

M

E

MELBOURNE 4.0 REPORT

C

4.0

B

N

R

THE NEXT INDUSTRIAL REVOLUTION



1ST INDUSTRIAL REVOLUTION

1780s

Steam, water,
mechanical production



2ND INDUSTRIAL REVOLUTION

1870s

Electricity,
division of labour,
mass production



3RD INDUSTRIAL REVOLUTION

1960s

Electronics, IT,
automated production



4TH INDUSTRIAL REVOLUTION

Today

Cyber-physical systems

"We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before...It is disrupting almost every industry in every country...And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society."

— **Professor Klaus Schwab, Founder & Executive Chairman, World Economic Forum**

FROM THE CHAIR AND CEO



Melbourne is one of the best places in the world to live, work and do business.

One of the reasons we're in this enviable position is that a group of passionate Melburnians created the Committee for Melbourne 30 years ago with one purpose: to shape a better future for our city.

Today, our appeal as a leading international city is being challenged – this time by the profound changes known as the Fourth Industrial Revolution. The Revolution marks the next period in humanity's progress, which will be characterised by a fusion of our physical, digital and biological worlds.

People, organisations and sectors will need to adapt to survive, and governments will need to move quickly to productively regulate the technologies behind these changes.

This next period in our evolution will bring enormous opportunity – but it will also disrupt employment markets, our economy, and society at large. The unprecedented

changes will be compounded by fragility in geopolitics, in our natural environment, and in the global business landscape.

Against this background of change which will shape our economy, the Committee established the Melbourne 4.0 Taskforce. Harnessing the knowledge and insight of our diverse membership base, the Taskforce has formed a credible policy agenda for our city to prepare for the challenges and opportunities facing our future economy and society.

We'd like to thank everyone involved in the Taskforce. Your knowledge and expertise has been invaluable in forming the policy options that will underpin the Committee's agenda for years to come.

Learning how Melbourne can benefit from the Fourth Industrial Revolution, while addressing its challenges, is the greatest strategic question facing our city. We need to be bold, ambitious and clear in our vision for Melbourne if we're to make the most of our advantages.

We're fortunate to draw on your collective wisdom to shape civic discussion and advocate for policy outcomes to make sure that no Melburnian is left behind.

We look forward to continuing to work with you as Melbourne navigates these uncharted waters to retain our mantle as a city of international significance.

Scott Tanner
Chair

Martine Letts
CEO

INTENTS

- ① The starting point
- ② What is scenario planning?
- ③ The Taskforce process
- ④ The scenarios
- ⑤ Melbourne's Strategic Needs
- ⑥ Our time starts now
- ⑦ Detailed scenarios
- ⑧ Acknowledgements
- ⑨ Bibliography



ABOUT THE COMMITTEE FOR MELBOURNE

The Committee for Melbourne is an apolitical, not-for-profit, member-based organisation that brings together over 120 organisations from Greater Melbourne's business, academic and community sectors, which share a common vision to make Melbourne a better place to live, work and do business.

As an independent organisation, we represent no single interest group or political position, but seek to challenge conventional thinking and to develop innovative ideas to continue to enhance our position as an economically prosperous and highly liveable global city.

The Committee for Melbourne encourages its member organisations and their representatives to become involved with the Committee's activities to shape a better future for Melbourne.

To ensure Melbourne can continue to thrive and remain a city of international significance as we experience the challenges and opportunities of the Fourth Industrial Revolution, you can get involved in a range of our Melbourne 4.0 workshops and forums.

For more information contact us via cfm@melbourne.org.au or (03) 9650 8800.

To keep up-to-date with our activities, membership and our city, make sure you sign up to our fortnightly eNewsletter, the Committee Communiqué, via melbourne.org.au/enewsletter/enewsletter-sign-up



This Committee for Melbourne publication is copyright © Reproduction, in whole or in part, is not permitted without permission of the Committee for Melbourne. The information contained within the report is, to the best of the Committee for Melbourne's knowledge, up to date, true and accurate, and all conclusions made have been based on the information contained within this report.

① THE STARTING POINT

"We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction."— **Bill Gates, Co-founder, Microsoft**

Thirty years ago, it was clear that Melbourne was losing its stature as the economic capital of Australia. Often referred to as a rust belt, Melbourne and Victoria were in decline with the private and public sectors fragmented, and becoming insular. Melburnians were emigrating in their thousands.

On this burning platform, the Committee for Melbourne was established to help Melbourne regain its footing and become a prosperous and globally relevant city. Today, Melbourne is in very different shape from 30 years ago. Having been voted 'The World's Most Liveable City' six years in a row, we could be forgiven for thinking that we are doing all right.

However, people and organisations are now starting to realise that perhaps the greatest challenge we face is complacency. A few observations confirm our slipping standards, particularly in the context of a future that potentially sees profound (digital) disruption and a shifting geopolitical landscape.

57[#]

Australia's position in global internet speed rankings.

6[#]

Melbourne's ranking among the most expensive housing markets on the globe.

5,000

Annual unmet demand for Australian computer science graduates.

28[#]

Australia's position in Year 4 mathematics ranking out of 49 countries (fall of 10 places since 2012).

53[#]

Australia's position in global high-tech export rankings.

90[#]

Australia's position in global ICT services export rankings.

50 %

Drop in the number of Australian students studying IT courses over the last decade.

66 %

AND

\$9 BILLION

Expected annual economic costs, by 2031, arising from delays on Melbourne's major roads (triple current levels) unless there is appropriate investment to reduce traffic congestion.

6 MILLION

Anticipated population of Melbourne by 2030. Meeting energy, water, waste, transport, food, and many other needs will require whole-of-government collaboration.

86 %

Respectively, the global economic output and patented innovation that is produced by the world's top 40 megaregions. Melbourne does not form part of any megaregion.

LAST

In the OECD rankings for research-based business collaboration.

② WHAT IS SCENARIO PLANNING?

“He who predicts the future lies,
even if he tells the truth.”— ***Arab proverb***

September 11, Amazon.com, WikiLeaks, the Global Financial Crisis, the iPhone, the Arab Spring, the Fukushima nuclear disaster, Facebook, Brexit, President Trump... These are just some of the hard-to-predict momentous events and developments that have taken place since the turn of the millennium seventeen years ago.

The world today looks very different from how you might have imagined it only a few years ago. For example, more than half of the companies that were in the Fortune 500 in the year 2000 have since disappeared due to digital disruption. In such a rapidly changing environment, all of us – including the city we live in – are required to progress and develop in concert with the surrounding environment. By having a structured conversation about this through the use of scenario planning, patterns emerge which help us to develop new and credible insights.

First developed by the US Air Force after World War II as a method for military planning, Royal Dutch Shell adopted scenario planning to successfully navigate the 1973 oil crisis, allowing its spectacular rise from being one of the weaker ‘Seven Sisters’ (the seven largest global oil companies) to becoming one of its strongest.

Scenarios are not attempts to predict the future. Nor do they try to articulate visions or desirable futures. Scenario planning is

a method that uses as a starting point, the uncertainty in the external environment that a business or city has little to no influence over, but which determines the circumstances in which it will have to operate and the challenges it will face.

Scenarios do not describe just one future, but rather a range of plausible futures that illuminate all the corners of the ‘playing field’ in which our city will need to operate and compete. A good set of scenarios will force us to critically assess our conscious and unconscious biases and help prevent us from being blindsided.

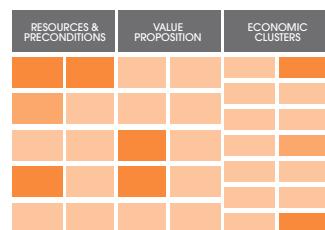
Despite not being predictions of the future, scenarios are particularly useful for having an informed dialogue about it. They provide structure in uncertainty, help us understand how different planning assumptions may play out over time, and thereby support decision makers in formulating robust long-term strategies and policies.

③ THE TASKFORCE PROCESS

The Melbourne 4.0 Taskforce process had scenario planning at its core. The Taskforce worked through six steps by way of workshops and online surveys, as well as individual interviews. The result is a co-created roadmap to help future-proof Melbourne in the face of significant change and uncertainty.

Step 1

Uncover city's value proposition



Every city can be viewed from the perspective of a Business Model Analysis (BMA). The model uncovers the unique way in which a city creates value for its businesses and citizens.

Using a 'heat map', at the heart of the analysis is the city's value proposition. In essence, the model tries to answer the question:

"Why do individuals or organisations choose Melbourne over other cities?"

Taking this perspective when looking at Melbourne allows critical thinking about how our city makes use of its resources, how its value proposition can be strengthened, and how it can stimulate economic growth and prosperity.

The identified elements and economic clusters of the 'heat map' were rated by the Taskforce members in terms of their contribution to the city's competitive advantage, as well as their sensitivity to changes in the external environment.

The BMA provided a high-level overview of Greater Melbourne's value proposition and focus for the Taskforce, as well as input for Step 2 of the process "Determine Scope".

BUSINESS MODEL ANALYSIS – GREATER MELBOURNE

RESOURCES & PRECONDITIONS		VALUE PROPOSITION		ECONOMIC CLUSTERS	
Education & Research	Capital	Connectivity	Human Capital	Education & Training	Healthcare
Amenities	Housing	Culture	Economic State	Bio & Medical Research	Building & Construction
Infrastructure	National Business Climate	Liveability	Knowledge Infrastructure	Transport, Infra. & Logistics	Financial Services
Labour Market	Business Location	Business Climate	Services Sector	Corporate Services	Manufacturing
Quality of Life	Governance	Brand Name	Sustainability	Events, Hospitality & Sports	Tourism

- █ Very sensitive to change
- █ Sensitive to change
- █ Little sensitivity to change

- Current contribution to competitive advantage of Greater Melbourne**
- Very high
 - High
 - Average
 - Low
 - Very low

Step 2
Determine scope

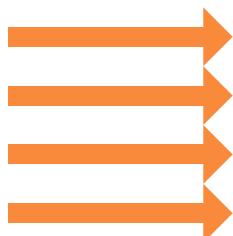


A clearly defined scope is essential for a valuable scenario planning exercise. Combined with the Business Model Analysis, the boundaries of the scope (i.e. time horizon, geographical location, stakeholders, etc.) guide the formulation of the focal question; i.e. which question are we trying to answer?

Given that the Fourth Industrial Revolution will profoundly change the way we live, work and do business – and in recognising that a city's liveability is fundamentally underpinned by its economic capacity – the focal question for the Melbourne 4.0 Taskforce was defined as:

“In 2030, how will our economy support a liveable and flourishing Greater Melbourne that has the ability to take advantage of significant change and disruption?”

Step 3
Explore the external environment



Next, trends and uncertainties in the external environment were identified. Often, the trends manifest themselves in megatrends – which are the large and structural changes that are outside our control, and which structurally shift the environment we find ourselves in.

Using the PESTED¹ dimensions, the Melbourne 4.0 Taskforce identified many important trends. These were subsequently reduced to a set of eighteen trend clusters that will fundamentally impact Melbourne's future economic environment.

¹PESTED: Political, Economic, Social, Technological, Ecological and Demographic

MELBOURNE 4.0 – TREND CLUSTERS



1. Rising Powers and Geopolitical Shifts

The rise of Asia will be a central feature of the 21st century. The unipolar system that characterised the post-Cold War international order appears set to be replaced by a multipolar system.



2. Cyber Security and Vulnerability

Technological advances and access to technology are intensifying the threat of cyber-crime, revolutionising warfare and posing new challenges to security.



3. The New Political Divide

The left versus right political divide is receding, with open versus closed societies representing the emerging political fault line.



4. Increasing Transnational Instability

Disruptive shifts in technology and geopolitics, as well as shifts in societal expectations, economic inequality, climate change and the (perceived) rising risk of a global pandemic are creating a new fragility in the world that is directly impacting how governments and businesses operate.



5. Near Shoring and Reshoring

Shorter product cycles, supply chain risks, and new manufacturing technologies are encouraging companies to increasingly move production facilities (back) closer to their major markets.



6. The Creative Class and Knowledge-Based Economy

A more automated economy will require different human skills and lead to a higher demand for highly skilled workers for which the competition is global and intense.



7. From a 'Push' to 'Pull' Driven System

The practice of 'pushing' standardised products to mass markets is being replaced by 'pulling' practices, where companies co-create and assemble products in customised ways to serve local and/or specialised needs.



8. Winner-Take-All Economy

In some key industries, a new 'winner-take-all' dynamic is emerging, with a wide gap between the most profitable firms and the rest.



9. From Ownership to Access

Traditional ownership models are becoming less relevant, with the new 'sharing economy' becoming increasingly important.



10. New Social Relationships and Increased Access to Information

Traditional forms of social engagement are declining as people increasingly move aspects of their life online, forming new social relationships.



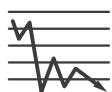
11. Big Data and the Internet of Things

Big data and the Internet of Things are becoming a key basis for competition and are creating game-changing opportunities; production efficiency, distribution, and innovation all stand to benefit immensely.



12. More Disruptive Technologies and Innovative Advancements

The speed and scope of disruptive technologies and innovative advances are heralding the Fourth Industrial Revolution, which is set to fundamentally alter the way we live and work.



13. Self-Sufficiency and Preparedness

An increasing number of people are more aware of and anxious about global developments, precipitating a rise in self-sufficient lifestyles.



14. More Emphasis on Environmental Sustainability

Concerns about climate change, resource scarcity, as well as a desire to be more frugal, are influencing the drive of individuals and communities towards greater environmental sustainability.



15. More Noticeable Effects of Climate Change

The impact of climate change is becoming more apparent, particularly with more extreme weather events and rising sea levels. Climate change adaptation and mitigation will become a significant focus.



16. Resource Scarcity

Urbanisation, population growth and economic development will continue to drive strong demand for (non-renewable) natural resources.



17. Urbanisation

Across the globe, particularly in developing countries, there is a strong and sustained trend of people moving from the countryside into cities.

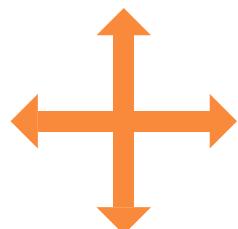


18. Changing Demographics

In addition to sustained population growth, significant changes are occurring to the age profiles of countries and communities across the world. This will impact the way businesses operate, governments deliver services and cities develop.

Step 4

Establish critical uncertainties

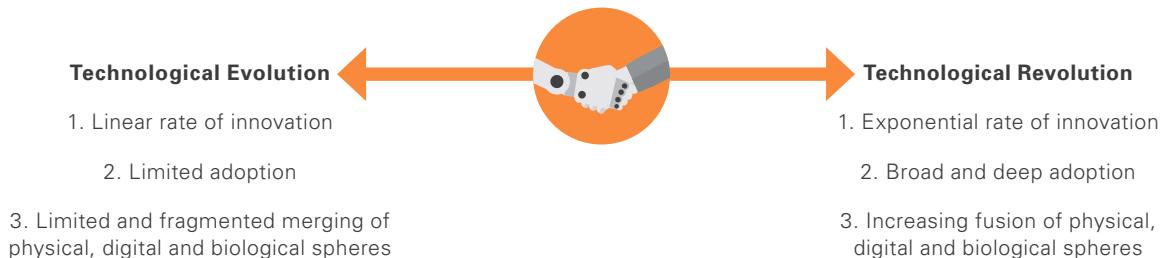


Employing the scenario planning process, the Melbourne 4.0 Taskforce found that the two most critical uncertainties – the two key ‘change drivers’ – for Melbourne’s economy out to 2030 were the impact of the shifting geopolitical landscape and the rate of global technological disruption and innovative advances.

CHANGE DRIVER 1: RISING POWERS & GEOPOLITICAL SHIFTS

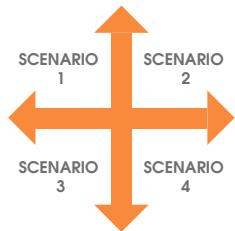


CHANGE DRIVER 2: MORE DISRUPTIVE TECHNOLOGIES & INNOVATIVE ADVANCEMENTS



These two change drivers formed the axes for the scenario framework.

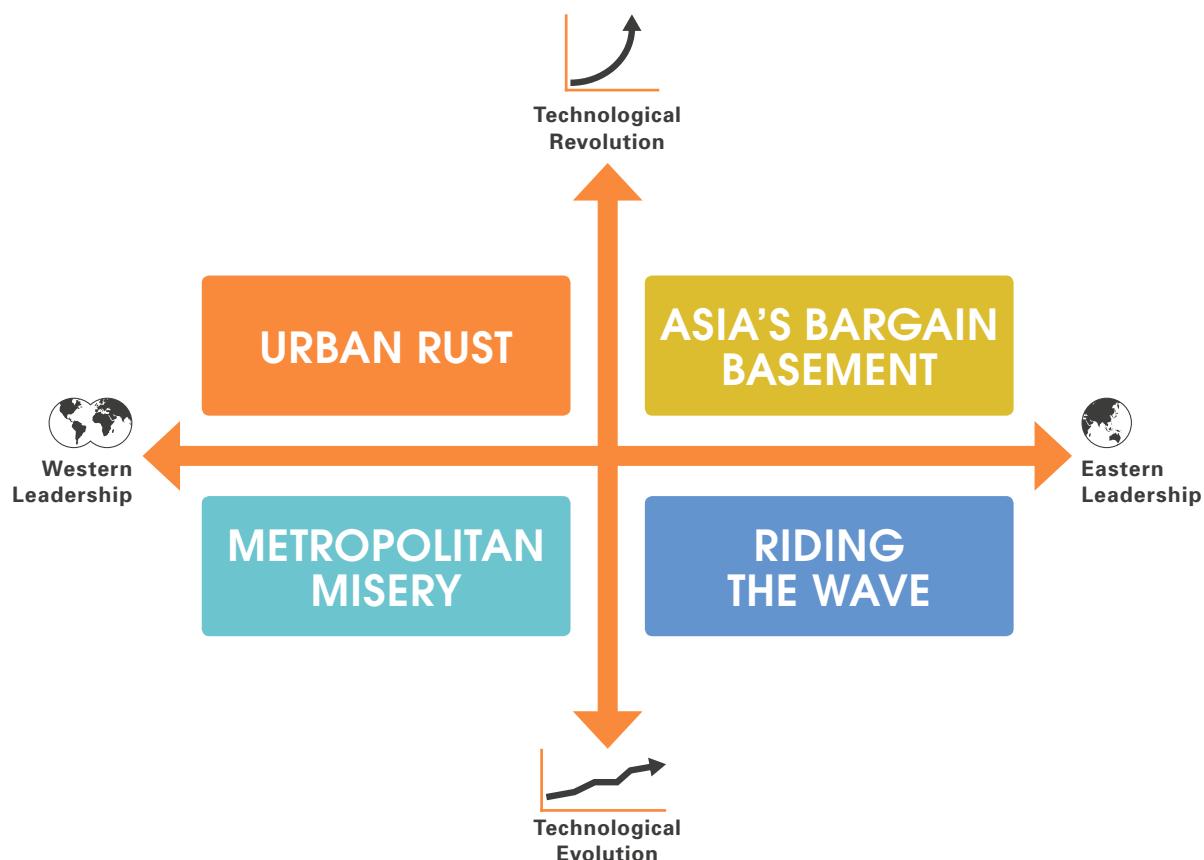
Step 5
Develop scenarios



The extreme ends of the spectrum of the two change drivers were used to develop the scenarios by forming the axes of the 2 x 2 matrix framework. By using the 'opposing' ends of the change drivers, we were able to create four maximally divergent and internally consistent scenarios that illuminate all corners of the 'playing field' in which Melbourne will need to operate and compete in 2030.

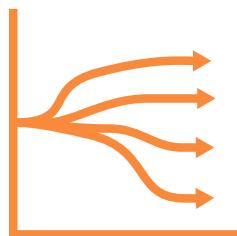
The resulting scenario framework developed by the Taskforce sketches a range of plausible futures for Melbourne which are divergent, challenging, and relevant.

In essence, the scenarios revealed that if we keep progressing with 'business as usual,' the future of our city will not be bright.



Step 6

Generate and validate Strategic Needs



Scenarios credibly stretch and challenge our frames of reference and as such provide an excellent platform for a structured conversation about the future of Melbourne and its stakeholders.

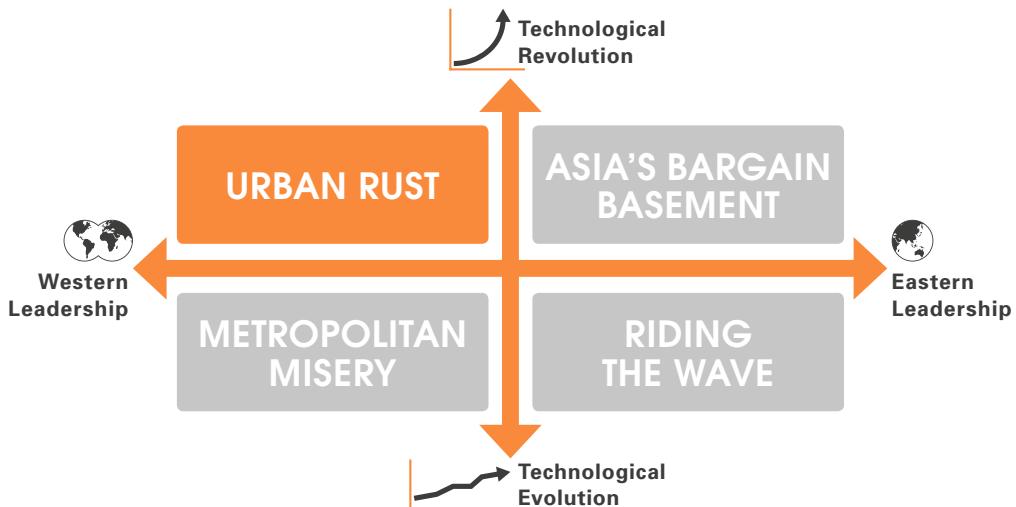
The final step that the Melbourne 4.0 Taskforce undertook was to generate responses to the challenges and opportunities that the scenarios uncovered.

To validate their robustness, the potential responses were 'wind tunnel' tested to rate how future-proof they are under all four scenarios.

④ THE SCENARIOS

SCENARIO 1: URBAN RUST

Each scenario is underpinned by a detailed narrative which can be found in section 7 of this report.



THE ROAD TO 2030...



After a brief period of turbulence, Western economic and political systems stabilised:

- Transatlantic harmonisation of investment and technology regulations accelerated innovation and competitiveness.
- Triple helix cooperation between government, business and knowledge sector drove innovation and growth.
- Cities and regions were engines of transatlantic innovation and growth.

Instability in the East hampered growth and political systems came under severe strain:

- Protectionism, corruption, debt burdens and housing bubbles.
- Maintaining control distracted from fostering innovative ecosystems.
- Mainly driven by key Western cities and regions, Fourth Industrial Revolution is underway with exponential rates of technological innovation.

AUSTRALIA IN 2030



- Complacent and not fully prepared for Fourth Industrial Revolution. Politics and regulation bedevil competitiveness.
- ‘Technology taker’: partially rides tech wave in agribusiness, healthcare and tourism.
- Economy enters recession as key Asian trading partners become protectionist, inward-looking and security obsessed.

- Melbourne and Sydney drive two-thirds of the national economy.
- Climate change impacts infrastructure and liveability of cities.

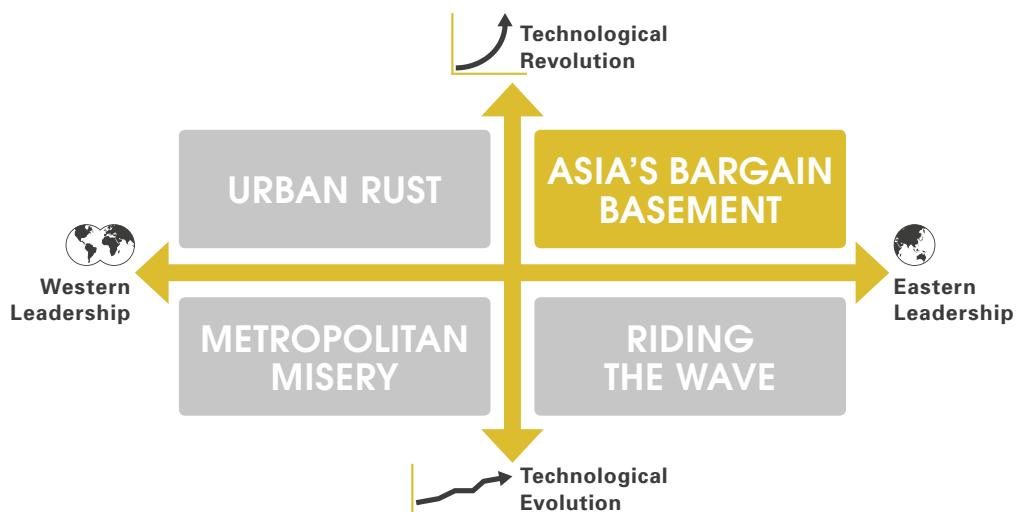
Life in Melbourne

It is the year 2030. Adam and Natalia are a married couple living in the eastern suburbs of Melbourne. Both are 47 years old and have two daughters, Danielle and Jessica, studying at university.

Life in Melbourne offers a snapshot of Adam and Natalia's outlook on life in each scenario.

It's Adam here. I currently work as a Relationship Manager at a medium-sized manufacturing company in Melbourne's east. I used to be the bookkeeper, but a fancy robot took my job. My wife, Natalia, is a human resources manager at a medium-sized biomedical company. With Australia again entering recession last year, life has been a bit of a struggle. My company is not performing well and I fear for its future. If I lose my job, it will be difficult to find another. To compound the stress, Natalia is only working three days per week. The biomed sector is holding up, but is not as competitive as it used to be. Locally designed innovations are being commercialised overseas, while automation of many processes means she no longer manages as many staff. Many 'good' jobs exist, but not here. Most are found in the advanced hubs and regions dotted throughout Europe and the US where commercialisation is strong. My kids are already contemplating moving to these parts of the world upon completion of their studies – it will break Natalia's heart to see them go. The technological explosion that took off a couple of years ago has left many people bewildered and angry. There have been some incredible advances in energy use, communications technology and transport, yet most people yearn for a simpler time when it was easier to find a well-paid, stimulating job. With the recession, there is a noticeable difference between people who are coping and those struggling to get by. Don't get me started on the crime wave sweeping parts of the city!

SCENARIO 2: ASIA'S BARGAIN BASEMENT



THE ROAD TO 2030...



Eastern economies continued their historical growth trajectories:

- In 2030, Asia is the global engine of innovation and growth.
- Asian mega-cities and regions have become centres of innovation.

Asia's rise contrasts with relative decline of the West:

- North America and Europe have not recovered from polarisation and isolationism.
- Capital and talent fled to prosperous and stable East.

Mainly driven by key Asian mega-cities and regions, Fourth Industrial Revolution is underway with exponential rates of technological innovation.

AUSTRALIA IN 2030



- Complacent and not fully prepared for Fourth Industrial Revolution. Politics and regulation bedevil competitiveness.
- Economies of key Asian trading partners thrive.
- Economy grows.
- Melbourne and Sydney drive two-thirds of the national economy.

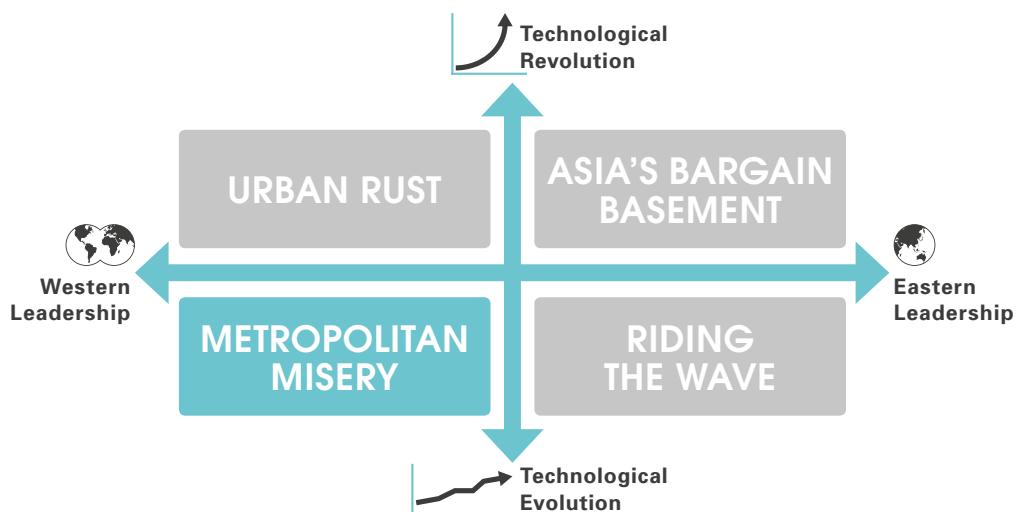
- 'Technology taker': partially rides tech wave in tertiary education, agribusiness, healthcare and tourism.
- Climate change impacts infrastructure and liveability of cities.



Life in Melbourne

Hi, Natalia here. Adam is down at Phillip Island showing some tourists the penguins, so I'll fill you in on how we're travelling. Unfortunately, due to intense competition and robotisation, Adam was laid off by his manufacturing firm, along with most of the remaining staff. It's been very difficult for all of us, but particularly Adam. He's managed to find some work as a travel guide, but they're long days, the pay isn't great and he doesn't find the work overly stimulating. Still, at least he's got something! I'm still clinging to my job. My firm was bought out by a Chinese competitor and as a result most of our research and operations have been relocated to Shanghai, home to China's largest cluster of biomedical science firms. They are encouraging Adam and me to relocate there so I can take up a position. I'd prefer to remain in Melbourne close to my family, but we may not have much choice. Melbourne's economy is simply not creating enough highly paid jobs in this transformed environment. Governments in Victoria and New South Wales are implementing initiatives to link Melbourne and Sydney, most notably with the creation of a high-speed transit system, which will help move goods and labour faster. By the way, the kids will be leaving for Jakarta next month, where there are many professional opportunities. I never could have envisioned a situation where they would be living in Indonesia, while we reside in China!

SCENARIO 3: METROPOLITAN MISERY



THE ROAD TO 2030...



After a brief period of turbulence, economic and political cooperation and integration returned in the West:

- Transatlantic security cooperation and trade and investment grew.
- Period of diminished trade exposed structural flaws in Asian economic and political systems:
- Prolonged period of economic instability and social unrest.
- Domestic strains increased tensions between Asian countries.

Fourth Industrial Revolution turned out to be an evolution:

- Serious cyber security issues and catastrophic technology failures led to clamp-down from governments.
- Differing regulatory environments and popular backlash against technology-induced unemployment.

AUSTRALIA IN 2030



- Economies of key Asian trading partners slow.
- Gateway to Asia status no longer an asset.
- Economy enters severe and sustained recession.
- Cities now overwhelmingly drive the national economy.

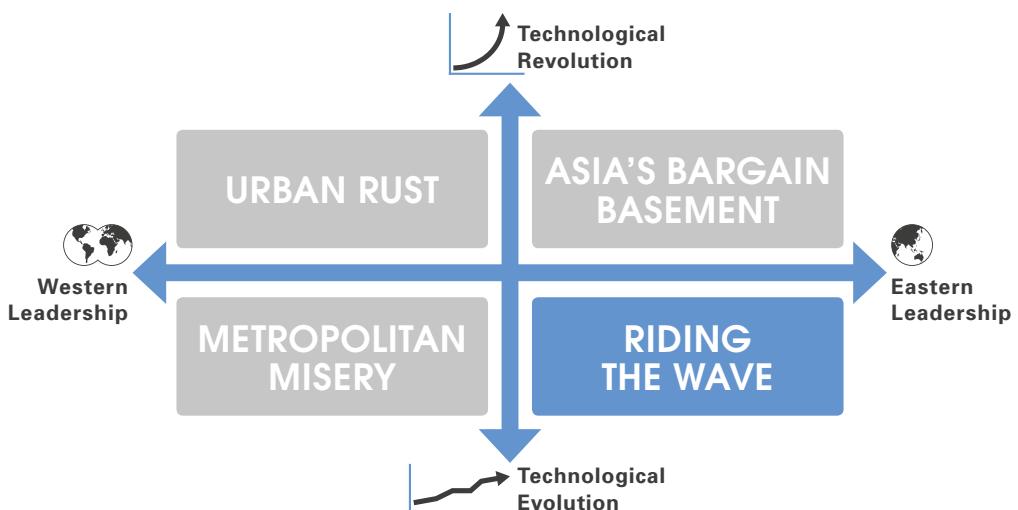
- State jurisdictions abolished to reduce cost of government; populism on the rise.
- Development of disruptive technologies slows following local and global popular backlash.
- Climate change has strong impact on infrastructure and liveability of cities.

Sorry WE'RE BROKEN

Life in Melbourne

Life is hard! The Australian economy entered a deep and sustained recession a few years back and there's no end in sight. Adam has been out of work for a couple of years now after his manufacturing company shut its doors. He now volunteers at a local homeless shelter, one of many which have sprung up in recent times. I think being around the homeless helps him keep perspective – knowing that things could always be worse. I'm still working my three-day-a-week job. Fortunately for me, the sharp slowdown in Asia helped relieve some competitive pressures, while the expected developments in automation and artificial intelligence did not occur. The 'innovations' and disruption that started to take place were completely chaotic, so governments put a stop to it. My company is still under pressure, but we're hanging on. Melbourne is not what it once was. Its confidence and energy are gone, having been replaced by apprehension and a shared sense of failure. The arts scene is a shade of its former glory – discretionary spending for most of us is limited or non-existent now. Along with the rise in homelessness, crime has also increased. This hasn't been helped by the series of budget cuts to the city's policing department. The city's green spaces are no longer as green, while inequality has risen. The city has lost its sparkle and the blame-game has begun on why and how it all went wrong. If I was to find one bright spot, the kids might now be able to afford a home, that is if they can find a job first.

SCENARIO 4: RIDING THE WAVE



THE ROAD TO 2030...

Prolonged polarisation and isolationism had crippling effect on the West:

- European Union disintegrated and Trump Doctrine closed off the United States.
- Painful and turbulent time for individuals, businesses and governments in the West.

Top-down and longer-term focus was fertile ground for economic success in the East:

- Key economies across Asia created favourable business climates; corruption, bureaucracy and infrastructure were effectively addressed.
- Home to two-thirds of global middle class; this is a prosperous and confident Asia.
- Fearing social instability, technological disruption was regulated and 'contained'. The Fourth Industrial Revolution turned out to be an evolution.



AUSTRALIA IN 2030

- We are in the orbit of major Asian economies.
- Australia joins intra-Asian alliance to balance China.
- Cities now overwhelmingly drive the national economy.

- Development of disruptive technologies less than predicted.
- Climate change has strong impact on country's infrastructure and liveability of cities.

Life in Melbourne

Hey, it's Adam here again! All things considered, life here is still pretty good. It has certainly been a tumultuous time in world affairs, but Melbourne and Australia continue to roll along at a nice clip. We could certainly be doing better, but I'm just grateful we're not trying to make a living in Europe! Its demise has been so sad to watch – many of its best and brightest have moved to Asia or made their way to our shores. This is not necessarily a bad thing. As Australia's education standards continue to slip, we are simply not producing enough highly skilled individuals. On a brighter note personally, my manufacturing firm is holding its own. There is intense competition throughout Asia – particularly in China and India – but we are competitive. Natalia's biomedical firm is also performing relatively well; the sector's research capabilities in Melbourne remain highly regarded around the globe. While challenged, Melbourne's key economic sectors – tertiary education, agribusiness, professional services, healthcare and construction – continue to perform well, thankfully. Natalia and I are confident our two kids will find decent jobs, although they may have to look outside of Melbourne if they want to purchase a home. Either that, or they'll continue to live with us for the foreseeable future. Might have to put off that planned overseas holiday for a few more years!

⑤ MELBOURNE'S STRATEGIC NEEDS

"Cities magnify humanity's strengths... They spur innovation by facilitating face-to-face interaction, they attract talent and sharpen it through competition, they encourage entrepreneurship, and they allow for social and economic mobility." — **Professor Edward Glaeser, Fred and Eleanor Glimp Professor of Economics, Harvard University**

Humanity has been moving into cities for thousands of years and the reasons for that today are no different to what they were millennia ago.

Throughout history, there have been three key elements that give cities enduring success: people, connectivity and governance.

While these elements do not change, the context in which these elements manifest themselves does. Now that we are in the early stages of the Fourth Industrial Revolution, we must ensure that our city can progress and develop in concert with our (rapidly) changing environment.

The scenarios produced by the Melbourne 4.0 Taskforce provided an excellent platform for a structured conversation about Melbourne's future economic environment, which generated a set of responses to the challenges and opportunities the scenarios uncovered.

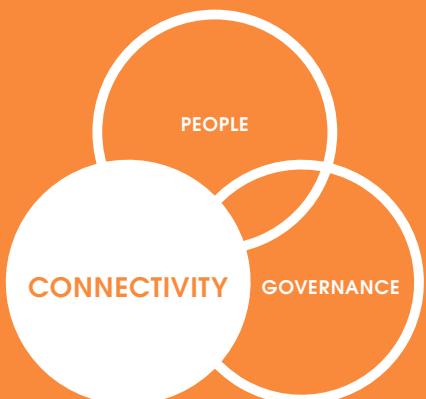
In line with the elements that give cities enduring success – people, connectivity and governance – the Taskforce identified nine Strategic Needs that will have to be addressed if we are serious about underpinning a liveable and flourishing Melbourne in the future.

MELBOURNE 4.0 KEY FINDINGS STRATEGIC NEEDS



People

1. Future skills
2. Innovative ecosystem
3. Housing mix



Connectivity

4. Competitive internet
5. Airport link
6. Eastern seaboard transit link



Governance

7. Metropolitan collaboration
8. Eastern seaboard collaboration
9. Digital capability

⑤ MELBOURNE'S STRATEGIC NEEDS

① Future skills



Linear careers will become less common as automation, globalisation and more flexible working arrangements are rapidly changing the nature of work. To succeed, our economy needs a workforce with a portfolio of skills and capabilities.

One of the most effective ways to address this is to encourage and support a job-creating and enterprising workforce in Australia.

Potential advocacy options for the Committee:

- An experiential entrepreneurship program in primary school and secondary school curriculum, and Vocational Education and Training (VET) programs.
- An annual entrepreneurial camp for highly skilled teenagers.

② Innovative ecosystem



Most globally relevant cities have a sizeable innovative (start-up) ecosystem. These places are attracting highly skilled workers and investors, generating the next wave of economic growth.

There are already great initiatives to help nurture Melbourne's innovative capacity and ecosystem. However, there is a need for continuous improvement and development.

Potential (advocacy) options for the Committee:

- A Committee for Melbourne Mentoring Network.
- Annual international tours for leading Melburnian entrepreneurs.
- An international network with other innovative cities.
- Yarra River activation to develop a corridor for arts, culture and commerce.
- A collaborative industry-research partnership to deliver innovative energy solutions.



③ Housing mix

Melbourne's key workers, including nurses, police officers and teachers, are particularly challenged in finding a place to live close to their location of employment.

Furthermore, high cost of living – of which housing costs are a major determinant – has a detrimental effect on a city's creativity and innovative capacity; expensive cities make self-employment and entrepreneurship more difficult.

Potential advocacy options for the Committee:

- Rental accommodation as an attractive institutional investment class.
- Student accommodation in aged-care facilities.



④ Competitive internet

Internet speed, coverage, capacity and security will profoundly affect cities' ability to compete in international markets.

We need a better understanding of our current and future internet requirements in light of international competitive developments and, if found to be wanting, act to address the situation.

Potential option for the Committee:

- A 'Competitive Melbourne Internet' taskforce to review options and make recommendations.



⑤ Airport link

The world's leading cities have high quality direct (public) transport links to their airports. Melbourne does not.

Appropriate options are available. They should be assessed, particularly with the objective of establishing Melbourne's airport(s) as a strong regional, interstate and global link, as well as improving Melbourne's international image.

Potential option for the Committee:

- An 'Airport Connectivity' taskforce to review options and advocate a preferred action plan.

Herald Sun

Saturday
May 11, 2019

Airport passenger footfall surges beyond expectation

For the first time in its history, passenger traffic at Melbourne Airport has surpassed 65 million annually. The announcement, made by Australia Pacific Airports Corporation, is yet another sign of Melbourne's broad appeal, both as a business hub and visitor destination. The figure has surpassed the estimated 60 million passenger trips forecast prior to the opening of the airport transit link in 2025. Connecting Tullamarine Airport and Southern Cross Station, the link has ensured Melbourne has a first-class transit system that is moving people in a timely and efficient manner.

27

⑤ MELBOURNE'S STRATEGIC NEEDS

⑥



Eastern seaboard transit link

Megaregions are the 'New Competitive Unit'. They are integrated sets of cities and surrounding (suburban) hinterlands across which labour and capital can be allocated at very low cost.

Constructing a high-speed eastern seaboard transit link will be a major step forward in the creation of a megaregion, which will effectively alleviate some of the major population challenges that our capital

cities experience, stimulate the economy and increase our ability to compete in international markets.

Potential advocacy option for the Committee:

- A competitive eastern seaboard transit link, including key Victorian regional centres.

⑦



Metropolitan collaboration

A hyper-competitive global business environment, a growing population, a challenging housing market and digital innovation are some of the key factors that will significantly increase pressure on Greater Melbourne's governance structures.

We need better metropolitan governance arrangements to build a resilient, economically competitive city that can confront the challenges and capture the opportunities that the 21st century will bring.

Potential option for the Committee:

- A 'Metropolitan Collaboration' taskforce to review governance structures and make recommendations.

⑧



Easter seaboard collaboration

Already a decade ago, the world's top 40 megaregions made up 'only' 18% of the population, but produced 66% of global economic activity and 86% of patented innovation. Megaregions are the 'New Competitive Unit'.

Effective collaboration between the (capital) cities along Australia's eastern seaboard will provide a real competitive boost.

Potential option for the Committee:

- An 'Eastern Seaboard Collaboration' taskforce led by the Committees for Melbourne and Sydney to develop a blueprint for an eastern seaboard megaregion.

The screenshot shows the homepage of The Age newspaper website. At the top, there are social media links, a date of '6.30PM Sat May 11, 2030', and a weather forecast for Melbourne. The main headline reads 'Melbourne and Sydney begin new romance'. Below the headline is a dark, geometric graphic. The text of the article discusses the historical rivalry between Melbourne and Sydney and how it has shifted towards cooperation due to economic factors like zoning regulation changes and government subsidies.

⑨

Digital capability



The scale and scope of rapid technological developments will drive productivity, growth and investment, as well as improve public services, and enable scientific breakthroughs. However, at the same time, it can cause great disruption to employment markets and society at large.

Melbourne must be digitally capable to successfully navigate the significant challenges and opportunities of the 21st century.

Potential advocacy options for the Committee:

- A Digital Commissioner for Victoria to engage with the world's top tech companies.
- A Victorian All-Party Parliamentary Group on Artificial Intelligence.

⑥ OUR TIME STARTS NOW

“The future is already here – it’s just not evenly distributed.”— **William Gibson, Science fiction pioneer**

The next decades will see profound changes to the environment in which Melbourne’s economy will operate and compete. The far-reaching technological changes that are taking place, coupled with big geopolitical shifts, are likely to alter the landscape beyond our imagination.

To echo William Gibson’s astute observation, we can, however, already catch a glimpse of the future and the opportunities it offers at a global level with Asia’s growing strategic weight and right here in Melbourne with technology. Our city’s biotech industry, for example, regularly delivers world-leading innovation.

No city is yet fully experiencing the breadth and depth with which the Fourth Industrial Revolution is likely to unfold. The Committee’s Melbourne 4.0 Taskforce was given the remit to help uncover – and try to make sense of – the impact that these changes are likely to have on Melbourne. By employing the collective knowledge and insight of our unique membership base, the Taskforce co-created a set of scenarios that sketch a range of plausible futures for Melbourne which are divergent, challenging and relevant.

We cannot predict the future. However, the Strategic Needs that the Taskforce identified present robust investment opportunities for our city; *they are rated essential under all scenarios*, and we must work together to address them.

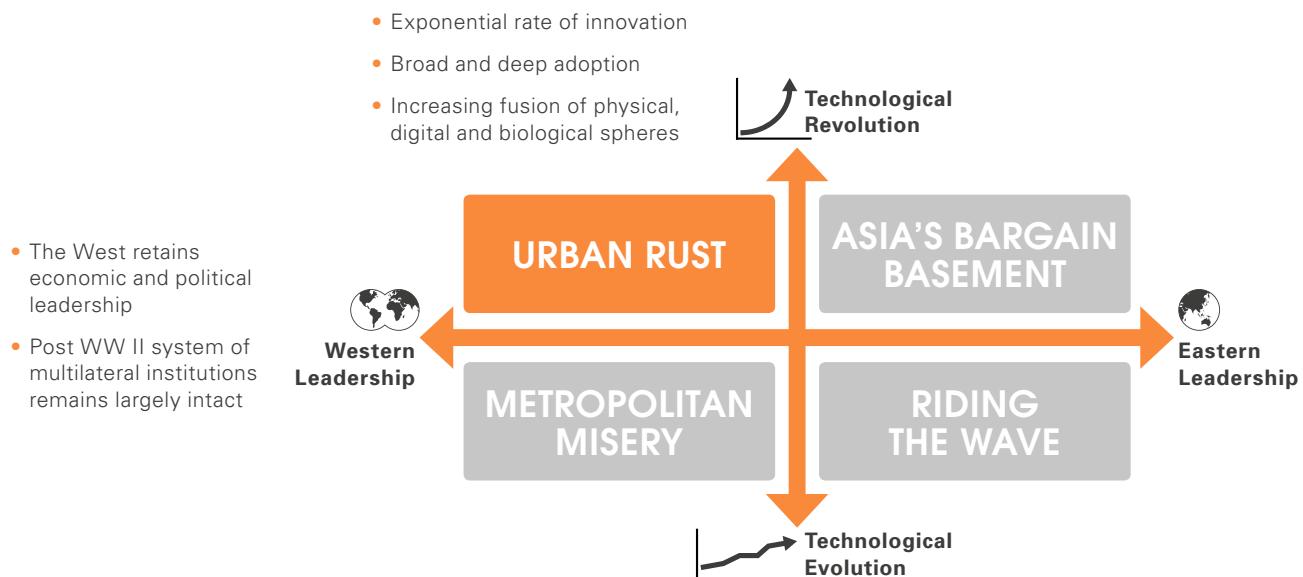
Moreover, in the course of our work, it has become clear that there are a number of conversations we cannot delay any longer. A Victorian All-Party Parliamentary Group on Artificial Intelligence, proposed to strengthen our digital capability, is just one example of how we must create an informed public debate and common understandings about how to manage the consequences for our society of accelerating digital disruption. Similar discussion is needed on a range of fast emerging fields from biotechnology to the Internet of Things, and from robotics to quantum computing. How do we feel about algorithms guiding parole decisions? What level of privacy is non-negotiable in an age of hyper-connectivity? And what does a ‘fair go’ mean when babies are genetically modified?

In reality, the findings of the Melbourne 4.0 Taskforce are only the beginning of a new and ongoing conversation about the future of our beloved city. We would like to thank all those who have contributed to the Melbourne 4.0 Taskforce through our workshops, interviews and online forum.

The Committee is looking forward to being at the forefront of these conversations as we continue to *shape a better future for Melbourne*.

⑦ DETAILED SCENARIOS

SCENARIO 1: “URBAN RUST”



THE ROAD TO 2030...

The negative effects on growth and innovation due to a brief period of social and political polarisation in a 'closed' West – manifesting itself in 'Brexit' and the Trump presidency – made Western societies realise that cooperation between countries and regions was vital. Protectionism and isolationist tendencies had to be avoided. After these years of turmoil, Western political, economic and financial systems stabilised.

Western economies invested in open innovation and data. Wide-ranging harmonisation of investment and technology regulations facilitated and accelerated innovation. Cooperation between companies, knowledge institutions and governments increased ('triple helix cooperation'). A more stable economic and political climate for investment in new technologies was created, leading to breakthroughs in a range of fields, including nanotechnology, biotechnology, materials science, energy storage, robotics, artificial intelligence and quantum computing. Impacts of climate change and resource scarcity, combined with social and economic challenges confronting ageing societies has spurred open, triple helix cooperation on new and innovative technologies. Innovation and growth is not distributed evenly across the West – Greece, Italy and the Balkan states remain stagnant. However, many key Western nation-states, including the US, Canada, UK, Germany, France, Switzerland and Finland, are reaping the benefits of their key cities and regions driving innovation and growth.

Over the same period, instability and uncertainty hampered many (emerging) economies in Asia where economic and political systems came under severe strain. The Chinese property market in large cities started to severely deflate, forcing authorities in Beijing to stabilise it. However, this exposed the country's large debt burden, making it hard for the government to manage the economy. A frustrated population could no longer accept being limited in their freedom and not having the power to determine their future direction. The Chinese government had to refocus its attention to maintaining domestic stability and increased protectionist measures. The carefully crafted supply chain networks in Asia started to disintegrate, which raised regional tensions. Historical grievances and disputes reignited. Water scarcity and control of its supply became an increasing source of tension as low-level conflicts between the countries along the Mekong and Indus river systems ensued. The resulting economic hardship in Asia not only brought to the fore the high levels of corruption, but ignited large-scale protests in countries with sizeable young populations, notably Indonesia, the Philippines and India. This further exacerbated the threat of transnational extremism and terrorism. Maintaining internal stability was the priority for many Asian countries, hindering their efforts to foster vibrant and innovative ecosystems able to compete on the global stage.

AUSTRALIA IN 2030

By 2017, Australia had marked 26 consecutive years of economic growth. However, Australia's success created a false sense of security among governments and large pockets of the private sector. Despite often widespread discontent with how politics is conducted in Australia, relative economic well-being meant that hard decisions were consistently put off in favour of short-term wins.

Australia's wealth is increasingly driven from its major cities, with Melbourne and Sydney now the source of 65% of national economic output.

Profound advances in wide-ranging technologies underpinning the Fourth Industrial Revolution have greatly improved the quality, speed and price at which many products and services are delivered. The velocity and breadth of the changes in advanced economies has outpaced Australia. The world's leading companies have introduced far-reaching innovations, such as the introduction of the first Artificial Intelligence machines on corporate boards – the relaxed 'she'll be right' attitude and lack of urgency has not helped Australia in this respect.

In the face of these fast-moving technological developments, many of Australia's closest trading partners in Asia have begun to sway towards protectionism, and the Federal Government and industry have had to scramble to pursue opportunities in other regions, notably the Middle East, Africa and Latin America.

The slowdown in Asia has also led to a significant reduction in inbound investment to Australia. The country's role as a gateway to Asia has disappeared as many investments are redirected to Europe and North America.

Australia dips in and out of recession.

Climate change continues apace and is beyond Australia's influence, but has had a strong impact on the country's infrastructure, and the liveability of its cities. Lack of investment in cutting-edge Information and Communication Technology (ICT) has held Australia back.

As a technology taker, Australia can still partially ride the wave of the disruptive technologies and innovative advances, especially in the health and agribusiness sectors. Australia remains an attractive tourism destination.

Politics and regulation bedevil Australia's competitiveness and ability to thrive in the Fourth Industrial Revolution, with implications for Australia's reputation as a 'lifestyle superpower.'

Pressure to change Australian governance arrangements increases to deal with these challenges and populism is on the rise.

MELBOURNE IN 2030

Governance

For years, cities such as Vancouver, San Francisco, New York, Oslo and Barcelona have implemented progressive policies allowing them to become urban laboratories incubating intelligent solutions to pressing urban challenges. As a result, citizens in these cities have an enviable relationship with their governments, and businesses enjoy a competitive business environment. Initiatives such as tax collection through blockchain technology mean these cities can interact effectively with their constituents and provide vastly more cost-effective government services, allowing them to direct precious resources to their city's ever-expanding value proposition.

These cities have formed international networks and are increasingly looked to for solving some of society's most entrenched challenges. Though Melbourne's liveability and reputation were highly respected in the 2010s and early 2020s, the lack of city-wide pro-active and coordinated policies around innovation, technological development, climate change and urban optimisation means the city has lost touch with other leading cities of the world.

Melbourne's inability to innovate and compete internationally is partially a result of the city's fragmented governance structure, consisting of 31 Councils across the metropolitan region. Consequently, the State Government has created a Greater Metropolitan Melbourne Council, stretching from Wyndham to the Yarra Ranges and from Whittlesea to the Mornington Peninsula. It is hoped this whole-of-city approach will support economic growth by not only improving planning and delivery of infrastructure, but promoting the wider metropolitan area as a great place to work, live, invest in, and visit.

It remains to be seen whether this alternative governance structure will deliver the desired results; lifting local businesses' international competitiveness, as well as retaining and attracting foreign investment will take time. Yet despite the Australian economy dipping in and out of recession due to Asia's contraction, there is a renewed sense of hope that this new governance structure can help Melbourne regain its footing and compete globally.

The Economy

While Australian consumers are keen adopters of technology, business and government have not matched the consumer's enthusiasm, making Melbourne's private sector a prime target for digital disruptors.

Only a limited number of businesses in Melbourne have benefitted and thrived in this rapidly evolving environment. Most companies lack the capacity to implement advanced technologies and struggle to attract the talent needed to thrive. Melbourne's (and Australia's) consistent drop in the educational rankings has seen foreign investment increasingly gravitate towards rival cities, where top talent is more abundant. Melbourne is no longer as attractive for foreign investors as it once was.

Globally, the new economic reality sees latent capacity being unlocked in areas ranging from accommodation to hospital equipment and from finance to construction machinery. Evolving customer expectations are accelerated by the increased bargaining power of customers who are at the centre of the economy, while automation, virtualisation and disintermediation significantly alter supply-side cost structures.

Despite Melbourne's economy contracting, a number of persistent organisations have been able to capitalise on the opportunities offered by the new landscape. In line with a larger trend in Europe and North America, some **manufacturing** has returned to Melbourne; entrepreneurs that make use of big data, robotics, production line simulation, 3D printing and predictive maintenance have been able to carve out a lucrative niche. However, the lack of a sufficient network of smart suppliers means that even these manufacturers find it hard to optimise their processes and opportunities. In addition – and despite Australia's significantly weaker currency – the city's products are uncompetitive in the major markets of North America and Europe that apply penalty tariffs on products that have a large environmental footprint.

Similarly, having been used to hardship, Victoria's farmers' entrepreneurial and innovative spirit to survive has produced many successful **agricultural businesses**. These enterprises make use of drones, sensors, genetically modified crops,

robots and synthetic biology to increase productivity, while fighting the increased effects of climate change. Nevertheless, many farmers have not been able to make the necessary investments in technology, and the associated labour, to capitalise on the opportunities. The state's crumbling infrastructure adds to these difficulties, with the costs of transporting produce to domestic and international markets still high.

Melbourne's **financial services** sector has taken a beating. Globally, 'fintech' saw enormous amounts of investments and the banks were trying to defend their large operational footprints. Recognising the growth of the fintech community in the 2010s, some local and global incumbents realised early a tipping point had been reached; however, making investments in unproven technologies and operations proved to be a hard sell, particularly in listed companies. It turned out that scale was no match; market provisioning, investment management, insurance, deposits and lending, and capital raising are systematically picked apart by nimble and segment-specific competitors. The banks in Australia still play an important role, especially given their 'protected' status; however, switching banking services has become far easier. Large segments of the banks' customer base moved on to the global fintech competitors, many of whom have become household names, including some of the early competitors that originated in Melbourne.

Melbourne's **education sector** has experienced significant headwinds due to the slowdown in Asia. While some local universities have devised new methods of engaging with students, such as using virtual and augmented reality, those same technologies have also emboldened the globe's top universities in the United States and England to successfully compete through online learning. Though the value of a 'Western' degree remains appealing, shifting skill requirements mean that many people are gravitating towards the new tertiary institutions – including those founded by the global tech giants – offering shorter courses and nanodegrees. This trend is further amplified by advances in blockchain technology, which allows prospective employers to easily check the authenticity of people's academic qualifications. As a result, Melbourne's universities have had to cut their overhead costs and increasingly engage the services of online tutors.

Biomedical research has historically been a strong contributor to Melbourne's economy and continues to perform relatively well. However, the city experiences difficulty attracting global talent, due in part to strict skilled migration controls imposed by successive governments. This development, combined with the fact that many locally developed innovations are commercialised overseas, means the sector is no longer as competitive as during its peak in the 2010s.

Tourism is another sector that has experienced turbulent times. The number of Asians visiting Melbourne has dropped significantly. Nevertheless, Melbourne's rich cultural offering and surrounding natural beauty – despite the serious loss of biodiversity in some pockets of Victoria's parks – still attracts many visitors, particularly those from North America and Europe. Some local entrepreneurs have successfully promoted Melbourne and Victoria through virtual reality, encouraging people to experience the real thing.

Globally, some of the biggest advances have been in the **healthcare sector**, which has benefitted from the technologies mostly developed in Europe and North America. Like the Myki initiative however, Australia has tried to develop its own digital health record program, which is still experiencing issues and long delays, meaning that certain areas are missing out on the enormous opportunities that big data delivers to the healthcare sector. Though not as ubiquitous as in some advanced cities in North America and Europe, Melbourne's elderly are welcoming robotic assistance with tasks such as picking up groceries or taking out the rubbish. Smart homes and 'Socially Assistive Robots' complement aged care workers and allow seniors to stay at home longer and live more active lives.

Human Capital

Melbourne's population has continued to grow and passed six million people. A severe shortage of schools means that the city's education system has been under pressure for over two decades. Larger classroom sizes, school rationing and multiple school shifts have become additional factors contributing to regular poor performances in international rankings. Moreover, Australia's fixation with testing students at primary and secondary school has stifled innovation. Schools have emphasised the importance of

academic discipline and the need to follow instructions to ensure they rank as high as possible, generating a workforce that is just as compliant. Melbourne's universities retain their decent reputation, but find it hard to compete with the top universities in Europe and North America. Oftentimes, Melbourne's most talented individuals who go overseas to study and work do not return.

Leading cities with modern ICT infrastructure are seeing significant parts of the workforce becoming truly international. The same technologies that allow their residents to work from a café also allow them to become 'virtual workers' for employers in other advanced cities. Importantly, this system works both ways and allows foreigners to bid for tasks and jobs in these same cities. Although these employees and contractors command considerable salaries, international competition for these contracts ensures that salaries are effectively kept in check. Melbourne, with its relatively slow internet connectivity, cannot fully capitalise on this trend. Organisations are forced to pay significantly higher salaries to attract and retain highly talented employees so they can survive in the international competitive environment. In the 'war for talent', Melbourne's businesses are fighting with one hand tied behind their backs.

In a city where the providers of intellectual, financial and physical capital are leaving the 'rest' behind, just keeping up requires continuous upskilling and lifelong learning for those that have the capacity to do so. Others are simply falling behind. Melbourne's unemployment rate hovers at nearly 18 per cent for much of the decade out to 2030 as governments scramble to find a balance between an open and productive economy against the backdrop of rising inequality and discontent. News outlets are now regularly speculating whether Melbourne and Australia will belatedly experience the 'new' political divide that Europe and the United States experienced 15 years ago.

Infrastructure and Urban Optimisation

The last five years have seen the compounding effects of technological innovation in smart and forward-thinking cities result in a critical turnaround – these cities are reaching the tipping point in solving some of the critical challenges around transport and the associated housing affordability issues. Autonomous public and

private vehicles, as well as remote (virtual) working are allowing people to live further from the centres of innovation while still having access to the denser job markets in the centre. The emergence of the first drones for personal transport in some of these cities has emerged. The three magic words of real estate ("location, location, location") are starting to take on a new meaning in these cities and their surrounding regions.

Australia did not lay the groundwork for these innovations. Many countries that were once considered the developing world now have much faster internet connections in their capital cities than Melbourne has. Squabbling state and federal governments are not able to provide an effective framework for the adoption of autonomous vehicles. Large infrastructure projects take years to implement and are still geared towards the traditional forms of public and private transport. Congestion is costing Melbourne close to \$10 billion a year, not even taking into account the sizeable opportunity costs imposed on the economy. Businesses that are trying to implement just-in-time deliveries are finding it impossible. Outside the CBD, residents and businesses are paying inflated prices for services that other cities seem to be able to deliver seamlessly. Melbourne's value proposition for business is certainly not what it used to be.

Despite the advances made in the City of Melbourne, the city as a whole has not kept pace with the leading cities of the world that have become centres of innovation for infrastructure and urban optimisation. This has meant Melbourne's housing market has entered uncharted territory. Severe affordability issues in the city centre and pockets throughout the south-eastern suburbs remain, while at the same time other suburbs have seen their house prices tumble due to the slowdown in large parts of the economy, as well as retreating Asian property investors.

Melbourne's housing affordability issues remain in the job-rich inner-city areas while housing development continues to focus on the periphery without the required transport and communications infrastructure. This has exacerbated spatial inequality, which is reflected in the uneven distribution of amenities and green spaces. This, in turn, is also causing worsened heat island effects – where an area is significantly warmer than its

surrounding rural areas due to human activity – in these neighbourhoods. Residents remain inside during the warmer months and choose to drive whenever they go out – even for their local coffee. Flooding has become a recurring feature in once highly rated suburbs along the Bay and the Yarra. The social impacts of climate change are becoming pronounced. Mental health issues, chronic disease and alcohol misuse, have become more common and widespread. Furthermore, access to, and participation in, cultural events and activities is limited in the outer suburbs as the government's and councils' eroding revenue base for amenities in the new suburbs is a world apart from what it was in the 'good old days.'

Liveability

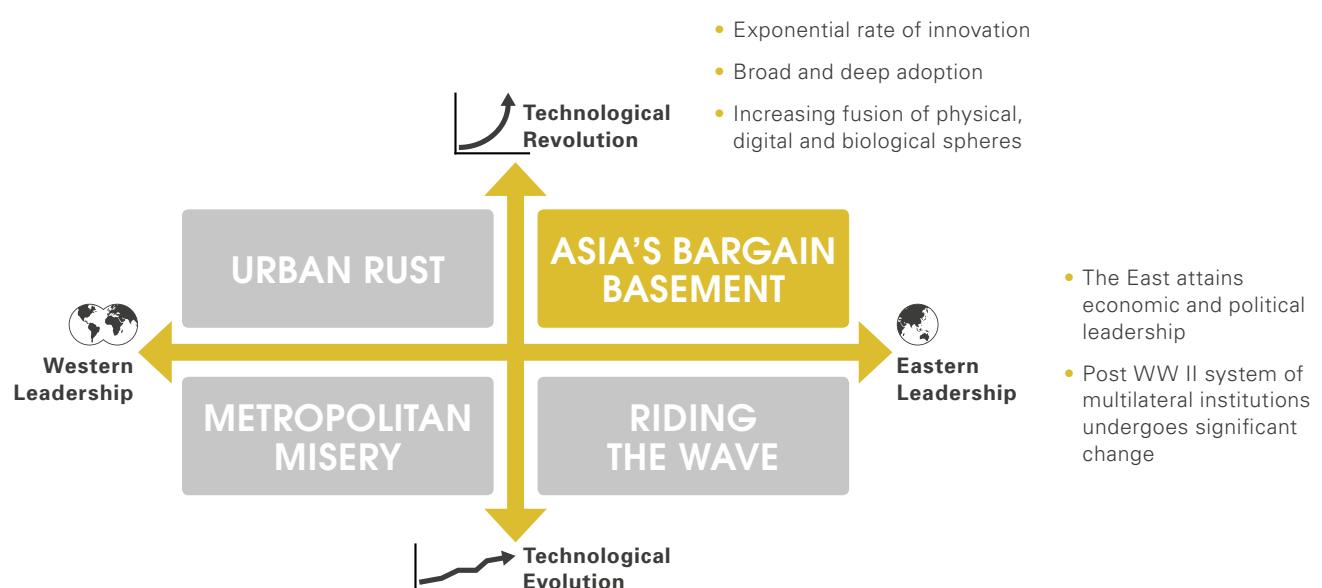
The early part of the 21st century saw Melbourne enjoy the fruits of the visionary longer-term decisions that were made in the preceding decades when the city was struggling. For most of its residents, life in Melbourne was very good during the 2010s and early 2020s as Melburnians enjoyed unprecedented prosperity and liveability. However, to some people the cracks started appearing long before others recognised it. Overseas visitors – who had experienced the Global Financial Crisis – were astonished by the level of prosperity, but surprised by the laid-back attitude and general lack of urgency in Australia's capital cities. This attitude prevented Melbourne from making the hard decisions needed for smart and sustained investments and this has now come back to haunt it.

Internationally, Melbourne's brand name is reliant on the Australian Open, which was secured for another 26 years in 2010, but uncertainty remains as to what will happen after that. The Grand Prix was labelled 'unaffordable' in the early 2020s and soon after left Melbourne. Melbourne meandered along with key stakeholders failing to truly grasp the challenges confronting the city. Today, the city's business climate is a shadow of its former self and the last five years have seen significant hardship for many once-thriving businesses. Years of sub-optimal investments, combined with an economy now unable to underpin them, has severely impacted Melbourne's liveability.

Crime, which already in 2016 was identified by Victorians as the biggest issue facing the state, has taken on a new dimension despite the government's 'tough on crime' approach. The increasing segregation between the 'haves and have-nots' has seen crime rise strongly and gated communities are now a familiar sight in Melbourne. Despite valiant efforts by some individuals, communities are increasingly disconnected and 'living in their own world.'

More and more voices are demanding leadership that will "Make Melbourne Great Again."

SCENARIO 2: “ASIA’S BARGAIN BASEMENT”



THE ROAD TO 2030...

The shift in global economic and political power to the East was unstoppable as Asian powers maintained their rapid growth trajectories. Three of Asia's largest economies – China, India and Japan – now dominate the world's top five. Large urbanised populations, government investments in education and infrastructure, combined with the will to tackle corruption, were key elements contributing to their rise. Business confidence soared, while inequality decreased with many millions of people lifted out of extreme poverty thanks to effective wealth redistribution initiatives. The expansion of the services and higher-value manufacturing sectors in these economies helped raise consumption as a share of GDP. Locked into the grids of these rapidly growing economies, the mature Asian economies, including Taiwan, South Korea and Japan, fared well.

Asian mega cities and regions have become centres of innovation. Open and urban societies throughout Asia have generated innovative solutions to major social and natural challenges, including pollution, energy, ageing populations, and natural disasters. A coordinated approach between business, universities and government has rapidly elevated these economies towards higher technological levels. In 2030, Asia is the global engine of innovation and economic growth.

Asia's rise contrasts with the relative decline of the West, which has not recovered from the social and political polarisation that began following the 2008 Global Financial Crisis. Unemployment rose sharply, as did the

subsidies and tariffs applied by nationalist governments in response. Some Western governments even started interfering with their central banks' independence. A spate of terrorist attacks across Western Europe encouraged these countries to further isolate themselves. Leaders throughout Asia and other parts of the world were scathing of their Western counterparts, accusing them of derailing global growth and threatening global peace and prosperity.

The post-World War II multilateral institutions, including the United Nations, NATO and the European Union, became less influential, and no alternative 'Western' successors formed. Major regulatory differences in the West created a challenging environment for the development and marketisation of new technologies. Capital increasingly fled to a more stable and prosperous Asia. Some European countries and cities that valiantly tried to resuscitate an open and cooperative climate did see some domestic economic successes, but it was not enough to lift the fortunes of the continent. Across the West, companies, tertiary institutions and governments failed to cooperate adequately, while a large pool of talent took advantage of exciting opportunities throughout Asia.

National governments – particularly in the West – gave up on real reforms and outsourced many of society's key challenges to their powerhouse cities or megaregions. Hundreds of years ago, vast city-states – such as Chengdu and Venice – played an outsized role in shaping the terms of trade between societies and we are seeing a resurgence of these functions among the world's leading cities and megaregions.

AUSTRALIA IN 2030

By 2017, Australia had marked 26 consecutive years of economic growth. However, Australia's success – and, by extension, Melbourne's success – created a false sense of security among governments and large pockets of the private sector. Resting on our laurels, governments at all levels began rolling out extravagant social programs and services, many of which were viewed as luxuries in other parts of the world. A soft underbelly was the result as the country lost its hunger to compete at the 'cutting edge'.

Australia's GDP is increasingly driven by its major cities, with Melbourne and Sydney now the source of 65% of national economic output. Australia's regions perform well due to the increase in demand for minerals and high-quality agricultural produce from Asia's rising middle class.

With upheavals in large parts of the West, Australia has capitalised on its economic links with a thriving Asia. Australia's top five trading partners are all located in the region.

Climate change continues apace and is beyond Australia's influence, but is having a strong impact on competitiveness in an Asia-dominated economy as well as on the liveability of Australia's cities.

Lack of investment in cutting-edge Information and Communication Technology (ICT) has held the country back in terms of productivity and foreign investment. As a technology taker, Australia can still partially ride the wave of the disruptive technologies and innovative advances, especially in the knowledge, health and agribusiness sectors. The country remains an attractive tourism destination for Asian travellers.

Politics and regulation bedevil Australia's competitiveness and ability to thrive in the Fourth Industrial Revolution, with implications for Melbourne's status as the 'World's Most Liveable City'.

Pressure to change Australian governance arrangements to deal with these challenges increases as calls for the removal of the country's states and territories grow louder, while key stakeholders in Melbourne and Sydney discuss collaborative governance and economic arrangements.

MELBOURNE IN 2030

Governance

Asia's communitarian tradition, where community interests come before those of the individual, has helped its economies stay the course in times of rapid change. A consistent approach to economic development, based on innovation and productivity gains, means that the benefits of the technological and innovative advances are being captured. Mindful of the need for political stability, the benefits are being distributed appropriately among Asia's vast populations.

Melbourne's fortunes are starting to plateau. The city (and country) is struggling to compete with the Asian powers to the north. Though Melbourne's liveability and reputation were highly respected in the 2010s and early 2020s, the lack of sufficiently coordinated policies concerning innovation, technological development, climate change and urban optimisation means that the city's value proposition is unravelling.

Melbourne's traditionally strong economic sectors have kept the economy afloat, but a combination of factors have spurred great change in governance structures. Skills shortages, a burgeoning population, inadequate transport, housing affordability issues and pollution all affect Melbourne's living standards.

Short-termism and a general lack of urgency have seen some benefits of compounding innovations elude Melbourne. Many countries once considered part of the developing world now have much faster internet connections in their capital cities, providing their businesses with a critical competitive advantage. Bitter partisan politics, combined with a cumbersome and slow-moving bureaucracy, has seen infrastructure projects delayed or shelved, stifling economic growth and productivity. While cities throughout the region build ultra-modern transport networks quickly and efficiently, Melbourne's key infrastructure projects take years to move beyond the 'feasibility study' stage. A comprehensive autonomous transport strategy, and subsequent implementation, is stalled due to disagreements in Spring Street. Sydney grapples with the same issues.

With no nationally coordinated plan for how Melbourne and other cities along Australia's eastern seaboard can grow and compete

globally, city authorities from Melbourne and Sydney – with heavy backing from the private sector – have advised federal authorities that they are forming an alliance that will proceed with the development of a highly integrated megaregion. This megaregion will have access to affordable land and incorporate 21st century sustainability principles. It will adopt a region-wide, highly rigorous education curriculum to ensure the cities can adapt and compete in the competitive global economy. Furthermore, authorities advocate strongly for an extremely fast and convenient land transport system to be constructed relatively quickly.

The Economy

Key stakeholders failed to grasp the magnitude of changes that would unfold out to 2030. They did not adequately prepare Melbourne and its people for the 21st century, where technological advances would disrupt and reshape entire industries and the global political and economic centre of gravity would shift decidedly eastwards.

Melbourne and Australia's hesitation was in stark contrast to the innovative and dynamic cities in the region, including Singapore, Hong Kong, Shanghai, Bangalore and Seoul, cities that had an abundance of home-grown talent, as well as the capacity to attract foreign talent, to drive their thriving economies. These cities, and many others throughout the region, have transitioned their economies to take advantage of the new demand for skills and expertise. With lighter regulatory frameworks, firms operating throughout Asia's booming economies have become more competitive as they take advantage of automation, the Internet of Things, robotisation, artificial intelligence and big data analytics. Artificially intelligent robots now sit on the boards of some of the world's leading companies, while robotics and smart manufacturing have become commonplace.

Melbourne has slowly become a second-tier economy on the edge of a thriving Asia. While its traditional sectors perform soundly, the majority of highly-paid and exciting job opportunities with the world's leading firms are now found to the north. Failure to embrace the Fourth Industrial Revolution has meant that Melbourne-based businesses are unable to create as many highly-paid and rewarding positions, nor is the city able to attract multinational firms.

Melbourne's fortunes are mixed in this disorientating and highly complex environment. On the one hand, the City of Melbourne is depicted as one of the world's 'smart cities' – data on issues ranging from traffic congestion to air quality to noise are available in real time, while autonomous vehicles operate freely throughout the CBD. However, due to a lack of resources, implementation of these advanced technologies is not replicated throughout Greater Melbourne. Furthermore, failure to adequately equip the city's youth and labour force to meet the demands of businesses has meant the economy lacks the skills to drive it forward.

Roles requiring advanced computer skills are in high demand globally, including big data analysts, information security analysts and software developers. Melbourne has not produced enough individuals with these skills to encourage local and foreign firms to invest. These skills are not just being demanded within the ICT industry; there is accelerated demand for data analysis skills and ICT literacy by a host of industries including the media, entertainment, transport, logistics and professional services.

Melbourne's economy continues to grow, but is heavily reliant on its traditional sectors, including agriculture, education, tourism and professional services to drive this growth, even though the dead hand of regulation limits their full potential. As large swathes of Asia continue to grow at breakneck speed, including some of Australia's key trading partners, these traditional sectors continue to service the millions of people moving into the middle class.

In Melbourne's **manufacturing sector**, some innovative entrepreneurs and highly-skilled individuals make use of the technological advances that have become commonplace throughout Asia. Big data, robotics, production line simulation, 3D printing and predictive maintenance are used in these niche production facilities that set up shop in various pockets of Greater Melbourne. However, the lack of a sufficient network of smart suppliers means that even these manufacturers find it hard to optimise their processes and opportunities. In addition – and despite Australia's significantly weaker currency – the city's products mainly serve the domestic market because the major markets of Asia are applying penalty tariffs on products that have a large environmental footprint.

The entrepreneurial spirit of Australia's **farmers**, combined with the harsh realities around climate change, has ensured they have embraced advanced agricultural technologies. Investment in drones, precision agriculture, sensors, genetically modified crops, robots, and synthetic biology has seen them compete in delivering their produce to domestic and international markets. However, prohibitive government regulations continue to undermine the sector's capacity to achieve its full potential. A suite of unnecessary regulations concerning land use, competition policy, foreign investment and food labelling, combined with a lack of adequate investment in transport infrastructure, remain factors that inhibit further growth.

Globally, the **traditional banks** continue to struggle, and Australia's banks are no exception. Competing with the disruptive 'fintechs' is proving to be a near-impossible task for these large institutions. However, Melbourne's vibrant fintech sector – which emerged in the 2010s – remains globally relevant and competitive, while a range of new and innovative digital platforms have advanced the 'sharing economy'. That said, a series of court rulings stipulating that organisations operating in the 'gig' and 'sharing' economies must provide benefits to employees, including leave entitlements and superannuation, has dampened growth in these important parts of the economy.

The **education sector** continues to thrive as Asia grows. While many of Asia's top tertiary institutions have surpassed Melbourne's finest in terms of quality and service, the value of an Australian university degree remains appealing. Many Asian students stay at home to study, but such is the enormity of their burgeoning middle class, the demand for high-quality education services remains strong. Many of Melbourne's most talented students are undertaking their studies at Asian institutions, while others are opting for shorter courses and nanodegrees as companies seek 'just-in-time' skills. The rise in online learning has further compounded the competitive stresses. Melbourne's finest institutions are competing by merging with universities in Sydney and Brisbane, and creating partnerships with Asian higher education providers. Online courses in foreign languages flourish.

Some of the biggest advances have been seen in Melbourne's **healthcare sector**. Local facilities, along with the city's

dedicated specialists and practitioners, continue to serve the population well. The technological advances in this sector have been revolutionary, with people starting to lead longer and healthier lives. Life expectancy for Australians is now close to 100 years. Cures for many debilitating illnesses continue to be discovered. Scientists in China have made enormous progress in developing treatments for a range of diseases, including polio, Alzheimers and Ebola. Melbourne and Australia largely remain 'technology takers' in this field with advances predominantly occurring in Japan, India and China. Despite a decline in funding, the United States continues to make progress in medical research and development. As a consequence, there are some limits to Melburnians benefitting from the latest technological advances. Wealthy Melburnians with adequate private health cover are receiving advanced treatment but as the cutting-edge technologies remain relatively expensive and are therefore not widely available, some Melburnians relying on the public system can be waiting for years for certain advanced treatments. Melbourne's elderly are seeing more robots moving into their homes to help with tasks such as picking up groceries or taking out the rubbish. In the **biomedical research** sector, failure to attract adequate sources of funding and investment, combined with government-imposed immigration restrictions on skilled migrants, has left once-thriving Melbourne-based businesses unable to compete globally. This is compounded by local talent going to Asia, where high wages and adequate research funding are more readily available.

Melbourne remains an attractive **tourist destination**. Visitor numbers from India and Indonesia have grown markedly, with a steady increase of tourists arriving from other parts of South East Asia. Chinese visitor numbers remain strong. Melbourne's service offering remains sophisticated, with a wealth of cultural events and attractions, while the natural beauty outside the city, particularly along the Great Ocean Road, remains a drawcard.

Human Capital

Melbourne's population now exceeds six million people. The population growth has fuelled demand for property, as well as for a range of consumer goods and services. Yet the state's education system continues

to struggle to produce enough students equipped with the skills to thrive in a transformed economy. The country's ranking in primary and secondary mathematics and science dropped significantly in the 2010s and remains just inside the world's top 30. Students throughout the region fare far better. Singapore, South Korea and Japan continue to produce exceptionally talented students, while Chinese students have improved considerably and are now in the top 10 globally. Melbourne's universities remain reputable, but often find it hard to compete with the top universities in Asia, which have the added advantage of close relationships with leading industries in their regions. Through partnerships with Asian universities, and with more lucrative positions being found throughout the region, Melbourne has found that oftentimes the city's talented individuals, who go overseas for a couple of years to be exposed to the best and brightest, end up not returning other than to visit their families and friends.

A relatively small segment of Melbourne's young, mobile and highly-skilled 'creative class' has readily embraced the challenges; improving productivity by constantly innovating and bringing various value-adding technologies to market. This adds much needed dynamism to Melbourne's economy.

Part of a larger trend, leading cities with modern ICT infrastructure are witnessing the rise of the 'virtual worker', highly-skilled professionals working specifically for employers located in other advanced cities and regions. Importantly, this system works both ways and allows foreigners to bid for tasks and jobs in these same cities. Melbourne, with its relatively slow internet connectivity, cannot fully capitalise on this trend. Due to the enormous demand for highly-skilled talent in Asia, Australian organisations are forced to pay very high salaries to attract and retain talented employees to survive in the international competitive environment. In the 'war for talent', Melbourne is fighting with one hand tied behind its back.

In a city where the providers of intellectual and physical capital are leaving the 'rest' behind, just keeping up requires continuous upskilling and lifelong learning for those who have the capacity to do so. Others are simply falling behind. Governments are scrambling to find a balance between an open and productive economy against the backdrop of

rising inequality and discontent. Discussions around a universal minimum wage have become commonplace in the public debate.

Infrastructure and Urban Optimisation

After years of increasing strain on cities' abilities to house growing populations, the last five years have seen the compounding effect of technological innovations in smart and forward-thinking cities result in solutions to some of the critical challenges around transport and the associated housing affordability issues.

Although Melbourne has not kept pace with the leading cities of the world that have become urban laboratories and centres of innovation, Melbourne's inner suburbs continue to attract people and foreign investment for its relatively stable business climate, as well as rich cultural and sporting offering. Housing affordability, whether purchasing or renting, remains a headache for Melbourne's residents and policy makers. With investments from Asia largely geared towards apartment complexes, many young Australians are only able to enter the property market through apartment living.

Melbourne continues to build on the city's edge, where land is available, but infrastructure arrangements are not. This is resulting in ever-increasing spatial inequality in Melbourne. Spatial inequality is also reflected in the limited access to, and participation in, cultural activities in the outer suburbs.

Implementing just-in-time deliveries is out of the question for most businesses. Congestion still costs Melbourne's economy enormously as businesses struggle to compete in international markets. Residents and businesses are paying inflated prices for services that companies in other cities seem to be able to deliver seamlessly. In an Asian Century with exponential rates of innovation, Melbourne's value proposition for business is inadequate and costly.

Liveability

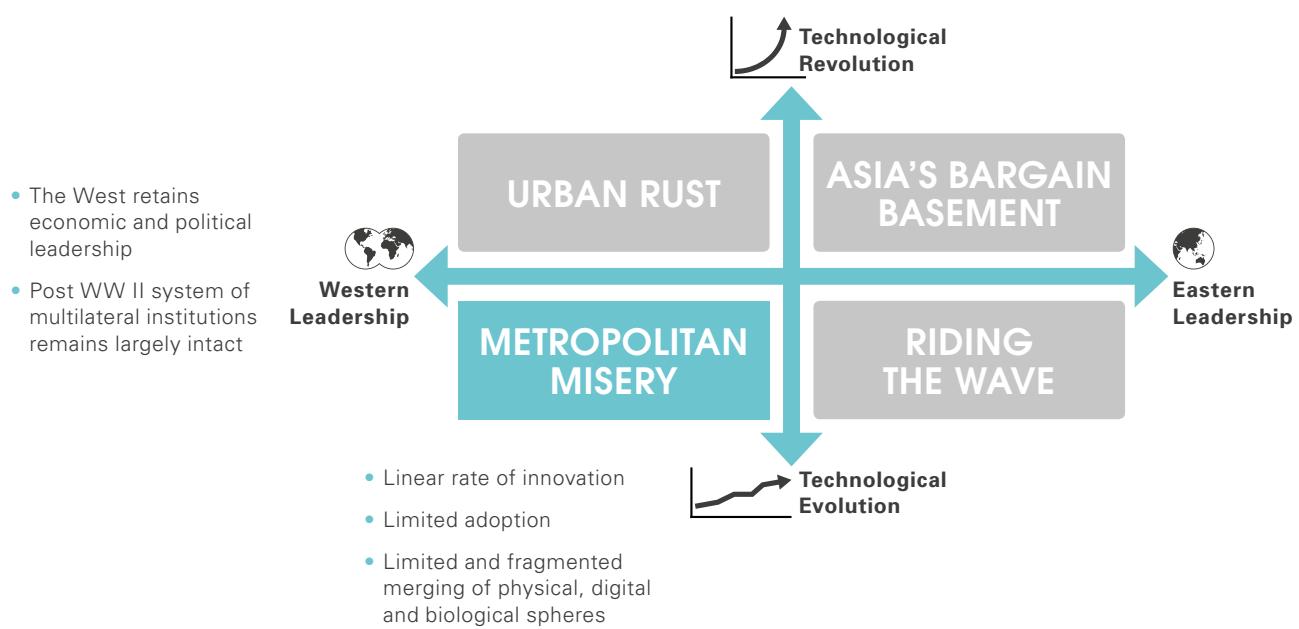
The effects of climate change are being felt acutely across the city. Lack of green spaces, particularly in Melbourne's west, is causing worsened heat island effects in these neighbourhoods. The rise in heat waves has increased the number of extreme fire weather days. Despite the deployment of technology which detects and warns

residents and authorities of impending bushfires, the scale and ferocity of bushfires around the state have increased, and they are now commonplace in spring and summer. Sizeable city resources, including human and financial, are called upon to help respond to these regular disasters. In 2021, the Yarra River flooded; causing widespread damage to property and businesses. The sizeable cost has divided the community about who should pay for the mitigation efforts. Since that episode, flood walls and flood gates have been installed to help avoid such a scenario from reoccurring. Coastal suburbs along Port Phillip Bay endure regular storm surges, while long-lasting periods of drought are common. Despite the reactivation of Melbourne's desalination plant, water scarcity remains a permanent threat. The social impacts of climate change are becoming pronounced. Mental health issues, chronic disease and alcohol misuse, have become more common and widespread among the community.

Melbourne's uneven economy has compounded the inner versus outer city divide, with gated communities now a common sight. Strong rhetoric and higher resource allocation have failed to truly fix the problem.

On the positive side of the ledger, Melbourne's arts and cultural scene remains vibrant and continues to attract many tourists. Regular high-quality theatre and musical productions remain a feature of the city, while its vibrant café and restaurant culture remains peerless throughout the country. Melbourne continues to host one of the four major tennis grand slams, the Australian Open, while the annual Formula One Grand Prix at Albert Park and the Spring Racing Carnival remain prominent features on the events calendar.

SCENARIO 3: “METROPOLITAN MISERY”



THE ROAD TO 2030...

The social and political polarisation and election of 'non-establishment' governments in the United States and some European countries heralded a period of protectionism in considerable parts of the West. Less trade with the West slowed the growth of many Asian economies. In the early 2020s, the detrimental effects of a more closed and protectionist economic climate led to the realisation that such policies were counterproductive. This realisation ignited a new period in which a return to cooperation and integration was made possible. The European Union strengthened its commercial and security ties with existing members and expanded its membership further eastward. The Transatlantic Trade and Investment Partnership, a trade agreement between the EU and the US, was signed and ratified, while the Trans-Pacific Partnership involving 12 Pacific Rim countries (excluding China) was eventually renegotiated and ratified.

In many Asian countries, diminished international trade aggravated structural and fundamental flaws in their economies and political systems, resulting in a prolonged period of social and economic unrest and instability. Authoritarian leaders in Beijing, for example, failed to reform the economy due to fear of political instability. The hoped-for transition from a production-driven to a consumer-led Chinese economy did not go as planned. State-owned enterprises

(SOEs) were flawed, while authorities failed to successfully re-structure the debt of local authorities and the SOEs. Domestic tensions led to increased tensions among Asian countries, primarily concerning commercial and territorial disputes. To compound matters, with less fresh water per capita than any other continent, disputes over this vital resource raised tensions between the countries along the Mekong and Indus rivers.

Reduced international trade produced an economic climate unfavourable towards rapid development of new technologies. This was severely compounded by persistent cyber-security issues and scandals around technological developments. The cross-border sharing of knowledge came to a halt, with contrasting international regulatory environments making development and marketisation of new technologies extremely costly and difficult. The prospect of robots and software taking over jobs and causing mass unemployment led to a popular backlash against such technologies. In the US, public pressure forced authorities to ban the implementation of automated trucks, noting that trucking was the biggest occupation in 29 states and one of the biggest in the country. Regulations hindering automation and other disruptive innovations dampened investor confidence in advanced technological sectors.

AUSTRALIA IN 2030

By 2017, Australia had marked 26 consecutive years of economic growth. However, that long run of success and prosperity abruptly ended in the early 2020s. Australian trade severely diminished as our key Asian trading partners contracted economically and turned inwards. Australia's economy is severely affected as it is not able to compete with resurgent transatlantic collaboration.

Disruptive technologies and innovative advances are slowed by a global popular backlash to "job-stealing technology" and cyber security concerns. Delays in adapting wide-ranging technologies that would underpin the Fourth Industrial Revolution have slowed economic progress. The slowdown in Asia also leads to a significant reduction in inbound investment. Australia's traditional role as the gateway to Asia has disappeared, while global investments are largely redirected to Europe and North America.

With Australia's economic fortunes closely tied to Asian growth, the country has gone into a severe and sustained recession. Key sectors of Melbourne's economy are dealt serious blows; education and corporate and financial services are among the hardest hit.

Climate change continues apace and is beyond Australia's influence, but has a strong impact on the country's infrastructure, and the liveability of its cities; a slow take-up of technology to mitigate its effects is compounding the problem.

Australia's economic output is increasingly driven from its major cities, with Melbourne and Sydney now the source of 55% of GDP.

Politics and regulation has bedevilled Australia's economic progress, with implications for Melbourne's status as the 'World's Most Liveable City'.

Pressure to change Australian governance arrangements to deal with these challenges increases and populism is on the rise. Australia votes to become a republic with its own head of state.

MELBOURNE IN 2030

Governance

Prominent analysts were concerned about the potential dangers of technological disruption to Melbourne's economic competitiveness. However, incremental technological change ensured that these fears did not materialise and the city continued to play to its traditional strengths. That all changed in 2019 with the Chinese Debt Crisis. Since the 2008 Global Financial Crisis (GFC), China went on a credit binge that saw debt rise twice as fast as its economic growth. With its financial stability tied to the stability of the Chinese Communist Party, no efforts were spared to keep things "under control." As a result, the severity of the crisis meant that much of the 2020s was lost trying to prevent the population's anger from boiling over and maintaining a hold on power. Across the continent, the Asian 'miracle' quickly turned to Asian 'misery'.

With Australia's economic fortunes closely tied to Asian growth, Australia went into a severe and sustained recession. Key sectors of Melbourne's economy suffered, with education and financial and corporate services among the most affected. The plunge of the Australian dollar meant that businesses and government scrambled to exploit opportunities in other markets, not only in Europe and the United States, but also the Middle East, Africa and Latin America. However, realigning Australia's export focus did not materialise overnight and unemployment reached new heights, particularly among Melbourne's youth.

Political pressure grew at all levels. Sound policy initiatives to boost economic growth were needed, but none were forthcoming. Fringe party representatives and independents blocked a raft of proposals arguing that they were a threat to the natural environment or undermined the rights of workers. As the country became increasingly insecure and polarised, prominent voices began calling for changes to how the country was governed. It was the Queen's passing that ignited this change; Australia voted to become a republic with its own head of state.

As part of this new arrangement, states and territories were abolished, while city authorities were granted greater control over their own destiny. The City of Melbourne

and surrounding local government authorities now play a greater role in managing economic and strategic development, policing, emergency services, transport and land use planning.

While the city's once lauded living standards have eroded, it is hoped that significant changes in governance arrangements will help meet the challenges. Melbourne increases its ties with cities across the globe to develop and implement best practice in areas ranging from urban optimisation to homelessness. The Australian President works closely with city authorities to roll out major capital works programs and deliver more efficient services.

The Economy

The Fourth Industrial Revolution turns out to be more of an *evolution*. The technological disruption witnessed in the 2010s turned chaotic. Starting with the cyber meddling of the 2016 US elections, cyber security quickly became a major concern for governments, business and society at large. The public is in no mood to step into cars controlled by computers or to invest in businesses reliant on networked algorithms to succeed.

Many of Melbourne's traditionally strong sectors are overly reliant on perpetual growth in Asia. Often viewed as 'the gateway to Asia', Australia was no longer considered a viable option for many multinational firms as their confidence in Asian markets cooled. Mass production processes still take place in Asia, but productivity gains have not continued as squabbling Asian governments throw up protectionist barriers, affecting the operation of their sophisticated supply chain networks. In this environment, many of Melbourne's sectors experience serious headwinds, with only a few able to stay competitive.

The **manufacturing sector** experiences mixed fortunes. On the one hand, the troubles in Asia saw some production return to more stable environments, including Melbourne. The low Australian dollar helps as well, but mass production does not return. The lower dollar was partly caused by the severe slowdown in the resources sector, which had tied its fortunes to growth in the emerging economies of Asia.

The slower and fragmented technological advances preclude any ground-breaking

developments in the **agriculture sector**, like the one witnessed during the 'Green Revolution' in the twentieth century. However, Melbourne's agricultural sector has been forced to innovate to improve agricultural yields and mitigate the effects of climate change. Reduced rainfall and higher temperatures in Victoria have led to more frequent and intense droughts and bush fires, as well as greater stress on water resources. Slowing growth in the demand for protein-rich foods in Asia has not led to a price drop in agricultural commodities as a changing climate has led to shortages in other parts of the globe. Victoria's produce continues to attract a premium because of its healthy and clean qualities.

The **Financial and corporate services** have experienced significant headwinds. The slowdown in the Australian economy because of the reversed fortunes in Asia has seen many businesses struggle. Furthermore, Asian investments in Melbourne – particularly in the property market – have cooled significantly. While the superannuation industry has had to report disappointing returns for some time because of their exposure to Australian and international share markets, the establishment of the modern Super industry in the 1980s and 1990s is still seen as a visionary initiative that serves Australia and Melbourne well, given the population's ever-increasing life expectancy.

Though the **education and training sector** in Melbourne remains highly regarded, Asia's economic malaise has precipitated a vast reduction in student enrolments from that region. Although the sector is working hard to attract students from other continents, the diversification of international student enrolments is not materialising overnight given that its prior efforts and investments primarily targeted Asian students. With over two-thirds of international students historically coming from Asia, the sector has had to undergo a dramatic realignment; Melbourne's universities have come together to pool resources and offerings to better coordinate and optimise the city's higher education value proposition to prospective international students. This is seeing some successes, but it is still a long way from replacing the lost enrolments from Asia. Furthermore, the relatively affordable online educational offerings from the world's top educational institutions in the United States

and the United Kingdom are injecting ample competition into an already contested international market. Fortunately, the strong reputation of Melbourne's institutions remains an important competitive advantage for the city.

The **tourism** sector is in a very different shape from the 2010s; Chinese visitor numbers, which used to be responsible for over a third of the sector's revenue, have slowed markedly. Although not yet nearly recovered, the sector's diversification strategy is starting to pay off, especially given the lower Australian dollar, which has made Australia a more attractive long-term destination for Europeans and North American retirees who enjoy the pleasant climate, and relative ease of travel. Climate change however has impacted the sector. Higher temperatures are extending the peak and shoulder seasons, but bushfires and droughts are negatively impacting ecosystems in and around Melbourne, including the ski resorts.

Healthcare and biomedical research is still an asset for Melbourne's economy. The Parkville precinct is one of the world's leading medical research clusters that attracts talent from domestic universities as well as overseas. Commercialisation is still a challenge, given Australia's relatively small market, but the sectoral ties developed over the years with some of the leading clusters in Boston, San Francisco and Cambridge are allowing research to continue. The city's public and private healthcare systems are still among the best in the world and have become a centre of excellence for age-related healthcare – an important feature of the city given the ageing populations in Australia and across many parts of the world.

Human Capital

Due to the lower than expected uptake of technology in societies across the world, the feared segregation of the job market between the 'haves' and 'have nots' did not eventuate as strongly as anticipated. However, highly skilled professionals still command a premium in an open and globally competitive economy where companies rely on the quality of their intellectual and creative capital. Melbourne's population has not grown as fast as was predicted by demographers in the 2010s – the economic difficulties have attracted far less skilled migrants and the city now has 5.5 million

inhabitants. It has become a challenge for Melbourne's businesses and other organisations to attract and retain talent due to the difficult economic times.

Biomedical research is one of the few sectors still able to attract international researchers, particularly the talented Asians who see little reason to stay in their home countries. Talent from North America and Europe is mostly here on a secondment from sister cities across these continents. Other sectors, however, are finding it much harder to find the necessary talent, despite the city's very high youth unemployment rates. A persistent and growing mismatch between the needs of employers and the skills of the workforce has appeared over the last couple of years. An alarmingly high number of companies report having positions open for more than six months. With many of Melbourne's young professionals venturing overseas, the city's talent management strategy needs a rethink.

The economic headwinds are making it hard to reach agreement on funding levels for primary and secondary education. All the while Australia's international student rankings in primary and secondary school continue to drop. The sharp reduction in the number of foreign students has forced many of the city's tertiary institutions to rescind some of their courses. All the signs are of a city that is not heading in a promising direction.

Infrastructure and Urban Optimisation

The slowdown in Asia exposed the highly leveraged households of Australia; record levels of household debt, including mortgages, credit cards, overdrafts and personal loans, have caused the housing bubble to burst. Cheap credit has come back to bite Australians now that the economy is unable to support continued growth in household incomes. While property prices have plummeted, high youth unemployment levels mean many young people live with their parents well into their 30s. With the pressure on Melbourne's housing stock tapering off due to the slower population growth and declining Asian investment, developments on the city's periphery have ground to a halt. Spatial inequality remains a concern. Lack of adequate infrastructure and job opportunities in Melbourne's once-booming growth corridors of Casey, Hume, Melton, Whittlesea and Wyndham, now see these areas suffering urban decay.

The building of transport infrastructure has not caught up with the city's rapid population growth of the 2010s and early 2020s. Congestion on the roads is costing the economy more than \$9 billion per year, while the associated stress on people's lives is compounding the problem. The city's public transport infrastructure does not fare much better. Lack of adequate investment to meet the demands of the growing population has meant the train system is severely strained, with services to the outer suburbs significantly reduced early in the evening.

The impacts of climate change are becoming a real headache for policymakers. Extreme weather events, including floods, have become a recurring feature in the suburbs along the Bay and the Yarra, forcing government and local councils to use limited funds to fight the elements. This is causing heated community debate about who should foot the bill for the costly mitigation efforts. The contracting economy is impacting our ability to deal with the various problems. The lack of funds for the upkeep of the city's green spaces is causing worsened heat island effects. In the outer suburbs, residents remain inside during the warmer months and choose to drive whenever they go out – even for their local coffee.

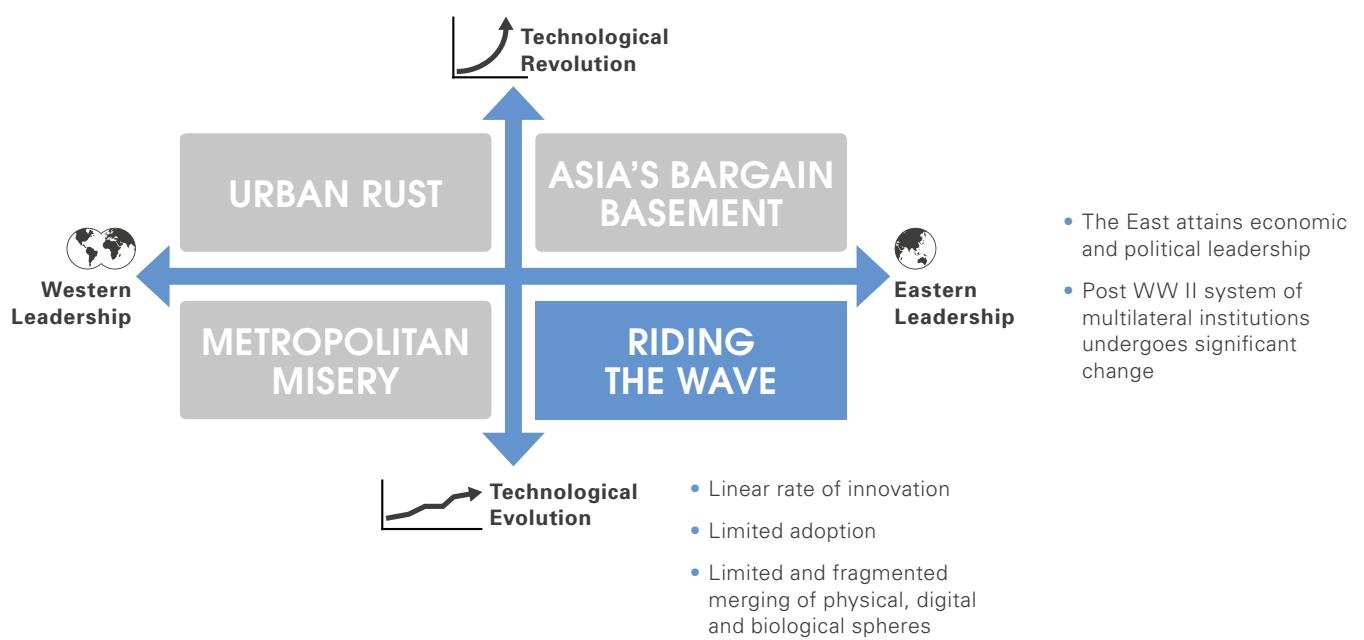
Liveability

No longer the 'World's Most Liveable City', what was long considered unimaginable is starting to become reality; Melbourne's liveability is in rapid decline. Unlike Detroit, which always knew that it was heavily dependent on the automobile industry, Melbourne did not sufficiently appreciate that its fortunes were so closely linked to that of its northern neighbours.

Rising levels of drug and alcohol misuse, as well as homelessness across the greater metropolitan region, have contributed to a surge in crime. Fear and anger is sweeping the city with more Melburnians than ever being affected by crime, either directly or indirectly through family and friends. The costs are significant, both for the economy and society in general. People now weigh the risks of going out to certain places, especially at night, or fear talking to strangers. Property damage has increased, forcing many victims, and even non-victims, to spend what disposable income they have on security measures, whether in the form of extra lighting, stronger locks or security alarms. Government authorities are also having to spend limited funds on additional security measures. In this environment, intolerance of criminals, particularly foreign-born criminals, is at an all-time high as large segments of society demand harsher sentencing for those convicted of summary offences.

Sporting facilities are not maintained and are becoming dilapidated, while the inner-city's arts and culture scene is a shade of its former self. Government funding cuts, along with a sharp decline in discretionary spending, have caused damage to many industry players and left the scene floundering. Similarly, the once-thriving restaurant scene – famous for its breadth, quality and experimentation – has seen many eateries go out of business.

SCENARIO 4: “RIDING THE WAVE”



THE ROAD TO 2030...

Social and political polarisation in Western countries had a crippling effect on their economies. Unstable markets drove capital towards the East, while a lack of coordination between Western governments contributed to the relative decline in global clout. Following the shock of 'Brexit' in 2016, repeated terrorist atrocities across key European Union member states, combined with mass refugee flows into the union, strongly polarised electorates across the continent. The Italian Banking Crisis of 2018 proved to be the final straw, resulting in a swift collapse of the European Union and ushering in a painful and turbulent time for individuals, businesses and governments across the continent. Combined with the ascendancy of the Trump Doctrine in the United States, in which the 'leader of the free world' retracted from the world order it helped to create, the period of Western dominance seems to have been a case of historical exceptionalism.

Protectionist policies in the West contributed to slower economic growth and a decline in technological innovation. The broad regulatory framework in Europe ended following the EU's collapse and was replaced by disparate regulatory environments across the continent, which only seemed to hinder technological advances and adoption. A lack of cooperation between knowledge institutions, businesses and governments lowered the rate of innovation and created a 'brain drain' to the East. Chaotic innovation, cyber security concerns, and safety scandals further caused the West to create barriers to the adoption of new and disruptive technologies.

Western leaders were chastised by their eastern counterparts for their cavalier approach to global trade. As it turned out, the woes in the West were a great motivator for the (emerging) economies in Asia to continue to grow. China effectively reformed its financial system and delivered further economic growth. India streamlined its regulatory environment, attracting greater amounts of foreign capital. Indonesia invested heavily in infrastructure and diversified its economy, while many South East Asian nations implemented anti-corruption measures which drove their economies forward. Top-down orchestrated schemes in many Asian countries fostered closer cooperation between businesses, tertiary institutions and governments. A longer-term investment focus provided fertile ground for Asian economies to successfully continue their production-driven models, while their growing (urbanised) middle classes concurrently became 'mature' consumers, which provided sustained economic stimulus. Much like the western response, government regulation stifled the high uptake of new technologies throughout Asia. Robotics, automation and artificial intelligence posed a major risk to the social stability in these societies. Government officials feared social disintegration, with revolution a real possibility, should millions of people be forced out of the workforce and be unable to make a living.

AUSTRALIA IN 2030

By 2017, Australia had marked 26 consecutive years of economic growth, which continued at a slow and steady pace out to 2030.

Australia's economic output is increasingly driven from its major cities, and Melbourne and Sydney are now the source of 55% of national GDP.

With the rapid decline of the West and the rise of the East, Australia is somewhat conflicted. Economically, it has capitalised on its links with a thriving Asia, but Australians are still coming to grips with the new world order.

As economic weight shifts, so does strategic weight. The United States has effectively disengaged from Asia. The resulting vacuum has been filled by China, which is increasingly creating facts on the ground at several strategic locations in the region based on historical claims. This has led to the creation of a new intra-Asian alliance to balance Chinese power.

Realising the vast dependence on the Chinese market, Australian state and federal governments are looking at diversifying trading arrangements regionally and globally. The decision is timely; Asia's economic strength, combined with rising levels of sophistication in many economic sectors, has made China, India and other key regional economies more competitive and less inclined to purchase Australian services.

The Fourth Industrial Revolution is more of an *evolution*, and the technological disruption far less than predicted.

Climate change continues apace and is beyond Australia's influence, but has a strong impact on the country's infrastructure and the liveability of its cities. A slow take up of technology to mitigate its effects compounds the problem.

Some sectors do relatively well in this environment, including construction, healthcare and biomedical research, agribusiness, tourism and aspects of education and training.

Politics and regulation however continue to bedevil Australia's competitiveness.

The status quo continues for governance arrangements at a time of profound geo-strategic change.

MELBOURNE IN 2030

Governance

For a while, several local observers were concerned about the potential dangers of technological disruption to Melbourne's economic competitiveness. While these fears have not materialised, Asia's unrelenting rise has seen it emerge as the epicentre of the global economy. For seventeen centuries – up until the first industrial revolution – Asia was responsible for approximately two-thirds of global economic output. By 2030 that historical equilibrium has been restored; home to nearly 60 per cent of the world's population and two-thirds of the global middle class, this is an Asia that is prosperous and confident. As such, the tyranny of distance – having shaped Australia's history since early settlement – has been supplanted by the promise of proximity. The opportunities in Asia are of historical proportions. However, having to a certain extent been insulated from competition for a long time, significant parts of Melbourne's economy are now also in the middle of the world's most lucrative and competitive regional playing field.

Victorian and Australian authorities are responding to meet these challenges. The completion of a suite of "open" trade agreements with many regional economies, including China, Japan, South Korea, Indonesia and India, enhanced the ability of local businesses to compete regionally. The Victorian government played a role in this development – doubling the number of trade missions regionally and, in conjunction with Austrade, establishing a *One Belt, One Road Department* to advise and help facilitate growth opportunities.

While closer engagement and integration with Asian markets presents enormous opportunities, governments at all levels recognise the need to avoid becoming subservient to powerful Asian economies. With the aid of state and federal governments, businesses now pursue greater opportunities in Africa, as well as Central and South America. The signing of Free Trade Agreements with Nigeria, Chile and Mexico certainly encouraged this. Melbourne's

wealth management and education providers serve a growing proportion of these markets, while our agricultural products and wine are obtaining greater market share.

The City of Melbourne remains an active member of the *C70* – a network of the world’s leading cities – to not only help address the impacts of climate change, but to collaborate on the implementation of ‘smart city’ technologies.

The Economy

As the Fourth Industrial Revolution turned out to be more of an *evolution*, the anticipated technological disruption did not eventuate to the extent predicted. However, the world of 2030 looks very different to the one of fifteen years ago. The shift to Asia was on the cards, but the profoundness of the shift was underestimated, perhaps because Australia has always been a part of the Commonwealth and viewed the world from a ‘Western’ perspective, or perhaps because the country underestimated the impact that Asia’s rise would have on its economic competitiveness.

Take **manufacturing** for example: for many years, companies from “advanced” economies had been comfortable outsourcing their low value-add production to emerging markets in Asia – the “world’s factory” – where labour was abundant and cheap. However, starting in China’s coastal areas, the Asian economies have relentlessly moved up the value chain and, given their often different (family) ownership structures, the companies in these economies can take a longer-term view of growth and investment. This allows them to focus on building leading positions as opposed to maximising (quarterly) earnings for shareholders. Having cut their teeth in difficult operating environments, these companies are more agile and have a natural advantage in the other fast-growing (emerging) markets. Having streamlined its regulatory environment, India – with its large, youthful population – has become the next big destination for manufacturing. Mass production, as well as advanced manufacturing, is dominated by the Asian economies. Smaller scale manufacturing still has its place in Australia and Melbourne; however, the return of mass employment in manufacturing has not taken place and is unlikely to do so again.

The **building and construction sector** in Melbourne is doing very well. The enormously wealthy upper and upper-middle classes in Asia continue to invest in Australia’s capital cities’ housing markets as a way of diversifying their vast investment portfolios. The associated local services sector has also enjoyed the benefits of riding this wave. At the same time, these investments have effectively shut out local first home buyers and young families from the property market in desirable locations such as the CBD and the eastern suburbs.

Melbourne’s **healthcare sector** is performing relatively well. The strong traditions of the local public and private healthcare sector mean that it is well set up to serve a largely domestic and ageing market. Nevertheless, the earlier ambition to make Melbourne a centre of excellence for medical tourism has not eventuated due to the enormous improvements that Asian healthcare industries have made in the last fifteen years. In fact, the improvements have been so significant that this is affecting Australia’s healthcare industry in unexpected ways as many domestic health insurers now send patients overseas to cheaper and better hospitals in Asia. India’s hospitals, for example, use learnings from the domestic market to carve out a strong market for medical tourism. Often referred to as ‘frugal’ or ‘downward’ innovation, they are doing more for less by using economies of scale and assembly-line techniques to re-engineer how heart surgery is performed while significantly improving the quality of the procedure at a vastly lower cost. Melbourne’s **biomedical research** capabilities are still well-regarded and provide the city with a strong niche sector. However, Asian economies have caught up and are increasingly attracting talented Australian researchers to earn a better living, while being exposed to cutting-edge research.

The **education and training sector** has continued to enjoy the benefits of Asia’s rise. The value of an Australian university degree is still well-regarded, and with its rising middle-classes, Asian institutions – many of which now set a global standard – are finding it hard to keep up with the enormous domestic demand. As a result, Melbourne’s tertiary education sector has continued to profit from Asian students, particularly through the links that have been forged with the Asian institutions that

see Australia's universities as a reliable partner in their efforts to accommodate the enormous domestic demand. Despite the strong competition from the 'old' and 'new' world's top institutions that are increasingly using their brand names online to fight in the previously less contested markets of Asia, Melbourne's universities have carved out a lucrative niche. Through mergers with other Australian universities, as well as partnerships with Asian universities, they have successfully aligned their practices with the demands of Asian students.

The local **financial services sector** did not capitalise on the Asian opportunities to the extent that the education sector did. While the domestic banking market has been good for a long time and continues to provide a solid customer base, sophisticated Asian competitors with deep pockets and a long-term view are successfully attracting Australian customers. The margins the domestic banking industry once enjoyed are gone. Similarly, Melbourne's superannuation industry did not fully capitalise on opportunities throughout Asia. However, a protective domestic regulatory environment allows Australian firms to hold their ground in the local market. Nevertheless, self-managed super funds are increasingly looking to participate in Asian investment vehicles that can attract some of the world's leading talent.

The **agricultural industry** is one sector that has witnessed innovative advances due to a combination of the entrepreneurial spirit of the Australian farmer and, importantly, the ever-increasing effects of climate change. Arable land around Melbourne is not only under pressure from a changing climate, but also from the ever-expanding city. Australian farmers are finding it hard to keep up with demand. Not only are there more mouths to feed in Australia, but Asia's rise means that Australian produce – which has an excellent reputation for clean and healthy qualities – is able to command a significant premium. This sustained windfall is great news for Victoria's agribusinesses, but is causing considerable strain on the poorer communities, which spend a disproportionately large part of their income trying to buy fresh produce.

Australia, Victoria and Melbourne are seen as great **tourist destinations**, particularly for Asian tourists, as the country has become a relatively inexpensive destination for them to

explore. However, the sector is contending with the increased effects of climate change, resulting in significant biodiversity loss. Furthermore, the building of accommodation is not keeping up with the enormous demand from Asia and, similar to the situation with food prices, this is making mid and high-level accommodation in Melbourne practically unaffordable. Camping holidays are growing in popularity for Australian families.

Human Capital

Mass automation has not led to the feared segregation of the job market between the 'haves' and 'have nots', although highly skilled professionals are earning high salaries in an open and highly competitive Asia-Pacific regional economy, where companies rely on the quality of their intellectual and creative capital. Despite not being the 'World's Most Liveable City' anymore, Melbourne regularly features in the top ten and is an attractive place to live and work, particularly for skilled professionals who can afford to live in the city's most attractive suburbs, where schooling and amenities are well provided for. A good portion of Melbourne's young professionals who venture overseas – mainly to Asia – tend to come back after gaining valuable experience to be closer to family and friends. Given the prolonged difficulties in Europe, migration from the 'old' continent has again picked up.

Despite having a proud history and tradition, the Victorian public and private education system has seen a slow but steady drop in global educational rankings, particularly when compared to regional competitors. Asian cultures, drawing on Confucian ethics, respect and value education both in terms of being inherently worthwhile and as a vehicle to gain status and wealth. This results in a focused environment where teachers – compared to those in Western countries – are held in high esteem and the expectation is that, with effort and ability, success is possible. The worrying trend of slipping educational standards back home is compounded by the fact that strong population growth in Melbourne's outer suburbs is often not matched by the provision of sufficient educational infrastructure.

Infrastructure and Urban Optimisation

With a growing population and greater competition from Asian investors and wealthy Australians, housing affordability has

continued to create great societal concern. In the late 2010s, the Federal Government belatedly made housing affordability a priority. However, many young Melburnians looking to purchase a home believe it is too little, too late. State and federal leadership on policy direction, strategic planning, land availability, taxation, infrastructure and workforce capacity has not been delivered.

The city continues to offer great amenities for all tastes and preferences. Melbourne's museums, art galleries and music festivals continue to add to the cultural atmosphere for which the city is renowned. Vibrant pedestrian precincts with shops, restaurants, apartments and offices located in the heart of Melbourne and along the inner-city edges continue to attract young professionals from around Australia and the world. Sporting lovers remain very well catered for in Melbourne. The MCG had a roof installed in the late 2020s, as well as a monorail linking it directly to Richmond Station and Flinders Street Station.

Overall though, access and mobility remain a concern. With underinvestment in transport infrastructure to manage growth, accessibility for individuals and families living in Melbourne's outer suburbs has become difficult. For all the progress in Melbourne's heart and inner suburbs, a spatial divide remains in the service offering between the inner city and outer suburbs. The inner city is highly valued for work and living, in large part because of government investment over decades on public transport and community services. More prominent public voices are commenting on rising locational disadvantage in which education, employment and community services are becoming ever less accessible for outer suburban residents.

State and federal governments have explored various avenues to fund upgrades to infrastructure which has deteriorated steadily. Budgetary constraints, combined with the limited public willingness to pay the taxes necessary for infrastructure upgrades, mean that public-private partnerships are common across Greater Melbourne. Fortunately, Melbourne's relative substandard internet connectivity has not cost the city as much as anticipated in competitive terms.

Liveability

Melbourne may not rank at the top of the global liveability rankings anymore, but remains a good place to live for those who can afford it. Housing affordability has become an ever-increasing headache. The 'Asian Century' has seen enormous wealth generated and accumulated with sizeable chunks of it finding its way into Melbourne's inner-city and eastern property markets. Property prices in these suburbs have skyrocketed and trickled down to surrounding areas. It is virtually impossible for local first home buyers and young families to enter the property market. As a result, Melbourne's rental market has experienced enormous demand, forcing the government to regularly review the Residential Tenancies Act to assist renters with sufficient longer-term housing security.

Aside from the issue of housing affordability, the city's economy underpins an acceptable standard of living for most of its residents. However, as with most democracies, politics often gets in the way of effective decision-making. Seeing the success of the Asian economies, national governments are increasingly criticised for having given up on real reforms. City governments are stepping into this role and are considered as more effective institutions for change.

Due to rising living standards throughout Asia, immigration from regional countries has slowed, but – reminiscent of the post-WW II period – more Europeans are making their way to Melbourne. The city's ability to effectively integrate different nationalities has once again proven invaluable, with the city's social cohesion a shining light for cities of comparable size. Diverse and multicultural, the city is a welcoming place with a relatively good safety track record. It continues to offer exceptional sporting, recreational, and cultural experiences. The Australian Open, the Australian Grand Prix and the Melbourne Cup continue to provide the city with a strong sporting brand.

Having been wedged between the East and the West since its founding, Australia's potential is once again the envy of many.

⑧ ACKNOWLEDGMENTS

For over 30 years, the Committee for Melbourne's influence has been built on the breadth, depth and calibre of our membership base. It is this collective strength that has been a major driving force behind the development and progress of our city.

Over the course of the Melbourne 4.0 process, we have captured the knowledge and expertise of our diverse membership.

The Committee for Melbourne would like to thank every individual involved in the Taskforce as well as the many subject matter experts who generously donated their time to provide expertise and perspective.

Below is an alphabetical list of the contributing individuals and members.

Steering Committee

Monique Dawson
Chief Executive Officer
Metropolitan Economic Development, DEDJTR

Krystal Evans
Chief Executive Officer
BioMelbourne Network

Lorenz Grollo
Chief Executive Officer
Grollo Group
Board Director
Committee for Melbourne

Toby Kent
Chief Resilience Officer
City of Melbourne

Prof Linda Kristjanson AO
Vice-Chancellor
Swinburne University

Martine Letts
Chief Executive Officer
Committee for Melbourne

Dr Magnus Moglia
Research Team Leader
CSIRO

Project Group

Kevin Begg
Technical Services Lead – Precinct Design and Urban Design
GHD

Monica George
Manager – Urban Development
GHD

Kylie Ling
Manager – Infrastructure Advisory
EY

Antony Maubach-Howard
Urban Designer
GHD

Sam Rowland
Market Leader – Property and Buildings Victoria
GHD

Ella Simmons
Law Graduate
Hall & Wilcox

Brett Van Duppen
Policy & Research Officer
Committee for Melbourne

Julian Vido
Employment & Industrial Relations Lawyer
Hall & Wilcox

Project Leader

Sander van Amelsvoort
Director, Policy & Research
Committee for Melbourne

Consulting partner

Jester

Taskforce Members		
AECOM	KJA	
Adshel	La Trobe University	
Airshuttle Commuter Express	McKinsey & Company	
Arts Centre Melbourne	Melbourne City Mission	
Arup	Melbourne Convention and Exhibition Centre	
Ashurst	Melbourne Recital Centre	
AusNet Services	Melbourne Water	
Bank of Melbourne	Metro Trains Melbourne	
Bates Smart	Monash University	
Bendigo Bank	NORTH Link	
BioMelbourne Network	Nous Group	
British Consulate-General, Melbourne	Peter MacCallum Cancer Centre	
Cabrini Foundation	Pitcher Partners	
Charter Keck Cramer	PwC Australia	
City of Melbourne	Royal Consulate General of Denmark	
City of Port Phillip	Royal Automobile Club of Victoria	
Citywide	RMIT University	
Clayton Utz	RPS	
Commonwealth Bank	Sofitel Melbourne On Collins	
Corrs Chambers Westgarth	Spolib	
CSIRO	Swinburne University	
Destination Melbourne	Telstra	
East End Theatre District	The Bank of Tokyo-Mitsubishi UFJ	
EY	The Big Issue	
Fed Square	The University of Melbourne	
GHD	The Walter & Eliza Hall Institute of Medical Research	
Grant Thornton	Urbis	
Grimshaw	Victoria University	
Grollo Group	Victorian Health Promotion Foundation (VicHealth)	
Hall & Wilcox	Victorian Planning Authority	
HASSELL	Yarra Valley Water	
Jo Fisher Executive	Youth Projects	
Keolis Downer (Yarra Trams)		

The Taskforce interviewed many subject matter experts who generously donated their time to provide their expertise and perspective.

Expert Interviewees

Meredith Angwin Partner Advisory EY	Alison Frame Deputy Secretary, Planning Policy, Strategy and Governance Department of Planning & Environment (NSW)
Paul Bassat Co-Founder Square Peg Capital	Roberto Garcia Senior Manager – HSE Climate Change and Sustainability Services EY
Hugh Bradlow Chief Scientist Telstra	Michael Georgeff Founder and Chief Executive Officer Precedence Health Care
Kathy Coultas Director, ICT / Tech Sector Development DEDJTR	Andrew Gordon Partner-Cyber, Information Technology and Services PwC Australia
Gerard Dalbosco Managing Partner – Melbourne EY Board Director Committee for Melbourne	Mark Gregory Associate Professor, School of Engineering Cluster RMIT University
Michael de Soyza Senior Manager Climate and Sustainability Services EY	Allan Gynell Adjunct Professor, Crawford School of Public Policy; Director, Crawford Australian Leadership Forum Australian National University
Tamara DiMatta Founder The New Joneses	Terrence Jeyaretnam Partner Climate Change & Sustainability Services EY
Alan Dupont Adjunct Professor of International Security University of New South Wales	Elizabeth Kinkade Executive Director, Planning Policy Department of Planning, NSW
Guy Edgar Senior Manager Climate Change & Sustainability Services EY	Joseph Lawrence Director, Industry Partnerships Monash University
Gareth Evans Chancellor Australian National University	

Expert Interviewees	
Vinnie Maharaj Project Manager Economic Development Strategic Projects DEDJTR	Phil Ruthven Founder & Director IBISWorld
John Marinopoulos Partner, Infrastructure and Urban Renewal PwC Australia	Darren Sanicki Director Sanicki Lawyers
Gerald Marion Partner Strategy and Customer Innovation EY	Renzo Scacco Director RMIT Activator
Zac McClelland Project Leader VicHyper	Vigi Selvan Consultant, Social Impact Advisory EY
Meg McDonald Director Australian Renewable Energy Agency	Bernard Shepherd Principal Consultant - Transport GHD
Paul Monk Principal Van Gelder & Monk	Ed Steane Director to the CEO Greater Sydney Commission
Jan Owen AM Chief Executive Officer Foundation for Young Australians	Matthew Tutty Executive Director, Strategy and Operations Telstra
Andrew Parker Partner, Asia Practice Leader PwC Australia	Michael Wesley Professor, International Relations; Dean, College of Asia and the Pacific Australian National University
Stuart Richardson Founder & Managing Partner Adventure Capital	Hugh White Professor of Strategic Studies, School of International, Political & Strategic Studies Australian National University
Richard Rigby Executive Director ANU China Institute	Taryn Williams Founder & Chief Executive Officer theright.fit
Carsten Rudolph Associate Professor, Faculty of IT Monash University	

⑨ BIBLIOGRAPHY

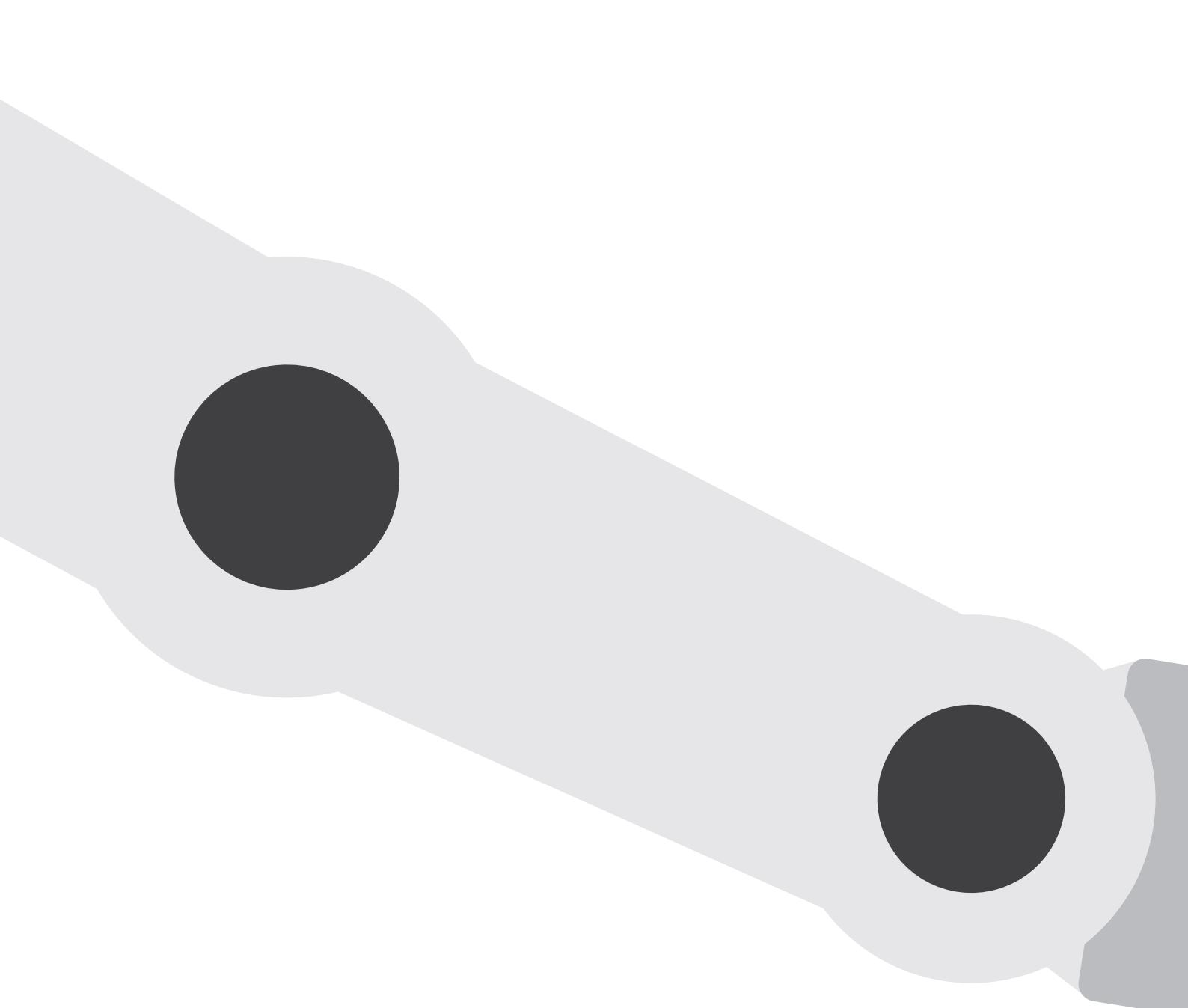
- Advanced Industries, *Automotive revolution-perspective towards 2030: How the convergence of disruptive technology-driven trends could transform the auto industry*, McKinsey & Company, January 2016
- America2050, *Megaregions*, america2050.org
- Andrews, D., Criscuolo, C., & Gal, P. N., *Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence From OECD Countries*, The Future of Productivity: Main Background Papers, OECD, 2015
- Arbelet, A. & Brown, D., *Artificial intelligence and the future of cyber-security*, SC Magazine London, 26 August 2016
- Atluri, V., Cordina, J., Mango, P. & Velamoor, S., *How tech-enabled consumers are reordering the healthcare landscape*, McKinsey & Company, 2016
- Australian Government DFAT Fact Sheet, *Victoria Export and Import figures 2014-2016*
- Bhens, S., Lau, L. & Sarrazin, H., *The new tech talent you need to succeed in digital*, McKinsey & Company, September 2016
- Business Council of Australia, *Building Australia's Comparative Advantages*, McKinsey & Company, 2014
- Association of Superannuation Funds Australia, *Superannuation Statistics December 2016*
- Australian Government, *Australia in the Asian Century*, White Paper 2012
- Australian Government, *Performance Review of the Australian Innovation, Science and Research System*, Innovation and Science Australia 2016
- Bughin, J., Manyika, J. & Woetzel, J., *A Future That Works: Automation, Employment and Productivity*, McKinsey Global Institute, 2017
- Carr, A., *Is Australia a Middle Power?*, Australian Journal of International Affairs, Vol 68 (1) 2014
- Carr, G., *The Future of Agriculture*, The Economist Technology Quarterly, June 2016
- Chellaney, B., *A Water war in Asia? The Strategist*, Australian Policy Institute, 30 November 2016
- Cheng, S., Daub, M., Domeyer, A. & Lundqvist M., *Using blockchain to improve data management in the public sector*, McKinsey & Company, 2017
- Christensen, A., *Melbourne and Sydney rivalry heats up over start-up scene*, The Sydney Morning Herald, 24 October 2016
- Chui, M., Manyika, J. & Miremadi, M., *Where machines could replace humans—and where they can't (yet)*, McKinsey Quarterly, July 2016
- Chui, M., Manyika, J. & Miremadi, M., *Four fundamentals of workplace automation*, McKinsey Quarterly, November 2015
- Citi GPS: Global Perspectives & Solutions, *Technology at Work v 2.0: The Future Is Not What It Used to Be*, Citi GPS, January 2016
- City of Melbourne, *Standard Industries*, accessed on 25 November 2016: www.melbourne.geografia.com.au/industries
- Committee for Melbourne, *Melbourne—a prosperous future: World-leading international student city*, 2015
- Committee for Sydney, *First among equals: Benchmarking Sydney's Performance*, 2016
- Compass, *The Global Startup Ecosystem Ranking 2015*, Startup Compass Inc.
- Cornell University, INSEAD, and the World Intellectual Property Organization, *The Global Innovation Index 2016: Winning with Global Innovation*, 2016
- Coumau, J-B., Furuhashi, H. & Sarrazin, H., *A smart home is where the bot is*, McKinsey Quarterly, January 2017
- Dawson, A., Hirt, M. & Scanlan, J., *The economic essentials of digital strategy: A supply and demand guide to digital disruption*, McKinsey Quarterly, March 2016
- Diamandis, P., *The World in 2025: 8 predictions for the next 10 years*, singularity.com, 11 May 2015
- Diamandis, P., *Exponential Technologies for Classrooms*, 21st Century Tech 2016

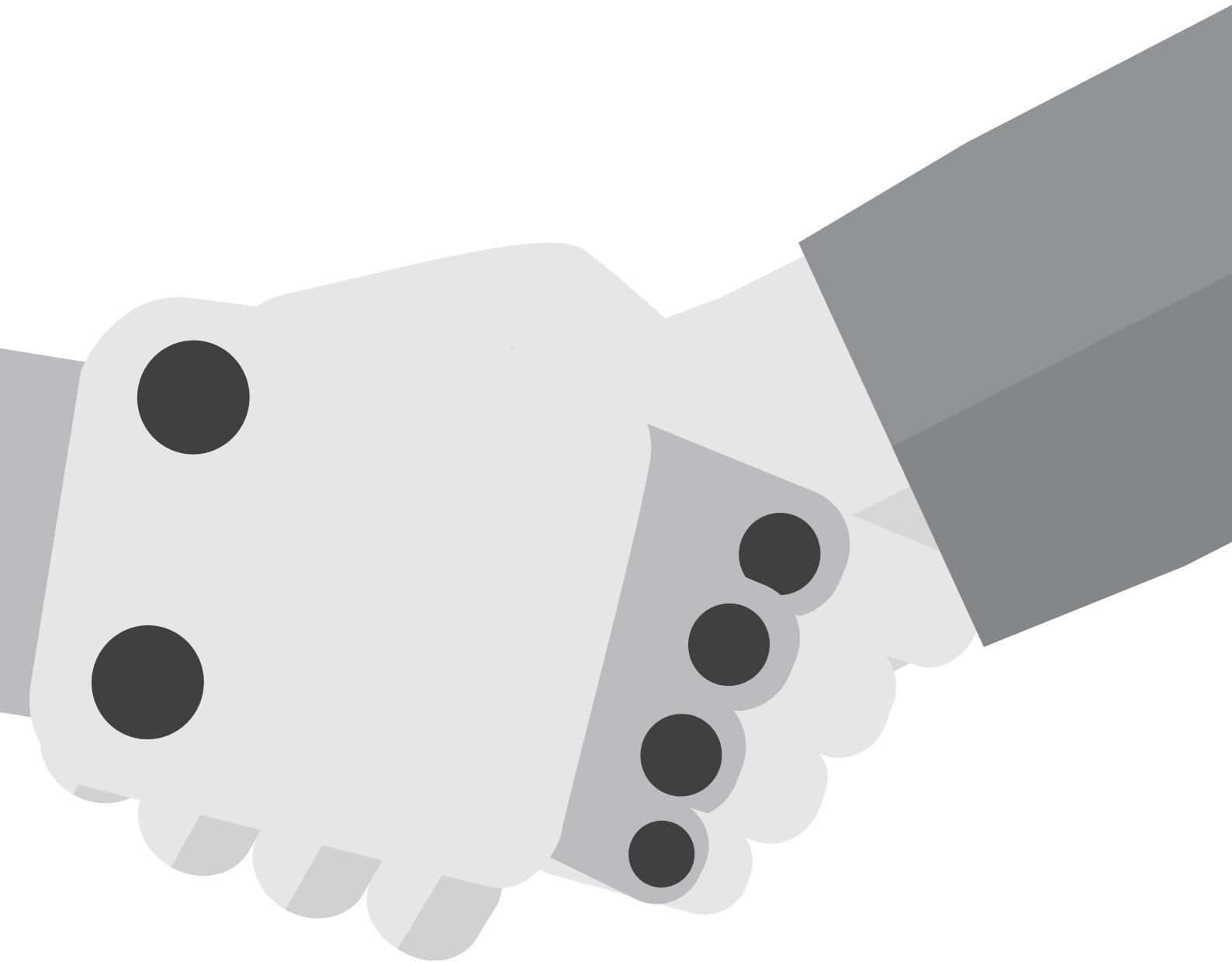
- Advanced Industries, *Automotive revolution-perspective towards 2030: How the convergence of disruptive technology-driven trends could transform the auto industry*, McKinsey & Company, January 2016
- America2050, *Megaregions*, america2050.org
- Andrews, D., Criscuolo, C., & Gal, P. N., *Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence From OECD Countries*, The Future of Productivity: Main Background Papers, OECD, 2015
- Arbelet, A. & Brown, D., *Artificial intelligence and the future of cyber-security*, SC Magazine London, 26 August 2016
- Atluri, V., Cordina, J., Mango, P. & Velamoor, S., *How tech-enabled consumers are reordering the healthcare landscape*, McKinsey & Company, 2016
- Australian Government DFAT Fact Sheet, *Victoria Export and Import figures 2014-2016*
- Bhens, S., Lau, L. & Sarrazin, H., *The new tech talent you need to succeed in digital*, McKinsey & Company, September 2016
- Business Council of Australia, *Building Australia's Comparative Advantages*, McKinsey & Company, 2014
- Association of Superannuation Funds Australia, *Superannuation Statistics December 2016*
- Australian Government, *Australia in the Asian Century*, White Paper 2012
- Australian Government, *Performance Review of the Australian Innovation, Science and Research System*, Innovation and Science Australia 2016
- Bughin, J., Manyika, J. & Woetzel, J., *A Future That Works: Automation, Employment and Productivity*, McKinsey Global Institute, 2017
- Carr, A., *Is Australia a Middle Power?*, Australian Journal of International Affairs, Vol 68 (1) 2014
- Carr, G., *The Future of Agriculture*, The Economist Technology Quarterly, June 2016
- Chellaney, B., *A Water war in Asia? The Strategist*, Australian Policy Institute, 30 November 2016
- Cheng, S., Daub, M., Domeyer, A. & Lundqvist M., *Using blockchain to improve data management in the public sector*, McKinsey & Company, 2017
- Christensen, A., *Melbourne and Sydney rivalry heats up over start-up scene*, The Sydney Morning Herald, 24 October 2016
- Chui, M., Manyika, J. & Miremadi, M., *Where machines could replace humans—and where they can't (yet)*, McKinsey Quarterly, July 2016
- Chui, M., Manyika, J. & Miremadi, M., *Four fundamentals of workplace automation*, McKinsey Quarterly, November 2015
- Citi GPS: Global Perspectives & Solutions, *Technology at Work v 2.0: The Future Is Not What It Used to Be*, Citi GPS, January 2016
- City of Melbourne, *Standard Industries*, accessed on 25 November 2016: www.melbourne.geografia.com.au/industries
- Committee for Melbourne, *Melbourne—a prosperous future: World-leading international student city*, 2015
- Committee for Sydney, *First among equals: Benchmarking Sydney's Performance*, 2016
- Compass, *The Global Startup Ecosystem Ranking 2015*, Startup Compass Inc.
- Cornell University, INSEAD, and the World Intellectual Property Organization, *The Global Innovation Index 2016: Winning with Global Innovation*, 2016
- Coumau, J.-B., Furuhashi, H. & Sarrazin, H., *A smart home is where the bot is*, McKinsey Quarterly, January 2017
- Dawson, A., Hirt, M. & Scanlan, J., *The economic essentials of digital strategy: A supply and demand guide to digital disruption*, McKinsey Quarterly, March 2016
- Desjardins, J., *The Largest Companies by Market Cap 2001-2016: The oil barons have been replaced by the whiz kids of Silicon Valley*, Visualcapitalist.com, 2016

- Diamandis, P., *The World in 2025: 8 predictions for the next 10 years*, singularity.com, 11 May 2015
- Diamandis, P., *Exponential Technologies for Classrooms*, 21st Century Tech 2016
- Dietz, M., Khanna, S., Olanrewaju, T. & Rajgopal, K., *Cutting through the noise around financial technology*, McKinsey & Company, 2016
- Dietz, M., Vinayak, HV. & Lee, G., *Bracing for seven critical changes as fintech matures*, McKinsey & Company, 2016
- Dodgson, M. & Gann, D., *There will be much less work in the future: We need to rethink our societies*, World Economic Forum, December 2016
- Donnelly, K., *Australia's great divide: who values education*, The Age, 9 February 2015
- European Commission, *Commission brings in top innovators to advise on a potential European Innovation Council*, 20 January 2017
- Evans, P., *Seven Possible Killer Apps for Blockchain & Digital Tokens*, Boston Consulting Group, 2016
- Evans, P. & Lanvin, B. (Eds), *The Global Talent Competitiveness Index 2017: Talent and Technology*, INSEAD, Fontainebleau, France
- EY, *Emerging technology trends: The road to the bank of the future*, EY Publication, 2015
- EY, *Is the gig economy a fleeting fad, or an enduring legacy?* EY Publication, 2016
- EY, *Profiling and defining the fintech sector*, FinTech Australia Census 2016, EY Publication
- Financial Review, *Boston CEO says Australia business must strive to lead digital revolution*, 24 June 2014
- Florida, R., Gulden, T. & Mellander, C., *The Rise of the Mega-Region*, University of Toronto, 2007
- Foundation for Young Australians, *The New Work Order: Ensuring Young Australians Have Skills and Experience for the Jobs of the Future, not the Past*, 2015
- GLENN—The census expert, *Migration in the last 5 years—focus on Victoria*, .id the population experts, 22 November 2011
- Government of Canada, *Driving Policy on a Shifting Terrain: Understanding the Changing Policy Environment Amid 21st-Century Complexity*, Policy Horizons Canada publications, 2012
- Government of Canada Metascan 2, *Building resilience in the transition to a digital economy and a networked society*, Policy Horizons Canada publications, 2012
- Government of Canada Metascan 3, *Emerging technologies: A foresight study exploring how emerging technologies will shape the economy and society and the challenges and opportunities they will create*, Policy Horizons Canada publications, 2013
- Govindarajan, V. & Bagla, G., *Understanding the Rise of Manufacturing in India*, Harvard Business Review, 18 September 2015
- Gray, A., *5 tech innovations that could save us from climate change*, World Economic Forum, 9 January 2017
- Hameed, A., *Why Patents Still Matter In The Era Of Open Innovation*, Law360, New York, 20 May 2016
- Hardy, E., *Driverless trucks threaten jobs in 'Trumpland'*, ABC news, 21 December 2016
- Hazan, J., Lang, N., Ulrich, P., Chua, J., Doubara, X. & Steffens, T., *Will autonomous vehicles derail trains?* The Boston Consulting Group, 2016
- Heath, A., *The Changing Nature of the Australian Workforce*, CEDA – Future Skills, 21 September 2016
- Jaipragas, B., *The Machines are coming: China's role in the future of artificial intelligence*, South China Morning Post, 31 December 2016
- Joerss, M., Neuhaus, F. & Schröder, J., *How customer demands are reshaping last-mile delivery*, McKinsey & Company, 2016
- Kaas, H., Mohr, D. & Collins, L., *Self-driving cars and the future of the auto sector*, McKinsey & Company, 2016

- Karras, J., *5 key ingredients to create a mega-region*, Urbanscale.com, 2014
- Khanna, P., *The End of the Nation State?*, The New York Times, 2013
- Katz, B. & Noring, L., *5 kinds of cities we'll see in the populist era*, Atlantic.com, 12 January 2017
- Le Grand, C., *Super-cities set to house two in three people*, The Australian, March 1, 2017
- Lee, K-F., *This is why China has the edge in artificial intelligence*, World Economic Forum, 12 January 2017
- Leiber, N., *Europe Bets on Robots to Help Care for Seniors: Mechanical aides can pick up groceries and take out the trash*, Bloomberg Business News, 18 March 2016
- Lui, S., *A non-sensationalist look at Australian internet speeds*, The Sydney Morning Herald, 25 March 2016
- Maddison, A., *The World Economy: A Millennial Perspective*, Development Centre Studies, OECD Publications, France 2001
- Mahbubani, K., *Yes, this is the Asian Century. But there's still cause for Western optimism*, World Economic Forum, 13 January 2017
- Maney, K., *Cheaper and smarter: Blowing up College with Nanodegrees*, Newsweek, 10 April 2015
- Martin, S., *Why we must embrace digital disruption and ensure no worker is left behind*, The Guardian, 22 September 2016
- McKinsey & Company, *Urban World–Cities' demographics: Australia insights*, 2016
- McKinsey & Company, *The technical potential for automation in the US*, 2016 McKinsey Global Institute, *Help wanted: The future of work in advanced economies*, McKinsey & Company, 2012
- McKinsey Global Institute, *Playing to Win: The New Global Competition for Corporate Profits*, McKinsey & Company, 2015
- McKinsey Global Institute, *Discussions on digital: The new war for talent*, McKinsey & Company, 2015
- Megalogenis, G., *Australia's second chance: What our history tells us about our future*, Hamish Hamilton, 2015.
- Melbourne Water, *Operating Environment Scan: Emerging Trends*, 2016
- Money Management, *Asian equities - eyes on the tigers*, accessed on 17 January 2017: www.moneymanagement.com.au
- Mulligan, M., *Australian households awash with debt: Barclays*, The Sydney Morning Herald, 16 March 2015
- Muggah, R., *America's dominance is over: By 2030, we'll have a handful of global powers*, World Economic Forum, 11 November 2016
- Muggah, R. & Barber, B., *Why cities rule the world*, TED 2016
- Muggah, R. & Zapata-Gareshe, E., *How cities are rewiring international affairs*, Devex, 3 August 2016
- National Intelligence Council, *Global Trends 2030: Alternative Worlds*, 2012
- National Intelligence Council, *Global Trends: Paradox of Progress*, 2017
- Nelson, A., *China to generate a quarter of electricity from wind power by 2030*, The Guardian, 21 June 2016
- Ottaviani, J., *Sydney to Melbourne in 55 minutes with Hyperloop Technology*, 8 February 2017
- Pezzini, M., *An Emerging Middle Class*, OECD Yearbook, 2012
- Pino, M., Boulay, M., Jouen, F. & Rigaud, A-S., *Are we ready for robots that care for us? Attitudes and opinions of older adults toward socially assistive robots*, Frontiers in Aging Neuroscience, 2015
- Porter, M. E., *The Competitive Advantage of Nations*, Harvard Business Review, 1990
- PwC, *Bending the Cost Curve: Emerging International Best Practices*, 2011
- PwC, *Cities of opportunity*, PricewaterhouseCoopers Australia, 2016
- PwC, *Going beyond reshoring to right-shoring*, PricewaterhouseCoopers US, 2013

- PwC, *Passing us by: Why Australian businesses are missing the Asian opportunity. And what they can do about it*, PricewaterhouseCoopers Australia, 2014
- PwC, *The rise of China's silicon dragon*, PwC Experience Centre, China and Hong Kong, 2016
- Quirk, B., *The four forces that make cities successful*, New Local Government Network, September 2016
- Rohozinski, R. & Muggah, R., *Brace for the Qualified Society*, Opencanada.org, 2015
- Ruthven, P., *In search of a more rational world*, IBISWorld Newsletter, February 2017
- Salt, B., *US businesses show us how to get it done*, The Australian, 16 February 2017
- Schwab, K., *The Fourth Industrial Revolution: what it means, how to respond*, World Economic Forum, 14 January 2016
- The Economist, *Special Report on Tech Start-ups*, January 2014
- SGS Economics and Planning, *Australian Cities Accounts 2015-2016*, accessed on 23 November 2016: www.sgs.com.au
- Slattery, C., *RMIT's Hyperloop prototype could one day shave Sydney to Melbourne travel to 50 minutes*, The Age, 22 November 2016
- Slezak, M., *China cementing global dominance of renewable energy and technology*, The Guardian, 6 January 2017
- SuperGuide, *SMSF investment Three most popular asset classes, and the rest*, accessed on 17 January 2017: www.superguide.com.au
- The Economist, *The great divergence: A group of elite firms has established a sustained lead. This is not a good thing*, economist.com.au, 12 November 2016
- The Economist, *Adidas's high-tech factory brings production back to Germany: Making trainers with robots and 3D printers*, 14 January 2017
- Trujillo, J. & Parilla, J., *Redefining Global Cities: The seven types of global metro economies*, Global Cities Initiative, 2016
- Turner, G. & Nugent, J., *International Linkages of the Australian Banking System: Implications for Financial stability*, Paper presented at 20th Melbourne Money and Finance Conference, 2015
- United Nations, *World Urbanization Prospects: The 2014 Revision*, 2014
- United Nations, *Population 2030: Demographic Challenges and Opportunities for Sustainable Development Planning*, New York 2015
- University of Melbourne, *Appetite for change: Global warming impacts on food and farming regions in Australia*, Melbourne Sustainable Society Institute, 2015
- Victorian State Government, *Department of Business and Innovation*, Industry Atlas of Victoria, October 2011
- Victorian State Government, Department of Treasury and Finance, *DataVic Access Policy Guidelines for the Victorian public sector* (version 2), August 2015
- Victorian State Government, Trade and Investment Victoria, *Statistics: Greater Melbourne Demographics*, accessed on 25 November 2016: www.invest.vic.gov.au
- Victorian State Government, Environment, Land, Water & Planning, *International visitation and expenditure in Victoria: Year ending September 2016*
- Victorian State Government, Environment, Land, Water & Planning, *Victoria in Future 2016: Population and household projections to 2051*, 2016
- World Economic Forum, *The Future of Financial Services: How disruptive innovations are reshaping the way financial services are structured, provisioned and consumed*, report prepared in collaboration with Deloitte, 2015
- World Economic Forum, *Deep Shift Technology Tipping Points and Societal Impact*, 2015
- World Economic Forum, *The Global Competitiveness Index: Historical Dataset 2005-2015*, 2015





COMMITTEE
MELBOURNE FOR
MELBOURNE 4.0