economics & Planning

Certified B Corporation

# Executive Summary

There is considerable policy ambition across Greater Melbourne for economic development, but no overarching metropolitan vision for the future. **Driver industries** in health, professional services and a range of manufacturing sub-sectors are identified to power the economy, and these are performing well. Most of Melbourne's driver industries have rebounded from the pandemic, except tertiary education and tourism.

But many of the **enablers of growth** are not in place to allow for ongoing and high-value economic development to occur. The performance of Greater Melbourne's skilled workforce, reputation for livability, and creative industries are sliding. While there have been improvements in Melbourne's innovation and regulatory systems, more work needs to be done. Immediate action is also required to improve Melbourne's once leading education system and improve the city's urban form, which should be more productive.

Even with growth, the benefits are unlikely to sustain wealth in the community and Melbourne's comparative advantages in the long term. Many of the **sustainers of growth** need immediate policy action to address poor performance. There is low community resilience and social capital in many parts of the city, and there is a need to improve the taxation system at a metropolitan level. Government is developing policies, but more support is required for a circular economy, to mitigate and adapt to climate change, address poor economic outcomes in aboriginal communities and develop strong local consumption economies.

The city not only needs to rebound to previous economic levels post the pandemic recession but emerge with sustained growth. A more holistic understanding of the economy and its function, and a clear vision, are required to drive, enable and sustain economic development in Greater Melbourne.

**Regional Development Australia (RDA) Melbourne** has developed a framework to consider economic development for the Greater Melbourne economy. The framework was built from a review of existing policy documents that are pertinent to Melbourne's future economic performance. Given there is no single policy document defining a metropolitan economic vision and how it operates, an implied vision for Greater Melbourne has been articulated.

This vision framework was built around three pillars:
1. Melbourne's economic **drivers**: Melbourne's world competitive sectors that draw in export income into the region
2. The **enablers** of economic activity: Melbourne's resources and capabilities (like skills or infrastructure) that are needed to support economic production
3. Economic **sustainers**: The sustainers are the systems across governance, regulation, leadership, social capital which support the economy

The implied economic vision was deduced as being:

*"Melbourne's economy will be powered by globally significant industries in health, education and niche manufacturing.*

*The region's competitiveness will stem from a high quality labour force, excellent transport links, outstanding creative and design capabilities, stable governance, liveability and cultural vibrancy.*

*Inclusive and environmentally sustainable approaches to economic regulation, spatial development and governance will maintain these advantages into the long term"*

The three pillars work in unison. Driver industries need the enablers to be successful, likewise the city can't invest in enabling capabilities unless the driver industries are creating wealth in the city to invest. Sustainers are often overlooked in economic development, but without systems for a robust democracy, that ensure wealth and opportunity are shared, or that the environment is sustainably managed, economic activity will not be achieving its ultimate purpose, to ensure happy, prosperous lives for Melbourne's residents through an economy that is sustainable and resilient for the long-term.

FIGURE: THE THREE PILLARS FRAMEWORK
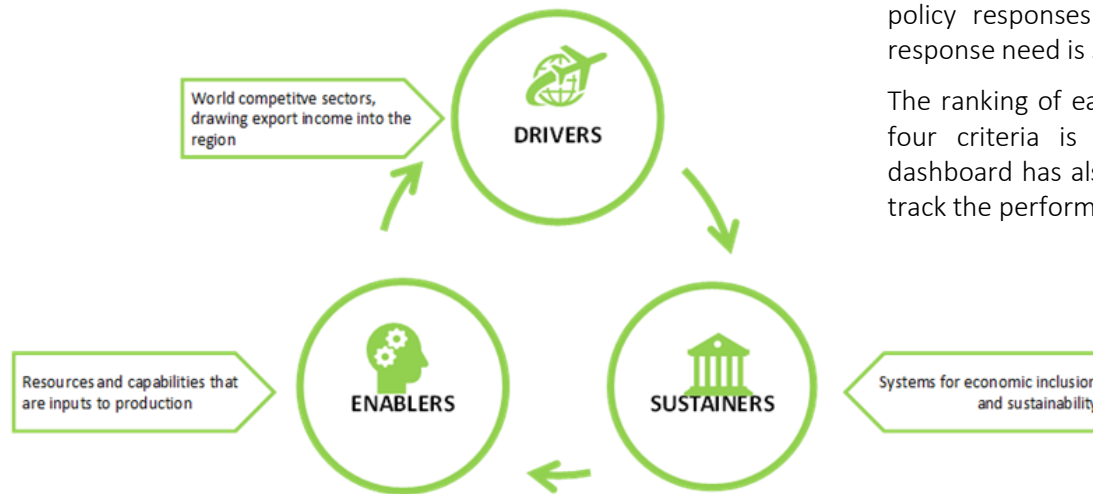


For each enabler, sustainer and driver, research was undertaken to identify strengths, weaknesses, opportunities and threats in local, national and international contexts. Each driver, sustainer and enabler were ranked against four criteria to understand performance:

1. Domestic standing
2. Global standing
3. Impact of COVID-19 and the government response
4. Business-as-usual 10-year prospects.

The analysis was then used to bundle together the drivers, enablers and sustainers into one of five categories to guide policy responses. This 'ladder' of performance and policy response need is shown on the next page.

The ranking of each driver, sustainer and enabler against the four criteria is then shown on the page after that. A dashboard has also been developed which will be updated to track the performance over time.

# Policy response ladder

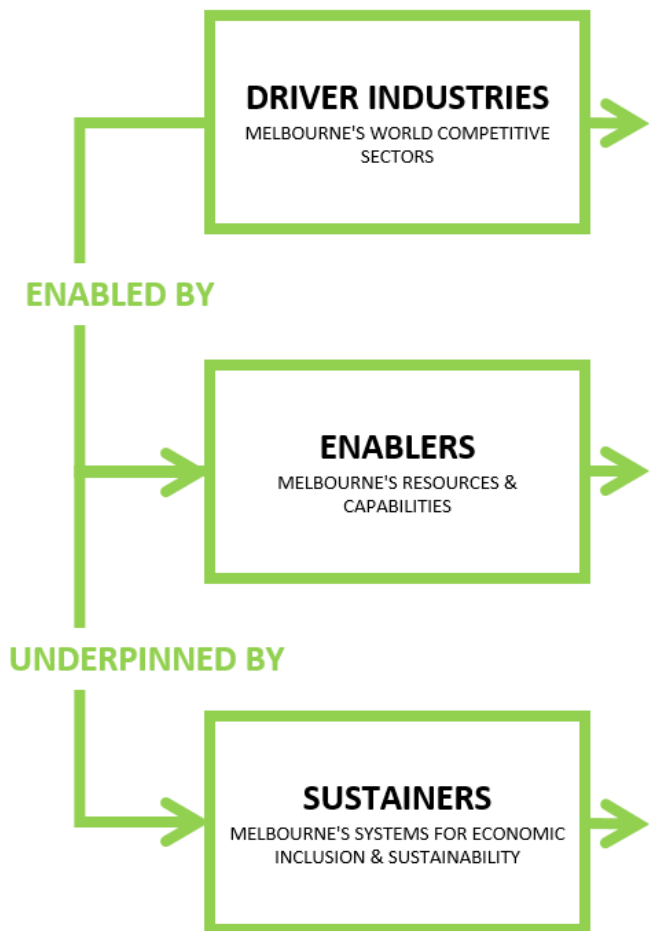| | Drivers | Enablers | Sustainers |
|---|---|---|---|
| **Clear strengths to promote:** Melbourne has a clear advantage nationally and globally, BaU prospects are good. These areas can be used to promote the city | Food and fibre product manufacturing and services; Health care; Professional services (design, engineering); Bio-med research and manufacturing | Ample capacity for urban growth and infill | |
| **Opportunities to elevate performance:** Areas of good and improving performance but with obvious weaknesses that can be addressed to boost performance | Defence and aerospace manufacturing and services; Transport-related product manufacturing and services | Transport and logistics infrastructure | |
| **Strengths that are sliding in performance requiring action:** Melbourne has a traditional strength in this area, but action is required to reverse declining performance or COVID-19 impacts | Tertiary education industry; Tourism (place and culture); Tourism (major events) | Highly skilled, good value workforce; Reputation for liveability; Creative industries (arts and fashion) | Welcoming, multicultural society with integrated links to Asia; Robust democracy and regulatory frameworks |
| **Ambition shown but support required:** These areas are not yet strengths for Melbourne, but performance is improving. Policy actions can support momentum and build these areas into strengths | Construction know-how | Leading innovation systems; Supportive regulatory and tax systems for start-ups | Local ownership of resource flows (circular economy); Comprehensive climate change mitigation/adaptation policies; Thriving Aboriginal communities & businesses backed by treaty; Local consumption economies |
| **Clear weakness requiring immediate action:** These areas are clearly lagging from a national or global perspective, have been heavily impacted by the pandemic or have poor BaU prospects. | | Leading education system; Productivity boosting urban form | Resilient communities & strong social capital; Efficient taxation systems |

# Melbourne's performance against the vision



**DRIVER INDUSTRIES** — MELBOURNE'S WORLD COMPETITIVE SECTORS

**ENABLED BY**

**ENABLERS** — MELBOURNE'S RESOURCES & CAPABILITIES

**UNDERPINNED BY**

**SUSTAINERS** — MELBOURNE'S SYSTEMS FOR ECONOMIC INCLUSION & SUSTAINABILITY

Legend:
- 🟢 Leading performance (first two columns) or good/minimal impacts of COVID-19 or good prospects.
- 🟡 Aspirational/improving performance or medium/short-term COVID-19 impact or uncertain prospects
- 🔴 Lagging performance or large COVID-19 impact or poor prospects

## Driver Industries

| | Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|---|
| Food and fibre product manufacturing and services | 🟢 | 🟢 | 🟢 | 🟢 |
| Tertiary education | 🟢 | 🟢 | 🔴 | 🟡 |
| Professional services (design, engineering) | 🟢 | 🟢 | 🟢 | 🟢 |
| Tourism – place and culture | 🟢 | 🟢 | 🔴 | 🟡 |
| Tourism – major events | 🟢 | 🟢 | 🔴 | 🟡 |
| Health care | 🟢 | 🟢 | 🟢 | 🟢 |
| Bio-med research and manufacturing | 🟢 | 🟢 | 🟢 | 🟢 |
| Defence and aerospace manufacturing and services | 🟡 | 🟡 | 🟢 | 🟢 |
| Transport-related product manufacturing and services | 🟡 | 🟡 | 🟢 | 🟢 |
| Construction know-how | 🟡 | 🟡 | 🟡 | 🟡 |

## Enablers

| | Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|---|
| Highly skilled, good value workforce | 🟢 | 🟡 | 🟡 | 🟡 |
| Leading education system | 🟢 | 🟡 | 🔴 | 🟡 |
| Transport and logistics infrastructure | 🟢 | 🟡 | 🟡 | 🟢 |
| Ample capacity for urban growth and infill | 🟢 | 🟡 | 🟡 | 🟡 |
| Productivity boosting urban form | 🟡 | 🔴 | 🟡 | 🟡 |
| Reputation for liveability | 🟢 | 🟢 | 🟡 | 🟡 |
| Creative industries (arts and fashion) | 🟢 | 🟢 | 🔴 | 🟡 |
| Leading innovation systems | 🟢 | 🟡 | 🟡 | 🟡 |
| Supportive regulatory and tax systems for start-ups | 🟢 | 🟡 | 🟡 | 🟢 |
| Welcoming, multicultural society with integrated links to Asia | 🟢 | 🟢 | 🟡 | 🟡 |

## Sustainers

| | Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|---|
| Robust democracy and regulatory frameworks | 🟢 | 🟢 | 🟢 | 🟡 |
| Strong local consumption economies | 🟡 | 🟡 | 🟢 | 🟡 |
| Thriving Aboriginal communities & businesses backed by treaty | 🟡 | 🟡 | 🟡 | 🟡 |
| Local ownership of resource flows (circular economy) | 🟡 | 🟡 | 🟡 | 🟢 |
| Comprehensive climate change mitigation/adaptation policies | 🟢 | 🟡 | 🟡 | 🟡 |
| Strong environmental protection regulations | 🟡 | 🟡 | 🟢 | 🟡 |
| Resilient communities & strong social capital | 🟡 | 🟢 | 🟡 | 🔴 |
| Efficient taxation systems | 🟡 | 🟡 | 🟡 | 🟡 |

# 01
## Introduction

# Project purpose

Regional Development Australia (RDA) Melbourne, in 2020 commissioned SGS Economics and Planning, in 2020 to provide a comprehensive economic profiling resource that will support the RDA Melbourne Committee's work and mandate by understanding the policy priorities, gaps and opportunities across the city.

RDA Melbourne's role is to facilitate business, investment and job formation in the metropolitan area. It does this by brokering partnerships and providing timely advice to the Commonwealth and State Governments on barriers and opportunities for economic growth in the region.

The RDA Committee delivers a range of key functions including:

- Provide independent advice to all three levels of government on critical issues affecting their region
- Collaborate with relevant stakeholders to identify economic opportunities and leverage private and public sector investment to their region
- Connect regional businesses, councils and industry sectors with international trade partners, financial markets and potential investors
- Work closely with community leaders to identify funding sources and develop project proposals to support economic growth
- Provide assistance to local communities to develop project proposals to support economic growth
- Promoting awareness of government programs in the RDA community

This research report comes at the end of a 12-month research and co-design process with the RDA. A research report profiling the metropolitan economy and its development over the medium term (nominated to be 10 years) has been produced (this document). This sets out an implied vision and gaps or opportunities in Melbourne's capacity and capabilities. In addition, a set of key indicators will now be devised for use in monitoring the on-going development of the regional economy. A co-design process was used to refine and redraw the research as it progressed to ensure this report and datasets would contain the information and insights needed by RDA Melbourne to deliver on its mandate.

It is important to note that this is not an economic development strategy; it will provide a durable system for thinking about issues, and a platform to enable RDA Melbourne to think broadly, understanding links and relationships between sectors, and to think tactically about opportunities. The report is not an exhaustive review of every matter, nor does it prescribe strategies or actions to pursue.

# Co-designing the research

This report meets multiple demands generated by disparate interests groups and, as yet unknown, issues and opportunities, as well as being innately adaptable to changing needs. These groups span those represented on the RDA, the various government agencies with service delivery responsibilities and the holders of data, amongst others.

Accordingly, the methodology was designed with a strong 'co-design' focus with significant effort in engaging the RDA Melbourne Committee throughout the project. The original brief for the project issued by RDA proposed four research themes: 'investment'; 'business & industry'; 'workforce, jobs & skills'; and 'place'. Under SGS's response to the brief, this framing was reviewed via the co-design process.

The first co-design workshop identified that in order for the RDA Melbourne to fulfil its mandate, it would need to have a vision for the metropolitan economy, to guide and prioritise their actions and advice. It was also, however, acknowledged that it is not the role of the RDA to establish or facilitate the development of an overall vision for metropolitan Melbourne – it can only advocate or influence.

The co-design discussions in the RDA Melbourne generated a four-step approach to the research:

1. Understand the current vision for the metropolitan economy (as implied in policy)
2. Understand the barriers and opportunities facing Melbourne in realising this vision (including the challenges and opportunities as a result of the current COVID-19 pandemic and associated economic challenges)
3. In light of this analysis, RDA Melbourne to decide where it can most effectively target its activities to make a difference, and
4. Design an on-going data collection & analysis process to support RDA Melbourne in its chosen areas of focus

Steps 1 and 2 are captured in this report.

It should be noted that it is not the intent or mandate of this project to develop an updated economic vision for Melbourne, although RDA Melbourne may provide advice to government regarding the fact that this should happen. This advice could incorporate the opportunities and impacts of COVID-19 and the associated economic condition that will likely be identified through the analysis.
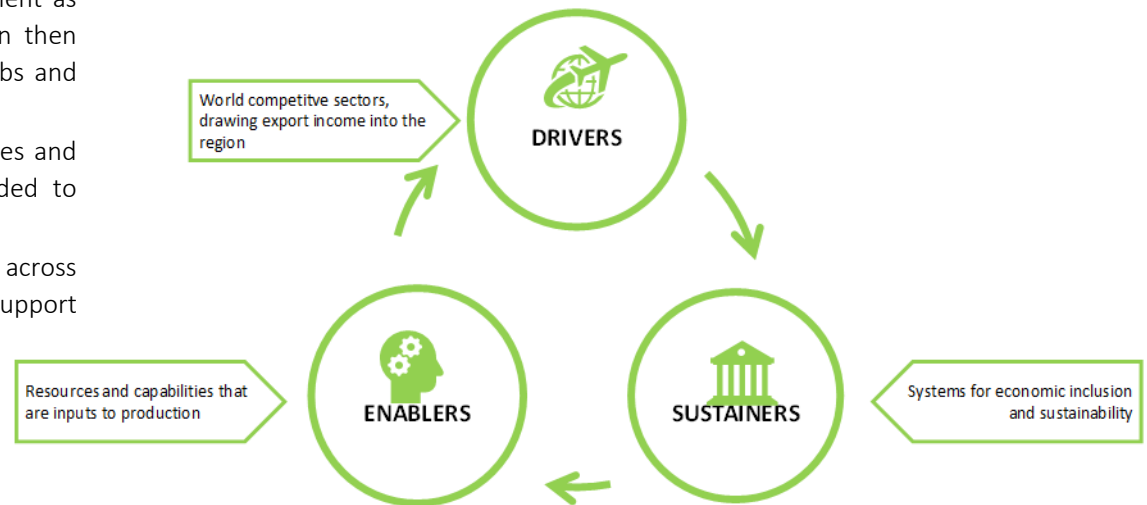
# The three pillars framework

Given there is no single policy document defining a metropolitan economic vision, this project initially sought to articulate the vision that is implied in a variety of strategies adopted by State Government, regional organisations and Councils.

An 'implicit metropolitan vision' was assembled from a thorough review of State policies and strategies . This vision was built around three pillars:

1. Melbourne's economic **drivers**: Melbourne's world competitive sectors that draw in export income into the region. Export income is particularly important to economic development as this is 'new' wealth that has been generated, and can then circulate around the metropolitan economy creating jobs and investment
2. The **enablers** of economic activity: Melbourne's resources and capabilities (like skills or infrastructure) that are needed to support economic production
3. Economic **sustainers**: The sustainers are the systems across governance, regulation, leadership, social capital which support the economy

The three pillars work in unison. Driver industries need the enablers to be successful, likewise the city can't invest in enabling capabilities unless the driver industries are creating wealth in the city to invest. Sustainers are often overlooked in economic development, but without systems for a robust democracy, that ensure wealth and opportunity are shared, or that the environment is sustainably managed, economic activity will not be achieving its ultimate purpose, to ensure happy, prosperous lives for Melbourne's residents through an economy that is sustainable and resilient for the long-term.



World competitve sectors, drawing export income into the region — DRIVERS

Resources and capabilities that are inputs to production — ENABLERS

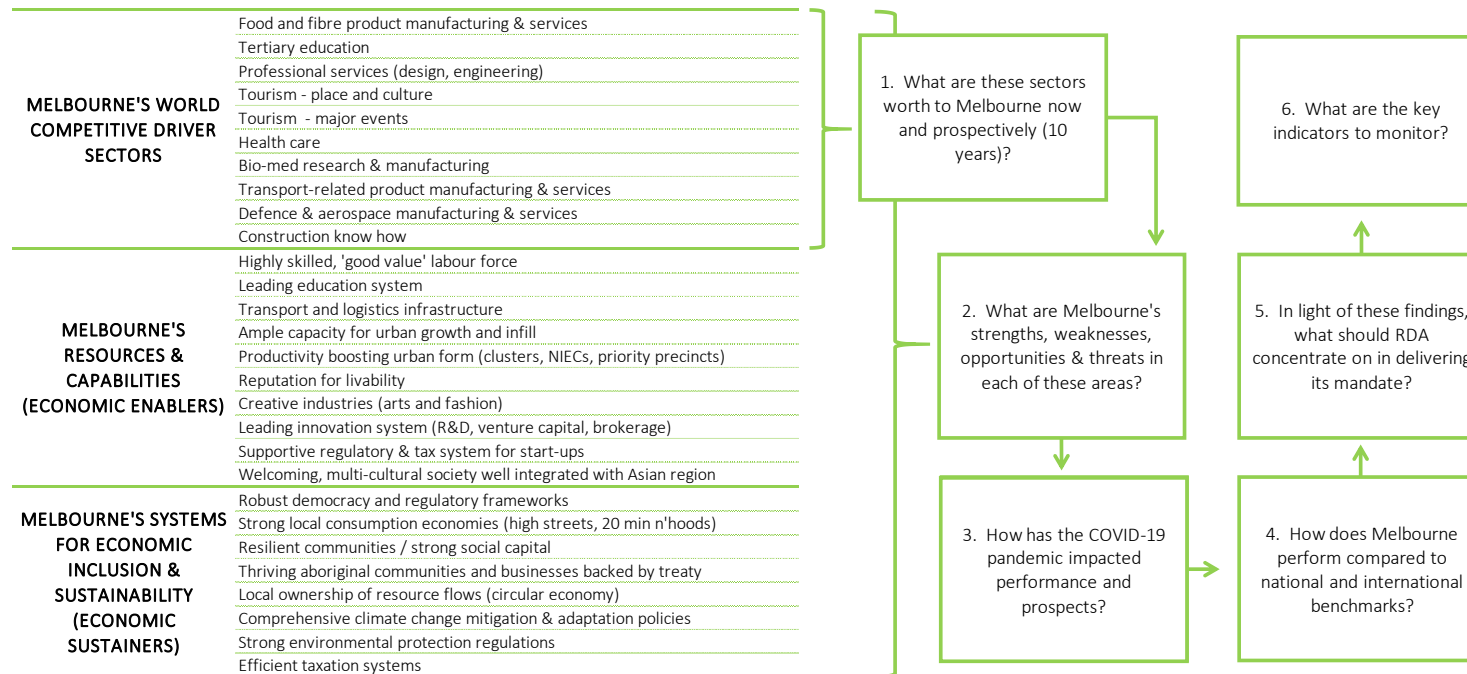Systems for economic inclusion and sustainability — SUSTAINERS

# The RDA strategic research agenda

The RDA's approach to this mandate will not be ad hoc or opportunistic. Rather, it will be guided by an economic vision for metropolitan Melbourne as derived from the three-pillar framework. To achieve this a data gathering, research and analysis phase sought to answer: does Melbourne have what is required to achieve the vision?

For each enabler, sustainer and driver (as shown below) the research sought to identify strengths, weaknesses, opportunities and threats in local, national and international contexts. Each driver, sustainer and enabler were ranked against four criteria:
1. Domestic standing
2. Global standing

3. Impact of COVID-19 and the government response
4. Business-as-usual 10-year prospects.

From this analysis, the Committee are then be able to identify how they can support any identified gaps or opportunities in Melbourne's capacity and capabilities, either through advice, collaboration or networks, and monitor the progress.

The connection between the implicit vision, the key questions for RDA research, the targeting of RDA effort in economic development initiatives and the monitoring of progress is shown in the following diagram. The research questions were pursued using a combination of qualitative and, where available, quantitative data.

## Research process and questions'



| MELBOURNE'S WORLD COMPETITIVE DRIVER SECTORS | |
|---|---|
| Food and fibre product manufacturing & services | |
| Tertiary education | |
| Professional services (design, engineering) | |
| Tourism - place and culture | |
| Tourism - major events | |
| Health care | |
| Bio-med research & manufacturing | |
| Transport-related product manufacturing & services | |
| Defence & aerospace manufacturing & services | |
| Construction know how | |

| MELBOURNE'S RESOURCES & CAPABILITIES (ECONOMIC ENABLERS) | |
|---|---|
| Highly skilled, 'good value' labour force | |
| Leading education system | |
| Transport and logistics infrastructure | |
| Ample capacity for urban growth and infill | |
| Productivity boosting urban form (clusters, NIECs, priority precincts) | |
| Reputation for livability | |
| Creative industries (arts and fashion) | |
| Leading innovation system (R&D, venture capital, brokerage) | |
| Supportive regulatory & tax system for start-ups | |
| Welcoming, multi-cultural society well integrated with Asian region | |

| MELBOURNE'S SYSTEMS FOR ECONOMIC INCLUSION & SUSTAINABILITY (ECONOMIC SUSTAINERS) | |
|---|---|
| Robust democracy and regulatory frameworks | |
| Strong local consumption economies (high streets, 20 min n'hoods) | |
| Resilient communities / strong social capital | |
| Thriving aboriginal communities and businesses backed by treaty | |
| Local ownership of resource flows (circular economy) | |
| Comprehensive climate change mitigation & adaptation policies | |
| Strong environmental protection regulations | |
| Efficient taxation systems | |

Flow chart boxes:
1. What are these sectors worth to Melbourne now and prospectively (10 years)?
2. What are Melbourne's strengths, weaknesses, opportunities & threats in each of these areas?
3. How has the COVID-19 pandemic impacted performance and prospects?
4. How does Melbourne perform compared to national and international benchmarks?
5. In light of these findings, what should RDA concentrate on in delivering its mandate?
6. What are the key indicators to monitor?

# Scope of this research report

The output from the steps from the drafting of an implied vision, the research agenda and the strategic indicators led to the drafting of this research report. The structure of the report is follows:

1. **Introduction:** an outline of RDA's role and purpose , the purpose of this project and the project method.

2. **Overview of the current economy:** A summary of the current state of the economy to set the scene, including historical economic development patterns, economic size and growth, main industries and exports, export product complexity and the opportunities and risks that the pandemic disruptions present.

3. **The economic vision for metropolitan Melbourne:** Describing the implied vision derived from a suite of government policy documents on how Melbourne's economy will develop from its current economic state. The vision is articulated via the three pillars framework – drivers, enablers and sustainers.

4. **Melbourne's economic drivers:** Taking each of the nominated sectors under the first pillar in turn, describe the evidence for Melbourne's claims to be globally competitive, identifying strengths, weaknesses and opportunities. Each driver's performance is then ranked across four criteria: Domestic standing, global standing, impact of COVID-19 and the government response and business-as-usual (BAU) prospects.

5. **Melbourne's economic enablers:** Taking each item in the second pillar in turn, describing Melbourne's strengths, weakness and opportunities and consider the metropolis against other Australian cities and relevant international comparators. Each enabler's performance is then ranked across the four criteria.

6. **Sustaining the metropolitan economy:** Taking each item in the third pillar in turn, describing Melbourne's strengths, weakness and opportunities and consider the metropolis against other Australian cities and relevant international comparators. Each sustainer is then ranked across the four criteria.

7. **Conclusion on Melbourne's performance against the vision:** The analysis is brought together to bundle together the drivers, enablers and sustainers into one of five categories to guide the RDA's response; clear strengths to promote; opportunities to elevate performance; strengths that are sliding in performance requiring action; ambition shown but support required; clear weakness requiring immediate action.

8. **Areas of focus:** Additional detail and research on three areas of interest to the RDA

### How to read this report

The main takeaway from this report is the development of the three pillars framework. The framework can be used by RDA to consider economic performance and shape policy responses in a holistic manner, focussing not only on driver industries, but what these drivers need to enable growth and sustain the communities of Melbourne.

The research presented under each driver, enabler and sustainer is a high level review of accessed research and data, and is by no means exhaustive. Due to the breadth of the framework, three areas are chosen for focus, further discussion and for the development of quantitative measures. These three areas of focus are included at a later date as an appendix to the framework.

**02**

# High level overview of the current Melbourne economy

# High level overview

The objective of this part of the research is to introduce the existing structure and performance of Melbourne's economy, before the following chapters delve into the implied vision on where to from here, including more detail on what drives, sustains and enables economic prosperity in Melbourne.

This chapter includes:

- Metropolitan Melbourne's recent economic growth (pre-pandemic)
- Economic structure and competitive advantages
- An analysis of economic complexity of the city (a Hausmann analysis)
- A survey of the potential high level and cross-sectoral impacts of COVID 19 on commerce, lifestyles, workstyles and the spatial structure of the Melbourne economy.
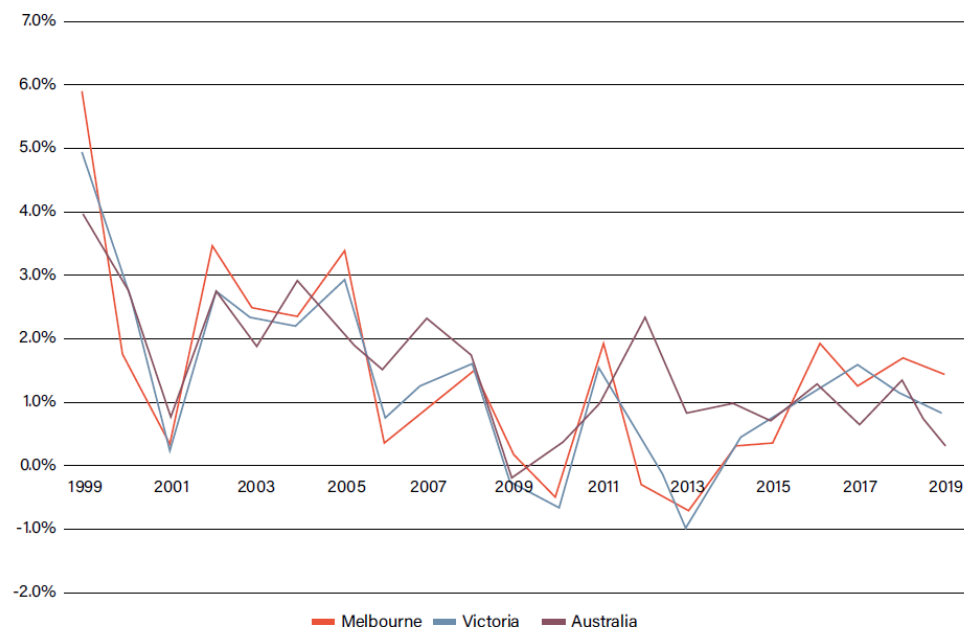
# Metropolitan Melbourne's recent economic growth (pre-pandemic)

Melbourne has generally outperformed the national economy over the past 2 decades, and in particular since 2016, though the pattern has been variable, particularly during the mining boom (see figure).

The metropolitan economy has grown steadily, rather than vigorously. The city has slipped into recession on two occasions since 1999, notwithstanding unbroken growth at the national level. Production in the Melbourne economy also rapidly contracted in 2020 due to the forced closure of business to fight the pandemic.

Although not evident in this chart, population growth has been a major factor in the State and city maintaining their modest rate of economic expansion. In per capita terms, the city has endured more recessive periods. For many citizens, the metropolitan economy has not felt as prosperous as official reports have proclaimed.

FIGURE: MELBOURNE GDP GROWTH, VOLUME MEASURE



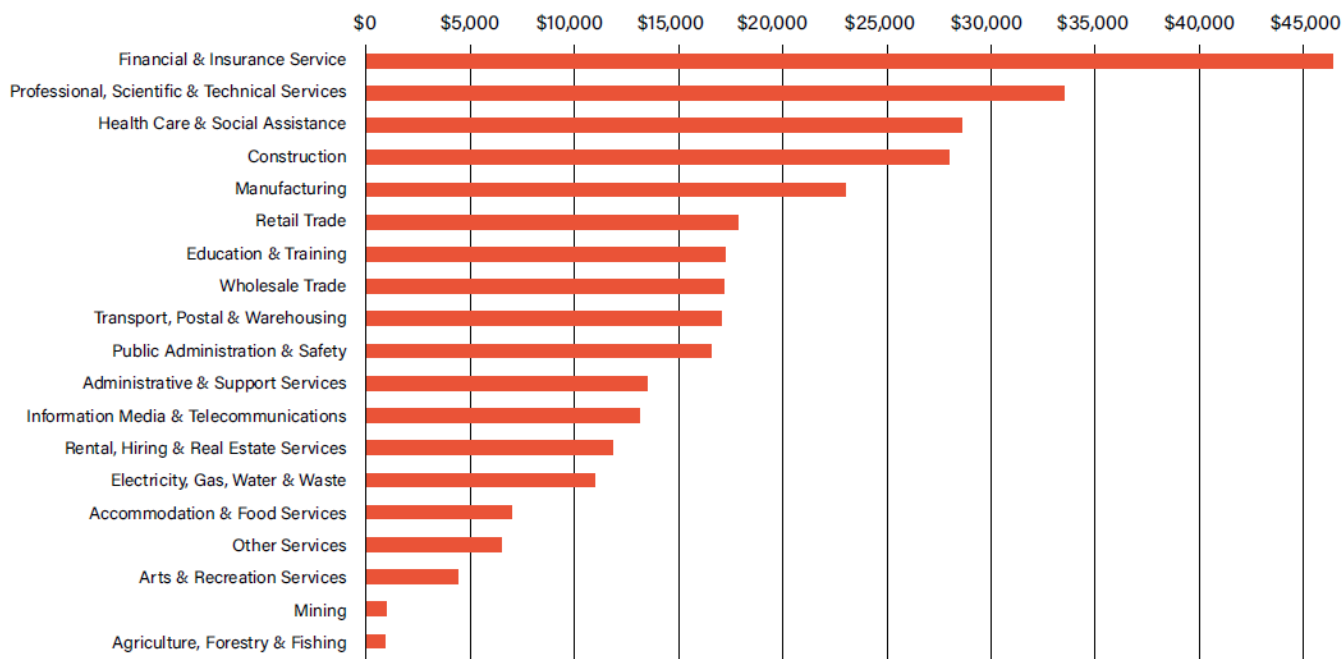Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

# Metropolitan Melbourne's recent economic growth (pre-pandemic)

Five sectors collectively accounted for the lion's share of total income generated in the metropolitan economy in 2018/19; financial services, professional services, health, construction and manufacturing (see Figure). Some of these, particularly health and construction, are strongly linked to the growth and profile of the city's population. However, these 5 drivers also point to a sophisticated, knowledge intensive, economy. This bodes well for metropolitan Melbourne's future prosperity.

The visitor economy is also likely to have been a strategic income earner for Melbourne. However, the tourist sector is not separately identified in standard ABS industry data. Rather it is embedded in a range of traditional sectors including accommodation and food services, transport and art and recreation.

FIGURE: CONTRIBUTION OF INDUSTRY SECTORS TO GRP 2018/19 ($ MILLIONS)



Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

# Metropolitan Melbourne's recent economic growth (pre-pandemic)

While manufacturing has not been major contributor to economic growth in recent years (see left figure), it remains a strategic sector for the metropolis. Aside from its still prominent share of metropolitan GDP (figure on the right), manufacturing is a key (and largest) inter-regional exporter for the city, along with professional and brokerage services. Again, this signifies that Melbourne has the basis for an advanced economy with a balanced portfolio of drivers.

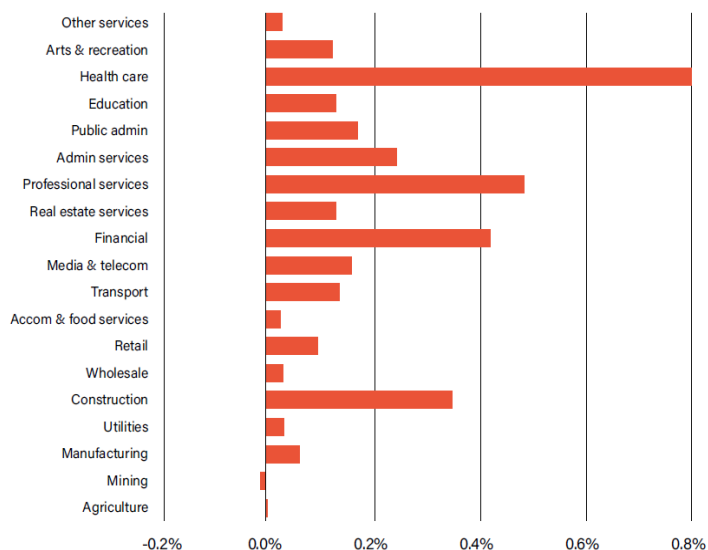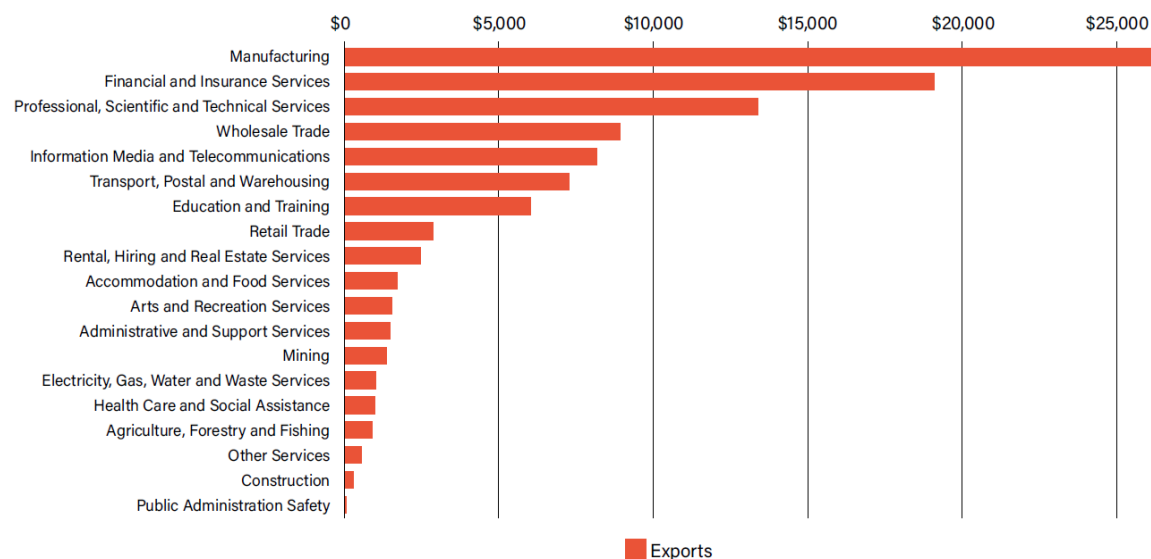FIGURE: CONTRIBUTION TO GDP GROWTH BY INDUSTRY 2018/19

FIGURE: VALUE OF EXPORTS BY INDUSTRY – RANKED BY VALUE



Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning
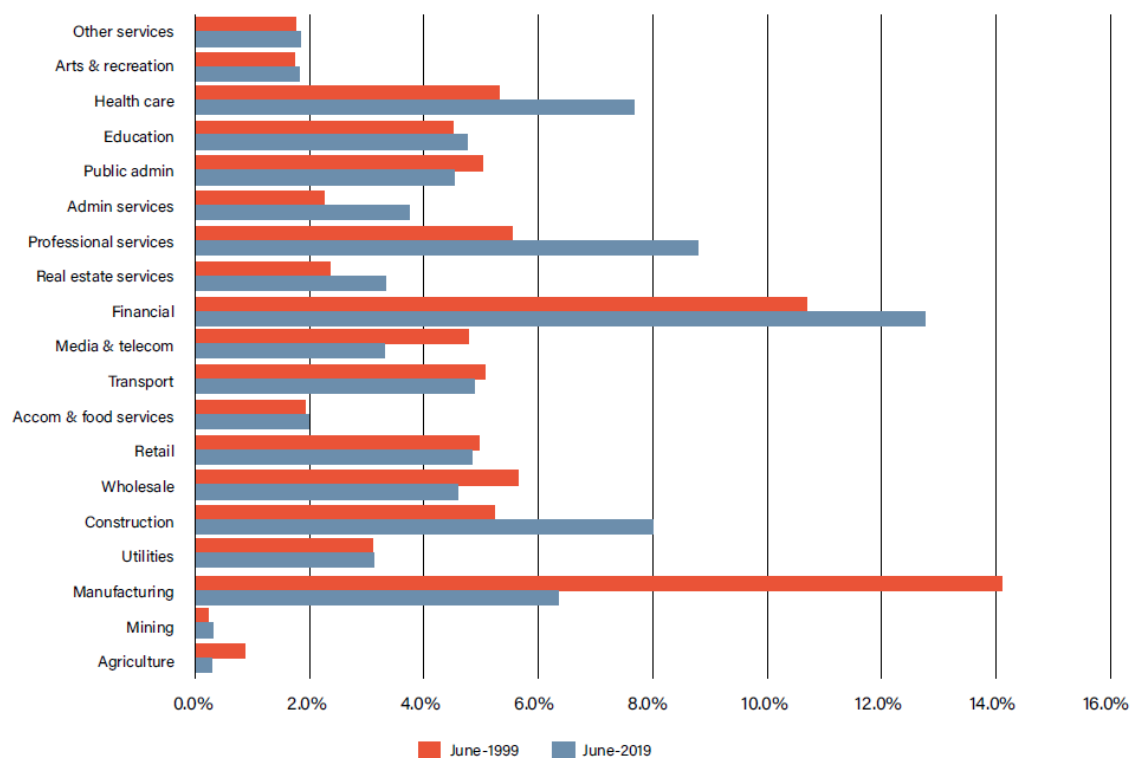
# Economic structure and competitive advantages

The dominant trend in Melbourne's economic structure over the past two decades has been the apparently dramatic shrinkage in manufacturing and the strong growth in professional services (see Figure). There is little doubt that Melbourne's economy is today less focussed on 'making things' and more concerned with a broad portfolio of brokerage and advisory services, cultural tourism and population serving industries, like health.

Nevertheless, it is important to avoid exaggerating this shift. In value added terms, manufacturing is still more important than a range of other prominent sectors, including education, retail, transport and utilities. Moreover, some of the shrinkage in manufacturing may be a statistical artefact; many functions which were once carried out within manufacturing firms including marketing, design, aspects of financial management and strategic planning, are now outsourced to specialist businesses nominally in other sectors. Many of these allied business are located in the metropolitan area.

FIGURE: INDUSTRY STRUCTURE OVER TIME (% GVA)



Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

# Economic structure and competitive advantages

The location quotient (LQ) analysis shown in this figure provides some insight to the competitive strengths inherent in Melbourne's economic structure. The LQ for a sector is given by its proportional representation in the metropolitan area divided by its proportional representation in Australia as a whole. An LQ of greater than 1.0 signifies that the sector in question is over-represented in Melbourne compared to Australia. Over-representation may suggest that the industry has a comparative advantage in Melbourne (that is, Melbourne has a specialisation in the industry) and could be exporting these services to other regions which are specialised in other fields.

While the vertical access indicates LQ, the horizontal access shows the growth rate of the sector in question at the national level. Growth indicates prevailing industry trends of growth or contraction. The quadrants formed in the chart by lines calibrated to an LQ of 1 and an industry growth rate of 0% per annum (in employment terms), creates a lens for judging the strategic value of sectors. The top right hand quadrant shows sectors which are both strongly growing and where Melbourne has a specialisation or implied competitive advantage. On the face of things, these sectors reflect Melbourne's strengths and best future prospects.

A further parameter shown in the chart is the size of each sector in Melbourne, measured by employment numbers.

FIGURE: LOCATION QUOTIENT (LQ) BUBBLE CHART FOR GREATER MELBOURNE
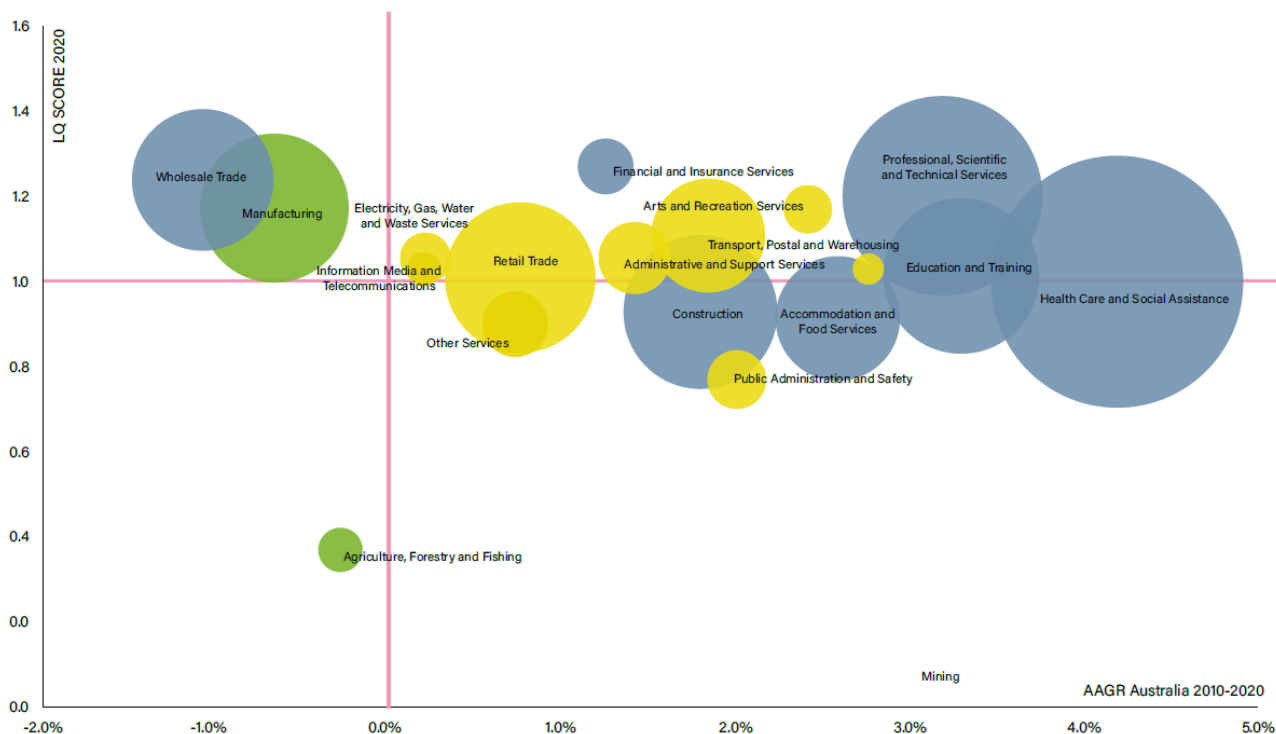


Source: SGS Economics Planning

Taking all three parameters into account, the stand out strategic sector for Melbourne is professional, scientific and technical services. Financial and insurance services, arts and recreation services and transport, postal and warehousing also have high LQ scores and can be considered as growth sectors. Industries with a comparative advantage in Melbourne but declining employment nationally are wholesale trade and manufacturing.

# The Economic Complexity of Melbourne's product exports: Hausmann analysis

The production and export of high value added products from the Melbourne economy reflects a dense and intricate set of supply links bringing together the metropolitan region's leading skills and technologies.

As demonstrated in the pioneering modelling work of Ricardo Hausmann, analysing these links can provide important insights to the growth prospects of an economy and the levers that might be applied to unlock this potential.

Higher levels of complexity in the products that an economy produces and exports are closely correlated with higher levels of income. And deviating from this relationship is predictive of future growth.

In other words, increasing complexity in the production mix can lead to economic growth. Conversely, complexity levels which are lagging income levels present a risk factor for slower economic development in the future.

The Atlas of Economic Complexity, developed by Hausmann at the Harvard Kennedy School of Government, maps the product space and complexity levels for the largest economies around the world.

This shows that Australia has relatively low levels of complexity, particularly for its high income per capita. This owes to our dominant mineral exports and the comparatively low production of more complex, manufactured goods.

To our knowledge, such an analysis has not yet been attempted for the Melbourne metropolitan economy. RDA has plugged this gap by modelling Melbourne's international export mix in terms of volume and complexity, along with that of regional Victoria, Australia and 234 other countries.

Complexity is scored on an index that reflects two things:

1) The **diversity** of products in the export basket, expressed as the number of products that an economy exports

2) The **ubiquity** of products in the export basket, represented as the number of countries that produce/ export a particular product.

More complex goods are made by countries with a diverse product mix and made by relatively few countries (i.e. less ubiquitous).

The chart below shows Melbourne's product exports by sector. Food and fuels make up the largest two export groups, combining to form over half of total export volumes from the city economy. They also have the lowest average complexity score of any sector. These products require relatively simple processing without the need for advanced technologies or highly skilled labour.

In contrast, the more complex Chemical, Machinery and Vehicle and Material Manufactures sectors make up a much smaller share of the product mix. These products require more advanced, higher-value manufacturing processes to prepare for sale and export.

The next page describes the products that make up these sectors in more detail.

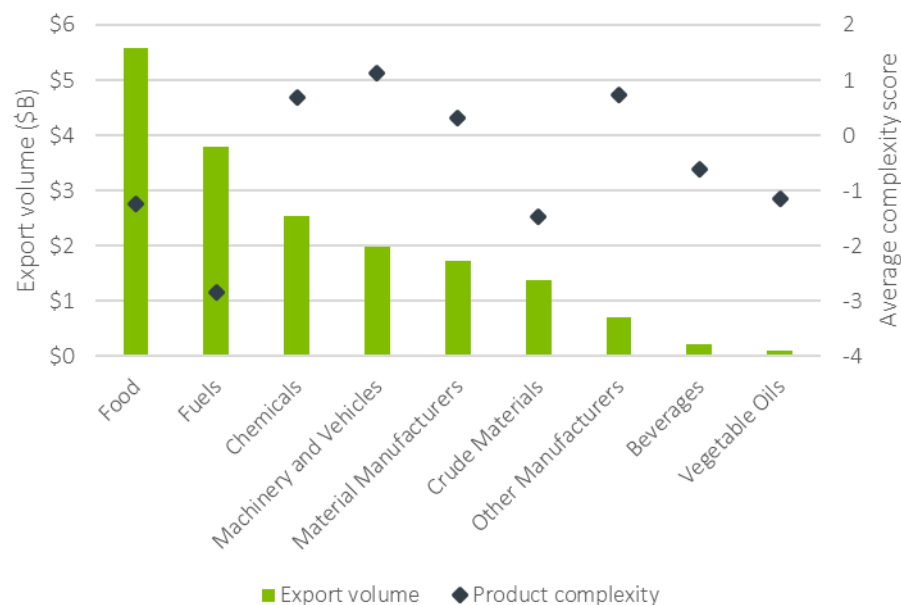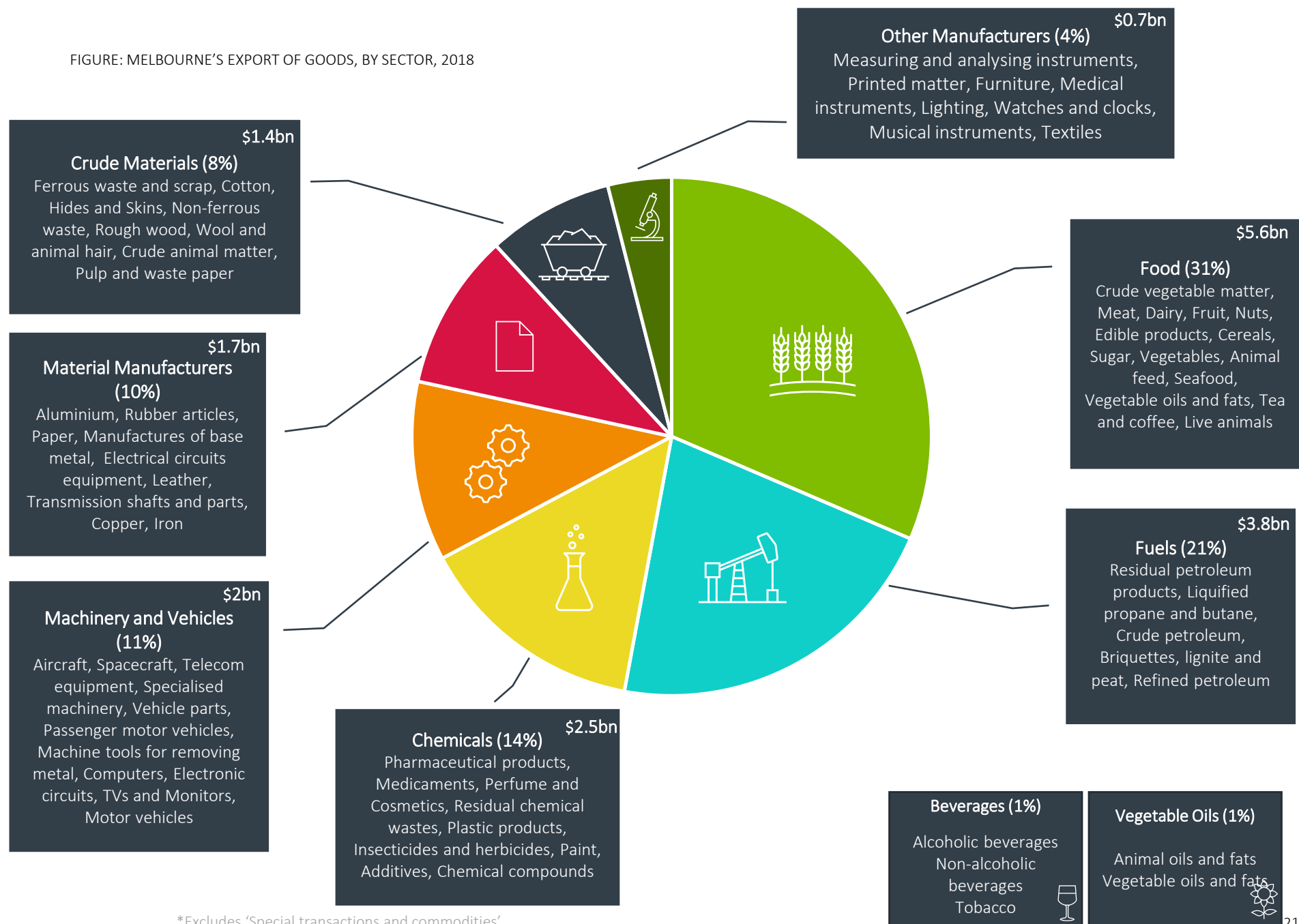FIGURE: VOLUME AND COMPLEXITY OF MELVOURNE'S EXPORTS BY SECTOR

FIGURE: MELBOURNE'S EXPORT OF GOODS, BY SECTOR, 2018

**Other Manufacturers (4%)** $0.7bn
Measuring and analysing instruments, Printed matter, Furniture, Medical instruments, Lighting, Watches and clocks, Musical instruments, Textiles

**Crude Materials (8%)** $1.4bn
Ferrous waste and scrap, Cotton, Hides and Skins, Non-ferrous waste, Rough wood, Wool and animal hair, Crude animal matter, Pulp and waste paper

**Material Manufacturers (10%)** $1.7bn
Aluminium, Rubber articles, Paper, Manufactures of base metal, Electrical circuits equipment, Leather, Transmission shafts and parts, Copper, Iron

**Machinery and Vehicles (11%)** $2bn
Aircraft, Spacecraft, Telecom equipment, Specialised machinery, Vehicle parts, Passenger motor vehicles, Machine tools for removing metal, Computers, Electronic circuits, TVs and Monitors, Motor vehicles

**Food (31%)** $5.6bn
Crude vegetable matter, Meat, Dairy, Fruit, Nuts, Edible products, Cereals, Sugar, Vegetables, Animal feed, Seafood, Vegetable oils and fats, Tea and coffee, Live animals

**Fuels (21%)** $3.8bn
Residual petroleum products, Liquified propane and butane, Crude petroleum, Briquettes, lignite and peat, Refined petroleum

**Chemicals (14%)** $2.5bn
Pharmaceutical products, Medicaments, Perfume and Cosmetics, Residual chemical wastes, Plastic products, Insecticides and herbicides, Paint, Additives, Chemical compounds

**Beverages (1%)**
Alcoholic beverages
Non-alcoholic beverages
Tobacco

**Vegetable Oils (1%)**
Animal oils and fats
Vegetable oils and fats

*Excludes 'Special transactions and commodities'

21

# Hausmann analysis: opportunities for Melbourne

Product opportunities are presented here for Metropolitan Melbourne, based on the combination of highest product complexity, opportunity gain, and distance from existing productive capabilities. Melbourne has the greatest opportunity to increase its economic complexity index and branch out into multiple new products by building a comparative advantage. Due to Melbourne's existing capabilities, 65% of Victoria's easy opportunities lie in machinery and vehicles manufacturing. More detail on product opportunities is provided on the next page.

## Product opportunities*

| Rank | Product | Sector | Product Complexity |
|------|---------|--------|--------------------|
| 1 | Metalworking machinery & parts | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◆ |
| 2 | Machine tools for removing metal | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◆ |
| 3 | Machine tools for working metal | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◆ |
| 4 | Textile & leather machinery & parts | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◇ |
| 5 | Specialised machinery & parts | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◇ |
| 6 | Ball or roller bearings | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◇ |
| 7 | Optical instruments | Other Manufacturers | ◆ ◆ ◆ ◆ ◇ |
| 8 | Hand or machine tools | Material Manufacturers | ◆ ◆ ◆ ◆ ◇ |
| 9 | Taps, cocks & valves | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◇ |
| 10 | Non-electrical machinery & parts | Machinery and Vehicles | ◆ ◆ ◆ ◆ ◇ |

## Distribution of sectors in top 40 product opportunities*

| Rank | Sector | Proportion in top 40 |
|------|--------|----------------------|
| 1 | Machinery and Vehicles | 65% |
| 2 | Material Manufacturers | 18% |
| 3 | Other Manufacturers | 13% |
| 4 | Chemicals | 5% |

Note: The Hausmann analysis is based only on the production of physical goods and international exports. It does not account for two important drivers of Melbourne's economy, the service economy and domestic exports to the rest of Australia, which also provide opportunity. A lack of complexity in Melbourne's product exports does not necessarily mean a lack of complexity and technical knowledge in other areas like services.

*Excludes 'Special transactions and commodities'

FIGURE: MELBOURNE'S PRODUCT EXPORT OPPORTUNITIES, BY SECTOR

**Chemicals (5%)**
Synthetic organic colouring,
Other primary plastics,

**Other Manufacturers (13%)**
Optical instruments, Office &
stationary supplies, Photo &
cinematography supplies,
Musical instruments and parts,
Measuring & analysing
instruments

**Material Manufacturers
(18%)**
Hand or machine tools,
Transmission shafts and
parts, Nails, screws, nuts,
bolts and rivets, Rubber
articles, Glass

**Machinery and
Vehicles (65%)**
Metalworking machinery
and parts, Machine tools
for removing and working
metal, Textile and leather
machinery and parts,
Specialised machinery
and parts, Ball or roller
bearings, Taos, cocks
and valves, Non-electrical
machinery, Vehicle parts
and accessories

# The impacts of the COVID-19 pandemic on the structure of the Melbourne economy

This report was prepared during the COVID-19 pandemic. At the time of writing (early 2021) the impact of COVID-19 was still unfolding and no detailed data on the long-term impacts is known. Though, it is already clear that the pandemic and associated restrictions have had a significant impact on the economy, with a reported decline in national gross domestic product (GDP) of 7% in the June quarter (2020). However, over recent months there has been evidence that the economy has bettered expectations and is making a fast recovery, noting though that the recovery is uneven and some groups, places and industries remain worse off than prior to the pandemic. Further outbreaks and issues with Australia's vaccine program may still cause economic disruptions.

**Population Growth**

Migration to Melbourne form overseas remains on hold due to border closures. The speed of the vaccine rollout is one factor in when migration can recommence, alongside international control of the virus. Melbourne's economic development has been heavily dependant on population growth. The lost immigration may not ever be made up in future years, having consequences for the structure of the Melbourne economy.

**Potential lasting effects of COVID-19**

Once the pandemic is over there are likely to be some lasting effects on the economy. These will largely be already existing or emerging trends amplified via the pandemic. Some will positively impact Melbourne, while others might be negative. It is currently unclear how they will balance out, which will in part be influenced by how the Melbourne community and various levels of government responds to them.

To understand this further, the impacts from the pandemic on each driver industry, enabler and sustainer has been explored and captured in the report in chapters 5 to 8.

# 03

# The economic vision for metropolitan Melbourne

# Introduction

The structure and performance of the Melbourne economy will continue to change and develop over coming decades from its current state as outlined in the previous chapter. Government policy has an important role to play in shaping development, but policy at a metropolitan level is piecemeal due to the various layers of government and different stakeholders responsible for the functioning of the city.

There is a long list of quality policy documents that articulate a vision for the future of the Melbourne economy. These policy documents relate to different areas of the Melbourne economy, including urban form (*Plan Melbourne, Regional Land Use Frameworks, National Employment and Innovation Clusters and Urban Renewal Precincts*), target industry development (*DJPR Priority Industries, Advancing Victoria's Manufacturing. A Blueprint for the Future, Creative Industries Strategy, Visitor Economy Strategy),* infrastructure (Infrastructure Victoria's *Growing Victoria's Potential, Victoria Freight Plan),* exports (*Victorian Trade Strategy*), new business formation (*LaunchVic Strategy 2019/20, Victorian Social Enterprise Strategy),* circular economy and the environment (*Recycling Victoria: A New Economy),* climate change (*Victoria's Climate Change Strategy), or* economic development for Aboriginal communities (*Tharamba Bugheen Victorian Aboriginal Business Strategy),* amongst many many others. At the Commonwealth level there are further strategies, and initiatives like City Deals. While each of the 31 local councils in Metropolitan Melbourne have their own economic visions and economic development strategies.

The lack of an overarching vision for Melbourne's economic future means the city is currently heading in many directions based on the multitude of visions of individual strategies. While that might achieve some goals, it is unclear as to whether the various directions are actually based on Melbourne's strengths and that investment and strategy align.

# The implied vision

The Melbourne RDA is one stakeholder who has identified that an overarching economic vision for Melbourne is necessary to guide the work of the newly established Melbourne RDA. An initial strategic directions workshop held for this project noted that there is:

> …"*need for a compelling vision of the future Melbourne economy, which would galvanise spontaneous co-ordination of planning and investment by all stakeholders.*"

This does not currently exist as a discrete statement, in a way which is comparable to other metropolitan areas (for example, Sydney via A metropolis of Three Cities).

There was general agreement in the project workshop that Melbourne lacked the institutional infrastructure to develop such a vision. The State Government has 'ownership' of the metropolis, but it tends to pursue a portfolio, rather than place-based, approach to economic development planning.

Against this background, independent advisory bodies like RDA Melbourne can potentially fill a strategic gap, and lead a visioning process.

As an advisory body, the role of the RDA is therefore not to develop this vision for Melbourne, but rather to collate it. There is an economic vision for Melbourne, implied by a number of policies and strategies.

This project identifies an economic vision, which was drafted based on a review of government policy literature, and then tested and refined via a series of analyses and discussions.

The current implied vision for the metropolitan economy was considered by SGS using these initial key questions:

1. What are the region's principal international and inter-regional exports?
2. Allied to this, what are the region's principal competitive strengths versus national and international peers?
3. What is the role of manufacturing in the Melbourne economy?
4. What kind of job mix does the economy generate?
5. What does this job mix mean for skills, education, training?
6. What distinguishes Melbourne's innovation system from those of its national and international peers?
7. Will role does the local consumption economy (the High Street as distinct from big business) play?
8. What is the spatial structure of the economy?
9. What are the social factors that impact the metropolitan economy?
10. How are the culture, skills and experience of Aboriginal groups included in Melbourne's economic vision?
11. How is the need to restore and protect the environment constraining or enhancing the economic prospects of Melbourne?

# Exploring the vision

The implied answers to these questions, based on a scan of government documents are outlined in the table below (page 1 of 2)

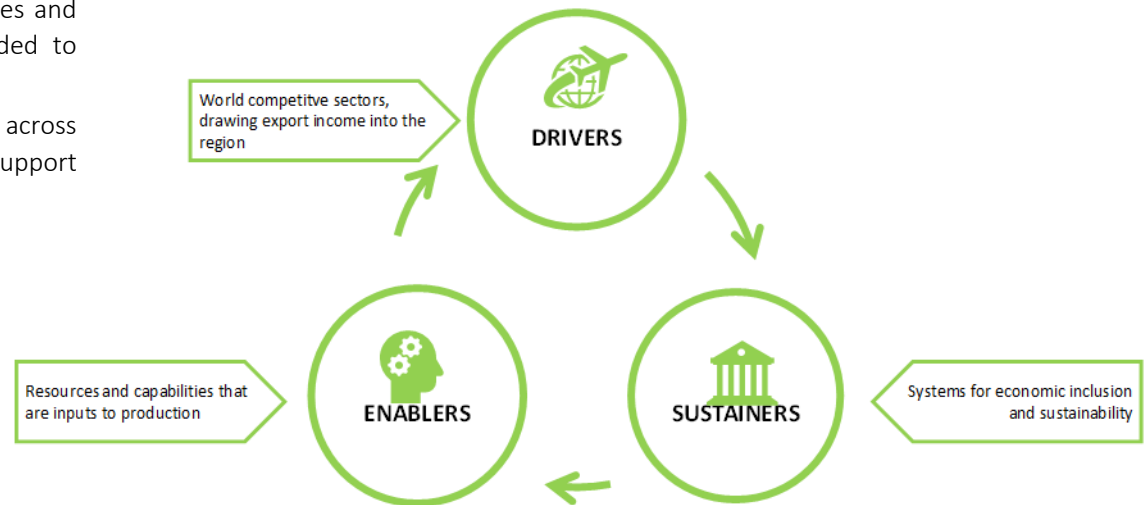| Parameter | Current implied vision |
| --- | --- |
| Exports | Exports are a significant player in economic development. Exports bring in new wealth for the city. Government policy documents identified Melbourne's main exports as being food and fibre product manufacturing, health care and research, transport-related products, tertiary education, professional services (design, engineering), creative industries (arts and fashion), place and culture-based retail, tourism and major events, and the defence and space industries. Melbourne's businesses are supported by the government to go global. |
| Competitive strengths | Melbourne's premier competitive strengths, compared to its competitors, are its transport and logistics network and plentiful land for growth. These strengths allow Melbourne's exports to reach Australia and the world. Advantages include access to the largest port in Australia, Inland Rail and Melbourne's 24-hour international airport. |
| | Melbourne is also an enviably liveable city, making it a great place to live, attracting and keeping skilled talent. Other advantages include a highly skilled workforce, robust democracy and regulatory frameworks, young and diverse population, world-class health and education, and strong research capabilities. These latter advantages mean that Melbourne has been less affected by the Coronavirus pandemic than other global cities. |
| Manufacturing | Though manufacturing has declined in terms of employment, it remains critical to Melbourne's economy. Advanced ways of manufacturing, relying on new technology and dense local supply chains in knowledge-intensive industries are coming to the fore. Industry partnerships continue to expand and create value. |
| | There are exciting opportunities in the growing need for a circular economy and in food product, construction technology and transport equipment manufacturing, linking in with Melbourne's national strength in freight and logistics. Bio-med manufacturing is another critical sector for Melbourne, linking to the city's world-class research institutions and bolstered by the renewed focus on health infrastructure, sovereign capability and local health equipment supply chains as a result of COVID-19. |
| Job mix | Melbourne's mix of jobs is an outcome of its competitive strengths. Melbourne has a diverse mix of jobs, from highly knowledge-intensive to more traditional blue-collar workforces. Many jobs in Melbourne are also highly creative. |
| Skills and education | Melbourne has an enormous stock of human capital, with a highly diverse and skilled workforce. Melbourne is a world leader in education, renowned as the education state. The easy access to high-quality education allows Melburnians to become highly trained or change career to suit demand. The Victorian Government vision for learning is that all students are empowered to learn and achieve, to experience high quality teaching practice and the best conditions for learning which equip them with the knowledge, skills and dispositions for lifelong learning and to shape the world around them. |

# Exploring the vision

| Parameter | Current implied vision |
| --- | --- |
| Innovation | Melbourne has a reputation for innovation and new technology. New technology and innovations, such as robotics, AI, driver-less vehicles, and new energy sources, are being brought into the economy over the next 5-10 years. Innovation in all industries is critical to capturing and creating new opportunities for Melbourne. Melbourne businesses are quick to adopt and take advantage of new technologies, supported by the government. |
| Local consumption economy | Melbourne has a diverse and vibrant CBD and inner-city as a result of bars, restaurant culture, live music and vibrant arts scene. Melburnians love retail and hospitality offers that are experience-based, not just transactional. The local consumption economy builds social capital. These sectors, though, have been some of the hardest hit by COVID-19. |
| Spatial structure | Melbourne is a city of 20-minute neighbourhoods supporting a vibrant local consumption economy. Melbourne has a series of innovative employment clusters (NEICs), where Melbourne's research institutions and export firms thrive. There is a balance between the benefits of agglomeration, focussed on the CBD, and easy access to jobs and services for residents, and supply chains and for businesses. Significant infrastructure investment is making this possible. |
| Social factors | Population growth, built on opportunity and liveability, is celebrated. Attracting new residents is vital to Melbourne's economy. Wealth and spatial inequality are noted as a drag on economic performance, and steps to make growth more inclusive for all Melburnians are being pursued. A sustainable economy needs to generate more than business profits. |
| Indigenous ownership of country | Indigenous Melburnians are the original custodians of the land that Melbourne's new economy is built on. They had their own economy before Europeans arrived. Treaty and reconciliation are critical to rectifying and acknowledging that Melbourne's economy is built upon the disposition of aboriginal land and ongoing structural inequality. Aboriginal Melburnian's hold the knowledge and expertise about what is best for themselves, their families and their communities. Power, opportunity, skills, and prosperity need to be shared with traditional custodians of the land and Incorporated in day-to-day business and industry practices for us to have a just economy. |
| The environment | Protecting the environment and reducing carbon emissions are not seen as prohibitive to the economy. Instead, they are seen as opportunities. Melbourne can be known as a leader in new energy technology. Reduced emissions and other pollution, and restoration of the environment and urban greening will have a positive impact on human capital and maintaining Melbourne's international strength in liveability. |

# The three pillars framework

To anaysle the performance and suitability of the implied vision, SGS has assembled an 'implicit metropolitan vision' from a thorough review of State policies and strategies. This vision was built around three pillars:

1. Melbourne's economic **drivers**: Melbourne's world competitive sectors that draw in export income into the region. Export income is particularly important to economic development as this is 'new' wealth that has been generated, and can then circulate around the metropolitan economy creating jobs and investment

2. The **enablers** of economic activity: Melbourne's resources and capabilities (like skills or infrastructure) that are needed to support economic production

3. Economic **sustainers**: The sustainers are the systems across governance, regulation, leadership, social capital which support the economy

The three pillars work in unison. Driver industries need the enablers to be successful, likewise the city can't invest in enabling capabilities unless the driver industries are creating wealth in the city to invest. Sustainers are often overlooked in economic development, but without systems for a robust democracy, that ensure wealth and opportunity are shared, or that the environment is sustainably managed, economic activity will not be achieving its ultimate purpose, to ensure happy, prosperous lives for Melbourne's residents through an economy that is sustainable and resilient for the long-term.

World competitve sectors, drawing export income into the region

**DRIVERS**

Resources and capabilities that are inputs to production

**ENABLERS**

**SUSTAINERS**

Systems for economic inclusion and sustainability

# The final vision

Based on the policy review and discussions with RDA, the final vision for Melbourne as articulated through the three pillar framework is:

"Melbourne's economy will be powered by globally significant industries in health, education and niche manufacturing.

The region's competitiveness will stem from a high quality labour force, excellent transport links, outstanding creative and design capabilities, stable governance, livability and cultural vibrancy.

Inclusive and environmentally sustainable approaches to economic regulation, spatial development and governance will maintain these advantages into the long term"

The next three chapters of this report explore each pillar of the vision in more detail to understand whether the performance of the Melbourne economy matches the implied vision.

# 04

# Melbourne's economic drivers

## Researching Melbourne's driver industries

The objective of this part of the research is to better understand the strategic significance of the claimed drivers of the metropolitan economy, as set out in the vision.  These drivers include (in alphabetical order):

1. Bio-med research & manufacturing
2. Construction know how
3. Defence & aerospace manufacturing & services
4. Food and fibre product manufacturing & services
5. Health care
6. Professional services (design, engineering)
7. Tertiary education
8. Tourism  - major events
9. Tourism - place and culture
10. Transport-related product manufacturing & services and logistics

In appraising the strategic significance of each of these sectors in turn, the research explored:

- The driver's domestic standing including strengths and weaknesses
- The evidence for Melbourne's claims to being globally competitive in each driver sector
- The short-term impact of COVID-19 and the governments response on performance
- 10-year, business-as-usual (BaU) prospects

Each driver's performance was then ranked by SGS based on the research, review of data and SGS's experience and judgement. Rankings were given as to whether national and international performance was leading or lagging, whether the impacts of the COVID-19 pandemic were severe or beneficial, and whether the driver's 10-year BAU are good or poor. Ratings are shown via an infographic as shown below.
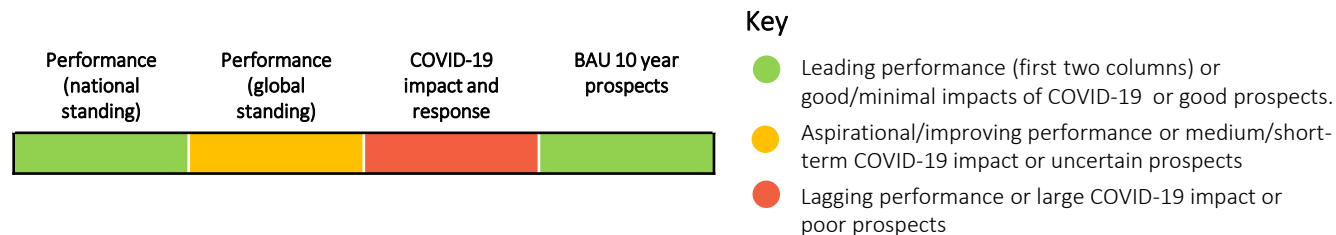
| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
| --- | --- | --- | --- |

**Key**

🟢 Leading performance (first two columns) or good/minimal impacts of COVID-19  or good prospects.

🟡 Aspirational/improving performance or medium/short-term COVID-19 impact or uncertain prospects

🔴 Lagging performance or large COVID-19 impact or poor prospects

# Bio-med research & manufacturing

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Bio-med manufacturing, represented by manufacturers of medical and surgical equipment and devices, is a critical sector for Melbourne, linking to the city's world-class research institutions and bolstered by the renewed focus on health infrastructure and local health equipment supply chains as a result of COVID-19

## Performance (national standing)

Melbourne has a leading performance from a national stand-point.

Strengths include:
+ Employment in this driver is 290% higher in Melbourne than Australia generally suggesting a concentration of expertise (see LQ results, figure 1 in appendix A)
+ More than 40% of Australian ASX-listed life science companies are based in Melbourne equating to US $12 billion in economic activity (Start-up Genome, 2020).
+ Pharmaceutical products are Melbourne's most valuable complex product manufactured for export (as ranked in the Hausmann analysis) and 4th overall (behind non-complex food and fuel products). Medicaments (incl veterinary) are Melbourne's third most exported complex product by value (11th overall).
+ Bio-med products, like medical devices, are one of Melbourne's fastest growing export products since 2011 (See Figure 3 in the appendix).
+ The development of Plan Melbourne with its focus on health and innovation precincts, most notably the Parkville biomedical precinct
+ The city's world-class research institutions have global expertise and many local firms are partnering with multinational companies
+ There are key anchors; like the Australian Synchrotron which has enabled more than 100 international patents and CSL, one of the top three most valuable biotech companies in the world.

Weaknesses include:
× Development is reliant on innovative design, access to skilled workers and ability to scale up quickly. These settings need to be improved.

## Performance (global standing)

Strengths include:
+ Melbourne has a global reputation for having a leading healthcare system
+ The Parkville Precinct is ranked in the top five precincts for biomedical excellence in the world and the University of Melbourne and Monash University are in the top five biomedical universities in the Asia-Pacific region.

Weaknesses include:
× Increasing international competition drawing investment to other jurisdictions
× Compared to global standards, a lack of research commercialization

The United States is the global leader in the biomedical industry, but countries across Europe and Asia are pursuing aggressive plans to close the gap and create the high-value jobs and capital the sector creates.

## COVID-19 impact and response

On balance, the impacts on bio-med research & manufacturing and services can be considered positive (in comparison to other components of the vision). Positive factors include:
+ The renewed government and community focus on local medical manufacturing and localisation of supply chains
+ Victorian public research institutions and companies have contributed to the national COVID-19 response, improving the understanding of the immunology and epidemiology of the virus, developing vaccines and treatments, and developing expertise
+ Investments in research capabilities from the State Government including the new Australian Institute for Infectious Disease and mRNA vaccine manufacture capabilities

Some negative impacts include:
× Interruption of international supply chains
× The loss of international skilled migration
× Severe financial impacts on the education system enabler due to loss of international students
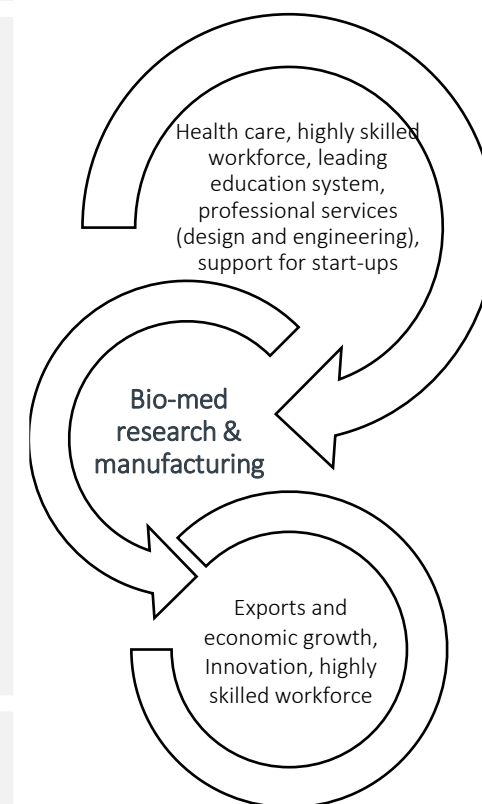
## BAU 10-year prospects

Melbourne's BaU prospects over the next ten years can be considered as good. Opportunities include:
+ International and domestic export markets will continue to grow through population growth and aging populations
+ Optical instruments and measuring & analyzing instruments are leading product opportunities identified by the Hausmann analysis

Identified threats are:
× Uncertain prospects in the Melbourne's tertiary education sector will impact university research capabilities and the quality of graduates

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Health care, highly skilled workforce, leading education system, professional services (design and engineering), support for start-ups

Bio-med research & manufacturing

Exports and economic growth, Innovation, highly skilled workforce

# Construction know how

**Claimed vision (hypothesis):** Melbourne has an enormous construction industry built on the back of population growth and infrastructure investment. The manufacture of prefabricated buildings is a significant opportunity for the city to grow an innovative and leading export industry.

## Performance (national standing)

Melbourne has an aspirational performance from a national stand-point. Strengths include:

+ Melbourne does have a large traditional residential and civil construction industry built on the back of population growth and infrastructure investment.
+ Melbourne has had some early success and investment in the prefabricated building industry, but the sector remains in its infancy. This sub-industry has a high LQ score, but low employment (figure 2 in the appendix).
+ Prefabricated buildings are a complex good from an economic complexity stand-point, but Melbourne's current international export of prefabricated buildings is very small.
+ Growth of the industry is supported by Melbourne's strong design and engineering workforce who can apply advanced manufacturing ideas to the development of prefabricated modular buildings for domestic use and export
+ The Australian Research Council's Training Centre for Advanced Manufacturing of Prefabricated Housing has been established at the University of Melbourne, with industry partners Prebuilt, Prefabaus, FWPA, habitech, enviroSIP, Timber Building Systems, and more.
+ The Australian and Victoria governments have announced support for the manufacturing and building and construction sectors, with support for the prefabricated building industry.

Weaknesses include:

× Melbourne has low LQ scores and declining employment in construction component manufacturing (see figure 2 in appendix), and of Melbourne's identified Driver Industries, construction has, the lowest export levels (see figure 3).
× At the 2016 census there were only 200 workers in the prefabricated metal and wood building manufacturing sectors across all of Greater Melbourne

## Performance (global standing)

Melbourne has an aspirational performance from a global stand-point. Strengths include:

+ Government investment and support
+ The untapped potential of the domestic market compared to overseas

Weaknesses include:

× There has been a renaissance in housing prefabrication and modularisation in Europe, the US and Japan which has yet to be replicated in Melbourne.
× Advanced manufacturing of prefabricated housing is a viable alternative to traditional on-site forms of construction, however the use of prefabricated building techniques is very low in Melbourne. In 2016, 80% of new building construction in Sweden were prefabricated, while in Victoria that rate was 5% (Victorian Department of Jobs, Regions and Precincts, 2019).
× Difficult to export internationally due to the size of components and distance from Melbourne to markets compared to competitors.

## COVID-19 impact and response

On balance, the impacts of the pandemic can be considered as medium (in comparison to other components of the vision). Positive factors include:

+ Melbourne's construction industry has been heavily supported by government grants and infrastructure spending to stimulate the economy

Some negative impacts include:

× Lower levels of construction may result from on-going restrictions on immigration

## BAU 10-year prospects

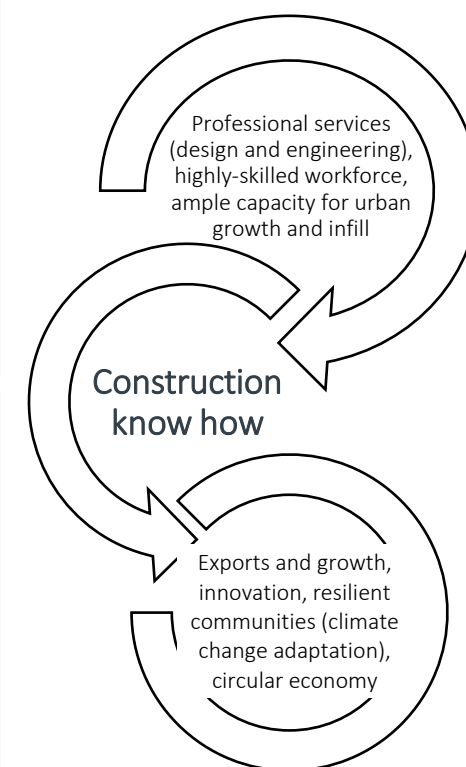Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.

+ The Prefabricated Building Market in Australia is in its formative stages but can be expected to grow strongly as the technology is accepted as normal practice driven by uptake in low-to-mid-rise residential buildings, project homes, public buildings and public housing.
+ Development of construction products for changing climate conditions and for a circular economy are large opportunities for growth and innovation

Identified threats are:

× Melbourne's residential construction industry will likely be impacted over the next ten years by lower levels of international migration

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Professional services (design and engineering), highly-skilled workforce, ample capacity for urban growth and infill

Construction know how

Exports and growth, innovation, resilient communities (climate change adaptation), circular economy

# Defence & aerospace manufacturing & services

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne plays a critical role in the development and sustainment of Australia's defence capability

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Defence manufacturing contributes around $8.4 billion annually to the Victoria economy and supports approximately 36,600 people and 6,300 businesses working in the supply chain to make equipment and provide services for defence activities (DJPR, 2019)
+ Aircraft, spacecraft & parts is Melbourne's second largest complex international export product in terms of value (behind pharmaceuticals), and 8th overall.
+ Melbourne is home to key defence research organisations such as the Defence Materials Technology Centre and Defence Science Institute. As well as holding key cyber security and ICT capabilities.
+ The Defence Science and Technology Group's Aerospace Division in Melbourne provides essential support and technical advice on the Australian Defence Force's (ADF) aircraft platforms
+ While the aerospace manufacturing industry has business presence in every state and territory, the majority of the activities are concentrated on the eastern coast of Australia, with inner Melbourne being a hub for aircraft manufacturing and repair services activity. There is additional activity in the northwest of the city
+ Melbourne has high LQ scores for aircraft manufacturing and repair services (LQ score of 2.43 and >1,800 workers) indicating comparative strength in this area.
+ Defence & aerospace products have a high complexity score in the Hausmann analysis
+ Manufacturing for the defence industry contributes greatly to research and development via its purchase of high-tech and innovative technology
+ Large defense contractors in the city have strong supply chain linkages to SMEs creating great economic value

Weaknesses include:
× Low LQ scores for ship and boat building indicating lack of strength in these fields
× Highly competitive sector with all States trying to attract and grow their defense manufacturing industries via funding promises

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's defence & aerospace manufacturing & services can be considered as positive or negligible (in comparison to other components of the vision). Positive factors include:

+ The large focus on manufacturing as an industry to drive recovery includes defence and aerospace manufacturing

Identified threats are:
× The sudden contraction of global travel has impacted demand for aerospace technology as demand for new airplanes declines

## Performance (global standing)

Weaknesses include:
× Australia doesn't have the capabilities of other countries, so defense contracts are often awarded to international partners
× Melbourne is not regarded as a major aviation/aerospace cluster on a global level. Leading cities include Seattle, Toulouse, Montreal, Singapore, and Sao Paulo. Emerging clusters include Dubai, Tulsa, Hong Kong, Hamburg and Shanghai.

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered good.

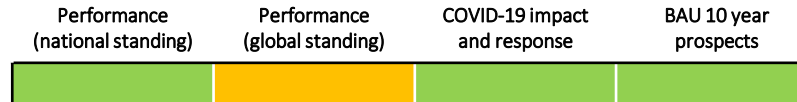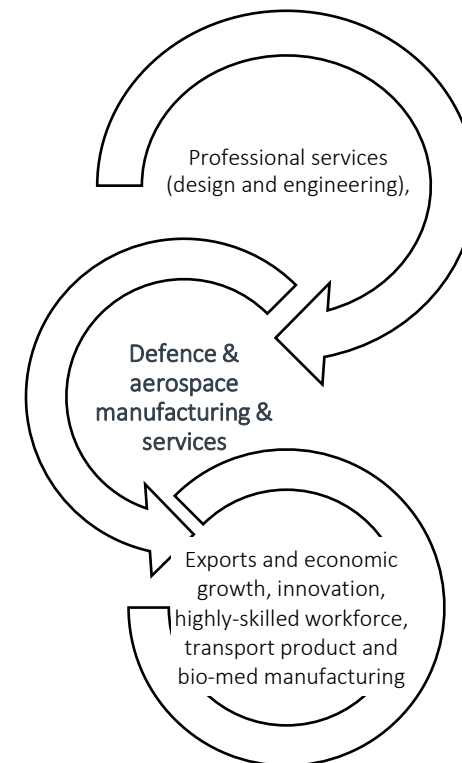+ Significant Federal government spending over the next 10 years in the sector provides an opportunity for Victorian manufacturers to consider investing in defence product development as part of their business
+ Fishermans Bend redevelopment to include incubators for defence, design and engineering.
+ Links to biomed technology manufacturing can be developed
+ Military expenses are on the rise as security threats continue to intensify

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Professional services (design and engineering),

Defence & aerospace manufacturing & services

Exports and economic growth, innovation, highly-skilled workforce, transport product and bio-med manufacturing

36

# Food and fibre product manufacturing and services

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
| | | | |

**Claimed vision (hypothesis):** Melbourne has the largest food product and textile manufacturing sector in Australia, with deep supply chains to the regions and growing exports to the world. Exports will continue to grow through global population growth and demand for fresh and healthy food.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Victoria is Australia's major food processing state, with Melbourne at its centre, accounting for one third of the processed food produced by Australia.
+ Nearly half of Victoria's top 100 exporters are from the food and fibre sector. Eight of Victoria's top 10 food and fibre export markets are in Asia, with China the largest
+ Food is Melbourne's largest export product
+ From a jobs growth and LQ perspective, the processing of fruit and vegetables, meat and milk and cream in Melbourne are doing very well and reflect Melbourne's comparative advantages in this driver. Confectionary manufacturing has a high LQ score as well
+ In fibre products Melbourne has a high LQ score for clothing manufacturing and cut and sewn textile product manufacturing
+ Integrated air and sea freight services operate regularly out of Melbourne's ports

Weaknesses include:

✗ The complexity scores for the types of food and fibre products that Melbourne exports are low. Crude vegetable matter, a very simple product, makes up 45% of the international export value of Melbourne's food products
✗ Melbourne exports textiles as unprocessed commodities that are then made into clothing overseas and sold back to Australian consumers in the form of luxury brands by American, French, Italian, and British fashion houses.

## Performance (global standing)

Strengths include:

+ Melbourne has a strong international reputation for food safety and biosecurity systems, which acts as a comparative advantage and economic moat for Melbourne businesses

Weaknesses include:

✗ Australia's lack of competitiveness in global commodities means there is a need to create new and novel products that can command a premium

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's food and fibre product manufacturing and services can be considered as positive or negligible (in comparison to other components of the vision). Positive factors include:

+ Though there were some supply chain disruptions, food is an essential good which remained in demand and production throughout the pandemic
✗ Labour shortages have been caused by the loss of international visitors

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered good.

+ Exports will continue to grow through global population growth and demand for premium, fresh and healthy food.
+ Technology disruption and digital-oriented consumption patterns in fashion will create opportunities and more engagement with overseas markets for fibre product manufacturers but will intensify international competition

Identified threats are:

✗ Exposed to technical barriers to trade and trade wars
✗ Climate change will disrupt growing seasons for food and fibre

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Transport and logistics infrastructure, creative industries (fashion), comprehensive climate change policies, strong environmental protection regulations

Food and fibre product manufacturing and services

Exports and economic growth, strong local consumption economies
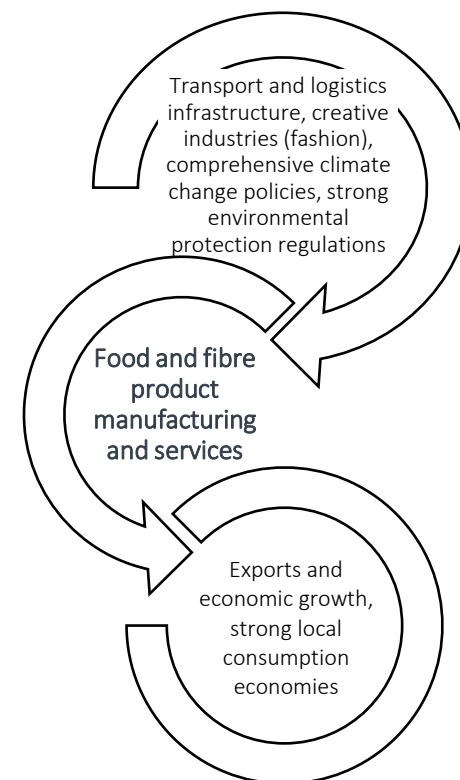
# Health care

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne offers world-class health and wellbeing services to help Victorians live a healthier lifestyle. Through the strong establishment of health and health research intuitions and capabilities, the sector provides quality treatment, care, education and research to Melburnians and visitors, whilst generating employment for Melburnians.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ High LQ score which has increased significantly since 2006 (see figure 1 in appendix), indicating Melbourne's health sector development from being mainly population serving to an important export industry that provides health services to people living outside of Melbourne
+ The Victorian business sector with the largest number of startups is health, and the share has been growing (see figure 6 in appendix) (LaunchVic, 2020, Ecosystem Map).

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's health care sector can be considered as positive (in comparison to other components of the vision). Positive factors include:

+ The pandemic has placed enormous strain on the global health care sector's workforce, infrastructure, and supply chain, and exposing social inequities in health and care. By comparison Melbourne's health care system has performed very well.
+ The rapid adoption of tele-health and other digital innovations
+ Unprecedented public-private collaborations in vaccine and therapeutics development

Some negative impacts include:

× Supply shortages, particularly early on, for basic medical supplies such as surgical masks, hand sanitiser and testing kits for COVID-19
× Frontline staff's safety and well-being was challenged during Melbourne's outbreaks

## Performance (global standing)

Strengths include:

+ In the World Index of Healthcare Innovation Australia is a world-leader, second to only Switzerland, when it comes to the quality of healthcare (see figure 5 in appendix)

Weaknesses include:

× In the World Index of Healthcare Innovation Australia ranks near bottom (out of 31 developed countries) when it comes using a science and technology in the healthcare system (see figure 5 in appendix), meaning low levels of scientific discoveries and medical advances compared to comparator countries. Melbourne though, is the key city for health care science in Australia. Even though the country is performing poorly on this global indicator the city is still doing well.

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered good.

+ Industry size and export value will continue to grow fueled by local and global population growth and population ageing
+ The roll-out of the National Disability Insurance Scheme will create opportunities for small businesses
+ The use of health information technology (tele-health) and the informatics field is rapidly expanding

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Leading education system, highly skilled, good value workforce, efficient taxation systems

Health care

Exports and economic growth, bio-med research & manufacturing, livability, resilient communities
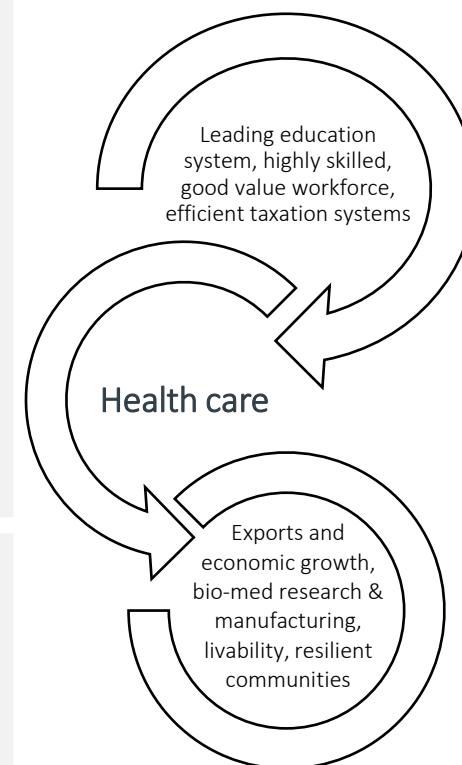
# Professional services (design, engineering)

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
| | | | |

**Claimed vision (hypothesis):** Melbourne is a leader in professional services in the Asia-Pacific region and recognised as Australia's design capital. The sector has competitive advantages as a result of a highly skilled workforce, first-class regulatory framework, a strong research base and high quality of life. The sector is primely positioned for robust future growth. Engineering, design, research, advanced manufacturing, cyber technologies, robotics and professional services are claimed as emerging comparative advantages.

## Performance (national standing)
Melbourne has a leading performance from a national stand-point. Strengths include:
+ The professional and financial services industry is the largest segment in the Melbourne economy, within that sit design and engineering capabilities which are foundational to Melbourne's economic growth
+ Melbourne has competitive advantages (based on LQ score) in architectural services and engineering design and engineering consulting services
+ Melbourne is home to a large proportion of Australia's engineering workforce, key funds (super and wealth), insurers, banks and research centres.
+ Melbourne's architecture industry has Australia's leading innovative developers and designers developing new models and designs for sustainability, accessibility and affordability such as the Nightingale and Assemble models.
+ The design and engineering industries are supported by strong architecture and engineering faculties of Victoria's universities who internationally renowned for design excellence. RMIT is ranked 11th globally for art and design. The University of Melbourne and Monash University are ranked 41st and 54th globally for engineering and technology.
+ Engineering and technology skillsets are most in demand by Melbourne's start-ups (LaunchVic, 2020)
+ Good land availability in and around Melbourne CBD and activity centres and cheaper rents than Sydney

Weaknesses include:
× Melbourne's Hausmann score indicates that Melbourne's design and engineering skills are not being utilized enough by Melbourne's manufacturing sector for complex product development and innovation (apart from bio-med and defence manufacturing sectors).

## Performance (global standing)
Strengths include:
+ Globally recognised as a leader in professional services in the Asia Pacific
Weaknesses include:
× Not recognized globally as SMART city (with Singapore the global benchmark), or a leader in design. Leading design cities include Copenhagen, Tokyo, London, Milan, Mexico City, Boston and New York

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's design and engineering services can be considered as positive (in comparison to other components of the vision). Positive factors include:
+ Professional services were able to shift to remote working meaning lower impacts from the pandemic lockdowns
+ Government stimulus measures and budget announcement will see contracts flowing to design and engineering firms
Some negative impacts include:
× Agglomeration and knowledge spillovers are important to knowledge industries like design and engineering, but the pandemic may lead to long-term changes to working patterns impacting agglomeration economies in Melbourne's CBD

## BAU 10-year prospects
Based on the research, Melbourne's BaU prospects over the next ten years can be considered good.
+ Growing demand for engineering and technology skillsets as a growing proportion of the value generated by manufacturing stems from pre- and postproduction activities such as R&D, design, and engineering
+ The large pipeline of major infrastructure projects will continue to create work for Melbourne's design, architecture and engineering industries.
+ Industry 4.0 will see an increasing demand for Melbourne's design and engineering capabilities
Identified threats are:
× Any slowing of population growth will ultimately reduce the demand for design and engineering in the residential housing and infrastructure sectors
× The poorly performing education system enabler may impact the flow of skilled graduates

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Highly skilled, good value workforce, leading education system, liveability

Professional services (design, engineering)

Exports and economic growth, manufacturing drivers, innovation,

# Tertiary education

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
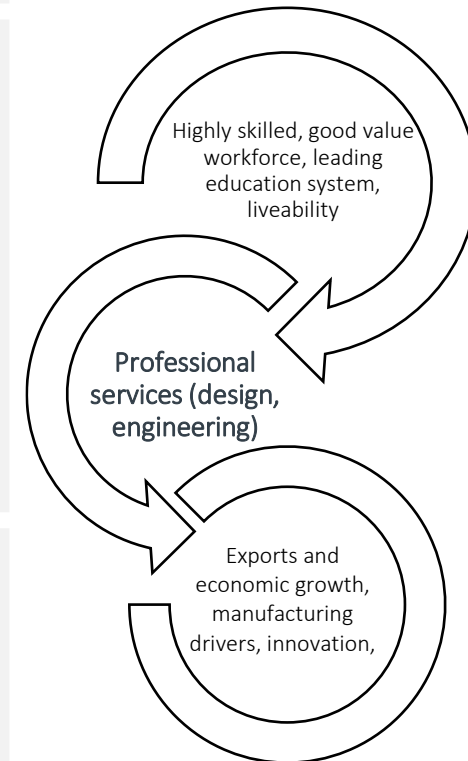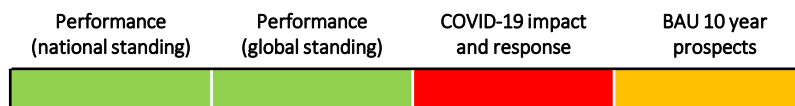
**Claimed vision (hypothesis):** Melbourne has a world-wide reputation for high-quality tertiary education. The sector draws in thousands of international students driving education exports for the city.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Tertiary education has become one of Melbourne's largest export sectors with over 250,000 international students studying in Victoria in 2019. These students contribute greatly to the vibrancy of Melbourne, and economic performance through local spending and international visitation of relatives and friends
+ The export value of tertiary education had been growing strongly (see figures 3 and 4 in the appendix)
+ Higher education has an LQ score of 1.44 reflecting Melbourne's comparative advantages in this driver.
+ The alumni network of Mellborne's universities links global research, trade and business across the world to Melbourne providing additional benefits beyond the export value
+ Melbourne's strengths in livability and multiculturalism act as a draw for international students

Weaknesses include:

× The tertiary sector is over reliant on International student income streams for its financial performance

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's tertiary education sector can be considered as severe (in comparison to other components of the vision). Positive factors include:

+ There may be reputational benefits via Australia's and Melbourne's handling of the pandemic and low case numbers

Some negative impacts include:

× The higher education system is in crisis due to a lack of Commonwealth Government support and the overreliance on international students as a core stream of revenue which has been exposed by border closures
× Potential for ongoing stop start disruption to international borders if surges in COVID-19 cases occur. The slow roll-out of the vaccine in increases the likelihood of this
× Once international travel resumes, Melbourne may be more attractive compared to European and US universities for safety reasons. However, the lack of wage support (JobKeeper) offered to international students who lost their jobs in Australia has hurt Australia's reputation compared to other countries

## Performance (global standing)

Strengths include:

+ The QS Best Student Cities 2019 ranking placed Melbourne third behind only London and Tokyo. In the ranking Melbourne scored highest in the world for student diversity, but performs poorly in affordability of fees and living.

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.

+ Export opportunities will continue to grow through global population growth and demand for education

Identified threats are:

× The poor financial position of Melbourne's universities and the need to cut costs will impact the quality of the offer going forward
× Political and trade tensions with China may see demand for a Melbourne education from Chinese students falling
× Overall impacts on university sector will affect long term competitiveness. As a large sector in Melbourne, this will have significant economic impacts particularly in the central city.

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Leading education system, productivity boosting urban form, reputation for liveability, Welcoming, multicultural society,

Tertiary education

Exports and economic growth, innovation, highly skilled workforce,

# Tourism - major events

**Claimed vision (hypothesis):** Melbourne has a reputation as Australia's Culture and Sporting Capital. As a result, Melbourne has a large standing as hosts to a plethora of major international festivals and special events throughout the year

## Performance (national standing)
Melbourne has a leading performance from a national stand-point. Strengths include:
+ Iconic venues for major events including the MCG, Melbourne Park, AAMI Park, Arts Centre, NGV and Flemington Race Course
+ Highly regarded cultural events including the International Comedy Festival, Fringe Festival, Melbourne International Arts Festival (now RISING Melbourne), Melbourne Food and Wine Festival, Next Wave
+ Highly regarded international and national sporting events including the Australian Open (tennis), Melbourne Cup (horse racing), AFL Grand Final, Boxing Day Cricket Test, and the Formula One Grand Prix.
+ High LQ scores in Horse and Dog Racing Administration, Sports and Physical Recreation Venues, Grounds and Facilities Operation, Sports and Physical Recreation Clubs and Sports Professionals and Catering services point to Melbourne's comparative advantages (see figure 2 in appendix)

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's major events can be considered as severe (in comparison to other components of the vision). Positive factors include:
+ The hosting of the Australian Open proved that Melbourne can still host major international events while the world is dealing with the pandemic
+ Melbourne may be able to position itself as a preferred host due to the ability to have large crowds where other cities globally can not

Some negative impacts include:
× COVID restrictions meant that the hosting of major events was difficult or impossible. All of Melbourne's major events were cancelled or run with crowd restrictions in 2020.
× The closure of international borders meant the dramatic and sudden loss of international arrivals. Though domestic tourism has increased, this is largely benefiting regional Victoria not Melbourne

## Performance (global standing)
Strengths include:
+ Melbourne outperforms its size and location to attract and put on truly international events including exhibitions, the Australian Open Tennis, Gran Prix, and Comedy Festival
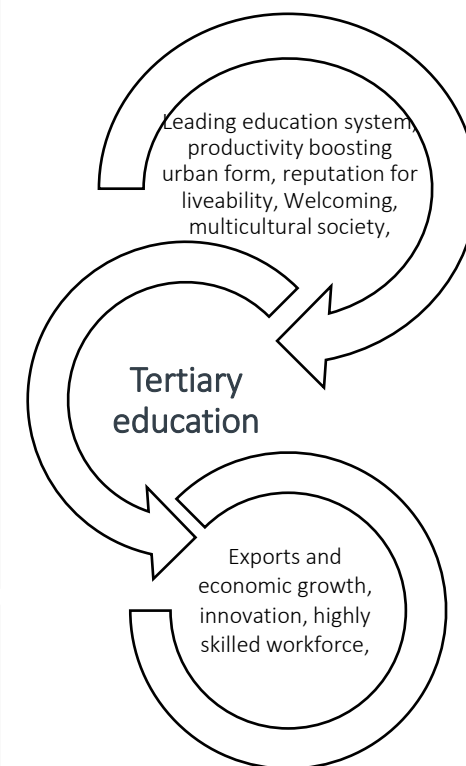
## BAU 10-year prospects
Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.
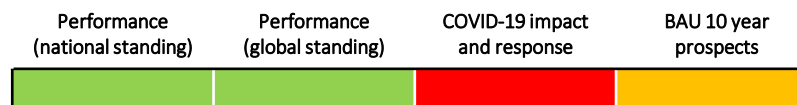+ Melbourne will likely maintain its major events calendar
× Maintaining status as a cultural and sporting capital is reliant on larger events being held over coming years as well as the continued operation of smaller venues and activities.
× Potential for ongoing stop start disruption to international borders as surges in COVID cases occur after restrictions are lifted

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Transport and logistics infrastructure, creative industries (arts and fashion)

Tourism - major events

Exports and economic growth, reputation for liveability, strong social capital

# Tourism - place and culture

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
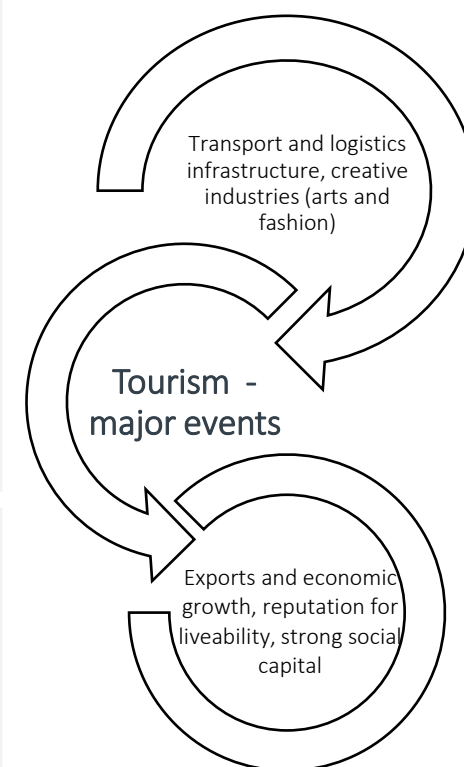
**Claimed vision (hypothesis):** Melbourne is a melting pot of cultures, with a reputation for its diversity and opportunities. This celebration has deeply entrenched into all aspects of Melbourne through its diverse and excellent dining options, opportunities for creative art and tourism through its natural landscapes. Culture has largely contributed to its reputation as one of the world's most liveable cities.

## Performance (national standing)
Melbourne has a leading performance from a national stand-point. Strengths include:
+ Melbourne is home to key institutions such as libraries, galleries and museums as well as a vibrant live music scene and broad festival program
+ Melbourne's First Nations cultural heritage offers something that cannot be found elsewhere in the world
+ Over the five years proceeding the pandemic, Victoria has outperformed the eastern region of Australia in attracting visitors. Tourist numbers has been fueled by the growing Asian markets
+ There has been an increase in total employment in sectors related to culture and shopping including accommodation & food service sector, retail trade, and arts and recreation
+ Many of the sub-industries that make up this driver have very high LQ scores; including book and music publishing, performing arts operation, museum operation, creative artists, musicians, writers and performers and cafes and restaurant workers. This reflects Melbourne's comparative advantages in this driver
+ Victoria has three times more live music performances than the national average.

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's place and culture tourism industry can be considered as severe (in comparison to other components of the vision):
Some negative impacts include:
× The atmosphere and vibrancy of Melbourne suffered because of the ongoing coronavirus pandemic, forcing many cultural businesses to close during lockdowns
× There has been an increase in demand in local travel for recreation and holiday as people look to substitute international trips. Demand for regional travel has increased, such as for peri-urban destinations, but this has not been matched for travel in metropolitan Melbourne. Domestic visitors will not replace the lost international tourism in Melbourne
× Australia's international borders are expected to be closed for some time and the depth of the contraction in international tourism will mean that many enterprises will not survive or they will be burdened with ongoing debt repayments

## Performance (global standing)
Strengths include:
+ Melbourne has been an UNESCO recognised City of Literature since 2008
+ According to the Euromonitor International (2019) ranking of Top 100 City Destinations, Melbourne is the 73rd most visited city in the world just behind San Francisco (72nd) and Copenhagen (71st). Given Melbourne's geographic distance from the rest of the world, that is a strong result. Melbourne has risen 13 places in the ranking since 2013.
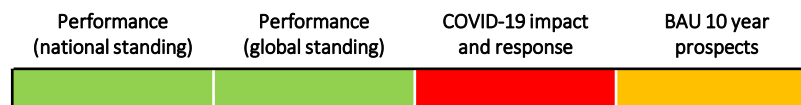
## BAU 10-year prospects
Based on the research, Melbourne's BaU prospects over the next ten years can be considered poor. Identified threats are:
× International tourism is on hold and unlikely to go back to previous levels any time soon - IATA reports that air passenger numbers will not return to pre-COVID levels until 2023-24
× Potential for ongoing stop start disruption to international borders as surges in COVID cases occur after restrictions are lifted
× The need to mitigate carbon emissions will increasingly impact tourism demand until low-carbon aviation becomes viable

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION
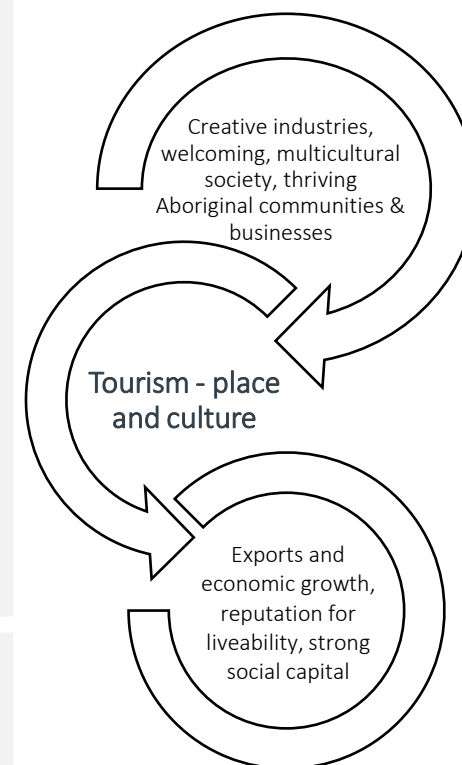
Creative industries, welcoming, multicultural society, thriving Aboriginal communities & businesses

Tourism - place and culture

Exports and economic growth, reputation for liveability, strong social capital

# Transport-related product manufacturing & services and logistics

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
|  |  |  |  |

**Claimed vision (hypothesis):** Melbourne has a long tradition as a car manufacturing heartland. However, the closure of the car industry has caused disruptions, but Melbourne is now pivoting too the manufacture of transport products in other areas

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Melbourne has high LQ scores (greater than 2), representing comparative advantage, in motor vehicle manufacturing, automotive electrical component manufacturing, motor vehicle body and trailer manufacturing, railway rolling stock manufacturing and repair services
+ Despite job losses, the LQ score for transport-related product manufacturing sectors has been growing, meaning that the sector is contracting less in Melbourne than Australia generally
+ Though automotive manufacturing has ceased in Melbourne, engineering services and design and product development services remain
+ Aircraft, spacecraft & parts, vehicle parts & accessories and Passenger motor vehicles are Melbourne's 2nd, 10th and 13th most valuable complex product exports respectively according to the Hausmann analysis (8th, 23rd, 27th overall).
+ Melbourne's logistics infrastructure is nation leading
+ The State Government is constructing and maintaining trains and trams locally

Weaknesses include:

× The closure of the car manufacturing industry over recent decades
× Low LQ scores in ship and boat building
× Rapidly changing technologies in products and manufacturing techniques are defining the transportation industry's future, and straining legacy systems and models. Success in the industry needs market innovation and a sound transformation strategy (incorporating the enablers and sustainers) which Melbourne's does not have.

## Performance (global standing)

Strengths include:

+ StartUs Insights (2020) analyzed the geographic distribution of global activity in rail tech start-ups identified 50 regional hubs that observe high activity in developing technology-driven solutions across the industry. Melbourne was identified as a hub for rail tech start-ups, with five firms working in the rail technology space. The leading cities are London, New Delhi, Silicon Valley, New York City, and Mumbai

Weaknesses include:

× StartUs Insights (2020) analyzed the geographic distribution of global activity for start-ups in the automotive industry and identified 46 regional hubs that observe high activity in developing technology-driven solutions like connected, electric or autonomous vehicles. Melbourne was not identified as a start-up hub. The leading cities are Silicon Valley, London, New York City, Los Angeles, and Paris.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's transport-related product manufacturing & services and logistics can be considered as positive or negligible (in comparison to other components of the vision). Positive factors include:

+ Government focus on rail infrastructure and manufacturing as an industry for post-recession growth
× Revenue for the global car and automobile manufacturing industry declined more than 15% in 2020, due to global manufacturing, supply chain and consumer spending disruptions (Ibis World. 2021)

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered good:

+ There is a significant government investment pipeline in transport infrastructure representing opportunities for local manufacturers.
+ The replacement of fossil fuel transport modes to clean energy and zero carbon transport methods, the need for last-mile transport solutions, and autonomous vehicles will accelerate over the coming decade providing new business opportunity if it can be capatalised on. The changes will disrupt transport services like repair and maintenance as cars become electric, more robust and owned by fleets for hire.
+ According to the Hausmann analysis Melbourne's complex product opportunities lie predominately in the manufacturing of machinery and vehicles
+ Boundaries between a tech company and an auto-maker are collapsing with software development becoming a huge component of transport product manufacturing and development which Melbourne can capitalize on

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Transport and logistics infrastructure, highly skilled workforce, comprehensive climate change policies

Transport-related product manufacturing & services and logistics

Exports and economic growth, defence & aerospace manufacturing, innovation
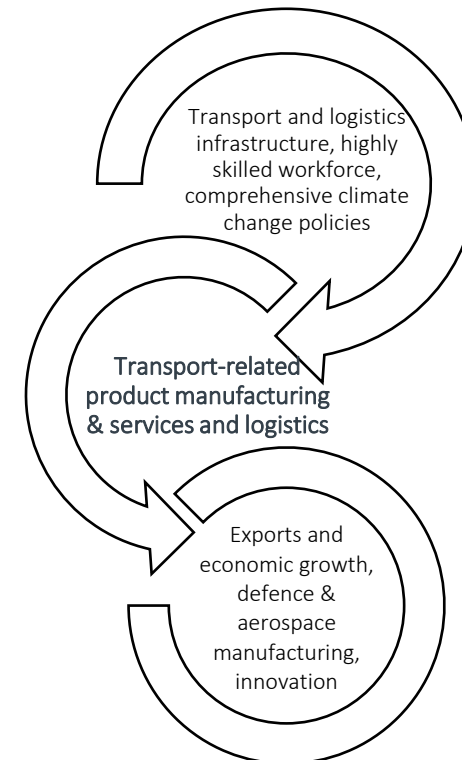
**05**

# Melbourne's economic enablers

## Researching Melbourne's economic enablers

This part of the research tested the robustness of the strategic advantages claimed by Melbourne and noted in the Vision with respect to resources and capabilities (enablers).

The economic enablers are Melbourne's:

1. Highly skilled, good value workforce
2. Leading education system
3. Transport and logistics infrastructure
4. Ample capacity for urban growth and infill
5. Productivity boosting urban form
6. Reputation for liveability
7. Creative industries (arts and fashion)
8. Leading innovation systems
9. Supportive regulatory and tax systems for start-ups
10. Welcoming, multicultural society with integrated links to Asia

In appraising the strength of each of these enablers in turn, the research explored:

- The evidence for Melbourne's claims to being nationally and globally competitive in each
- Each enabler's strengths, weaknesses, opportunities and threats
- The impact of COVID-19 and the governments response

Each enabler's performance was then ranked by SGS based on the research, review of data and SGS's experience and judgement. Again, rankings were given as to whether national and international performance was leading or lagging, whether the impacts of the COVID-19 pandemic were severe or beneficial, and whether the enablers' 10-year BAU are good or poor. Ratings are shown via an infographic as shown below.

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Key**

- 🟢🟡 Leading performance (first two columns) or good/minimal impacts of COVID-19 or good prospects.

  Aspirational/improving performance or medium/short-term COVID-19 impact or uncertain prospects

- 🔴 Lagging performance or large COVID-19 impact or poor prospects

# Highly skilled, good value workforce

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
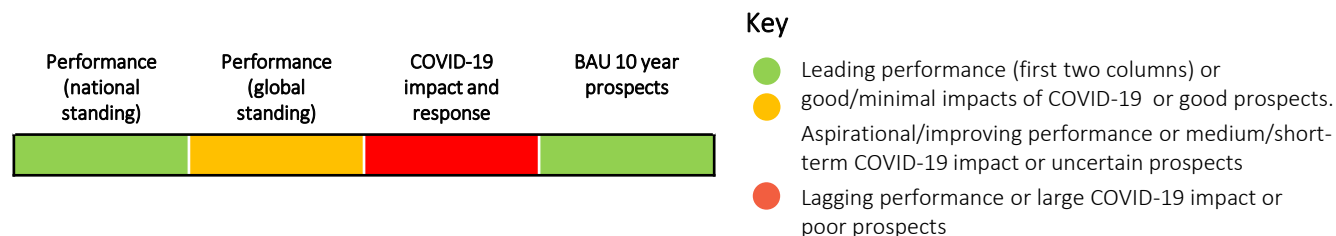
**Claimed vision (hypothesis):** Melbourne has a highly diverse and skilled workforce, built on education and immigration. The easy access to high-quality education allows Melburnians to become highly trained or change career to suit demand.

## Performance (national standing)

In terms of size, in the Australian context, Melbourne has an enormous stock of human capital, and alongside Sydney, represents a nation leading performance. Positives include:

+ Melbourne's workforce is comparatively young and with high levels of education attainment
+ Melbourne is able to attract highly skilled talent to the city through Australia's skilled immigration program and existing multicultural community
+ Melbourne's livability attracts highly skilled talent

Weaknesses in Melbourne's performance include:

× Doubts as to whether the workforce is prepared for the jobs of the future in the driver industries and in advanced manufacturing and industry 4.0 as supported by the Hausmann analysis
× On a per-capita basis, the Melbourne population is no more skilled than other cities in Australia. Though Melbourne is likely to have more elite talent

## Performance (global standing)

Melbourne can be considered to be performing well in this area from a global standing viewpoint.

+ Melbourne does well at attracting skilled talent with the Global Talent Competitiveness Index (GTCI) ranking Melbourne 21st in the world.
× According to the GTCI indicator, Melbourne is not doing well at enabling talent (ranked 77th) which refers to the status of regulatory arrangements and market landscape in the city.
× Leading cities also have demonstrated readiness for future industries in AI and advanced technologies, which is an area where Melbourne is comparatively weaker (linking to issues in the education sector enabler)

Internationally, the cities well renowned for their skilled workforces are New York, London, Singapore, San Francisco and Boston.

## COVID-19 impact and response

On balance, the impacts of the pandemic on skilled workforce can be considered minor (in comparison to other components of the vision). Positive factors related to the pandemic include:

+ The uptake of remote working means Melbourne businesses can now reach a larger workforce in the knowledge economy, not just those residing locally
+ The forced working from home showed that Melbourne's knowledge workers can be productive working remotely. This increases workforce flexibility, though there may be long-term impacts on innovation and creativity
+ Melbourne, due to Australia's handling of the pandemic, may become more attractive to potential skilled migrants compared to Europe or North America

Short-term impacts have included:

× Migration of skilled labour away from the city to other areas of Victoria and Australia (though many will still work in Melbourne remotely)
× Mental health impacts on Melbourne's workers
× Lost education to employment pathways for graduates
× Several years of lost skilled migration

## BAU 10-year prospects

Based on the research, Melbourne's BAU prospects in this area can be considered as uncertain.

+ Melbourne will continue to have a large and diverse workforce based on the existing population

× Without intervention, existing skills shortages and skill shortages in driver industries may be exacerbated due to limited immigration to fill roles and issues in the education system

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Welcoming, multicultural society, leading education system, liveability

Highly skilled, good value workforce

Skilled workers for driver industries, innovation

# Leading education system

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
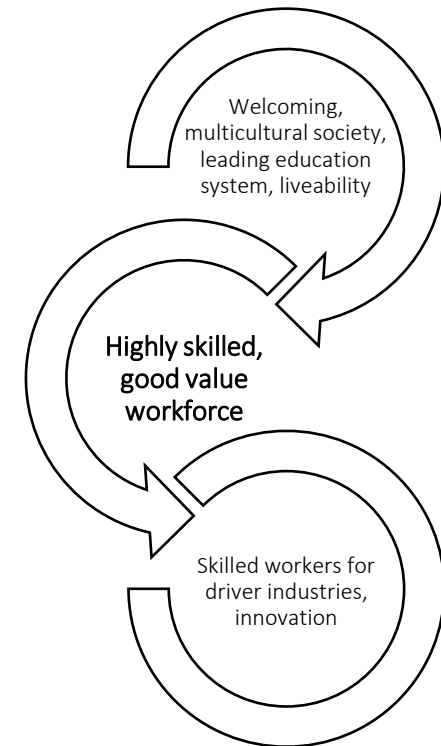
**Claimed vision (hypothesis):** Melbourne is a world leader in education, with Victoria renowned as the education state.

## Performance (national standing)

Melbourne leads the nation in education, however there are issues than need addressing in Melbourne's current performance.
Strengths include:

+ Two of the eight 'Group of Eight' are located in Melbourne
+ Melbourne's tertiary education sector is a key input to Melbourne's skilled workforce, as is the local vocational education system.
+ Melbourne has high quality private and public-school systems
+ Within the 2020-21 Victorian budget there is $1 billion for TAFE and training, including provision of up to 80,000 extra Free TAFE and subsidized training places

Weaknesses are:

× There has been declining outcomes at tertiary graduation and lack of clear pathways to employment that match skills and ambitions for many young Melburnians
× The vocational education system is no longer fit-for-purpose, particularly for jobs of the future in advanced manufacturing
× Students are receiving less support from government payments in comparison to rising living costs in Melbourne and must work and study or live with their parents to get by impacting outcomes

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's education system can be considered severe (in comparison to other components of the vision). Negative factors related to the pandemic include:

× The pandemic, lockdowns and shift to virtual learning has had an impact on educational outcomes for university, TAFE, primary and secondary schooling across Melbourne. Students in the education system have lost many hours of education which will likely impact their educational outcomes and long-term earning potential (Foster, 2020).
× Even prior to the pandemic the over-reliance on international student revenue was seen a high risk for Melbourne's university sector. Now, with the loss of international students due to border closures and the subsequent revenue falls the sector is under great financial stress. This has led to job losses and course reductions and ultimately impacts long term teaching and research capacity of Melbourne's higher education system

## Performance (global standing)

Melbourne can be considered to be performing well in this area from a global standing viewpoint.

+ Melbourne is globally renowned for its higher education system with three universities ranked in the top 100 in the world.
+ Australia's research capabilities are also well regarded, with Melbourne's universities accounting for 3% of global research output with less than 0.5% of world's population
+ In the QS global student cities index 2019, Melbourne is up three places to seventh in the employer activity indicator, demonstrating a continued increase in opportunities for graduates.

× Primary and secondary school results are declining compared to global benchmarks (OECD, 2018).

## BAU 10-year prospects

Based on the research, Melbourne's BAU prospects in this area can be considered as uncertain. Identified threats are:

× The university sector will continue to be exposed to international shocks in student numbers and revenue unless new funding models are developed.
× There are ongoing issues with underfunded and not fit-for-purpose TAFE system and the situation may not improve without intervention. Though government is making more places available there is a need to improve the quality of course offerings and the connection between education and employment, to ensure a workforce that is ready for the jobs of the future
× Without intervention, existing skills shortages and skill shortages in driver industries may be exacerbated due to poor training outcomes

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Tertiary education driver, welcoming, multicultural society, liveability

Leading education sector

Skilled and good value workforce, innovation

# Transport and logistics infrastructure

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
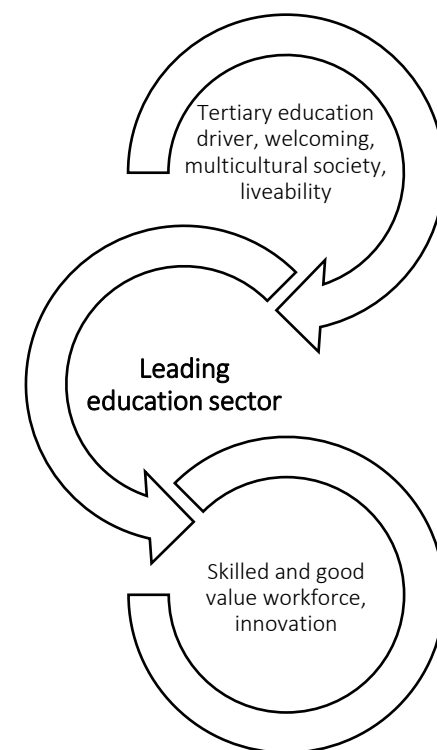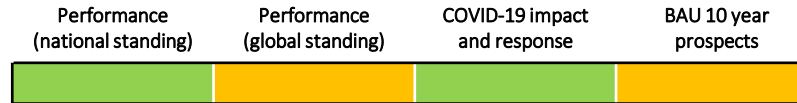
**Claimed vision (hypothesis):** Melbourne has the best transport and logistics infrastructure in Australia. The city's major ports, roads, rail, airports and freight hubs are well networked for efficient freight movement to local, regional, interstate and international markets. Modes of transport change with technology and Melbourne is well-placed to take advantage.

## Performance (national standing)

Melbourne has a nation-leading performance. Strengths include:

+ Melbourne Airport is Australia's only major 24-hour International airport, and the Port of Melbourne is Australia's largest container port
+ Melbourne has 24-hour road access to 80 per cent of Australia's population via key routes
+ Victoria's supply chain advantages make it an attractive place for businesses to locate
+ Government and other sectors are actively investing to continually enhance the infrastructure including a high-capacity rail line servicing Melbourne's CBD and adjacent precincts, the Suburban Rail Loop and Inland Rail to Brisbane, as well as key road projects

Weaknesses include:

× Road congestion is the second worst in Australia slowing down the transport of goods and people
× Overcrowding on public transport (prior to the pandemic) and trams are held up by congested roads mixed with general traffic
× Lack of take up of innovative transport solutions like automated rail systems and congestion charges. There is an overreliance on building big infrastructure projects to fix problems
× Public transportation coverage is poor and underutilised in Melbourne's outer fringes, where investments has not kept pace with sprawling growth. Poor public transport leads to social isolation on Melbourne's urban fringes.

## Performance (global standing)

Melbourne can be considered middling in this area from a global viewpoint. The cities most well renowned for their transport and logistics infrastructure are Singapore, London, Stockholm, Hong Kong and Amsterdam. This is evident due to their ranking in the top 5 of the Oliver Wyman Forum's Urban Mobility Readiness index (OWF, 2020).

Weakness include:

× In terms of personal transport, other cities including Sydney have a stronger multimodal network with car, train, and boat networks all better connected.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's transport and logistics infrastructure can be considered minimal (in comparison to other components of the vision). Positive factors include:

+ Transport infrastructure projects such as fast-tracking road and rail projects as well as implementing cycling infrastructure have been used for stimulus spending
+ Increased remote working provides an opportunity to re-think the urban form and target reductions in congestion
+ There has been a move towards localisation reducing demands on public transport and increasing active transport

Negative factors related to the pandemic include:

× Car use will likely increase initially as virus fears linger creating greater congestion even as more workers work remotely
× The decrease in ridership on public transport has financial sustainability implications
× A shift to regional/suburb living preferences will require more public transport options in those distant locations, especially with the increase of congestion on regional/suburban roads. A faster rail regional system will be in even greater demand
× There was an increase in online shopping which put pressure on logistics infrastructure, particularly last-mile delivery

## BAU 10-year prospects

Based on the research, Melbourne's performance in this area over the next ten years can be considered as uncertain. Factors include:

+ Significant government investment increasing capacity including the Metro Tunnel, North East Link, Inland Rail and new fright hubs
+ Decentralisation of the city (spurred by working from home) will allow for a rethink around infrastructure needs and investment
× The history of high levels of congestion on motorways, freeways and arterials slowing people and freight movements is likely to continue, even with hybrid remote working as high rates of personal car use remain
× The construction of new transport infrastructure alone will unlikely to effectively deal with the congestion problems being experienced across Greater Melbourne (Infrastructure Victoria, 2020).

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Ample capacity for urban growth and infill, efficient taxation systems

Transport and logistics infrastructure

Driver industry exports, productivity boosting urban form, liveabilty, strong local consumption economies

48
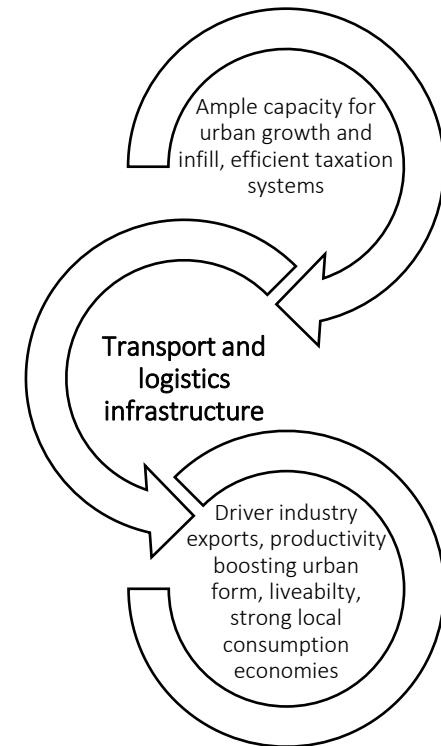
# Ample capacity for urban growth and infill

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
| | | | |

**Claimed vision (hypothesis):** Melbourne, due to its geography and changing land use, has abundant land for growth and renewal. This capacity means businesses and industry have the opportunity to easily call Melbourne home in the coming decades.

## Performance (national standing)
Melbourne has a nation-leading performance. Strengths include:
+ There is ample land with redevelopment potential within the urban growth boundary.
+ Melbourne has abundant land for infill, with large brownfield and former industrial sites circling the CBD ready for redevelopment
+ Greater Melbourne exceeds Sydney's supply of vacant employment land by over 2,500 hectares.
+ The identification of state significant industrial precincts, that are then protected from incompatible land uses, is allowing the continual growth in freight, logistics and manufacturing investment.

Weaknesses include:
× High inner city land costs
× No comprehensive integrated transport plan, which incorporates transport, land-use and economic development planning.
× There is resistance to more intensive redevelopment and infill from urban residents in existing suburbs
× There is a lack of transparency in Melbourne's planning system

## Performance (global standing)
Melbourne can be considered leading in this area from a global standing viewpoint:
+ Many large global cities have limited land supply for new development, particularly in Europe. This is not an issue for Melbourne.
+ Cities with successful urban growth trajectories focus on strengthening links between urban and rural locations and build on existing economic, social and environmental ties. There are opportunities for Melbourne to improve linkages with peri-urban and rural areas to unlock more growth opportunities

× Global best practice states that growth must ensure access to infrastructure and social services for all, ensuring vulnerable groups have access to affordable housing, education, health care, decent work and a safe environment. However, much residential growth in Melbourne does not meet this ideal due to the prohibitive cost of inner-city land pushing growth to the fringe away from services and employment lands.

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's capacity for urban growth and infill can be considered minimal, or positive (in comparison to other components of the vision). Positive factors include:
+ COVID's full impact on housing and business location preferences is yet to be seen, however, there is an opportunity to rethink the urban form which could improve the accessibility of more land increasing the supply of high-quality opportunities for growth and infill by alleviating pressure in the inner city

## BAU 10-year prospects
Based on the research, Melbourne's BaU prospects over the next ten years can be considered good.
+ The Melbourne Industrial and Commercial Land Use Plan (MICLUP), Precinct Structure Plans and the Strategic Urban Renewal Sites provide city-wide direction for urban growth and infill for beyond the next 10 years.

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Transport & logistics infrastructure, robust democracy and regulatory frameworks

Ample capacity for urban growth and infill

Driver industry growth, productivity boosting urban form, liveabilty, strong local consumption economies

# Productivity boosting urban form

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
| 🟧 | 🟥 | 🟩 | 🟧 |

**Claimed vision (hypothesis):** Melbourne has a productive urban form with a highly productive CBD, vast employment and industrial lands and local activity centres. There is a balance between the benefits of agglomeration, focused on the CBD, and easy access to jobs and services for residents, and supply chains and for businesses.

## Performance (national standing)
Melbourne has a middling performance from a national stand-point. Strengths include:
+ Investment is being redirected to planned activity centres working towards a city of 20-minute neighbourhoods supporting vibrant local economies.
+ Melbourne has a series of innovative employment clusters (NEICs), where Melbourne's research institutions and export firms can locate
+ Significant transport infrastructure investment is improving connectivity
+ The establishment of an Urban Growth Boundary
+ The Melbourne CBD has a strong agglomeration economy with a high concentration of talent, services, social vibrancy and capital

Weaknesses include:
× Melbourne is economically and socially polarised, with limited creation of outer urban jobs leading to imbalance of where people live and where they work. Melbourne ranks 20th nationally for share of jobs that can be reached by car in a commute of 30 minutes or less during the morning peak – with less than 50% of jobs able to be reached. This also has high externality costs, such a high ecological footprint, congestion, long commutes and air-quality.
× Due to Melbourne's expanding size, there is growing tension between productivity and agglomeration benefits with congestion
× There are no linkages between industry sectors, development and Plan Melbourne
× Lack of appreciation amongst policy makers that a place-based response to economic development is required in addition to sectoral perspectives

## Performance (global standing)
Melbourne can be considered lagging in this area from a global standing viewpoint:
× Melbourne ranks 28th on the OECD list of city GRP. Compared to cities with a similar GRP though, Melbourne's GDP per capita is low. Minneapolis, Dublin, Munich, Brussels, Amsterdam are similar size but have much higher GDPs per capita.
× According to the World Bank (2018), Melbourne's relative low density has contributed to a lack of employment opportunities within its outer fringes, spatial inequality a drag on economic performance. As a result, the city losses out on productivity benefits relating to agglomeration economies, including innovation, knowledge spillovers and connectivity and proximity to place.

The World Economic Forum (2019) estimates that the top productive urban areas are New York, Tokyo, Shanghai, London and Beijing. These cities benefit greatly from agglomeration and the opportunities gained from high-density urban forms.

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's urban form can be considered minimal and positive (in comparison to other components of the vision). Positive factors include:
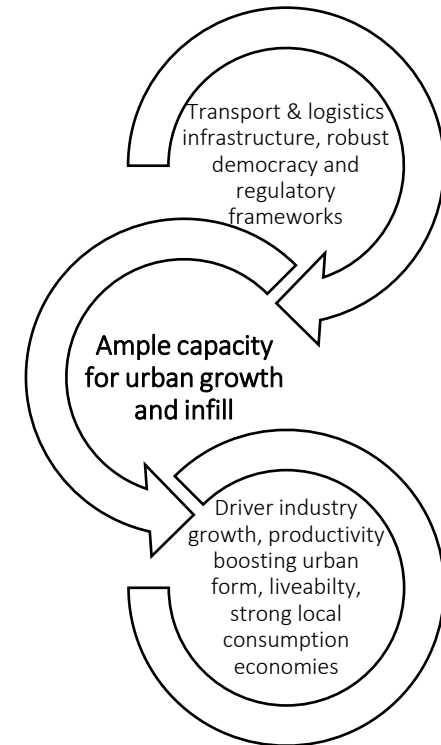+ The pandemic has expediated a shift to remote and hybrid working, boosting the productive of the urban form (though their may be impacts on innovation and productivity in the long run)
+ Workers staying within local areas was necessary for large portions of 2020 and a rethink of how local areas and economies operate is underway

Some negative impacts include:
× Large impacts on the agglomeration economy of the CBD as workers stayed away due to restrictions
× Melbourne's hospitality and arts sectors were hard hit by lockdowns impacting activity center vibrancy

## BAU 10-year prospects
Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.
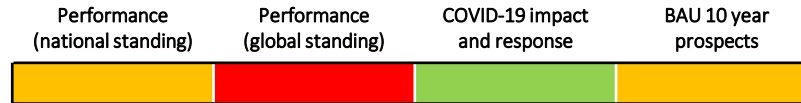+ It is yet to be understood how much more flexible working arrangements may remedy the growing tension between productivity and agglomeration benefits with congestion, but the rethink should lead to opportunity to achieve greater decentralisation in economic activity across the metro area with less dependence on the CBD and accelerated development of the NEICs.
+ Plan Melbourne and the development of inner brown field areas will improve Melbourne's urban form over the coming decade
× A compact city remains a challenging work in progress as the supply of housing mainly consists of largely low-quality high-rise apartments and outer urban detached housing. Infill growth targets for new housing are not being achieved

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Transport & logistics infrastructure, ample capacity for urban growth and infill

Productivity boosting urban form

Driver industry growth, innovation, livability, strong local consumption economies

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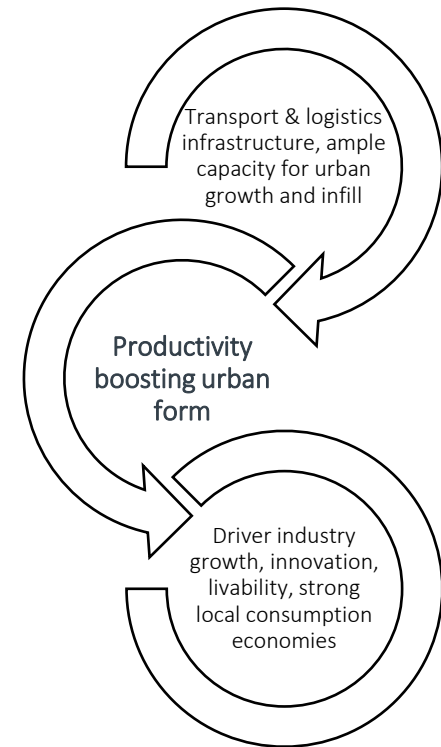
# Reputation for liveability

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne is an enviably liveable city. Melbourne's cohesive and stable society, healthcare, education, and infrastructure, plus outstanding arts, food and wine, Australia's best shopping, and diverse sporting and leisure opportunities make Melbourne one of the world's best cities and a great place to live, attracting and keeping skilled talent.

## Performance (national standing)
Melbourne has a leading performance from a national stand-point. Strengths include:
+ Melbourne offers some of the most high-quality public and private health care in the world
+ Melbourne performs very well on transport infrastructure, arts and culture, major events and being a welcoming multi-cultural society.
+ Melbourne's inner suburbs are very attractive places to live

Weaknesses include:
× Unaffordable housing. Housing and rental stress is present across Greater Melbourne
× Less than 50% of dwellings are located within walking distance of public open space, much less than other Australian cities

## Performance (global standing)
Melbourne can be considered leading in this area from a global standing viewpoint: Strengths include:
+ Melbourne known for the being one of the most livable cities in world, often at the top or near the top of published rankings, including second (formally first) on the Economist Intelligence Unit's Liveability Index
+ JLL (2019) benchmarked cities across the world and deducted their key attributes. Melbourne was identified as a 'lifestyle city' alongside Vancouver, Copenhagen and others (see figure 10 in appendix). This group of cities possess a quality of life that has become their strongest brand asset

Weaknesses include:
× The EIU's Liveability index does not full capture the perception of the Melbourne experience. For example, the measure captures housing quality and the availability and quality of private education, however, excludes housing affordability, traffic congestion, walkability, lack of public transport, bike paths and essential services. These are real problem that Melbournians face, which are all aspects of liveability.

Vienna is the most reputable city for livability based on the EIU index. Vienna's strengths in liveability come from its ample social housing for residents (62% of the population live in social housing), that half of city reserved for green spaces, the affordability of transportation, and expanded car-free options (Bloomberg, 2019).

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's reputation for liveability can be considered as moderate (in comparison to other components of the vision). Positive factors include:
+ Compared to the rest of the world, Melbourne has had very low numbers of COVID-19 cases and the city has followed government directions and endured months of lockdowns for the greater good and is now free of lockdowns

Some negative impacts include:
× Much of Melbourne's reputation is due too the arts, food and wine, shopping, and events. Businesses in these areas have been hard hit by pandemic lockdowns
× The rise in people working from home has tested how effective Greater Melbourne's neighbourhoods are. Unequal local access to healthcare, goods and services has been revealed.

## BAU 10-year prospects
Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain:
+ The opening of the metro tunnel will improve travel times and add new stations to the public transport network
+ Better building and planning outcomes are likely to be achieved for new infill and greenfield developments than seen in the past decades
× Liveability is declining due to congestion and increased travel time due to urban sprawl (Infrastructure Victoria, 2020).
× Climate change will have ongoing impacts to the liveability of Melbourne, particularly as extreme heat makes summers particularly harder to bear.
× There may be lasting impacts from the pandemic on Melbourne's creative industries including music, the arts and hospitality

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Transport infrastructure, healthcare, creative industries, welcoming multi-cultural society, robust democracy

Reputation for liveability

Highly skilled good value workforce, strong local consumption economies
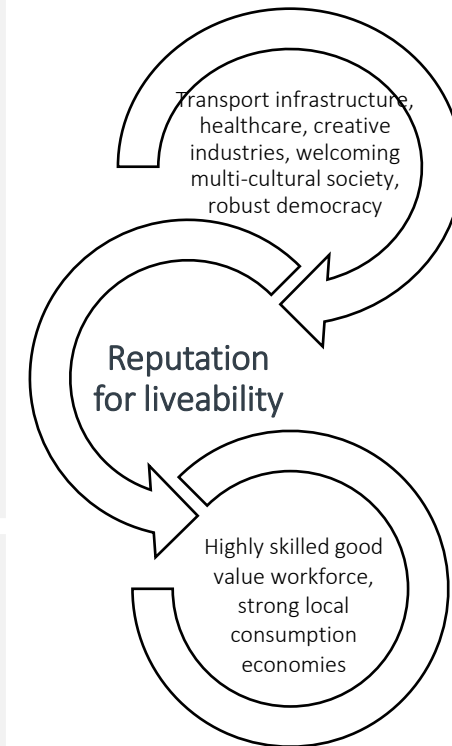
# Creative industries (arts and fashion)

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne has a reputation as Australia's design capital.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Renowned as Australia's creative capital across fashion, music, film, comedy and publishing
+ Melbourne is the national leader in visual and performing arts, home to leading libraries, galleries, festivals and museums, and deep literary and live music scenes
+ Melbourne hosts 62,000 live music concerts each year and Victoria has three times more live music performances than the national average
+ Melbourne's literary and publishing sector has been recognised internationally with the designation as a UNESCO City of Literature.
+ The arts and fashion industry offers both export (e.g. textile manufacturing) and cultural tourism opportunities
+ Melbourne's First Nations cultural heritage offers something that cannot be found elsewhere in the world
+ Melbournians have sophisticated tastes, a high quality of life and disposable income creating a wide market for a range of creative industries to target
+ Melbourne home to a significant number of retail headquarters

Weaknesses include:

× Underutilisation of creative services in other industries through lack of investment and co-ordination
× Victorian funding for the creative sector is not indexed, so from a funding perspective the sector is going backwards.

## Performance (global standing)

Melbourne can be considered leading in this area from a global standing viewpoint. Strengths include:

+ Melbourne holds the title as being a creative capital, coming in 1st place in Australia, 3rd in Asia and 25th globally in the Inkifi index (Inkifi, 2020).
+ Melbourne widely acknowledged as Australia's fashion capital and as one of Asia-Pacific's most sophisticated fashion destinations
+ Melbourne is attracting international film productions

Weaknesses include:

× Melbourne exports textiles as unprocessed commodities that are then made overseas in Asia or sold back to Australian consumers in the form of luxury brands by French, Italian, and British fashion houses.

Internationally, Paris has been dubbed as the world's most creative city, by Inkifi's Most Creative Cities ranking system. Other renowned creative cities include Barcelona, Dublin, London and Tel Aviv. Paris has a long history of leveraging the cultural capital in its creative sectors, while adopting high-technology innovation.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's creative industries can be considered as severe (in comparison to other components of the vision). Negative impacts include:

× COVID-19 has led to mass retail closures and the future of both smaller labels and larger brands is uncertain
× Major and minor events were cancelled impacting the arts and fashion sectors
× The future of many major events remain uncertain due to the risk of outbreaks and lockdowns
× The sharp reduction in visitor numbers has severely impacted tourism businesses including retail, accommodation, food services, arts and recreation

## BAU 10-year prospects

Melbourne's BaU prospects over the next ten years can be considered uncertain:

+ As the economy transitions to knowledge intensive, creative industries will be increasingly important to the economic future of the City
+ Technology disruption and digital-oriented consumption patterns will create opportunities and more engagement with overseas markets
+ The Melbourne Arts Precinct Transformation will be a huge asset for the city. It is the biggest ever cultural infrastructure project in Australia
+ Consumer shifts towards high-quality, sustainable and local over fast-fashion will benefit Melbourne's fashion and textile manufacturing sectors
× Future growth in the arts sector is uncertain, as this sector is particularly vulnerable and reliant on government policy to be competitive
× There will be lasting impacts from the pandemic as business pay down debt accrued to survive
× The university price hikes for arts degrees will reduce creativity and skill development over the next decade from Melbourne's universities

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Thriving Aboriginal communities, leading education system, supportive regulatory and tax systems for start-ups, welcoming multi-cultural society

Creative industries (arts and fashion)

Fibre product manufacturing, tourism, livability, strong local consumption economies, innovation

52

# Leading innovation systems

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|:---:|:---:|:---:|:---:|
| 🟩 | 🟧 | 🟧 | 🟧 |

**Claimed vision (hypothesis):** Melbourne has a reputation for innovation and new technology. New technology and innovations, such as robotics, AI, driver-less vehicles, and new energy sources, are being brought into the economy over the next 5-10 years. Melbourne businesses are quick to adopt and take advantage of new technologies, supported by the government.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:
+ In Australia, the city most renowned for innovation is Melbourne (2thinknow, 2019)
+ Melbourne is Australia's technology hub with more than half of Australia's top 20 technology companies
+ Melbourne is a growing start-up ecosystem with emerging fintech success (GSER, 2020)
+ Melbourne has two top 20 universities in the global biomedical rankings and highest number of graduates with technology talent in Australia (GSER, 2020)

Weaknesses include:
× Australia's productivity growth has slipped well below its long-term average and Victoria's is beginning to slip at the margins (Deloitte, 2020)
× Per capita, Melbourne had fewer patent applications in 2019 than Canberra, Sydney, Perth and Brisbane (see figure 8 in appendix)
× Lack of product development and commercialisation from the higher education institutions
× Critical thinking and creative skills from the humanities and social science sector are important for innovation, but the cost of these courses has been increased
× Casualisation of the research workforce increases risk of long-term projects with increased job insecurity and stunting of expertise growth
× Industry, research organisations and policy have not been invested in enough due to Australia's high dependence on commodity exports (as reflected in the Hausmann analysis results)

## Performance (global standing)

Melbourne can be considered middling in this area from a global standing viewpoint. Strengths include:
+ Melbourne was the only Australian city to be named on the Savills Tech Cities Index in 2019 coming in at #22. The index includes metrics on business environment, tech environment, city buzz and wellness as well as talent pool, real estate costs and mobility
+ In the 2thinknow innovation index, Melbourne placed in 11th globally (Sydney 15th) (2thinknow, 2019).

Weaknesses include:
× Australia and Melbourne have strong research systems, however is weaker than global competitors in its performance in innovation and commercialisation. While research systems produce high quality research, works occur in organisations weakly connected to industries. Collaboration levels between research institutions and industry are too low.
× Australia is an innovation follower rather than a leader, with innovation generally centred around technology absorption and adaptation for domestic markets.

Internationally, the cities most well recognised for their leading innovation system are New York, Tokyo, London, Los Angeles and Singapore (2thinknow, 2019). US cities are supported with strong research system, and strong innovation system. This has been supported with US programs and policies that facilitates commercialisation and entrepreneurship.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's innovation systems can be considered as moderate (in comparison to other components of the vision). Positive factors include:
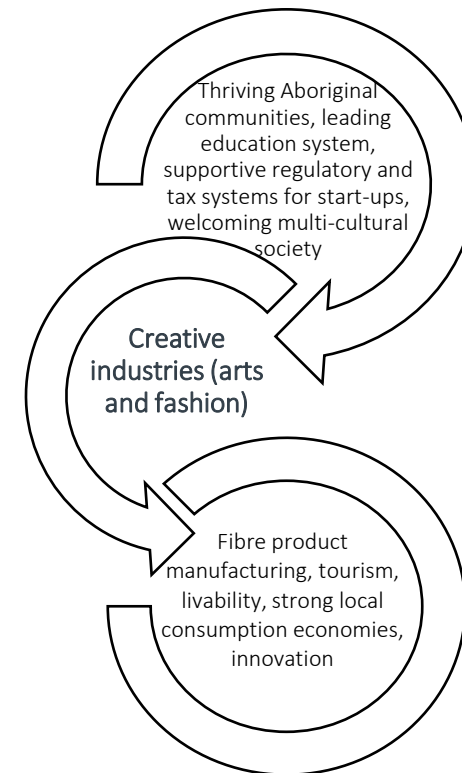+ Crises speed up innovation. Many businesses quickly developed new products, process or ways of working which will be carried forward

Some negative impacts include:
× Melbourne start-up and innovation ecosystems derive talent from skilled migration which has been halted
× The large impacts on the tertiary education sector

## BAU 10-year prospects

Melbourne's BaU prospects over can be considered uncertain:
+ The cultivation of successful innovation precincts will be a key determinant of innovation
+ Advanced ways of doing business, relying on new technology and innovation are coming to the fore creating new opportunities for innovation
× The poor prospects for Melbourne's education system will flow through to a reduced capacity in innovation

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Highly skilled workforce, leading education system, supportive regulatory and tax systems for start-ups, productive urban form

Leading innovation systems

Driver industry growth

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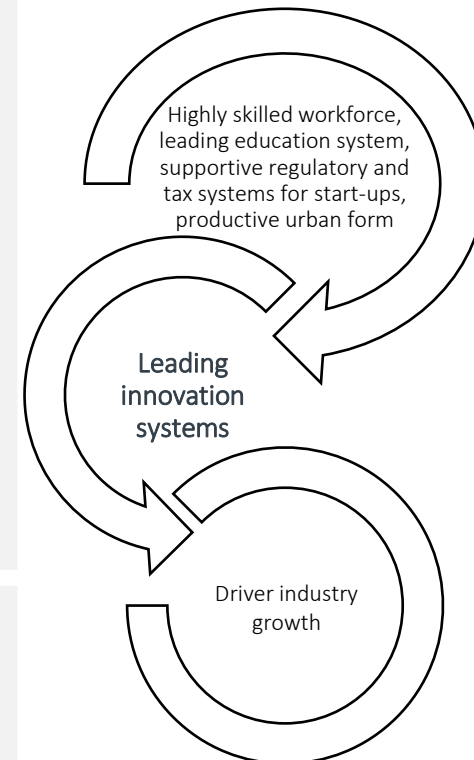
# Supportive regulatory and tax systems for start-ups

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne has the required support, regulatory and tax systems in place for start-up success

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Low business tax rates compared to other parts of Australia
+ The Victorian State Government has focused attention on attracting investment in priority industries by facilitating investment opportunities, for example advanced manufacturing and digital technologies.
+ LaunchVic has been an instrumental service delivering support services to entrepreneurs, investors and talent. Melbourne's startup ecosystem is growing at a rapid rate given its current size (Startup Genome, 2020)
+ Five 'unicorns' have emerged from Melbourne (REA Group, Carsales.com, SEEK, MYOB and Aconex) each valued at more than $1 billion – more than any other state in Australia.
+ Over 40% of firms in Victoria intend to create a new market, compared with only a quarter of firms in 2018. Those focused on new markets are ambitious, with over half self-described as 'wanting to change the world'. This represents a growth in founder ambition and a welcome change from the traditionally very modest performance on new-to-market innovation (LaunchVic, 2020, Ecosystem map)

Weaknesses include:

× Sydney, not Melbourne, has the most mature startup ecosystem within Australia (Deloitte, 2020)
× Industry policy is a jumbled, with all manner of slogans, incentives and bureaucracies between local, state and commonwealth government

## Performance (global standing)

Melbourne can be considered middling in this area from a global standing viewpoint. Strengths include:

+ Melbourne was recently positioned 36th in Startup Genome's 2020 Global Startup Ecosystem Ranking.
+ Females are much more prevalent in Melbourne's start-up system compared to the US (LaunchVic, 2020)

Weaknesses include:

× Despite its increasing maturity, the Victorian (Melbourne has 97% of Victoria's start-ups) startup ecosystem continues to be relatively small in terms of firm density per one million. To match its closest international comparators as they grow, Victoria needs to increase its density of firms by at least 50% (see map in appendix, figure 9) (LaunchVic, 2020)
× Research and development funding is low compared to leading international start-up powerhouses (GSER, 2020)
× Despite some growth, Victoria's Startup Ecosystem has a significantly lower funding volume, quality and activity compared with other ecosystems internationally (LaunchVic, 2020)

Internationally, the cities most well renowned for their start-up ecosystem and support are Silicon Valley, New York, London, Beijing and Boston, as reported by Startup Genome's 2020 Global Startup Ecosystem Ranking. These cities have successful entrepreneurial ecosystems, including place-specific assets e.g. strong universities, desirable place to live and/or strong industrial tradition, information rich ecosystems and availability of finance.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's regulatory and tax systems for start-ups can be considered as moderate (in comparison to other components of the vision). Positive factors include:

+ Tax concessions and policy was implemented to support small business during the pandemic recession

Some negative impacts include:

× Small and start-up businesses were impacted during the lockdowns and recession as they have smaller cash reserves to offset losses

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects in improving regulatory and tax systems over the next ten years can be considered good. Positives include:

+ LaunchVic has a mandate to establish a sophisticated startup ecosystem and drive innovation and R&D
+ LaunchVic has actively put in place a number of measures to address some of the ecosystem's shortcomings, such as support for new angel networks and pre-accelerator funding to increase the next generation of startup founders

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



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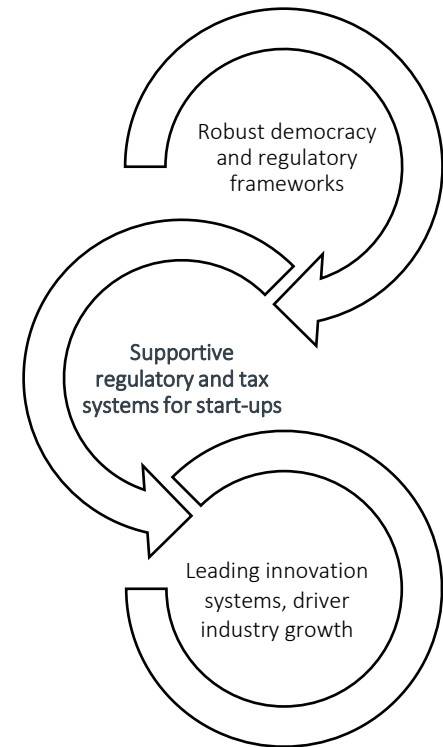
# Welcoming, multicultural society with integrated links to Asia

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne has a long tradition of immigration from all over the world. Immigration has contributed greatly to all of Melbourne's strengths and will continue to contribute to Melbourne's economic future

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Melbourne has great linguistic diversity with over 580,000 people speaking a language other than English at home. Major languages include Mandarin, Vietnamese, Cantonese, Arabic, Punjabi, Hindi and more.
+ Melbourne has longstanding business and cultural ties with China
+ The 24-hour airport provides easy connections to Asia
+ With overlapping time-zones Melbourne is uniquely placed to interact with the Asia Pacific – the world's fastest growing economic region
+ Population growth, built on opportunity and liveability, is core government policy

Weaknesses include:

× High levels of social exclusion in some areas of the City
× Entry level housing options for new migrants are scarce
× Business support services for the global market are lacking (Blakely & Hu, 2019)
× Increasingly restrictive visa arrangements (at the Federal level)
× Lack of financial support for migrants during the pandemic
× The pandemic and previous high levels of population growth (which is sometimes blamed for congestion, loss of livability and high property prices) has led to some opposition to high-levels of immigration

## Performance (global standing)

Melbourne can be considered leading in this area from a global standing viewpoint. Strengths include:

+ Melbourne has multi-culturalism imbedded in its character and remains one of the world's most desirable destinations for immigration

Weaknesses include:

× Australia has had a turbulent political relationship with China over the past 12-24 months and has been in direct fire from China's trade wars, with other countries likely to benefit
× Australia's treatment of refugees undergoing off-shore processing
× Even in multicultural cities like Melbourne discrimination and racism is still an ongoing issue

Internationally, the city most well renowned for their multiculturalism is Toronto, with their official moto dubbed 'Diversity Our Strength'. Approximately 51% of residents are not born in Canada. Canada was the first country in the world to adopt multiculturalism as an official policy. Multiculturalism in Canada is used to manage group relations and community development. Canada, unlike Australia, provided income support to migrants and visa holders during the pandemic.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's welcoming, multicultural society with integrated links to Asia can be considered as moderate (in comparison to other components of the vision). Positive factors include:

+ Melbourne's society collectively met the challenges of lockdowns and is the only city in the world to beat a second wave of cases.

Some negative impacts include:

× Immigration has been halted due to travel restrictions and there in no guarantee of a return to pre-pandemic levels.
× International students from Asia have been left out of government supports programs harming Australia's reputation as an educational destination

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.

+ Melbourne will likely retain the strengths that make it a welcoming multicultural society and connections with Asia will naturally increase

Identified threats are:

× The China-Australia relationship will likely remain volatile over the next ten years
× Melbourne may be a less desirable location for immigration compared to competitors due to lasting reputational impacts of the pandemic on the education sector and loss of international students

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



- Resilient communities & strong social capital, leading education system, robust democracy
- Welcoming, multicultural society with integrated links to Asia
- Driver industry growth (exports), highly skilled & good value workforce, innovation, livability

55

# 06

Sustaining the Melbourne economy

## Researching Melbourne's economic sustainers

This part of the research tested the robustness of the strategic advantages claimed by Melbourne and noted in the Vision with respect to inclusion and sustainability in economic development ('sustainers').

The sustainers are the systems across governance, regulation, leadership, social capital which support the economy. If these systems are well aligned, they would be expected to deliver greater equity in the distribution of the fruits of economic growth both across and between generations. This would be evident in healthy local consumption economies (due, for example, to appropriate planning regulation of retail centre development), advanced circular economies (due, for example, to appropriate price signals in the regulatory regime) and equitable access to opportunity.

The Sustainers identified as supporting the economic vision for Melbourne are its:

1. Robust democracy and regulatory frameworks
2. Strong local consumption economies
3. Thriving Aboriginal communities & businesses backed by treaty
4. Local ownership of resource flows (circular economy)
5. Comprehensive climate change mitigation/adaptation policies
6. Strong environmental protection regulations
7. Resilient communities & strong social capital
8. Efficient taxation systems

In appraising the strength of each of these sustainers s in turn, the research explored:

- Each sustainer's strengths, weaknesses, opportunities and threats
- The impact of COVID-19 and the governments response

Each sustainer's performance was then ranked by SGS based on the research, review of data and SGS's experience and judgement. Again, rankings were given as to whether national and international performance was leading or lagging, whether the impacts of the COVID-19 pandemic were severe or beneficial, and whether the enablers' 10-year BAU are good or poor. Ratings are shown via an infographic as shown below.

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Key**

● Leading performance (first two columns) or good/minimal impacts of COVID-19 or good prospects.

● Aspirational/improving performance or medium/short-term COVID-19 impact or uncertain prospects

● Lagging performance or large COVID-19 impact or poor prospects

# Robust democracy and regulatory frameworks

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
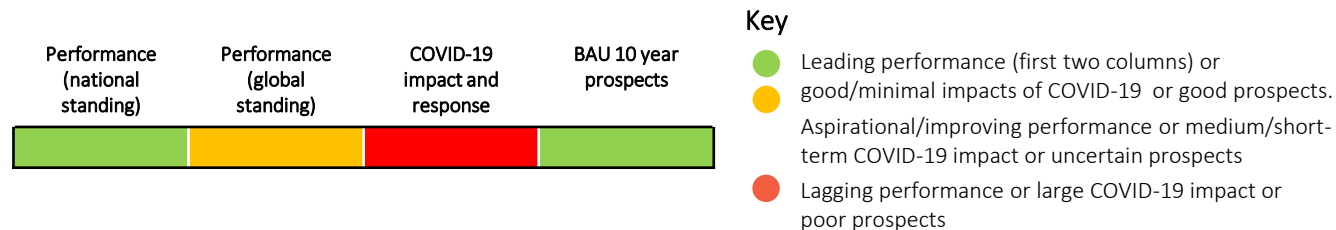
**Claimed vision (hypothesis):** Melbourne and Victoria have globally leading institutions for democracy with robust democracy and regulatory frameworks.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ The Local Government Act (2020) mandates deliberative democracy and 'aims to ensure all Victorians have the opportunity to engage with their council on the future of their community'.
+ Strength of Victoria's Charter for Human Rights (only Victoria and the ACT have a charter, QLD has a Human Rights Act).
+ JLL (2020) prepared a ranking of global cities and identified that Melbourne has an advantage in its stable public governance, which successively invests in a high-amenity urban platform that is very conducive to interaction and collaboration.

Weaknesses include:

× Governance of the city is not fit-for-purpose with no city-wide institution. Leadership for the city resides with the State Government or the 31 city councils across the greater city
× There is no overarching vision for metropolitan Melbourne's future economy including public buy in and alignment between industry, government and research on priorities
× Lack of an institution like the Greater Sydney Commission (GSC) to lead the formation of a shared economic vision
× Inertia. There is a propensity to return to previous passive policy settings

## Performance (global standing)

Strengths include:

+ Australia is well regarded internationally as strong and robust democracy, ranking 21st for *Governance Effectiveness*, 9th for *Regulatory quality*, and 25th for *Voice and Accountability*. (World Bank 2019)
+ A study from Eden Strategy Institute (2020) ranked the top 50 smart city governments globally by investigating the roles that city governments play in leading a smart city strategy. The rankings go beyond technological attainments to also include leadership, people-centric approach and clarity of vision. On the ranking Melbourne placed 8th out of 140 cities.

Weaknesses include:

× At a national level, trust in government is at 45 per cent in 2020, which middle of the range OECD rankings and below New Zealand at 63% Germany at 65% and Switzerland at 85%, but above the UK at 35% (OECD, 2020)

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's democracy and regulatory frameworks can be considered as positive (in comparison to other components of the vision). Positive factors include:

+ Overall, the pandemic response has been met with an increase in public trust of government and community compliance with instructions.

Some negative impacts include:

× Division within the community in response to all or part of the State and Federal Government's pandemic response.
× State Ombudsman found the State Government breached human rights laws when it locked down nine public housing towers in inner Melbourne after a coronavirus outbreak in early July 2020.

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.
Strengths includes:

+ Melbourne is likely to come out of the pandemic in a relatively strong economic position
+ The Local Government Act 2020 provides a foundation for improved governance over the next decade
+ The innovation economy, the experience economy, the sharing economy and the circular economy are changing the competitive landscape for cities. Melbourne is well positioned to benefit if it can get its policy settings correct.

Potential negative impacts include:

× The implementation of a whole of city government remains highly unlikely given that the State nor Councils are unlikely to relinquish some of their own power and control
× There will likely be continued district of government in some segments of the community with degrading social capital a root cause

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Resilient communities & strong social capital

Robust democracy and regulatory frameworks

Transport and logistics infrastructure, ample capacity for urban growth and infill, liveability, supportive regulatory and tax systems for start-ups, comprehensive climate change policies, strong environmental protection regulations

58

# Strong local consumption economies

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne has strong local consumption economies supported by a network of vibrant high streets and 20-minute neighbourhoods

## Performance (national standing)

Melbourne is well known for its network of vibrant high streets with a strong local consumption economy leading performance from a national stand-point. Strengths include:

+ A strong network of vibrant centres in many inner and middle suburbs
+ Planning principles and activity centre structure plans support 20-minute neighborhoods.
+ Melbourne's municipal markets are an important part of the local consumption economies
+ The shift towards more service-based activity (retail services, cafes, restaurants, banks, medical centres, education facilities, gyms, libraries, and other services) has been a positive for many centres. This has been supported by the shift to retail as recreation.
+ There is a trend towards localism in Australia, where consumers are becoming more attached to local businesses and supporting them

Weaknesses include:

× Not enough money is captured in local economies via locally owned small businesses and dense local supply chains.
× Melbourne is largely operating on the legacy of past planning, with a strong network of activity centres in inner and middle ring suburbs that has not extended to new areas
× Limited focus on community wealth building concepts, developing local businesses and keeping benefits circulating in local economy
× Overall performance varies from centre to centre. There are high vacancy rates in many centers, yet there are no policy tools at local level to address and State government is too remote for such localized issues
× There are no mechanisms that enable a coordinated approach such as the US urban development organisations or Panuka Development Auckland.
× In outer areas there is a greater dependance on big box and multi-national retail stores which sees money leaving local economies to external shareholders

## Performance (global standing)

Strengths include:

+ Melbourne's reputation as a liveable city
+ Leadership that is pushing for 20-minute neighbourhoods which is world leading

Weaknesses include:

× Many global cities have focused on enhancing inner-city economies and lifestyles, with a common outcome being increased social and spatial divides. It could be argued that this occurring in Melbourne and may be enhanced by COVID-19 economic impacts. Inner city councils have much greater resources than outer suburban councils

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's local consumption economies can be considered as positive (in comparison to other components of the vision). Positive factors include:

+ The shift to work from home has initiated a trend towards localism, where consumers are becoming more attached to the local ecosystem and workplaces are decentralizing from the CBD

Some negative impacts include:

× The pandemic further exacerbated the trend towards online shopping weakening local retail centres.
× Redistribution of congestion as increased deliveries in local areas contribute to suburban congestion

## BAU 10-year prospects

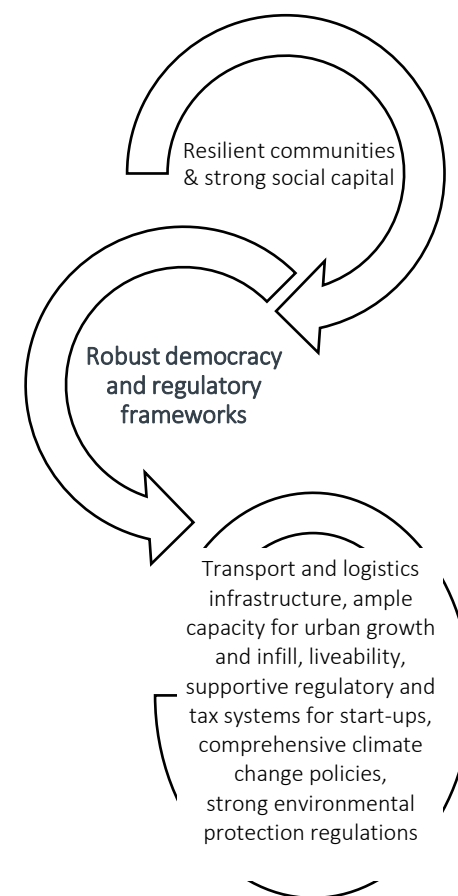Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain. Positives include:

+ The continued progress of 20-minute neighbourhoods and local amenity and access as a result of COVID-19.
+ Investments in transport and logistics infrastructure
+ The development and implementation of circular economy ideas

Drags on progress include that:

× The extent to which local economies are underpinned by community wealth building principles (avoiding leakage and keeping money circulating in the local economy) is likely to be limited in most areas.
× There are limited scope to apply a whole of city lens to planning for strong local consumption economies.

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION
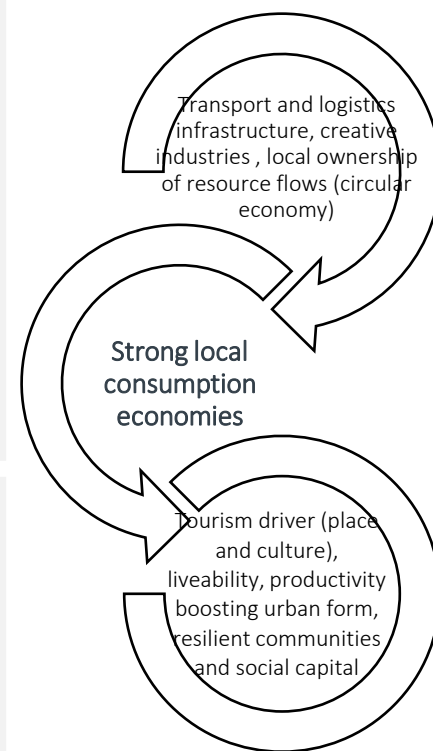


Transport and logistics infrastructure, creative industries , local ownership of resource flows (circular economy)

Strong local consumption economies

Tourism driver (place and culture), liveability, productivity boosting urban form, resilient communities and social capital

59

# Thriving Aboriginal communities & businesses backed by treaty

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne has thriving aboriginal communities and businesses backed by Treaty.

## Performance (national standing)
Melbourne has a leading performance from a national stand-point. Strengths include:
+ Victoria is the first and only jurisdiction to have begun to action the Treaty and Truth elements of the Uluru Statement from the Heart by committing to establishing a truth and justice process. The process is underway for the Yoo-rrook Justice Commission expected to begin in July 2021.
+ A First Peoples' Assembly of Victoria (FPAV) has been declared to be the Aboriginal Representative Body in accordance with the Treaty Act.
+ Melbourne has seen a 50% increase in Indigenous owner–managers between 2011 to 2016, the greatest increase of all capital cities in Australia.

Weaknesses include:
× Entrenched wealth inequality and poor economic outcomes for Aboriginal communities
× Recent Government decisions including removal of sacred trees and land sales that appeared not to align with Treaty intentions have undermined the government credibility
× Sense that the Victorian Government has compromised its message about Aboriginal led processes by legislating a process before the FPAV was established.
× There has been an increase in the numbers of Aboriginal students in business courses, however there is still a 7% gap between Aboriginal and non-Aboriginal Victorians choosing business courses (State of Victoria, 2017)

## Performance (global standing)
Strengths include:
+ The Victorian Traditional Owner Native Foods and Botanicals Strategy, which is a world leading effort to provide funding support for projects that boost existing activity by Aboriginal organisations working to commercialise native plant production.
Weaknesses include:
× Melbourne, and Australia more broadly, lags behind Canada and New Zealand, who both have treaties in place. The Māori economy has advanced significantly in the last decade.

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's Aboriginal communities is mixed. Positive factors include:
+ Overall implementation timelines have not been significantly affected by COVID-19 and the truth and justice process has continued to progress.
Some negative impacts include:
× Aboriginal Australian's were among the more vulnerable, particularly in terms of health outcomes, but also economic.

## BAU 10-year prospects
Melbourne's BaU prospects in improving outcomes over the next ten years can be considered uncertain.
+ There is a ground swell of support and momentum in the community for justice
+ The State Government, and in turn Melbourne, is taking the steps to develop thriving aboriginal communities and business back by treaties..
+ The Treaty Process will set the scene for thriving aboriginal communities & businesses backed by treaty. New Zealand provides a model for supporting this growth.
Drags on progress include that:
× The treaty process will be complicated and not necessarily destined for success due to the extent of dispossession over a long period of time has and the complexities around speaking on or for someone else's Country, which poses challenges that the government and the community will have to grapple with
× Inaction at the federal level is a limitation

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION

Resilient communities & strong social capital, robust democracy and regulatory frameworks

Thriving Aboriginal communities & businesses backed by treaty

Resilient communities & strong social capital

60
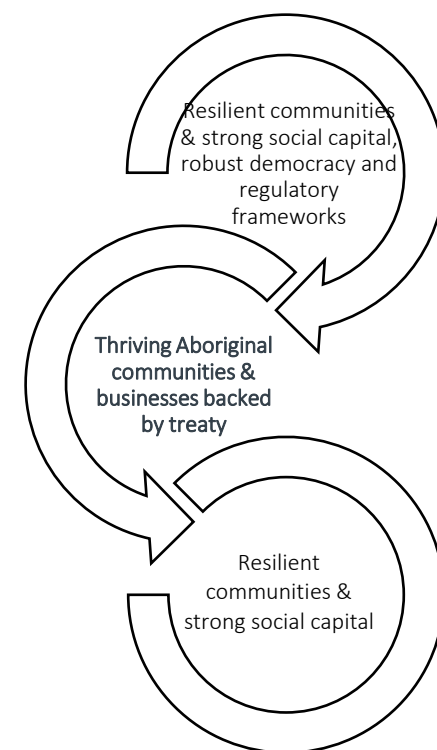
# Local ownership of resource flows (circular economy)

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne is harnessing its waste as a resource and leading the circular economy movement.

## Performance (national standing)
Melbourne has a leading performance from a national stand-point. Strengths include:
+ Melbourne's councils have been early adopters and supporters working with local business, the CSIRO (ASPIRE) and the Metropolitan Waste and Resource Recovery Group (MWRRG). The MWRRG involves all 31 Melbourne metropolitan councils to reduce waste and maximise resource recovery.
+ Strong legislative framework and policy at the state level, including *Recycling Victoria: A new economy,* and the Circular Economy Business Innovation Centre.
+ New container deposit scheme (CDS), set to start in 2023
+ Landfill levies on municipal and industrial waste increases the cost of waste disposable compared to recycling.
+ Melbourne's overall waste recovery rate already sits at 71%.
+ Circular economy is an opportunity to develop a leadership position for the City.

Weaknesses include:
× Landfill levies on municipal and industrial waste are set by the State and go into the State revenue stream. Revenues therefore do not support metropolitan circular economy efforts.
× Other levers, like the ability to set mandates and set price signals to business sit with State and Federal Government, again taking power away from the level of government who are best placed to implement action, local councils.
× The amount of waste being generated is growing, requiring a stronger focus on waste minimization not just recycling and reuse
× There are infrastructure shortfalls, with Infrastructure Victoria identifying the need for 35 new or upgraded facilities across Metropolitan Melbourne.
× Lack of incentives such as Extended Producer Responsibility (EPR) schemes to encourage life cycling thinking in manufacturing
× There is great variability across the city by LGA in how and what waste is collected

## Performance (global standing)
Melbourne is moving in this space but lags global leaders. Weaknesses include:
× Australia does not currently have the onshore capability to process the growing volume of recyclable material
× Circularity Gap (2021) identifies Australia as a 'shift country'. Shift countries are the largest consumers across all resource groups; their extraction of fossil fuels is relatively high, as is their participation in global trade" (Circularity Gap 2021)

An increasing number of municipalities around the world have an ambitious vision and strategy to become minimal or zero waste cities. A leader is Amsterdam who have a city-wide circular economy roadmap and the ambition to be a global, aiming to fully circular by 2050 and use 50% less primary materials by 2030.

## COVID-19 impact and response
On balance, the impacts of the pandemic on Melbourne's developing circular economy can be considered as moderate (in comparison to other components of the vision). Positive factors include:
+ The renewed focus on on-shore manufacturing
Some negative impacts include:
× The trend of declining per capita household waste has reversed, Victoria's per capita household waste grew by 5.5 per cent from 2019 to 2020 (Infrastructure Australia 2021).
× Contamination of recycling collections in Australia is high, and is increasing due to soft plastic takeaway containers and food scraps from home deliveries (Infrastructure Australia, 2021)
× Virgin plastic prices dropped in line with oil prices due to COVID-19, at the same time the value of resins from plastic recovery has dropped significantly and the global market for paper exports has also reduced. Lower prices for recovered materials make the economics of investment in recovery infrastructure more challenging (Infrastructure Australia, 2021).
× The use of single use plastics like face masks, surface wipes and coffee cups increased as health was prioritized over environmental sustainability.

## BAU 10-year prospects
Melbourne's BaU prospects over the next ten years can be considered uncertain. The transition to a circular economy is difficult and involves breaking up dominant economic processes. Positives include:
+ Melbourne has a strong policy framework to build from over the decade
Obstacles to future success include:
× Treating circular economy as a marketing gimmick and not doing the hard work in transforming economic systems

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION
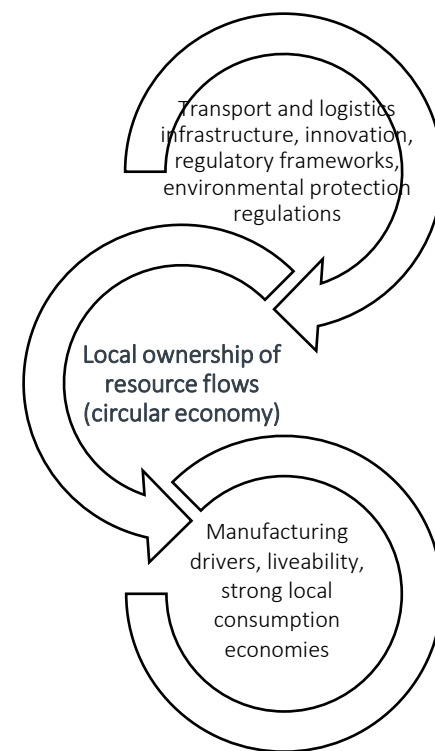


Transport and logistics infrastructure, innovation, regulatory frameworks, environmental protection regulations

Local ownership of resource flows (circular economy)

Manufacturing drivers, liveability, strong local consumption economies

# Comprehensive climate change mitigation/adaptation policies

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne's economic growth is underpinned by comprehensive climate change mitigation and adaptation policies

## Performance (national standing)

Melbourne is among the leaders from a national stand-point. Strengths include:

+ Many of Melbourne's councils have shown leadership in responding to climate change by developing energy partnerships, policy positions, supporting pilot projects and the Climate Emergency movement. Eighteen councils have declared a climate emergency
+ The Draft Regional Climate Change Adaptation Strategy for Greater Melbourne provides a metropolitan wide focus on action.
+ State Government has developed the Monitoring, Evaluation, Reporting & Improvement Framework for Climate Change Adaptation in Victoria
+ The State has set moderately ambitious State targets including net zero emissions by 2050, and the Victorian Renewable Energy Targets (VRET)

Weaknesses include:

× National policy settings remain a barrier to mitigation and adaptation
× Adaptation and mitigation policies do not go far enough to combat climate change and risks. Victoria ranks 5th in vulnerability to economic damages from extreme weather.
× Melbourne is still a very high polluter per capita and relies too heavily on car transportation due to urban sprawl

## Performance (global standing)

Strengths include:

+ The City of Melbourne is on the CDP Cities A List for environmental action and performance, along with Adelaide, Sydney and Canberra
+ The take up of roof top solar in Australia and Melbourne is world leading

Weaknesses include:

× Almost all of Australia's major trading partners and strategic allies, as well as Australian state and territories, are now committed to net zero emissions by around mid-century. Melbourne and Victoria's targets are not overly ambitious or world leading

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's climate change policies can be considered as moderate (in comparison to other components of the vision). Positive factors include:

+ Reduced travel due to lockdowns saw emissions decline

Some negative impacts include:

× Shift away from public transport and increase in car ownership as a result of COVID-19 may prove difficult to reverse

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.

+ Melbourne is heading in the right direction with strong local government support and action in most metropolitan LGA's supported by the State government and the Regional Strategy.
+ The take-up of renewable energy is now occurring for financial reasons regardless of government policy settings
× The impacts of climate change will become more pronounced and will likely overwhelm any adaption response with the threat to natural and built assets along with the human health and safety impacts felt more acutely over time.
× Local efforts may be undermined by inaction at the federal level, though the lack of action in Canberra may be reversed this decade as momentum builds

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Robust democracy and regulatory frameworks, productivity boosting urban form

Comprehensive climate change mitigation/ adaptation policies

Construction and transport product manufacturing drivers, Innovation, liveability, resilient communities

# Strong environmental protection regulations

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis):** Melbourne has strong environmental protection regulations that set clear expectations for industry and sound environmental protection.

## Performance (national standing)

Melbourne has a middling performance from a national stand-point. Strengths include:

+ State level policy and legislation establish environmental protections. System is under review with a view to being strengthened protections
+ The new Environment Protection Amendment Act 2018 (Vic) includes new obligations and penalties to ensure waste is properly managed and reporting on pollution incidents is improved

Weaknesses include:

× Melbourne's tree canopy has been shrinking due to development though government policy including urban forest or greening strategies are aiming to reverse this trend
× Doubts in place around effectiveness of the State Government's Biodiversity 2037 and the Environment Protection Amendment Act 2018 (Vic).
× The Environment Protection and Biodiversity Conservation Act 1999 (EPBC) Act interim report found that the Act is failing to curb our loss of habitat and species. Biodiversity offsets can be problematic and in practice often do no achieve the desired outcome.
× Melbourne experiencing biodiversity loss as a result of urban development and continuing urban sprawl
× The green wedge is protected but still under threat from development

## Performance (global standing)

Strengths include:

+ According to the Global Pollution Index by City 2021, Melbourne is ranked 306th out of 340 for pollution levels. Most cities with less pollution have much smaller populations including Hobart, Adelaide and Canberra, and Nordic cities in Northern Europe

Weaknesses include:

× According to the Global Biodiversity Outlook, biodiversity in Australia is declining at unprecedented rates and faster than most areas in the world

Global leading eco-friendly cities include Copenhagen, Amsterdam, Stockholm, Ljubljana, Portland and Vancouver

## COVID-19 impact and response

On balance, the pandemic has not impacted on Melbourne's environmental protection regulations. Positive factors include:

+ Increased time spent outdoors and in nature has seen many residents connect with and express an interest in the health of their local environment.

Some negative impacts include:

× COVID-19 has delayed the implementation of the Environment Protection Amendment Act 2018 (Vic)

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.

+ Opportunity for the review of the State and Federal environmental protections and regulations to drive amendments that will deliver the level of protections required to preserve Melbourne biodiversity and natural habitat.
× In the absence of action to strengthen the State and Federal environmental protections and regulations Melbourne's biodiversity and habitat is at risk.

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



- Robust democracy and regulatory frameworks
- Strong environmental protection regulations
- Liveability, circular economy, resilient communities

# Resilient communities & strong social capital

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|
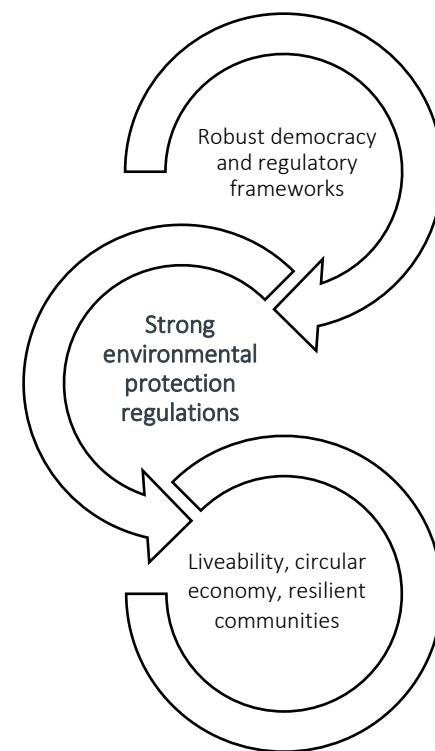
**Claimed vision (hypothesis):** Melbourne is a city with strong social capital and resilient communities.

## Performance (national standing)

Melbourne has a leading performance from a national stand-point. Strengths include:

+ Australia ranked 16th of 82 countries for social mobility
+ Supportive policy frameworks such as the Community Resilience Framework for Emergency Management aim to build collective capacity and capability to cope with and recover from acute shocks
+ COVID-19 and the 2019/2020 bushfires brought a sense of cohesion in the community and willingness to come together as local communities

Weaknesses include:

× Significant spatial disadvantage across metropolitan Melbourne (inner versus outer and east versus west).
× Melbourne's volunteering rate is lower than Australian cities
× Vulnerable communities and levels of social and community engagement and community capital vary across Melbourne
× Socio-economic disadvantage and youth unemployment are too high in many parts of the city
× Significant differences across Metropolitan Melbourne in resilience in coping capacity (the means by which communities or organisations can use available resources and abilities to face adverse consequences).

## Performance (global standing)

Strengths include:

+ Melbourne, and Australia more broadly, are seen to have a quality social fabric and relatively low levels of social inequality compared to other cities and nations.

## COVID-19 impact and response

On balance, the impacts of the pandemic on Melbourne's resilience and social capital can be considered as moderate (in comparison to other components of the vision). Positive factors include:
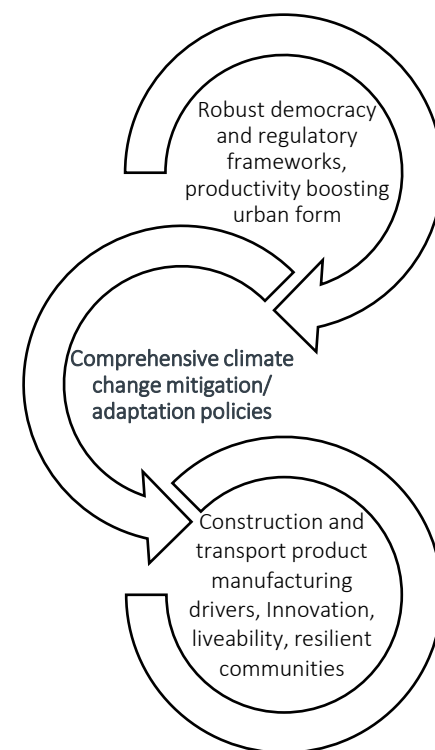
+ Melbourne's lockdowns demonstrated an ability for the community to adapt and respond.

Some negative impacts include:

× Low socio-economic and vulnerable workers were disproportionality affected by the pandemic. They were more likely to have adverse financial impacts and were less likely to be able to switch to remote work.

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain. Drags on progress include that:

× Risk of social and economic inequality becoming further entrenched, particularly as the disparity between the highly mobile knowledge workers and the remainder of the workforce becomes more entrenched
× In the longer-term social inequality and the ability to cope with the acute shocks and to take action to mitigate the chronic stresses unclear. If these chronic stresses and inequalities go unchecked, they will impact on the economy

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Strong local consumption economies, climate change policies, leading education

Resilient communities & strong social capital

Reputation for liveability, welcoming multicultural society, robust democracy
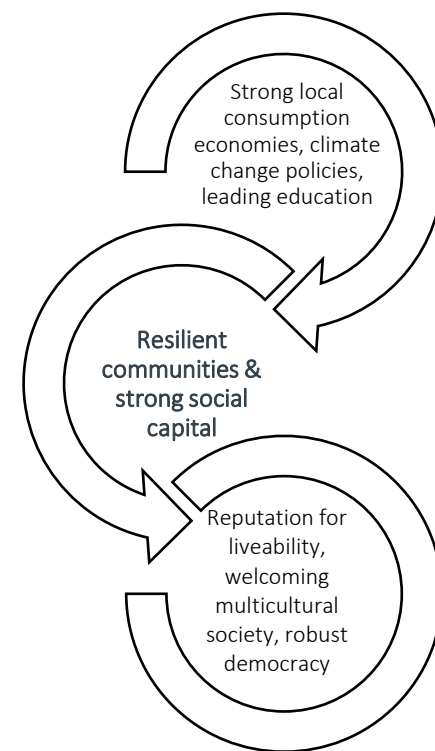
# Efficient taxation systems

| Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|

**Claimed vision (hypothesis): Melbourne has an efficient taxation system that is supportive of economic development**

## Performance (national standing)

Melbourne has a middling performance from a national stand-point.
Strengths include:

+ Overall Melbourne's taxation system is efficient and supportive of economic development.
+ The Victorian taxation system at the state level is free of corruption, competitive and well run
+ Lower payroll rate than NSW and ACT

Weaknesses include:

× Metropolitan Melbourne is not fiscally independent. Matters of taxation are dealt with by the State and there is a disconnect between the economic performance of Melbourne and its ability to capture the proceeds as revenue
× There is no systematic process for capturing land value
× Melbourne is bound by the State's decisions on stamp duty/land tax and is unable to pursue an alternate model such as the property tax changes (shifting away from stamp duty to a broad-based land tax.)
× Local Governments are unable to determine/ influence their own revenue beyond a cap imposed by the State Government

## COVID-19 impact and response

On balance, the taxation system has been able to respond well to the pandemic.
Positive factors include:

+ All three levels of government have been able to offer supports, including payroll tax relief, payments to support business, electricity rebates, land tax relief, rent relief and JobKeeper.

Some negative impacts include:

× Government debt levels have increased substantially impacting future spending as debt is repaid

## Performance (global standing)

Strengths include:

+ Unlike the United Kingdom, the central government has not starved local government of tax receipts in the name of austerity over the past decade since the GFC

Weaknesses include:

× Cities around the world, most notably those in the United States, have much greater scope to levy and collect taxes that capture the benefits of economic development locally and allows local authorities to exercise more power of planning, strategy and development
× In Australia most tax revenue is collected at the national level then distributed to state and local councils

## BAU 10-year prospects

Based on the research, Melbourne's BaU prospects over the next ten years can be considered uncertain.

× The lack of a systematic process for capturing land value is a limitation for the fair distribution of the proceeds of uplift as the economy develops
× The longer-term impacts of the various stimulus measures and tax/rate concession on local and state government financial viability remain to be seen

FIGURE: MAJOR ALIGNMENT WITH OTHER COMPONENTS OF THE VISION



Robust democracy and regulatory frameworks

Efficient taxation systems

Transport and logistics infrastructure, supportive systems for start-ups
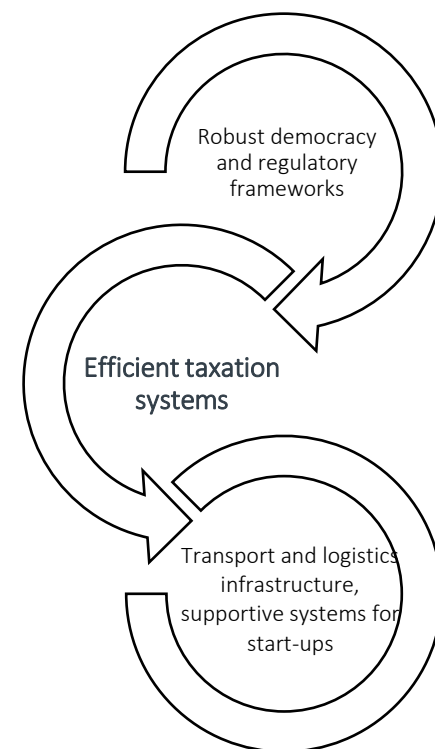
# 07

# Conclusion: Performance against the vision

## Conclusion: Performance against the vision

The analysis is used to bundle together the drivers, enablers and Sustainers into one of five categories to guide the RDA's response:

1) **Clear strengths to promote:** Areas where Melbourne has a clear advantage nationally and globally, and where future business-as-usaul prospects are already good. These areas can be used by RDA to promote the City without the need for major policy interventions

2) **Opportunities to elevate performance:** Areas where Melbourne is performing well, but there are some obvious weaknesses than can be addressed by policy decisions which the RDA can advocate for to improve performance further

3) **Strengths that are sliding in performance requiring action:** Areas where Melbourne has a traditional strength nationally and/or globally, but the impacts of the pandemic have been high, or the ten-year prospects are uncertain, and could lead to sliding performance. Policy action is required to reverse declining performance

4) **Ambition shown but support required**: These areas are not yet national or global strengths for Melbourne, but performance is improving. Policy actions can support momentum and assist Melbourne to become leaders in this space

5) **Clear weakness requiring immediate action required**: These areas are clearly lagging from a national or global perspective, have been heavily impacted by the pandemic or have poor 10-year prospects. Immediate action is required to address and improve performance if Melbourne is to pursue its implied vision.

# Melbourne's performance against the vision

**DRIVER INDUSTRIES** — MELBOURNE'S WORLD COMPETITIVE SECTORS

*ENABLED BY*

**ENABLERS** — MELBOURNE'S RESOURCES & CAPABILITIES

*UNDERPINNED BY*

**SUSTAINERS** — MELBOURNE'S SYSTEMS FOR ECONOMIC INCLUSION & SUSTAINABILITY

Legend:
- 🟢 Leading performance (first two columns) or good/minimal impacts of COVID-19 or good prospects.
- 🟡 Aspirational/improving performance or medium/short-term COVID-19 impact or uncertain prospects
- 🔴 Lagging performance or large COVID-19 impact or poor prospects

## DRIVER INDUSTRIES

| | Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|---|
| Food and fibre product manufacturing and services | Green | Green | Green | Green |
| Tertiary education | Green | Green | Red | Yellow |
| Professional services (design, engineering) | Green | Green | Green | Green |
| Tourism – place and culture | Green | Green | Red | Yellow |
| Tourism – major events | Green | Green | Red | Yellow |
| Health care | Green | Green | Green | Green |
| Bio-med research and manufacturing | Green | Green | Green | Green |
| Defence and aerospace manufacturing and services | Yellow | Yellow | Green | Green |
| Transport-related product manufacturing and services | Yellow | Yellow | Green | Green |
| Construction know-how | Yellow | Yellow | Yellow | Yellow |

## ENABLERS

| | Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|---|
| Highly skilled, good value workforce | Green | Yellow | Yellow | Yellow |
| Leading education system | Green | Yellow | Red | Yellow |
| Transport and logistics infrastructure | Green | Yellow | Yellow | Green |
| Ample capacity for urban growth and infill | Green | Yellow | Yellow | Yellow |
| Productivity boosting urban form | Yellow | Red | Yellow | Yellow |
| Reputation for liveability | Green | Green | Yellow | Yellow |
| Creative industries (arts and fashion) | Green | Yellow | Red | Yellow |
| Leading innovation systems | Green | Yellow | Yellow | Yellow |
| Supportive regulatory and tax systems for start-ups | Green | Yellow | Yellow | Green |
| Welcoming, multicultural society with integrated links to Asia | Green | Green | Yellow | Yellow |

## SUSTAINERS

| | Performance (national standing) | Performance (global standing) | COVID-19 impact and response | BAU 10 year prospects |
|---|---|---|---|---|
| Robust democracy and regulatory frameworks | Green | Green | Green | Yellow |
| Strong local consumption economies | Yellow | Yellow | Green | Yellow |
| Thriving Aboriginal communities & businesses backed by treaty | Yellow | Yellow | Yellow | Yellow |
| Local ownership of resource flows (circular economy) | Yellow | Yellow | Yellow | Green |
| Comprehensive climate change mitigation/adaptation policies | Green | Yellow | Yellow | Yellow |
| Strong environmental protection regulations | Yellow | Yellow | Green | Yellow |
| Resilient communities & strong social capital | Yellow | Green | Yellow | Red |
| Efficient taxation systems | Yellow | Yellow | Yellow | Yellow |

# A vision for Melbourne's economy – clear strengths to promote

**DRIVER, ENABLER OR SUSTAINER**

**CONCLUSION**

**Clear strengths to promote**

| Driver, Enabler or Sustainer | Conclusion |
|---|---|
| Food and fibre product manufacturing and services | Melbourne has the largest food product and textile manufacturing sector in Australia, with deep supply chains to the regions and growing exports to the world. Exports will continue to grow through global population growth and demand for fresh and healthy food. This driver remains largely unaffected by COVID-19 but will face challenges from climate change. |
| Professional services (design, engineering) | Melbourne has a standing as leaders in professional services in the Asia-Pacific region, including engineering and design, fuelling strong job growth in recent years. The sector has competitive advantages from Melbourne's highly skilled workforce, first-class regulatory framework, strong research base and high quality of life. The sector is primely positioned for robust future growth, which will be driven by domestic and international demand, innovation, the knowledge economy and advanced manufacturing. |
| Bio-med research and manufacturing | Bio-med manufacturing is a growing export sector, linking to the city's world-class research institutions and bolstered by the renewed focus on health infrastructure and local health equipment supply chains. Manufactured medical goods are Melbourne's leading complex product export and many of Melbourne's success stories of innovation and businesses growth are in this driver. There are opportunities to boost the sector through new investments and better commercialisation of research. |
| Health care industry driver | Melbourne offers world-class health and wellbeing services generating significant employment and economic value. Through the strong health care and health research intuitions and capabilities, the sector can provide quality treatment, care, education and research. Growth in this sector will continue to be fuelled by population growth, but export opportunities will need to be pursued to increase the economic value of the sector to Melbourne further. |
| Ample capacity for urban growth and infill | Melbourne, due to its geography and changing land use, has abundant land for growth and renewal. Government plans set out city-wide direction for urban growth and infill and the preservation of industrial precincts. This capacity means businesses and residents have the opportunity to easily call Melbourne home in the coming decades. In the residential space, a compact city transition, from "suburban" to "urban" remains a challenging work in progress. |

# A vision for Melbourne's economy – opportunities to elevate performance

DRIVER, ENABLER OR
SUSTAINER

CONCLUSION

**Opportunities to elevate performance**

| Defence and aerospace manufacturing and services | Melbourne plays a critical role in the development and sustainment of Australia's defence capability providing significant employment and export value, particularly in aerospace manufacturing, repair and services. Melbourne is home to key defence research organisations, plus cyber security and ICT capabilities. Significant Federal government spending over the next 10 years provides ongoing opportunity, but there is much competition from other cities in Australia and globally. |

| Transport-related product manufacturing and services | Melbourne has a long tradition as a transport product manufacturing heartland. However, the closure of the car industry has caused disruptions and contraction of the sector in both exports and employment. Melbourne is now pivoting to the manufacture of transport products in other areas, and maintenance and design roles backed by government. Intelligent and low-carbon transport systems are industries which are forecast to grow and aligned with Melbourne's existing strengths |

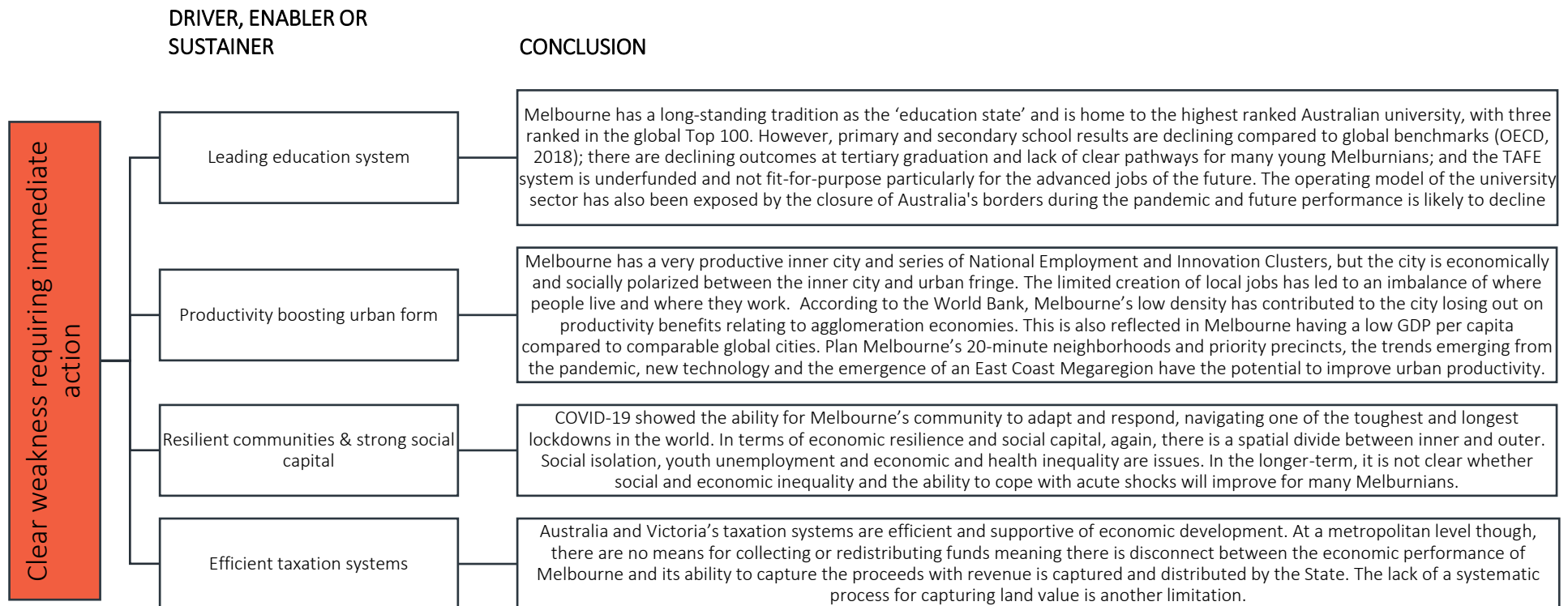| Transport and logistics infrastructure | Major ports, roads, rail, airports and freight hubs are well networked for efficient freight movement to local, regional, interstate and international markets for Melbourne's businesses. From a worker mobility perspective, infrastructure lags global leaders. There is an overreliance on car transport, congestion and crowding, and innovative solutions like congestion charging have not been taken up.  The construction of new transport infrastructure alone will unlikely deal with the problems being experienced. |

# A vision for Melbourne's economy – strengths that are sliding in performance requiring immediate action and reform

**DRIVER, ENABLER OR SUSTAINER**

**CONCLUSION**

**Strengths that are sliding in performance requiring action**

| DRIVER, ENABLER OR SUSTAINER | CONCLUSION |
|---|---|
| Tertiary education industry | Melbourne has a world-wide reputation for high-quality tertiary education. The sector draws in thousands of international students driving education exports for the city. Growth in the industry had been strong but the closure of Australia's borders due to the pandemic has severely impacted the sector. This disruption needs to be overcome if Melbourne's tertiary education sector is to be a major export earner again. Rising political tensions with China poses another risk. |
| Tourism – place and culture | Melbourne is a melting pot of cultures, with a reputation for its cultural diversity and opportunities. Melbourne has diverse and excellent dining options, opportunities for creative art and tourism and natural and cultural landscapes. However the pandemic has halted international arrivals leaving businesses on the brink. Interstate visitation will not sufficiently replace international arrivals for the city, meaning employment and export value will fall in the short-term leading to business closures or high business debt. |
| Tourism – major events | Melbourne is Australia's culture and sporting event capital, with a worldwide reputation for events. Melbourne hosts a plethora of major international festivals and special events throughout the year, from the Melbourne Comedy Festival, Australian Open, Boxing Day Test, Melbourne Cup and the Grand Prix. The pandemic has had a severe impact on the events industry, with many being cancelled or progressed without crowds (and therefore tourists). Events at the same scale remain unlikely until a vaccine is in place. |
| Highly skilled, good value workforce | Melbourne has an enormous stock of human capital, with a diverse and skilled workforce. Leading cities globally though have readiness for future industries in AI and advanced technologies and the manufacture of complex goods, which Melbourne is lagging. Due to immigration the workforce is young, educated and growing, but the pandemic has paused this. In addition, the issues being experienced in the tertiary and vocational education sectors will ultimately impact the quality of the workforce. |
| Reputation for liveability | Melbourne is an enviably liveable city. The city's cohesive and stable society, healthcare, education, and infrastructure, outstanding arts, food and wine, Australia's best shopping, and diverse sporting and leisure opportunities make Melbourne one of the world's best cities to live, attracting and keeping skilled talent. Melbourne's liveability though is not spatially equal, while the inner city is very livable, parts of the city are not. The livability and vibrancy of the inner city has also been hit by COVID-19 lockdowns. |
| Creative industries (arts and fashion) | Melbourne is the creative arts, fashion and retail capital of Australia and renowned globally as a creative destination. In comparison to leading cities globally, Melbourne undervalues their creative industries in terms of government funding and support. Due to the pandemic lockdowns, many creative businesses have taken on debt to survive and recovery may be a long process. Many shops, studios and venues may not reopen. |
| Welcoming, multicultural society with integrated links to Asia | Melbourne has a long tradition of immigration from all over the world. Immigration has contributed greatly to all of Melbourne's strengths and will continue to contribute to Melbourne's economic future. The pandemic, lack of pandemic support for non-permanent residents, rising but still marginal anti-immigrant sentiment, increasingly restrictive visa arrangements and geo-political tensions with China pose risks to population growth, social cohesion and export markets. |
| Robust democracy and regulatory frameworks | Melbourne and Victoria have robust democratic and regulatory frameworks and is renowned globally for its stable democracy and as safe place to invest. There is a need for greater citizen engagement though, with trust in government falling over recent decades, particularly with young people. The lack of a metropolitan level of governance is an issue that needs addressing but faces significant barriers as the other levels of government are unlikely to relinquish their power over the regulation of the city. |

# A vision for Melbourne's economy – ambition shown but support required

**DRIVER, ENABLER OR SUSTAINER**

**CONCLUSION**

**Ambition shown but support required**

| Driver, Enabler or Sustainer | Conclusion |
|---|---|
| Construction know-how | Melbourne has an enormous construction industry built on the back of population growth and infrastructure investment. However the sector remains predominately population serving, with exports very low. Melbourne has had some success in the prefabricated building industry, but it remains an unrealised opportunity for the city. The need for environmentally friendly and climate resilient buildings is another innovation opportunity. Slower population growth due to the pandemic is a risk to the industry's prospects. |
| Leading innovation systems | Melbourne is Australia's technology hub, home to half of Australia's top 20 technology companies. Melbourne has high-quality research institutions, but while research systems produce high quality research, research occurs in organisations weakly connected to industries. Productivity growth is also in decline. The cultivation of successful innovation precincts will be a determinant of success in as advanced ways of manufacturing, new technology and knowledge-intensive industries are coming to the fore. |
| Supportive regulatory and tax systems for start-ups | Melbourne has a growing start-up ecosystem, having climbed international rankings for start-up hubs. Melbourne investors experience some of the world's most generous R&D support in a cost-competitive business environment. Areas for improvement include improved research and patent production support as targeted research and development funding is low compared to International start-up powerhouses. |
| Strong local consumption economies | Melbourne's local economies are largely operating on the legacy of past planning - a strong network of activity centres in inner and middle ring suburbs which is largely absent in outer suburbs and greenfield areas. The COVID-19 lockdown and work from home has placed a renewed focus on local economies. Success is subject to closing the spatial divide and creating 20-minute economies (not just neighbourhoods). While the policy intent is there, this part of the vision for Melbourne is yet to be delivered. |
| Thriving Aboriginal communities & businesses backed by treaty | The Treaty process is underway, with Victoria the first and only jurisdiction to have begun to action the Treaty and Truth elements of the Uluru Statement. Melbourne has seen a 50% increase in Aboriginal owner–manager businesses between 2011 to 2016, the greatest increase of all capital cities. The Treaty Process will set the scene for thriving aboriginal communities & businesses. How the Treaty process is finalised and supported by aboriginal communities remains to be seen and is a challenging work in progress. |
| Local ownership of resource flows (circular economy) | Councils have been early adopters and supporters of a circular economy - working with local business, the CSIRO (ASPIRE) and the Metropolitan Waste and Resource Recovery Group, but Melbourne trails international leading cities. Policy at the state level includes Recycling Victoria and the Circular Economy Business Innovation Centre. The shift to a circular economy is in its early stages and there are infrastructure gaps. The amount of waste being generated is growing requiring a stronger focus on waste minimization. |
| Comprehensive climate change mitigation/adaptation policies | Comprehensive climate change mitigation/adaptation policies are being enacted at the state and local levels. Victoria has a moderately ambitious net zero target, and a draft Regional Climate Change Adaptation Strategy for Greater Melbourne provides a metropolitan wide focus. Melbourne is on the A list of cities for cities setting ambitious targets and adapting. Local action is undermined by federal inaction, and assessments of risk, city small area climate data and adaption works still need to be pursued. |

# A vision for Melbourne's economy – clear weakness requiring immediate action

**DRIVER, ENABLER OR SUSTAINER**

**CONCLUSION**

## Clear weakness requiring immediate action

### Leading education system

Melbourne has a long-standing tradition as the 'education state' and is home to the highest ranked Australian university, with three ranked in the global Top 100. However, primary and secondary school results are declining compared to global benchmarks (OECD, 2018); there are declining outcomes at tertiary graduation and lack of clear pathways for many young Melburnians; and the TAFE system is underfunded and not fit-for-purpose particularly for the advanced jobs of the future. The operating model of the university sector has also been exposed by the closure of Australia's borders during the pandemic and future performance is likely to decline

### Productivity boosting urban form

Melbourne has a very productive inner city and series of National Employment and Innovation Clusters, but the city is economically and socially polarized between the inner city and urban fringe. The limited creation of local jobs has led to an imbalance of where people live and where they work. According to the World Bank, Melbourne's low density has contributed to the city losing out on productivity benefits relating to agglomeration economies. This is also reflected in Melbourne having a low GDP per capita compared to comparable global cities. Plan Melbourne's 20-minute neighborhoods and priority precincts, the trends emerging from the pandemic, new technology and the emergence of an East Coast Megaregion have the potential to improve urban productivity.

### Resilient communities & strong social capital

COVID-19 showed the ability for Melbourne's community to adapt and respond, navigating one of the toughest and longest lockdowns in the world. In terms of economic resilience and social capital, again, there is a spatial divide between inner and outer. Social isolation, youth unemployment and economic and health inequality are issues. In the longer-term, it is not clear whether social and economic inequality and the ability to cope with acute shocks will improve for many Melburnians.

### Efficient taxation systems

Australia and Victoria's taxation systems are efficient and supportive of economic development. At a metropolitan level though, there are no means for collecting or redistributing funds meaning there is disconnect between the economic performance of Melbourne and its ability to capture the proceeds with revenue is captured and distributed by the State. The lack of a systematic process for capturing land value is another limitation.

# Policy response ladder

| | Drivers | Enablers | Sustainers |
|---|---|---|---|

**Clear strengths to promote:**
Melbourne has a clear advantage nationally and globally, BaU prospects are good. These areas can be used to promote the city

- Food and fibre product manufacturing and services
- Health care
- Professional services (design, engineering)
- Bio-med research and manufacturing
- Ample capacity for urban growth and infill

**Opportunities to elevate performance:**
Areas of good and improving performance but with obvious weaknesses that can be addressed to boost performance

- Defence and aerospace manufacturing and services
- Transport-related product manufacturing and services
- Transport and logistics infrastructure

**Strengths that are sliding in performance requiring action:**
Melbourne has a traditional strength in this area, but action is required to reverse declining performance or COVID-19 impacts

- Tertiary education industry
- Tourism (place and culture)
- Tourism (major events)
- Highly skilled, good value workforce
- Reputation for liveability
- Creative industries (arts and fashion)
- Welcoming, multicultural society with integrated links to Asia
- Robust democracy and regulatory frameworks

**Ambition shown but support required:**
These areas are not yet strengths for Melbourne, but performance is improving. Policy actions can support momentum and build these areas into strengths

- Construction know-how
- Leading innovation systems
- Supportive regulatory and tax systems for start-ups
- Local ownership of resource flows (circular economy)
- Comprehensive climate change mitigation/adaptation policies
- Thriving Aboriginal communities & businesses backed by treaty
- Local consumption economies

**Clear weakness requiring immediate action:** These areas are clearly lagging from a national or global perspective, have been heavily impacted by the pandemic or have poor BaU prospects.

- Leading education system
- Productivity boosting urban form
- Resilient communities & strong social capital
- Efficient taxation systems

# 08

# Key areas of focus and indicators

# Introduction

The Research Report explored, at a high level, the performance of 10 economic drivers, 10 enablers and 8 sustainers for economic development in Melbourne.

In addition to the high-level overview RDA identified three areas for additional research, to understand in more detail their performance and how RDA can contribute to policy development to benefit the three areas.

Discussions led to these three areas being chosen:
1. The manufacturing driver industries (as a bundle)
2. Melbourne's education system
3. Professional services (design and engineering)

The interconnections between the three was a key focus of the additional research. The education system is an enabler of both manufacturing and design and engineering. Further, with the transition to more advanced manufacturing methods there is a growing reliance on design and engineering skills and a high-quality education system that produces them.

Quantitative indicators have also been developed to track performance as part of a separate dashboard.

# A transition from a manufacturing to a services economy

The past thirty years have seen a profound restructuring of the Melbourne economy. The metropolis has transformed from an industrial city into a knowledge-intensive economy. This structural change has impacted the structure and growth trajectory of Metropolitan Melbourne.

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

Employment in manufacturing (as traditionally defined) has declined and will likely continue to decline, while employment in professional and financial services has increased. A range of population serving industries are also expanding, including health care, retail and education.

But the continuing changes in manufacturing are more nuanced than a simple decline as identified via falling employment numbers. Melbourne's manufacturing sector and manufacturing driver industries are transforming rapidly, competing in an increasingly globalised economy.

While manufacturing jobs may be declining, the value of what Australia manufactures is actually increasing. Since 1989, manufacturing has halved its share of contribution to Australia's economic activity (from 12% to 6%) while professional, scientific and technical services and financial services combined has increased by almost half (to 17%). Significantly though, while manufacturing has declined as a share of total economic activity, the size of its contribution has increased by 16% over that time (ABS, Australian National Accounts, 2019). This data suggests that while knowledge intensive service industries have overtaken manufacturing, its economic contribution continues to grow. Manufacturing output growth is driven by advances in both what we produce and how we produce it.

The popular thinking is that manufacturing is in decline, but the industry (or, more correctly, the wide range of industries that comprise the manufacturing sector) continues to evolve. Manufacturing production increasingly overlaps with professional services like design and engineering and presents growth opportunities for these driver industries. This is particularly so as more hybrid roles emerge with technological advancements, allowing for movement up the value chain (e.g. rapid prototyping, 'customise-make-service-sell').

Knowledge-based industries encompass research and development (R&D), design, engineering, marketing, advertising and creative industries, and more traditional jobs such as lawyers, bankers, financiers, doctors, and management consultants. These knowledge-based industries require strong educational and training pathways for skill development.

# A transition from a manufacturing to a services economy

In recent decades, three key drivers behind the structural transition of the Melbourne labour market have been trade liberalisation, labour market deregulation, and the automation of jobs. Unlike the first two of those factors, the impact of automation is ongoing with continual technological development and innovation in Melbourne and around the world. Technology will shape the firms and jobs of Melbourne's future.

Task-biased technical change is the leading framework for analysing the impact of technology on work. It is used to measure the intensity of abstract, routine and manual tasks across different occupations.

ABSTRACT, ROUTINE AND MANUAL TASKS

**Abstract tasks** involve problem solving, creative thinking or complex interpersonal communication. They are intensive in **high skill** managerial, professional and technical occupations such as designer, researchers or engineers.

**Routine tasks** are more common in **middle skill** occupations and can be *routine cognitive* tasks that are intensive in jobs like bookkeepers and accounting clerks, or *routine manual* tasks that are intensive in jobs like machine operators, factory workers and assemblers.

**Manual** tasks require interpersonal or environmental adaptability, visual or language recognition and in-person interactions. They are common in **low skill** personal care, protective services and food/cleaning occupations.

In this report, **task intensity** means the average importance of a task to a particular job.

The intensity of these task types have been modelled to analyse the impact of automation on Greater Melbourne. Other researchers have shown that demand for routine tasks is falling in many advanced economies, including the United States, United Kingdom, European Union and Australia more broadly. A similar trend can be seen for Victoria in the figure below. In the last three decades, there has been a consistent trend of rising intensity in abstract tasks across all jobs and falling intensity of routine and manual tasks.

As all industries innovate and adopt new technologies, abstract tasks are likely to become more critical over the coming decades.

FIGURE: AVERAGE TASK INTENSITY IN VICTORIAN LABOUR MARKET (1986-2018)
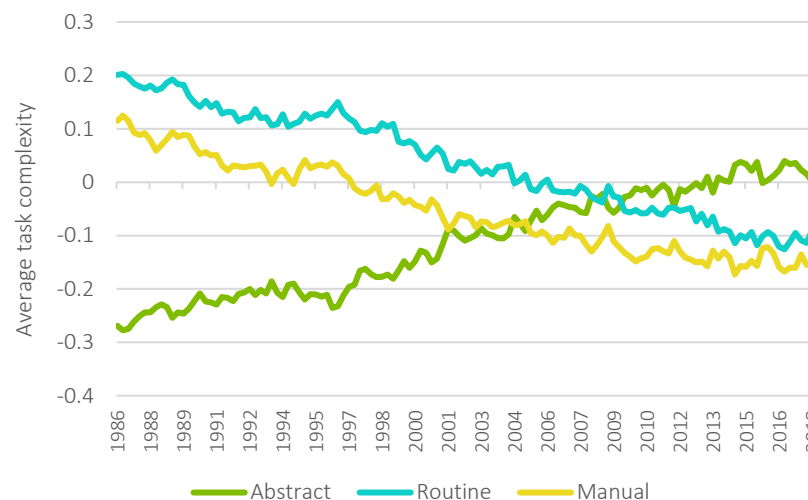


Note: Time series data was not available for Melbourne so the figure shows data for all of Victoria
Source: SGS Economics and Planning; derived from ABS (2018), Labour Force, Australia

# Melbourne's position in global supply chains

Australia's geographic location, relatively small population and abundance of natural resources mean that Melbourne plays an interesting role in global supply chains. Australian and Melbourne companies tend to engage with global supply chains at both ends. At the one end, a considerable quantity of raw or semi-processed materials such as iron ore, aluminum, rare and precious metals and increasingly lithium are exported overseas. On the other end, consumers import back into the country finished products often comprised of our raw materials. Melbourne's relatively small population and highly skilled workforce mean the city has been transitioning away from a production economy towards a services economy over the past thirty years as international trade barriers have been gradually removed.

However, current global events are causing a rethink regarding the reliance on global supply chains. The COVID-19 pandemic and response have highlighted the fragility of global supply chains. The manufacturing process itself was disrupted as Chinese factories shut down. The reduction in air freight due to government intervention also had significant effects on the production and distribution of goods.

Emerging geopolitical tensions between Australia and China throughout 2020 and 2021 have alsp caused the Australian Government to rethink what trade, production, and consumption may look like domestically in the future. The COVID-19 pandemic and response have led some sectors to claim that Australia should 'reshore' its manufacturing capabilities to safeguard against future threats. Onshoring and efforts to replace imports with local production would clearly have a significant impact on the size of the manufacturing sector.

To identify opportunities in this context, it is essential to understand Melbourne's competitive advantages in the global economy. The CSIRO has identified these relative advantages and disadvantages in their Advanced Manufacturing Roadmap.

TABLE: AUSTRALIA'S MANUFACTURING COMPETITIVE LANDSCAPE

| Comparative advantages | Comparative disadvantages |
|---|---|
| Education and research skills | High labour costs |
| Quality and standards | Geographical remoteness |
| SMEs | Small and dispersed domestic market |
| Access to Asia | Risk averse culture |
| Early adopters | Segregated national agenda |
| Political and economic stability | Commercialisation |
| Natural resources | Staff training and development |
| Intellectual Property laws | Digital infrastructure |
| | Public perception |
| | Quality and quantity of leaders |

Source: CSIRO, 2016 'Advanced Manufacturing: A roadmap for unlocking future growth opportunities for Australia

An analysis of the competitive landscape, the findings from the drivers, enablers and sustainers, along with the more recent COVID-related experience tells us that Melbourne's advantage lies in the intersection of the knowledge economy and advanced manufacturing capabilities; in niche, high-value markets requiring specialisation, strong links to world-class R&D and high levels of quality control.

# Industry linkages

The charts on this page demonstrate the reliance of the manufacturing sector on professional, scientific and technical skills like design and engineering.

The top chart shows the 25 sub-industries (out of 114) with the most substantial upstream linkages to professional, scientific and technical skills. The data is from the Australian National Accounts, Input-Output Tables, 2017-18, and shows the share of inputs sourced from professional, scientific and technical services to make an additional $100 worth of output. For example, to make an additional $100 worth of output in the ship and boat manufacturing sector, 33% of inputs would need to be sourced from professional, scientific and technical services to design and engineer the manufactured product. Manufacturing's strong linkages with design and engineering is demonstrated by the fact that 11 of the top 25 sub-industries with the strongest upstream linkages to professional services are manufacturing sub-sectors. Sub-industries with strong connections include transport product manufacturing (ships and boats, aircraft and railway rolling stock), bio-med product manufacturing, and some food products (soft drinks, cereals). As a comparator, sub-industries with weak relationships (~1%-2%) to professional, scientific and technical services include forestry, oil and gas extraction and residential care.

As reflected in the bottom figure (the three pie charts), the linkages with engineering and design vary by manufacturing sub-sector. The manufacture of products like ships and aircraft have strong linkages, while more straightforward products like clothing, textiles, meat or sawmill logs have lower connections to design and engineering. These connections are further reflected in the high complexity scores of transport and bio-med goods in the Hausmann analysis.

Given these strong connections between Melbourne's driver manufacturing industries and engineering and design, there is a need to ensure that these skills are present in the Melbourne economy. High-quality training and skill development pathways need to be in place if these drivers are to grow and power the economy.

FIGURE: TOP 25 INDUSTRIES (FROM 114) WITH LARGEST UPSTREAM CONNECTION TO PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES (2018/19)
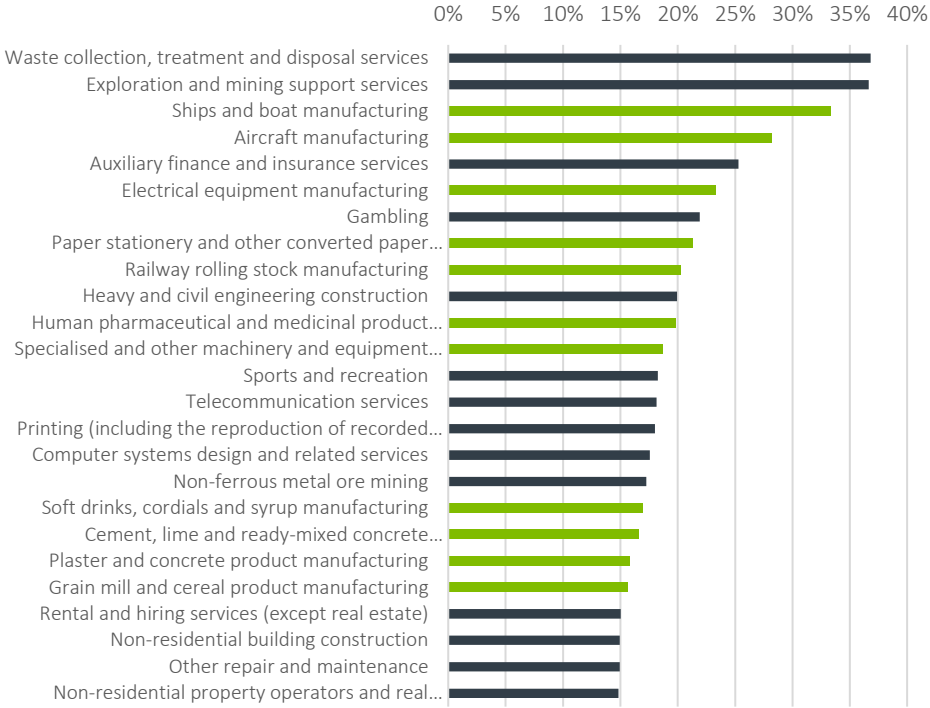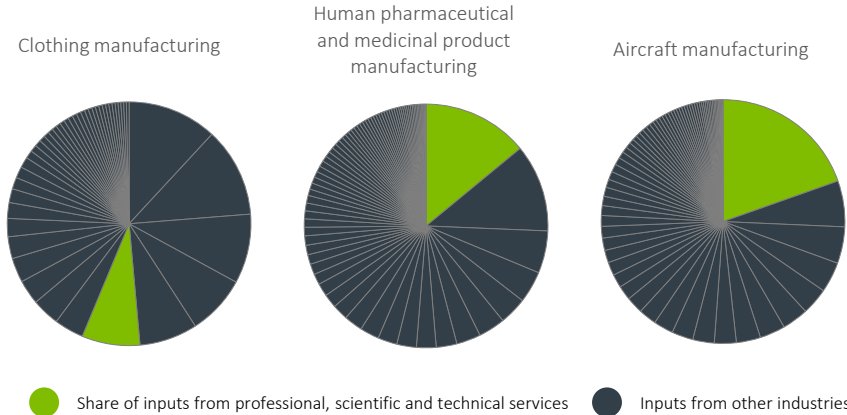


FIGURE: SELECTED MANUFACTURING SECTORS AND UPSTREAM CONNECTION TO PROFESSIONAL, SCIENTIFC AND TECHNICAL SERVICES



Clothing manufacturing

Human pharmaceutical and medicinal product manufacturing

Aircraft manufacturing

● Share of inputs from professional, scientific and technical services    ● Inputs from other industries

# Leveraging the overlap of manufacturing and professional services

The transition to high-value production and advanced manufacturing technologies presents a significant opportunity for economic development in Melbourne based on the city's established manufacturing specialisations and in design and engineering, enabled by the education system.

Future innovation will increasingly come from the intersection of different industries. These intersections are illustrated in the 'Stretch and Leverage' concept. The concept is an economic development framework that focuses on the expansion and interaction of existing industries to create new opportunities.

Stretching involves expanding existing resources, infrastructure and core competencies of an industry sector (e.g. building on the strengths of exiting sectors and industries). The Hausmann analysis results allow us to identify which products Melbourne can most easily stretch to and produce to grow exports or replace imports.

The leverage approach leverages resources between industries to create new hybrid industries in white space between industry sectors.

Given Melbourne's highly diverse industry mix of professional services coming up alongside and overtaking manufacturing, the opportunity to stretch and overlap seemingly separate industries is high.

For Melbourne, this presents an opportunity for the operations of the traditionally strong industries of manufacturing and professional services (plus construction, tertiary education and health) to interact with one other as a means of identifying and capitalising on a city-specific competitive advantage, and in so doing, grow the driver industries for economic development.

Modern manufacturing increasingly involves the leverage of design and engineering skills to produce new products via new methods. The renewed interest (or need) for domestically-based, high-value manufacturing presents a real opportunity to leverage the existing design and engineering skillset and corporate knowledge, education system, with a focus on 21st-century manufacturing.

FIGURE: STRETCH AND LEVERAGE MODEL
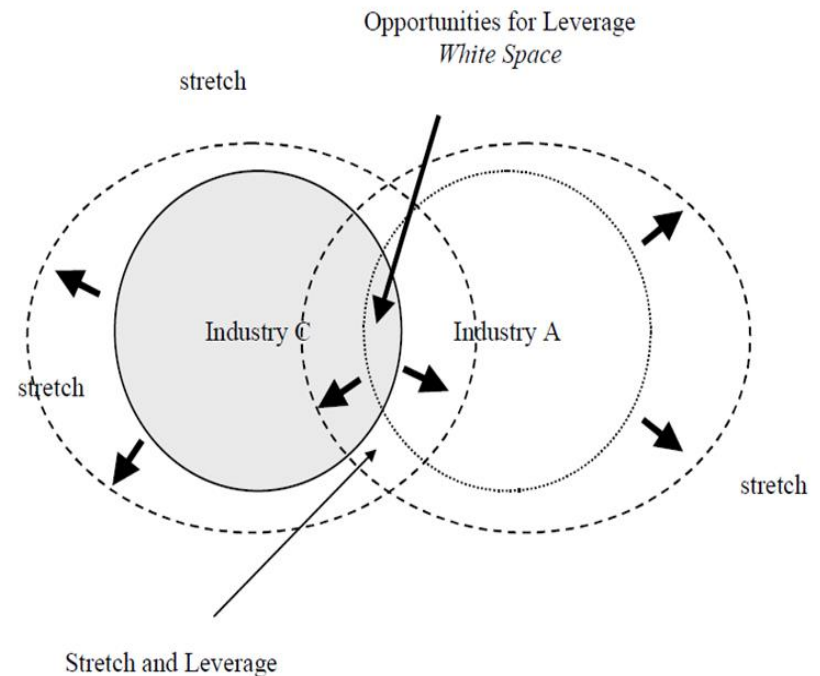
# Modern manufacturing

One of the most significant emerging trends relevant to the future of Melbourne's driver industries, design and engineering and skills is advanced manufacturing processes. Advanced manufacturing is not a sector in its own right but a description of the operational processes that manufacturing businesses use. Advanced manufacturing is therefore not about what is produced, it is about how it is being produced.

The Commonwealth Government identified Advanced Manufacturing as one of the five industry areas of focus at a national level. It established the Advanced Manufacturing Growth Centre (AMGC) to drive the growth of this sector. The AMGC considers a manufacturer as 'Advanced' when they demonstrate three key aspects to their operational processes:
- Use of advanced knowledge
- Use of advanced processes
- Application of advanced business models

In Melbourne, advanced manufacturing represents a significant opportunity for economic development and growth. This transition is often referred to as 'Manufacturing 4.0' and is conceived as an economic evolution that more fully integrates the industrial and knowledge sectors, as well as having close links with research and development.

The Victorian Government recognises the potential, developing *Advancing Victoria's Manufacturing. A Blueprint for the Future.* The document provides the vision for the Victorian manufacturing industry, focusing on industry growth, preparing Victorians for the jobs of the future, encouraging innovation, building scale, capability and supply chain excellence, and fostering a globally competitive business environment.

The successful growth of an advanced manufacturing sector in the Melbourne urban economy is underpinned by a recognition of the competitive advantages of the city around design and engineering. The COVID-19 pandemic has furthered interest in this area at both state and federal government level, with a renewed interest in the growth of the Australian manufacturing sector recognising that advanced processes align with Australia's skill profile and higher cost (but also higher value) workforce.

# Modern manufacturing skills

Competitive design and engineering capabilities drive advanced manufacturing. But according to the Advanced Manufacturing Growth Centre (2020), Australia has low utilisation of high-skill workers relative to the US across many manufacturing sub-industries (chart).
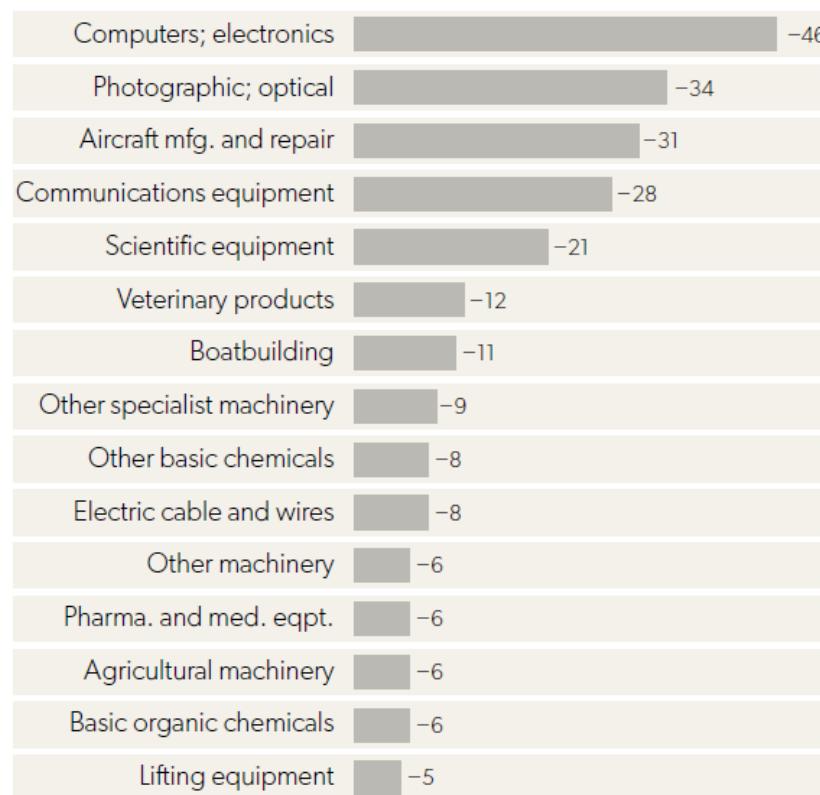
For example, the proportion of workers with higher skills is larger in the US than in Australia in computer and electronics manufacturing (46 percentage points difference), photographic and optical manufacturing (34 percentage points), and aircraft manufacturing (31 percentage points).

These skill deficits are particularly stark given that Australia has a significant cost advantage in higher-skilled workers compared to the US: as much as 40% in some industries.

A number of sizeable manufacturing industries in Australia with a large presence in Melbourne have significant skill gaps compared with US equivalents, most notably aircraft manufacture and pharmaceutical and medical manufacturing, implying significant upside from boosting skill levels. Shifting a larger proportion of the city's employment into non-production roles and more skill-intensive sub-industries represents an opportunity to improve competitiveness and increase productivity.

The next page provides more information on the skill profile of Melbourne's manufacturing driver sectors.

FIGURE: TOP 15 ADVANCED MANUFACTURING SECTORS BY SKILLS GAP – AUSTRALIAN IN COMPARISON TO THE UNITED STATES



| Sector | Skills gap |
|---|---|
| Computers; electronics | −46 |
| Photographic; optical | −34 |
| Aircraft mfg. and repair | −31 |
| Communications equipment | −28 |
| Scientific equipment | −21 |
| Veterinary products | −12 |
| Boatbuilding | −11 |
| Other specialist machinery | −9 |
| Other basic chemicals | −8 |
| Electric cable and wires | −8 |
| Other machinery | −6 |
| Pharma. and med. eqpt. | −6 |
| Agricultural machinery | −6 |
| Basic organic chemicals | −6 |
| Lifting equipment | −5 |

Source: Advanced Manufacturing Growth Centre (2020)

# Manufacturing skills profiles

To explore Melbourne's manufacturing skill profile further, the share of the workforce that are highly-skilled professionals (by sub-industry related to Melbourne's drivers) is shown below. Data is shown for Greater Melbourne in 2016 and 2011, plus Greater Sydney and Australia for comparison. Professionals include workers design, engineering and science, plus arts and media, marketing, and ICT.

The analysis revealed that:

• The proportion of highly-skilled professionals working in manufacturing increased across all driver sub-industries between 2011 and 2016 (as shown by the arrows) except for two of the bio-med sub-industries.

• The railway rolling stock and professional and scientific equipment manufacturing sub-industries saw a significant increase in their skill intensity between 2011 and 2016.

• Melbourne clearly has a more advanced manufacturing workforce than Sydney and Australia in the manufacture of professional and scientific equipment, aircraft and motor vehicles.

• Bio-med and aerospace manufacturing are much more skill intensive due to the product complexity, while food and fibre have lower design and engineering requirements. Complex products like pharmaceuticals and aerospace technology rely heavily on R&D expenditures and break-through innovations driven by engineering and design professionals.

Increasing the share of high-order knowledge jobs in driver industries is an opportunity to leverage Melbourne's design and engineering skill base to develop, manufacture and export complex products to drive economic growth.

FIGURE: SHARE OF THE MANUFACTURING WORKFORCE BY DRIVER SUB-INDUSTRY THAT ARE HIGHLY-SKILLED PROFESSIONALS



Source: ABS table builder OCCP – 1 Digit Level by INDP – 4 Digit Level

# Hausmann analysis: opportunities for Melbourne

As derived from SGS's Hausmann analysis, product opportunities are presented here for Metropolitan Melbourne, based on the combination of highest product complexity, opportunity gain, and distance from existing productive capabilities. Melbourne has the most significant opportunity to increase its economic complexity index and branch out into multiple new products by building a comparative advantage in these products.

The largest product opportunity is in machinery and vehicles, which aligns with Melbourne's driver industries of transport product manufacturing and defence and aerospace manufacturing. Melbourne has a traditional strength in these areas, which can be further capitalised on. The chart below on the right shows that machinery and vehicles is also a good bet for Melbourne as

an export earner due to its sizeable global value.

Other opportunities include producing materials like nuts and bolts, rubber articles and glass related to the construction driver, plus hand or machine tools. Other manufactures include products related to bio-med manufacturing like optical instruments and measuring and analysing instruments. Enabling and supporting the production of complex products like machinery, vehicles and bio-med products will see Melbourne's economic complexity score increase leading to economic benefits in innovation, workforce skills development, higher economic moats for Melbourne's products and higher wages for workers.

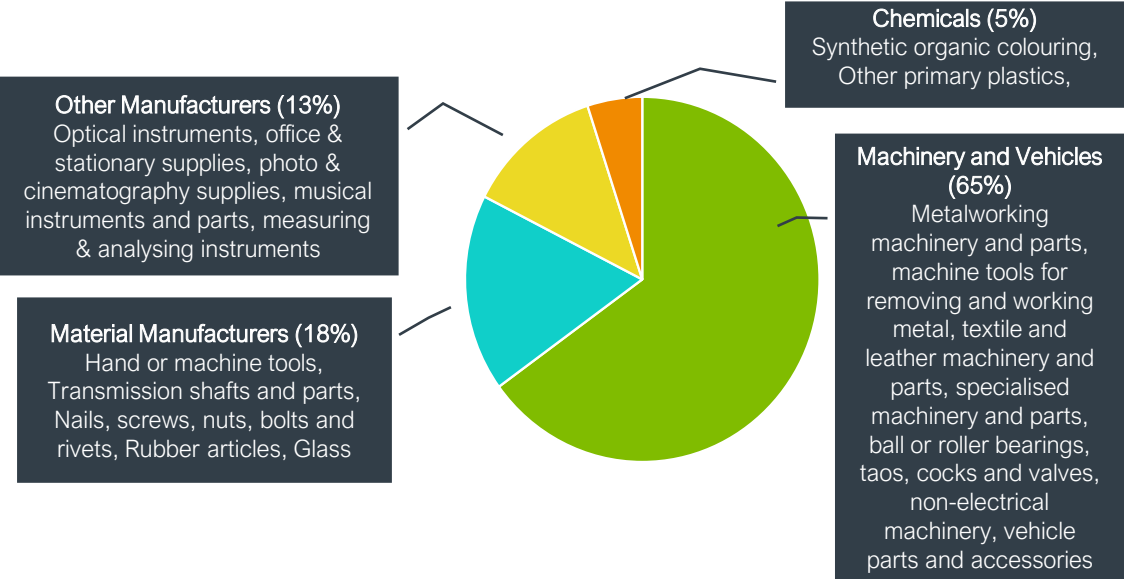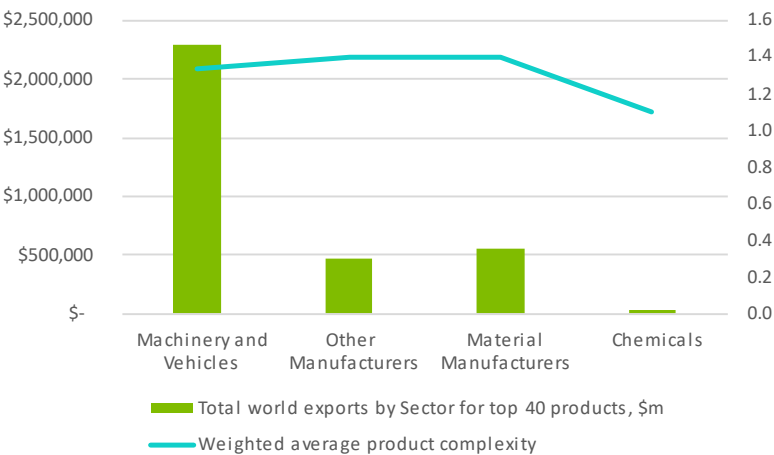FIGURE: HAUSMANN ANALYSIS RESULTS: PRODUCT OPPORTUNITIES FOR MELBOURNE

FIGURE: WORLD EXPORTS BY SECTOR FOR MELBOURNE'S TOP 40 PRODUCT OPPORTUNITIES, IN $MILLIONS, WITH WEIGHTED AVERAGE PRODUCT COMPLEXITY BY SECTOR FOR THE TOP 40 PRODUCTS



**Other Manufacturers (13%)**
Optical instruments, office & stationary supplies, photo & cinematography supplies, musical instruments and parts, measuring & analysing instruments

**Material Manufacturers (18%)**
Hand or machine tools, Transmission shafts and parts, Nails, screws, nuts, bolts and rivets, Rubber articles, Glass

**Chemicals (5%)**
Synthetic organic colouring, Other primary plastics,

**Machinery and Vehicles (65%)**
Metalworking machinery and parts, machine tools for removing and working metal, textile and leather machinery and parts, specialised machinery and parts, ball or roller bearings, taos, cocks and valves, non-electrical machinery, vehicle parts and accessories



Total world exports by Sector for top 40 products, $m

Weighted average product complexity

# Enabling growth through world leading education

Human capital and a skilled workforce is a significant contributor to growth. Human capital is the set of knowledge, skills and characteristics that make someone valuable to their workplace and the broader economy. Essential sources of human capital include innate ability, schooling, quality of education, training, work experience and sociological factors. While individuals can accumulate human capital through these factors, particularly by investing in education, other factors can lead to the depreciation of human capital, primarily ageing and technological development.

At a macro level, the stock of human capital is influenced by the level of education, the age distribution of the population, and the population's size (in turn, influenced by the rate of births, deaths and migration). Since the 1980s, education has been an essential driver of growth in Melbourne's human capital stock, while the ageing population has reduced the stock.

Skill levels have been rising across all of Greater Melbourne. The figure on the right shows growth rates of working-age people with different levels of qualification. The proportion of people with at least a bachelor's degree is growing faster than any other group, particularly in Melbourne's western, northern and southern regions. In contrast, the number of unqualified workers has shrunk in some subregions as older workers reach retirement age and other workers obtain higher qualifications.

Assuming these trends continue, they will further grow the human capital stock in Greater Melbourne. Notably, the more substantial growth rates in outer areas should improve the equality of the distribution of human capital.

However, skills development must be aligned with driver industries if growth is to be enabled.

FIGURE: GROWTH IN WORKING AGE POPULATION (20-64 YEARS) BY EDUCATIONAL ATTAINMENT AND GREATER MELBOURNE REGION (2006-2016)
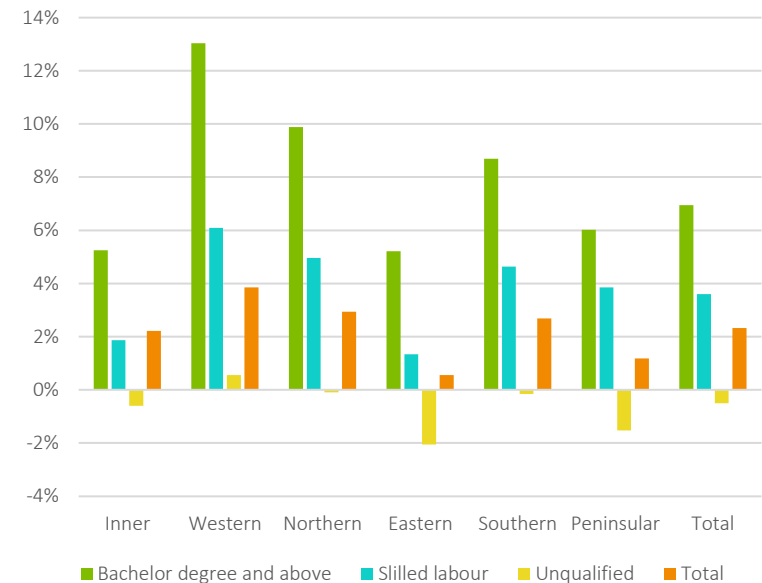


**CLASSIFYING EDUCATIONAL ATTAINMENT**

**Higher degree:** Postgraduate degree, such as a masters or PhD

**Bachelor's degree:** Bachelor's degree, graduate diploma or graduate certificate

**Skilled labour:** Advanced diploma or certificate level

**Unqualified:** Higher school education or below

# Enabling growth through world leading education

The changing demand for skills and the increased skill level required of businesses in the manufacturing sector point to a change in the traditional skill acquisition to job continuum.

Manufacturing skills were traditionally obtained in TAFE or on-the-job apprenticeships and were done at the beginning of a career. The increasing complexity and diversity of skills, though, indicate that skill acquisition is likely to come in the future from both changed TAFE courses and more traditional university-obtained skills (such as engineering, data science and business).

Additionally, it is likely that the change of pace in technological advancement and the need to produce more complex goods to be competitive in the manufacturing sector will necessitate a move towards lifelong learning.

The manufacturing supply chain accommodates businesses that play various roles along such value chains. Their role must be understood. One way to illustrate this is through the business management concept known as the 'Smiling Curve'. The Smiling Curve illustrates the relative value added by the various activities in the manufacturing value chain. It contends that relatively more value is added in the pre and post-production phases, like in research and design, than in the manufacturing process itself.

Applying this to the education and skill needs illustrates that as Melbourne's manufacturing sector becomes increasingly dependent on the R&D and design process, there is a blurring of the traditional value chain (which results in a commensurate blurring of skills acquisition (bottom figure). These changes mean that Melbourne's education system is not yet leading in its ability to produce graduates ready to drive forward Melbourne's manufacturing, and engineering and design, economic drivers.

FIGURE: THE SMILING CURVE CONCEPT)
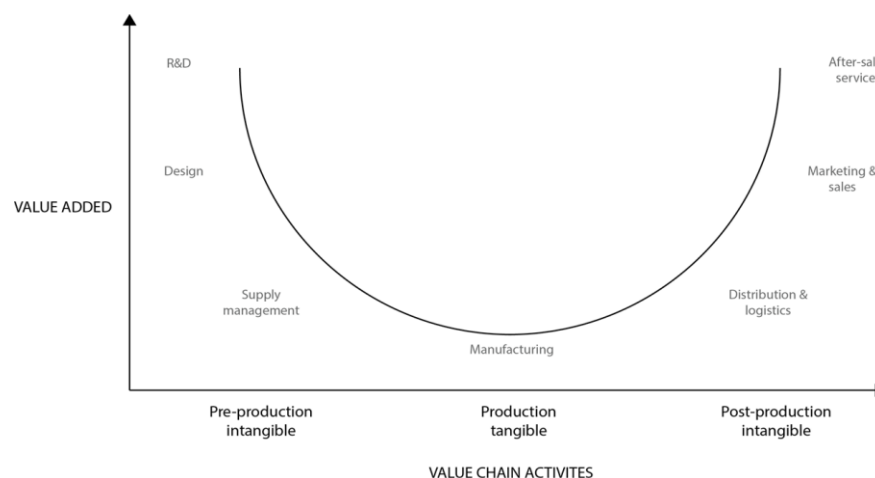


Source: CSIRO, 2016 (Adapted from Stan Shih's 'Smiling Curve')

FIGURE: SKILL ACQUISITION ALONG THE CURVE
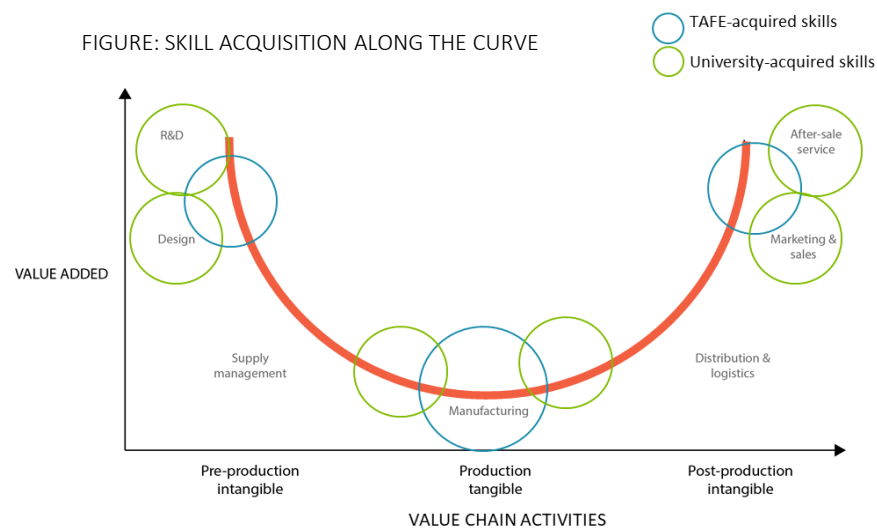
# Enabling growth through world leading education

Recent research work undertaken by SGS (working with TAFE NSW) has identified the future skill requirements of the manufacturing sector that need to be incorporated into Melbourne's Universities and TAFE system if the manufacturing driver industries are to be a success. These include:

- **Increase in multi-disciplinary competencies.** As the workforce develops skills across a range of fields, new Industry 4.0 technologies will lead to specialised labour, with manufacturers required to have knowledge and skills across these technologies. Specialist skill-sets will become increasingly sought after, with employees required to have the knowhow to design, manufacture and service automated systems.

- **Increase in digital and data literacy**. Manufacturers are becoming increasingly adaptive to sophisticated ICT systems and digital infrastructure, including installed fibre optics. Data science and digital skills are required beyond strong skills in computers, coding, mechatronics and data management, as employers look towards capabilities in smart data systems, communication and data interpretations (CSIRO Futures, 2016, p. 53). Digital literacy is particularly important as global value chains move workers to new roles in information management. This requires greater proficiency in new computerised models, simulation tools and analytics (PolicyLinks, 2017).

- **Increased demand in STEM skills**. STEM skills are underrepresented in business operations, notably in product design and development which has the potential to increase modelling and prototype capabilities. Raising the standard of baseline STEM skills would provide benefit for workers to acquire a broader interdisciplinary skillset, combining scientific expertise with software and data skills (CSIRO Futures, 2016).

- **Increased understanding of cybersecurity**. With the increased automation of processes and introduction of Internet of Things (IoT) technologies, cybersecurity threats are reported to be a growing risk for many businesses, especially in the manufacturing sector (AiGroup, 2019). All workers in the manufacturing supply chain need to be aware of the risk of cybersecurity.

- **Focus on high-margin customisation**. The increasing pressure for firms to create value through global value chains has created opportunities for firms to provide high-margin customisation, increasing the demand for specialised design skills. A highly specialised and high-value product would allow local firms to differentiate their products against international manufacturers with low-costs by targeting the niche industry. The skill-sets necessary to enable the production of this level will include design skills to prototype services for new products and components, superior componentry skills to improve or add characteristics, and skills to manufacture novel products from upgrades to existing products (CSIRO Futures, 2016, p. 26).

- **Increased focus on sustainable manufacturing.** The manufacturing industry faces increasing pressures to produce more sustainable products and to operate with greater efficiency in regard to energy and materials and circular models (as explored in the Sustainers). Jobs in the future will require greater knowledge of how to integrate efficient and sustainable processes and operating models. The knowledge that should be addressed involves supply chains and product lifecycle, including the production processes and end-of-life disposal. Workers will need experience in cleaner energy resources, leaner processing techniques, smarter design using innovative technologies and resource efficiency (CSIRO Futures, 2016, p. 26).

- **Increased demand in soft skills**. Importantly, the changing face of advanced manufacturing is requiring workers to develop advanced soft skills, including communication, empathy, teamwork and leadership. The trend sees more manufacturers forming a direct relationship with end-use customers through high-value customisation, which will continue to make customer engagement even more important. A hybrid ability must be developed that consists of a solid technical foundation, as well as a strong sense of business awareness in how to commercialise products (PolicyLinks, 2017, p. 15)

# Draft indicators for dashboard

A database of key indicators in a dashboard format has been developed to track performance over time.

Indicative indicators on the performance of Melbourne's manufacturing, design and engineering drivers include:

- Ongoing success in the up-skilling of Melbourne's manufacturing workforce for advanced methods, design and engineering will be reflected in the 2021 and 2026 ABS census results for share of workforce that is highly skilled. In 2016, 13.6 per cent of Melbourne's manufacturing workforce were highly skilled professionals in design, engineering and science, plus arts and media, marketing, and ICT. Success will see this proportion increasing.
- Many manufacturing firms also out-source design and engineering to other firms. To capture developments in this space, supply chain analysis from the Australian National Accounts Input-Output Tables can be utilized, or more in-depth surveys and analysis can be carried out. Manufacturing's strong linkages with design and engineering were clearly evident in 2017/18, and in future years a deepening of these linkages and output growth in both manufacturing and professional services would indicate progress.
- The Hausmann analysis can be used to track growth in exports of complex products. At present Melbourne performs will in select complex products like pharmaceutical products (excl medicaments) and aircraft, spacecraft & parts. The overall complexity of the economy can be improved through the increased manufacture of complex products for export, with a focus on easy opportunities first, which will be reflected in Melbourne's ongoing Hausmann score.
- The value of manufacturing exports can be readily followed to track the size of the driver industries. Tracking the value of manufactured imports in selected products that have been identified as import replacement opportunities in light of COVID-19 and renewed focus on re-shoring some manufacturing, is another method to understand the evolving strength of the sector.

In the education space, quantifiable indicators can include:
- The number of students qualifying with a STEAM qualification
- The number of young Melburnians working in manufacturing. If the number is increasing it can help prove that the sector has overcome its reputation as an 'old and dying' industry and the sector is capaitlising on young people's skills and technological ambitions.
- The performance of Australia's tertiary education sector is in jeopardy due to border closures and unsustainable funding models. The performance of Melbourne's universities on global ranking charts can be monitored to understand whether performance is slipping and where immediate action is required.

A qualitative research indicator would include a review of University and TAFE course offerings over time to understand how they are changing to align to the manufacturing driver industries and the opportunities on offer.

# Appendix A

**Figures and data**

# FIGURE 1: LQ MAP OF DRIVER INDUSTRIES

Analysis of economic specialisation can provide a guide to current and emerging opportunities for business growth as well as highlighting potential areas of under-provision in a regional economy. This helps to address those aspects of economic development.

## Comparative advantage

Location quotient (LQ) analysis is a valuable statistical tool for quantifying the comparative strengths of a regional economy. It can reveal what makes an area 'unique', due to their physical, technological and intellectual characteristics. Regions like Greater Melbourne have cost, productivity and other strategic advantages relative to other economies. Comparative strategic advantages result in high levels of employment in industries that benefit from these strengths. LQ analysis reveals these advantages.

When the LQ value is higher than one, it is an indication that the regional economy is relatively specialised and has a competitive advantage in that industry over other regions. Typically, a local economy is a net exporter if the location quotient is high (that is >1), and a net importer if the location quotient is low (that is <1).

Using LQ analysis, economic activity in Greater Melbourne was compared to Australia to identify comparative advantage. The analysis shown in this document is in two forms.

Firstly in a 'bubble map' form (figure) for driver industries. Driver industries have been built by SGS by collecting relevant 4-digit sub-industries to create industry definitions which mimic the driver industry. In figure 1, the LQ score is on the vertical axis; driver industries above 1 (the horizontal red line) are more concentrated in Greater Melbourne than Australia generally. Bubbles to the right of the chart (above 0%) have an increasing LQ score meaning that comparative advantage for those industries in Melbourne is increasing. The size of the bubble reflects the size of the employment connected to that driver industry group. The bubble chart reveals that Melbourne's driver industries, at a high level, have been well picked. They all, except defense and aerospace manufacturing, have an LQ above one, and have rapidly growing LQ scores.

The second LQ analysis (figure 2) shows the 4-digit industries allocated to each driver industry to identify industry strengths and weakness within each driver. For example, the driver of defense and aerospace manufacturing had a total LQ score of less than one, but the disaggregated scores reveal that that is due to the underperformance of shipbuilding which drags down the total score. The disaggregated score, in this case, reveals that other parts of the driver (namely aircraft manufacturing and repair services) are performing well.

The LQ analysis relies on data from the ABS Census 2016, and so the most recent changes to industry structure will not be captured. The next census is set to be held in 2021.

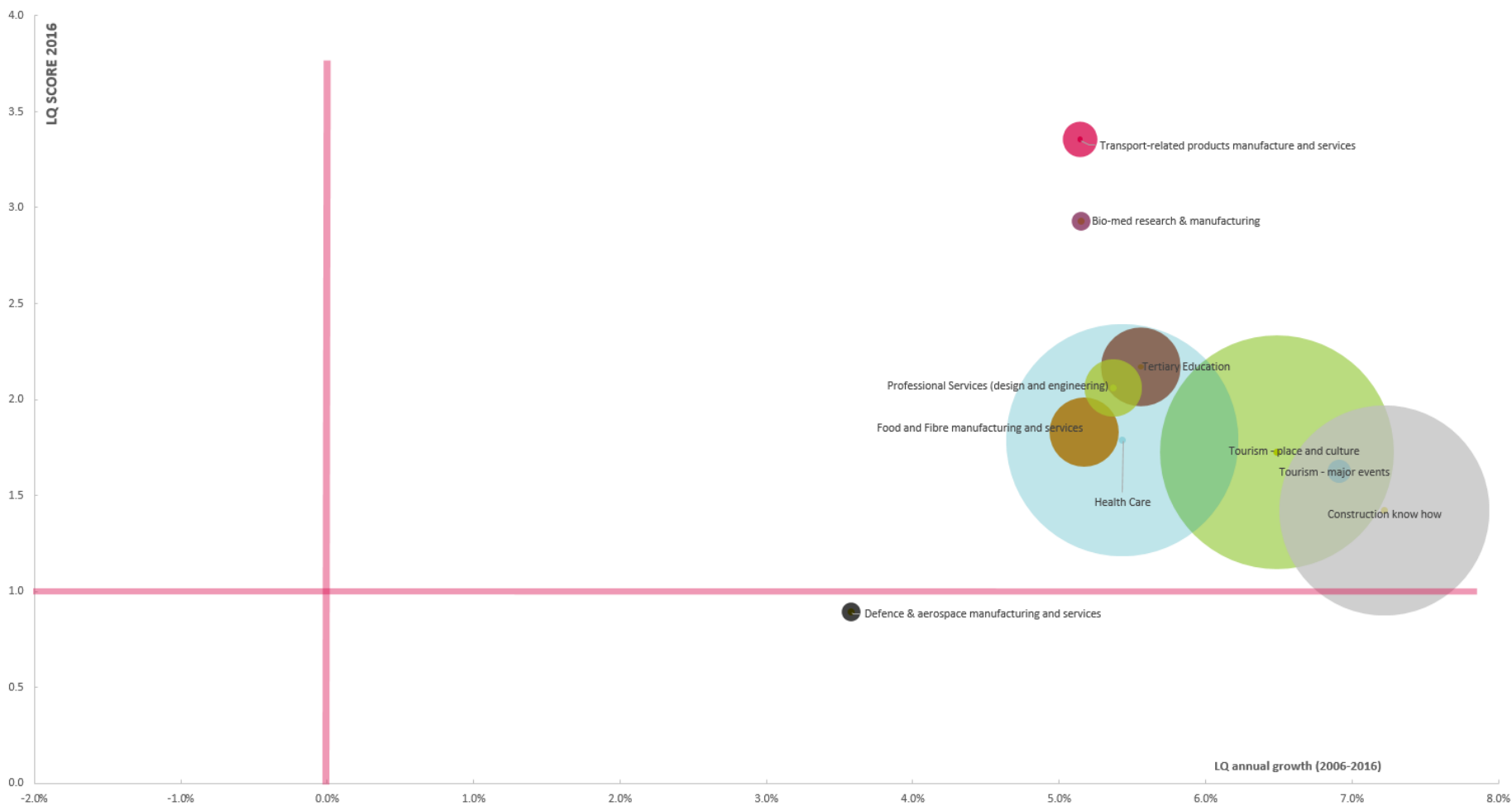# FIGURE 1 (CONTINUED): LQ MAP OF DRIVER INDUSTRIES

# FIGURE 2: LQ OF 4 DIGIT INDUSTRIES BY DRIVER – RANKED BY LQ SCORE

| Driver: Bio-med research & manufacturing | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Human Pharmaceutical and Medicinal Product Manufacturing | 5,581 | 3.76 | 5.4% |
| Other Professional and Scientific Equipment Manufacturing | 1,249 | 2.42 | 4.7% |
| Medical and Surgical Equipment Manufacturing | 1,378 | 1.70 | 4.8% |

| Driver: Defence & aerospace manufacturing & services | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Aircraft Manufacturing and Repair Services | 1,820 | 2.4 | 2.5% |
| Defence | 6,535 | 0.9 | 0.3% |
| Shipbuilding and Repair Services | 125 | 0.2 | -12.2% |

| Driver: Construction know how | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Prefabricated Wooden Building Manufacturing | 50 | 3.57 | 13% |
| Land Development and Subdivision | 838 | 1.36 | 1% |
| Non-Residential Building Construction | 12,461 | 1.22 | -2% |
| Plumbing Services | 12,061 | 1.22 | 1% |
| Wooden Structural Fitting and Component Manufacturing | 2,762 | 1.20 | -2% |
| Other Building Installation Services | 1,648 | 1.19 | 0% |
| Other Residential Building Construction | 9,041 | 1.16 | -1% |
| Air Conditioning and Heating Services | 2,782 | 1.15 | -1% |
| House Construction | 14,807 | 1.13 | 1% |
| Glazing Services | 1,806 | 1.08 | -2% |
| Fire and Security Alarm Installation Services | 1,339 | 1.07 | -2% |
| Carpentry Services | 8,759 | 1.03 | 0% |
| Concreting Services | 4,958 | 1.00 | 0% |
| Plastering and Ceiling Services | 3,068 | 0.97 | 3% |
| Electrical Services | 13,147 | 0.96 | -1% |
| Other Heavy and Civil Engineering Construction | 6,635 | 0.90 | -2% |
| Landscape Construction Services | 5,410 | 0.90 | 0% |
| Structural Steel Erection Services | 669 | 0.86 | 2% |
| Tiling and Carpeting Services | 3,005 | 0.86 | 2% |
| Bricklaying Services | 1,803 | 0.82 | 3% |
| Painting and Decorating Services | 4,997 | 0.81 | 0% |
| Prefabricated Metal Building Manufacturing | 154 | 0.78 | 1% |
| Road and Bridge Construction | 3,544 | 0.75 | -4% |
| Roofing Services | 1,382 | 0.70 | -2% |
| Mining and Construction Machinery Manufacturing | 559 | 0.69 | 2% |
| Site Preparation Services | 3,405 | 0.60 | 0% |
| Hire of Construction Machinery with Operator | 337 | 0.57 | -4% |

| Driver: Healthcare | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Chiropractic and Osteopathic Services | 2,037 | 2.2 | 5.3% |
| Psychiatric Hospitals | 1,510 | 2.0 | 11.3% |
| Optometry and Optical Dispensing | 3,171 | 1.9 | 6.4% |
| Other Allied Health Services | 13,932 | 1.9 | 4.0% |
| Physiotherapy Services | 3,978 | 1.9 | 6.3% |
| Specialist Medical Services | 7,805 | 1.9 | 5.3% |
| Dental Services | 9,299 | 1.8 | 5.6% |
| Hospitals (except Psychiatric Hospitals) | 78,715 | 1.8 | 5.2% |
| General Practice Medical Services | 17,876 | 1.7 | 5.0% |
| Pathology and Diagnostic Imaging Services | 7,180 | 1.6 | 4.5% |

| Driver: Professional Services (design and engineering) | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Architectural Services | 7,079 | 2.5 | 4.3% |
| Surveying and Mapping Services | 1,608 | 1.8 | 9.1% |
| Engineering Design and Engineering Consulting Services | 13,791 | 1.7 | 4.4% |
| Other Specialised Design Services | 960 | 1.7 | 8.2% |

| Driver: Tertiary Education | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Higher Education | 39,270 | 2.3 | 5.2% |
| Technical and Vocational Education and Training | 9,615 | 1.6 | 5.2% |

Key: ● High LQ score (>2) or strong LQ growth (>5% p.a.)  ● Low LQ score (<1) or shrinking LQ score (<0%)

93

# FIGURE 2 (CONTINUED): LQ OF 4 DIGIT INDUSTRIES BY DRIVER – RANKED BY LQ SCORE

| Driver: Food and Fibre manufacturing and services | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Knitted Product Manufacturing | 166 | 5.5 | 3.6% |
| Cigarette and Tobacco Product Manufacturing | 324 | 3.5 | 5.5% |
| Textile Finishing and Other Textile Product Manufacturing | 405 | 3.5 | 8.1% |
| Textile Floor Covering Manufacturing | 587 | 3.5 | 4.9% |
| Confectionery Manufacturing | 2,126 | 3.5 | 4.2% |
| Cut and Sewn Textile Product Manufacturing | 1,414 | 3.0 | 6.6% |
| Ice Cream Manufacturing | 413 | 2.8 | 2.0% |
| Clothing Manufacturing | 2,747 | 2.7 | 4.6% |
| Beer Manufacturing | 1,238 | 2.7 | 4.2% |
| Oil and Fat Manufacturing | 248 | 2.6 | 4.5% |
| Cheese and Other Dairy Product Manufacturing | 2,533 | 2.5 | 5.9% |
| Rope, Cordage and Twine Manufacturing | 43 | 2.5 | 6.4% |
| Synthetic Textile Manufacturing | 141 | 2.3 | 2.1% |
| Bakery Product Manufacturing (Non-factory based) | 4,320 | 2.3 | 6.6% |
| Cake and Pastry Manufacturing (Factory based) | 1,402 | 2.2 | 7.5% |
| Leather Tanning, Fur Dressing, Leather Product Manu. | 281 | 2.2 | 5.7% |
| Natural Textile Manufacturing | 82 | 2.1 | 7.7% |
| Other Food Product Manufacturing nec | 2,444 | 2.1 | 3.9% |
| Milk and Cream Processing | 762 | 1.9 | 8.9% |
| Footwear Manufacturing | 265 | 1.9 | 4.5% |
| Fruit and Vegetable Processing | 1,591 | 1.8 | 9.2% |
| Soft Drink, Cordial and Syrup Manufacturing | 1,356 | 1.8 | 4.3% |
| Bread Manufacturing (Factory based) | 4,424 | 1.8 | 6.6% |
| Cereal, Pasta and Baking Mix Manufacturing | 617 | 1.4 | 6.3% |
| Potato, Corn and Other Crisp Manufacturing | 196 | 1.4 | 6.7% |
| Cured Meat and Smallgoods Manufacturing | 734 | 1.3 | 5.0% |
| Biscuit Manufacturing (Factory based) | 405 | 1.3 | 5.1% |
| Spirit Manufacturing | 31 | 1.2 | 14.1% |
| Poultry Processing | 1,633 | 1.1 | 3.7% |
| Prepared Animal and Bird Feed Manufacturing | 473 | 1.1 | 7.2% |
| Wine and Other Alcoholic Beverage Manufacturing | 1,707 | 1.1 | 7.8% |
| Meat Processing | 2,850 | 0.9 | 7.5% |
| Grain Mill Product Manufacturing | 233 | 0.9 | 3.6% |
| Seafood Processing | 104 | 0.6 | 6.6% |
| Wool Scouring | 7 | 0.6 | 1.7% |
| Sugar Manufacturing | 172 | 0.4 | 2.8% |

| Driver: Tourism - major events | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Horse and Dog Racing Administration and Track Operation | 839 | 3.3 | 9.9% |
| Sports and Physical Recreation Administrative Service | 2,061 | 3.0 | 6.9% |
| Sports and Physical Recreation Clubs and Sports Professionals | 3,991 | 2.4 | 7.5% |
| Recreation Venues, Grounds and Facilities Operation | 4,565 | 2.2 | 7.2% |
| Catering Services | 7,861 | 2.1 | 4.2% |
| Other Horse and Dog Racing Activities | 1,281 | 1.7 | 3.6% |
| Accommodation | 13,594 | 1.1 | 6.6% |

| Driver: Tourism - place and culture | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Book Publishing | 1,704 | 3.7 | 4.7% |
| Music Publishing | 72 | 3.1 | 7.2% |
| Performing Arts Operation | 1,557 | 2.4 | 5.1% |
| Zoological and Botanical Gardens Operation | 865 | 2.2 | 5.6% |
| Museum Operation | 2,014 | 2.1 | 5.7% |
| Creative Artists, Musicians, Writers and Performers | 4,664 | 2.1 | 6.4% |
| Cafes and Restaurants | 56,309 | 2.1 | 6.6% |
| Performing Arts Venue Operation | 987 | 1.9 | 5.1% |
| Arts Education | 3,745 | 1.8 | 5.4% |
| Travel Agency and Tour Arrangement Services | 6,607 | 1.8 | 5.8% |
| Takeaway Food Services | 35,546 | 1.7 | 5.7% |
| Pubs, Taverns and Bars | 12,396 | 1.5 | 5.9% |
| Amusement Parks and Centres Operation | 1,002 | 1.4 | 9.9% |
| Nature Reserves and Conservation Parks Operation | 1,110 | 1.1 | 4.3% |
| Accommodation | 13,594 | 1.1 | 6.6% |
| Clubs (Hospitality) | 4,344 | 0.9 | 4.9% |

Key: ● High LQ score (>2) or strong LQ growth (>5% p.a.)    ● Low LQ score (<1) or shrinking LQ score (<0% p.a)

## FIGURE 2 (CONTINUED): LQ OF 4 DIGIT INDUSTRIES BY DRIVER – RANKED BY LQ SCORE

| Driver: Transport-related products manufacture and services | Employment 2016 | LQ 2016 | LQ growth |
|---|---|---|---|
| Motor Vehicle Manufacturing | 7,491 | 5.3 | 6.6% |
| Automotive Electrical Component Manufacturing | 499 | 4.9 | 2.3% |
| Motor Vehicle Body and Trailer Manufacturing | 4,447 | 4.0 | 8.6% |
| Other Motor Vehicle Parts Manufacturing | 3,900 | 3.9 | 3.6% |
| Other Transport Equipment Manufacturing nec | 305 | 3.2 | 4.7% |
| Railway Rolling Stock Manufacturing and Repair Services | 720 | 2.1 | 10.4% |
| Boatbuilding and Repair Services | 459 | 0.8 | 7.0% |
| Shipbuilding and Repair Services | 125 | 0.2 | -9.0% |

Key: ● High LQ score (>2) or strong LQ growth (>5% p.a.)   ● Low LQ score (<1) or shrinking LQ score (<0%)

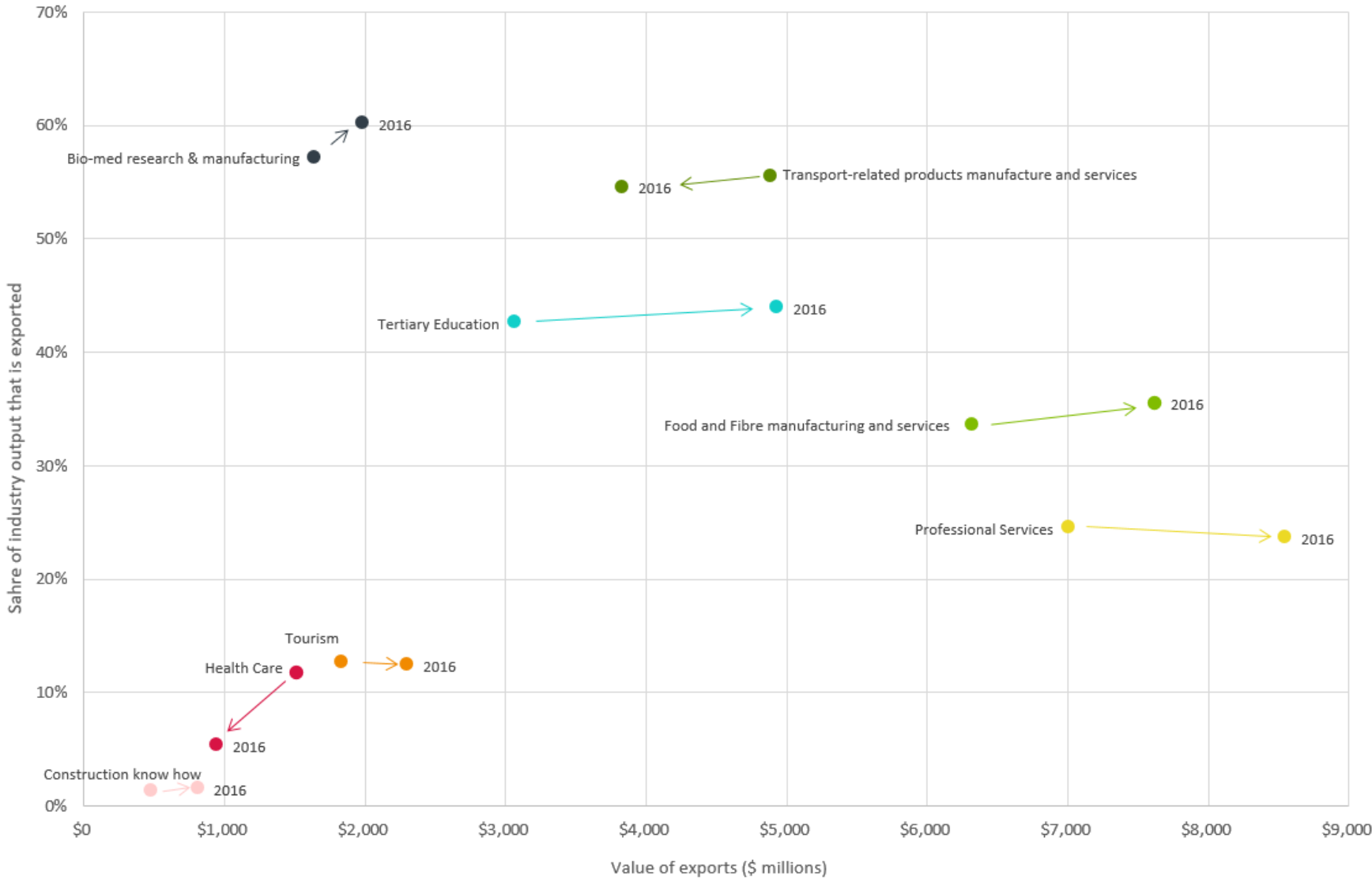# FIGURE 3: EXPORTS BY DRIVER INDUSTRIES – CHANGE 2006 TO 2016

# FIGURE 4: 4-DIGIT INDUSTRY EXPORTS – TOP 20 FASTEST GROWING (2009/10 TO 2015/16)



Value of exports ($ millions)

Legend: Exports 2009/10, Exports 2015/16

Categories (top to bottom):
- Finance
- Insurance and Superannuation Funds
- Auxiliary Finance and Insurance Services
- Telecommunication Services
- Wholesale Trade
- Technical, Vocational and Tertiary Education Services (incl undergraduate and…
- Professional, Scientific and Technical Services
- Computer Systems Design and Related Services
- Retail Trade
- Transport Support services and storage
- Petroleum and Coal Product Manufacturing
- Basic Non-Ferrous Metal Manufacturing
- Food and Beverage Services
- Electricity Transmission, Distribution, On Selling and Electricity Market Operation
- Iron Ore Mining
- Meat and Meat product Manufacturing
- Polymer Product Manufacturing
- Rail Transport
- Human Pharmaceutical and Medicinal Product Manufacturing
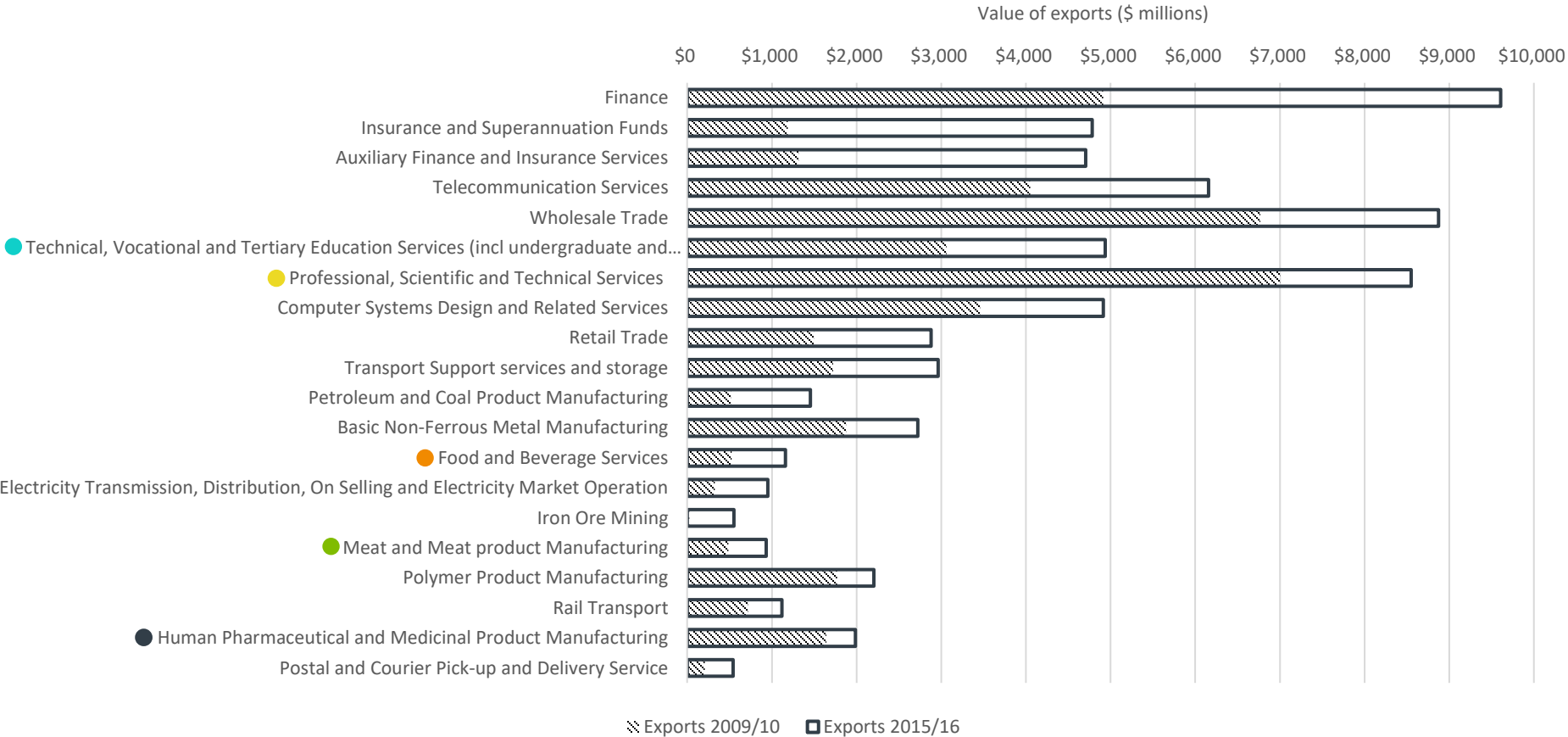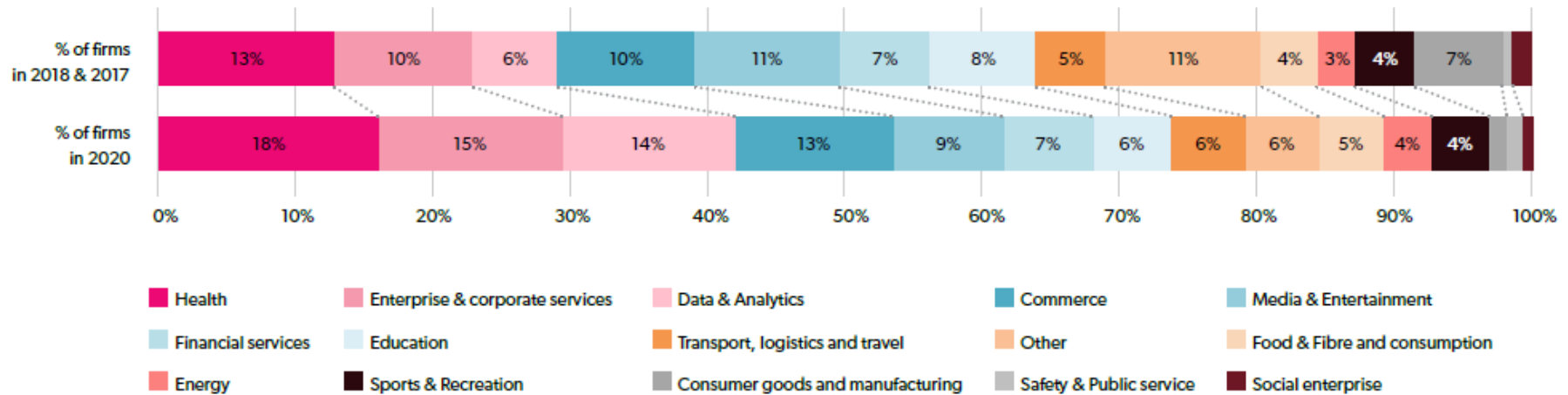- Postal and Courier Pick-up and Delivery Service

## FIGURE 5: WORLD INDEX OF HEALTHCARE INNOVATION (2020 RANKINGS)

| Overall Rank | Country | Overall Tier | Overall Score | Quality | Choice | Science & Technology | Fiscal Sustainability |
|---|---|---|---|---|---|---|---|
| 1 | Switzerland | Excellent | 59.56 | 73.35 | 46.53 | 47.28 | 71.06 |
| 2 | Germany | Excellent | 59.28 | 60.99 | 47.95 | 46.90 | 81.28 |
| 3 | Netherlands | Excellent | 59.14 | 65.70 | 50.42 | 49.97 | 70.46 |
| 4 | United States | Excellent | 54.96 | 59.71 | 57.65 | 75.14 | 27.33 |
| 5 | Ireland | Excellent | 54.48 | 67.07 | 41.77 | 40.71 | 68.39 |
| 6 | Israel | Good | 51.14 | 63.89 | 43.20 | 38.79 | 58.69 |
| 7 | Singapore | Good | 50.37 | 55.77 | 46.84 | 47.98 | 50.89 |
| 8 | Czech Republic | Good | 49.80 | 52.22 | 40.80 | 27.39 | 78.78 |
| 9 | Belgium | Good | 49.65 | 56.55 | 39.23 | 44.89 | 57.95 |
| 10 | Taiwan | Good | 49.19 | 57.15 | 46.42 | 25.28 | 67.90 |
| 11 | Australia | Good | 48.38 | 69.51 | 45.38 | 26.67 | 51.97 |
| 12 | Norway | Good | 48.26 | 64.16 | 32.06 | 43.74 | 53.11 |
| 13 | United Kingdom | Good | 47.78 | 58.76 | 42.01 | 49.39 | 40.97 |
| 14 | Denmark | Good | 47.59 | 57.53 | 34.15 | 52.63 | 46.03 |
| 15 | Sweden | Good | 47.40 | 61.73 | 38.18 | 49.72 | 39.98 |
| 16 | Hong Kong | Good | 47.35 | 48.36 | 37.13 | 28.29 | 75.61 |
| 17 | Canada | Good | 47.05 | 61.55 | 38.72 | 34.43 | 53.48 |
| 18 | Austria | Good | 46.59 | 58.57 | 43.36 | 40.90 | 43.52 |
| 19 | South Korea | Good | 46.47 | 61.39 | 44.92 | 18.83 | 60.75 |
| 20 | New Zealand | Good | 45.97 | 64.66 | 35.69 | 30.32 | 53.22 |
| 21 | Portugal | Moderate | 44.82 | 69.22 | 40.18 | 27.01 | 42.87 |
| 22 | United Arab Emirates | Moderate | 44.68 | 50.62 | 32.71 | 22.77 | 72.61 |
| 23 | Finland | Moderate | 43.65 | 52.60 | 27.20 | 46.78 | 48.04 |
| 24 | Spain | Moderate | 43.31 | 49.06 | 38.58 | 35.10 | 50.50 |
| 25 | Hungary | Moderate | 41.47 | 43.61 | 32.97 | 31.15 | 58.16 |
| 26 | Slovakia | Moderate | 41.36 | 43.70 | 34.47 | 27.46 | 59.80 |
| 27 | Greece | Moderate | 40.12 | 44.13 | 42.88 | 32.60 | 40.86 |
| 28 | France | Moderate | 40.08 | 55.98 | 35.13 | 39.17 | 30.03 |
| 29 | Italy | Poor | 37.29 | 50.57 | 30.42 | 30.39 | 37.81 |
| 30 | Poland | Poor | 34.44 | 29.28 | 35.72 | 10.21 | 62.55 |
| 31 | Japan | Poor | 31.51 | 63.16 | 39.58 | 23.31 | 0.00 |

Source: FREOPP World Index of Healthcare Innovation

## FIGURE 6: SECTORIAL MIX OF START-UP BUSINESSES IN VICTORIA



**% of firms in 2018 & 2017:** Health 13%, Enterprise & corporate services 10%, Data & Analytics 6%, Commerce 10%, Media & Entertainment 11%, Financial services 7%, Education 8%, Transport, logistics and travel 5%, Other 11%, Food & Fibre and consumption 4%, Energy 3%, Sports & Recreation 4%, Consumer goods and manufacturing 7%

**% of firms in 2020:** Health 18%, Enterprise & corporate services 15%, Data & Analytics 14%, Commerce 13%, Media & Entertainment 9%, Financial services 7%, Education 6%, Transport, logistics and travel 6%, Other 6%, Food & Fibre and consumption 5%, Energy 4%, Sports & Recreation 4%

Legend: Health, Enterprise & corporate services, Data & Analytics, Commerce, Media & Entertainment, Financial services, Education, Transport, logistics and travel, Other, Food & Fibre and consumption, Energy, Sports & Recreation, Consumer goods and manufacturing, Safety & Public service, Social enterprise

NB: Categories add to over 100% as firms could choose more than one sector.

n = 1729

Figure source: LaunchVic (2020) Victorian Startup Ecosystem Mapping Report 2020

# FIGURE 7: THE WORLD UNIVERSITY RANKINGS OF MELBOURNE'S UNIVERSITY

The 2020 Times Higher Education (THE) World University Rankings placed eight Victorian universities in the top 400, and two universities (University of Melbourne and Monash University) in the top 75
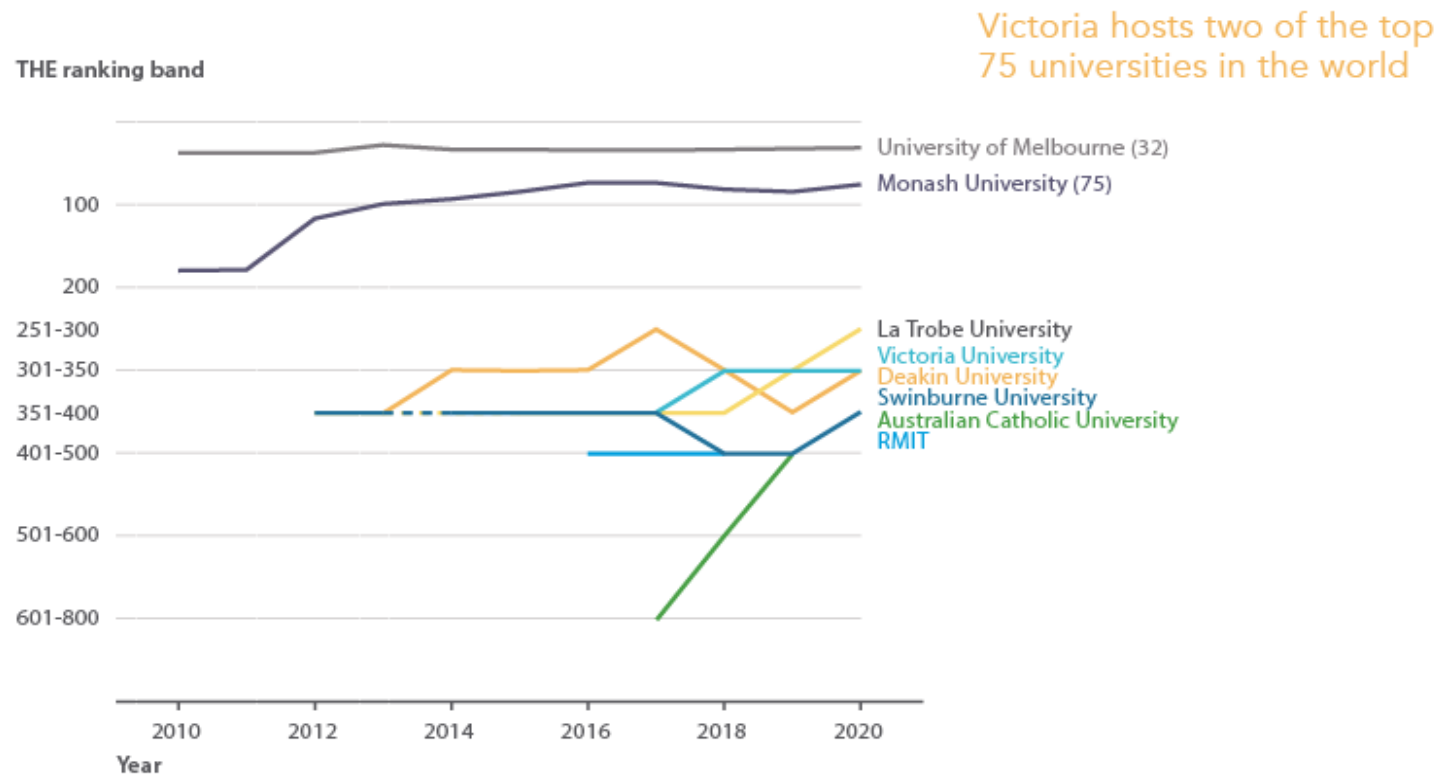


Figure source: Australian Council of Learned Academies (2020) Stimulating the Science and Research Ecosystem Creates Jobs and Investment. acola.org

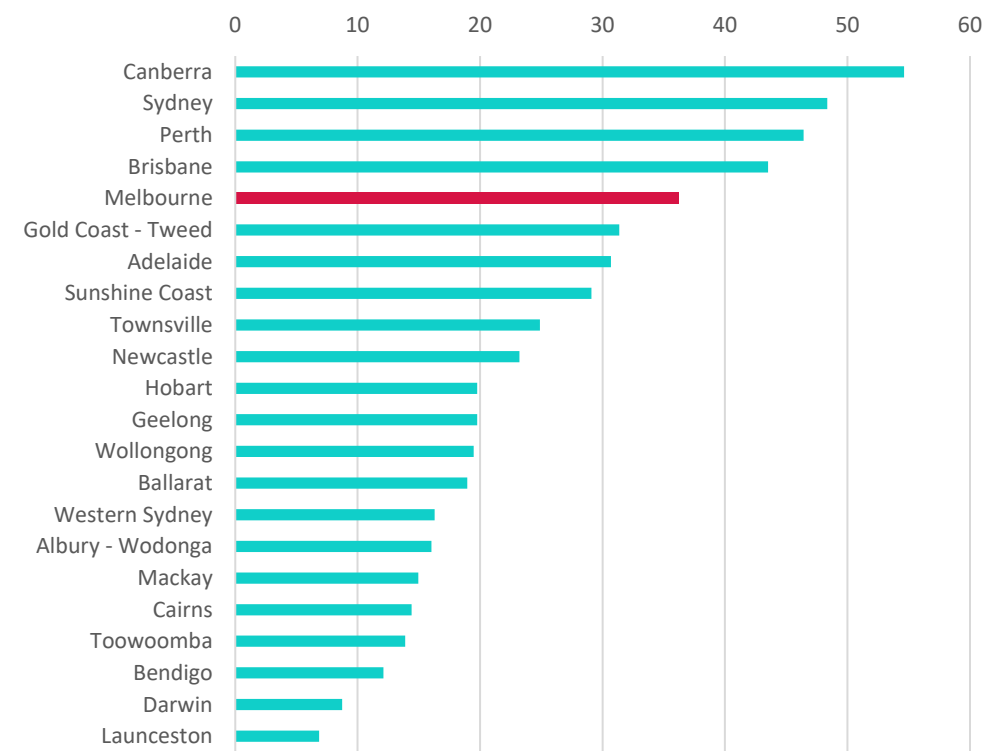## FIGURE 8: NUMBER OF PATENT APPLICATIONS PER 100,000 PERSONS IN THE CITY (2019)



Figure source: SGS (2020) National Cities Performance Framework
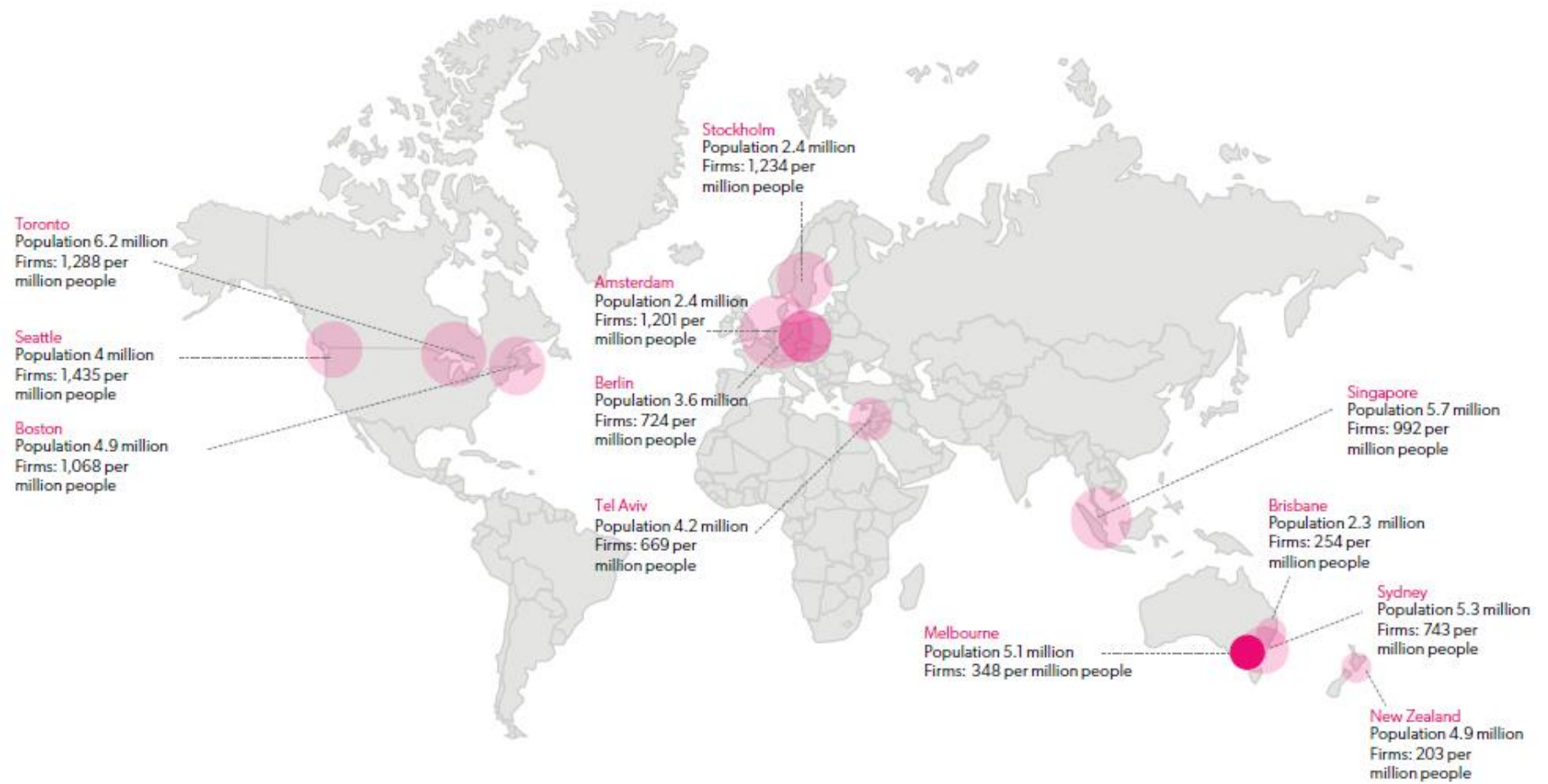
# FIGURE 9: START-UP FIRMS PER MILLION PEOPLE



**Stockholm**
Population 2.4 million
Firms: 1,234 per
million people

**Toronto**
Population 6.2 million
Firms: 1,288 per
million people

**Amsterdam**
Population 2.4 million
Firms: 1,201 per
million people

**Seattle**
Population 4 million
Firms: 1,435 per
million people

**Berlin**
Population 3.6 million
Firms: 724 per
million people

**Boston**
Population 4.9 million
Firms: 1,068 per
million people

**Singapore**
Population 5.7 million
Firms: 992 per
million people

**Tel Aviv**
Population 4.2 million
Firms: 669 per
million people

**Brisbane**
Population 2.3 million
Firms: 254 per
million people

**Sydney**
Population 5.3 million
Firms: 743 per
million people

**Melbourne**
Population 5.1 million
Firms: 348 per million people

**New Zealand**
Population 4.9 million
Firms: 203 per
million people

Figure source: LaunchVic (2020) Victorian Startup Ecosystem Mapping Report 2020

# FIGURE 10: JLL CLASSIFICATION OF CITIES
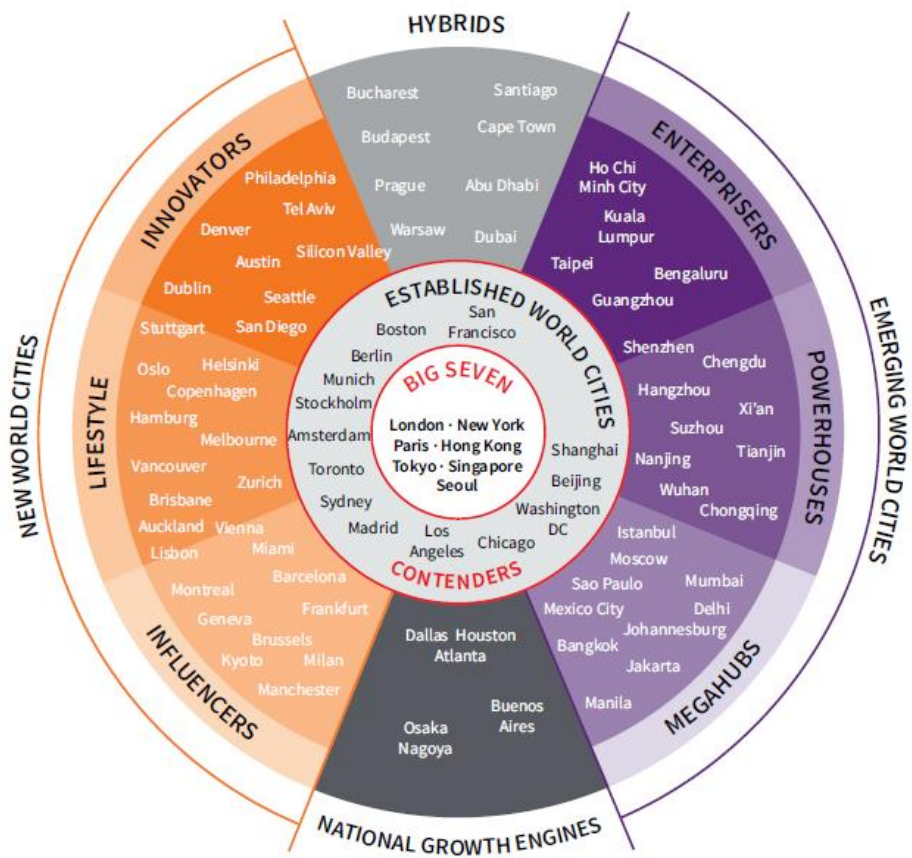


Figure source: Source: JLL and The Business of Cities, 2019

# Appendix B

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